Financial Liberalization and Economic Growth:
Some Simulation Results*

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I. Introduction

Recently there has been a resurgence of interest inspired in large part by the works of McKinnon[1] and Shaw[2] in the role of financial development as a means of accelerating economic growth of developing countries. Broadly speaking, two different schools of thought with somewhat different policy prescriptions can be indentified. The first is the 'financial structuralist' view[3] which maintains that a widespread network of financial institutions and a diversified array of financial instruments will have a beneficial effect on the saving-investment processes and hence, on growth. The other is the 'financial repressionist' view which considers low real interest rates, caused by arbitrarily set ceilings on nominal interest rates and high and variable inflation rates, as being the major impediments to financial deepening, capital

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[1] See McKinnon (1973).

[2] See Shaw (1973).

[3] See Goldsmith (1983).

formation and growth. According to this school, thus, the solution lies in freeing the interest rates to find their equilibrium levels in a free market environment.[4]

This paper deals with the effects of financial liberalization in the Asian and the Latin American countries. Financial liberalization is interpreted as an increase in the expected real rates of interest. In order to examine the effects of such liberalization, a simultaneous equations model, using pooled time series data for countries in these two regions is specified and estimated and then simulations are performed under alternate assumptions about the real rate of interest. Both final or the equilibrium multipliers and the interim multipliers are calculated. The latter provides some idea about the speed or the sluggishness with which financial policies of this type work. The scheme of the paper is as follows. In Section II, the model is specified. In Section III, the data and the estimates are described. In Section IV, the methodology for calculating the dynamic multipliers is discussed and the simulation results are presented. The paper is concluded with a brief summary of the major findings.

II. The Model

A. Variables

The variables (all in real terms) used are as follows:

Endogenous variables

F1R	:	currency and demand deposits at commercial banks
F2R	:	savings and time deposits at commercial banks
F3R	:	other financial assets held by the non-financial private sector
FS	:	private savings in financial assets
RS	:	private savings in real assets
GCR	:	government consumption expenditure
GRR	:	government revenue
IPR	:	private fixed investment (gross)

[4] McKinnon, *op. cit.* and Shaw, *op. cit.*

IMPR : imports
SPR : total private savings
CPR : total private consumption
GSR : government savings
SNR : national savings
YDR : private disposable income
YR : gross national product

Lagged endogenous variables

F1LR : one period lagged F1R
F2LR : one period lagged F2R
F3LR : one period lagged F3R
FSL : one period lagged FS
RSL : one period lagged RS
GCLR : one period lagged GCR
GRLR : one period lagged GRR
IMPLR : one period lagged IMPR

Exogenous variables

NI : nominal interest rate
PE : rate of expected inflation
PU : rate of unanticipated inflation
IGR : government fixed investment (gross)
ISR : change in inventories
XR : exports

The model is specified as follows:

(1) $F1R = a_1 + a_2YDR + a_3NI + a_4PE + a_5F1LR$
(2) $F2R = a_6 + a_7YDR + a_8NI + a_9PE + a_{10}F2LR$
(3) $F3R = a_{11} + a_{12}YDR + a_{13}NI + a_{14}PE + a_{15}F3LR$
(4) $FS = a_{16} + a_{17}YDR + a_{18}NI + a_{19}PE + a_{20}PU + a_{21}FSL$
(5) $RS = a_{22} + a_{23}YDR + a_{24}NI + a_{25}PE + a_{26}PU + a_{27}RSL$
(6) $GCR = a_{28} + a_{29}GRR + a_{30}GCLR$
(7) $GRR = a_{31} + a_{32}YR + a_{33}IMPR + a_{34}GRLR$
(8) $IPR = a_{35} + a_{36}YR + a_{37}NI + a_{38}PE + a_{39}IGR + a_{40}FS$
(9) $IMPR = a_{41} + a_{42}YR + a_{43}IMPLR$
(10) $SPR = FS + RS$
(11) $CPR = YDR - SPR$
(12) $GSR = GRR - GCR$

(13) SNR = SPR + GSR
(14) YDR = YR-GRR
(15) YR = CPR + IPR + IGR + GCR + ISR + XR-IMPR

Expected signs of the coefficients are given in Table 1.

