

PRELIMINARY DRAFT

CENTRE FOR LATIN AMERICAN MONETARY STUDIES

SAVINGS, INVESTMENT AND UNCERTAINTY IN
LATIN AMERICA

FLAVIA RODRIGUEZ

MEXICO CITY, NOVEMBER 1988

INDEX

	Page
INTRODUCTION	3
I SAVINGS IN LATIN AMERICA	6
a) Background	6
b) Inflation and the Financial System	10
II EXTERNAL DEBT, RECESSION AND INFLATION	15
a) Description of the Model	16
b) Results of Calculations	20
III INVESTMENT, RISKS AND RETURNS	24
a) Consumption and Investment	24
b) Portfolio Analysis	26
IV RISKS AND THE FINANCIAL SYSTEM	31
a) Savings and Unsystematic risk	31
1) Fixed interest assets	32
2) Stocks	38
b) Institutional Savings	42
V CONCLUSIONS	45
BIBLIOGRAPHY	
APPENDIX	

INTRODUCTION

The financial crisis that Latin America has been experiencing since the early 1980's has led to a sharp decline in regional investment rates to levels comparable only to those prior to the Second World War.

Given the importance that investment has for the present and future economic development of the region, and the burden on Latin American countries to service their external debt, the need to increase regional savings and to retain the savings being generated at present inside the countries of origin, avoiding capital flight, has become greater.

This paper analyses what have been the main factors that have helped to increase domestic savings in the region, on both macro and microeconomic levels, in order to be able to evaluate them and consider measures that can be adopted to encourage savers and investors to increase their savings and keep them within the region.

To do this, the behaviour and determinants of savings in Latin America are studied. It is argued that savings are positively related to economic growth and to macroeconomic stability, and have a negative relation to inflation and

certainty, and that the interest rate has not played a major role in the incentive to save.

The paper also argues that external transfers to service their external debt are the main cause of the present uncertainty in these economies, and one of the main reasons why inflation cannot be controlled in spite of the different adjustment programs that have been implemented in the region. This is analysed and quantified by means of a simple econometric model.

On the subject of investment decisions, this work shows that, in accordance with portfolio theory, a rational Latin American investor would have part of his portfolio invested in foreign assets, or foreign exchange denominated assets. It also demonstrates that, due to the uncertainty of returns and the risk involved in fixed capital investments, very few or none of these would be included in his portfolio.

The paper is divided into four parts. The first analyses the relationship between, on the one hand, savings in Latin America and macroeconomic stability and inflation. In the second part, the influence of negative external transfers on current regional inflation is estimated. The third section studies investment options in Latin America within the framework of portfolio theory, while in the fourth part, some comments are made on the possibility of improving the financial instruments

for attracting deposits in the region, and some possible alternative policies for increasing savings are suggested. The paper closes with conclusions and some final remarks.

A sample of six countries is considered: three with serious external debt problems -Argentina, Brazil and Mexico- and three with comparatively less problems with the debt service -Colombia, Chile and Venezuela-.

I SAVINGS IN LATIN AMERICA

a) Background

The importance that external savings have had in the investment performance of the six sample countries can be seen clearly from Table 1, that shows total gross investment and its sources of financing for the period 1972-1982. As an average, external savings accounted for about 16% of the resources that financed total investment, varying between 44.3% in the case of Chile, to proportions of only 4.0% and 4.6% in Venezuela and Argentina, respectively.

However, since 1982 international credit markets have been closed to the region leaving the countries without resources, because interest on the external debt is being paid out of domestic savings. This means that domestic savings earmarked for investment must be increased, not only to take the place of what is not being received from outside, but also to pay for external transfers.

Until now it has not been possible to achieve this, as can be seen from Table 2 that shows the main economic indicators for Latin America and the Caribbean. GDP growth has declined sharply since 1982, with the average growth rate of the eighties falling

Table No.1

Gross Capital Formation and its Sources of Financing
in Selected Countries
(1972-1982)

(Millions of dollars at current prices)

Countries	Investment	External Savings	National Savings	External Savings/ Investment (%)
Argentina	207.063	9.550	197.513	4.6
Brazil	476.614	88.419	388.195	18.6
Chile	30.273	13.408	16.865	44.3
Colombia	45.766	4.697	41.069	10.3
Mexico	314.664	51.150	263.514	16.3
Venezuela	129.631	5.208	124.423	4.0

SOURCES: Investment: UNO, National Account Yearbook, 1982;
External Savings: ECLA, Anuario Estadístico de América Latina,
1981, 1983, 1984.

Table no.2

Main Economic Indicators of Latin America and the Caribbean

	Average 1970-79	Average 1980-87	1980	1981	1982	1983	1984	1985	1986	1987
Real GDP Growth a/	5.7	2.0	6.1	0.2	-1.0	-2.5	3.5	3.1	4.0	2.3
Per Capita Real GDP Growth a/	3.1	-0.4	2.8	-1.9	-3.5	-4.5	1.2	0.8	1.7	0.1
Gross Capital Formation b/	23.5	19.3	23.4	22.8	20.7	17.0	17.1	17.6	18.3	17.6
Consumer Prices Weighted Average a/	34.8	98.1	54.8	60.7	66.8	108.2	131.9	143.2	88.4	130.8
Terms of Trade a/	3.8	-2.1	7.2	-4.4	-4.8	-3.0	3.8	-2.8	-14.2	1.2
Total External Debt c/			242.2	295.5	332.0	359.7	376.9	386.4	399.4	418.1
Interest Payments c/			26.4	38.6	45.8	40.6	44.3	42.0	36.5	33.5

NOTES : a/ Annual changes, in percent;
b/ In percentage of GDP;
c/ US\$ billions.

SOURCES: IMF, World Economic Outlook and International Financial Statistics, various issues;
World Bank, World Debt Tables, 1987-1988 Edition.

3.7 percentage points relative to that of the seventies; on the other hand, gross capital formation has fallen by approximately six points in relation to GDP since 1980. This is even more serious if it is borne in mind that a much lower GDP growth has been registered in the 1980's.

The data in Table 2 also shows the fact that per capita GDP has declined in the eighties to a negative average growth for the period. Also shown is the considerable surge of inflation in the region during this last period to unprecedented levels, increasing 63 points relative to the average inflation of the 1970's.

Since the countries of the region are unable to increase domestic savings enough to both grow and pay, it is necessary to find out what have been the most important determinant of savings and what are the negative effects that have influenced its behaviour in the past.

Table 3 shows that the growth of the financial system of the six sample countries, as represented by the growth of their M2 and M3 monetary aggregates has been largely associated with the growth in GDP in the last seventeen years, and also negatively related to the increase in inflation. It could be seen that from 1982 to 1987 the average real growth of M2 and M3 declined sharply relative to the previous period in all countries, except

Table No. 3

Real Growth Rates of GDP, Inflation, and Real
Growth of M2 and M3 in Selected Countries

(Percentages)

	1971	1972	1973	1974	Average 1975-1977	1978	1979	1980	1981	Average 1982-1987
Argentina										
DReal GDP	3.7	4.5	6.0	6.8	-0.13	-3.4	6.8	0.9	-6.3	0.59
DIPC	34.8	58.4	61.5	23.5	266.67	175.5	163.2	100.0	104.0	338.27
DM2	-1.2	-0.4	28.9	33.4	-2.60	-4.4	14.1	-6.7	-2.3	-3.20
DM3	1.0	-5.1	19.5	25.9	0.87	3.0	14.0	-6.8	-2.3	-2.51
Brazil										
DReal GDP	12.2	10.9	13.5	9.7	6.19	4.8	7.2	9.1	-3.3	3.87
DIPC	20.3	16.4	12.8	27.6	38.24	38.7	52.7	82.8	105.6	173.10
DM2	-7.7	23.1	28.6	4.0	3.50	9.0	12.6	-11.0	-9.2	7.16
DM3	n.d.	n.d.	34.5	7.2	10.20	9.3	9.3	-7.8	18.4	15.51
Chile										
DReal GDP	9.0	-1.2	-5.6	1.0	0.16	8.2	8.3	7.8	5.5	0.89
DIPC	19.0	77.3	354.5	504.5	226.20	40.1	33.3	35.1	19.7	21.16
DM2	68.1	39.4	26.0	-27.5	-6.63	36.2	24.7	33.4	21.5	0.72
DM3	73.4	53.8	28.3	14.1	-13.40	6.6	22.8	17.2	33.2	4.05
Colombia										
DReal GDP	5.8	7.8	7.1	6.0	4.40	8.0	5.4	4.1	2.3	3.24
DIPC	9.0	14.3	22.8	24.4	24.37	17.4	24.6	26.6	27.5	21.12
DM2	3.9	13.0	9.7	0.8	5.00	7.7	-1.5	14.8	6.2	5.10
DM3	5.8	8.6	9.0	-0.6	9.37	10.5	0.8	17.7	8.0	5.62
Mexico										
DReal GDP	3.4	7.3	7.6	5.9	2.97	6.6	9.2	8.3	8.0	0.73
DIPC	5.4	5.0	12.0	23.7	19.97	17.4	18.0	26.4	27.9	83.69
DM2	2.2	12.0	12.8	-2.3	32.73	13.3	14.9	8.1	16.8	-4.27
DM3	10.0	10.3	-1.6	-4.8	3.87	8.9	24.1	8.4	5.1	2.20
Venezuela										
DReal GDP	4.5	3.0	6.7	5.8	6.47	5.8	1.3	-2.0	-0.3	0.38
DIPC	3.2	2.9	4.1	8.2	8.57	7.2	12.4	21.5	16.0	13.20
DM2	13.2	18.9	15.5	23.1	23.10	8.0	-5.7	-2.9	0.2	5.12
DM3	14.8	21.5	16.1	16.5	23.20	9.2	-0.7	-3.8	-0.2	0.77

SOURCES: Banco Central de la República Argentina, Bulletin of Statistics, various issues;
 Banco do Brasil, Monthly Bulletin, various issues;
 Banco Central de Chile, Monthly Bulletin, various issues;
 Banco de la República (Colombia), Monthly Bulletin, various issues;
 Banco de México, Economics Indicators, various issues;
 Banco Central de Venezuela, Monthly Bulletin, various issues;
 International Monetary Fund, International Financial Statistics, various issues.

in the case of Brazil, while at the same time inflation accelerated and GDP declined.

