

International Constraints on Macroeconomic Policies in Nepal: 1957-1978

by Robert F. McNown*

I. Introduction

The decade of the 1970s has brought an international perspective to macroeconomic theory. Macroeconomic disturbances of foreign origin have been recognized as important sources of changes in output, employment and inflation rates in countries, such as the United States, which had previously been assumed to be largely immune from such shocks. The recognition of macroeconomic inter-dependence among nations has led to the acceptance of new macroeconomic models and their application to the analysis of appropriate stabilization policies for open economies.

In this paper some of the lessons of the macroeconomics of open economies are applied to Nepal. The theory of macroeconomic policy for a small open economy experiencing limited capital mobility is presented for both fixed and flexible exchange rate regimes, and the structure of monetary policy formation in Nepal is considered empirically in the light of the theory presented.

The following section sets out the basic assumptions upon which the subsequent analysis is based. Section III presents the theory of macroeconomic policy under fixed exchange rates, and Section IV examines empirically the constraints on monetary policy during the fixed

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exchange rate era. Section V discusses the possibilities for and limitations on effective macro-economic policies under flexible exchange rates, and section VI concludes with some remarks on policy and areas for further investigation.

I. Characteristics of A Small Open Economy: Model Assumptions

In order to draw conclusions about macroeconomic policy relevant to Nepal a model is specified which captures its essential macroeconomic characteristics. The assumptions employed here are a slight, but significant, departure from those of the Meade paradigm,¹ which dominated economists, thinking about macroeconomic interdependence until the early 1960s. The revolution in the analysis of open economy macroeconomics initiated by Mundell² and Flemming³ pertains primarily to the consideration of international capital movements, which, while interesting, is nonetheless of limited relevance to Nepal.

For simplicity the analysis is conducted within the confines of a two country model. The home country is assumed to be so small relative to the foreign country (i. e. the rest of the world) as to have no impact on the levels of macroeconomic variables in the foreign country (smallness assumption).

The home country is assumed to be open with respect to international trade in goods and services but closed to international capital movements, imports and exports are responsive to changes in relative (home vs. foreign) prices, and each country's imports depend upon that country's level of income. It is also assumed that the price elasticity of import demand exceeds unity in absolute value, which is sufficient to guarantee that a depreciation of the home country's currency will improve that country's trade balance.

Consistent with the usual short run macroeconomic analysis, changes in the money stock are permitted to affect expenditure flows, while the capital stock is assumed fixed. The analysis does have a longer run view than is usual, in that the home economy is not considered

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1. Meade, J. E., The Theory of International Economic Policy, Vol. I; The Balance of Payments, London : Oxford University Press 1951 .
 2. Mundell, R. A., International Economics, New York : Macmillan (1968).
 3. Flemming, J. M., "Domestic Financial Policies Under Fixed and under Floating Exchange Rates," IMF Staff Papers, 9 (1962).

to be in full equilibrium until changes in the money stock resulting from balance of payments disequilibria have ceased (i. e. the trade balance must be zero in long run equilibrium). In accordance with the situation usually assumed for undeveloped financial markets, there is no possibility for sterilization of balance of payments surpluses or deficits by the monetary authority. A balance of payments surplus therefore causes an equal increase in the monetary base and a proportionate increase in the money supply.

The supply of labor in the home country is assumed to be infinitely elastic at the prevailing real wage.⁴ This is consistent with an aggregate supply function which is infinitely elastic at a price level equivalent to the world price level.

These assumptions are taken to be a set of reasonable abstractions suitable for the analysis of macroeconomic policy in Nepal. A more careful investigation of the reality of these assumptions is offered in Section IV following the discussion of policy under fixed exchange rates.

III. Macroeconomic Policy under fixed Exchange Rates

In the two-country world without capital flows, as set out in the previous section, macroeconomic interdependence comes about through changes in the trade balance. Net exports are a component of aggregate demand, and the first-round effects of any macroeconomic disturbance on an open economy must include consideration of changes in exports and imports. Macroeconomic policies initiated in the home country are weakened in their effect on home country income levels by the "leakage" of expenditures abroad. An expansionary fiscal or monetary policy, for example, increases the demand for both foreign and domestic goods and services, so that a portion of the increased expenditures leaks abroad as an increase in imports. Keynesian multipliers for an open economy are thus smaller by the inclusion of the marginal propensity to import.