Table 1

EXPECTED SIGNS OF THE COEFFICIENTS

Coefficient	Sign	Coefficient	Sign
a_2	>0	a_{23}	>0
a_3	>0	a_{24}	<0
a_4	$\gtrless 0$	a_{25}	>0
a_5	>0	a_{26}	$\gtrless 0$
a_7	>0	a_{27}	>0
a_8	>0	a_{29}	>0
a_9	$\gtrless 0$	a_{30}	>0
a_{10}	>0	a_{32}	>0
a_{12}	>0	a_{33}	>0
a_{13}	<0	a_{34}	>0
a_{14}	$\gtrless 0$	a_{36}	>0
a_{15}	>0	a_{37}	$\gtrless 0$
a_{17}	>0	a_{38}	$\gtrless 0$
a_{18}	>0	a_{39}	$\gtrless 0$
a_{19}	<0	a_{40}	>0
a_{20}	$\gtrless 0$	a_{42}	>0
a_{21}	$\gtrless 0$	a_{43}	>0

A brief explanation of the model now follows. The discussion is organized in terms of the major channels through which financial development is thought to influence real growth according to the 'repressionist' hypothesis.

B. Financial Deepening and Financial Repression

Equations (1)-(3) are specified to represent the effect of artificially low real interest rates on the degree of financial deepening. Financial deepening normally refers to the volume of *real* financial assets. The standard approach towards examining this question is to estimate demand functions for money (M_1 or M_2) defined in terms of real interest rate (ex-post or ex-ante, the distinction is not always made clear). This approach suffers from at least two shortcomings. First, when it concentrates on M_2, it creates problems due to aggregation bias by lumping together non-income earning assets like currency and demand deposits with income earning financial assets like savings and time deposits. And second, this approach defines financial assets rather narrowly. The concept should be broadened along the lines suggested by Goldsmith. Once the definition is broadened, the single equation approach becomes even more questionable and the question of substitutability becomes even more important. We have tried to avoid both of these problems by specifying three separate equations for three classes of financial assets. Needless to say, the last category, F3R, is still too broad, but given the lack of data on this series for most of the countries, it was decided not to disaggregate it further.

The actual specification of equations (1)-(3) follows the standard Brainard-Tobin framework in a simplified way. It is assumed that the assets depend upon permanent income and expected real rates of return. Normally, it can be assumed that the own rate of return will have a positive sign while that of other assets a negative sign. However, in a world of more than two assets, we cannot rule out the possibility of complementarity. In our case, in view of the fact that F1R carries no positive return, this complementarity is likely to be exhibited by F2R and F3R. It should be noted that the absence of the own rate and the rates on the alternate assets in the equations for F1R, F2R and F3R does complicate the formal testing of the complementarity (or substitutability) hypothesis. However, given the paucity of relevant data, the approach used here is the only viable one.

At a more specific level, note that equations (1)-(3) have been specified in terms of only one nominal interest rate and the expected rate of inflation. Two remarks are in order here. First, it

can be easily shown that the equation specified in terms of expected real rates can be reduced to the form in (1)–(3). Second, it can be shown that the sign of PE in the reduced form will be ambiguous. Finally, the reason for using only one rate of return is that the data on the rate of interest on deposits are the only ones available.

C. Financial Repression and Savings

The 'repressionist' school does not offer any new theoretical insights on this issue. As we know, theory predicts that changes in interest rate will have a positive income effect and a negative substitution effect, so that the net effect on savings on a priori grounds is unpredictable. The usual approach on this topic is to regress savings on nominal or real interest rates. These results are suspect because of the inappropriate measure of savings and interest rates used. For example, it is difficult to argue that interest rate affects government or corporate savings. And yet, more often than not, aggregate savings is used as the dependent variable.

Leaving aside questions of measurement of variables, the problem of indeterminacy remains the most intractable. We have tried to deal with this by following a disaggregated approach. It is argued that although the effect of interest rate changes is unpredictable on total savings, such is not the case with respect to its major components, namely, savings in financial assets and those in physical assets. Once we do this, we can argue, following standard portfolio theory, that the own rate of return should have a positive effect and that on the substitute a negative effect. The effect on aggregate savings can be taken as the sum of the two. In equations (4) and (5) we have used the nominal rate of return on savings deposits as the representative rate on financial assets and the expected rate of inflation on physical assets. The stipulated signs on the two coefficients then follow immediately. It is, of course, recognized that these rates are not the best proxies but given the lack of other data, there was no alternative. The inclusion of the unanticipated inflation rate follows along the lines of work by Deaton.