This Table supports those analysts who maintain that one of the great enemies of financial development is inflation, which has been endemic in several countries of the region for many years (Argentina, Bolivia, Brazil and Chile).

One the causes to which the persistence of inflation is attributed -in spite of the many adjustment programs that have been implemented and are still being introduced in Latin America- are the big spending policies pursued by the Government of these countries. The continuous adjustment programs adopted to control inflation only caused more uncertainty in the private sector, since the appropriate corrective measures were not taken.

Among the stabilisation programs implemented, the liberalisation experiences carried through in Chile and Argentina between 1978 and 1981 are worth mentioning because of the high cost to the financial systems of these countries, although their aim was to accelerate their développement.

Among the most important measures adopted in these programs was financial liberalisation through a reduction in required reserves, and market interest rates. In addition, restrictive policies were applied to domestic credit, leading to a

considerable increase in real interest rates in both countries during the period 1979-1981, as shown in Table 4. What is interesting for the purpose of this study is to relate these increases of the interest rate to changes in the M2 and M3 growth rate shown in Table 3.

As this table shows, bank deposits grew in Argentina only during 1979, the same year when GDP registered a high rate of real growth. Conversely, deposits declined in the other two years (1980-1981) of the liberalisation experiment. In this same period, Chile experienced a high growth in deposits, but it can also be seen that during these years there was a high rate of growth of GDP while inflation was kept under control.

Table 3 also shows that in Argentina, during the years 1973-1974, and in Chile during 1971-1972, savings were higher than in the period when the liberalisation policies were being applied. This can be interpreted as meaning that savers respond more to economic growth and macroeconomic stability than to high rates of interest, since in the periods mentioned interest rates were negative in real terms. This is supported by the figures for the other countries in Tables 3 and 4, where it can be clearly seen that the real rates of interest were negative for long periods, but bank deposits rose to high levels when the GDP was growing and inflation was under control.

Table No.4

Real Rates of Interest 1/
in Selected Countries

(Percentages)

	Argentina	Brasil	Chile	Colombia	Mexico a/	Mexico b/	Venezuela
1970	-4.80	-3.56	-22.70	-2.50	-0.40	3.61	1.40
1971	-17.10	-1.94	-13.40	-4.50	-0.60	3.16	0.80
1972	-25.80	-0.41	-41.90	-6.20	-0.20	2.78	1.10
1973	-27.40	0.93	-77.30	-11.40	-6.70	-2.90	-0.10
1974	-7.00	-9.23	-64.00	-12.40	-15.50	-12.09	-3.90
1975	-58.20	-8.33	-1.50	-10.70	-9.10	-5.43	-5.60
1976	-64.80	-8.32	-4.50	-2.90	-9.80	-6.74	-2.90
1977	-23.30	-7.98	0.90	-12.00	-19.10	-16.34	-2.60
1978	-15.40	-3.04	16.40	-2.60	-11.00	-5.45	-2.10
1979	-15.40	-13.16	11.30	-8.60	-11.40	-1.60	-4.50
1980	-11.60	-25.92	-2.20	-4.40	-17.30	-0.97	-1.51
1981	12.30	-8.21	12.50	-5.10	-18.30	-2.05	2.16
1982	-15.10	6.07	27.20	-2.90	-24.50	-5.69	4.90
1983	-12.00	11.10	-1.80	1.03	-40.50	-23.33	7.30
1984	-9.45	-28.64	10.25	4.23	-27.51	-12.05	1.29
1985	-56.14	-37.08	2.76	-2.46	-23.93	4.78	-1.29
1986	-10.79	-23.54	3.35	1.76	-35.56	2.13	-1.41
1987	-5.63	-23.13	7.31	-1.84	-48.24	-6.94	-14.22

i - DCPI

NOTES: 1/ Formula used: $r = \frac{i - DCPI}{1 + DCPI} \times 100$;

DCPI = Variations in the Consumer Price Index;
 Argentina: Rate payable at 90 days; Bulletin of Statistics;
 Brazil : Rate for National Treasury bills; Monthly Bulletin;
 Chile : Rate payable at 30-89 days; Monthly Bulletin;
 Colombia : Savings deposit rate; Annual Report;
 Mexico : a/ Savings account rate; Economic Indicators;
 b/ One month deposit rate; Economic Indicators;
 Venezuela: Savings certificate rate; Economic Report.

The analysis made before, in the sense that there is no clear relationship between real rates of interest and deposits, is not corroborated by some empirical works that support the view that the interest elasticity of savings is significant in developing countries,¹ but Giovanini (1983), using the same data as one of these works, did not find evidence of the responsiveness of savings to changes in the real rates of interest. He attributed the success of the findings of the mentioned researchs to the use of data on countries where financial reforms were experienced, with associated large portfolio shifts on the part of the private sector, and drastic swings in the government budget. When the data for a longer period is used, the hypothesis tested is rejected. Also, a previous work, the report by Gurley, Patrick and Shaw (1965) shows skepticism about the effectiveness of high interest rate policies in increasing private savings.

So, although this section does not include a formal analysis, the data studied presents more support for the hypothesis that financial savings in Latin America have responded more favorable to economic stability than to high real interest rate, and that inflation has been its main deterrent.

b) Inflation and the financial System

1. See for example the works of Fry (1981) and Balassa (1983)

The negative effect of inflation on bank deposits is due to the large number of distortions it creates in the functioning of the financial system and to the uncertainty it brings to the expected returns on economic agents.

The distortions that inflation creates in the financial system include the following:

1. It affects the relative returns on the different instruments attracting resources, favouring short term ones to the detriment of long term ones. Consequently, the liquidity level of the financial system increases and its role as arbiter of terms between borrowing and lending operations becomes more difficult.

2. It affects the different types of financial institutions; those offering long term financing are the ones to be affected the most, as they may have their portfolios in fixed interest loans, especially when there is no historical record of inflation, and thus incur in great losses.

3. As levels of inflation grow, so does the variability of the monthly inflation rates and the possibilities of arbitrage among different types of deposit instruments increase. For example, the incentive to hold currency and demand deposits is

reduced and short term interest paying deposits increase.

4. The shorter deposit terms drastically reduce the funds available for the financing of long term investment projects and raise their cost, tending to push up the nominal interest rates.

5. The use of nominal interest rates that include adjustment for inflation in conjunction with credit practices that originated in times of stable prices gives rise to severe distortions and to the shortening of terms for credit operations when assessed in real terms. This arises the risk of default on the part of debtors and therefore increase portfolio risk for financial institutions.

6. Regulations on the investment and use of bank's capital and on the lending interest rate can lead to a process of decreasing capitalisation when returns on these assets are insufficient to protect their capital from inflation, increasing the risk of bankruptcy.

7. Institutional savings are seriously affected when their returns are eroded by inflation. For example, the real value of an insurance policy or pension fund.

8. If the adjustment of interest rates to inflation is not permitted there will be an overall failure of financial

intermediaries. The risk of involuntary indexation is imminent under these circumstances.

9. In an open economy, assets that will keep their value and real returns in pace with inflation will be the ones most sought after. Therefore, the demand will rise for assets denominated in foreign currency, for property and for those instruments indexed to inflation.

The above list of the distortions that inflation can cause in the financial system is not exhaustive, but it does point to the fact that inflation affects all assets, and that its influence is stronger on some than on others. This depends partly on the protection and support given by the government. For example, in most countries that are suffering from high inflation, the safest assets in national currency are indexed government bonds, which explains why demand for them has grown considerably to the detriment of the rest of private sector assets. This can be seen by looking at the growth rate of total net holdings of government bonds in relation to the growth of M2 and M3 in the sample countries in Table 5.