In addition, under fixed exchange rates open economies are influenced by the policy actions of the foreign country. Again any policy actions of the foreign country will be transmitted

4. Such an assumption is based upon the Lewis model of surplus labor in developing economies, as in Lewis, W. A., "Economic Development with Unlimited Supplies of Labor," the Manchester School of Economics and Social Studies, 1954, 139-191.

through the trade balance to the home economy. Expansionary fiscal and monetary policies of the foreign country increase the level of expenditures by this country in the home economy, so that these policies also cause an expansion in the home country's level of income.

However, the preceding analysis considers only the first round, expenditure effects of home or foreign initiated policies. Further long run monetary effects will materialize as the shifting trade balance produces monetary changes through the actions of the monetary authority to fix the exchange rate. Expansionary policies in the home country move the economy toward trade and hence is balance of payments deficit. This turn reduces central bank holdings of foreign assets and the monetary base and therefore also the money supply. Assuming these effects cannot be sterilized, the resulting monetary contraction reduces income and expenditure (both on domestic and foreign goods) levels until the trade deficit is eliminated. In the long run neither fiscal nor monetary policy has effect on income levels under a system of fixed exchange rates.

This conclusion rests on the assumption that possibilities for sterilization of balance of payments effects by the central bank are limited. This assumption is reasonable for the case of LDC's where undeveloped or non-existent markets in government securities eliminate open market operations as a key tool of monetary policy. From this point of view the possibilities for sterilization are no greater for offsetting a balance of payments surplus (which requires the central bank to sell securities on the open market) than for offsetting a deficit (which may also be limited by finite holdings of foreign exchange).

Expansionary policies initiated abroad, as we have seen, cause an expansion in the home country as well, and these first-round effects are magnified in the long run through trade balance effects on the monetary base. A foreign expansion induces a trade surplus for the home country and this initiates the home country's expansion. This trade (and balance of payments) surplus increases the monetary base and hence the money stock, which causes a further expansion in home country income and expenditures. Full equilibrium is finally restored when expenditures on foreign goods increase sufficiently to eliminate the trade surplus. Thus in the long run equilibrium, home country income must increase by $-\frac{1}{u} \Delta TB$, where u is the home country's marginal propensity to import and ΔTB is the initial change in the trade balance resulting from the foreign country's expansionary policies.

These long run effects of foreign country macro-policies on home country income levels are clearly quite large, and compensating policies by the home country can only meet with frustration. Fiscal and monetary policies by the home country have no long run effects on the level of income, and this remains true for policies which are designed as a reaction to foreign disturbances. A foreign expansion, for example, raises home country exports causing both an increase in the money supply at home. These effects can be offset only by policies designed to raise home country imports to restore the trade balance to zero. Such an increase in imports may come about through (a) an increase in home income, which is the result to be avoided, (b) a lowering of import restrictions, which takes us beyond the realm of short-term macroeconomic adjustments, or (c) a revaluation of the home currency, which of course moves us out of the regime of fixed exchange rates.

A small open economy is therefore faced with a rather grim outlook for effective macroeconomic policies. Neither fiscal nor monetary policies initiated by the home country can have any long run impact on income/output levels. In addition, these tools are ineffective as compensating policies employed as a reaction to undesired macroeconomic disturbances from abroad. Furthermore, the long run impact on the home economy of macroeconomic disturbances from abroad is of considerable magnitude, leaving the small, open economy fully at the mercy of foreign macroeconomic shocks.

It should be emphasized that these results, which may appear unconventional to some, depend on the assumptions spelled out in Section II. In particular, the economy under consideration here faces no international Capital flows, has no possibilities for sterilizing monetary effects of the balance of payments, and is committed to a fixed exchange rate. A relaxation of these assumptions will change these conclusions in a fundamental way. However, such assumptions have been imposed here as an attempt to realistically capture the problems of macroeconomic policy formation for a country like Nepal under a fixed exchange rate regime. The appropriateness of these assumptions is the subject for examination in the following section.

IV. Monetary Constraints on Macroeconomic Policy in Nepal: 1957-78

The purpose of this section is to examine empirically the relevance of the assumptions employed in this paper to the case of Nepal during the period 1957-1978. First of all, exchange rate movements over this period are examined to determine the extent of exchange

rate adjustments and to specify the periods of fixed rates. Secondly, the sources of monetary change are studied for the fixed rate period. It is established that during the fixed rate period changes in foreign asset holdings of the central bank accounted for most of the variation in changes in the monetary base and also the money supply, and that while some potential for sterilization of these changes did exist, especially towards the end of this period, monetary policy was largely passive in the face of large changes in foreign exchange holdings. Furthermore all balance of payments phenomena during the period were dominated by events on the current account, so that capital flows played a minimal role. Consequently the empirical evidence is consistent with the model and implications of the previous sections: an economy whose monetary affairs are determined by the balance of payments, with little scope for sterilization, insignificant capital flows, and holding to fixed exchange rates over substantial periods of time.

