

ESTUDIOS MONETARIOS VII

ALTERNATIVAS DE POLITICAS FINANCIERAS EN ECONOMIAS PEQUEÑAS Y ABIERTAS AL EXTERIOR



DIRECCION DE
POLITICA FINANCIERA



BANCO CENTRAL DE CHILE

1981

CONTENIDO

CONTENTS

	Página
DISCURSO INAUGURAL DEL EX PRESIDENTE DEL BANCO CENTRAL, Sr. Alvaro Bardón M.	9
FOREIGN EXCHANGE POLICY AND ECONOMIC LIBERALIZATION IN LESS DEVELOPED COUNTRIES, Ronald McKinnon	13
Exchange Rates in Practice	15
Currency Inconvertibility, Financial Immaturity, and the need for a Pegged Exchange Rate	18
The Adjustable Peg in a Repressed Economy	20
Discrete Devaluation and Partial Liberalization	23
Devaluation and the Trade Balance	26
Passive Downward Crawling	29
Active Downward Crawling during Economic Liberalization	32
Sustaining Liberalization: Fixed versus Floating Exchange Rates	36
Bibliography	39
Comentarios	41
MACRO-ECONOMIC POLICY IN AN OPEN ECONOMY, Jacob Frenkel	51
Introduction	53
Macro-Economic Policies Under Pegged Exchange Rates	54
Flexible Exchange Rates	71
The Choice of the Exchange Rate Regime and the Optimal Managed Float	82
References	93
Comentarios	99
INDICATORS OF PERFORMANCE IN MONETARY POLICY IN OPEN ECONO- MIES: THE HISTORICAL RECORD, Arnold C. Harberger y Sebastián Edwards ...	115
Introduction	117
The World Inflation, 1952-1976	118
Chronic and Acute Inflations	121
Looking Beyond the Money Supply	123
Recent Inflation Experience	127

The Devaluation Crisis Countries	128
Reserves Policy and the Ability to Defend a Fixed Exchange Rate	137
Appendix:	
Reserves Ratios Distributions under Critical Values of Indicators of $-.10$ and $.10$	149
References	154
Comentarios	155
SOME REFLECTIONS ABOUT EXTERNAL PUBLIC DEBT MANAGEMENT,	
E. Walter Robichek.....	169
Comentarios	185

DISCURSO INAUGURAL DEL PRESIDENTE DEL BANCO CENTRAL DE CHILE

Fue pronunciado por el señor Alvaro
Bardón Muñoz, ex Presidente del Banco
Central, el 21 de enero de 1980.

Distinguidos amigos del extranjero y del país que han tenido la deferencia de unirse al Banco Central de Chile con el objeto de analizar los problemas que preocupan a las pequeñas economías que han decidido abrirse a la competencia internacional.

Queremos darles una cordial bienvenida y desearles unos días provechosos, en los que puedan entregarnos y sacar lecciones de utilidad para todos, en el sentido de que podamos llegar a comprender mejor el funcionamiento de nuestras economías, facilitando con ello el desarrollo más rápido y, en último término, la eliminación de la extrema pobreza y la creación de la posibilidad de una efectiva igualdad de oportunidades.

Me limitaré en esta oportunidad, como introducción a esta Conferencia, a describir brevemente la experiencia reciente de Chile y las interrogantes que de ella surgen, para luego permitir el desarrollo de los temas que se encuentran preparados y las discusiones consiguientes.

La estrategia de desarrollo iniciada en el año 1973 se basa en la apertura al exterior, el libre funcionamiento de los mercados, la iniciativa privada y el rol subsidiario del Estado. Esta política constituyó un cambio radical respecto de las que hasta entonces habían prevalecido.

En efecto, la estrategia de desarrollo aplicada en Chile durante más de 30 años fue —salvo excepciones que sin éxito trataron de apartarse de ella— la conocida como de desarrollo hacia adentro, caracterizada fundamentalmente por la sustitución de importaciones y un control creciente del Estado.

La aplicación de esta estrategia significó la implantación de altísimas y prohibitivas tasas arancelarias, un gran número de restricciones para arancelarias y un sistema de tipos de cambio múltiples. Asimismo, se siguió una política de fijación de precios y, entre éstos, la tasa de interés. Esta última

fue, durante gran parte del período, fuertemente negativa, con el consiguiente efecto sobre el desarrollo del mercado de capitales y la asignación de los recursos.

La creciente intervención del Estado en la economía, unida a un sistema tributario ineficiente, significaron la existencia de grandes déficit fiscales financiados con emisión. Esto se tradujo en un continuo y creciente proceso inflacionario, además de frecuentes crisis de balanza de pagos, favorecidas por políticas cambiarias inadecuadas.

Es en este marco de cuasi hiperinflación, de elevado endeudamiento externo, ausencia de reservas, cesación de pagos en el exterior y falta de credibilidad internacional en nuestra economía, que se decidió alterar el rumbo seguido hasta entonces, poniéndose en marcha una nueva estrategia económica.

En las condiciones antes señaladas, era imposible pensar siquiera en la posibilidad de implantar una política de tipo de cambio fijo o una de tipo de cambio flotante. La primera, debido a que la situación de déficit fiscal crónico financiado por el Banco Central, habría implicado una pérdida de reservas (que por lo demás no existían), insostenible. La segunda, debido a que una condición necesaria para lograr un sistema de tipo de cambio flexible, estable, es que el Banco Central, además de no intervenir en transacciones de divisas, conduzca su política monetaria en forma también estable, a fin de que los especuladores puedan pronosticar el comportamiento del mercado.

En esas condiciones, una política de tipo de cambio "reptante" pareció ser la más adecuada. Esta permitió mantener un tipo de cambio congruente con el proceso inflacionario que vivía el país en aquella época. En esta forma se logró minimizar los efectos de la inflación sobre los precios relativos de bienes transables y no transables, incentivando así en forma importante el comercio exterior, especialmente las exportaciones no tradicionales. Asimismo, se evitaron los riesgos de variaciones bruscas en el valor del tipo de cambio. Esto contribuyó a eliminar los movimientos especulativos de capitales, que se producen cuando hay expectativas de una gran devaluación y los consiguientes cambios en la demanda de dinero.

Al mismo tiempo que se establecía este tipo de cambio "reptante", se inició la reforma arancelaria y la reforma fiscal. La primera fijó el plan de reducción de los aranceles, que concluyó en 1979, con un arancel general del 100/o, salvo pequeñísimas excepciones. La reforma fiscal y del sistema tributario permitieron reducir paulatinamente el déficit hasta lograr un control de las finanzas públicas.

Paralelamente se establecieron las normas necesarias para el desarrollo de un mercado de capitales eficiente que permitió la determinación de tasas de interés acorde con las condiciones de oferta y demanda. Paulatinamente se ha ido abriendo ese mercado al exterior, en la medida que las reducciones en los encajes y ajustes del mercado interno lo han ido permitiendo.

Los avances conseguidos en el control de las finanzas, conjuntamente con la realización de los objetivos planteados en la liberalización del comercio exterior y el mercado de capitales, hicieron posible la fijación de una tabla de valores para el dólar, que contribuyó notablemente a quebrar las expectativas inflacionarias existentes y facilitar la superación de la recesión de 1975.

El progreso conseguido en el primer semestre de 1979 aconsejó fijar, en junio de ese año, el precio del dólar en \$ 39 para los siguientes 8 meses. Esta medida fue confirmada más adelante con el anuncio de que éste se mantendrá fijo indefinidamente.

Las condiciones de nuestra economía favorecen claramente la adopción de una política de tipo de cambio fijo. Un tipo de cambio flotante requiere, conjuntamente con una política crediticia estable por parte del Banco Central, de un mercado cambiario a futuro bien desenvuelto. Ello implica costos en recursos reales y, por lo tanto, su desarrollo dependerá del volumen de transacciones en el mercado. Una manera de evitar esos costos es fijando el cambio.

Al decidir fijar el tipo de cambio, debemos determinar contra qué moneda lo vamos a hacer. Aquí caben dos posibilidades. Atarlo a una moneda o bien a un conjunto de ellas.

Dos condiciones parecen importantes para optar por fijarlo contra una moneda. En primer lugar, la estabilidad de ésta, en el sentido de que el país al cual pertenezca dicha moneda tenga estabilidad de precios. En segundo lugar, que tengamos un porcentaje importante de nuestro comercio en esa moneda, ya que así se reducen los costos de transacción en el intercambio comercial y financiero.

De no existir algunas de estas condiciones, parte de las ventajas de fijarnos contra una moneda disminuyen y se hace conveniente considerar la posibilidad de un grupo o canasta de monedas. Al analizar esta última alternativa, surge el problema de decidir cuáles serán las monedas de la canasta y cual será el peso relativo de cada una de ellas.

Parece obvio que las monedas incluidas serán aquéllas de economías estables y con las cuales comerciamos. El problema de decidir sobre las ponderaciones de cada moneda en la canasta dependerá de los objetivos que tenga la autoridad económica.

A este respecto, es importante tener en cuenta que elegir un objetivo probablemente será inconsistente con alcanzar otros. Por ello, al determinar el conjunto de ponderaciones debemos evaluar las ventajas y desventajas de cada objetivo y considerar también las características propias de la economía.

Estos son algunos de los puntos sobre los que en la actualidad debemos pensar, puesto que si bien hoy día el dólar parece cumplir con los requisitos

necesarios para ser la moneda a la cual debemos atarnos, en el futuro las condiciones podrían cambiar.

Dentro del esquema económico actual, y a fin de mantener la elevada tasa de crecimiento que el país ha experimentado en los últimos años, se hace necesario contar con un flujo estable de recursos foráneos. En este sentido, es importante que la deuda externa se mantenga en niveles prudentes, que sean compatibles con la solvencia y confianza internacional del país. A este respecto, el Banco Central ha establecido un sistema de encajes al crédito externo con el objetivo de regular el monto del ahorro que entre al país. En esta forma tratamos de ponernos a cubierto de una inundación de créditos que podría tener efectos desestabilizadores. Este es otro punto sobre el cual es necesario pensar e intercambiar opiniones.

Estamos absolutamente convencidos de que para avanzar es necesario no sólo tener claros los objetivos, sino también conocer científicamente la naturaleza y posibilidades de los instrumentos de política disponibles y la relación entre las variables económicas sobre las que debemos actuar para conseguir los objetivos deseados.

Por ello, el Banco Central ha organizado esta Conferencia sobre "Alternativas de Política Financiera en Economías Pequeñas y Abiertas al Exterior".

A este evento han sido invitados, como expositores, cuatro distinguidos economistas y sus trabajos tocarán precisamente los temas que son para nosotros, en la actualidad, de crucial importancia.

De sus trabajos, como del intercambio de opiniones, surgirán ideas que, estamos ciertos, coadyuvarán a aclarar muchos puntos. Esto contribuirá a que nuestro país siga creciendo y desarrollándose al ritmo en que lo ha hecho en los últimos cuatro años.

**FOREIGN EXCHANGE POLICY AND ECONOMIC
LIBERALIZATION IN LESS DEVELOPED COUNTRIES**

Expositor: Profesor Ronald McKinnon (*)

Moderador: Sr. Alvaro Bardón M.

Comentaristas: Sr. E. Walter Robichek

Sr. Manuel Guitián

* Stanford University.

FOREIGN EXCHANGE POLICY AND ECONOMIC LIBERALIZATION IN LESS DEVELOPED COUNTRIES

This paper surveys the principal exchange rate regimes used by less developed countries, and how they have worked out in practice. It identifies particular exchange rate policies that best suit different sets of monetary, fiscal and foreign trade policies the country in question is likely to follow. How the optimum foreign exchange regime changes as the economy moves from a state of "repression" to one of full "liberalization" is traced out. Contents include:

- Exchange rates in practice
- Currency inconvertibility, financial immaturity, and the need for a pegged exchange rate
- The adjustable peg in a repressed economy
- Discrete devaluation and partial liberalization
- Devaluation and the trade balance
- Passive downward crawling
- Active downward crawling during economic liberalization
- Sustaining liberalization: fixed versus floating exchange rates

Exchange Rates in Practice

Do we live in a world of generally floating exchange rates? The collapse in February 1973 of the short-lived Smithsonian agreement, which established official par values for major currencies against the American dollar, is widely regarded as the herald of a new era of unrestricted exchange-rate flexibility. But appearances and casual newspaper commentary are deceiving. Of the 122 currencies tabulated by the International Monetary Fund in Table 1, only 11 were floating independently as of June 30, 1975. They

include the major Western industrial economies such as the United States, Japan, Britain, France, Italy, Canada, Switzerland, etc., and one or two oil-rich countries such as Saudi Arabia and Nigeria with ample supplies of foreign exchange for preserving free currency convertibility. These independent floaters account for about 46.4 percent of world trade.

TABLE 1

Exchange Rate Practice of International Monetary Fund Members
(As of June 30, 1975)

SPECIFICATION	Number of currencies	Percentage share of trade of fund members
Currencies that float independently	11	46.4
Currencies pegged to a single currency, of which:	81	14.4
Pegged to U.S. dollar	54	12.4
Pegged to French franc	13	0.4
Pegged to pound sterling	10	1.6
Pegged to Spanish peseta	1	—
Pegged to South African rand	3	—
Currencies pegged to a composite of currencies of which:	19	12.4
SDR	5	5.0
Other	14	7.4
Currencies pegged to others but that change the peg frequently in light of some formula	4	2.0
Currencies that are floating jointly	7	23.2
Total	122	98.4

SOURCE: International Monetary Fund Annual Report, 1975.

Another small group of Western European countries, with a somewhat revolving membership, maintain common currency margins with each other and are said to be joint floaters: Belgium, Denmark, Germany, the Netherlands, Norway, and Sweden. These joint floaters account for another 23 percent of world trade.

Otherwise, the remaining 104 countries whose exchange practices were sufficiently systematic to permit classification in Table 1, all peg to a convertible foreign currency such as the U.S. dollar or the French franc; or they peg to a statistical index or a composite of currencies from the major industrial countries. But even in the latter case, a single intervention currency (usually the U.S. dollar) is the financial instrument for adjusting the international value of the domestic currency to the weighted index of other currencies. The great majority of these 104 are the poor less developed countries of Latin America, Africa, and Asia with inconvertible currencies.

With only minor modifications, this basic pattern of exchange rates has persisted throughout 1979. The number of independent floaters remains about the same, with some minor expansion in the number floating jointly within the new European Monetary System. The number of countries maintaining formally fixed exchange rates with the U.S. dollar has fallen from 54 to about 40, and the number pegged to the pound sterling has fallen from 10 to 3. However, this has been offset by an increase from 19 to 33 in the number of countries pegged to a composite of convertible currencies; and an increase from 4 to about 7 in those adopting a crawling peg. Thus the great majority of countries persist in using some form of pegging despite the increasing difficulty of finding a major trading partner with a convertible currency sufficiently stable to warrant an indefinite pegging commitment.

For those receiving their economics training at the University of Chicago, this persistence of pegging by LDCs —pegging that we all know is abortive from time to time— seems irrational. Given the newly revised Article IV of the International Monetary Fund allowing members to choose virtually any exchange-rate system, why haven't more countries adopted the purist solution of free floating? True, under the Chicago influence, floating was tried (temporarily) by Israel in 1977 (with very poor results). But most LDCs have been more like Chile, which listens politely to visiting academics who advocate floating without taking their advice.

I shall argue that only a fairly limited group of "financially mature" economies have sufficient internal monetary control and freedom in foreign exchange transacting to make pure floating a feasible policy option —an option they may or may not choose to exercise according to the theory of optimum currency areas. Otherwise, most governments, particularly those in LDCs with inconvertible currencies, must intervene in the foreign exchanges to support their domestic monetary and foreign trade policies. For many of these countries, freely floating their exchange rate would be disastrous.

I am not arguing that all techniques of official intervention are warranted. A fixed exchange rate may be inappropriate in some circumstances, and a crawling peg could destabilize an otherwise stable monetary system in yet other circumstances. Instead, my purpose is to specify what foreign exchange system best complements different domestic trade and financial policies, however rational or irrational they may seem.

In this classification procedure, the degree of economic liberalization is of paramount importance. A country relying heavily on strict exchange controls, import quotas, and high protective tariffs may well opt for a different exchange rate system from one that is moving towards free trade. Similarly, the sudden liberalization of domestic financial processes, where real rates of interest are raised sharply, may well alter the first-best foreign-exchange policy. All this remains to be spelled out.

Currency Inconvertibility, Financial Immaturity, and the Need for a Pegged Exchange Rate

Unlike LDCs, most industrial economies have sufficiently convertible currencies that free floating is at least technically feasible. In order to actually make the spot exchange market, foreign-exchange departments of authorized commercial banks—henceforth simply dealers—are allowed to take open positions in foreign exchange. Although some industrial countries may still restrict the rights of individual citizens to hold interest-bearing securities in foreign monies, large trading corporations and commercial banks are quite free to hold forward positions or interest-bearing foreign bonds as a means of covering their foreign-currency exposures. This active flow of short-term capital between any two industrial countries is essential in developing a vigorous forward market on the one hand, and to minimize the capital constraints on dealer-speculators taking balancing spot positions in foreign exchange on the other¹. In contrast, in order to prevent capital outflows, LDCs typically go to considerable lengths to prevent firms and banks—as well as individuals—from buying foreign securities.

To maintain a foreign-exchange market with a floating rate, more is required than just freedom to move capital internationally. If domestic capital markets are immature and/or subject to usury restrictions on interest rates, or if the bank-based part of the capital market is subject to heavy reserve requirements, then domestic financial instruments for providing forward liquidity to foreigners may not exist. Hence, industrial economies have been rather lucky with the unplanned advent of eurocurrency transactions in their own monies. The large volume of interbank transacting that is the heart of the euros system avoids the interest-rate restrictions and reserve requirements that exist in purely national money markets. Banks can more easily exchange one national currency for another (a) in covering forward foreign exchange commitments to their non bank customers, and (b) in undertaking covered interest arbitrage that aligns interest differentials with forward premia or discounts. Both (a) and (b) are essential to allow private banks to make the market successfully, but only currencies that start with a substantial degree of spot convertibility and are in substantial

¹ The key relationship between unrestricted capital flows and the forward market is developed in some detail in McKinnon [1979a], Chapters 5 and 7. The capital constraint on dealers is treated in McKinnon [1979b].

international demand can be successfully traded in euromarkets². In most LDCs, on the other hand, domestic capital markets are more distorted by official regulations, and eurocurrency transacting to offset these distortions is not feasible.

Financial immaturity, or more active domestic financial repression, is clearly linked with maintaining tight controls over foreign exchange transactions. If, as in most LDCs, domestic financial assets are illiquid and bear a low real rate of return for that degree of liquidity, then domestic nationals will prefer to hold liquid assets abroad unless prevented by official restrictions. These exchange controls are usually tightened in a situation of on-going price inflation, an important aspect of which is to collect a tax from the domestic banking system. Because the tax is levied on domestic currency and deposits³, the purchase of foreign bonds or working balances of foreign exchange erodes the tax base. These resources not only elude the government's inflation tax but in doing so cause a further socially unwarranted capital outflow from the domestic economy. Given the initial distortion of on-going price inflation, therefore, a detailed web of exchange controls is a perfectly rational —indeed necessary— policy response.

Even in the absence of exchange controls, a high and variable rate of domestic inflation destroys the idea of a "normal" exchange rate around which regressive private expectations might have some chance of stabilizing the market. Not only is the supply of domestic base money in the future unknown, but the demand for currency and deposits is likely to be quite unstable in immature financial systems where money/GNP ratios are subject to frequent changes. Hence the equilibrium exchange rate and domestic price level, which just clear the domestic money market, are unknown to potential private speculators. In a free float, the swings in the exchange rate experienced by a typical less developed economy would be much greater than the swings already experienced by the industrial economies in more favorable circumstances.

These difficulties with pure floating lead authorities in almost all LDCs to adopt some version of a pegged exchange rate. The central bank itself becomes responsible for making the market on a day-to-day basis, and for providing forward cover to merchants —insofar as any such cover exists. With the central bank buying and selling foreign exchange directly, there is no need to have even a narrow band around the official parity⁴. While usually subject to ongoing inflationary pressure, the domestic price level is made somewhat more stable and the difficulties experienced by merchant traders

² A more complete description of the role of euromarkets in foreign exchange trading can be found in McKinnon [1979a], Chapter 9.

³ The government may collect the tax by direct borrowing from the banking system at zero or low rates of interest through the "reserve" requirements it imposes. Alternatively, the government may implicitly assign revenue from the tax to a few favoured private borrowers who receive loans at less than market rates of interest.

⁴ The main point of a narrow band is to allow the central bank to devolve the clearing of foreign payments to commercial banks (McKinnon, [1979a], Chapter 2).

are minimized. The only question is whether the pegged exchange is kept rigid for several months or years before some traumatic devaluation is undertaken as per the "adjustable peg", or whether devaluation proceeds smoothly according to the precepts of a downward crawling peg. Let us discuss each in turn.

The Adjustable Peg in a Repressed Economy

By a "repressed" economy, I mean one with widespread restrictions on foreign trade and domestic finance. Consider first the macroeconomic implications of restrictions on foreign trade apart from their microeconomic protective effects.

Besides detailed and extensive exchange controls for preventing capital flight from our prototype LDC, much of the current flow of imports and exports is repressed by quota restrictions (QRs) and redundantly high tariffs⁵. These QRs create a large body of "pseudo nontradables" whose domestic currency prices are detached from those prevailing in world markets. Although the exchange rate is pegged, increases in aggregate demand in the domestic economy raise the prices of genuinely nontradable services and also increase the domestic currency prices of a wide variety of primary products and manufactured goods that are pseudo nontradables. Because additional imports in the QR categories are prevented from entering the economy in response to inflationary pressure, their domestic prices and associated premia on licenses are simply bid up. The domestic price level is substantially independent of where the exchange rate is set. In such an economy, therefore, the exchange rate cannot be used as a macroeconomic device for determining the domestic price level. Nor is the choice of an exchange effective in balancing international payments.

When QRs are very detailed, extending even to some exports, then the quota system itself becomes the principal mechanism by which foreign payments are balanced. If its reserves are being drawn down too quickly, the central bank simply tightens up on its import QRs or loosens up on its export allocations. In this sense, the exchange rate is set "passively": it is not the primary short-run device for balancing the supply of, and demand for, foreign exchange. The total volume of imports is determined largely by access to foreign capital plus ongoing export receipts. With foreign finance liberally available, the authorities can easily be more generous in allocating import QRs, and vice versa.

Under this passive pegging in a repressed economy, the domestic monetary system is largely insulated from the foreign exchanges. An excess domestic demand for goods in terms of money does not immediately spill

⁵ Such regimes have been described in some detail in the massive ten-country studies by Bhagwati [1978] and Krueger [1978].

out as an increase in imports and loss of reserves. Rather there is increased demand domestically for nontradables and pseudo nontradables resulting in price inflation. The domestic monetary base is determined largely by domestic credit expansion by the central bank and not by foreign exchange transactions. In this respect, the economy behaves as if it were closed to foreign trade: the foreign exchanges do not automatically equilibrate the domestic supply of, and demand for, money. Similarly, in "normal" circumstances, the domestic monetary system is less likely to be upset by unexpected disturbances coming through the foreign exchanges.

The second relevant aspect of a repressed economy is the state of its domestic financial system. Rigid ceilings on nominal rates of interest on sight and time deposits are set below the rate of inflation and/or heavy official reserve requirements are imposed. Both may be part of the mechanism for actually collecting the inflation tax from the banking system. Except for fringe markets, little or nothing exists in the way of open markets in non-monetary debt where interest rates are free to move on a day-to-day basis. Therefore, the interest-rate on "bonds" that defines the opportunity cost of holding money—in standard Keynesian or monetarist macro-economic models—simply does not exist. To be sure, people worry about the ebb and flow of domestic price inflation and arbitrage slowly between goods and money in determining what level of real cash balances to hold. However, they have no opportunity to arbitrage quickly between money and domestic "bonds" in response to what must be purely hypothetical variations in some open-market rate of interest. With varying degrees of success, the government then tries to encompass the repressed domestic financial system with a cordon sanitaire of exchange controls that prevent arbitrage with foreign capital markets.

Clearly, the behavior of a "repressed" economy with a pegged exchange rate is very different from the standard textbook example of an economy whose foreign trade and domestic finance are (implicitly) completely liberalized and which might also use a pegged exchange rate. How common is this repression syndrome? Jagdish Bhagwati [1978] and Anne Krueger [1978] have finished a massive study of the foreign trade of ten less developed countries for the 1950s and 1960s: Brazil, Chile, Colombia, Egypt, Taiwan, India, Israel, Philippines, South Korea and Turkey. No one country provides a pure prototype of the repression syndrome because there is such an ebb and flow to economic policy making. Yet Bhagwati and Krueger find that economic repression is commonplace, whereas it was difficult to find an example of a completely liberalized less developed country. Moreover, Bhagwati and Krueger recite chapter and verse on the incredible microeconomic distortions associated with operating an elaborate set of quota restrictions on imports or exports. Indeed, they actually define trade "liberalization" as a process of moving from QRs to moderately high tariffs!