This Table shows that only in Chile have investments in government bonds diminished, due to the avowed policy of reducing government participation in the economy. On the other hand, in Colombia, Mexico and Venezuela, this type of securities have

Table no.5

Real increments of (M2-M1) and (M3-M1)
Net flow of government bonds
in Selected Countries

(Billion of national currency, 1980 prices)

	1979	1980	1981	1982	1983	1984	1985	1986	1987
Argentina									
D(M2-M1)	1.26	-0.55	0.29	-1.24	0.81	-0.68	-0.84	0.74	2.00
D(M3-M1)	1.26	-0.56	0.29	-1.24	0.90	-0.22	-1.39	0.84	2.10
DBonds	0.90	0.53	2.26	2.99	5.16	2.06	0.87	0.40	0.68
Brazil									
D(M2-M1)	0.0208	-0.0994	0.0636	0.0804	0.1562	0.2197	0.2508	-0.4897	0.0841
D(M3-M1)	0.2081	-0.0836	0.3098	0.3464	0.6270	1.0519	1.4977	-0.9716	2.8063
DBonds	-0.0230	-0.0800	0.5370	0.4610	0.6090	0.5024	1.1270	0.5112	2.5547
Chile									
D(M2-M1)	27.65	21.63	45.93	38.48	-52.09	35.25	32.22	31.66	1.91
D(M3-M1)	34.61	33.11	116.49	-30.07	-25.01	36.39	65.92	49.98	86.49
DBonds	n.d.	n.d.	n.d.	n.d.	16.33	-0.95	-3.23	0.11	-6.92
Colombia									
D(M2-M1)	-3.58	39.32	30.52	-11.50	4.71	8.94	23.73	18.17	19.76
D(M3-M1)	3.75	63.38	46.20	3.14	29.24	23.54	39.49	32.07	16.82
DBonds	4.53	0.46	1.62	2.06	11.91	1.30	21.16	9.62	1.61
México									
D(M2-M1)	4.96	2.26	3.27	-24.27	-2.57	33.33	-95.01	-13.66	88.11
D(M3-M1)	180.20	35.24	21.09	82.44	-88.43	26.72	-62.07	141.71	179.84
DBonds	16.05	28.50	32.68	131.33	48.58	-33.36	103.09	189.94	195.28
Venezuela									
D(M2-M1)	5.02	5.03	7.56	1.55	10.21	-1.13	1.81	10.92	0.55
D(M3-M1)	2.03	-1.16	3.60	-0.45	8.73	-9.54	-1.61	7.92	-6.73
DBonds	0.28	-0.86	8.41	2.28	1.22	5.95	5.67	9.09	n.d.

NOTES: The following was taken as flow of bonds:

- Argentina: Circulation of securities instruments issued by the government in national currency (billions of australes); Bulletin of Statistics;
- Brazil : Federal domestic floating debt (billions of cruzados); Monthly Bulletin;
- Chile : Registered, discountable Treasury Bills in the possession of the private sector (billions of pesos); Monthly Bulletin;
- Colombia : Internal debt financing through government bonds (billions of pesos); Annual Report;
- México : Net circulation of Treasury Certificates (billions of pesos); Economic Indicators;
- Venezuela: Direct internal authorized public debt (billions of bolivars); Economic Report;
- n.d. : No data available.

grown noticeably since 1982, reflecting the need these countries have of funds from the private sector to finance the service of their external debt.

Besides the distortions above mentioned that inflation creates in the operation of the financial system, the worst problem is the impact on the financing of gross capital formation, that is the most affected not only by the shortening of the lending period of the banking system, but by the "crowding out" of the private sector by the Government. In the countries studied the drop in private fixed investment was 2.8 percentage points of their average GDP, between 1980 and 1987.

II EXTERNAL DEBT, RECESSION AND INFLATION

The net transfer of resources from Latin America and the Caribbean from 1980 to 1987 due to the interest payment on the external debt amounted to US\$307.7 billions, which represented approximately 74% of its outstanding debt at 1987, as shown in Table 2.

This huge transfer of resources is the main reason why it has not been possible to control inflation in the region and to overcome the stagnation. These transfers have also had a negative impact in the regional terms of trade during the eighties,² which declined on average of 2.1% during this period.

The relationship between inflation and the payment of interest on the external debt, comes from the non-interest current account surplus that have to be generated for this payment. This surplus increases the money base of the debtor countries in spite of the restrictive monetary policies that they are pursuing.

To analyze the above mentioned relationship between

2. Rodriguez (1987) shows the relationship that exists between decline in the terms of trade, external debt servicing and inflation.

inflation and the payment of interest, a model is presented below based on Cardoso (1988), and the price equation obtained from the model is estimated.

a) Description of the model

Consider a developing country economy in which the residents choose between two assets: domestic non-interest bearing money (pesos) and an interest bearing foreign currency (dollar) deposit. Such an asset structure is representative of Latin American countries where "money" consists of currency and bank deposits with controlled interest rate, and other financial assets are foreign assets or domestic assets the rates of return on which are linked to changes in the exchange rate. In this economy, the public sector finances its expenditures through tax revenues, money creation, issuance of foreign currency denominated or index-linked debt instruments, and changes in its foreign exchange reserves position.

In this economy the behavior of the real money base can be expressed as the sum of changes in domestic credit and international reserves.

$$(1) \dot{m} = \dot{c} + \dot{R}$$

where the dot represent the variable growth rate through time, m is the real money base, c is the real domestic credit and R are international reserves.

$$(2) \dot{R} = NX - i^*B + \dot{B}$$

$NX = (X-M)$ net exports of goods and services without interest payments.

$B =$ Government Debt

$i^* =$ Foreign interest rate.

Equation (2) means that the changes in international reserves will come from the difference between net exports and the interest payment on the debt plus the additional foreign borrowing done by the Government.

The Government budget constraint is:

$$(3) (T-G) + (i^*e)B = \dot{C} + e\dot{B}$$

$G =$ Government expenditure

$T =$ Government income

$e =$ Exchange rate

This means that the operational budget deficit plus the interest payments on the Government debt will have to be financed

by domestic credit or by foreign borrowing.

From (2), this equation can be rewritten as:

$$(3A) \quad (T-G) + (i^*e)B = \dot{C} + e\dot{R} - eNX + (i^*e)B$$

$$\text{From (3A): (4) } (T-G) + eNX = \dot{C} + e\dot{R} = \dot{M}$$

The operational Government budget deficit plus net export will be equal to nominal money base growth rate. This means that for a zero growth rate of the money base, a surplus is needed in the operational Government budget to offset the net export surplus.

If $[(T-G) + eNX]/P = (g+n)$; and using the steady state condition: $\dot{m} = (\dot{M}/P) - \pi m = 0$; where π is the steady state inflation rate, thus, equation (4) can be rewritten as:

$$(4A) \quad (g+n)/m - \dot{m} = \pi$$

Equation (4A) means that the trend inflation will be equal to the difference between the share in real money base of the operational budget deficit plus net exports and the rate of growth of real money balances.

Once the trend inflation has been found, it is necessary to

discover the other factors that determine the inflation of domestic prices in the short run. If it is supposed that domestic prices are determined by production costs, composed of the unitary wage and the value of imported inputs that is represented by the exchange rate.

$$(5) P = W^{\alpha} e^{\beta}$$

Wages respond to unemployment, that will be represented by the output gap. If actual output is above potential, wages will be rising, and falling if output is below potential. If output is at full employment, then actual wages will be equal to last period wages. The wages behaviour is represented by equation (6):

$$(6) W_t = W_{t-1} y^{\tau}$$

Where: y is the output gap

$$\text{And, } W_{t-1} = (P_{t-1} / e^{\beta}_{t-1})^{1/\tau}$$

This last equation gives the equation for price changes in the short run:

$$(7) P = e^{\beta} y^{\alpha\tau}$$

Adding the trend inflation to (7), and taking logarithms an

equation is obtained that can be easily estimated:

$$(7a) \quad p = a_1 y + a_2 e + a_3 [(g+n)/m]$$

b) Results of calculations

Equation (7a) was estimated by the least square method for three of the countries in the sample, Chile, Mexico and Venezuela. The results are shown in Table 6.

As can be seen from this table the equation explains very well the behaviour of prices in these three very different economies. Excluding Chile, all the estimated coefficients have the expected signs.

According to this regression, the most important explanatory variable in the price changes in Mexico is the share of the operational budget and current account surplus in the real money base -the "trend inflation"-. A 1% increase in this variable will induce a price increase of 0.62%. But a devaluation of the exchange rate of the same magnitude, only affect prices in 0.005%, while an increase in economic activity induce a price increase around .015%.

In Venezuela, on the other hand, the variations in the exchange rates is the most important explanatory variable of

Table No.6

Regression Results

Equations Regressed:

- 1) $Dp = a_0 + a_1 Dy + a_2 De + a_3 (g+n)/m$
- 2) $Dp = b_0 + b_1 Dy + b_2 De + b_3 (g+n)/m$
- 3) $Dp = c_0 + c_1 Dy + c_2 De + c_3 (g+n)/m$

Equation (1)	a0	a1	a2	a3	² R	D.W.	F
Chile	14.90 (1.46)	1.34 (1.25)	0.77 (20.70)	-10.90 (-1.29)	0.97	1.83	173.5
Mexico		1.54 (1.06)	0.49 (2.79)	61.20 (1.99)	0.84	1.98	23.7
Venezuela		0.19 (0.84)	2.26 (4.10)	1.00 (1.87)	0.77	1.80	9.3
Equation (2)	b0	b1	b2	b3	² R	D.W.	F
Chile	108.90 (2.35)	12.39 (3.40)	0.17 (1.45)	106.60 (3.13)	0.62	2.57	5.5
Mexico	34.70 (1.40)	4.73 (1.78)	0.86 (1.91)	29.80 (0.26)	0.33	1.90	1.9
Venezuela	-66.50 (-2.19)	0.42 (0.14)	10.50 (2.50)	14.40 (2.24)	0.49	1.98	3.8
Equation (3)	c0	c1	c2	c3	² R	D.W.	F
Chile	169.90 (3.00)	13.23 (3.40)	0.78 (1.51)	179.40 (2.96)	0.60	2.47	5.0
Mexico	28.60 (5.80)	0.77 (1.30)	0.26 (3.87)	77.55 (5.50)	0.95	2.00	89.1
Venezuela		0.23 (1.00)	2.28 (4.20)	2.20 (1.92)	0.77	1.79	9.6

NOTES: "t" values are in parenthesis;

Sample period was 1970-1987 for Mexico and Venezuela (n=18), and 1970-1985 for Chile (n=16).

price changes, while the least influential variable is economic activity. In Chile, on the contrary, the greatest impact on prices comes from the increased economic activity, while the devaluation of the exchange rate has a lower effect.