It should be pointed out that the above disaggregated approach on savings, besides helping in determining the effect of interest rate, also serves to highlight the importance of financial

flows. It can be shown that financial flows are the cruical flows in making available resources for capital formation.[5]

D. Financial Repression and Investment

The standard neoclassical view is that physical capital and financial capital (money) are substitutes, so that an increase in interest (real) rates will lead to a reduction in the level of investment. The repressionist school, on the other hand, argues that in financially repressed economies the relationship between physical and financial assets is one of 'complementarity' so that an increase in the real rate of interest will stimulate, rather than retard, real investmet. In equation (8), however, we allow the empirical results to speak for themselves about the nature of this relationship, hence the ambiguous sign of a_{37}. Note also that instead of entering the real rate of interest, we have used the nominal rate and the expected rate of inflation as separate variables. This is because the former approach would imply imposing the constraint that the size of the coefficient of NI and PE are equal (but of opposite sign), which is rather too strong an assumption. Note that the ambiguity on the sign of NI also implies ambiguity on the sign of PE.

The repressionist school has also argued, as already pointed out, that low and variable real interest rates discourage savings in financial assets, which then inhibits domestic capital formation. In order to capture this effect, we have included FS as one of the determinants of IPR. Since financial savings assets, which as explained above represents financial deepening, the inclusion of FS may be taken to measure the effect of financial deepening on private investment. Finally, the inclusion of government investment (IGR) is meant to capture the possibility of 'crowding out' effect on private investment which such investments are sometimes supposed to have.

For the sake of completeness, it was decided to treat government consumption, revenues and imports as endogenous variables. The rest of the equations are self-explanatory. They are either identities or definitions.

[5] See Gupta (1970).

One feature of the model needs explanation. In a number of equations, the lagged dependent variable is included among the regressors. The reason for this is that we have defined the constraint to be the permanent magnitude of the appropriate variable. Thus, for example, private disposable income in equations (1)-(3) refers to permanent disposable income. As we know, if we have an equation of the form $X = f(\overline{Y})$, where, say, $\overline{Y}$ is permanent income, it can be shown that this structural equation can be reduced to $X = g(Y, X_{-1})$. However, it should also be pointed out that the same reduced form will also result if we start with a structural equation of the form $\overline{X} = f(Y)$ where $\overline{X}$ is defined as the 'desired' level of X. In practice, therefore, the reduced form cannot help us in identifying the underlying structural form.[6]

III. The Data

The model was estimated for a sample of twenty-five Asian and Latin American countries.[7] The length of the time series used was determined entirely by the data on interest rates and savings. In most cases, the time period is shorter. There are no data available on financial savings, government investment, disposable income or savings in physical assets. All these had to be constructed through a laborious process. In many cases, the quality is not as good as it could be, but not much can be done about it. The main sources of data are Fry and Galbis for interest rates and the *International Financial Statistics,* IMF, various issues for the others. Two other variables, PE and PU need special mention. These variables are, of course, not observable. They must be constructed. A model of savings behavior was estimated for each of the countries in our sample, using time series data without interest rate for Latin America but with for Asia. As part of the estimation procedure, PE and PU were also calculated. PU was simply defined as the difference between the actual and the anticipated rate of inflation.

[6] See Dhrymes (1971).

[7] The list of countries is as follows: Group I - El Salvador, Guatemala, Honduras, Malaysia, Panama, Singapore, Sri Lanka and Venezuela; Group II - Costa Rica, D. Republic, Ecuador, India, Indonesia, Mexico, Pakistan, Paraguay, Philippines, Taiwan and Thailand; Group III - Argentina, Bolivia, Columbia, Korea, Peru and Paraguay.