The data used in this analysis were all taken from various issues of the **Quarterly Economic Bulletin** of the Nepal Rastra Bank. All series were mid-July figures for the years 1957-1978, and most analysis were based on year-to-year changes. The analysis is based primarily on simple correlations between pairs of variables in the monetary accounts.

Exchange Rate Movements:

In April, 1960, the exchange rate of the Nepali rupee was fixed in terms of the Indian rupee at a selling rate of 1.60. The international monetary system at that time was one at mutually fixed rates, so that this also fixed the Nepali rupees in terms of other major currencies. This exchange rate was maintained until June, 1966, when, in reaction to the devaluation of the Indian rupee, the Nepali rupee was appreciated by 57.5% with respect to the Indian rupee. While this action maintained the old exchange rate with respect to the other major currencies of the world, this was a major appreciation vis-a-vis Nepal's dominant trading partner. Such a large appreciation could not be maintained, and in December, 1967, Nepal devalued the rupee by 24.8% with respect to all major currencies. This new rate was maintained until the realignment of all currencies on December 17, 1971, which was followed by a further devaluation of the U. S. dollar in early 1973 and the onset of generalized floating of exchange rates.

To summarize this history, the twenty-one year period survey was marked by a decade of fixed rates pierced by two exchange rate changes followed by a decade of generalized floating. Based on mid-July to mid-July annual changes the fixed rate period for Nepal

is given by the years ending in 1961-1971 excepting 1966 and 1968, years during which realignments occurred. This period may also extend back to 1958, before the rupee was officially fixed, and both the 1961-1971 and 1958-1971 periods (excepting 1966 and 1968) are specified as the fixed rate eras I and II respectively. Following 1971 currency realignments were frequent, and after 1971 generalized floating precludes the identification of any post 1971 years as fixed rate periods, even though the Nepali rupee-Indian rupee rate was largely fixed.

The Foreign Asset Component of the Money Base:

For the stereotypical developing country monetary affairs are dominated by balance of payments phenomena,⁵ and during its fixed rate period Nepal was no exception. The foreign asset holdings of the central bank were the largest and often most variable of the sources of monetary base. As a fraction of the total assets of the monetary authority (all sources of money base), foreign asset holdings grew from 40% in 1957 to 80% in 1971 and fell back to 54% in 1978. Over the fixed rate period most of the changes in base money can be traced to changes in foreign asset holdings, and in some years the change in base money was almost identical to the change in foreign assets. The simple correlations between changes in base money and changes in net foreign assets (foreign assets minus foreign liabilities) over the fixed rate periods I and II were .793 and .790 respectively, indicating that approximately 63% of the variation in changes in base money can be attributed to changes in net foreign assets.⁶

Potential for Sterilization :

The problem of monetary policy formation in a developing economy is that the limited financial structure precludes the use of traditional policy tools such as open market operations in government securities or lending to commercial banks.⁷ Not only are monetary

5. Sen, R. S., *Central Banking in Underdeveloped Money Markets*, 1967.

6. From the balance of payments accounts it is clear that net changes in foreign assets have been dominated by the current account balance and official foreign loans. It is difficult to determine exactly the size of private capital flows since these are aggregated in the accounts with errors and omissions, undoubtedly an important item for Nepal with its long open border with India. However, the assumption of insignificant private capital flows appears tenable.

7. Sen R. S., *Central Banking in Underdeveloped Money Markets*, 1967.

authorities in developing countries constrained in initiating changes in the money supply, but also they are unable to offset undesired changes in the monetary base caused by balance of payments surpluses or deficits.

In Nepal during most the period under study virtually no use was made of loans to commercial banks as a tool of monetary policy. Prior to 1965 there were no central bank loans to commercial banks and even up to 1973 the largest volume of loans outstanding at year's end was 29.4 million rupees, accounting for only 6.4% of the outstanding monetary base. After 1973 there were incidents of large changes in loans to commercial banks, which did offset a major portion of the change in monetary base stemming from changes in foreign asset holdings. Therefore, while some potential for the use of commercial bank loans as a tool of monetary policy or sterilization does exist, particularly in most recent years, there is no evidence that significant use of this tool was made during the fixed exchange rate periods.