The high coefficients of determination (R^2), indicate that most of the price variation is explained by the model, the D.W. show that there is no correlation among independent variables, and although the "t" values corresponding to the coefficient of economic activity, y , are not significant at confidence levels of 90%, and in the case of Venezuela is no different statistically from zero, those corresponding to the devaluation rate are significant.

The coefficient corresponding to $(g+n)/m$ deserves a separate comment. This coefficient, both in Mexico and Venezuela, has the expected sign, and in addition is statistically significant to confidence levels of 90%. On the other hand, in addition to having the opposite sign, the "t" value for Chile is very low. It is interesting to see that Chile is the only country of the sample that has had an operational surplus in the public sector since the mid seventies, and that the surpluses it has had in the current account net of interest payments, have been very small and for very few years, which explains the sign and the "t" value of the mentioned coefficient.

Given the above results, two additional specifications were estimated as a test. One is the estimation of the changes in inflation as a function of these same variables:

$$(7b) \Delta\pi = b_0 + b_1 y + b_2 \Delta e + b_3 [(g+n)/m]$$

The other specification consists in changing $(g+n)/m$ for the ratio of the surplus in the current account net of interest payment to real money bases.

$$(7c) \Delta P = c_0 + c_1 y + c_2 \Delta e + c_3 (n/m)$$

The results obtained from these regressions can also be seen in Table 6. One of the most striking differences found with these new specifications is in the case of Chile, where it can be seen that the "t" values for this country improve considerably and that both the coefficient $(g+n)/m$ and n/m have the expected signs. Furthermore, these become the most important explanatory variables in the regressions. The estimation of equation (7b) suggest that a 1% change in "trend inflation" will cause a more than proportional change in inflation, it will increase approximately 1.07%, and the estimation of (7c) says that a change of 1% in n/m will increase prices in 1.79%.

For Mexico and Venezuela, the "t" values improve when the coefficient n/m is included, which corroborates the importance of

the negative external transfers in the surge of inflation in these countries. However, the results of the regressions of the changes in inflation, point, in the case of Venezuela, to the unimportance of economic activity in determining it; in the case of Mexico, this coefficient becomes highly significant statistically, while trend inflation loses importance.

As a concluding remark, according to the regressions estimated, the specification of the price equation of the model used explains very well the price variations in the selected countries. In the Chilean case the results of equation 7, were very disappointing, but they improved with the alternative estimations, and reassured the strong incidence in the price behaviour of the share of the net export surplus in the real money base.

Thus, this analysis provide analytical support for the original assertion made in the sense that the net transfer of resources that is being made by debtor countries in payment of the interest on external debt is closedly related to the surge of inflation in the region during the eighties.

III INVESTMENT, RISKS AND RETURNS

a) Consumption and investment

The analysis of the behaviour of savings in this chapter is based on the Mean Variance, Risk and Returns approach. The risk is the a very important factor in determining the form taken by savings and whether they remain in the domestic market or are channelled abroad.

Generally speaking, two types of risk are recognised: systematic and unsystematic. Systematic risk in a country comes, among other things, from changes in interest rates, the changes of the inflation rate and the exchange rate, as well as from non economic disturbances and from external shocks. Systematic risk is present in the market and affects the price of all assets equally.

When the domestic savings of a country are referred to, they are generally associated with productive investment, but this is not necessarily so in reality. Table 7 shows there has been a growth in domestic savings, but a sharp decline in national savings and investment in Latin America during the last few years because of interest payments on the external debt.

Table No.7

Savings and Investment in Selected Countries

(As % of GDP at current prices)

	1980	1981	1982	1983	1984	1985	1986	1987
<u>Argentina</u>								
Domestic Savings	17.4	18.5	21.8	21.9	16.2	20.1	14.1	11.8
National Savings	18.4	15.6	16.9	15.7	9.7	13.9	10.8	8.8
Fixed Investment	23.0	20.3	15.5	14.2	12.6	11.0	12.8	12.1
<u>Brasil</u>								
Domestic Savings	19.8	21.8	19.9	19.5	22.1	23.1	23.1	---
National Savings	16.6	17.7	14.5	13.7	16.6	17.9	19.3	---
Fixed Investment	22.0	22.2	20.6	17.1	16.5	18.0	18.1	---
<u>Chile</u>								
Domestic Savings	12.5	8.2	12.8	14.7	11.3	17.0	18.4	18.3
National Savings	9.1	3.8	5.0	6.1	1.1	6.1	7.2	10.0
Fixed Investment	16.6	18.6	14.6	12.0	12.3	14.2	14.6	15.2
<u>Colombia</u>								
Domestic Savings	17.2	13.1	11.3	11.4	13.7	15.2	20.5	21.3
National Savings	16.6	12.3	9.6	9.5	10.9	11.6	15.4	16.0
Fixed Investment	16.8	17.7	17.5	17.2	17.0	16.6	15.6	18.3
<u>Mexico</u>								
Domestic Savings	23.2	23.2	25.4	27.4	24.1	26.9	22.9	25.1
National Savings	20.5	18.9	18.9	21.2	18.4	22.1	17.1	20.2
Fixed Investment	24.2	25.7	22.3	17.8	16.2	21.9	18.5	17.6
<u>Venezuela</u>								
Domestic Savings	33.5	30.3	21.0	27.4	25.0	21.4	20.0	--
National Savings	33.9	31.1	18.8	23.5	22.1	16.4	19.2	--
Fixed Investment	25.2	24.5	24.1	19.1	14.3	15.4	19.2	--

Source: Barandiaran, Edgardo, op. cit.

Table B shows that private consumption per capita has declined sharply in the selected countries, as has aggregate consumption. However, these drops have been less than that in investment. This is entirely in keeping with the reduction of the national disposable income during the eighties. It is likely that, at least initially, income losses were perceived as temporary, consequently the consumption levels were reduced only slightly. As time elapsed and that perception changed, the increased loss of wealth might have further lowered consumption relative to current income.

As was seen in Chapter II, this loss of income is closely related to the transfers being made to pay interest on the external debt of the region. Therefore, if a reduction in servicing is obtained, or if the balance of the debt is partially or totally cancelled, regional income can be expected to grow again, especially if this debt relief is in turn accompanied by viable adjustment programmes that reduce uncertainty in the economy.

In this context, a debt relief not tied to particular investment projects could be used mainly to increase consumption to compensate the previous decline, if the debt relief is seen as a permanent income growth in the country. This is so, because the binding constraint on the recovery of output in the region has been a shortage of foreign exchange rather than of capital

Table No.8

Private Consumption per Capita at Constant Prices in
Selected Countries
(1980-1987)

	1980	1981	1982	1983	1984	1985	1986	1987
Argentina	102.30	97.90	87.40	85.80	93.20	84.30	93.40	94.10
Brazil	103.20	95.70	96.60	93.60	92.60	97.50	107.10	---
Chile	98.60	107.30	92.70	88.00	87.70	85.20	87.80	90.70
Colombia	99.80	101.30	102.10	103.00	103.50	104.50	101.40	103.00
Mexico	99.90	104.50	102.90	92.80	92.90	92.70	88.10	85.80
Venezuela	100.70	97.00	96.00	84.20	84.10	82.10	81.50	---
Total Consumption per Capita								
Argentina	104.30	96.80	87.10	88.10	95.40	85.50	95.40	97.20
Brazil	102.70	95.70	96.90	93.60	91.50	98.10	105.80	---
Chile	98.70	107.30	82.30	78.70	83.90	78.80	81.30	84.60
Colombia	99.60	102.60	104.10	103.80	103.00	102.90	105.50	101.40
Mexico	100.40	105.90	98.60	90.30	91.20	92.50	84.30	81.50
Venezuela	100.60	97.00	98.40	80.20	84.40	82.80	83.20	---

Source: Barandiaran, E., Op. cit.

goods, and because consumption has been restricted to a level below that consistent with a return to more normal conditions.

In other words, if households regard the increase in income resulting from debt relief as permanent, consumption is likely to rise to the previous levels, and investment will not increase with the foreign exchange liberated. Therefore, policies must be designed to encourage household and corporate savings so that part of the income increase is used to augment present consumption, but also a large proportion is earmarked for increasing future consumption and hence the savings that can be used for investment.

With this in mind, an analysis is now made of the investment options in Latin America and the expected returns and risks that accompany different assets in order to use the Mean Variance and Returns Approach to study what incentives can be offered to the investor. These incentives must not only encourage savings growth but also try to ensure that current savings remain inside the local financial system and are not deposited abroad.

b) Portfolio Analysis

Some of the investment options available in Latin America are the following:

- 1) Gross Capital Formation
- 2) Government bonds indexed to inflation
- 3) Time and savings deposits in commercial banks
- 4) Treasury bills and time deposits in a foreign country
- 5) Securities (in those countries with a stock exchange).