Table 2

STRUCTURAL ESTIMATES (TSLS) FOR THE FULL SAMPLE

1. F1R = 319.312 + .08312YDR − 16.697NI − 3.01064PE + .451413F1LR
(5.456) (13.991) (2.451) (.662) (13.141)
SE = 583.264

2. F2R = 265.122 + .018279YDR + .082339NI − 13.7360PE +
(5.002) (5.322) (.013) (3.411)
.776085F2LR
(21.995)
SE = 525.089

3. F3R = .000237YDR + 5.1423NI − 4.9505PE + .99027F3LR
(.108) (1.260) (1.676) (55.876)
SE = 398.075

4. FS = .020270YDR + 42.7262NI − 58.7430PE − 71.5352PU +
(1.741) (2.454) (4.829) (4.528)
.06915TSL
(1.078)
SE = 1539.48

5. RS = −307.874 + .123322YDR − 32.2693NI + 35.1970PE +
(1.379) (8.471) (1.148) (1.951)
56.7958PU + .365201RSL
(2.496) (6.148)
SE = 2176.1

6. GCR = 242.030 + .400246GRR + .204797GCLR
(2.032) (5.441) (3.808)
SE = 1462.19

7. GRR = .008681YR + .747183GRLR
(2.664) (24.766)
SE = 863.458

8. IPR = 1005.81 + .014087YR − 13.3093NI + 22.2073PF —
(6.227) (2.113) (.750) (1.870)
.794431GR + .011715FS
(12.717) (.163)
SE = 1510.47

9. IMPR = 227.115 + .01017YR + .856755IMPLR
(3.143) (2.174) (22.232)
SE = 742.448

All of the equations were estimated both by ordinary least squares method and that of the two-stage least squares (TSLS). However, to conserve space, we report only the TSLS estimates. Since the meaning of R^2 in TSLS estimates is ambiguous, we only report the standard errors of the regression equation among the summary statistics. The 't' statistics are given in the parentheses.

The estimates of the model are given in Table 2. Instead of going through each equation, summary results of major interest are given in Table 3. It can be seen from this table that the two components of the real interest rate exercise different effects, as predicted, but with different levels of significance in some cases, for example, F1R, F2R, and IPR. This justifies the inclusion of NI and PE as separate arguments in our model.

Table 3

EFFECTS OF NI AND PE*

	Effect of NI	Effect of PE
F1R	- (s)	- (ns)
F2R	+ (ns)	- (s)
F3R	+ (ms)	- (ms)
FS	+ (s)	- (s)
RS	- (ms)	+ (s)
IPR	- (ns)	+ (ms)

* *Source:* Table 2
s: significant at the 5% level
ms: coefficient to greater than its own standard error
ns: coefficient to smaller than its standard error

IV. Benefits of Financial Liberalization

In order to evaluate the benefits of financial liberalization we use the technique of dynamic multiplier anaylsis. Briefly it can be explained as follows.[8] The model of Section II can be written, in matrix form, as follows:

[8] See Intrilligator (1978).

$$(16)\ AY_t = BX_t + CY_{t-1}$$

where the dimensions of Y_t, X_t, Y_{t-1}, A, B, and C are approximately defined. Assuming that A is non-singular, equation (16) can be solved for Y to give

$$(17)\ Y_t = \pi_1 X_1 + \pi_2 Y_{t-2}$$

where

$$(18)\ \pi_1 = A^{-1}B \text{ and } \pi_2 = A^{-1}C$$

We can easily show that

$$(19)\ \left|\frac{\partial Y_{t,m}}{\partial X_{t,n}}\right| = \sum_{j=0}^{i-1} (\pi_1 \pi_2^j)_{mn} = [\pi_1 (I+\pi_2 \ldots + \pi_2^{i-1})]_{mn}$$

Setting $i=1$ gives us the *impact multiplier*. If $1<i<\infty$, we get *cumulative interim multipliers*. In (19), it shows the changes in the endogenous variable m in response to a sustained change in the exogenous variable n over i periods. When $i \to \infty$ we get

$$(20)\ \frac{\partial Y_{t,m}}{\partial X_{t,n}} = [\pi_1 (I-\pi_2)^{-1}]_{mn}$$

provided the power series in (20) convergences. Equation (20) gives the long-run multipliers.