Throughout the 1960s, similarly, changes in central bank holdings of government securities were small relative to changes in net foreign assets (a mean absolute change of 7.3 million rupees for government securities holdings versus 84.5 million rupees for net foreign assets). However, from 1970 onwards changes in government securities holdings were a more significant source of changes in the monetary base, equalling in magnitude the change in net foreign asset during several years. However, as a tool to sterilize changes in net foreign assets, purchases and sales of government securities were not significant during either the fixed rate periods or the entire 21 year period considered. Perfect sterilization would be indicated by a correlation coefficient between changes in net foreign assets and changes in government security holdings of minus one. However, over fixed rate periods I and II this correlation coefficient was only $-.049$ and $.056$ respectively, and over the entire period 1958-1978 this correlation equaled $-.118$.⁸ In summary, while there was some potential for sterilization in recent years through changes in securities holdings, no significant use of this tool was made during the fixed rate era nor during the entire 21 year period studied.

The Relation Between Money Supply, Money Multiplier, Money Base and Net Foreign Assets:

While the relation between changes in net foreign assets and changes in the monetary base has been established, the connection between these changes and those of the money

8. None of these are statistically significant at 5% levels by the corresponding F-test.

supply has not been drawn. The relation between the monetary base and the money supply is given by

$$M = m \cdot B$$

Where M is the money supply, m is the money multiplier and B is the monetary base. The money multiplier may be either a stabilizing force (if changes in m tend to offset changes in B) or a destabilizing factor (if changes in m amplify changes in B) in the determination of the money supply. It is also possible that changes in the money multiplier may weaken the impact of foreign asset changes on the supply of money.

TABLE 1

Money Supply, Money Multiplier, Monetary Base and Net Foreign Assets

	Fixed Period I	Fixed Period II
A. Standard Deviations of Money Supply and Money Base Changes.		
Changes in Money Base	34.436	33.759
Changes in Money Supply	27.899	29.208
B. Correlations		
Changes in Money with changes in Monetary Base	.918	.934
Changes in Monetary Base with changes in Money Multiplier	-.623	-.649
Change in Money with changes in Net foreign Assets	.743	.760

The relevant statistics on these variables over the fixed rate periods are presented in Table 1. The first part of this table indicates that the variance of changes in the money supply is less than that of changes in the monetary base, suggesting that changes in the money multiplier had some stabilizing influence on the money supply. This is supported by the correlations between changes in the base and changes in the money multiplier, which are strongly negative. However, while the indicated movements in the money multiplier are in the right

direction. They are of insufficient size to substantially offset the changes in the base. This is indicated by the high positive correlations between changes in the money base and changes in the money supply (above .9) as well as the high positive correlations between changes in net foreign assets and changes in the money supply. These latter correlations are almost as high as those between changes in net foreign assets and changes in base money, so that changes in the money multiplier do little to weaken the dominance of net foreign assets in the money supply process.

Summary

The statistics presented in this section are consistent with the assumption that monetary changes in Nepal over the fixed rate era were dominated by changes in net foreign asset holdings of the central bank. No evidence of sterilization of these foreign sector effects was found. The description of Nepal as an economy dependent upon balance of payments phenomena in its monetary affairs, with insignificant capital movements, and unable to sterilize foreign sector effects is therefore supported. Consequently, limited possibilities for macroeconomic policies as described in Section III have existed for Nepal during periods of fixed exchange rates.

V. Macroeconomic Policies Under Flexible Exchange Rates

During those periods in which Nepal has adhered to fixed exchange rates, the options for macroeconomic policy have been severely constrained. Over the years of fixed rates surveyed here Nepal fits most closely the model of an open economy with insignificant capital mobility, whose money supply is largely determined by central bank holdings of foreign assets, with virtually no sterilization of balance of payments effects on the money supply. As discussed in Section III, as long as such an economy adheres to fixed rates, neither monetary nor fiscal policies can affect the level of income in the long run, while policy actions of a large trading partner will have substantial impact on economic activity of the small open economy. In view of such constraints it is reasonable to consider the possibilities for macroeconomic policies under a system of flexible exchange rates, both as a descriptive discussion of macroeconomic policy possibilities during past years of flexible rates and as a prescriptive analysis of such possibilities should all attempts to fix exchange rates be abandoned.