Using the framework of portfolio theory to analyze the expected returns on these assets, it is seen that when the depreciation of the exchange rate and the systematic and unsystematic risks of all assets have been taken into account, the least risky assets with the highest expected returns, are those in foreign currencies or else indexed to them.

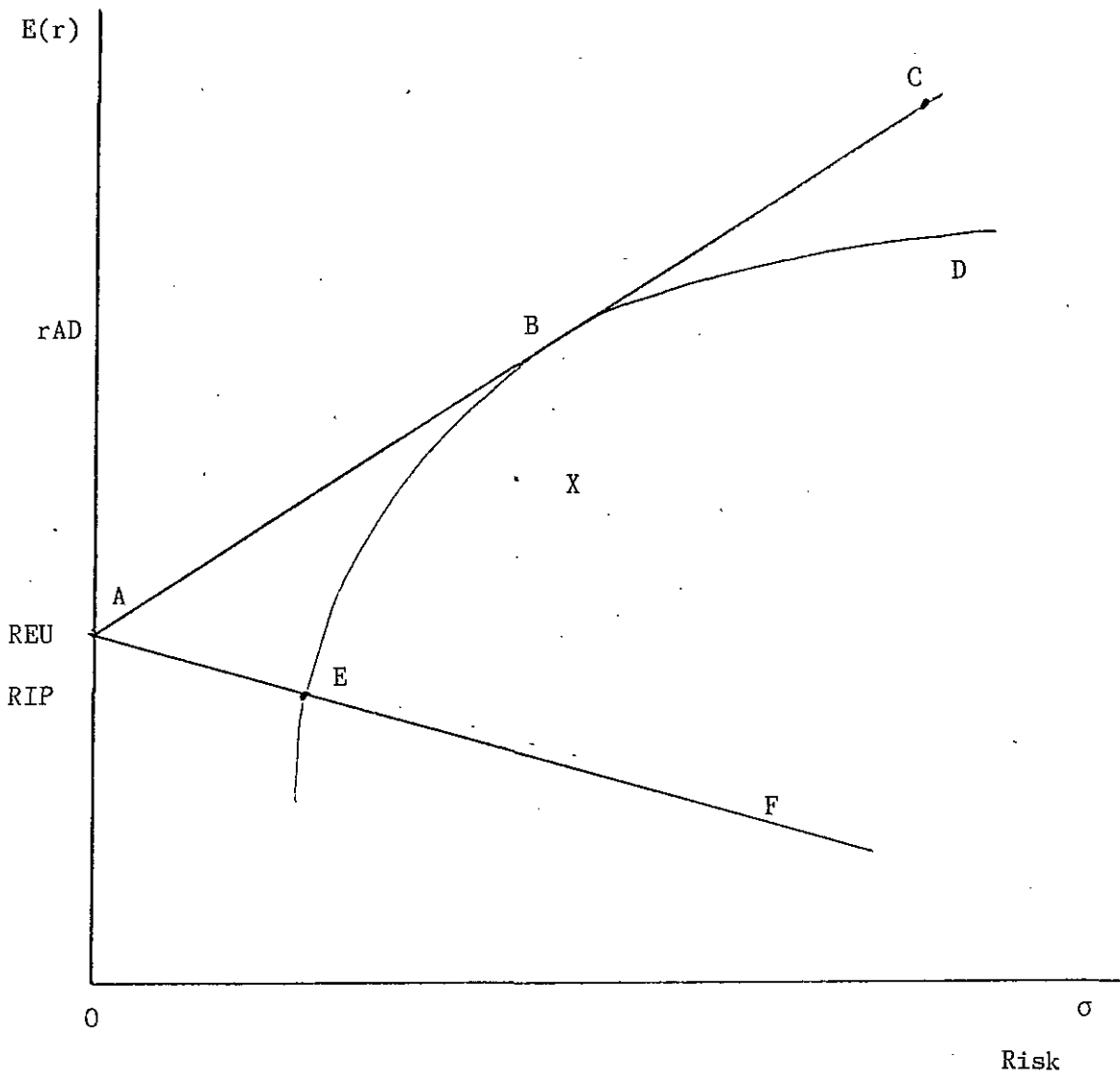
Figure 1 shows some possible distributions of investors portfolios according to the returns and risks of the assets.

The curve ED is the efficiency frontier, where the portfolios are efficient combinations of investment opportunities on the assets available on the market. That is to say, only portfolios lie in this curve, because these will always be preferred to individual assets since they have the great advantage of reducing unsystematic risk through hedging.

It is assumed that the portfolios within the efficiency frontier dominate (i.e. are better than) all those lying outside, such as in point X, and that therefore investors will select only

Expected
Returns

Figure No. 1



the former.

Among the five types of assets under consideration, the only ones that would be free of the inherent systematic risk to be found in a country with great economic problems would be those held abroad. These, therefore, could be taken as risk-free assets, whose returns would be REU. This REU is the interest rate which equates the supply of, and the demand for, loanable funds.

Thus, if investors were to study all investment possibilities, they would find that the best combination of assets, bringing them the greatest returns and the lowest risks, would be those linear combinations falling between points A and C, and in times of crisis they would possibly invest only between A and B. This is so, because these combinations would be the only ones to guarantee a positive return on their investment in a crisis. B is the market portfolio, the unanimously desirable portfolio containing all securities in exactly the proportions in which they are supplied. The return on the market portfolio is the weighted average return on all securities in the market.

Portfolio combinations falling between B and C are risky because in those points investors are borrowing at the REU rate and investing these funds in financial market securities, increasing the expected returns, but also the risks. In Mexico

investment has grown in this area since 1986, when the monetary authorities reduced private sector credits to a minimum. Many investors converted their assets denominated in dollars into pesos and lent them at the high domestic market interest rate.

Any combination on the curve AF would be dominated by the curve AC and would not even be considered, since portfolios on AF have lower yields but the same risks as those on the AC curve. It is in fact on the AF curve where the combinations of assets that include fixed investments must be looked for. These cannot offer higher yields due to the high cost of investment, represented by the lending interest rates. Additionally, they have a high total risk, since nobody can reduce systematic risk which cannot be hedging for as it is there in the market and it is also impossible in times of economic crisis to eliminate the unsystematic risk that any fixed investment implies.

The investment alternatives can be seen clearly from Figure 2 and Table 9, where assets are classified according to their expected returns and risk in Mexico over the last ten years.³ The chart shows that investments in the manufacturing sector have been those with the lowest and most variable returns in the country during these years. It also shows that all domestic

3. The risk is measured by the standard deviation of the returns. Annex I shows the data and formula used in the calculation of the risks and returns.

Figure No. 2

FINANCIAL INSTRUMENTS

Real Return and Risk, Average
(1978-1987)