It is clear from equation (20) that before we can compute the interim or the long-run multipliers we should check for the stability of the model. In the case of our model, since it can be reduced to a system of difference equations, the necessary and sufficient conditions for stability is that the values of all moduli be less than unity. In order to determine whether the estimated model was stable, the eigenvalues of the model were calculated from the endogenous parts of the estimated model. The eigenvalues, the moduli and the damping period are given in Table 4. It can be seen that the condition for stability is satisfied. Therefore, we can perform the multiplier analysis.

Using interim multipliers (not cumulative, though cumulative

Table 4

STABILITY CONDITIONS OF THE MODEL

	Eigenvalue	Modulus	Damping Period (year)
1.	0.7402	0.7402	1.35
2.	0.8221	0.8221	1.22
3.	0.2064	0.2064	4.84
4.	0.0326	0.0326	20.68
5.	0.0851	0.0851	11.75
6.	0.4514	0.4514	2.22
7.	0.7761	0.7761	1.29
8.	0.9903	0.9903	1.01

multipliers can be easily calculated given each period's multiplier), we examine the time profile of the effects of real interest rates over a period of fifteen years. It is assumed that a given increase in real interest rates which, as explained before, reflects the degree of financial liberalization here, can be achieved in three alternate ways: (i) by manipulating the nominal interest rate alone, which is essentially the approach recommended by the financial repressionists; (ii) by controlling inflation alone, as presumably the monetarists would argue; and (iii) a policy which combines elements of both. Following this approach, three alternate simulations were performed, corresponding to the three different shocks as follows:

SHOCK 1: It was assumed that there was a one percent sustained increase in the nominal interest rate (NI) while the expected rate of inflation (PE) remained constant.

SHOCK 2: The nominal interest rate was assumed to increase at a sustained rate of 0.5 percent while the expected rate of inflation was assumed to decline by 0.5 percent.

SHOCK 3: In this simulation, the expected rate of inflation was assumed to decline at a sustained rate of one percent while keeping the nominal rate of interest constant.

The interim effects of these shocks on the main endogenous variables are shown in Figures 1 to 7. We discuss these graphs in some detail now.