Because of the continual use of adjustments in QRs to balance foreign payments in a repressed economy, authorities can maintain a pegged

exchange rate at “disequilibrium” level for years on end unless domestic price inflation is rapid and prolonged. Indeed, because their hold over the domestic money supply process is tenuous at best, central banks see a fixed exchange-rate as an important signal to the market that the authorities are at least trying to keep inflation down to international levels. True, only a few domestically produced goods —largely exports— are arbitrated directly in world markets at the existing exchange rate. But people know that the government must ultimately take measures to keep exports competitive, such as devaluing, if domestic inflationary pressures become too great. Thus most governments of repressed economies try to maintain a fixed exchange rate, rather than a continuous downward crawl, in order to reduce private inflationary expectations.

Equally important, economic rents accruing to import licensees, to most of whom the government is politically committed, would be greatly reduced if a major devaluation occurred. For example, the domestic cost of a social program to bring in cheap food from abroad, even one for which people have to queue, would increase with devaluation.

Even if inflationary pressure builds up so as to squeeze exports, the government is reluctant to devalue across the board. Yet inflationary pressure is the rule rather than the exception in repressed economies. Hence the QR system is often supplemented with subsidies and taxes as internal inflation proceeds. Certain classes of exporters —say of manufacturers— are given subsidies, whereas exporters of more traditional goods (say coffee) are not. Some economic rents accruing to import licensees are partially taxed away by special customs levies, whereas other more fortunate licensees with greater political clout can import without tax at the increasingly cheap official price for foreign exchange. The QR system may be extended to all categories of imports with everyone vying for favored treatment. The result of inflation, combined with a passively fixed exchange rate, is a deepening morass of microeconomic distortions in foreign trade and a buildup of substantial net bias against exporting.

However, the final triggering mechanism that forces a devaluation is typically not the state of the current account and complexities of import licensing or export subsidies. Because of the patronage involved, many governments do not mind wallowing in these current-account problems. Instead, many countries had devaluation forced on them because they lost foreign-exchange reserves and experienced capital flight that threw them into the arms of private external creditors, or of the IMF. Internal inflation had proceeded in the face of a pegged exchange rate such that owners of capital came to expect a devaluation despite the proliferation of QRs and export subsidies. Loose domestic fiscal and monetary policies were usually to blame for the loss of control over the domestic price level, and private traders expected them to continue.

This problem of capital flight deserves closer scrutiny, however. Even if owners of capital do not expect imminent devaluation, the domestic price

level is rising above foreign prices because of the insulating effects of QRs in the face of excess domestic demand. Hence, the yield on capital held abroad in terms of real consumable services (if you travel abroad) rises relative to capital held domestically. This imbalance becomes particularly acute if domestic nominal rates of interest on financial assets are held down by usury laws so that they do not accurately reflect ongoing domestic inflation —as discussed above.

When one couples this effect of price-level and interest-rate disalignment with the fear of a rationalizing devaluation, the incentives to move capital out of the country overwhelm the previously “adequate” system of exchange controls. Foreign creditors take fright that they will not be repaid. The normal flow of supplier credits for imports dries up and older lines of bank credit are cancelled. Official agencies such as the IMF become loath to provide credits to finance what they perceive to be a flight of private capital. A consortium of foreign creditors is then formed, and typically demands a devaluation and rationalization like that which happened to, say, India in 1966, Peru in late 1978, Turkey in 1979, and in a wide variety of LDCs with repressed economies in the postwar period.

Discrete Devaluation and Partial Liberalization

In the ten countries that Bhagwati and Krueger studied, major discrete devaluations occurred 22 times between 1950 and 1970. Starting from a state of economic repression, consider three broad analytical categories for analysing the diverse outcomes of discrete devaluation:

- (1) *Rationalization*: the reduction in the variance of differential rates of protection to individual importers and exporters.
- (2) The reduction in *bias* favoring import substitution industries over export activities⁶.
- (3) Macroeconomic *stabilization* through the complementary use of monetary and fiscal policy.

Virtually all the devaluations examined by Bhagwati and Krueger met with some initial success —often not sustained in the years to follow— in rationalizing the sometimes grossly different incentives given to various classes of imports and exports. At the time devaluation occurs, most heterogeneous export subsidies are reduced or eliminated —to be replaced by the uniformly higher price of foreign exchange. Similarly, license premia on QRs fell naturally to more moderate levels, and in some cases were actually replaced by tariffs. Indeed, in one or two cases —Brazil [1957] and Chile [1959]— substantial new import tariffs were imposed after devaluation.

⁶ In Bhagwati [1976], the variance in effective rates of protection for different import-competing activities is referred to as affecting the *pattern* of import substitution, whereas the bias affects the *degree* of import substitution.

These actions would constitute "liberalization" in the narrow sense that Bhagwati and Krueger use the term. For almost all of the group of ten, therefore, devaluation did result in a significant microeconomic tidying up of the morass of export subsidies and QR restrictions so as to reduce the variance of protection from one industry to the next.

Less successful were attempts to reduce bias against exporting in general, and to move away from inward looking industrialization based mainly on import substitution. A regime is biased according to Bhagwati and Krueger if the effective peso cost of one dollar's worth of an "average" import exceeds the peso receipts from one dollar's worth of an "average" export. More precisely, Krueger's measure of bias is

$$(1) \quad B = (1 + t + n + PR_m) / (1 + r + s)$$

where

- t is the formal import tariff
- n is the value of import surcharges
- PR_m is the average premium on import licenses
- r is the value of export encouragement schemes
- s is the subsidy (or tax) per dollar of exports

If $B > 1$, the foreign exchange mechanism is biased against exports. Note that a purely "rationalizing" exchange-rate change would not eliminate bias against exporters as defined in equation (1). Export subsidies under r and s can take a variety of forms: an specially favorable exchange-rate category for non-traditional exports, cheap bank credits, access by exporters to the premia on import licenses, or simply outright cash grants on an ad valorem basis. After devaluation, these tend to be reduced or eliminated. And the reduction in these export incentives may be of the same order of magnitude as the fall in license premia and reduction in import surcharges. Moreover, if one "liberalizes" by simply replacing QRs by tariffs, no significant reduction in bias is likely.

Measuring bias across the ten countries often foundered on the very difficult problem of getting even a rough estimate of the value of import license premia. Fortunately, Krueger succeeded in pooling rough estimates of license premia for five of the ten: Brazil, Chile, the Philippines, South Korea and Turkey. The resulting magnitudes of bias, before and after devaluation, are presented in the last three columns of Table 2.

One or two things stand out in Table 2. First, the effective exchange rate (EER), exclusive of license premia, facing both exporters and importers generally rose following a devaluation. That is, the rise in the domestic price of foreign exchange exceeded the coincident elimination of import surcharges and export subsidies. So, in an immediate sense, devaluation would seem to benefit genuine "tradable" activities —those that were not protected by

TABLE 2

Bias of Trade Regimes before and after Discrete Devaluations, Five Countries

Country	Devaluation Year	Export EER			Import EER Plus Premium			Bias		
		Old	New	Two Years Later	Old	New	Two Years Later	Old	New	Two Years Later
Brazil	1957	53	65	114	130	188	258	2.45	2.89	2.26
	1961	160	245	553	287	367	779	1.79	1.50	1.41
	1964	884	1874	2200	1245	2601	2953	1.41	1.39	1.34
Chile	1956	0.181	0.351	0.715	0.667	0.994	1.387	3.69	2.83	1.94
	1959	0.715	1.049	1.049	1.387	1.893	2.093	1.94	1.80	1.99
	1965	2.471	3.310	5.080	4.817	6.040	9.106	1.95	1.82	1.79
Philippines	1960-1962	2.00	3.15	3.90	4.03	5.27	5.33	2.01	1.67	1.36
	1970	3.90	5.15	7.26	5.36	8.03	8.41	1.37	1.55	1.16
South Korea	1961	147.6	150.6	189.4	100.2	146.4	148.1	.67	.97	.78
	1964	189.4	281.4	322.9	148.1	293.1	296.4	.78	1.04	.92
Turkey	1958-1959	3.17	5.87	9.00	20.0	17.9	14.3	6.31	3.05	1.59
	1970	9.96	12.90	14.52	30.0	27.2	26.2	3.01	2.11	1.80

SOURCE: Krueger, *op. cit.*, page 102.

Note: EER is the "Effective Exchange Rate" and is the domestic currency cost of foreign exchange inclusive of all tariffs, subsidies, surcharges, etc. except for the premia on import licenses.

highly restrictive QRs. Whether or not the real devaluation is sustained, however, depends on future movements in domestic prices that are not shown in this particular table.

Secondly, the devaluations and associated policies generally were not successful in eliminating the normally high degree of bias against exporters in Brazil, Chile, Turkey and, to a lesser extent, the Philippines. For bias to be zero, entries in the last three columns of Table 2 should be close to unity. Only South Korea maintained a consistent export orientation with $B \leq 1$. For the other four, devaluations and associated policies sometimes reduced bias but did not come close to eliminating it. That is, after devaluation premia on QR licenses and tariff protection were only partly reduced relative to export subsidies. And, unsurprisingly, South Korea is the one country in the group that has been a consistently successful exporter of industrial products.

Chile's move to free trade in 1976-79 (too recent to be included in Table 2) is another relatively rare example where bias against exporters has been largely eliminated. For most LDCs, however, the bias against exporting remains quite severe even after devaluation and partial liberalization have occurred. Without sustained export growth after devaluation, the usual pattern is for economic repression to intensify once more.

Devaluation and the Trade Balance

Consider a standard elasticities approach to devaluation, or an aggregative income-absorption approach to improving the trade balance. A major devaluation and/or macroeconomic stabilization should typically improve the current account and, specifically, reduce expenditures for imports measured in foreign currency. What is surprising for "traditional" theory, therefore, is that Krueger [1978] finds no consistent response pattern for the current account in the 22 devaluation episodes—even in the nine that were ultimately considered "successful". Imports are more likely to increase than to decline (page 138); exports increased at best with a lag and only if the new favorable incentives were sustained. Equally surprisingly, the rate of growth in real output did not change predictably—it rose, fell or stayed approximately the same (page 157). Moreover, the before-and-after response of the rate of inflation was also unpredictable (page 148).

Undoubtedly special circumstances prevailed in each country, and in each devaluation in that country. Hence, the traditional macroeconomic models of devaluation might well apply in any one such special case, when all relevant circumstances are taken into account. Still, I think it behooves economic analysts to step back and ask:

(1) What criterion or motive is relevant for deciding whether a discrete devaluation cum liberalization worked or not?

(2) Starting with a repressed economy, what is a more appropriate analytical framework for looking at the role of devaluation than the pure elasticities and absorption approaches that focus solely on the current account?

At the simplest level, one would expect no significant macroeconomic effects in commodity markets from a pure rationalization or “tidying up” operation. On average, devaluation more or less offsets export subsidies, leaves untouched the volume of imports rigidly protected by QRs, and offsets the elimination of surcharges in the “open” categories or imports. Because average volumes of imports and exports do not change, there is no significant impact on the trade balance, on domestic output, or on the price level. And at least five of the 22 devaluations seemed to be in this tidying up category, with pure rationalization also being an important aspect of most of the others. Hence, an important message of Bhagwati and Krueger is that devaluation in a QR regime need not improve the trade balance.

One might go further and suggest that after devaluation the foreign currency value of imports may well rise more than the foreign currency value of exports: the trade balance deteriorates (McKinnon [1979c]). This anti-traditional result is linked to a post-devaluation capital inflow, opposite to the outflow that triggered the devaluation in the first place. A devaluation, perhaps even an over devaluation in terms of price-level alignment, makes the new pegged rate seem sustainable for a couple of years so that domestic real interest rates seem higher compared to those abroad. Private capital returns with a capital gain that compensates for the pre-devaluation levy of the inflation tax. Foreign bankers roll over old debts and may even extend a few new credits. The IMF makes a precautionary line of credit available on the belief that it will not be immediately depleted. In summary, the devaluation is simply a precondition for the restoration of the country’s normal access to foreign capital: it is not meant to improve the trade balance as traditional theory would have it! ⁷.

⁷ One should not overstate this capital markets approach. Starting from a price for foreign exchange that is far too low, the devaluation may be a precondition for releasing an export bottleneck-but the idea is that imports are just as likely to increase.

This improved access to external capital then resolves the paradox that imports seemed more likely to increase than decline after a devaluation because most countries can then get more trade credits to finance a large import flow —or at least a once-and-for-all surge in imports. Bhagwati and Krueger recognize that official aid and a package of private credits often accompany devaluation, but they do not spell out the conditions for equilibrium in the domestic capital and money markets. Going even further, an effective devaluation may increase the profitability of domestic investment, touching off a mini-boom that raises imports relative to exports⁸.

This “capital-markets” approach to devaluation also resolves another paradox that seemingly bothered Anne Krueger:

“... despite frequent references to belt-tightening, stringent monetary policy, and stabilization programs, increases in the rate of expansion of the money supply following devaluation have exceeded reductions. A number of countries experienced increased rates of inflation following devaluation, and an inability to check the growth in the money supply was an important factor in some of these instances.” (Krueger, [1978], p. 129)

This paradox is resolved if the domestic money supply increases naturally because of the return flow of private capital. As the country reconstitutes its foreign reserves, the government must step into the foreign exchange market and buy dollars for pesos to keep the new higher price of dollars from falling below the official peg. If the reflux of capital is truly massive, then it could by itself cause a loss of monetary control as high powered base money is pumped into the economy through the repurchases of foreign exchange by the central bank⁹. In LDC’s, open capital markets in non-monetary government debt are usually too rudimentary to permit easy sterilization of foreign capital inflows following devaluation.

Remember, however, that the *demand* for domestic money is also likely to be higher immediately after the devaluation. Further devaluation no longer seems imminent, and domestic prices are better aligned making domestic financial assets (including money) more attractive to hold. Hence, post-devaluation, the government would normally expect the domestic demand for money to increase and should allow a matching increase in supply in order to prevent sharp deflation. But, needless to say, tailoring supply to demand —to maintain a stable price level— in such unsettling circumstances is an extraordinarily difficult job.

⁸ John Cuddington suggested that one should emphasize the margin between saving and investment in evaluating the effects of a devaluation in this context.

⁹ As happened in Korea following some trade reforms and devaluation in 1964, and a financial reform in 1965. (McKinnon, [1973], Chapter 11).

In summary, using a discrete devaluation to better align anticipated yields on foreign and domestic financial assets can be, to a considerable degree, a desirable end in itself. From this viewpoint, the absence of *net* change in flows of commodity trade and the failure of most devaluations to eliminate bias against exporters is not so surprising. Nor is the failure of most countries to get control of domestic inflation and to secure macroeconomic stability so surprising either —particularly when the underlying fiscal incapacity persists. These periodic discrete devaluations, which are often highly traumatic, would hardly seem like a “first-best” economic policy. Nevertheless, they are understandable —perhaps inevitable— in highly restrictive regimes with ongoing inflation where authorities commit themselves to a fixed exchange rate.

Passive Downward Crawling

How can these costly traumas of capital flight and periodic discrete devaluation be avoided? Suppose we continue to take repression of foreign trade and of domestic finance as the given, if regrettable, state of the economy. There is little or no prospect of getting inflation under control because of government fiscal deficits or other economic pressures on the continued extension of central bank credit. The authorities are committed to using the inflation tax but cannot predict what the future rate of inflation will be. What type of exchange-rate regime should it then adopt?

Remembering that a free float is inadmissible for reasons discussed above, the preferred policy option is a passively crawling peg. By “passive” I mean that the government adjusts the pace of downward crawling, *ex post facto*, to whatever domestic inflation turns out to be. The rate of inflation is out of control and, *ex ante*, cannot be predicted with any accuracy. The main objective is to index the real exchange rate roughly at purchasing power parity with the outside world to avoid destabilizing foreign trade. The political obstacle to adopting passive downward crawling is to get governments to admit that inflation will continue indefinitely and is unpredictable. Typically, only countries having long experience with high inflation —Chile in the 1960s, or Colombia or Brazil more recently— can bring themselves to adopt passive downward crawling as a way of insulating foreign trade against the worst effects of inflation. In effect, officially fixing the exchange rate for long periods of time is no longer a credible device for convincing the populace that the authorities intend to bring inflation under control, or indeed are capable of maintaining an unchanging foreign parity.

To illustrate, consider Colombia's method of passive crawling. Each month, the Colombian authorities calculate the increase in the domestic wholesale price index (in pesos) relative to the monthly increase in the U.S. wholesale price index (in dollars). Insofar as Colombian prices increase by, say, 30/o, whereas U.S. prices increase by, say, 10/o, the authorities would announce a 20/o downward crawl in the peso in several small steps for the month following, and perhaps averaged forward for a somewhat longer period. In this sense, the Colombian exchange rate is adjusted ex post to domestic inflationary pressure. Although this downward crawl does nothing to mitigate inflation, neither does it exacerbate inflationary pressure beyond what domestic impulses would warrant. At the same time, exporters (and producers of import substitutes outside of the QR categories) are given invaluable forward assurance that the real exchange rate will not turn sharply against them. And Diaz [1976] indicates that this policy has been an important ingredient in the substantial growth of "minor" exports from Colombia in the late 1960s and early 1970s. More generally, Krueger [1978] recommends such a system for maintaining export incentives in an inflation-prone context.

Changing the exchange rate in very small steps, sufficiently small to be almost below the transactions costs of money changing, avoids the massive capital outflows preceding, and inflows following, the periodic discrete devaluations associated with the adjustable peg. Similarly, smooth downward crawling avoids the really large changes in the demand for domestic money associated with the discrete devaluations. Finally, the exchange rate is indeed pegged in the very short run so that the cost and risk of money changing is reduced: traders need not worry about large day-to-day exchange-rate fluctuations under a pure float —fluctuations that would be greatly exaggerated for a "repressed" economy in comparison to a more liberal one. Nor need they worry about being caught by a large discrete devaluation as would be the case under the adjustable peg.

Whatever the very substantial economic distortions of running a repressed financial system with an inconvertible currency might be (McKinnon, [1973]), it nicely complements a downward crawl in the exchange rate that passively reflects a variable rate of domestic price inflation. We can rule out variable downward crawling for convertible currencies precisely because extrapolative expectations associated with varying the crawl would cause destabilizing movements out of non-interest bearing domestic money into foreign exchange; or variations in nominal rates of interest on domestic bonds (also incorporating extrapolative exchange-rate expectations) would destabilize the demand for money on the part of purely domestic transactors. But money holders in repressed financial systems do not have these options! True, people can go into non-financial inflation hedges such as real estate or hoards of grain as their expectations shift regarding the future rate of inflation. Even so, authorities need have much less fear of a variable downward crawl further destabilizing the demand for money in a repressed financial system in comparison to an open one.

For example, suppose the domestic price inflation and downward crawl speed up unexpectedly so as to heighten inflationary expectations about the future. The resulting fall in demand for non-interest bearing real money balances and augmented inflationary pressure (with some leakage into losses of foreign reserves) would be proportionately less in a repressed financial system than in a liberalized one, where bond rates of interest are free to vary and accurately reflect the rate of crawl. In practice, however, financial and foreign trade repression are usually incomplete, and exchange controls on capital flows are somewhat porous. Thus, countries like Colombia must still worry about the destabilizing monetary consequences of changing the rate of crawl (Hanson, [1978]), but not as much as the typical European country with a convertible currency would have to worry¹⁰.

Secondly, we have established that the rate of commodity price inflation is largely domestically determined within the repressed economy. The downward crawl in the exchange rate is, in the first instance, insulated from domestic prices by the widespread QRs on imports, some of which extend to export categories. Thus an acceleration in the rate of downward crawl, due to an unexpected blip in domestic inflation, would not itself be immediately transmitted to domestic prices. In effect, domestic prices lead the foreign exchange rate and not vice versa. Hence, dynamic price level instability is not significantly worsened by variable, but passive, downward crawling.

By contrast, consider a liberalized economy without QRs on imports and without exchange controls on capital flows but with ongoing price inflation. One must then worry more about downward movements in the exchange rate feeding concurrently into domestic price inflation, and perhaps even leading it as people begin to speculate on further exchange depreciation. To illustrate, such cumulative instability was associated with the fall of the French franc in the mid 1920s, the elimination of exchange controls and the abortive (downward) floating of the Israeli pound in 1977-79, and with the "officially authorized" fall of the United States dollar (against the yen and certain European currencies) from early 1977 to November 1, 1978.

In summary, suppose we start with an unfortunate economic datum: a continuing and uncontrolled domestic inflation arising out of fiscal incapacity that requires the government to tax the banking system. From that follows a certain logical consistency to having quota restrictions on foreign trade, exchange controls on capital movements, a repressed domestic financial system, and a passive downward crawl in the exchange rate. Then the internal inflation rate can be used as an indicator of how fast the peg should crawl, in order to protect exporters, without further endangering the macroeconomic stability of the economy. Indeed, it might be quite dangerous to partially liberalize either foreign trade or domestic finance by

¹⁰For a lengthier analysis of why variable crawling is inappropriate for liberalized economies, see McKinnon [1979d].

itself because the economy may become more dynamically unstable. Bringing inflation under control through fiscal reforms, and eliminating economic repression in domestic capital markets and in foreign trade, should proceed hand in hand. And to the tricky problem of managing such a balanced liberalization I now turn.

Active Downward Crawling during Economic Liberalization

By “active” I have a very specific policy meaning in mind. Suppose now the government brings the public finances under sufficient control that the inflation tax can be phased out. With its newly gained credibility, the monetary authority pre-announces the rate of downward crawl for the next several months to a year into the future. This actively projected downward crawl may now diverge from recent inflationary experience; it is no longer tied to movements in last month’s price index. Indeed, the objective is to transform the exchange rate into an instrument for reducing inflation and then ending it.

As already implied, this newly found fiscal and monetary control is compatible with ending the repression of foreign trade and domestic finance. In order to avoid an unending taxonomy of cases, therefore, let me simply assume that the government’s new economic program also includes:

- (i) the elimination of high tariffs and quota restrictions on foreign trade;
- (ii) the lifting of usury restrictions on domestic rates of interest, the reduction of official reserve requirements on commercial and savings banks, and the development of an open capital market in domestic bonds (non-monetary debt); and
- (iii) the relaxation of exchange controls over capital inflows and outflows, possibly with a significant lag behind measures (i) and (ii).

Such a sharp change towards economic liberalization corresponds roughly to events in Korea in 1964-65 (apart from the downward crawl) and to Chile in 1976-79. How should the exchange rate and other domestic instruments of monetary policy be managed during, and for a year or two following, major financial and trade liberalizations so that those liberalizations are sustained?

At the time general liberalization occurs, suppose that the real exchange rate has been successfully adjusted so it is not far from its “equilibrium” (purchasing power parity) level. In Chile, this was accomplished largely by passive downward crawling during massive inflation from 1975 to 1977; in Korea the exchange rate was discretely devalued and unified in 1964 to compensate for a sharp inflation over the previous two years. Hence in our model economy, the authorities need not plan for further large realignments in the real exchange rate. Moreover, assume that trade liberalization, particularly the elimination of QRs, has progressed to the point where the

domestic price level is now much more closely linked through the exchange rate to prices prevailing in foreign markets.

In Chile in 1977 and Korea in 1965, however, the domestic financial system was by no means under control despite the reforms in foreign trade. Severe difficulties arose out of the need to raise sharply the nominal rates of interest on domestic bank deposits and loans in order to compensate for lingering inflationary expectations. In both countries, the real size of the organized financial system had been badly squeezed by past inflation and usury restrictions. Because the ratio of money —broadly defined to include interest-bearing deposits as well as coin and currency— to GNP had fallen very low, the flow of private financial saving available for new industrial or agricultural investments was quite inadequate. Hence, the authorities in each country encouraged rapid growth in loanable funds from the banking system, at high equilibrium rates of interest, to finance capital accumulation during liberalization. The principal means was to raise sharply the real yields on bank deposits available to domestic savers, a strategy that became feasible once inflation could be phased out and the government stopped tapping the banking system as a fiscal resource.

However necessary for rationalizing the domestic financial system¹¹, the sudden sharp increase from low pegs to higher pegs in nominal rates of interest on some classes of bank deposits —and the complete freeing of interest rates on some other money-market instruments—created severe new problems for monetary control. With the accompanying reduction in inflationary expectations, the demand for domestic financial assets —including currency, demand deposits, and interest-bearing deposits— began to rise rapidly in an unpredictable way. Most of this new growth was concentrated in interest-bearing time and savings deposits, and variation in their interest rates would cause sharp shifts in the currency to deposit ratio. Because a key aspect of the liberalization was to greatly reduce reserve requirements against time and savings deposits, shifts in the deposit to currency ratio made it even harder to project the “real” demand for base money. Although the fiscal reforms had allowed the monetary authorities to better control the supply of central bank credit from domestic sources, it became virtually impossible to use domestic means —say discounting or open-market operations— to tailor the supply of base money to the (unknown) demand for it.

Mistakes would have serious consequences. Failure to increase the monetary base fast enough to satisfy the rapidly increasing demand could cause sharp deflation and a curtailment of economic growth. On the other hand, overly rapid increases in base money would upset the new, but still fragile, expectations that price-inflation was going to be reduced. In short, if the authorities floated the exchange rate at the time general liberalization occurred, they would be thrown back on purely domestic devices to balance

¹¹More complete accounts of domestic financial liberalization can be found in McKinnon [1973] and [1980].

the supply and demand for money and to secure the domestic price level. In a time of rapid and unpredictable financial transformation, fledgling internal control devices are entirely unequal to the task.