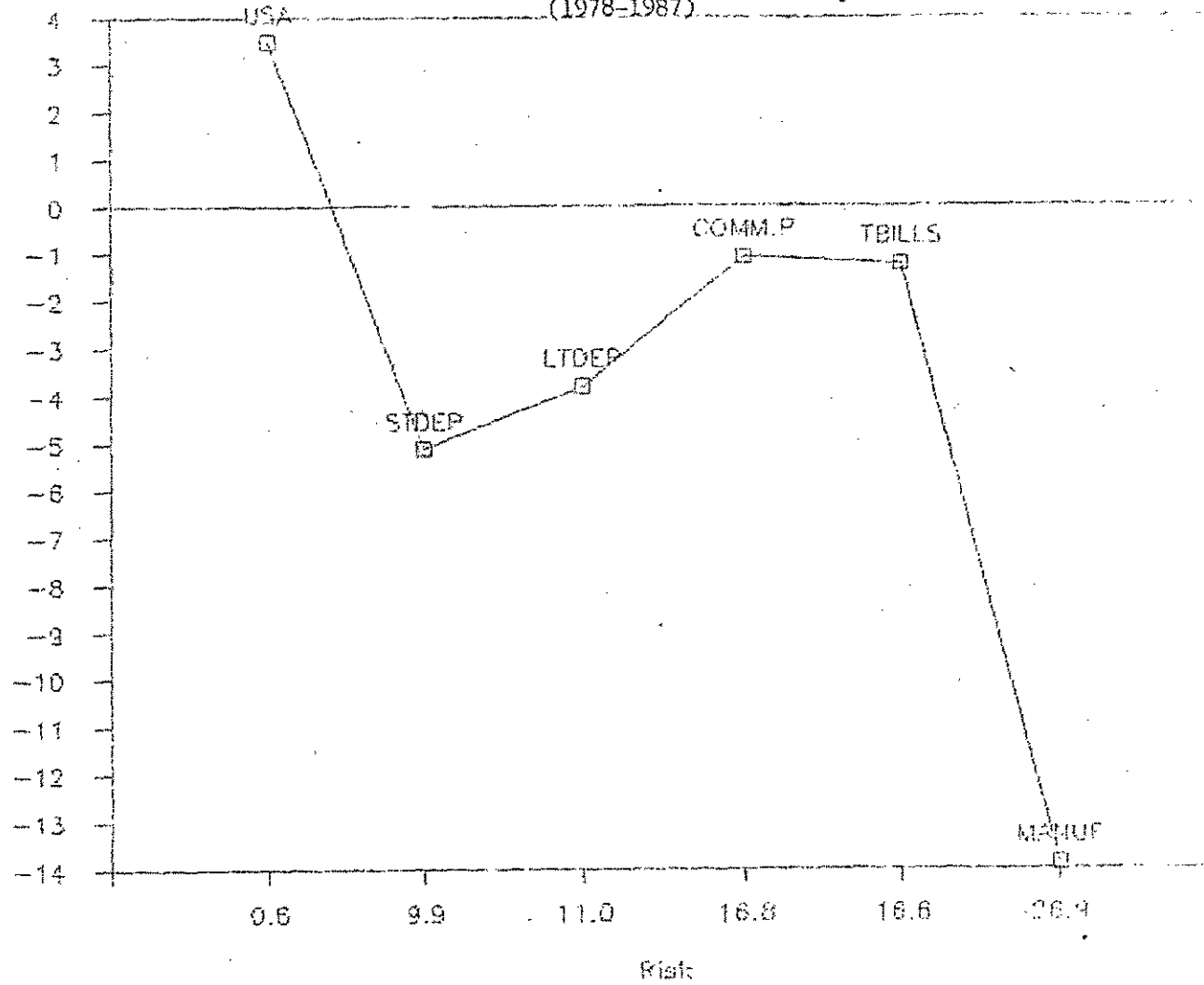


Figure No. 2

FINANCIAL INSTRUMENTS

Real Return and Risk: Average
(1978-1987)

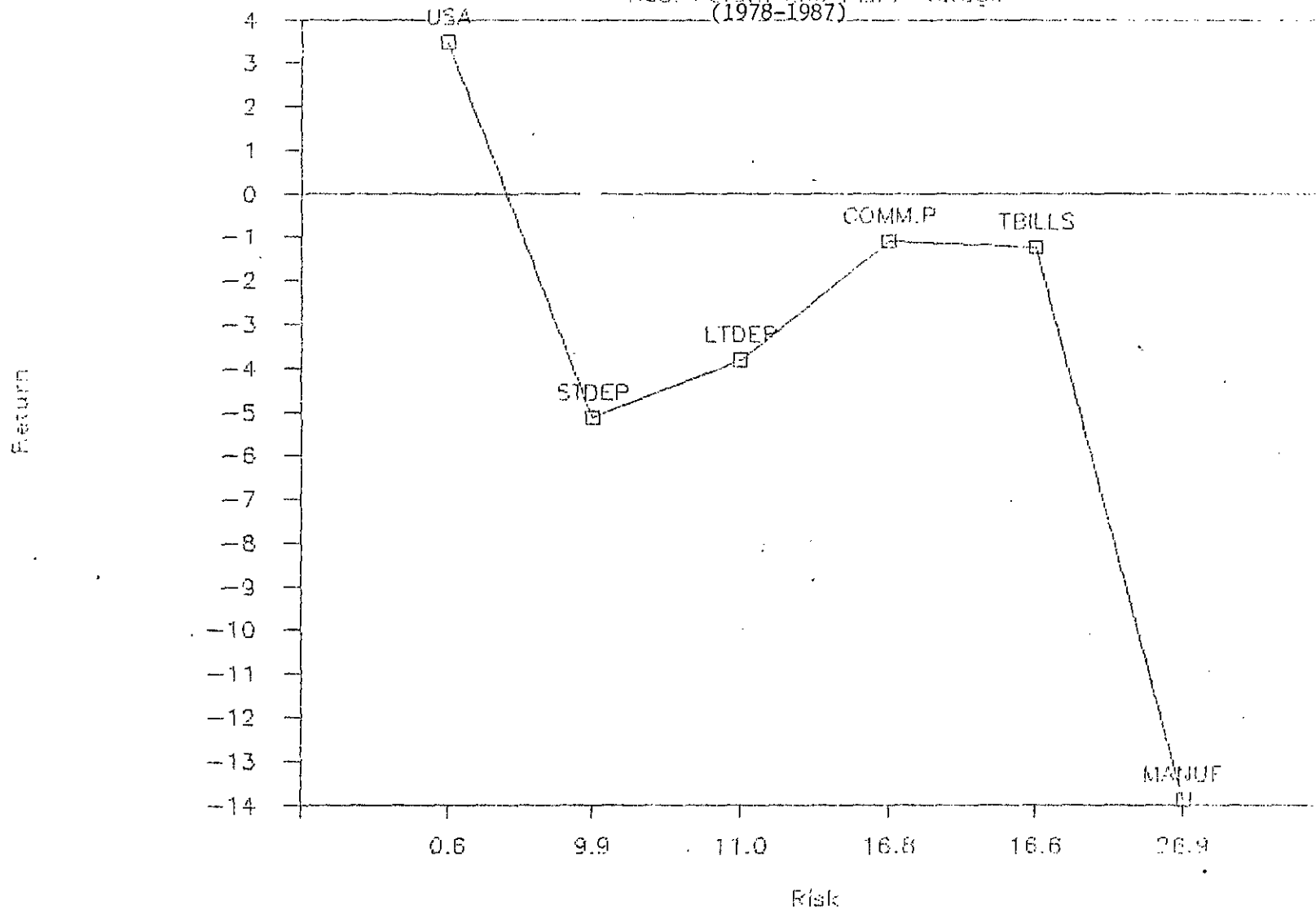


Table No.9

Real Returns and Risks
for Some Financial Instruments
in Mexico and the United States
(1978-1987)

Instrument	Average Returns	Expected Risk
<u>Mexico</u>		
CETES (Treasury bills)	-1.2	16.62
Deposits 30-89 days	-5.1	9.91
Deposits 90-175 days	-3.8	11.01
Comercial Paper 1/	-1.1	16.83
Manufacturing Ind. 2/	-13.9	26.91
<u>U.S.A.</u>		
Money Market	3.5	0.58
Deposits at 30 days	2.7	0.62
Treasury bills	3.1	0.25

NOTES: 1/ Data for 1980-1987;
2/ Data for 1978-1986;
The data sources and the estimation of returns
are in Appendix I.

assets have average negative returns and their associated risks are higher than those on foreign assets.

In these circumstances, to encourage productive investments it would be necessary to increase their yields or lower their risks, so that they would enter as part of a portfolio on the AC curve (curve of the capital market). The instruments that might be used for this purpose would be those that could reduce the cost of fixed investment and, above all, what would help most would be a stable macroeconomic environment.

IV RISKS AND THE FINANCIAL SYSTEM

In the analysis of the previous sections it has been established that the systematic risk due to inflation and stagnation dampens the growth of savings, along with high risks in the returns on assets and higher yields abroad. Since the systematic macroeconomic risk can only be reduced by lower transfer made for external debt servicing, and by pursuing stabilisation programs with consistent macroeconomic policies enabling to reconcile the adjustment with the return to the growth paths of these economies, thus, attention is focussed here on the reduction of unsystematic risk.

This section discusses some aspects that could be used to reduce the unsystematic risk of financial assets and, consequently, lessen the uncertainty of investors as to the expected returns on them.

a) Savings and unsystematic risk

As the unsystematic risk is inherent in the assets being discussed, the way to reduce it is to offer savers a range of assets that is wide and attractive enough for the same savers to neutral it out or decrease it through different combinations of these investment options. In turn, this might be a way of

building financial portfolios with reduced risk and attractive profits, encouraging households to reduce hidden savings and present consumption in anticipation of the prospect of real gain on their financial investment which could help them to improve future consumption.

In this range of assets to be offered, those already existing in the financial markets of the region could be improved in so far as risk reduction and greater profitability. Also, the introduction of some new instruments that might help to develop and improve the long term capital market could be considered.

To help the analysis of financial assets, they are classified into two groups: those carrying fixed interest, and stocks.

1) Fixed Interest Assets

This type of assets are the most important in Latin America, since they represent approximately 90% of the financial markets. Therefore, their profitability and safety are extremely important when the problem of increasing savings is being discussed. These assets, in turn, can be classified into two groups; the first consists of the most liquid and easily negotiable, and the second of less liquid assets with a fixed maturity date.

In the first group are the so-called money market instruments, such as short term government securities, indexed or not, and privately issued documents, such as commercial paper,⁴ and bankers acceptances, which can be traded on a secondary market.

In the second group are savings and time deposits in commercial banks and other savings institutions.

Among the assets of the first group, indexed government bonds can be considered risk-free assets in normal, stable macroeconomic conditions, and therefore, under these circumstances, do not have to pay high returns. If they do, they will be strong competitors against all the other assets supplied by the private sector, which will have to pay much higher returns or run the risk of being forced out of the market.

In the latter case, the public sector, by forcing up the rate of return offered to savers, increases the market risk. This is so, because financial institutions will have to demand higher yields on their investment of the funds they attract in order to remain solvent. This, in turn, implies greater risks in the recovery of loans made, and as a result the portfolios of these institutions become more unstable.

4. The commercial paper is a short term promissory note offered by firms to finance their operations.

Therefore, the amount and returns of bonds issued by the Government must be carefully controlled, so as not to have a negative effect on the quality of other assets on the financial market.

Commercial paper is issued by firms on the basis of their prestige and solvency, and so one way of increasing confidence in them would be to regulate companies issuing them to be listed on the stock exchange in such a way that all the necessary financial information about these firms would be published. In addition, the issues are more acceptable if they are backed by a highly reputable bank or by an insurance company.