Figures 1 to 7: Interim Multipliers for Different Shocks

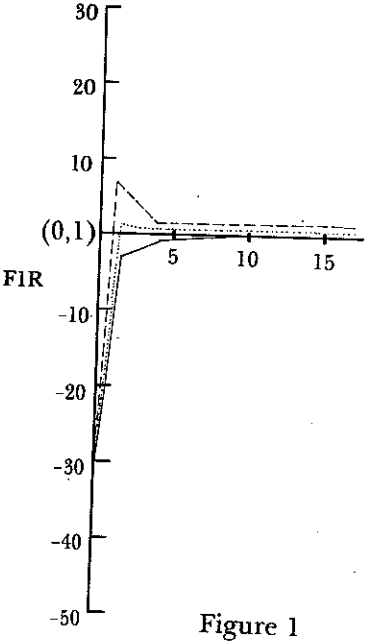

Figure 1

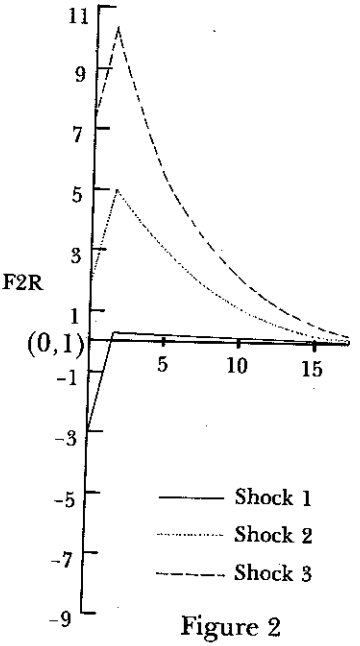

Figure 2

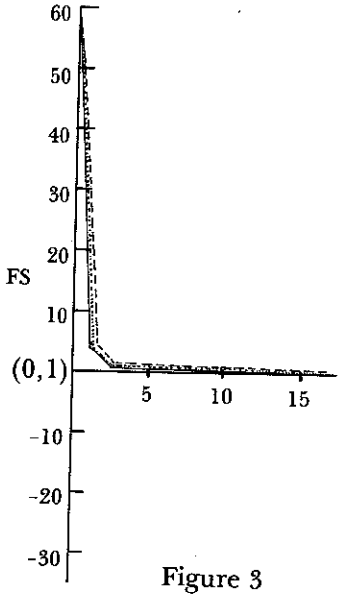

Figure 3

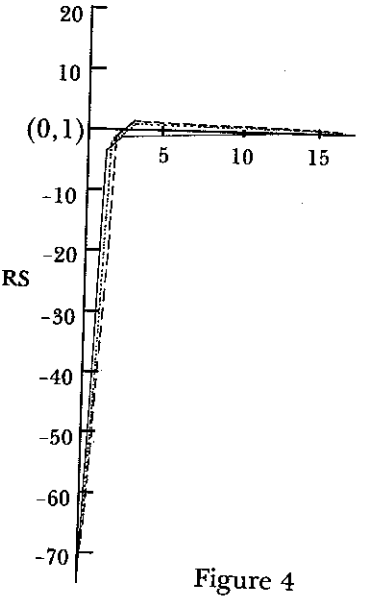

Figure 4

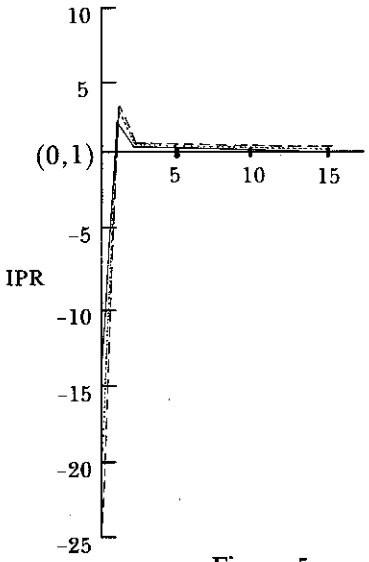

Figure 5

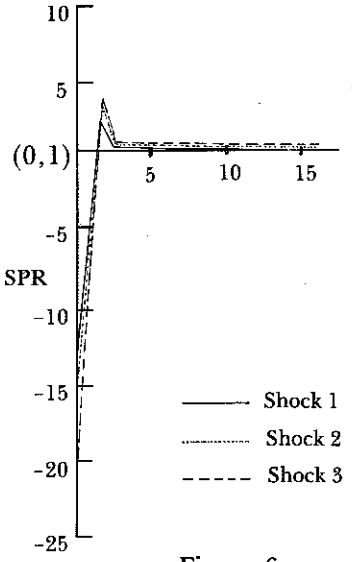

Figure 6

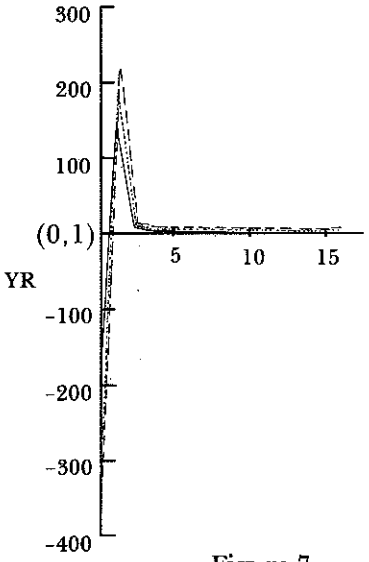

Figure 7

F1R: It can be seen from Figure 1 that Shock 1 is the least effective and Shock 3 is the most effective. While all three shocks lead to an initial reduction in F1R, eventually they all suggest an increase in F1R. The quantitative effect of Shock 3 is much more pronounced. It should, however, be noted that the effects of all three shocks are concentrated in the first four years.

F2R: The same pattern, as in the case of F1R, can be observed in this case, from Figure 2. However, as we would expect from the portfolio theory discussed earlier, the effects are much more pronounced. Except for Shock 1, the effects of the other two shocks are spread over a much longer period, even though the largest effects are concentrated during the first few years. Note that the peak for all three shocks reaches in the second year. The effect of Shock 3 is vastly greater than that of the other two.