A better solution is to use an officially pegged exchange rate as the principal device for determining the domestic price level and the stock of base money in the economy. This strategy becomes feasible once the liberalization of exports and imports permits free commodity arbitrage between domestic and foreign markets. Then the selection of an exchange rate has an immediate and widespread impact on domestic prices. At the margin, the domestic monetary base is then endogenously determined through purchases and sales of foreign exchange at the pre-determined exchange rate. If the supply of base money from domestic sources turned out to be less than the demand for it, the shortfall would be satisfied by a surplus in the balance of payments that forced the authorities to create more base money by buying foreign exchange in order to maintain the peg. Similarly, a balance of payments deficit would signal that the stock of base money should be curtailed; and, if there were no sterilization such that this curtailment were automatic, no adverse speculation in the foreign exchange would result.

How does active downward crawling fit into this otherwise traditional "gold standard" regime for operating the monetary system? After the appropriate adjustment in the real exchange rate, why not instead simply maintain a fixed nominal exchange rate with some stable foreign currency?

Both Chile and Korea found that domestic rates of interest had to rise very sharply, at the time liberalization occurred, in order to balance the domestic demand and supply for bank loans. Residual price inflation, and the inflationary expectations of domestic nationals, were still very substantial. An imbalance developed between domestic and foreign capital markets. The nominal rate of interest, necessary to assure households and small savers that real yields on domestic time and savings deposits were now positive, was far above the margin of risk perceived by foreign exchange traders and merchants regarding the likelihood of devaluation of the officially pegged exchange rate. As confidence in the sustained character of the liberalization came first to the foreign exchanges, a massive inflow of foreign financial capital emerged in both countries. And some of this inflow was once-and-for-all in the sense that domestic nationals, who had moved capital abroad prior to the liberalization, were now bringing it back.

This "foreign" inspired inflow of capital, above and beyond that warranted by any discrepancy between the purely domestic supply and demand for base money, threatened to overwhelm the domestic monetary system in each country. Unless the authorities were willing to accept a huge trade deficit—probably unsustainable—as the real counterpart of this inflow of financial capital, the monetary base would expand too fast by any reasonable standard. If no other action were taken to stem the inflow of foreign capital, either inflation would be accelerated or the commitment to

peg the exchange rate at close to its purchasing power parity level would have to give. And a sharp real appreciation would cause great difficulties in the newly liberalized foreign trade sector.

One help would be to tighten controls on capital inflows during the transition, as both countries eventually did. However, going very far in this direction defeats the basic idea of economic liberalization.

Far better to use an actively downward crawling peg over a sharply prescribed period of time—say a year or two—in order to reduce the “real” yield seen by foreigners (whose monetary habitat is a foreign currency) of investing in domestic financial assets. The government could simply preannounce a downward rate of crawl roughly equal to the difference between foreign and domestic rates of interest adjusted for risk. The rate of crawling would be progressively reduced along with parallel reductions in domestic interest rates, until a permanently fixed exchange rate could be established. At this termination of the active downward crawl, interest rates at home and abroad would be correctly aligned with inflationary expectations completely wrung out of the domestic economy. Chile appeared to successfully use such a strategy in 1978 and 1979. Trade and finance were substantially liberalized during 1976 and 1977, when passive downward crawling was employed to compensate for extremely high and variable inflation. Then with liberalization virtually complete, but with domestic real rates of interest still much higher than those prevailing abroad, in 1978 on February 3 the authorities announced a schedule of exchange rates which would apply from February 6 to December 31 irrespective of the rate of domestic inflation actually experienced in 1978.

As announced, the peso did depreciate “actively” from 28.91 pesos/dollar to 33.95 pesos/dollar, or 17.4⁰/o, bringing its total nominal depreciation for 1978 the whole year to 21.4⁰/o. In 1979, the peso was initially scheduled to depreciate by 14.76⁰/o in small steps. However, the Chilean authorities decided that nominal and real rates of interest were coming down sufficiently quickly that there seemed to be no point in extending the downward crawl beyond June 30, 1979, when the rate was fixed at 39 pesos/dollar. To be sure, the Chileans experienced heavier capital inflows in some months of 1978 and 1979 than they would like, but the active downward crawl was a deterrent.

Having no previous experience with a crawling peg, the Koreans did not manage their foreign exchange policy so deftly. After very successful financial reforms in 1965, when nominal and real rates of interest were raised very sharply, the Koreans tried to maintain an absolutely fixed exchange rate. Huge inflows of foreign capital caused an unduly rapid increase in the domestic monetary base. In part because foreign trade liberalization was incomplete, domestic inflationary pressure was rekindled and forced unplanned devaluations over the next several years. A temporary, but active, downward crawl in 1966 and 1967 may well have helped the

Korean authorities to better maintain internal monetary control (McKinnon, [1973], Ch. 11) in an otherwise successful series of liberalization measures.

Let us now summarize the above arguments regarding the appropriate use of the crawling peg. Proper concern for monetary control greatly narrows the scope for using a crawling peg in any country maintaining a convertible currency and stable domestic monetary system. Nevertheless, there remain two well-defined sets of circumstances where downward crawling is warranted.

First, in response to high and variable domestically generated inflation, the monetary authority can passively adjust the exchange rate in small steps without contributing further to dynamic instability only if (1) many importables (and possibly some exportables) are insulated from world prices by quota restrictions, and (2) the domestic financial system is “repressed” and isolated from the world capital market. Although seemingly extreme, these circumstances have a certain mutual consistency and are applicable to several less developed countries at the present time. But once trade and financial liberalization occur, the rationale for passive crawling disappears and retaining it could be dangerously unsettling.

Secondly, in the course of general liberalization aimed at ending price inflation altogether, active downward crawling at ever decreasing rates can be a useful—even indispensable—temporary device for maintaining monetary control during rapid financial transformation. In paradoxical contrast to passive crawling, active crawling is effective as a stabilizing instrument in bringing the price level under control only if trade is relatively free and quota restrictions are absent.

Sustaining Liberalization: Fixed Versus Floating Exchange Rates

Suppose after much travail, our prototype economy emerges from the purgatory of economic repression to the full liberalization of domestic fiscal and financial policies, free foreign trade with the termination of quota restrictions and all but moderate tariffs, and the elimination of exchange controls or other barriers between the domestic financial system and the world capital market. It ends ongoing price inflation, stabilizes private expectations about future inflation and secures control over domestic credit expansion by its central bank. Only for such a liberalized economy is it worthwhile to reopen the old debate: should the country opt for a fixed or “freely” floating exchange rate?

The choice between fixing or floating essentially hinges on whether (1) the monetary authorities find it more convenient to use the exchange rate as the principal policy instrument for stabilizing the domestic price level; or (2) they have full domestic control over the monetary base—and can accurately predict the domestic demand for it—so that the foreign exchange rate can be discarded as an active instrument for executing domestic monetary policy.

Although fully liberalized as defined above, countries like Chile presently, or Taiwan ten years ago, are not financially "mature". The ratio of M_2 /GNP in Chile at the present time (1979) is of the order of 250/o, where M_2 is broadly defined money to include interest-bearing deposits of all kinds. In 1975 Chile's M_2 /GNP ratio was less than 100/o. On the other hand, Taiwan achieved the 250/o level in the early 1960s and currently has a M_2 /GNP ratio of over 700/o. If the liberalization in Chile is sustained, one naturally expects high real monetary growth to continue —but not at a rate that is easily predicted across currency, demand deposits and time deposits. Hence, the increase in demand for base money, commensurate with stable prices in Chile, is unknown to the authorities on a week-to-week or month-to-month basis.

On the supply side, the public finances are now under control so that the Chilean authorities are no longer forced into unwanted and unplanned domestic credit expansion by the central bank. On the other hand, as a legacy of their great inflation, they have yet to develop a robust open-market in non-monetary debt. Transacting in treasury bills is limited with little or nothing of a market in peso securities of a maturity greater than a year. Hence, the authorities cannot easily tailor the monetary base to a predetermined schedule of increases on a week-to-week or month-to-month basis. Thus, on both the supply and demand sides, the Chilean authorities would experience difficulty if they floated and managed their monetary system independently of the foreign exchanges.

An alternative monetary control mechanism, for a liberalized economy but not for a repressed one, is to fix the exchange rate to a "stable" and convertible foreign money. Free commodity arbitrage through the foreign exchanges then makes the domestic price level determinate. Then, at that price level, the authorities no longer need to predict the domestic demand for base money with any accuracy on a day-to-day or month-to-month basis. For example, if planned domestic credit expansion by the central bank happens to fall short of the increased domestic demand for base money, an incipient surplus will show up in the balance of payments: domestic nationals will borrow from foreigners (the most likely avenue if capital flows are free) or run a trade surplus such that the authorities are forced to buy foreign exchange (at the fixed rate) and provide the required domestic base money in exchange. Correspondingly, if domestic credit expansion is excessive, a deficit in foreign payments would develop automatically to drain the excess base money out of the system.

The key requirement for consistency under such a fixed exchange rate is that the authorities not sterilize changes in domestic base money arising out of these foreign exchange transactions. Rather, they must recognize that, in the short run, fluctuations in the stock of domestic base money and exchange reserves are endogenously determined from the demand side. An increase in foreign reserves is simply the monetary machinery by which excess domestic demand for base money is satisfied. It would be entirely inappropriate to offset this by sterilizing: selling bonds or treasury bills to

retire base money from circulation. Then the system becomes unstable as capital inflows are redoubled. Instead, in the long-run, if exchange reserves accumulate "unduly", the authorities can modestly step up the rate of domestic credit expansion for creating base money. The reverse would be true if reserves fell secularly.

Therefore, the second element in this alternative monetary strategy is simply to adjust domestic credit expansion in the long-run (not on a week-to-week basis) to stabilize the country's foreign reserve position. Foreign reserves become the leading indicator of how fast base money, and with it domestic credit expansion, should increase. In our "immature" liberalized economy, real monetary changes can be quite rapid—and indeed desirable if the domestic financial system had been too small. And, under a fixed rate, the foreign exchanges can respond more flexibly than the authorities.

To what foreign currency(ies) should the government peg? Accepting the fact that we live in a world of high international inflation where several currencies are floating, when should a single trading partner be chosen? Remember that only one independent intervention is feasible¹².

The first and fairly trivial observation is that the trading partner itself must have a fairly stable monetary system. In this respect the United States has become much less satisfactory than it was in the 1950s and 1960s.

A further condition—particularly important for small countries—is that they be highly integrated with the country or area to which they are pegging: the old argument on optimum currency areas (McKinnon [1963]). Then, if the partner country does succeed in establishing domestic price stability, the substantial trade between the two, at a fixed exchange rate, will impose domestic price stability through unhindered commodity arbitrage. Also, a stable exchange rate is important to exporters and importers for reducing risk; they would benefit more when the partner country dominated the foreign trade of the country in question.

Finally, the potential trading partner issuing the intervention currency should have a broad and deep capital market. Then, the liberalized economy can more easily hold liquid exchange reserves earning a market rate of interest, and, if need be, draw on lines of credit from the partner who behaves as a lender of last resort. By this criterion, the New York capital market (or its eurodollar progeny) still retains its dominance.

If a single trading partner cannot be found that satisfies all three criteria, then some of the simplicity and advantages of fixing the exchange rate are lost. However, the newly liberalized economy can diversify some risk by pegging to a basket of convertible currencies from mature industrial countries—say, that associated with the International Monetary Fund's SDR (Special Drawing Rights). As is clear from the introduction, increasing

¹² In a world of N currencies, only $N-1$ can each pursue one independent intervention strategy. This point is developed in more technical detail in McKinnon [1979] Ch. 2.

numbers of less developed countries have been doing this in practice. However, the SDR is not itself a tradable currency but only a unit of account: a weighted index of national monies. Thus the monetary authorities must still choose one national intervention currency to make the pegging stick, and transactions in this intervention currency would still determine short-run movements in the domestic monetary base.

Only when international inflation (or depression) in mature economies becomes intense, would it seem worthwhile for a newly liberalized economy to avoid importing that inflation by floating, and thus to discard the exchange rate as an instrument of monetary policy. But in so opting for monetary independence, the government had better be sure it has the will and financial capability of exercising that independence in an appropriate way. If it has, so much the better, but the technical problems remain formidable.

The moral of our story is clear. The old argument on fixed versus floating exchange rates is misspecified when posed that way. Rather, ensuring consistency in monetary cum exchange-rate policy—with either a fixed or a floating exchange rate—is probably the more important policy decision in sustaining economic liberalization.

BIBLIOGRAPHY

- Bhagwati, Jagdish [1978], *Anatomy and Consequences of Exchange-Control Regimes*, for the National Bureau of Economic Research, Ballinger, Cambridge.
- Díaz, Alejandro Carlos [1976] *Foreign Trade Regimes and Economic Development: Colombia*, for The National Bureau of Economic Research, Ballinger, Cambridge.
- Hanson, James [1979], "The Colombian Experience with Financial Repression and Incomplete Liberalization: Stagnation, Growth and Instability 1950-1978" presented to First International Conference on the Financial Development of Latin America and the Caribbean, Coraballeda, Venezuela, February.
- Krueger, Anne [1978], *Liberalization Attempts and Consequences* for the National Bureau of Economic Research, Ballinger, Cambridge.
- McKinnon, Ronald I. [1973], *Money and Capital in Economic Development*, The Brookings Institution.
- [1978], "Exchange-Rate Instability, Trade Imbalances, and Monetary Policies in Japan, Europe and the United States", presented to a conference honoring Harry Johnson, Oxford University, September.
- [1979a], *Money in International Exchange: The Convertible Currency System*, Oxford University Press, New York.
- [1979b], "Foreign Exchange Dealers, the Domestic Money Market, and Stabilizing Speculation", Stanford University, unpublished July.
- [1979c], "Foreign Trade Regimes and Economic Development: A Review Article", *Journal of International Economics*, August.
- [1979d], "Monetary Control and the Crawling Peg", presented to a conference, The Crawling Peg: Past Performance and Future Prospects, Rio de Janeiro, October.
- "Financial Repression and the Liberalization Problem within Less Developed Countries" in S. Grassman and E. Lundberg (eds.) *The Past and Prospects of the World Economic Order*, forthcoming.
- Williamson, John [1979], "The Crawling Peg in Historical Perspective", presented to a conference: The Crawling Peg: Past Performance and Future Prospects, Rio de Janeiro, October.

I trust all of you have enjoyed the paper Professor McKinnon has just presented to us in his just completed talk as much as I did. He uses a classification of exchange regimes that strikes me as much more sensible than the one used officially by the International Monetary Fund and to which he referred in his paper. The Fund's classification encompasses four categories of exchange regimes: floaters, joint floaters, peggers and "others". And as it is to be expected, it is the residual categories that contain some of the most interesting cases, Professor McKinnon deals with these cases under the headings of passive downward crawl and active downward crawl; and it is the description and analysis of these two crawls that is the main point of his paper. But I will leave the few points I am going to make about the core of Professor McKinnon's presentation to the very end of my brief comments. I will turn first to his description of financial repression. He explains very clearly what he means by this term. But like all systematic classifications his juxtaposition of free and repressed financial systems is a little forced. Many industrialized countries retained certain forms of financial repression, notably Japan, but even the United States, whose financial system was quite rigid before the early 1960s. There is still a distance to go before the financial system can be considered to be absolutely free. Conversely it would be difficult to find an example of total repression among the L.D.C.s. I would venture that the typical L.D.C. practices only partial repression. Take Mexico for example. That country has a totally free exchange market, a partially free financial market and a strongly repressed goods market. But even L.D.C.s. who officially are driven in favor of state intervention cannot plug loopholes that render their systems in fact much less restricted than the official line would suggest. I would conclude therefore that the conditions for successful floating are probably not quite as strict as Professor McKinnon has presented them. Japan with its financial system that until recently resembled that of an L.D.C. more than that of the United States, has been floating for some time; and Canada floated as far back as the 1950s. Leaving aside the problem of choosing the right exchange rate regime posed by degrees of repression, I am not sure where Professor McKinnon really stands or how much it really matters. He states for example early in the paper that relative prices among countries do not really have an appreciable impact on their current accounts; yet, later on, he argues that a higher inflation differential will affect exchange rates expectations. Turning to Professor McKinnon's views on the effectiveness of discrete devaluations I feel he is distinctly too pessimistic. Over the years I have witnessed a number of successful devaluations in Latin America and although these were without exception accompanied by appropriate changes in domestic policies, I doubt that these policy changes alone could have explained payment's reversals given the extent the devaluation had been anticipated. But I very much agree with Professor McKinnon that it is the capital rather than the current account that typically forces a reluctant government to perform a discrete devaluation. For a transition from a repressed to a liberalized economy

Professor McKinnon prescribes an active crawl; meaning that the exchange rate should be depreciated in line with the differentials between the inflation rates at home and abroad. But such a crawl may not produce the desired results because the expected inflation rate may not decline as fast as the actual one; and the real exchange depreciation that would result from this would create expectations of an eventual appreciation and thus rekindle capital inflows. As Professor McKinnon puts it on page 32 and I quote: "the nominal rate of interest necessary to insure households and small savers that real yields on domestic financial savings deposits were now positive was far above the margin of risk perceived by foreign exchange creators and merchants, regarding the likelihood of devaluation of the officially pegged exchange rate". But to state this is only a description and not an explanation. Once the country has successfully completed the transition to a stable liberalized system the question of a fixed versus a floating exchange rate may well be a less crucial question than Professor McKinnon suggested it; and, besides, the choice may have to be made on other grounds. If the essential criterion for the choice is the depth of the financial market as Professor McKinnon suggests, then I wonder why South Korea or Singapore for example could not live with a floating rate. More generally, while I agree a good deal on what Professor McKinnon says in support of a fixed rate for L.D.C.s. with an economic liberalized system —such an exchange regime is tantamount to opting for absolute monetary dependance or a gold standard type system— his approach may be quite acceptable to some countries but it is also possible to visualize that a country might opt for a greater exchange rate flexibility, perhaps even floating, in order to ensure a minimum of insulation from external disturbances.

Ser el último en comentar un trabajo siempre presenta un pequeño problema: muchas de las cosas que uno quisiera decir ya están dichas. Sin embargo, encontré la exposición del Profesor McKinnon muy interesante y lo que voy a intentar hacer es quizá argumentar algunos de los puntos que su trabajo plantea, porque siempre cabe una interpretación diferente del mismo hecho.

Por ejemplo, al Profesor McKinnon le sorprende que haya tantos países que pegan el tipo de cambio. No le parece que eso sea consistente con el tipo de enseñanza económica imperante en la Universidad de Chicago; mi impresión habría sido exactamente la contraria. Si todos los países utilizan una regla monetaria tipo Friedman entonces, en general, los tipos de cambio no variarían; se quedarían fijos. De modo que la tradición de Chicago se puede utilizar tanto para hablar a favor de tipos de cambio flotantes o de tipos de cambio fijos. Si por encima uno entiende que las alteraciones de tipos de cambio no afectan a los precios relativos, todavía hay más fuerzas para que la tradición de Chicago se incline más hacia el tipo de cambio fijo. Quizá en esto mi colega y yo estamos un poco separados. En su análisis de las economías reprimidas quedé un poco confuso porque mi impresión fue que una economía reprimida suele estar caracterizada por la existencia de desequilibrios prolongados. Sólo eso puede explicar la existencia de distorsiones, de represión, de controles de cambio y es claro que si no se elimina el desequilibrio, las represiones van a tener que continuar.

Querría hacer la exposición no tanto en términos del mercado del dinero como en términos del mercado de bienes y servicios. Mi impresión caracteriza una economía pequeña y abierta, por un estado de exceso de demanda. Si se tiene un tipo de cambio fijo la economía se va a ver expuesta a una restricción de presupuesto por la limitación de las reservas internacionales. Si se tiene un tipo de cambio flotante, lo que la economía está haciendo es perpetuar un ritmo de inflación superior al del exterior; y si se tiene un tipo de cambio flotante, de los que llaman no limpios, se perderán reservas.

Ahora, para pasar de la economía reprimida a la economía liberal, lo que uno tiene que hacer es eliminar el exceso de demanda. En su trabajo McKinnon indica que en esas economías reprimidas no existe opción de hecho para flotar. Si lo que acabo de decir es la interpretación correcta, estas economías han inflado más que el resto del mundo durante un período largo de tiempo. Yo en eso vería un gran incentivo para pegar el tipo de cambio, porque cuando una economía infla más que las otras con tipo de cambio fijo, exporta parte de la inflación. En otros términos, no sólo no hay opción, sino que hay un incentivo positivo para mantener el tipo de cambio fijo. (Estoy suponiendo que el resto del mundo no infla en absoluto.)

En el tratamiento de la elección de qué sistema establecer con respecto al tipo de cambio, en la comparación entre devaluaciones discretas con el

crawling peg, mi impresión es que una devaluación normalmente no es una medida que se toma en forma aislada. Así el impacto de la devaluación sobre la balanza comercial, la balanza de cuenta corriente, es el impacto conjunto de una serie de medidas que acompañan a la devaluación. Entonces, si el estado original de la economía es exceso de demanda, una devaluación simplemente, sin ninguna otra medida, no va a resolver el problema; va a tener que haber una reducción o en la demanda o un aumento en la oferta, o cualquiera combinación de esas dos cosas; y, entonces, si estas medidas internas financieras se aplican soportando la devaluación, va a haber un impacto sobre la cuenta corriente. Yo creo que él tiene razón al decir que en muchos casos un paquete de medidas como las que acabo de describir resultan en un empeoramiento de la balanza comercial y en gran parte —y el Sr. McKinnon lo explica— es porque los flujos de capital vuelven al país y eso les permite un nivel de importación superior al que había antes. Yo diría que eso refleja quizá no tanto el impacto de la devaluación en sí sobre las importaciones; eso puede reflejar simplemente la reacción del resto del mundo a la adopción de políticas financieras que parecen compatibles con la capacidad de desarrollo de un país. En este sentido, países en vías de desarrollo normalmente deberían tener un déficit en cuenta corriente porque son países que importan capital, y de hecho eso les sirve en general para financiar su proceso de desarrollo. Entonces, una cuenta corriente sostenible es un déficit. Si uno tiene que introducir medidas, controles, es porque el déficit es superior a eso que entre comillas se podría llamar “un déficit sostenible”. Ahora, con respecto al “crawling peg”, y a la experiencia chilena, lo que el Profesor McKinnon denomina un crawling activo, a mí me parece un tipo de cambio fijo. La única diferencia es que en el crawling activo se está diciendo de antemano cómo se va a mover el tipo de cambio. En lugar de definir un tipo de cambio fijo como un tipo de cambio que no varía, se va a definir un tipo de cambio en que se fija su ritmo de variación. Me parece que la conclusión a que el Profesor McKinnon llega, de que es muy lógico que una vez que se establece este tipo de crawling activo correspondería en un momento determinado fijar el tipo de cambio, que es lo que han hecho aquí, es correcta. Al adoptar el crawling activo, sin embargo, me parece que se tomó un cierto riesgo en la medida en que el anuncio predeterminado de cómo se va a mover el tipo de cambio tendrá éxito en función de lo que el resto de la economía crea que es lo que va a ocurrir. Eso implica un riesgo porque es lo mismo que si uno dijera “si el público cree que eso va a ocurrir el mecanismo funciona, si el público no lo cree el mecanismo puede saltar”. Una de las cosas interesantes en Chile es que la economía reaccionó de la manera esperada y permitió al país en un momento determinado fijar el tipo de cambio.

En fin, el trabajo a mí me parece muy interesante porque plantea problemas de maneras bastante nuevas. Y quiero terminar sólo con otra pregunta: ¿Cuál es la relación entre los flujos de capital a un país y el control monetario de ese país? Si uno interpreta que porque los rendimientos que se pueden obtener en el país exceden de los que se puedan obtener en el exterior, el resto del mundo aumenta su demanda de activos, denominados

en la moneda de ese país, yo no vería eso como un problema de control monetario. No veo cómo eso puede financiar la inflación si el resto del mundo está dispuesto a demandar y a mantener activos denominados en pesos chilenos, no veo cómo eso me va a explicar la inflación en Chile. Lo que sí veo es que, si el proceso de flujo de capital no refleja un aumento de la demanda de pesos chilenos sino que lo que refleja es que dado que los rendimientos aquí son más altos que fuera, el sistema bancario tiene que cobrar a los que piden crédito interno una tasa que le permita pagar sobre depósitos el rendimiento elevado que hace que los flujos de capital vengan. Entonces si eso provoca que los residentes del país, como el crédito interno es caro con relación al exterior, se vayan al exterior para pedir prestado y con eso financian un nivel de demanda muy superior al nivel de capacidad productiva o de capacidad de importación del país, eso sí financiaría inflación. Pero eso no es un aumento de la demanda de dinero, eso es lo que la gente de dentro quiere gastar; le resulta más barato pedir prestado fuera, pide prestado fuera, viene y gasta y eleva el nivel de demanda. Pero si los flujos de capital no elevan el nivel de demanda o el nivel de gasto, yo no vería cómo la cuenta de capital pueda financiar la inflación.