With flexible exchange rates adjustments to external disequilibrium take place through exchange rate changes with consequent effects on the trade balance. The central bank does not intervene in foreign exchange markets, and therefore faces no undesired changes in foreign asset holdings, so that monetary changes are effectively insulated from the foreign sector.

In the model without capital flows, flexible exchange rates force the balance of trade to be in equilibrium at all times. Any fiscal or monetary policy therefore has an effect on income identical to that which is experienced by a totally closed economy. Net exports must always be zero, so this component of aggregate demand is eliminated as a possible source of income changes. An expansionary (fiscal or monetary) policy, for example, raises expenditures including imports, causing currency depreciation, which in turn raises net exports to restore trade balance equilibrium. The initial import "leakage" from the expenditure stream is offset by the increase in net exports, and monetary and fiscal policies have the full multiplier effects predicted by a closed economy (IS-IM) model.

By the same reasoning flexible exchange rates in an economy without capital flows insulate a small open economy from macroeconomic policies initiated abroad. With the trade balance always in equilibrium there can be no transmission of macroeconomic disturbances between countries.

The arguments against flexible rates implied by the economics of optimum currency areas⁹ indicate that the macroeconomic policies of small open economies are constrained even under flexible rates. For example, an economy with a large fraction of its output consisting of tradable goods will have its price level set in world markets on which it has insignificant impact. Invoking the usual assumption of an infinitely elastic demand for tradable goods produced by the home country, it follows that any currency depreciation by the home country leads directly to a proportionate rise in the price of tradables. If such goods carry substantial weights in the home country's price index, then an important influence of the foreign sector on home country macroeconomic variables is introduced. In the extreme case of 100% tradable goods, with infinite elasticity of world demand for the home country's goods, any currency depreciation is fully matched by a rise in the price level and exchange rate flexibility is unable to restore trade balance equilibrium.

Such an argument does not apply to the economy specified here, in which the supply of labor, and hence the aggregate supply function, is infinitely elastic. As long as world

9, See, for example, Mundell, B. A., "A Theory of Optimum Currency Areas," *American Economic Review* September, 1961, 657-665 and McKinnon, R. 1., "Optimum Currency Areas," *American Economic Review*, September, 1963, 717-725.

demand for the home country's products is less than infinitely elastic, currency depreciation will be successful in increasing net exports without a rise in the price level. The (finite) increase in demand for the home country's output induced by a currency depreciation will be satisfied by the absorption of excess labor into the tradable goods sector, and no increase in the price level occurs.

Therefore, for the model specified here flexible exchange rates permit fiscal and monetary policies to be effective and insulate the economy for foreign macroeconomic shocks. The maintenance of trade balance equilibrium through exchange rate adjustments results in policy effects indential to those of a closed economy (I S- IM) model.

VI. Conclusion

In this paper the international constraints on effective macroeconomic policies have been discussed iheoretically and analyzed empirically. It has been demonstrated that during the fixed exchange rate period Nepal's monetary policy has been dominated by balance of payments phenomena, and that there has been virtually no sterilization of such effects. The theory of macroeconomic policy in open economies indicates that in such an environment neither fiscal nor monetary policies have any effect on economic activity in the long run. Under flexible rates, on the other hand, macroeconomic policies are effective in the model employed here and flexible rates also achieve independence of the home economy from foreign macroeconomic disturbances.

A Number of issues remain unsettled by this discussion. First of all there is a discrepancy between the conclusions of this paper and those of the literature on optimum currency areas concerning the desirability of flexible rates for small open economies. This discrepancy hinges upon the assumptions of infinitely elastic supply versus infinitely elastic demand posited by the two opposing models, and some less extreme combination of these models should be explored. Secondly, the conclusions of this paper are all long run equilibrium conclusions, and naturally some consideration of the speed of adjustment to equilibrium is in order. If we are concerned with short run stabilization policies, and if the adjustment to full equilibrium is a long process, then the conclusions of this paper will be less important. Thirdly the theoretical discussion could be extended by a relaxation of any of the basic assumptions of the model. For example, a relaxation of the assumption on import price elasticities would alter the arguments concerning flexible rates which are based on smooth adjustments in the trade balance to exchange rate changes. Finally, the model incorporating Capital flows, were this to be found relevant to the Nepalese experience, leads to conclusions fundamentally different than those presented here.