FS: Figure 3 shows that the effects of the three shocks are very close over the entire fifteen years. But still, Shock 3 has the most pronounced effect. In the first year, the effect of Shock 3 is substantially greater than that of Shock 1 and slightly greater than that of Shock 2.

RS: It can be seen from Figure 4 that the time profile of the effects of the three shocks is initially opposite to that noted for FS and in accordance with the substitutability hypothesis discussed before. In the first three years, the effects are the greatest and suggest that an increase in the real interest rate leads to a decline in savings in real assets. However, after the third year, the effects of all three shocks suggest a complementary effect, namely, that both FS and RS increase. Once again, it should be noticed that the effects of the three shocks are very close to each other.

IPR: As Figure 5 shows, in the first year all three shocks depress real private investment, but after that all suggest an increase. The maximum effects are concentrated in the first three years. For the rest of the period, the effects are very close although Shock 3 dominates.

SPR: We can see from Figure 6 that in the first year all three shocks suggest a sharp negative effect, but positive effect thereafter. Maximum effects are, once again, concentrated in the first three years. After the first year, Shock 3 dominates. It would appear that in the first year the depressing effect on RS more than

outweighs the positive effect on FS, thus leading to a decline in the total private savings.

YR: Finally, Figure 7 shows that the effects on income of all three shocks reflect the effects on private investment, though all effects are more pronounced. In the first year, the three shocks exercise a negative effect, but after that all suggest a positive. Shock 3 again dominates.

From the above discussion, we can draw the following conclusions. First, that Shock 3 dominates. In other words, increases in real interest rates brought about by reducing the rates of inflation are more effective than the other two methods. Second, for all three shocks most of the effects are concentrated in the first few years of the reform. Third, there is no overwhelming support for the 'complementarity' hypothesis. But the interesting thing in this respect is that the relationship changes over time in response to a given increase in the real interest rate. It goes from being the typical 'neo-classical' to 'complementary.' And finally, the effects on the pattern of savings are more pronounced than on the aggregate savings.

So far we have examined the effects of financial liberalization in terms of their interim effects. We now turn to the examination of the long-term equilibrium effects. These can be calculated according to equation (20). The long term multipliers for the three shocks and for all of the endogenous variables are given in Table 5, but we concentrate only those examined in the above graphs. A brief discussion now follows.

F1R and F2R: It is clear that Shock 3 leads to the smallest decline in F1R while Shock 1 the largest. The results for F2R are just the reverse. The largest increase is caused by Shock 3 and smallest (in fact, a decline) by Shock 1. It appears that the long-term effect of Shock 1 is to decrease the total size of the financial sector. If we add up the effects of the different shocks on F1R and F2R, we find that the largest increase is caused by Shock 3 while an absolute decline is caused by Shcok 1.

FS, RS, and SPR: The long-term equilibrium effects on FS of all the shocks are positive and negative on RS. In general the long-term relationship between FS and RS is that of substitutability. The net effect of the different shocks can be read from

Table 5

LONG-TERM AND IMPACT MULTIPLIERS

Endogenous Variables	Shock 1		Shock 2		Shock 3	
	Impact	Long-Term	Impact	Long-Term	Impact	Long-Term
	(1)	(2)	(3)	(4)	(5)	(6)
F1R	-31.047	-34.652	-27.916	-22.414	-24.784	-10.176
F2R	-3.073	-1.903	2.275	25.501	7.624	52.906
F3R	5.101	527.824	4.986	517.779	55.309	61.966
FS	40.953	45.593	48.131	53.779	55.309	61.966
RS	-53.558	-56.237	-64.996	-65.884	-76.433	-75.530
GCR	-.605	0.498	-0.889	-1.174	-1.172	-1.850
GRR	-1.512	-0.989	-2.200	-2.333	-2.928	-3.676
IPR	-15.283	-13.181	-20.797	-18.085	-26.311	-22.989
IMPR	-1.771	-2.045	-2.606	-4.823	-3.430	-7.600
SPR	-12.605	-10.644	-16.865	-12.104	-21.124	-13.863
CPR	-160.024	-17.172	-236.635	-53.491	-313.247	-89.810
GSR	-0.907	-0.491	-1.331	-1.159	-1.756	-1.826
SNR	-13.512	-11.136	-18.196	-13.263	-22.881	-15.389
YDR	-172.628	-27.817	-253.500	-65.595	-334.371	-103.374
YR	-174.140	-28.806	-255.720	-67.928	-337.299	-107.050

SPR. All three shocks lead to a net decline in the level of real savings. Shock 3 is the most preferred one. An interesting feature of these results is that Shock 2 does not turn out to be the most preferred shock in any of the cases.