Because my memory is poor I will start just with the last comments, then work back as I still have them in my head. I think Mr. Guitian addressed the question of the disalignment in the domestic and foreign rates of interest after liberalization occurs and I observed that it is quite common for rates of interest to rise domestically by more than the current expected depreciation in the exchange rate and, therefore, you have got a surge of capital coming into the economy and the result is inflationary; and we can't suggest how this can be if this is the way of the normal borrowing and lending process which connects the world capital markets to the domestic. Now, if we have instantaneous commodity arbitrage—which we know is somewhat weaker than the economists like to think—there will be no inflationary effect on the economy, the trade deficit would equal the increased inflow of capital coming into the market; so there should be no domestic inflation. If you had a perfect arbitrage in the commodity markets in this very great degree of responsiveness to surges in capital flows, then I think his argument is correct, but if we take a somewhat more limited view of commodity arbitrage I think it is reasonable to expect that when the liberalization occurs and takes traders somewhat by surprise they are not ready to meet the surge of the increased monetary base with increased imports. Then you may get inflation at the time liberalization occurs from the financial capital inflows that are not matched by a real inflow. I agree that most countries who are liberalizing will have a trade deficit which reflects its option in capital, whereas on a longer term basis there is nothing wrong in that, but probably you want to control any unusual surges in capital inflows that the trade balance cannot easily accomodate. That is where I think the downward crawl calendar, the method of reducing the interest differential is warranted and one might even try with residual control in capital inflows trying to keep them down until the system settles down to a more normal long run path with a more normal trade deficit.

And let me give an example; there are two kinds of examples that are relevant. If you have incomplete trade liberalization and you then liberalize the capital market, interest rates become very high, you get a surge of financial capital into the economy but there is no way that the trade balance can widen. The trade deficit can't widen, to accomodate that inflow of capital and so you very definitely will get inflationary pressures. Elements of that kind of problems are present in Argentina at the present time. Although Argentinians have made some progrees, liberalization has been incomplete and perhaps the liberalization in capital accounts is premature and liable to be jumped on. Another kind of possible mistake—in some ways a worse one—is when you try to liberalize an economy which is essentially repressed, and you remove exchange controls and perhaps even float the exchange rate. An example of this kind of mistake would be Israel in late 1977, perhaps after the visit of a very famous Chicago economist. What he advocated I am sure I can't tell, but what happened to Israel policy then was pretty clear

cut. Prior to 1977, Israel had been sort of bumping along with a 250/o or so inflation, with mini devaluations offsetting more or less in line with our idea of passive crawl; but lots of restrictions on foreign trade, although by no means being fully repressed, and with quite strict restrictions on capital accounts. Then the Prime Minister Mr. Rabin came under a cloud, if you remember, because his wife was found to hold a dollar account in New York, even though it was very small, but withstood him some political damage; and probably was instrumental in having the new more conservative government come into power. Well, in late 1977, they did not liberalize that much in foreign trade; they left the ungoing inflation with an uncovered budgetary deficit. With that financial repression still in the system they then decided to completely eliminate exchange controls and float the exchange rate. Well, if you are going to use the inflation tax to cover a government budgetary deficit, an inflationary tax is levied on the domestic financial system, in this case on Israeli pounds, then you have got to make people stand there and be taxed; you can't allow them to go into U.S. dollars and convertible currencies and avoid the tax.

When people got rid of those controls, everybody got out of pounds into dollars; the tax base for the uncovered public sector deficit was greatly narrowed so the rate of inflation had to be drastically stepped up to provide the same amount of tax revenue to the government from the inflation tax; and the Israeli pound sunk like a rock in the foreign exchange markets. Israel is now near a hundred plus in the rate of inflation, a hundred per cent or more per year, which is something new even by Israeli standards. So this is clearly a case where attempted liberalization has been done in the wrong order, was done only on the one thing, capital control, not having the comprehensive financial and trade reforms preceding that elimination of capital controls and thus the economy in question had a financial disaster. These matters of liberalization are not as straightforward as they might seem, as when we talk about them. Let me come back to something Mr. Robichek said. He thought my classification system was a little too sharply defined and particularly I associated certain advanced economies with financial liberalization when it is evident that Japan still has a lot of restrictions on domestic interest rates, and some exchange controls have been introduced recently. European countries are the same way, maybe with Germany the exception, but there are lots of interest rate restrictions within Europeans, with Holland, Belgium and so forth; and there are mild capital account restrictions on people moving individuals, moving money about, so these countries don't approach full financial liberalization in the sense that I am using the term. As Mr. Robichek correctly points out, the U.S. itself has what we call regulations Q, and other restrictions on interest rates; and from October 6 maybe even further on unwarranted reserve requirements on the management liabilities of the banks, that interfere with the financial intermediation process in the U.S. I agree fully that I am over simplifying to refer to the industrialized countries as being financially liberal but let me say there are two saving features in this which makes their floats work substantially better than they otherwise would. The most important one is

the presence of your own currency trading in well known convertible international moneys. This does provide a free market basically that is unrestricted in guilders, marks, francs and sterling, where commercial banks who are responsible for making this spot and forward markets in foreign exchange, can cover their positions and hence make the really deep forward market because they have free access to the European currency market. Unfortunately, smaller countries that are less well known in trade than the industrial ones, or fortunately, I don't know which, don't have their currencies traded in Europe markets so there is not this loophole in the regulations which makes floats smoother than would otherwise be the case. So they are more likely to have to peg, the smaller countries or less developed countries. Another sort of loophole in financial regulations on Europe currency trading is to let authorized commercial banks and foreign traders operate with relative freedom even though individuals, say a Swede who wants to take a savings account out of Sweden and move it to California cannot do it, but a commercial Swedish trading firm or a Swedish bank can operate freely in dollars. So there is a sort of loophole that is accorded to banks which makes the thing work a little better than it otherwise would. But that does not finish the story. There is a great deal of financial liberalization that remains to be done in the industrial countries for the world's money machine to work better and particularly, at the present time, important unresolved issues as to whether or not European currencies markets should be reformed, if at all, and how their relationships to the domestic financial markets should be rationalized. There is still the real problem of whether or not the presence of Europe trading undermines national monetary controls, if at all, and how should one rationalize the control of Europe markets relative to the financial monetary systems; this is still an open issue.

Now, Robichek refers to something which makes me think my paper was unclear: a note that it has to do with relative prices and the trade balance. When I talked about a repressed economy and a pegged exchange rate and then the advent of inflation, I said that this may not affect the trade balance because although exports may diminish you can just put a greater squeeze on quota restrictions and you can balance imports directly by direct controls; but I didn't mean to say that this effect of the inflation in the face of a pegged exchange rate washed out in terms of any real effect; in fact it is very likely to depress the economy that is undertaking the inflation in the face of a fixed rate.

When you devalue, again I accept the criticism as it is a whole package, it is not just a devaluation that is forced on you by the I.M.F. But I.M.F. with all its wisdom has a whole package that goes with it, which countries just love to accept; and it is the greater macroeconomic control that attempts to secure control over the monetary base, improvement on public finance and so forth, that goes with the devaluation; and the devaluation is often successful. I don't mean to say that it ever isn't, indeed it is necessary together with this package, but it is a success in a way not common to the

text books. It is not primarily successful in improving the trade balance because, as we mentioned, the trade balance can go in either direction; imports may actually increase more than exports; it is successful in restoring the level of economic activity and in rationalizing the domestic economy; and in particular getting access to capital; and increasing investment in the economy. In that sense then output is increased and we have a real effect of devaluation.

MACRO-ECONOMIC POLICY IN AN OPEN ECONOMY

Expositor: Profesor Jacob Frenkel(*)

Moderador: Sr. Daniel Tapia de la Puente

Comentaristas: Profesor Ronald McKinnon

Profesor Carlos Rodríguez

(*) University of Chicago.

Macro-Economic Policy in an Open Economy (*)

I. Introduction

This paper examines the implications of alternative macro-economic policies in a small open economy under alternative exchange rate regimes. Section II analyses the question of the appropriate policy mix for an economy under a pegged exchange rate regime. It modifies the traditional analysis of the "assignment problem" by recognizing that in a small open economy monetary policy has to be defined in terms of changes in the domestic source component of the monetary base. The modified model shows that the optimal assignment of fiscal and monetary policies depends critically on the degree of capital mobility. The analysis then proceeds to examine the relationships among the budget deficit, the rate of credit expansion and the balance of payments from the analytical perspective of the monetary approach to the balance of payments. The section concludes with an application of a portfolio-balance model to an analysis of the efficiency of policies in the open economy. Section III contains an analysis of flexible exchange rates. It outlines the basic elements of the monetary (or the asset market) approach to exchange rate determination and demonstrates the key role that is being played by expectations. This perspective is then

*Prepared for presentation at a "Conference on Alternatives for Financial Policy in Small Open Economies" held in Santiago, Chile, January 21-22, 1980. I am indebted to the National Science Foundation grant SOC78-14480 for financial support. The research reported here is part of the NBER's research program in International Studies. Any opinions expressed are those of the author and not necessarily those of the NBER.

applied to the interpretation of the high volatility of exchange rates. Section IV contains an analysis of the optimal degree of exchange rate flexibility and it develops the analytical framework for determining the optimal degree of exchange rate management. It is shown that the optimal mix between pegged and flexible exchange rate regimes depends on the details of the stochastic structure of the shocks which affect the economy. The important characteristic of the approach is that the choice of an exchange rate regime is an integral part of a general optimization process.

II. Macro-Economic Policies Under Pegged Exchange Rates

One of the central insights provided by the theory of macro-economic policies for the open economy is the recognition that one may not analyse the effects of using a specific policy instrument without the knowledge of what is being done with other relevant instruments. Consequently, it does not make much sense to develop a separate analysis of "monetary policy for the small open economy" or of "fiscal policy for the small open economy" or of "exchange rate policies for the small open economy". The proper perspective should examine the package of macro-economic policies and analyse their combined effects on the entire set of the policy goals.

The theory of macro-economic policy for the open economy has been mostly advanced by the contributions of James E. Meade and Robert A. Mundell. The key characteristic of these contributions is the perception that considerations concerning the openness of the economy and the implications of the openness to the conduct of policies are fundamental and belong to the center stage of the analysis. This notion is in sharp contrast with the conventional view (which is particularly popular in the United States) that the "foreign trade sector" is an appendix to the economy which could otherwise be analyzed as if it were closed. More recent developments associated with the implications of the monetary approach to the balance of payments and more generally with the role played by "rational expectations" which tends to nullify the intended effects of policies, have led to doubts about the efficacy (and wisdom) of stabilization policies and have resulted in "policy pessimism".

This section surveys some of the issues relevant for the analysis of policies. A convenient starting point is Mundell's analysis of the proper assignment of fiscal and monetary policies to the attainment of internal and external balance.

II.1. The Assignment Problem: Mundell's Solution (1962)

Mundell's analysis of the assignment problem serves as a convenient starting point since it was developed against a similar background of policy

pessimism. The relevant question at the time was: how can a small open economy which gives up the use of its exchange rate as a policy instrument (by deciding to peg the rate) and which gives up the use of tariffs, quota and other measures of commercial policy (by abiding with the rules of GATT), attain simultaneously internal balance and external balance with the use of fiscal and monetary policy? In providing the answer to this question Mundell first recognized that an application of Jan Tinbergen's policy principle (1952) which states that to attain two independent targets there must be at least two policy instruments, implies that with the aid of two policy instruments (fiscal and monetary policies) there is a way to attain simultaneously internal and external balance. He then extended Tinbergen's principle by developing the effective market classification principle which guides the policy maker (according to the stability criterion) in pairing the two instruments with the objectives on which they have the most influence. To illustrate Mundell's framework, consider the following fully employed small open economy.

Let government spending be G and let private aggregate demand be $E(y, r)$ where y denotes income and r denotes the rate of interest and assume that aggregate demand depends negatively on the rate of interest. Both the private sector and the government divide their spending between imported goods and domestically-produced goods. For simplicity of exposition suppose that both the private sector and the government spend a fraction m on imports and $(1 - m)$ on domestically-produced goods. Internal balance is attained when aggregate demand for domestic goods equals aggregate supply as in equation (1);

$$(1) \quad (1 - m) [E(\bar{y}, r) + G] + \bar{x} = \bar{y}$$

where $\bar{y}$ denotes full employment income and where $\bar{x}$ denotes the (exogenously given) level of exports which represents foreign demand for domestic output.

External balance is specified as balance of payments equilibrium in which the sum of the surpluses in the current account and the capital account is zero so that there is no need for international reserve flow. Thus, external balance is attained when

$$(2) \quad \bar{x} - IM + z(r) = 0$$

where IM denotes imports and where $z(r)$ denotes the surplus in the capital account which is assumed to depend positively on the rate of interest. Recalling that imports are a fraction m of the sum of private and government spending, we can write the condition for external balance as

$$(3) \quad \bar{x} - m [E(\bar{y}, r) + G] + z(r) = 0$$

If we define monetary policy in terms of changes in the rate of interest and fiscal policy in terms of the rate of government spending, it is clear that in general equations (1) and (3) can be solved with the appropriate choice of the policy instruments r and G . This is the implication of Tinbergen's principle.

The effective market classification principle can be demonstrated using Mundell's diagram. In Figure 1 the locus XX describes combinations of monetary and fiscal policy which maintain internal balance. Using equation (1) the slope of that locus is:

$$(4) \quad \frac{dr}{dG|_{XX}} = \frac{1}{-E_r} > 0$$

where E_r denotes the partial derivative of private aggregate demand with respect to the rate of interest. In the same figure, the locus FF describes combinations of monetary and fiscal policies which ensure external balance. Using equation (3), the slope of that locus is:

$$(5) \quad \frac{dr}{dG|_{FF}} = \frac{1}{-E_r + z_r/m} > 0$$

A comparison of the slopes of the XX and the FF schedules indicates that as long as $z_r > 0$ (i.e., as long as there is some degree of international capital mobility), the XX schedule is steeper than the FF schedule. The explanation is obvious. A rise in government spending creates an excess demand in the market for goods and induces a deterioration in the balance of trade. The rise in aggregate demand and the deterioration in the balance of trade can be offset by a rise in the rate of interest. The latter however also induces an improvement in the capital account of the balance of payments. The relative slopes of the two schedules reflect the fact that changes in the rate of interest have a relatively stronger effect on the external balance than on the internal balance. This differential effect arises because the rate of interest affects the capital account in addition to its effect on the balance of trade through the induced changes in aggregate demand.

The differential impact of the two instruments on the two targets has important implications for the proper allocation of responsibilities between the monetary and the fiscal authorities. Consider for example points A and A' in panels (a) and (b) of Figure 1. These points correspond to a position of external balance which is combined with an excess supply of domestic output. Internal balance could be restored by an expansionary monetary policy which lowers r as in panel (a), or alternatively by an expansionary fiscal policy which raises G as in panel (b). These policies yield equilibrium at points B and B' respectively which correspond to a position of internal

balance combined with a deficit in the balance of payments. The deficit can be eliminated by a fiscal contraction which lowers G as in panel (a) or by a monetary contraction which raises r as in panel (b). The external balance is restored at points C and C'. As is evident, the path that is followed in panel (a) leads away from the global equilibrium at point Q while the path that is followed in panel (b) leads progressively towards the global equilibrium. The key difference between the two panels is in the allocation of instruments to targets. In panel (a) the responsibility for external balance was given to the fiscal authority while the responsibility for internal balance was given to the monetary authority. In contrast, panel (b) corresponds to the opposite allocation where fiscal policy deals with internal balance while monetary policy with external balance. The allocation of instruments according to the effective market classification principle ensures that path (b) will be followed and yields Mundell's famous propositions that monetary policy ought to be aimed at external balance and fiscal policy at internal balance, and that failure to follow this prescription may yield a progressively worsening situation.

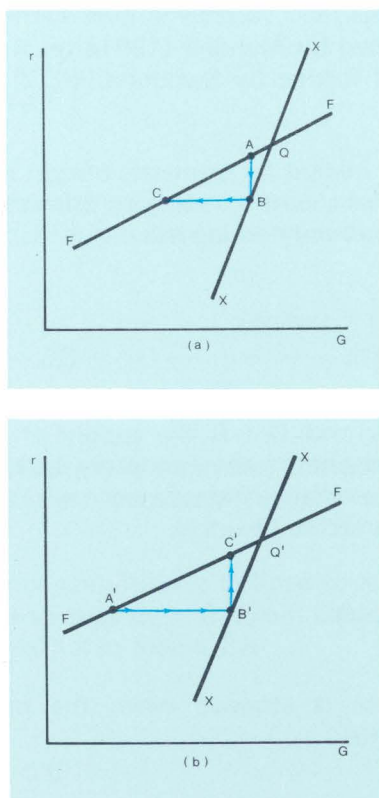


Figure 1: Mundell's Analysis of the Assignment Problem: The XX and the FF schedules denote internal and the external balance respectively. In panel (a) monetary policy is allocated to the attainment of internal balance and fiscal policy to the attainment of external balance. In panel (b) monetary policy is allocated to the attainment of external balance and fiscal policy to the attainment of internal balance.

11.2. *Further Developments of the Assignment Problem: The Role of Capital Mobility*

The analysis in Section 11.1 introduced the concept of the assignment problem, the notion of Tinbergen's principle about the relationship between the number of targets and the number of independent policy instruments and finally, it introduced Mundell's principle of the effective market classification. The specific model, however, is subject to a major limitation in that it defines monetary policy in terms of the changes in the rate of interest rather than in terms of open market operations. The difference between the two definitions of monetary policy is fundamental since when capital is highly mobile the monetary authorities may not be able to alter the rate of interest or even to alter the supply of money. In this section I modify the analysis of the assignment problem. The modification defines monetary policy in terms of open market operations which alter the domestic source component of the monetary base. The analytical framework is that of the standard pegged exchange rates variable output open economy version of the IS-LM model as developed by Mundell (1961a) extended by McKinnon and Oats (1966), elaborated further by Swoboda (1972) and surveyed by Mussa (1979b).

Equilibrium in the market for domestic output is described by equation (6) where G denotes government spending on domestic goods and where, for simplicity, imports depend only on income.

$$(6) \quad E(y, r) + \bar{x} - IM(y) + G = y.$$

Money market equilibrium is described by equation (7) where $L(y, r)$ denote the demand for money and $D + R$ the supply of money; D denotes the domestic source component of the monetary base and R denotes international reserves. The exchange rate is normalized to be unity and the money multiplier is assumed to be unity.

$$(7) \quad L(y, r) - (D + R) = 0$$

Finally, external balance is attained when the balance of payments is balanced as in equation (8).

$$(8) \quad \bar{x} - IM(y) + z(r) = 0$$

From equations (6) and (7) the impact effects of fiscal and monetary policies on income and the rate of interest can be expressed as

$$(9) \quad dy = -\frac{L_r}{\Delta} dG - \frac{E_r}{\Delta} dD$$

$$(10) \quad dr = \frac{L_y}{\Delta} dG - \frac{s+m}{\Delta} dD$$

where $\Delta = -(s+m)L_r - E_r L_y > 0$, s and m denote the marginal propensities to save and import respectively, L_r denotes the negative effect of a change in the rate of interest on the demand for money and where L_y denotes the inverse of the velocity of circulation.

In general these changes in income and the rate of interest will not persist for the long run since as long as the balance of payments is imbalanced, the money supply is being changed and as a result income and the rate of interest are altered. From equation (8) the change in reserves (the balance of payments) can be expressed as

$$(11) \quad \frac{dR}{dt} = -m dy + z_r dr$$

where dR/dt denotes the change in reserves per unit of time. Using equation (9)–(10) in (11), the equilibrium change in reserves can be written as

$$(12) \quad \frac{dR}{dt} = \frac{mL_r + z_r L_y}{\Delta} dG + \frac{mE_r - z_r (s+m)}{\Delta} dD$$

Equation (12) with $(dR/dt) = 0$, expresses the combinations of fiscal and monetary changes that are necessary for the maintenance of external balance.

The internal balance condition is defined in terms of the attainment of a given level of income so that $dy = 0$. From equation (9), the slope of the internal balance schedule XX in Figure 2 is

$$(13) \quad \frac{dD}{dG|_{XX}} = \frac{-L_r}{E_r} < 0.$$

This slope indicates that in order to maintain a given level of income an expansionary monetary policy must be accompanied by a contractory fiscal

policy. All points to the right of the XX schedule correspond to an excess demand for output while points to the left correspond to excess supply.

From equation (12) (with $dR/dt = 0$) the slope of the external balance schedule FF is

$$(14) \quad \frac{dD}{dG|_{FF}} = \frac{mL_r + z_r L_y}{(s+m)z_r - mE_r} > 0.$$

All points above the FF schedule correspond to a deficit in the balance of payments and all points below the schedule correspond to a surplus. As may be seen, the slope of the external balance schedule depends on the degree of capital mobility. If the degree of capital mobility is relatively low, $mL_r + z_r L_y < 0$ and the schedule is negatively sloped. Conversely, when the degree of capital mobility is relatively high, $mL_r + z_r L_y > 0$ and the schedule is positively sloped. The economic interpretation is straightforward. A rise in government spending raises income and the rate of interest. The rise in income induces a deterioration in the balance of trade and the rise in the rate of interest induces an improvement in the capital account. If capital is highly mobile the improvement in the capital account will exceed the deterioration in the balance of trade; the balance of payments will be in surplus which could be corrected by an expansionary credit policy. In contrast, if the degree of capital mobility is relatively low, the deficit in the balance of trade will exceed the surplus in the capital account, and the overall balance of payments will be in deficit which could be corrected by a contractory credit policy.

In what follows it is shown that the solution to the assignment problem depends in a fundamental way on the degree of capital mobility. Consider first the case where capital is relatively immobile. In that case the external balance schedule is negatively sloped and, as can be seen by a comparison of equations (13) with (14), the external balance schedule is flatter than the internal balance schedule. Figure 2 describes the implications of two alternative assignments of fiscal and monetary policies. As may be seen, the implications of Mundell's analysis remain intact. When fiscal policy is assigned to attaining external balance and monetary policy is assigned to attaining internal balance as in panel (a), the system becomes unstable as the situation gets progressively worse. In contrast, under the opposite assignment as in panel (b), the system is stable and the point of global equilibrium is reached.

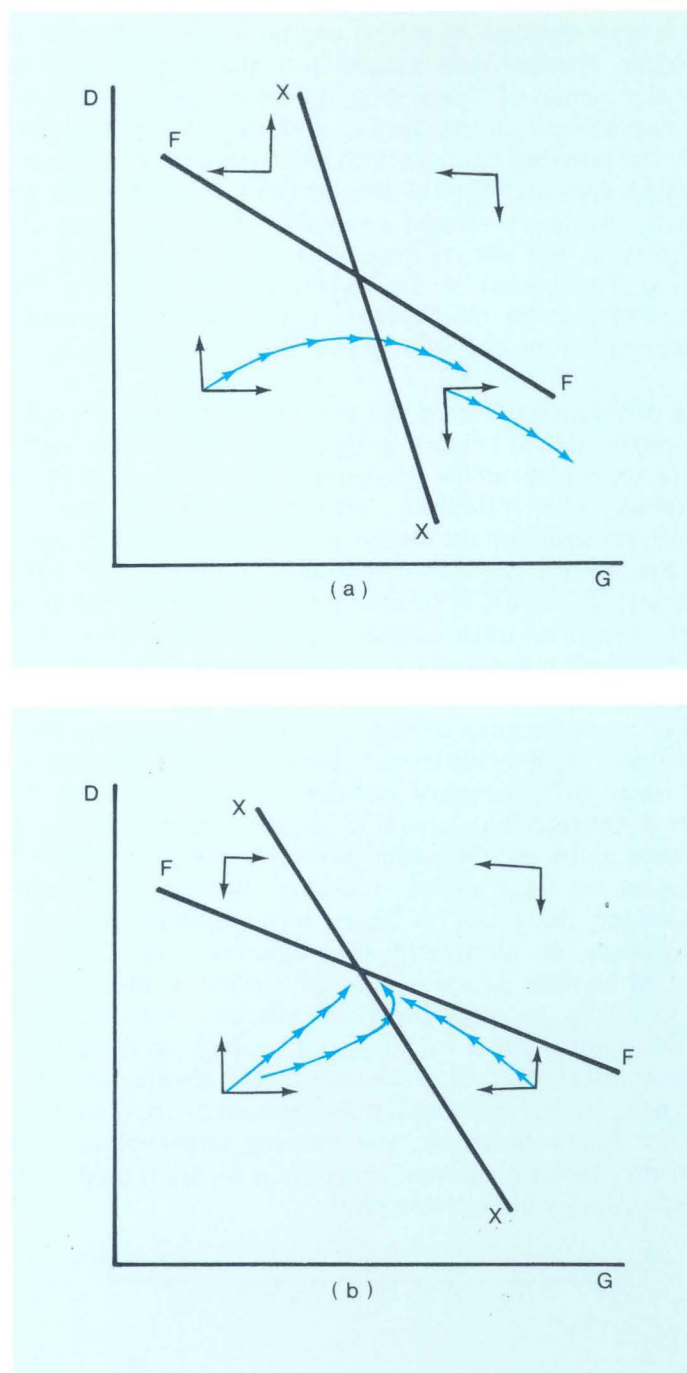


Figure 2: The Assignment Problem with Low Capital Mobility: The XX and the FF schedules denote internal and external balance, respectively. In panel (a) monetary policy is allocated to the attainment of internal balance and fiscal policy to the attainment of external balance. In panel (b) monetary policy is allocated to the attainment of external balance and fiscal policy to the attainment of internal balance.