The assets of the second group, are less liquid and are also the most demanded from savers, these assets are the main source of funds for savings and loan associations and long term financing institutions. Savings and time deposits are the main determinants of the growth of financial intermediation not only in Latin America but also in developed countries such as the U.S.A., Canada, and Japan.

Therefore, the stability and security of the banking system in general is extremely important, so that public confidence in these assets is not only maintained but also increased, since runs on banks have very high social costs. A financial panic

leads to a liquidity squeeze and to a substantial decline in real balances, which causes a drop in the economic activity. The social costs of financial bankruptcy are what have led governments to take a keen interest in the safety and soundness of the banking system.

In turn, this interest of the Government has led to excessive regulations that have a negative incidence on the costs of the banking system. These regulations range from the imposition of high reserve requirements, borrowing and lending interest rates ceilings, to the way in which institutions can distribute their investment portfolios among risky and risk-free assets in the different sectors of the economy; and also to control the entry of new businesses into the system.

These regulations have been designed with the purpose of using them as instruments of short term monetary policy, the distribution of funds among sectors of the economy and, in addition, to try to prevent the instability of financial institutions.

The joint result of these regulations has been to create a very inefficient financial intermediation which is reflected in a wide spread between the borrowing and the lending rates. This discourages savings, since appropriate returns are not offered, as well as investment, that requires very high rate of returns

on projects to compensate for the cost of money.■

Leaving the problem of monetary policy aside, one way of reducing the risks of illiquidity and insolvency in the banking system with fewer regulations, is by deposit insurance, which reduces the risk of a run on banks to a minimum. This insurance offer more guarantees to the stability of financial intermediaries, since they not only provide liquidity in the event of massive withdrawals, but also guarantees the liquidity necessary to prevent these situations from ever arising by giving the public the confidence that deposits will be covered against any eventuality.

This insurance could be provided either by a private institution or by the government. Presumably the government would inspire more confidence than private insurers, since the latter would need to have a considerable sum of money in reserve to underwrite these insurances. This would mean that the premiums would be very high, increasing costs to banks. On the other hand, government insurance could be much lower in price, since deposits would be guaranteed simply by its backing.

In the latter case the insurance premium could be charged as

5. There is quite an extensive bibliography on the problems caused by banking regulations in developing countries. See for example McKinnon (1973) and Shaw (1973).

a tax on deposits only in the event of a run on the bank, defined as the withdrawal of a specified amount from deposits. In this way, the saver is discouraged from withdrawing deposits without ample justification.

However, since insurance of this nature might encourage bankers to acquire more risky portfolios there must be some regulation on the maximum ratio of risky assets/liabilities allowed and of the maturity conversion they make, with proper supervision of these assets.

As financial intermediation per se is carried out by the banking system in Latin America, banks have to make maturity conversion,⁶ which necessarily involves quite a large risk. To reduce this, banks can be required to use preferably deposits with the longest terms in these conversions. Banks can also be required to place securities backed by their long term assets on the secondary market as collateral to obtain new money. Thus, costs are reduced and its liquidity improved.

Banks must be allowed to make long term loans at variable interest rates so that changes in inflation do not affect their solvency. Of course, in stable economic conditions they would be able to lend at fixed rates, with a small premium to cover the

6. Maturity conversion means that banks contract short term deposits and make long term loans.

risk of normal changes in the interest rate.

If liquidity and solvency are controlled in this way, required reserves and interest rate ceiling can be reduced to a minimum. Thus, allowing banks to narrow the spread between the borrowing and lending rates. In this way banks can pay savers greater returns in real terms without damaging its own profits or the need to increase the rate charged to investors.

2) Stocks

Generally speaking, stocks⁷ are long term financial assets that are bought and sold on the stock exchange, in both primary and secondary markets.

The importance of a capital market supplying long term securities is that at the same time it provides a new range of financial assets in which savers can invest, and it also offers them the opportunity of obtaining liquidity by the sale of these securities on the secondary market, in addition to higher returns than on bank deposits.

On the other hand, it is a source of long term financing for

7. Stocks are those assets that do not guarantee the holder a fixed return, since the dividend on them may vary through adjustment in their prices in response to supply and demand.

gross capital formation, generally at lesser cost than bank debts. Besides, the long term capital market, for the simple reason that its financing matures on a long term basis, can improve the productivity of capital.

For example, if bank financing is on a short or medium term basis because of the restrictions imposed by its liabilities, borrowers must have large cash flows available in order to meet their credit obligations. As the loans mature in a very short time they must limit their investment to physical capital with very short depreciation periods, which may be efficient, but whose economic life is generally very short, corresponding to the redemption period. Therefore, these investments are less profitable than investment in physical capital with long periods of useful life.

These latter investment projects are ignored in favour of other short-lived ones because of the lack of long term financing. When an entrepreneur takes short or medium term bank debts he must be prepared for a program to repay the debt that falls due long before his investment has sufficient yields, and he finds himself with a medium term horizon characterised by weak cash flows and the uncertainty that is caused by placing a new product on the market.

Despite all the advantages that the stock market offers, it

has traditionally received little support from government policies. However, in almost all countries, using different institutional means, governments have promoted the banking system as a source of financing through the reduction of the liquidity risk of banks by backing deposits, subsidising long term bank loans by means of central bank rediscounting, the indirect subsidy of less costly supervision and regulations than that of the stock market, and by encouraging financing with debts instead of share financing.

On the other hand, it is rare for government to want to back stock market institutions that have financial problems. In some countries, government bodies such as securities commissions or stock exchanges can try to prevent the failure of these institutions through vigilance and forced mergers, but financial aid to dealers in difficulty is rarely found.

This means that listed securities not only carry a risk as financial investments, but have little or no government support. This makes them unattractive to the average saver, which is why they have to pay high returns, to compensate this risk in order to attract any savings. This, in turn, means that the funds obtained by a firm from bonds placed on this market are not as cheap as it is supposed to. Therefore, fixed investments made with them must be very profitable and safe in order to be financially sound and to meet obligations. Hence, the

possibility of these obligations not being met is much higher.

It can be seen that for the stock market to become more attractive to householders it must be given greater support by government policies. Some suggestions on how to make this market less risky for investors are the following:

1) Establish insurance schemes to protect shareholders who put their securities in the hands of dealers.

2) Establish an insurance scheme for small shareholders similar to the one for small deposits in order to offer at least equal treatment for both types of investment.

3) For at least while the security market develops, bonds placed on the stocks exchange must be backed by mortgage or other real assets. This would offer savers more protection and inspire more confidence.

4) If bank interest is exempt from taxation, the same should apply to the yield of bonds, to offer equal treatment.

5) To guarantee the payment of bonds enough checking should be made that the firms issuing them are sufficiently solvent. Therefore, at the moment of the issue, they must not only publish their financial statements, but also the liabilities to capital

ratio must be restricted to within certain limits, for example 1 to 3. Also, a fixed minimum proportion must be kept of current assets to current liabilities and of assets not given in guarantee against guaranteed liabilities.

Finally, it should be added that if the financial policy of a country provides predominantly one type of assets to the detriment of the rest, or if, when there are many choices available, it gives more support to some than to others, it is very likely to be pushing savers who wish to diversify their portfolios to do so by investing on their own account in non-financial assets or in assets outside the country.

Thus, the most appropriate policy would be of equal treatment for all financial investments, since they are complementary, in the sense that a weak development of the stock market could mean, on the side of the demand for financial assets, less growth in the fixed interest market.

b) Institutional Savings

According to the life-cycle hypothesis and to studies made in several developed countries,⁸ most households try to balance their consumption during their lifetime, saving in their working

8. See for example the studies of Ando and Modigliani (1963), King and Dicks Mireaux (1982) and Soderstrom (1982).

years and using accumulated funds during retirement, in addition to saving for certain precautionary reasons. This is done by means of social security, private pension funds and private life insurance.

Because of the importance of this type of savings for households and the need that the countries of the region have to increase it, regulation to ensure that it is not eroded by inflation or will not be lost through the bankruptcy of the institutions where it is deposited must be a priority.

In this regard, the investments of these institutions must be regulated, a watch being kept that their portfolios are not full of high-risk assets. In Mexico, insurance companies were deregulated in 1984, being allowed to invest funds freely. The consequence was that they invested a high proportion of their portfolios in high-risk assets on the stock exchange, which were those bringing the greatest returns. When the stock market crashed in 1987, these earnings were lost, with the result that a large number of insurance companies are on the verge of bankruptcy.

One of the most serious problems with pension funds and insurance companies is that they guarantee the policyholder a nominal, not real, value. Therefore, to encourage this type of savings, policyholders must be guaranteed a real value,

especially in countries with a long history of inflation. This could be done by using part of the premium or contribution paid by the policyholder or member of the pension plan to buy short term insurance. This insurance would cover the additional value represented by the rise in the cost of living over the same period, and thus indexation is achieved. The way to finance this insurance without putting additional financial burden on the parties could be by following the practice of some insurance companies of charging a premium that exceeds the cost of providing insurance during the first few years. Thus, instead of reducing the sums paid as premiums or paying the policyholder a bonus on the amount of money accumulated, as is generally done, the short term policy would be paid.