IPR: The long-term effects do not support the 'complementarity' hypothesis. Shock 1 is the most preferred one. It should be recalled that this shock was not the most preferred one for either the structure of savings or the level of aggregate private savings. This raises the interesting question, namely, whether the same method of achieving a given increase in the real interest rate can be beneficial, simultaneously, for raising savings and investment.

YR: The long-term multipliers suggest a depressing effect of financial liberalization on growth.

We can draw the following conclusions from this section. First, different shocks seem to be appropriate for financial and for real development. This raises the question of how one goes about selecting an appropriate policy of financial liberalization which can, simultaneously, achieve both rapid financial development and rapid growth. Second, as was the case with the interim multipliers, long term equilibrium effects of financial liberalization are also sensitive to the particular policy adopted for achieving a given degree of financial liberalization. And, finally, in terms of the effects on growth, the benefits of financial liberalization do not appear to be significant. If anything, the effects tend to be negative because of the traditional negative effect on private investment. It should be reiterated that financial liberalization is being interpreted here in the very specific sense of increases in real expected interest rates.

Finally, it is useful to compare the impact multipliers, as can be found by using equation (19), and the long-run multipliers. Both types of multipliers are given in Table 5. This table gives the multipliers for all of the endogenous variables for the three shocks. We consider the effects of one shock at a time.

Shock 1: Except for GCR, the direction of the effect of the impact and the long-run multipliers is the same. In terms of the quantitative differences, the most notable differences are in the case of F3R, CPR, YDR and YR.

Shock 2: Once again the direction of the effects of the two multipliers is the same. Quantitatively, the major differences are in the case of F2R, F3R, CPR, YDR and YR.

Shock 3: There is no difference in the direction of the effects of the two multipliers. Quantitatively, the major differences are for the same variables as in the case of Shock 2.

It is clear from this brief discussion that in order to analyze the effects of financial liberalization, the relevance of time horizon should be kept in mind. For it may well be the case that in the short-run, the effects are minimal, but in the long-run they are substantial, as, for example, is the case with the effects of Shocks 2 and 3 on F2R.

V. Concluding Remarks

In this paper, we have specified a simultaneous equations model to examine the role of financial liberalization on the growth of countries in Asia and Latin America. Using the estimated model simulation techniques have been used to analyze the effects of financial liberalization. The results show that there are considerable differences between the short-run, interim and the long-run. Consequently, emphasis on impact or short-run effects can be a misleading guide in determining the appropriateness of the role of the financial liberalization.

References

Brainard, W. and J. Tobin, "Pitfalls in Financial Model Building," *American Economic Review*, May 1968.

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

Dhrymes, P. J., *Distributed Lags*, San Francisco, 1971.

Fry, M. J., "Interest Rates in Asia," memographed, March 1981.

Galbis, V., "Inflation and Interest Rate Policies in Latin America: 1967-76," *IMF Staff Papers*, April/June 1979.

Goldsmith, R. W., *Financial Structure and Development*, New Haven, 1969.

———, *The Financial Development of India: 1860-1977*. New Haven, 1983.

Gupta, K. L., "Household Savings in Financial Assets: A Case Study of India," *Indian Economic Journal*, April/June 1970.

Intrilligator, M. D., *Econometric Models, Techniques and Applications*, Prentice Hall, 1978.

McKinnon, R. I., *Money and Capital in Economic Development*, Washington D.C., 1973.

Shaw, E., *Financial Deepening in Economic Development*, London, 1973.

Tun Wai, U., *Financial Intermediaries and National Savings in Developing Countries*, Praeger, 1972.

Zellner, A., "An Efficient Method of Estimating Seemingly Unrelated Regressions and Tests for Aggregation Bias," *Journal of the American Statistical Association*, June 1962.