Consider next the case in which capital is highly mobile. In that case the FF schedule is positively sloped and the implications of the two alternative assignments of fiscal and monetary policies are described in Figure 3. A comparison of panels (a) and (b) of Figure 3 shows that in contrast with the previous analysis both solutions to the assignment problem lead to a stable system. It is in this context that one may argue that a liberalization of capital flows and a removal of controls may contribute to greater flexibility in the use of fiscal and monetary policies for the small open economy. The reason is that when capital is highly mobile, these policies do not need to be rigidly tied to the attainment of specific targets as in the case in which the degree of capital mobility is not too high.

The key difference between the two solutions lies in the dynamics. As is seen, in panel (a) of Figure 3 the direction of the path to global equilibrium is clockwise while the direction of the path in panel (b) is counterclockwise. The difference between the two paths may be of substance once we consider the delays and the costs that are associated with changes in the course of macro-economic policies. For example, it is reasonable to assume that it is relatively easy to agree on the proper policies when the attainment of both targets require expansionary or contractory actions. The problem arises in the case of a conflict. When the attainment of one target calls for an expansionary policy while the attainment of another target calls for a contractory policy, the choice between panel (a) and (b) may be significant. As is evident from panel (a) following the phase during which both fiscal and monetary policies move in the same direction (an expansion or a contraction), there is always a phase during which fiscal policy continues in its course while monetary policy changes direction. In contrast in panel (b) fiscal policy is always the instrument which changes direction following the phase in which both instruments operated in the same (expansionary or contractionary) direction. To the extent that in circumstances of conflict between policies it is easier to alter the monetary instrument than it is to alter the fiscal instrument (which might require legislation), the path in panel (b) might be superior to the path in panel (a), and the proper allocation of instruments to targets would not be the conventional one. In that case fiscal policy would be assigned to the external target while monetary policy to the internal target. Nevertheless, and in contrast with the standard analysis, if capital is highly mobile this alternative assignment would still yield a stable path.

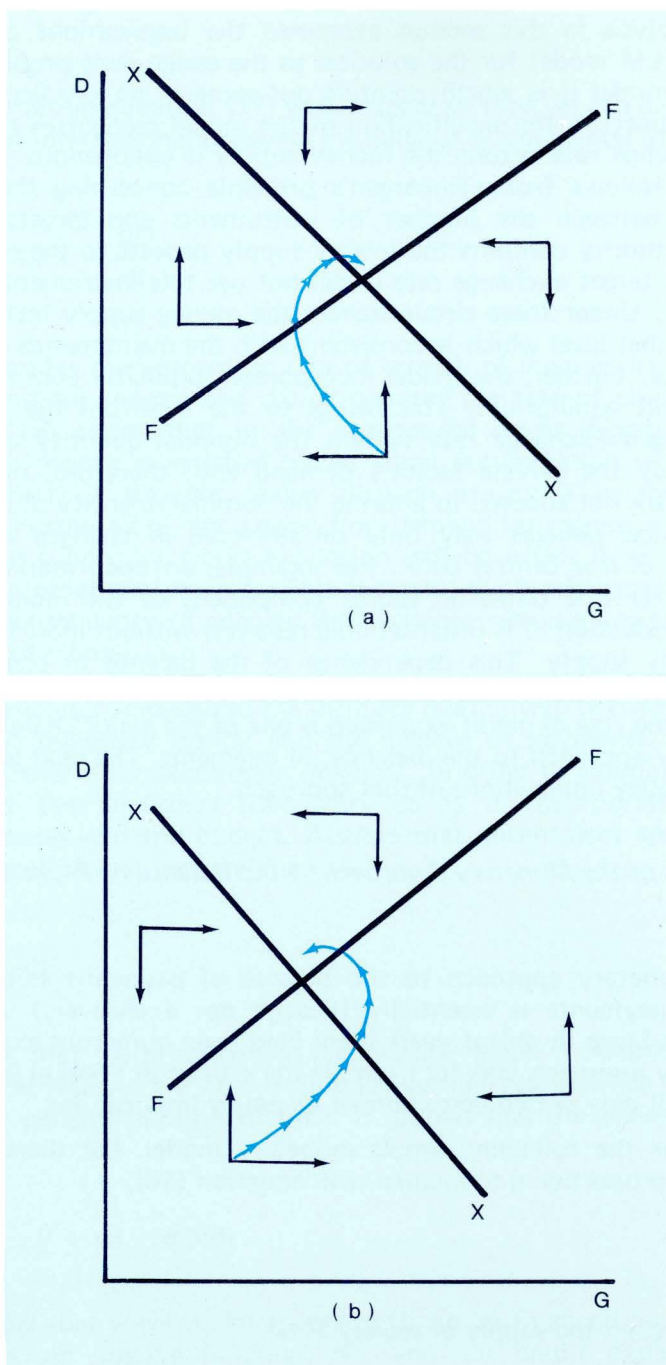


Figure 3: The Assignment Problem with High Capital Mobility: The XX and the FF schedules denote internal and external balance, respectively. In panel (a) monetary policy is allocated to the attainment of internal balance and fiscal policy to the attainment of external balance. In panel (b) monetary policy is allocated to the attainment of external balance and fiscal policy to the attainment of internal balance.

The analysis in this section examined the implications of the open economy IS-LM model for the solution to the assignment problem. Before leaving this model it is worth pointing out some of its key features. First, and most important, the specification of the model recognizes that under a pegged exchange rate system the money supply is endogenous. This simple proposition follows from Tinbergen's principle concerning the necessary relationship between the number of instruments and targets. Once the monetary authority commits the money supply process to the maintenance of a specific target exchange rate it can not use this instrument to achieve other targets. Under these circumstances the money supply instrument has to be set at that level which is consistent with the maintenance of the given exchange rate. Further, the model incorporates explicitly considerations of money market equilibrium. This brings to the forefront the notion that under a pegged exchange rate system the nominal quantity of money is determined by the private sector's demand and, therefore, open market operations may not succeed in altering the nominal quantity of money. The effects of such policies may only be reflected in changes in the asset composition of the central bank. For example, an open market purchase which raises D (the domestic source component of the monetary base), results in a reduction in R (international reserves) without inducing a change in the money supply. This dependence of the balance of payments (the change in international reserves) on the relationship between the demand for money and the rate of credit expansion is one of the major characteristics of the monetary approach to the balance of payments. The next section deals with some policy implications of that approach.

11.3 *Aspects of the Monetary Approach to the Balance of Payments*

The monetary approach to the balance of payments states that the balance of payments is essentially (though not exclusively) a monetary phenomenon. Since in recent years there have been numerous expositions of the monetary approach [see for example the articles in Frenkel and Johnson (1976)], I will only sketch here some of its policy implications.

Consider the following simple monetary model. Let the demand for money L be proportional to income as in equation (15),

$$(15) \quad L = kY$$

and, as before, let the supply of money M be

$$(16) \quad M = R + D$$

Money market equilibrium requires equality between the demand and the supply of money as in equation (17)

$$(17) \quad kY = R + D$$

By differentiating equation (17) with respect to time we can express the rate of change of international reserves (the balance of payments) as

$$(18) \quad \frac{dR}{dt} = k\lambda Y - \frac{dD}{dt}$$

where λ denotes the percentage rate of growth of income, $k\lambda y$ denotes the flow demand for money and dD/dt denotes the rate of credit expansion. Equation (18) states that in the absence of credit expansion the flow demand for money is satisfied by an equal accumulation of international reserves which is brought about through a surplus in the balance of payments. Furthermore, for a given flow demand for money, any attempt to increase the supply by credit expansion will be offset by a corresponding decline in international reserves. This reiterates the fundamental fact that the necessary consequence of pegging the exchange rate is a loss of control over the supply of money.

This analysis emphasized the intimate relationship between the demand for money, monetary policy and the balance of payments. What are the effects of other macro-economic policies? In order to examine these issues we extend the analytical framework so as to incorporate government spending, taxes and the budget. Assume that government spending G is a constant fraction g of national income

$$(19) \quad G = gY$$

and assume that the proportional income tax rate is τ . Assume further that international reserves are held in interest earning assets which yield a rate of return of r percent per unit of time. It follows that the government budget constraint is

$$(20) \quad G = \tau Y + rR + dD/dt$$

which states that government spending G can be financed by taxes, τy , by the return on reserve holdings, rR , and by credit expansion dD/dt . Substituting equation (19)–(20) into (18) yields

$$(21) \quad \frac{dR}{dt} = [k\lambda - (g - \tau)]Y + rR$$

Equation (21) indicates that a rise in government spending worsens the balance of payments while a rise in the growth of income, in the tax rate and in the return on reserve holdings improves the balance of payments. Further, *ceteris paribus* a balanced budget rise in government spending (so that $dg = d\tau$) will not affect the balance of payments. This analysis demonstrates the intimate relationship between the budget deficit, the rate of credit expansion and the balance of payments which are interconnected by the budget constraints of the government and of the private sector. These constraints imply that in a fundamental sense not all policy instruments are independent and, therefore, it may not be always appropriate to treat monetary and fiscal policies as two independent instruments of policy.

It should be emphasized that these interrelationships are not specific to the monetary approach to the balance of payments. Rather, they are a reflection of the fundamental identities of national income accounting according to which national product must equal the sum of private aggregate demand E (absorption), government spending G and net foreign demand – the surplus in the balance of trade $(X - IM)$.

$$(22) \quad y = E + G + (X - IM)$$

By subtracting total taxes (denoted by T) from both sides of (22) and rearranging, we obtain

$$(23) \quad (X - IM) = [(y - T) - E] + (T - G)$$

which expresses the surplus in the current account (which equals the balance of payments in the absence of capital movements) as the sum of private savings (the excess of disposable income over spending) and public savings (the budget surplus). The same idea is expressed in equation (21) above in which private savings is the flow demand for money $k\lambda Y$, while the budget surplus is $rR + (\tau - g)Y$.

From the policy perspective equation (23) emphasizes that what matters for determining the current account of the balance of payments is the total level of spending rather than the composition of spending between domestic and foreign goods. It follows that for a given level of income, the only effective balance of payments policies are those which are either expenditure-reducing or expenditure-increasing policies. Under these circumstances expenditure-switching policies which alter the composition of spending between imports and domestically-produced goods, will not be effective. Since this policy implication is derived directly from the identities of national income accounting, they are not specific to the monetary approach and should characterize any model with similar features.

The emphasis on the relationship between total income and total expenditures is the key insight of the absorption approach to the balance of

payments. As a policy matter, however, there may be room for expenditure switching policies once the existing structure of relative prices in the economy does not correspond to the equilibrium price structure. To illustrate the point and to introduce the notion of relative prices it is necessary to disaggregate total output as in Dornbusch (1974). Consider an economy which produces traded and non-traded goods and denote the relative price of non-traded goods by p_N . The value of output (using traded goods as a numeraire) is

$$(24) \quad y = y_T + p_N y_N$$

where y_T and y_N denote the rates of production of traded and non-traded goods respectively. The value of private spending is

$$(25) \quad E = E_T + p_N E_N$$

where E_T and E_N denote private spending on traded and non-traded goods, respectively. Government spending G is also allocated between the two goods so that

$$(26) \quad G = G_T + p_N G_N$$

where G_T and G_N denote government spending on traded and non-traded goods, respectively. Subtracting equation (25) from (24) we obtain

$$(27) \quad y - E = (y_T - E_T) + p_N (y_N - E_N)$$

To introduce the effects of government spending we subtract total taxes T from both sides of (27) and we add and subtract government spending to the right hand side using equation (26). After rearranging this yields

$$(28) \quad (X - IM) = [(y - T) - E] + (T - G) + p_N [(E_N + G_N) - y_N]$$

where the balance of trade $(X - IM)$ was substituted for the excess supply of traded goods $y_T - (E_T + G_T)$. It is clear from equation (28) that the balance of trade (or the balance of payments in the absence of capital movements) can be described and analyzed in terms of three basic magnitudes: (i) the excess of private disposable income over expenditures (ii) the excess of public income over expenditures (the budget surplus), and (iii) the excess demand for non-traded goods. The first two components have been discussed and introduced in equation (23) above. The third component

reflects a "disequilibrium" relative price structure that prevents market clearing for non-traded goods. The first two components reflect the traditional factors emphasized by the absorption approach. They relate to aggregate private and government spending which could only be influenced by expenditure-increasing or by expenditure-reducing policies. On the other hand the third component could be influenced by expenditure-switching policies which alter the relative price structure.

Returning to the implications of the monetary approach to the balance of payments, it is worth reiterating the general principle which determines the effects of policies. According to the monetary approach the effects of policies on the balance of payments can be conveniently analyzed in terms of their effects on the supply and the demand for money. Thus, a devaluation which lowers the supply of real cash balances, creates an excess demand for money and improves the balance of payments [see for example Mundell (1971) and Dornbusch (1973)]. Similarly, the imposition of a tariff which raises the price level, creates an excess demand for money and improves the balance of payments [see for example Mussa (1976a)]. The effects of transfers, taxes, and all other policies can also be analyzed in terms of their effects on the excess demand for money as in Johnson (1976).

In all of these cases the speed and the pattern of the adjustment process depends critically on whether or not capital is mobile internationally. When capital is immobile and the monetary authorities do not engage in domestic credit expansion, changes in the nominal money stock can only be brought about by the gradual process of saving or dissaving that is reflected in a surplus or a deficit in the balance of payments. In contrast, when capital is highly mobile, changes in the nominal money stock need not correspond only to changes in the level of wealth but may also be brought about by fast alterations in the composition of portfolios. For example, consider the adjustment to a devaluation which lowers the real value of wealth and lowers the relative share of real balances in the portfolio of assets. Given the access to world capital markets, asset-holders will be able to immediately restore equilibrium in portfolio composition by swapping some of their holdings of securities for money and thereby recuperating some of the depreciated stock of money. The rest of the adjustment will proceed as in the case of no capital mobility through the gradual process of saving [see Frenkel and Rodriguez (1975)].

The implication of capital mobility on the efficiency of policies is illustrated in Figure 4 [adapted from Frenkel and Rodriguez (1975)] which describes the effects of open market operations. Consider a portfolio which is composed of real cash balances M/P (where P denotes the price level) and common stocks, K , and let the price of a security in terms of goods be p_K . The value of wealth W is thus

$$(29) \quad W = M/P + p_K K$$

Suppose that the desired money/securities ratio depends negatively on the rate of interest as in equation (30)

$$(30) \quad M/P = \ell(r)p_k K$$

Portfolio equilibrium is described by point A in Figure 4. The negatively sloped schedule describes the wealth constraint which corresponds to the given quantity of money, securities and prices, and the positively sloped schedule describes the desired composition of assets given the rate of interest. An open market purchase moves the economy from point A to point B at which the money supply has risen and the holdings of securities by the private sector has fallen. Since at point B the composition of the portfolio has been disturbed and since asset holders have access to world asset markets at the given rate of interest, they will restore portfolio equilibrium instantaneously by exchanging the increased stock of cash for foreign securities and thereby returning to point A. Thus, the fact that world capital markets are integrated and that open market operations are conducted in assets that are traded internationally at a given price, enables the private sector to nullify the actions of the monetary authority. In fact, in this case open market operations amount to an exchange of foreign exchange reserves for securities between the monetary authorities and foreign asset holders. [These implications are elaborated in Mundell (1963), McKinnon (1969), Dornbusch (1975) and Frenkel and Rodriguez (1975)]. This analysis also suggests that the monetary authority of the small open economy may regain some of its powers by conducting open market operations with assets that are not-traded internationally and thereby do not have a predetermined world price [see Dornbusch (1976a)].

The same figure can be used for the analysis of a once and for all rise in the quantity of money that is brought about through an unanticipated transfer of cash balances which moves the economy from point A to point C. The impact of this policy is to raise the value of assets and to raise the relative share of money in wealth. Portfolio composition equilibrium is restored by an immediate exchange of part of the increased monetary stock for equities as individuals move to point D. Since at D the value of assets exceeds the equilibrium value at A, individuals will wish to run down their holdings of both equities and real cash balances by increasing expenditures relative to income. This part of the process will be gradual. The transition towards long-run equilibrium follows along the path from D to A and is characterized by a surplus in the capital account and a deficit in the monetary account of the balance of payments.

The previous analysis of open market operations assumed implicitly that the returns on government holdings of securities are rebated to the private sector (in a lump sum fashion) but that the private sector does not capitalize the expected future flow of transfers. As a result the open market operations did not change the wealth position of individuals who moved

from point A to B along the given wealth constraint. Under the alternative assumption that asset holders anticipate and capitalize the flow of transfers and treat them as any other marketable asset, they effectively conceive of the equities that are held by the government as their own. In that case the open market purchase only raises the supply of real cash balances and moves the economy from point A to point C. The effects of this policy are identical to the effect of the pure monetary expansion that is brought about through the governmental transfer. The analysis of these two extreme cases illustrates the importance of the degree of capitalization and marketability of claims to future income streams which were analysed in the context of a closed economy by Metzler (1951) and Mundell (1960).

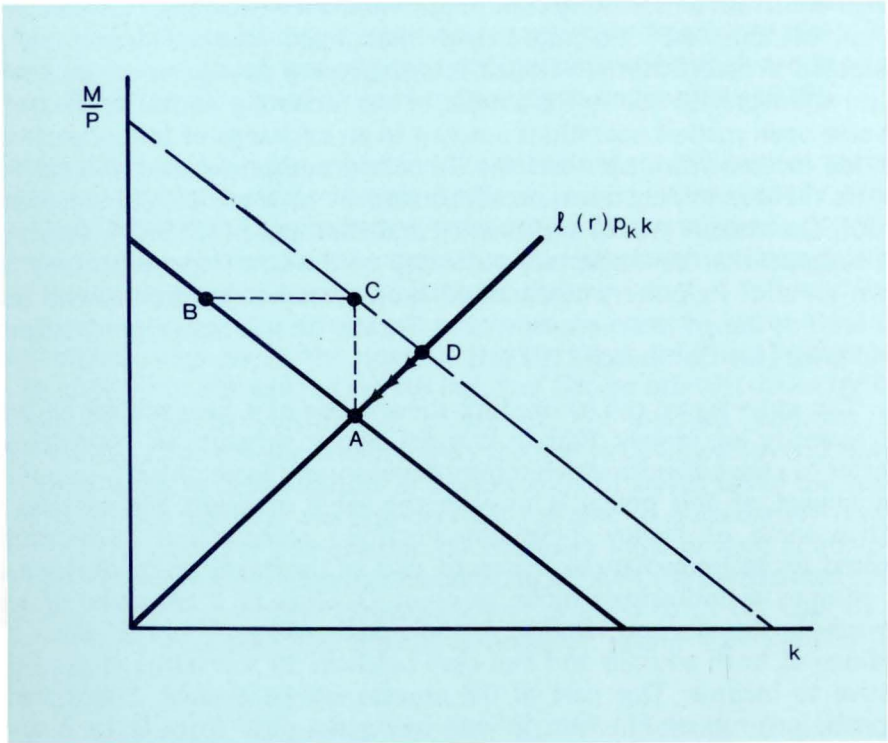


Figure 4: Portfolio equilibrium and the adjustment process. The negatively sloped schedule describes the asset constraint, and the positively sloped schedule describes the liquidity preference which determines the equilibrium composition of the portfolio.

Throughout this section we have not incorporated explicitly the role of inflation and inflationary expectations. These considerations were left out of the analysis since the rate of inflation for the small open economy which pegs its exchange rate is primarily determined by the rate of inflation in the rest of the world. Except for the very short run, the small open economy can not affect its rate of inflation and, as was shown above, attempts to influence the rate of inflation by changes in the rate of credit expansion will be frustrated by the balance of payments. The only way in which the inflation rate in the small open economy can differ from world inflation for any substantial period of time is by foregoing the commitment to the pegged exchange rate system and by having a flexible exchange rate regime. Some aspects of the economics of flexible exchange rates are analysed in the next section.

III. *Flexible Exchange Rates*

To set the stage for the analysis of flexible exchange rates, it is convenient to return once more to Figure 4. Purchasing power parities imply that the domestic price level P equals the foreign price level P^* times the exchange rate S (defined as the price of foreign exchange in terms of domestic currency), and thus real cash balances in Figure 4 can be written as M/SP^* . For convenience let P^* be given. A once and for all rise in the quantity of money moves the economy from point A to point C in Figure 4, and the new equilibrium is reached when the exchange rate (and the price level) rise equiproportionately so as to return the economy back to point A. This long-run equilibrium is the same under both exchange rate regimes. The dynamics however differ. When the exchange rate is pegged the adjustment to the monetary disturbance (following the initial swap of assets which brings the economy to point B) is gradual and is effected through time as the community runs a deficit in the balance of payments. When the exchange rate is flexible, the return from C to A is instantaneous and the currency depreciates immediately at the instant of the monetary change. This difference in the dynamics of adjustment is important and it reflects a fundamental characteristic of exchange rate determination. Section II.1 presents a simple monetary model which highlights the key characteristics of exchange rate determination.

III.1 *A Monetary Approach to Exchange Rate Determination*¹³

This section outlines a simple model of exchange rate determination which reflects the recent revival of the monetary approach (or more

¹³ The material in this section is adapted from Frenkel and Clements (1980).

generally, the asset-market approach) to the analysis of exchange rates¹⁴. The monetary view of exchange rate determination emphasizes that the exchange rate, being the relative price of two national monies, is determined primarily by factors which affect the relative supplies and demands for these monies. Since the demands for the various national monies depend on expectations, incomes, rates of return and other considerations which are relevant for portfolio choice, the approach is referred to as an asset-market approach to the determination of exchange rates. The major building blocks of the theory are hypotheses concerning (i) the properties of the demand for money (ii) the purchasing power parity condition and (iii) the interest parity theory.

Consider first the equilibrium in the money markets. The supplies of domestic and foreign real balances are M/P and M^*/P^* where M and P denote the nominal money supply and the price level, respectively, and where variables pertaining to the foreign country are indicated by an asterisk. Denoting the demands for real balances by L and L^* (both of which are functions which will be specified below), equilibrium in the money markets is attained when

$$(31) \quad L = M/P \text{ and}$$

$$(32) \quad L^* = M^*/P^*$$

From equations (31)-(32), equilibrium in the money markets implies that the ratio of the two price levels is:

$$(33) \quad \frac{P}{P^*} = \frac{M}{M^*} \frac{L^*}{L}$$

The second building block links domestic and foreign prices through the purchasing power parity condition according to which,

$$(34) \quad P = SP^*$$

¹⁴ For theoretical developments and applications of the approach see, for example, Dornbusch (1976a, 1976b), Kouri (1976), Mussa (1976b), Frenkel (1976), Frenkel and Johnson (1978), Bilson (1978) and Hodrick (1978).

where S denotes the spot exchange rate —the price of foreign exchange in terms of domestic currency¹⁵. Using equation (34) in (33) yields

$$(35) \quad S = \frac{M}{M^*} \frac{L^*}{L}$$

which expresses the exchange rate in terms of domestic and foreign supplies and demands for money. To gain further insight into the determinants of the exchange rate, assume that the demand for money depends on real income (y) and the rate of interest (i) according to:

$$(36) \quad L = ay^{\eta} e^{-\alpha i}$$

$$(37) \quad L^* = b^* y^{*\eta^*} e^{-\alpha^* i^*}$$

Using equations (36)-(37) in (35) and assuming for simplicity of exposition foreign and domestic parameters of the demand for money are the same, i.e., that $\alpha = \alpha^*$, and that $\eta = \eta^*$, we obtain:

$$(38) \quad \ln S = C + \ln \frac{M}{M^*} + \eta \ln \frac{y^*}{y} + \alpha (i - i^*)$$

where $C \equiv \ln(b^*/a)$.

Denoting a percentage change in a variable by a circumflex (e.g., $\hat{x} = \Delta x/x$), the percentage change in the exchange rate is:

$$(39) \quad \hat{S} = (\hat{M} - \hat{M}^*) + \eta(\hat{y}^* - \hat{y}) + \alpha \Delta(i - i^*)$$

Equation (9) relates the percentage change in the exchange rate to the differences between domestic and foreign (i) rates of monetary expansion,

¹⁵ For a discussion of the choice of the relevant price index to be used in equation (4) see Frenkel (1978). To the extent that purchasing power parity pertains to traded goods only, the exchange rate equation would also contain terms which relate to the relative prices of traded to non-traded goods; for a formulation along these lines see Dornbusch (1976b) and for an empirical application see Clements and Frenkel (1980). A more refined specification would allow for the effects of tariffs on the relationship between domestic and foreign prices as well as for short-run effects of unanticipated money on output rather than only on prices and the exchange rate.

(ii) rates of growth of real incomes, and (iii) changes in interest rate differentials¹⁶.