CONCLUSIONS

This paper has found evidence that in the last seventeen years, the growth of savings in Latin America has been more positive related to macroeconomic stability and GDP growth than to the real interest rate. Using a sample of three debtor countries of Latin America, it was also found that there is a close relationship between the surge of inflation in the region and the transfer of resources to pay the service of their external debt. These transfers have also represented a real burden for the countries that has meant economic stagnation and a drop in the standard of living of their population and in their capital formation.

Therefore, the most urgent problem for these countries is how to limit these external payments in order to get back on the path towards growth. The second problem that has to be faced, after solving the first, is how to achieve a balance so that the liberated resources are not channeled to consumption but are used largely for productive investment. There is a serious risk that if some debt relief is obtained, it will be used to increase consumption, which has fallen substantially in the last decade. Without considerable and sustained increases in regional investment, any growth in income will not last very long.

The Mean Variance, Risk and Returns approach was used to show that given the high macroeconomic systematic risk a rational Latin American investor would have a part of his portfolio invested in foreign assets. It was also shown, using data for Mexico, that due to the uncertainty of returns and the risk involved in fixed investment in manufacturing sector, very few or none of these would be included in this portfolio, unless some measures are taken by the authorities to reduce macroeconomic instability, and the unsystematic risk of this type of investment.

Some ideas have been proposed here as to what can be done to strengthen the financial systems of the region and to try to increase public confidence in them. Some incentives have been suggested that could be offered to the public so that part of any increase in earnings would be earmarked for future consumption. What is stressed most, however, is the fact that without macroeconomic stability it will not be possible to increase regional savings and investment and it will be very difficult to persuade economic agents to keep their savings in local assets.

Appendix I
Real Returns and Risks

	MEXICO										UNITED STATES					
	Treasury Bills		S.T. Deposits 1/		L.T. Deposits 2/		Commercial Paper		Manufacturing Industry 3/		Money Market 4/		Treasury Bills		S.T. Deposits 5/	
	r	R	r	R	r	R	r	R	r	R	r	R	r	R	r	R
1978	-4.0	0.77	-5.5		-4.7	0.07	n.d.	n.d.	2.1	28.33	0.3	1.01	-0.4	0.92	1.9	0.14
1979	-0.2	0.10	-1.7	1.18	-1.2	0.68	n.d.	n.d.	9.6	61.28	-0.1	1.29	-1.1	1.43	1.1	0.38
1980	1.1	0.54	-0.9	1.77	-0.2	1.33	2.2	1.16	4.1	35.82	-0.1	1.28	-1.9	2.06	4.2	0.12
1981	4.1	2.89	-2.1	0.93	3.0	4.70	6.2	6.23	-8.2	3.63	5.5	0.39	3.9	0.16	1.3	0.33
1982	-0.9	0.01	-5.7	0.06	-4.0	.00	-1.7	0.09	-25.5	14.91	5.7	1.53	4.6	0.39	2.2	0.09
1983	-23.8	50.89	-23.3	33.11	-23.3	38.06	-21.8	54.65	-41.8	86.53	5.7		5.6	0.84	6.0	0.85
1984	-9.9	7.48	-12.0	4.79	-12.5	7.49	-9.9	10.06	-26.6	17.96	5.7		5.4	0.75	3.7	0.04
1985	10.4	27.06	4.8	9.82	8.0	14.02	10.9	17.27	-14.8	0.09	4.4	0.08	4.0	0.19	3.9	0.06
1986	10.4		2.1	5.27	4.8	7.49	8.6	11.37	-23.9	11.15	4.8	0.17	4.1	0.22	3.4	0.01
1987	0.5	0.31	-6.9	0.33	-8.2	1.93	-3.3	0.75	n.d.	n.d.	2.9	0.03	2.3	0.01	3.2	0.002
MEDIA	-1.2		-5.1		-3.8		-1.1		-13.9		3.5		2.7		3.1	
D.STD	9.5	16.62	7.6	9.91	8.7	11.01	10.1	16.83	16.1	26.91	2.4	0.58	2.6	0.62	1.4	0.25

NOTES: 1/ S.T.DEPOSITS = time deposits at 30 to 89 days;
 2/ L.T.DEPOSITS = time deposits at 90 to 175 days;
 3/ MANUFACTURING IND. = The nominal return of the manufacturing industry was calculated as the ratio of the capital income over the capital stock of the sector minus the average corporation tax rate of the period;
 4/ M. MARKET = average rate of the U.S. money market;
 5/ S.T.DEPOSITS = time deposits at 30 days in NewYork;

The formulas used were:

$$r = \text{real return} = \frac{(i/100) - (p/100)}{1 + (p/100)} \times 100; \quad P(r) = \frac{\text{no. of occurrences of } r}{\text{total no. of occurrences}}$$

$$R = \text{risk} = P(r) \times (r - \bar{r})^2; \quad \text{Risk of Instrument} = \text{Standard Deviation of } (R).$$

SOURCES: International Monetary Fund, International Financial Statistics, several issues;
 Bank of Mexico, Economics Indicators;
 Bank of Mexico, Capital Stock 1960-1985;
 Instituto Nacional de Estadística, Geografía e Informática, Sistema de Cuentas Nacionales de México, several issues.

BIBLIOGRAPHY

Abraham, W., "Saving Patterns in Latin America", Economic Development and Cultural Change, July 1964, 12, pp. 377-91.

Ando, Albert and Modigliani, Franco, "The life cycle hypothesis of saving: agregate implications and tests". American Economic Review, March 1963, pp. 55-83.

Balassa, B., "The adjustment experience of developing economies after 1973", in: Williamson, ed., IMF Conditionality, Cambridge, Ma., 1983.

Barandiaran, Edgardo, "The adjustment process in Latin America's highly indebted countries", mimeo, World Bank, March 1988.

Blejer, Mario I., and Khan, Moshin, "Government Policy and Private Investment in Developing Countries", IMF Staff Papers, June 1984, 31, pp. 379-403.

Cardoso, Eliana A., "Seigniorage and Repression: Monetary Rythms of Latin America", mimeo, Fletcher School, Tufts University, March, 1987.

Clark Francis, Jack, Investments Analysis and Management, McGraw

Hill Series in Finance, MacGraw Hill Book, Co., New York, 1980.

David, Paul A., and Scadding, John L., "Private savings, Ultrarationality, Aggregation, and Denison's Law", Journal of Political Economy, Vol. 82, March/April 1974, pp. 225-249.

Deaton, Angus, "Involuntary Saving through Unanticipated Inflation", American Economic Review, December, 1977.

Diamond, Douglas W., and Dybvig, Philip H., "Bank runs, deposit insurance, and liquidity", Journal of Political Economy, Vol. 91, No. 3, 1983, pp. 401-419.

Fry, M. J., Interest rates in Asia, manuscript, 1981.

Giovanini, A. "Saving and the real interest rate in LDC's", Journal of Development Economics, Vol. 18, 1983, pp. 197-217.

Hakanson, Nils H., "Capital growth and the mean-variance approach to portfolio selection", Journal of Financial and Quantitative Analysis, Vol. VI, No. 1, January, 1971, pp. 517-557.

Hemming R., and Kay, J.A., "The costs of the state earnings related pension scheme", The Economic Journal, Vol. 92, June, 1982, pp. 300-319.

Howard, David H., "Personal saving behaviour and the rate of inflation", Review of economics and Statistics, Vol. LX, November 1978.

Hubbard, Glenn R., The financial impacts of Social Security, Monograph Series in Finance and Economics, Graduate School of Business Administration, New York University, New York, 1983.

Interamerican Development Bank, Interest rate policies, inflation and development in Latin America, Washington, D.C., 1982.

International Monetary Fund, International Financial Statistics, several issues.

Kalymon, Basil A., "Estimation risk in the portfolio selection model", Journal of Financial and Quantitative Analysis, Vol. VI, No. 1, January 1971, pp. 559-582.

King, Mervyn A., and Dicks-Mireaux, Louis, "Asset-Holdings and the life cycle", The Economic Journal, Vol. 92, June 1982, pp. 247-267.

_____, "Portfolio Composition and Pension Wealth: An Econometric Study", Working Paper no. 903, National Bureau of Economic Research, Inc., June

1982.

Kotlikoff, Laurence J., "Testing the theory of Social Security and life cycle accumulation", American Economic Review, Vol. 69, June 1979, pp. 396-410.

Mckinnon, R.I., Money and Capital in Economic Development, Washington, D.C., Brookings Institution, 1973.

Mikessell, Raymond, "The nature of the savings function in developing countries" a survey of the theoretical and empirical literature", Journal of Economic Literature, March 1978, pp. 1-26.

Rodriguez, Flavia, "Deuda externa, tipo de cambio y precios", Cuaderno de Investigacion No. 21, Centre for Latin American Monetary Studies, Mexico City, 1987.

Schoepflein, Robert N., "The effect of pension plans on other retirement saving", The Journal of Finance, 1970, pp. 633-637.

Shaw, E.S., Financial Deepening in Economic Development, New York, Oxford University Press, 1973.

Soderstrom, Lars, "The life cycle hypothesis and aggregate

household saving", American Economic Review, Vol. 72, No. 3, June 1982, pp. 590-595.

Swamy, S., "A dynamic, personal savings function and its long-run implications", Review of Economics and Statistics, Vol. XLV, No. 1, February 1968, pp. 111-116.

Virmani, Arvind, The Determinant of Savings in Developing Countries: Theory, Policy and Research Issues, Report No. DRD186, World Bank, August 1986.