The third building block is the interest parity theory according to which, in equilibrium, the premium on a forward contract for foreign exchange for a given maturity is (approximately) equal to the interest rate differential:

$$(40) \quad i - i^* = \pi; \pi \equiv \ln(F/S)$$

where π denotes the forward premium on foreign exchange and where F denotes the forward exchange rate. Substituting (40) into (38) and (39) yields:

$$(41) \quad \ln S = C + \ln \frac{M}{M^*} + \eta \ln \frac{y^*}{y} + \alpha \pi$$

$$(42) \quad \hat{S} = (\hat{M} - \hat{M}^*) + \eta(\hat{y}^* - \hat{y}) + \alpha \Delta \pi$$

One of the central implications of the monetary (or the asset-market) approach is the key role that is assigned to expectations concerning future events. The role of expectations in the determination of exchange rates is summarized by the forward premium or discount on foreign exchange. The monetary approach that is summarized in equation (41)-(42) differs from the elasticities approach to exchange rate determination in that concepts like exports, imports, and the like, do not appear explicitly as being fundamentally relevant for the understanding of the evolution of the exchange rate. Rather, the relevant concepts relate to two groups of variables: first are those which are determined by the monetary authorities and second, are those which affect the demands for domestic and foreign monies¹⁷.

The implications of the model are that, *ceteris paribus*, (i) a rise in the supply of domestic money will depreciate the home currency (i.e., raise S) while a rise in the supply of foreign money will appreciate the home currency; (ii) a rise in domestic income due, for example, to a rise in

¹⁶ To the extent that purchasing power parity pertains only to traded goods, equation (39) will include another term describing the ratio of domestic to foreign relative prices of traded to non traded goods (i.e., the relative real exchange rates).

¹⁷ It should be noted that when properly specified other approaches to exchange rate determination would also yield reduced form equations like (38), or (39) with money supplies, incomes and interest rates appearing on the right-hand side. The virtue of the monetary approach in comparison with the elasticities approach is in bringing these variables to the foreground rather than leaving them in the "background".

productivity will appreciate the currency (lower S), while a rise in foreign income will depreciate the currency, and (iii) a rise in the forward premium on foreign exchange will depreciate the currency (raise S). This dependence of the current exchange rate on expectations concerning the future rate (as summarized by the forward premium) is a typical key characteristic of price determination in asset markets (and markets for durable goods). Thus, an expected future depreciation of the currency is reflected immediately in the current value of the currency. The model yields the following predictions concerning the values of the various elasticities (i) the elasticity of the exchange rate with respect to the domestic money supply is unity and the elasticity with respect to the foreign money supply is minus unity; (ii) the elasticity with respect to domestic and foreign real incomes should approximate the income elasticities of the demand for money η (positive for foreign income and negative for domestic income), and (iii) the (semi) elasticity with respect to the forward premium should approximate (in absolute value) the interest (semi) elasticity of the demand for money.

In the above model we have not drawn the distinction between "the demand for domestic money" and "the domestic demand for money". Implicitly it has been assumed that domestic money is demanded only by domestic residents while foreign money is demanded only by foreign residents. Furthermore, the formulation of the demands for real cash balances (in equations (36)-(37)) included the domestic interest rate in the domestic demand, and the foreign interest rate in the foreign demand; it has been implicitly assumed that the only relevant alternative for holding domestic money is domestic securities while the only relevant alternative for holding foreign money is foreign securities. In principle, however, the alternatives to holding domestic money include domestic securities, foreign securities as well as foreign exchange. It follows that a richer formulation of the demand for money would recognize that, as an analytical matter, the spectrum of alternative assets and rates of return that are relevant for the specification of the demand for money is rather broad, including both rates of interest, i and i^* , as well as the forward premium on foreign exchange π . Furthermore, to the extent that under a flexible exchange rate system individuals might wish to diversify their currency holdings, the demand for domestic money would include a foreign component which depends on foreign income, while the demand for foreign money would include a domestic component which depends on domestic income¹⁸. These characteristics reflect the phenomenon of currency substitution which is likely to arise when the exchange rate is not pegged¹⁹.

¹⁸ For a discussion of the specification of the demand for money under a flexible exchange rate regime see Frenkel (1977, 1979) and Abel, Dornbusch, Huizinga and Marcus (1979).

¹⁹ For an analysis of the phenomenon of currency substitution see Boyer (1973), Chen (1973), Chrystal (1977), Girton and Roper (1976), Stockman (1976), Calvo and Rodriguez (1977) and Miles (1978). On the extent of currency substitution during the German hyperinflation see Frenkel (1977).

The above discussion suggests the need for a more detailed specification of the demand for money. Let domestic demand for domestic money depend on domestic income and on the three alternative rates of return according to:

$$(43) \quad L_1 = a y^{\eta_1} \exp(-\alpha_1 i - \beta_1 i^* - \gamma_1 \pi)$$

and let the foreign demand for domestic money be

$$(44) \quad L_1^* = a^* y^{\eta_1^*} \exp(-\alpha_1^* i - \beta_1^* i^* - \gamma_1^* \pi)$$

where the total demand for domestic money is $L_1 + L_1^* = L$. Analogously, the demand for foreign money is also composed of domestic and foreign components: domestic demand for foreign money L_2 and foreign demand for foreign money L_2^* according to:

$$(45) \quad L_2 = b y^{\eta_2} \exp(-\alpha_2 i - \beta_2 i^* + \gamma_2 \pi)$$

$$(46) \quad L_2^* = b^* y^{\eta_2^*} \exp(-\alpha_2^* i - \beta_2^* i^* + \gamma_2^* \pi)$$

where the total demand for foreign money is $L_2 + L_2^* = L^*$.

Using the above relationships, the domestic and the foreign demands for money are $L_1 + L_2$ and $L_1^* + L_2^*$, respectively. Substituting equations (43)-(46) into equation (35) yields the more general relationship between the exchange rate and the various components of the supplies and demands for the two monies. For expositional simplicity, assume that all the various income elasticities of money demands are equal to η , i.e., that $\eta_1 = \eta_1^* = \eta_2 = \eta_2^* = \eta$, that the semi-elasticities of the demands for money with respect to both interest rates are equal, i.e., that $\alpha_i = \beta_i = \alpha_i^* = \beta_i^*$ ($i = 1, 2$), and that the semi-elasticities of the demands for money with respect to the forward premium on foreign exchange are equal to γ , i.e., that $\gamma_1 = \gamma_1^* = \gamma_2 = \gamma_2^* = \gamma$. Under these assumptions the exchange rate can be written as:

$$(47) \quad S = \frac{M}{M^*} \frac{by^\eta + b^*y^{*\eta}}{ay^\eta + a^*y^{*\eta}} e^{\beta\pi}$$

where $\beta \equiv 2\gamma$.

From (17), the percentage change in the exchange rate is

$$(48) \quad \hat{S} = (\hat{M} - \hat{M}^*) + \eta(\lambda^* + \lambda - 1)(\hat{y}^* - \hat{y}) + \beta\Delta\pi$$

where

$$\lambda^* \equiv L_2^*/L^* \text{ and}$$

$$\lambda \equiv L_1/L.$$

The implications of equation (48) are similar to those of equation (42) except for the inference concerning the elasticity of the exchange rate with respect to real incomes. When individuals hold diversified portfolios of currencies, the effects of income growth on the exchange rate depend on the income elasticity of the demand for money as well as on the parameters λ and λ^* indicating the currency mix of money holdings. If domestic and foreign residents hold portfolios with identical currency mixes, changes in incomes will not affect the exchange rate. In general, it is expected that the typical portfolio of currencies will be intensive in the local currency and thus, that both λ and λ^* are each larger than one-half and, therefore, that $\lambda + \lambda^* > 1$. Under these circumstances it is expected that the elasticity of the exchange rate with respect to domestic income would be negative while the elasticity with respect to foreign income would be positive but somewhat less than the corresponding income elasticities of the demands for money since $(\lambda + \lambda^* - 1)$ is less than unity. In the special case where money holdings are not diversified, individuals hold only local currency, $\lambda = \lambda^* = 1$, and equation (48) reduces to equation (42).

Prior to concluding this section it should be emphasized that the monetary (or the asset-market) approach to the exchange rate does not claim that the exchange rate is "determined" only in the money or in the asset-markets and that only stock rather than flow considerations are relevant for determining the equilibrium exchange rate. Obviously, general equilibrium relationships which are relevant for the determination of exchange rates include both stock and flow variables. In this respect, the asset market equilibrium relationship that has been used, may be viewed as a reduced form relationship. Furthermore, the fact that the analysis of the exchange rate has been carried out in terms of the supplies and the demands for monies, does not imply that "only money matters" or that the exchange

rate is determined only by the supply of domestic and foreign monies; on the contrary, the demand for money plays a critical role and it depends on real variables like real income as well as on other real variables which underlie expectations. The rationale for concentrating on the relative supplies and demands for money is that they provide a convenient and a natural framework for organizing thoughts concerning the determinants of the relative price of monies. It is the same principle which has been used by proponents of the monetary approach to the balance of payments in justifying the use of the money demand-money supply framework for the analysis of the money account of the balance of payments under a pegged exchange rate system²⁰.

III.2 *The Role of Expectations*

The analysis in section III.1 presented a monetary model of exchange rate determination. Expectations concerning future exchange rates were assumed to be summarized by the forward premium on foreign exchange. It is noteworthy that the key implication of the asset market perspective to the determination of exchange rates need be incorporated into a specific monetary model like the one presented above. The more general framework emphasizing the unique role of expectations is presented in this section²¹.

The most important implications of the asset market theory of the exchange rate can be explicated in a simple model. Suppose that the logarithm of the spot exchange rate on day t , $s(t)$, is determined by

$$(49) \quad s(t) = z(t) + b \cdot E[s(t+1) - s(t); t]$$

where $E[s(t+1) - s(t); t]$ denotes the expected percentage change in the exchange rate between t and $t+1$, based on information available at t , and where $z(t)$ represents the ordinary factors of supply and demand that affect the exchange rate on day t (among which are domestic and foreign money supplies, incomes, output levels, and the like). Assuming that expectations are "rational" in that equation (49) applies to expectations of future exchange rates, it follows, by forward iteration, [as shown by Mussa (1976b)], that

²⁰See for example Mussa (1974) and Frenkel and Johnson (1976); in the context of flexible exchange rates the same argument is made by Dornbusch (1976b) and Mussa (1976b). It should be noted that the money demand-money supply framework is not employed only for convenience; it reflects the hypotheses that money markets clear fast relative to goods markets, that the demands for real balances are relatively stable and that the supply of nominal balances is a policy instrument that is controlled by the monetary authorities. The emphasis on the role of the money supply places a unique responsibility on the monetary authorities in affecting the rate of exchange.

²¹The material in this section draws on Frenkel and Mussa (1980).

$$(50) \quad E(s(t+j); t) = (1/(1+b)) \cdot \sum_{k=0}^{\infty} (b/(1+b))^k \cdot E(z(t+j+k); t).$$

Thus, the current exchange rate ($j = 0$) and current expectations of future exchange rates ($j > 0$) are linked because both depend on expectations concerning the future z 's. The presumption is that this linkage should be quite strong at least for the exchange rates expected in the near future. The reasoning is straightforward. If the expected change in the exchange rate over a single day is one percent, the expected rate of return from shifting wealth from one currency of denomination to another is extremely high. The flow of funds induced by such a high expected rate of return should swamp the ordinary factors of supply and demand represented by $z(t)$. Hence, the current exchange rate, $s(t) = E(s(t); t)$, should be closely linked to the current expectation of tomorrow's exchange rate, $E(s(t+1); t)$, which in turn should be closely linked to the exchange rate expected for the following day, $E(s(t+2); t)$; and so on. Further, using equation (50) we may determine the expected change in the exchange rate, conditional on information available at time t . The actual change is this expected change plus the (necessarily unpredictable) unexpected change due to "new information" that alters expectations concerning the z 's.

This perspective implies that periods which are dominated by uncertainties, new information and rumors, are likely to be periods in which changes in expectations are the prime cause of fluctuations in exchange rates. Further, since the information which alters expectations must be new, the resulting fluctuations are intrinsically unpredictable. It follows that the existence of forward markets for foreign exchange can not take care of the consequences of this basic fact. Indeed, the evidence from various experiences with floating exchange rates suggests that while the forward premium on foreign exchange is an unbiased forecast of the future change in the exchange rate, the forecast errors are very large. Generally, predicted changes in the exchange rate (as reflected by the forward premium) account for a very small fraction of actual changes [This is a general phenomenon that has been documented in Mussa (1979a), Frenkel and Mussa (1980) and Frenkel (1980a)]. Figure 5 describes this phenomenon with reference to the recent evolution of the \$/DM exchange rate. As can be seen the forward premium accounts for a small fraction of the actual fluctuations. Another fact illustrated in Figure 5 is that short-run changes in exchange rates bear little relationship to short-run differentials in inflation rates. The social cost of these two phenomena have not yet been fully evaluated.

The principle that exchange rates change in response to new information is relevant for understanding the relationship between the trade balance and exchange rate changes. This principle suggests that a deficit in the trade balance may or may not be associated with depreciation, depending on whether this deficit was unexpected or expected. More generally, since exchange rates already reflect expectations of future deficits or surpluses, changes in exchange rates will depend largely on the unexpected

component of the trade balance and on the extent to which the new information embodied in this unexpected component affects expectations concerning future trade imbalances.

Since exchange rates are affected not only by current policy actions but also by current expectations about future policy, the instability of policy can affect expectations about future policy and thereby have a magnified effect on current exchange rates. The resulting turbulence of exchange rates may be associated with significant short-run deviations from purchasing power parities and thereby generate significant social cost. What is the policy implication of this analytical framework? The key implication is that the government can make a positive contribution to reducing costly and unnecessary turbulence of exchange rates by reducing high and variable rates of monetary expansion and by adopting stable and predictable patterns of macro-economic policy.

PERCENT CHANGE

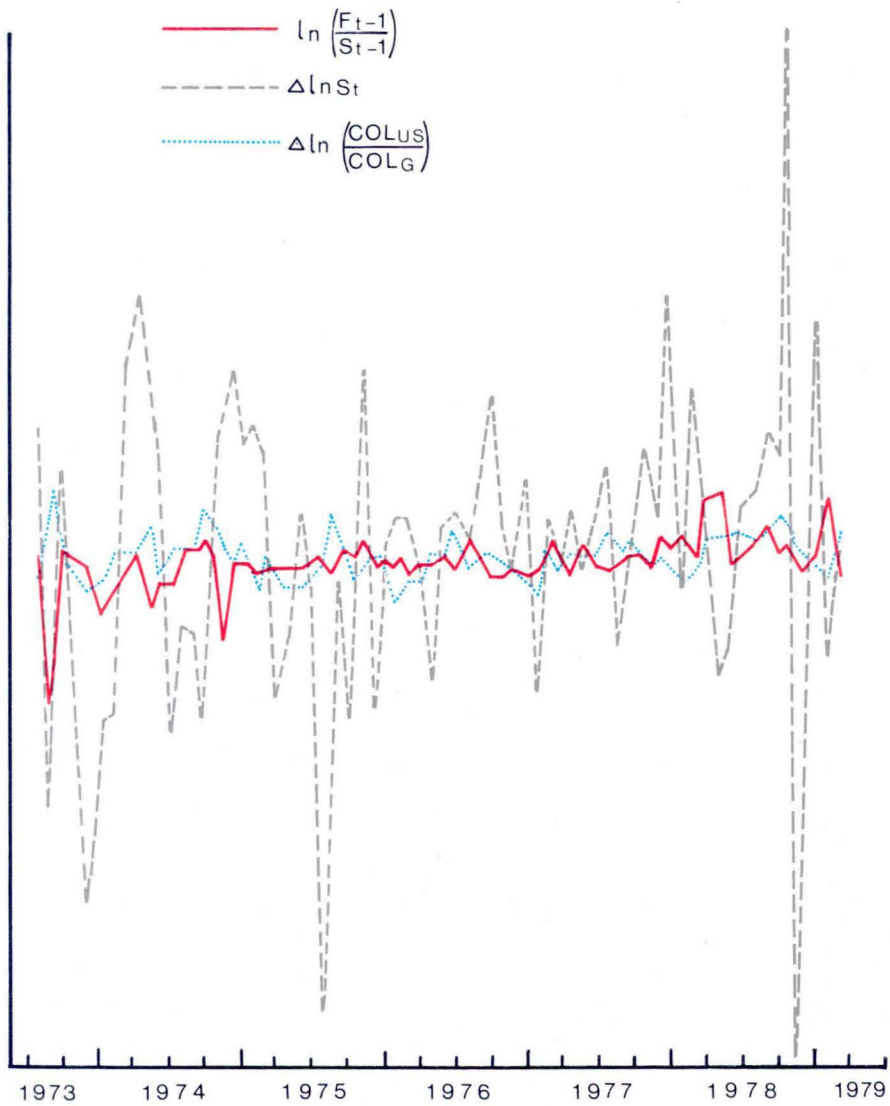


Figure 5: Monthly percentage changes of the U.S./German Consumer Price Indices, of the \$/DM Exchange Rate and the Monthly Forward Premium; July 1973 – February 1979.

IV. *The Choice of the Exchange Rate Regime and the Optimal Managed Float*

The analysis in Section II examined the various policy implications of a pegged exchange rate regime and the analysis in Section III examined the characteristics of a flexible exchange rate regime. In this section we turn to the normative question of the choice of an optimal exchange rate regime.

The early discussions concerning the choice between fixed and flexible exchange rate systems centered around questions of stabilization policies, the effect of capital mobility on the efficacy of monetary and fiscal policies, the role of speculation in the foreign exchange market, the nature and origin of exogenous disturbances, and the like. More recent discussions originating with contributions in the 1960's by Mundell (1961b), McKinnon (1963) and Kenen (1969) [For a survey see Tower and Willett (1976)], have shifted the focus of analysis to the choice of the optimal currency area. The shift of emphasis reflected the recognition of the fact that the optimal exchange rate regime need not be the same for all countries. Rather, a country might find it useful to maintain a fixed rate with some currencies while having a flexible exchange rate with some other currencies.

The analysis in this section recognizes that the spectrum of possibilities open for the various economies is much broader than the one implied by the framework of analysis of the optimal currency area. Rather than dividing the world into currencies among which the exchange rates are flexible and those among which the exchange rates are fixed, one might consider the optimal degree of fixity of exchange rates between each pair of currencies. In this framework the choice of an exchange rate regime between any pair of currencies need not be a fixed or a flexible rate but rather it might be some optimal mix of the two extremes. The optimal mix is referred to as the optimal managed (or dirty) float.

The analytical framework that is outlined below builds upon, and extends the analysis of recent papers by Fischer (1976) and Gray (1976). Fischer analyzes the choice between the two extreme exchange rate systems in terms of the source of exogenous disturbances. He demonstrates that when the exogenous shocks are real, the variance of steady-state consumption will be lower under a fixed rate system than under a flexible rate system. On the other hand, when the exogenous shocks are monetary, the opposite holds and the flexible rate system is preferred to the fixed rate system. Gray's paper deals with wage indexation in a closed economy and develops the concept of the optimal degree of wage indexation when the system is subject to real and monetary shocks which occur simultaneously. Lack of complete information precludes identifying the effect of each shock separately, and thus results in the optimal degree of wage indexation. In what follows I combine the two approaches of Fischer and Gray into a framework which yields an index measuring the optimal degree of fixity of exchange rates, i.e., the optimal managed float. The major determinants of

the optimal mix are the variance of and the covariance among the various shocks which affect the economy²².

IV.1 *The Analytical Framework*

Consider a small economy that is subject to three types of repetitive and serially uncorrelated shocks. These shocks which are specified below are referred to as real, monetary, and foreign shocks.

Denote the supply of output by Y_t , and assume that

$$(51) \quad Y_t = ye^\mu ; \quad \mu \sim N(-\sigma_\mu^2/2, \sigma_\mu^2)$$

where μ is a stochastic disturbance with a constant variance σ_μ^2 . The mean of the distribution of μ is chosen to be $-\sigma_\mu^2/2$ so as to assure that the expected value of output $E(Y_t)$ equals y . Thus, y referred to as permanent income and μ is referred to as the real shock. It can be shown that σ_μ is approximately equal to the standard deviation of current income as a percentage of permanent income²³.

The second source of disturbances arises from the monetary sector of the economy. Let the demand for nominal balances L_t be

$$(52) \quad L_t = kP_t Y_t e^\epsilon ; \quad \epsilon \sim N(-\sigma_\epsilon^2/2, \sigma_\epsilon^2)$$

where k is the Cambridge k denoting the desired money income ratio, P denotes the domestic price level and ϵ denotes the stochastic disturbance to the demand for money. As for the distribution of the real shock, the standard deviation of the monetary shock σ_ϵ is approximately equal to the standard deviation of the income velocity as a percentage of permanent velocity.

²² I am indebted to Michael Bazdarich for helpful assistance. The material in this section is adapted from Frenkel (1980b). For an early analysis of the optimal exchange rate regime in terms of the structure of the economy see Stein (1963). Modigliani and Askari (1973) have emphasized that the optimal exchange rate regime depends on the nature of the shocks and that the optimum may be an intermediate system between fixed and flexible rates, e.g., sliding parities. A similar emphasis on the origin of shocks is found in Flood (1979) and in Buiter (1977) who also emphasizes the stochastic nature of the various shocks.

²³ $E(Y_t) = y$, $E(Y_t^2) = y^2 e^{\sigma_\mu^2}$ and $\text{var}(Y_t) = y^2 (e^{\sigma_\mu^2} - 1)$ thus
 $\sigma_\mu / E(Y) = y(e^{\sigma_\mu^2} - 1)^{1/2} / y = (e^{\sigma_\mu^2} - 1)^{1/2} \approx \sigma_\mu$

for small σ_μ . It should be clear that the choice of $-\sigma_\mu^2/2$ as the mean of the distribution of μ is made solely for analytical convenience. None of the results are affected by rescaling the distribution so as to move its mean to zero.

The third source of disturbances stems from the foreign sector. Denote the foreign price level by P_t^* and let it be related to its permanent value p_t^* according to

$$(53) \quad P_t^* = p_t^* e^{\chi}; \quad \chi \sim N(-\sigma_\chi^2/2, \sigma_\chi^2)$$

Thus, χ denotes the shocks due to variability of foreign prices. Again, σ_χ is approximately equal to the standard deviation of foreign prices as a percentage of their mean.

The domestic price level is linked to the foreign price level through the purchasing power parity. Thus

$$(54) \quad P_t = S_t P_t^*$$

where S_t denotes the exchange rate which is defined as the price of foreign exchange in terms of domestic currency²⁴.

A complete characterization of the nature of disturbances requires a specification of the covariance among the various shocks. To facilitate the exposition and to avoid a tedious taxonomical analysis, it is assumed that domestic real and monetary shocks are independent so that their covariance is zero, while foreign shocks and the various domestic shocks are related to each other. Denote these covariances by

$$\text{cov}(\chi, \mu) = h_1$$

$$\text{cov}(\chi, \epsilon) = h_2$$

Let the flow demand for money ΔM^d correspond to a stock adjustment process by which individuals wish to restore stock equilibrium by a constant multiple of the discrepancy between desired and actual money holdings:

$$(55) \quad \Delta M^d = \alpha(L_t - \bar{M})$$

In (55), α denotes the speed of adjustment while $\bar{M}$ denotes money holdings at the beginning of the period. The determinants of $\bar{M}$ will be discussed later.

Using equations (51), (53) and (54) in (52) we may express the demand for money as

$$(52') \quad L = kp^* S_t e^{(\mu + \epsilon + \chi)}$$

²⁴ To simplify the exposition it is assumed that purchasing power parities hold deterministically. It is easy to incorporate stochastic elements into equation (54).

When the exchange rate is flexible, stock disequilibrium in the money market will automatically disappear since the exchange rate will change so as to guarantee that $L_t - \bar{M} = 0$. Using equation (52'), it follows that when the exchange rate is flexible the money market clears and equation (53) holds.

$$(56) \quad k p^* S_t y e^{(\mu + \epsilon + \chi)} - \bar{M} = 0.$$

Thus, the equilibrium exchange rate is

$$(57) \quad S_t = (\bar{M}/k p^* y) e^{-(\mu + \epsilon + \chi)}$$

and the percentage change thereof is

$$(58) \quad \log S_t - \log S_{t-1} = \log(\bar{M}/k S_{t-1} p^* y) - (\mu + \epsilon + \chi)$$

The other extreme system is the fixed exchange rate system for which

$$(59) \quad \log S_t - \log S_{t-1} = 0$$

Using (58) and (59) we may define an index γ such that $0 \leq \gamma \leq 1$:

$$(60) \quad \gamma \equiv (\log S_t - \log S_{t-1}) / [\log(\bar{M}/k S_{t-1} p^* y) - (\mu + \epsilon + \chi)]$$

In Equation (60) the parameter γ characterizes the whole spectrum of exchange rate regimes. In the two extreme systems of a fixed and freely flexible exchange rate, the value of the coefficient γ is zero and unity respectively. Between these two extremes there is the wide range of possible mixture of the two extremes. From (60), the coefficient γ may be viewed as indicating the fraction of money market disequilibrium that is allowed to be eliminated through changes in the exchange rate. In what follows we will refer to γ as the coefficient of managed float. Equation (60) also defines the current exchange rate as

$$(61) \quad S_t = S_{t-1}^{1-\gamma} (\bar{M}/k p^* y)^\gamma e^{-(\mu + \epsilon + \chi)}$$

IV.2 The Objective Function

The optimal managed float strategy is necessary because the government (as well as the private sector) possess information that is incomplete. If information was complete and during each period the various shocks could

be observed and identified separately, an optimal policy would be to allow changes in the exchange rates to correct only for the monetary disturbances and not for the real disturbances. This is essentially the main insight from Fischer's paper (1976). In introducing incomplete information it is assumed that during a given period only the joint outcome of the shocks $\mu + \epsilon + \chi$ are known and not their separate values. Because complete information is not available, some second-best policy is required.

It is assumed that the objective is to minimize the losses due to imperfect information, and that the policy maker seeks to minimize the quadratic loss function H :

$$(62) \quad \text{Minimize } H \equiv [E(c_t - E(Y_t))]^2 = \text{var}(c_t) + [E(Y_t) - E(c_t)]^2$$

where c_t denotes the rate of consumption which, from the budget constraint, equals the rate of income minus the real value of additions to cash balances

$$(63) \quad c_t = Y_t - \frac{\Delta M}{p_t}$$

The previous relationships imply that

$$(64) \quad [c_t - E(Y_t)] = y(e^\mu - 1) - \alpha k y [e^{\mu + \epsilon} - (\bar{M}/k S_{t-1} p^* y)^{1-\gamma} e^{\gamma(\mu + \epsilon) + \chi(\gamma-1)}]$$

and using (64) in (61) yields the loss function which is to be minimized with respect to the intervention index γ ²⁵. As is clear, the expected value of the (squared) discrepancies in (64) (i.e., the loss function) contains terms which involve the various covariances h_1 and h_2 .

Inspection of (64) suggests that in addition to finding the optimal γ , the policy maker might want to pursue what Fischer terms "active" monetary policy by setting the beginning of period holdings of cash balances $\bar{M}$, at some desired level. It is assumed that at the beginning of each period the monetary authority changes the money supply so as to compensate for past disturbances. Thus, the money supply is set at that level for which

$$(65) \quad \bar{M} = k S_{t-1} p^* y$$

²⁵ In a recent analysis of the optimal foreign exchange intervention Boyer (1978) extends and applies Poole's framework (1970) to the problem at hand. Boyer assumes that real income is fixed and that the objective function is to minimize variability of prices.

Substituting (65) in (64) and minimizing the loss function (52) with respect to γ results in cumbersome expressions which are not reported here. Some general qualitative results and some illustrative computations are reported in Section IV.3.

Prior to turning to the analysis of the illustrative computations, the specification of the "active" monetary policy is elaborated further. The above specification is somewhat arbitrary since, in principle, other rules are possible. For example, one could specify a rule by which the monetary authority sets $\bar{M}$ so as to ensure equality between the values of the mathematical expectations of the streams of consumption and income, i.e., $E(c_t) = E(Y_t)$. Even more generally, equation (64) highlights the fact that the monetary authority possesses two instruments for the attainment of its policy goals: a γ policy—the optimal intervention index and an $\bar{M}$ policy—the optimal stock of money at the beginning of each period. The general optimization procedure would then solve simultaneously for the optimal combination of $\bar{M}$ and γ so as to minimize the loss function. In the following section we report and analyze the results of computer simulations that are based on determining $\bar{M}$ according to Fischer's specification of "active" monetary policy. We have experimented with the other two alternative monetary rules. It turns out that, at least for the range of parameters that have been assumed, the resulting optimal intervention index is almost invariant among the various monetary rules for the choice of $\bar{M}$ and thus, for ease of exposition, we report only simulations using Fischer's rule.

IV.3 *Illustrative Computations and Implications*

To gain some insights into the quantitative effects of the size of the various parameters on the size of the optimal intervention index, consider first the case for which there are no foreign price shocks. In that case the first derivative of the objective function evaluated at the two extreme exchange rate systems ($\gamma = 0$ and $\gamma = 1$) is:

$$(66) \quad \left. \frac{\partial H}{\partial \gamma} \right|_{\gamma=0} = 2\alpha k y^2 [\sigma_\mu^2 - \alpha k (\sigma_\mu^2 + \sigma_\epsilon^2)] < 0$$

if $1 - \alpha k (1 + \sigma_\epsilon^2 / \sigma_\mu^2) < 0$

$$(67) \quad \left. \frac{\partial H}{\partial \gamma} \right|_{\gamma=1} = \alpha k y^2 [(\sigma_\mu^2 + \sigma_\epsilon^2) (e^{\sigma_\mu^2} - 1) + 2\sigma_\mu^2 e^{\sigma_\mu^2}] \geq 0$$

Thus, in general, the optimal intervention index will be within the range (0, 1) so that the optimal exchange rate regime will correspond to neither of the

extremes of a completely fixed or of a completely flexible rate regime. The intermediate solution is more likely the higher is αk —the propensity to save out of transitory income. It can also be seen that in that case, when foreign price shocks are absent, the optimal intervention index is zero when the only shocks to the system are real. That is, when $\sigma_\epsilon^2 \rightarrow 0$, γ^* (denoting the optimal level) is set at zero and the optimal regime is that of fixed rates. On the other hand, in the absence of real shocks ($\sigma_\mu^2 \rightarrow 0$), the loss function is minimized at $\gamma^* = 1$, i.e., with freely floating rates. With both shocks appearing jointly, the optimal policy may indicate an intermediate value, a combination of monetary changes and exchange rate changes —an optimal managed float.

Table 1 contains the results of some illustrative computations of the optimal intervention index for the case in which there are no foreign price disturbances. The computations are performed for alternative values of the savings propensity as well as for alternative assumptions concerning the magnitudes of the various shocks. It should be recalled that these real and monetary shocks approximate respectively the percentage deviations from permanent income and velocity.

TABLE 1

Optimal Dirty Float for Alternative Values of Real and Monetary Disturbances and Saving Propensities

σ_ϵ \ σ_μ	$\alpha k = .5$					$\alpha k = 1$				
	.01	.03	.05	.07	.09	.01	.03	.05	.07	.09
.01	.0	.80	.92	.96	.98	.50	.90	.96	.98	.99
.03	.0	.47	.69	.80	.87	.10	.50	.74	.85	.90
.05	.0	.0	.0	.33	.53	.04	.27	.50	.67	.77
.07	.0	.0	.0	.0	.25	.02	.16	.34	.50	.63
.09	.0	.0	.0	.0	.0	.01	.10	.24	.38	.51

The major implication of the results in Table 1 is that the higher the variance of the monetary shock, the larger will be the optimal γ , while the higher is the variance of the real shock the lower will be the optimal γ . That is, in general,

$$(68) \quad \frac{\partial \gamma^*}{\partial \sigma_\epsilon^2} > 0 \text{ and}$$

$$\frac{\partial \gamma^*}{\partial \sigma_\mu^2} < 0$$

High variance of real shocks, *ceteris paribus*, tends to raise the desirability of greater fixity of exchange rates, and conversely for high variance of monetary shocks.

Small economies, and in particular developing countries, tend to have concentrated production patterns and thus, are likely to have higher variance of real shocks than more diversified economies. *Ceteris paribus*, these economies will find it optimal to have greater fixity of exchange rates.

The role of the saving propensity, αk , is also clear. The optimal intervention index tends to rise with the value of αk . Thus, high speed of adjustment to asset market disequilibrium (high α) and low velocity of circulation (high $\bar{k}$) tend to reduce the desirability of greater flexibility of exchange rates. As an empirical matter the value of αk is probably closer to unity than to one-half.

The above discussion focused on the case for which all shocks (real and monetary) were generated domestically. Consider next the situation in which all three shocks (including those which originate abroad) appear jointly. In that case, we have to specify in addition to the magnitudes of the shocks also the covariance among foreign and domestic disturbances. These computations are reported in the various panels of Table 2.

Consider first the comparison between panels A and B of Table 2. In panel A all three shocks are assumed to be of the magnitude of 3 percent while in panel B all three shocks are assumed to be of the magnitude of 9 percent. As is apparent, tripling of the magnitudes of the shocks while maintaining their ratios constant, does not seem to have a significant effect on the optimal intervention index. We may conclude, therefore, that the relevant relationships for the determination of the optimal intervention index seem to be the ratios of the various shocks rather than their actual magnitude.

Panels C, D and E of Table 2 illustrate the effects of changing the ratio among the various disturbances on the optimal exchange rate regime. When the magnitudes of foreign price disturbance or domestic monetary disturbance are high relative to the other shocks (panels C and E, respectively) the optimal regime is closer to that of a freely flexible rate. When the magnitude of the real shock is high relative to the other shocks (panel D) the optimal regime is closer to that of a fixed rate.

The various panels of Table 2 also illustrate the effects of the covariances among foreign and domestic disturbances. Generally speaking, a positive covariance between foreign price shocks and domestic monetary shocks, tends to raise the optimal intervention index and thereby tends to lower the desirability of fixed rates. The opposite holds generally for a positive covariance between foreign price shocks and domestic real shocks.

TABLE 2

Optimal Dirty Float for Alternative Values of
Disturbances and their Covariances

cov(χ, ϵ) cov(χ, μ)		A					B				
		$\sigma_{\mu}=.03; \sigma_{\epsilon}=.03; \sigma_{\chi}=.03; \alpha k=1$					$\sigma_{\mu}=.09; \sigma_{\epsilon}=.09; \sigma_{\chi}=.09; \alpha k=1$				
		-.6	-.3	0	.3	.6	-.6	-.3	0	.3	.6
-.6		.33	.66	.78	.83	.87	.35	.67	.78	.84	.87
-.3		.42	.61	.71	.77	.81	.42	.62	.71	.77	.81
0		.44	.58	.67	.72	.76	.45	.59	.67	.73	.76
.3		.46	.57	.64	.69	.73	.46	.57	.64	.69	.73
.6		.47	.56	.62	.67	.70	.47	.56	.62	.67	.71

cov(χ, ϵ) cov(χ, μ)		C					D				
		$\sigma_{\mu}=.03; \sigma_{\epsilon}=.03; \sigma_{\chi}=.09; \alpha k=1$					$\sigma_{\mu}=.09; \sigma_{\epsilon}=.03; \sigma_{\chi}=.03; \alpha k=1$				
		-.6	-.3	0	.3	.6	-.6	-.3	0	.3	.6
-.6		1.0	1.0	1.0	1.0	1.0	.0	.0	.03	.10	.16
-.3		.98	.99	.99	.99	.99	.0	.06	.12	.17	.22
0		.87	.89	.91	.92	.93	.08	.14	.18	.22	.26
.3		.79	.83	.85	.87	.88	.15	.19	.23	.26	.29
.6		.75	.78	.81	.83	.85	.19	.23	.26	.29	.32

cov(χ, ϵ) cov(χ, μ)		E				
		$\sigma_{\mu}=.03; \sigma_{\epsilon}=.09; \sigma_{\chi}=.03; \alpha k=1$				
		-.6	-.3	0	.3	.6
-.6		.94	.95	.96	.97	.97
-.3		.90	.92	.93	.94	.95
0		.87	.89	.91	.92	.93
.3		.84	.87	.88	.90	.92
.6		.82	.85	.87	.89	.90

What are the elasticities of the intervention index with respect to the various shocks? The answer to this question is illustrated by the computations in the various panels of Table 3 which correspond to the parameter values reported in panel B of Table 2. As is apparent from Table 3 the elasticity of γ^* with respect to the real shock is negative and the elasticities with respect to monetary and foreign price shocks are positive. A more striking result is the close similarity between the magnitudes of the elasticities with respect to the latter two shocks. The effect of the covariance among the shocks on the magnitude of the elasticities is also apparent from Table 3: all three elasticities decline (in absolute value) as the covariance between foreign price shocks and domestic monetary shocks gets higher.

TABLE 3

The Elasticity of the Optimal Intervention
Index with respect to σ_μ (Panel A),
 σ_ϵ (Panel B) and σ_χ (Panel C)
($\sigma_\mu = .09$; $\sigma_\epsilon = .09$; $\sigma_\chi = .09$; $\alpha k = 1$)

cov(χ, ϵ)		A					B				
cov(χ, μ)		-.6	-.3	0	.3	.6	-.6	-.3	0	.3	.6
-.6		-1.6	-.82	-.55	-.41	-.33	3.0	.40	.16	.08	.05
-.3		-.81	-.55	-.41	-.33	-.27	1.1	.35	.17	.10	.07
0		-.54	-.41	-.33	-.27	-.24	.68	.30	.17	.11	.08
.3		-.41	-.33	-.28	-.24	-.21	.49	.26	.16	.11	.08
.6		-.33	-.27	-.24	-.21	-.18	.38	.23	.15	.11	.08

cov(χ, ϵ)		C				
cov(χ, μ)		-.6	-.3	0	.3	.6
-.6		3.1	.41	.16	.08	.05
-.3		1.1	.35	.17	.10	.07
0		.69	.30	.17	.11	.07
.3		.49	.25	.16	.10	.08
.6		.38	.22	.14	.10	.08

IV.4 *Some Concluding Remarks*

As a general comment on the analysis in this section it should be noted that monetary policy and foreign exchange intervention are treated as extremely close substitutes. In fact, as a first approximation, in the above framework, these two policies are non-distinguishable. It is believed that this feature of the model is much closer to reality than would be the other extreme in which monetary policy and foreign exchange policies are viewed as two independent policy instruments.

The special role of the exchange rate should also be noted. In the above framework the exchange rate (and thereby the price level) is determined by considerations of asset market equilibrium. This characteristic is in accord with the recent developments of the theory of exchange rate determination which were outlined in Section III.

An important characteristic of the approach is that the choice of an exchange rate regime is an integral part of a general optimization process. It calls, therefore, for an explicit specification of the objective function as a prerequisite to the analysis. This feature is emphasized since such a specification of the objective function has been neglected by much of the writings in the area.

An important limitation of the model is the absence of an explicit incorporation of an integrated world capital market which would reflect itself in the capital account of the balance of payments. As such it seems to be especially relevant for economies with limited access to world capital markets.

Finally, it should be noted that the present specification of the nature of the shocks is somewhat biased in favor of government intervention since the shocks have been presumed to originate from the instability of the private sector rather than from the actions of government policies. Furthermore, the concept of the optimal managed float and thereby the derived demand for international reserves were developed as a policy prescription for the monetary authorities. This was motivated by realism and could be rationalized in terms of the assumption that the monetary authorities possess superior information concerning its own actions as well as concerning the official holdings of international reserves. In principle, however, much of the optimal mix could also be performed by the private sector.

REFERENCES

- Abel, Andrew; Dornbusch, Rudiger; Huizinga, John; and Marcus, Allan. "Money Demand During Hyperinflation". *Journal of Monetary Economics* 5, N° 1 (February, 1979), 97-104.
- Bilson, John F. O. "Rational Expectations and the Exchange Rate", in Frenkel J. A. and Johnson, H. G. (eds.) *The Economics of Exchange Rates: Selected Studies*, Reading Mass: Addison-Wesley, 1978.
- Boyer, Russel S., "Substitutability Between Currencies and Between Bonds: A Theoretical Analysis of Gresham's Law", unpublished manuscript, University of Western Ontario, 1973.
- _____, "Optimal Foreign Exchange Market Intervention", *Journal of Political Economy*, 86, N° 6, December 1978, 1045-55.
- Buiter, Willem, "Optimal Foreign Exchange Market Intervention with Rational Expectations", Unpublished manuscript, London School of Economics, 1977.
- Calvo, Guillermo A. and Rodriguez, Carlos A., "A Model of Exchange Rate Determination Under Currency Substitution and Rational Expectations", *Journal of Political Economy*, 85, N° 3 (June, 1977): 617-26).
- Chen, Chow-Nan, "Diversified Currency Holdings and Flexible Exchange Rates" *Quarterly Journal of Economics*, 87, N° 1 (February, 1973): 96-111.
- Chrystal, K. Alec. "Demand for International Media of Exchange", *American Economic Review* 67, N° 5 (December 1977): 840-50.
- Clements, Kenneth W. and Frenkel Jacob A., "Exchange Rates, Money and Relative Prices: The Dollar-Pound in the 1920's" *Journal of International Economics* 10, 1980, forthcoming.

Dornbusch, Rudiger, "Devaluation Money and Non-Traded Goods", *American Economic Review*, 63, N° 5 (December, 1973), 871-83.

_____, "Real and Monetary Aspects of the Effects of Exchange Rate Changes", in Aliber, R. Z. (ed.) *National Monetary Policies and the International Financial System*, Chicago: University of Chicago Press, 1974, pp. 64-81.

_____, "A Portfolio Balance Model of the Open Economy", *Journal of Monetary Economics*, 1, N° 1 (January, 1975): 3-20.

_____, (1976a), "Capital Mobility, Flexible Exchange Rates and Macroeconomic Equilibrium", in Claassen, E. and Salin, P. (eds.) *Recent Issues in International Monetary Economics*, Amsterdam: North-Holland, 1976, pp. 29-48.

_____, (1976b), "The Theory of Flexible Exchange Rate Regimes and Macroeconomic Policy", *Scandinavian Journal of Economics*, 78, N° 2 (May, 1976), 255-75. Reprinted in Frenkel, J. A. and Johnson, H. G. (eds.) *The Economics of Exchange Rates: Selected Studies*, Reading: Addison-Wesley, 1978.

Fischer, Stanley, "Stability and Exchange Rate System in a Monetarist Model of the Balance of Payments", in Aliber, R. Z. (ed.) *The Political Economy of Monetary Reform*, Montclair, N. J.: Allanheld, Osmun and Co., 1976, pp. 59-73.

Flood, Robert P., "Capital Mobility and the Choice of Exchange Rate System" *International Economic Review*, 20, N° 2, June, 1979, 405-16.

Frenkel, Jacob A., "A Monetary Approach to the Exchange Rate: Doctrinal Aspects and Empirical Evidence" *Scandinavian Journal of Economics* 78, N° 2 (May, 1976), 200-224, reprinted in Frenkel, J. A. and H. G. Johnson (eds.) *The Economics of Exchange Rates: Selected Studies* Reading: Addison-Wesley, 1978.

_____, "The Forward Exchange Rate, Expectations and the Demand for Money: The German Hyperinflation", *American Economic Review* 67, N° 4 (September, 1977), 653-70.

_____, "Purchasing Power Parity: Doctrinal Perspective and Evidence from the 1920's", *Journal of International Economics*, 8, N° 2 (May, 1978): 169-91.

_____, "Further Evidence on Expectations and the Demand for Money During the German Hyperinflation" *Journal of Monetary Economics* 3, N° 1 (February 1979): 81-96.

_____, (1980a) "Flexible Exchange Rates in the 1970's" in *Stabilization Policy: Lessons from the 1970's and Implications for the 1980's*, Center for the Study of American Business at Washington University, St. Louis, Missouri, 1980.

_____, (1980b) "The Demand for International Reserves Under Pegged and Flexible Exchange Rate Regimes and Aspects of the Economics of Managed Float" forthcoming in *Kredit and Kapital*, and in Bigman, D. and Taya, T. (eds.) *The Functioning of Flexible Exchange Rates: Theory, Evidence and Policy Implications*, Cambridge: Ballinger, 1980.

Frenkel, Jacob A. and Kenneth W. Clements, "Exchange Rates in the 1920's: A Monetary Approach" in Flanders, M. June and Razin Assef (eds.) *Development in an Inflationary World*, New York: Academic Press, 1980 forthcoming.

Frenkel, Jacob A. and Johnson, Harry G. (eds.) *The Monetary Approach to the Balance of Payments* London: Allen and Unwin and Toronto: U. of Toronto Press, 1976.

_____, (eds.) *The Economics of Exchange Rates: Selected Studies*, Reading: Addison-Wesley, 1978.

Frenkel, Jacob A. and Mussa, Michael L. "Efficiency of Foreign Exchange Markets and Measures of Turbulence", *American Economic Review*, 70, N° 2 (May, 1980), forthcoming.

Frenkel, Jacob A., and Rodriguez, Carlos A., "Portfolio Equilibrium and the Balance of Payments: A Monetary Approach", *American Economic Review*, 65, N° 4 (September, 1975), 674-88.

Girton, Lance and Roper, Don, "Theory and Implications of Currency Substitution. International Finance Discussion Papers, International Finance Section, Board of Governors of the Federal Reserve System, N° 86, 1976.

Gray, JoAnna, "Wage Indexation: A Macroeconomic Approach", *Journal of Monetary Economics*, 2, N° 2 (April, 1976): 231-46.

Hodrick, Robert J., "An Empirical Analysis of the Monetary Approach to the determination of the Exchange Rate" in Frenkel, J. A., and Johnson, H. G. (eds.) *The Economics of Exchange Rates: Selected Studies* Reading Mass: Addison-Wesley, 1978.

Johnson, Harry G., "The Monetary Theory of Balance of Payment Policies", in Frenkel, J. A. and Johnson, H. G. (eds.) *The Monetary Approach to the Balance of Payments*, London: Allen and Unwin and Toronto, University of Toronto Press, 1976.

Kenen, Peter B. "The Theory of Optimum Currency Areas: An Eclectic View" In Mundell, R. A. and Swoboda, A. K. (eds.) *Monetary Problem of the International Economy*, Chicago; University of Chicago Press, 1969, pp. 41-60.

Kouri, Pentti, J. K. "The Exchange Rate and the Balance of Payments in the Short Run and in the Long Run: A Monetary Approach", *Scandinavian Journal of Economics*, 78, N° 2 (May, 1976), 280-304.

McKinnon, Ronald I., "Optimal Currency Areas", *American Economic Review* 52 (September, 1963), 717-24.

_____, "Portfolio Balance and International Payments Adjustment" in Swoboda, A. K. and Mundell, R. A. (eds.) *Monetary Problems of the International Economy*, Chicago: University of Chicago Press, 1969.

McKinnon, Ronald I. and Oates, William E., "The Implications of International Economic Integration for Monetary, Fiscal and Exchange Rate Policy", *Princeton Studies in International Finance*, N° 16, 1966 (Princeton University).

Meade, James E., *The Theory of International Economic Policy, Volume I: The Balance of Payments* (London, N.Y., Toronto: Oxford University Press) 1951.

Metzler, Lloyd A., "Wealth, Savings and the Rate of Interest", *Journal of Political Economy* 59, N° 2 (April, 1951): 93-116.

Miles, Marc A., "Currency Substitution, Flexible Exchange Rates and Monetary Independence", *American Economic Review* 68, N° 3 (June, 1978): 428-36.

- Modigliani, Franco and Askari, Hossein, "The International Transfer of Capital and the Propagation of Domestic Disturbances Under Alternative Payment Systems" *Banca Nazionale del Lavoro Quarterly Review* 26, N° 107 (December, 1973): 295-310.
- Mundell, Robert A., "The Public Debt, Corporate Income Taxes and the Rate of Interest" *Journal of Political Economy* 68, 2 (December, 1960): 622-26).
- Mundell, Robert A. (1961a), "The International Disequilibrium System", *Kyklos*, 14, N° 2 (1961), 154-72. Reprinted as Ch. 15 in his *International Economics*, 1968.
- _____, (1961b), "A Theory of Optimum Currency Areas", *American Economic Review* 51 (November, 1961), 509-17, Reprinted as Chapter 12 in his *International Economics*, 1968.
- _____, "The Appropriate Use of Monetary and Fiscal Policy Under Fixed Exchange Rates", *IMF Staff Papers*, 9 (March, 1962) 70-79, Reprinted as Chapter 16 in his *International Economics*, 1968.
- _____, "Capital Mobility and Stabilization Policy Under Fixed and Flexible Exchange Rates", *Canadian Journal of Economics and Political Science*, 29 (November, 1963), 475-85, Reprinted as chapter 18 in his *International Economics*, 1968.
- _____, *International Economics*, New York: MacMillan, 1968.
- _____, *Monetary Theory* Pacific Palisades, California: Goodyear Publishing Co., 1971.
- Mussa, Michael L. "A Monetary Approach to Balance-of-Payments Analysis", *Journal of Money Credit and Banking*, 6 (August, 1974), 333-51.
- _____, (1976a) "Tariffs and the Balance of Payments" in Frenkel, J. A. and Johnson, H. G. (eds.) *The Monetary Approach to the Balance of Payments*, London: Allen and Unwin and Toronto: University of Toronto Press, 1976.
- _____, (1976b) "The Exchange Rate, the Balance of Payments and Monetary and Fiscal Policy Under a Regime of Controlled Floating", *Scandinavian Journal of Economics*, 78, N° 2 (May, 1976), 229-48. Reprinted in Frenkel, J. A. and Johnson, H. G. (eds.) *The Economics of Exchange Rates: Selected Studies*, Reading: Addison-Wesley, 1978.
- _____, (1979a) "Empirical Regularities in the Behavior of Exchange Rates and Theories of the Foreign Exchange Market", Vol. 11 of the Carnegie-Rochester Conference Series on Public Policy, a supplementary series to the *Journal of Monetary Economics*, 1979, pp. 9-57.
- Mussa, Michael L. (1979b), "Macroeconomic Interdependence and the Exchange Rate Regime", in Dornbusch, R. and Frenkel, J. A. (eds.) *International Economic Policy: Theory and Evidence*, Baltimore: Johns Hopkins University Press, 1979.
- Poole, William, "Optimal Choice of Monetary Instruments in a Simple Stochastic Macro-Model", *Quarterly Journal of Economics* 84 (May, 1970): 197-216.
- Stein, Jerome L., "The Optimum Foreign Exchange Market", *American Economic Review* 53, N° 3 (June, 1963): 384-402.
- Stockman, Alan C., "Monetary Cross-Substitution and the International Transmission of Monetary Shocks Under Floating Exchange Rates" Unpublished manuscript, University of Chicago, 1976.

Swoboda, Alexander, K. "Equilibrium, Quasi-Equilibrium, and Macroeconomic Policy Under Fixed Exchange Rates", *Quarterly Journal of Economics*, 86, N^o 1 (February, 1972), 162-71.

Tinbergen, Jan, *On the Theory of Economic Policy*, Amsterdam: North-Holland, 1952.

Tower, Edward and Willet, Thomas D. *The Theory of Optimum Currency Areas and Exchange Rate Flexibility*, Special Papers in International Economics, Princeton University, N^o 11, May 1976.

First I would like to congratulate Frenkel for doing a nice review of the earlier literature on macroeconomic policy in an open economy. Particularly the familiar assignment which is sketched on the board. Taking what you might call a Keynesian approach, where the government tries to find a tune to the economy by manipulating aggregate demand in one way or another to reconcile internal and external balance, Jacob shows how Mundell extended basic Keynes-Meade analysis to specialize the instruments of policy. Particularly if you are dealing with a fixed exchange rate regime you would have assigned monetary policy, as initially represented by the rate of interest, to take care of the balance of payments. If there is some sort of disequilibrium in the minds of the policy maker and you would assign fiscal policy in the Keynes-Meade analysis to take care of the external balance, presumably in the market for non tradable goods; Keynes's insistence. Now Jacobs' innovation is interesting and essentially correct and that is on the vertical axis of the diagrams to substitute "D" the domestic credit component of the monetary base, for "r". "D" being under the direct control of the policy maker if special conditions are specified regarding fiscal policy. Here there may be a bit of a gap in the analysis; because if you can control "D" independently, this means that in fact within the system there must be a market for non monetary government debt that can be easily marketed. So, if the government is running a deficit in the system and the manipulation of "G" on the whole suggests the size of the deficit, it would mean that this effect is taken up basically in the market for non monetary debt and the government retains independent control over "D". I think this is implicit (unless I have made some mistake understanding it). But, anyway, with that consideration it is an improvement to make that substitution in the analysis then we get the standard assignment problem and Jacob shows how the whole system becomes more stable when the degree of external capital mobility becomes greater. Indeed in the extreme the particular assignment does not matter any more and the economy will stay stable. Now, this is ancient Keynesian analysis, that Jacob has extended, surprising in a young man of the University of Chicago. But let me take a more modern approach to this old Keynesian view of the making of macroeconomic policy. What is implicit in this Mundell approach to the assignment problem; is that it there is something in the private sector of the economy, either in the foreign or in the private domestic sector, which is very unstable and is continually pushing the system out of equilibrium. Then we have a wise and omnipotent government, who is out to stabilize the system and has social welfare as its interest. The government using its omniscience and the controls over monetary and fiscal policy manipulates "D" and "G", in the diagram, so as to push the economy back towards a stable equilibrium, if in fact it departs, because of the implicit private shocks that are going on in the system. That is the essence of Keynesian analysis. Now, a more modern approach would be to suggest that it may well be instability in the Government's own behavior

which is the main cause of economic instability in the economy. And rather than have this detailed fine tuning which is the essence of the Mundell-Keynes analysis, instead the Government should make its own policy perfectly predictable in a way which is easy to understand. So instead of the detailed manipulations of "D" that are suggested in the analysis, a more modern approach, say, suggested by Milton Friedman, might be that we just set "D" at a constant rate of growth of 50/o a year, and everyone in the private sector can adjust to that rate of growth and we get away from this fine kind of fine tuning. That is an over simplification, but nevertheless that is the essence of the modern monetary critique I think, of the old Keynesian approach.

And then, secondly, government fiscal policy. We should not look at it particularly as the regulator of internal demand. Modern theory of rational expectations would suggest that it can only affect aggregate demand when people are taken by surprise and we don't want to do that too much. Rather we should think more of the state of the public finance as influencing the state of balance between saving and investment in the economy and in doing so influencing the trade balance. So the size of the trade deficit will in fact be directly related to "G"; not the balance of payment deficit necessarily but just the trade deficit. This is one important point that I intend to return to later.

I will conclude my criticism of the analysis saying that the presumption is that refined tuning is quite against the spirit of modern analysis, which is to attempt to get the government to stabilize its own behaviour.

Now, Jacob goes on and discusses the monetary approach to the balance of payments; and here, this is more modern as the way he discussed it. One of the things we have learned about the monetary approach is that exchange rate policy and monetary policy are inseparable. They are just two faces of the same policy, as Jacob emphasized rightly. Under the old Meade-Kindleberger analysis people might put the exchange rate in one axis, monetary policy in another and fiscal policy on a third, coming out from the blackboard and try to manipulate all three. But we now know we can't do that; that exchange rate policy and monetary policy are two aspects of the same thing, so we should just refer to exchange rate = monetary policy. That is point number One. It is a very important lesson from the monetary approach. You simply set up your exchange rate system in such a way as to stabilize domestic price level and stabilize aggregate demand in the economy. Taking this approach that the exchange rate is just an instrument in maintaining the purchasing power of domestic money, then it's not something that you would change if there were any real shocks in the system. Even if those real shocks directly affect the balance of trade, for example, if you are suddenly hit with a higher bid for oil, because there is an Opec increase in the price of oil, so then your economy begins to show a large deficit, that is no particular cause at all to worry about changing the exchange rate. That is a real change of terms of trade against you, but there is no reason to debase the currency or otherwise to upset the monetary system

by devaluation to try to offset that real shock. So that is the second major lesson I think that we got from the monetary approach; and the University of Chicago has been very important, in this more modern as well as more ancient tradition, to macroeconomics.

I would half agree with Jacob's dichotomy where you stick with a fixed exchange rate system at real shocks like changes in the price of oil. I agree with that part. But his other part, where he suggested a flexible exchange rate is in order, if there's in fact a monetary shock in the system, I think he is just half right. If the monetary shocks are external to the economy in question, for example, a burst of international inflation, then one can use a floating rate or a managed float as an insulation device. Particularly if you are financially mature it is easy to do this. However there are other domestic monetary shocks like shifts in the domestic demand for money, and then you want a fixed exchange rate. That is exactly where a fixed exchange rate works best because that means the supply of base money will increase through the balance of payments in response to an unexpected rise of the demand for money; so we have a kind of safety system. So for that kind of shock we want to stick with the fixed exchange rate system.

Now, let me just give an example of where authorities make the wrong assignments with disastrous results and fail to understand the correct role of monetary policy. Let me take American monetary policy and exchange rate policy 1977-78. When the Carter administration came to power they saw a very large trade deficit in the balance of payment and a very large current account deficit. They suggested then that perhaps the U.S. dollar was overvalued and on the other side of the coin the Japanese yen was undervalued; and the Japanese were getting an unfair trading advantage over the Americans. Advisers to the President Cooper and Fred Burxstone both made speeches where they allowed that the dollar was overvalued; and then Secretary Blumenthal made his famous speech where he allowed that he also thought the dollar was overvalued. This is very rare for a Finance Minister to suggest to the general public that he thinks the dollar, his own currency is overvalued, almost always Finance Ministers are doing the reverse. But, if you think of the exchange rate policy being linked with monetary policy and that nobody knew what the future course of American monetary policy was going to be, then this began the long decline of the dollar in the foreign exchange markets. The initial uncertainty because of the announcement effect of Blumenthal was projected into the future because the uncertainty of the rate of money expansion might indeed be quite a bit higher in the future. So the dollar began to fall and a sharp forward discount on the dollar developed; there was a flight from dollars into Swiss francs, Deutsche marks, Japanese yens and so forth, and the thing accumulated as the demand for dollars fell. This gave a bigger inflationary impact in the U.S. and, of course, had further repercussions in the foreign exchange markets. So we set in motion a stage that confused not only American monetary policy by trying to devalue the dollar but confused that of our trading partners as well. Now, O.K. suppose we accept this argument of the monetary approach, that you

think of exchange rate and monetary policy as part of the same package. What should the American authorities have done about the trade deficit that they imagined was hurting themselves?

For that you almost have to reverse the assignment that Jacob put on the board here. Because I have given you the advantages of the monetary approach to the balance of payments; the big disadvantage, only partially overcome by Jacob, is to smirch fiscal policy and the relationship of the government finances, particularly to the size of the current account deficit. When you relate the state of fiscal policy to the balance of trade; it is very important to specify what is going on in the bond market rather than leaving it implicit or leaving it out. Another area where the same problem arises is on page 17, equation 20. Here we have the government finances on equation 20; and on the left hand side "G" is the level of government expenditures and then the variables on the right hand side are the methods by which expenditures are financed. The first term is simply the tax revenue as a proportion of income; the second term is the interest earnings on the government's reserves; and the third term is the expansion of central bank credit, the domestic component. The "D" that appears on the vertical axis. So, if the Government does no tax financing or earn interest enough to cover his expenditures that means that it has thrown into the business of issuing money in the kind of model Jacob has presented. And that of course is a very special kind of model, and impressively reflects a very immature financial system where there is not any market of non monetary debt, and where the Government had the option at least of non inflationary finance.

Now, I bring these out because I think there is something to be learned in recent Chilean and American experience by concentrating on the relationship of fiscal policy to the trade balance, then one doesn't make the policy mistakes that could happen.

When the American authorities early in 1977, looked at the large trade deficits, what they should have done was to look at the even larger government budget deficit, put two and two together and solve what the problem was regarding trade, if indeed there was a problem. Instead they chose to react to an earlier kind of model which would assign monetary exchange rate policy to the external sector. They chose to devalue the dollar in response to the preceding deficit instead of doing the correct thing which is just to close the budgetary gap domestically and then the trade balance would have improved without completely destabilizing the monetary system.

Now, this close relationship between government deficit and the trade deficit which we associate with the issue of non monetary debt breaks down once we get into a world where we have an immature financial system and the government runs a deficit, typically has to turn to the Central Bank for financial support; then it loses control over the money supply and we could easily get an outbreak in inflation.

The fiscal side of the argument that we made this morning about not wanting to absorb capital too fast in the course of liberalization, is that you

limit the depressive effect of liberalization by maintaining a surplus in the government budget. This is Keynesianism completely upside down.

Now, which I think is the way it should be because, remember, we are also assigning fiscal policy to the state of the balance of trade. Let me make one more point in this connection. Though people here may not look at it this way, the argument that I have made is that when you are liberalizing you want to avoid taking up a great deficit here and depressing activity in your tradable sector. The surplus here, in Chile in the trading account was due to the fact that there were large debt repayments that had to be made and it was necessary to keep "R" large relative to "G" in order to meet foreign debt amortizations.

Well, my argument really suggests that in some extent Chile was fortunate by undertaking a great liberalization at the time it had to actually pay back foreign debt. Most less developed countries are not so lucky. They get international agencies like the World Bank and the I.M.F. and various private banking to lend them lots of money just at the time liberalization takes place and they remove all exchange controls. I am indebted to Theodor Fuchs for this argument; the first part of the argument. So the moral of the story is that if you are going to liberalize, do it on your own, don't absorb a lot of foreign capital that merely confuses things, it makes the liberalization much more difficult. The best way to do it is to be actually repaying foreign debt while you are liberalizing.

Creo que después de la más que excelente exposición de Jacob, casi cualquier cosa que yo diga va a reducir el valor agregado promedio, al menos de esta reunión. Sin embargo, debo tratar. No sólo la exposición fue excelente, sino que desde mi punto de vista el análisis es esencialmente correcto, lo cual me deja dos vías de escape; una, criticar los supuestos y, la otra, hablar de temas relacionados con el asunto de la reunión, pero que no hayan sido específicamente tratados por él. Creo que voy a hacer algo de ambas.

El primer supuesto, que quisiera en alguna manera no criticarlo, pues Jacob ha hecho un excelente trabajo, es el problema de la asignación de instrumentos.

El punto de vista de Jacob está muy bien enfocado; tanto Mundell como él están correctos, excepto que cada uno define el instrumento de política monetaria en forma diferente. Mundell, siguiendo la tradición de los años 60, se vio tentado a definir la política monetaria en términos de la tasa de interés. Sin embargo, los bancos centrales no controlan la tasa de interés, lo que controlan es el crédito y Jacob, correctamente, identifica el crédito como instrumento. Si ambos se movieran juntos monotónicamente, o sea, si el nivel de crédito y el de la tasa de interés estuvieran siempre negativamente relacionados en este proceso, no es problema, sería una transformación de variables. Sin embargo, Mundell encuentra que una cierta regla de asignación de instrumentos, o sea, política fiscal al balance externo, política monetaria al balance interno, es inestable y Jacob encuentra que es estable. Lo que sucede es que la relación entre crédito y tasa de interés dentro de este modelo, por raro que parezca, no es monotónica, porque está el ingreso como variable; y en el modelo Keynesiano el ingreso varía y es posible que un aumento en el nivel del crédito, que es lo que pasa en el modelo de Jacob, dé lugar a un aumento del ingreso que aumente la demanda por dinero de tal manera que en realidad haga falta un aumento en la tasa de interés para volver a equilibrar el mercado monetario. Es por eso que encontramos los resultados distintos. De cualquier manera es reconfortante dentro de la tradición del modelo Keynesiano en que estamos hablando, este resultado; porque de alguna manera dentro del análisis Mundelliano uno se quedaba con la idea de que el tipo de cambio flotante sería más eficiente para los propósitos de obtener balance interno y externo, porque ya tenemos el tipo de cambio que sólo nos daría el balance externo y nos quedaríamos con dos instrumentos para obtener el balance interno de política monetaria y de política fiscal. En cambio con la política de cambio fijo corríamos el peligro de hacer una asignación equivocada de instrumento y crear una situación simplemente explosiva. Lo que Jacob nos ha demostrado es que si interpretamos esto correctamente cualquier tipo de asignación será estable aún bajo tipo de cambio fijo; o sea, que ésto no debería preocuparnos. El problema de la asignación de instrumentos se convierte en un problema inexistente.

Ahora, yo quisiera ir un poco a los fundamentos básicos de este modelo Keynesiano, en particular; como Uds. saben, este modelo se basa en inflexibilidad al menos a la baja de los precios. Quisiera analizar dentro de este contexto el rol de la política fiscal. ¿Qué es lo que se está obteniendo? ¿Qué balance interno se está consiguiendo? Quisiera distinguir entre nivel de actividad económica y bienestar económico, globalmente bienestar agregado. Creo que ambos deben ser diferenciados. Daré el ejemplo típico de clases, de cómo opera la política fiscal para expandir la demanda agregada y, por lo tanto, el nivel de empleo en la economía. Supongan que estamos en pleno empleo y de golpe hay una caída en la demanda agregada y, para simplificar, supongamos que se concentra en la demanda por zapateros. Pero la gente, al precio dado, al salario de los zapateros, no quiere contratar más servicios; entonces quedan desempleados cien zapateros. Si nada se hace, dentro del modelo Keynesiano, esas personas quedan desempleadas para siempre. Hemos tenido una caída en el nivel de ingresos de esas personas. Ahora bien, la solución Keynesiana es que el Gobierno contrate a esos zapateros y los ponga a cavar pozos y que después los tapen. Estos zapateros ahora van a estar empleados, el salario pagado se computa, de acuerdo con la metodología de cómputo de ingreso nacional como gasto público y, por lo tanto, como componente del ingreso nacional. Ahora bien, ¿de dónde viene la plata para pagarles? Puede venir de dos lados: el que teóricamente parece más consistente es a través de impuestos, o sea, se saca plata a alguien que previamente estaba empleado y ganaba un salario, se le reduce eso, para pasarle ese ingreso y su poder de compra a los otros individuos que previamente estaban desempleados.

Bueno, habría otra posibilidad. Ustedes dirían que financiar el gasto público a través de la emisión de deuda, podría tener algún efecto de corto plazo, dependiendo que haya o no ilusión impositiva, podríamos llamarlo, por parte del público. O sea, la deuda pública no es un regalo, el Gobierno no puede crear riqueza emitiendo papeles; a la larga el Gobierno va a tener que pagar interés sobre la deuda pública y ese interés va a venir de futuros impuestos; y si el público descuenta esos futuros impuestos dentro de su ingreso permanente, inmediatamente tenemos un efecto contractivo sobre el ingreso disponible de los individuos, de la comunidad como un todo. La conclusión que yo saco de aquí es que la política fiscal redistribuye ingreso, no aumenta el ingreso ni aumenta el tamaño de la torta, es un instrumento de redistribución de ingreso y, volvamos ahora al problema inicial. Cae la demanda agregada ahora en la economía como un todo, supongamos; para que se recupere el nivel previo de demanda agregada la solución, en una economía sin ningún tipo de distorsión, debería caer el nivel de precios para inducir a la gente a que consuma más nuevamente; estimular la demanda agregada y volver a la misma asignación de recursos inicial.

La otra solución de alguna manera es ser pesimista y decir "el nivel de precios no va a caer nunca", o "no puede caer"; entonces vamos a compensar la caída en la demanda agregada con gastos públicos. Ahora eso lo debemos mantener para siempre, porque una vez que se recuperó la demanda agregada

al viejo nivel, no existe más la tendencia para que el nivel de precios se reduzca y nos encontramos con una economía en la cual simplemente hemos convalidado el bajo nivel de actividad económica como resultado de la caída inicial de la demanda agregada. Lo único que hemos hecho es redistribuirlo entre aquellos sectores en los cuales estuvo más concentrada, o sea, aquellos que se quedaron desempleados y los otros. Ahora, esto puede sonar atractivo desde el punto de vista de la distribución del ingreso. Desde el punto de vista de la eficiencia de largo plazo de la economía, claramente, es totalmente ineficiente. Podemos imaginar continuos shocks de caídas y caídas de la demanda agregada y al final todo el mundo estaría cavando pozos, pero habría pleno empleo. Desde ese punto de vista tengo bastante poca confianza en la política fiscal en general como instrumento de estabilización. Previene el ajuste necesario; éste cuando cae la demanda tiene que venir vía precio y no vía compra del excedente por parte del Gobierno.

Ahora quisiera hablar brevemente, dejando este tema, y dejando de lado entonces el problema de la política fiscal. No volveré a referirme a ella. ¿Qué nos queda como instrumento de estabilización? Porque ciertamente el mundo no vive permanente en equilibrio o al menos en el equilibrio que nos gustaría tener y, por lo tanto, algo podría hacerse. El problema es cuáles son los instrumentos. Tal como lo veo hay muchos instrumentos microeconómicos, por supuesto, que pueden afectar la situación de asignación de recursos y a un costo social la política comercial, la política tributaria, etc. En los instrumentos macroeconómicos tenemos la política monetaria, es lo único que nos queda en sus dos manifestaciones; o control monetario con tipo de cambio flotante; o control del tipo de cambio con oferta monetaria en dólares. Ambos sistemas en el equilibrio de largo plazo de ellos, aclarando más adelante que, formalmente son idénticos, siempre y cuando haya movilidad de capitales, o sea, que el país tenga acceso al mercado de capitales y de crédito. La diferencia, la elección de flotar o fijar el tipo de cambio, o sea, de controlar la cantidad de dinero, o controlar el tipo de cambio, es una decisión que yo creo es tomada fundamentalmente sobre la base de la necesidad de estabilizar la economía en el corto plazo. Usualmente los economistas empezamos nuestro análisis en función del equilibrio, entonces eso nos lleva a escribir las dos fórmulas típicas: "M es igual a P por Q equilibrio monetario, precios internos es igual a tipo de cambio por precios internos, y nos lleva a la conclusión de que ambos sistemas son iguales. Es claro, estoy en una situación de equilibrio; pero el problema de estabilización y de la elección óptima de instrumentos es un problema de la transición. Tenemos que empezar suponiendo que estamos en desequilibrio. Yo voy a suponer a pesar de lo que Jacob haya dicho, de que el tipo de cambio libremente flotante es una posibilidad; lo he escuchado discutir muchas veces acá en nuestros países, al menos los del Cono Sur. Creo que es posible siempre y cuando se efectúen las regulaciones necesarias sobre el accionar del Banco Central; obviamente en la Argentina, por ejemplo, que tiene 14.000.000 de dólares en el Banco Central no puede anunciar "mañana flotamos" y que el mercado de futuro decida la trayectoria óptima, porque nadie le va a creer al Banco Central. Ahora, si se llega a imponer alguna regla

para la intervención del Banco Central, por ejemplo, que se saquen las reservas de encima a lo largo de tres años, vendiendo tanto por ciento por mes o lo que fuera, como lo está haciendo el Fondo Monetario con el oro, el mercado ya anticiparía eso; se sabe que ya no habría ningún otro tipo de intervención pragmática de parte del Banco y el tipo de cambio puede ser libremente flotante. Quisiera analizar el caso que es el que más nos interesa a nosotros, en particular a los países nuestros, que empezamos con una situación de alta inflación y lo que queremos es parar esa inflación. ¿Cómo hacerlo? Ya sea a través de la elección de una regla monetaria y de un tipo de cambio flotante y estipular una regla monetaria del 50/o famoso, o el 40/o famoso; o lo que les guste. O de lo contrario, la otra estrategia supone por dado el tipo de cambio. La otra estrategia es la que han adoptado los tres países del Cono Sur: Chile, Uruguay y Argentina. Es hacer que la tabla del dólar controle el tipo de cambio pero de una manera más o menos gradual, o sea, no ir de una inflación del caso argentino del 80/o ó 90/o mensual, con una devaluación del 8 ó 90/o mensual, de golpe a devaluar cero por mes, sino hacerlo gradualmente. Ambas metodologías, ambos planes van a lograr los objetivos de largo plazo. El problema son las dificultades de la transición de corto plazo, los costos, la velocidad y quién va a pagar el costo del ajuste, porque detener la inflación cuesta. En general, los países ganan cuando crean la inflación, así es que suena lógico que cuando la controlen se pierda. Quién va a perder dependerá de la estrategia que se utilice. Si se disminuye la expansión monetaria el primer efecto va a ser un alza en la tasa de interés real. Eso tiene dos efectos; por un lado pone el costo del ajuste sobre aquel sector de la economía que más depende del crédito, aquel componente del gasto que usualmente llamamos inversión en las cuentas nacionales. Pero debe ser inversión globalmente definida; la compra de heladeras o casas por parte de la gente también debe estar incluido allí. Ese sector va a sufrir porque ahora el crédito le va a salir más caro. Si se pone en práctica, por el contrario, el plan de una tasa de devaluación más baja, viniendo de una tasa de inflación alta, el primer efecto de eso va a ser incentivar una entrada de capitales. O sea, veníamos devaluando al 80/o, ahora devaluamos de golpe a 40/o; las tasas de interés internas instantáneamente no van a reaccionar; dado el nivel de la tasa de interés interno como el costo ahora del crédito externo ha bajado, porque el costo del crédito externo será, digamos, del 10/o en dólares mensual y antes era el 10/o más 8 de devaluación, ahora es el 10/o más 4 nada más. Así se crea una entrada de capitales que tiende a hacer bajar la tasa de interés. O sea, como pueden ver, el efecto inmediato de un plan de estabilización, de contracción monetaria, es subir la tasa de interés; y si la contracción se hace a través del tipo de cambio, la otra alternativa, el efecto es bajar la tasa de interés. Bueno, claramente hay varios efectos diferenciales. Por un lado, la distribución del ingreso; por otro lado, el nivel agregado de actividad económica. Tomemos el último primero.

Un plan de estabilización que comienza creando recesión, o más bien una tendencia recesiva puede no ser políticamente factible o deseable. Puede serlo o no serlo, dependerá del poder político que exista. La otra alternativa de la tabla del dólar opera al contrario. Se trata de detener la

tener tipo de cambio fijo. ¿Por qué? Porque si por un año nada más cayó la producción nos convendría importar más para compensar la caída en la producción doméstica con producción importada. Pero si estamos en tipo de cambio flotante y no hay movimiento de capitales la balanza comercial va a ser siempre cero, o sea, que el nivel de absorción siempre va a tener que ser igual al ingreso y si el ingreso cae, de igual manera tiene que caer el consumo. Al tener un tipo de cambio fijo, el Banco Central dispone de reservas internacionales, pero esto es esencialmente lo mismo que disponer de un stock de bienes listos para el consumo en forma de papeles, pero uno puede ir y comprar esos bienes. Entonces no es sorpresa que convenga tener un stock de bienes para actuar como "shock-absorber" para los distintos shocks que puedan pasar en la economía. Ahora supongamos que pudiéramos tener tipo de cambio flotante, pero que hay movimiento de capitales; y yo creo que hay un alto grado de movilidad de capitales en nuestros países, a lo menos de los tres que hemos estado hablando, en estos momentos. (Puede no haberla habido en el pasado, pero en estos momentos sí la hay). En ese caso la balanza comercial no tiene por qué ser igual a cero, incluso con tipo de cambio flotante, o sea, si cae la producción real podemos importar más de lo que exportamos simplemente endeudándonos afuera en vez de endeudarnos con el Banco Central, lo cual luego será repagado.

Respuesta del profesor Jacob Frenkel a los comentarios hechos a su exposición

I will refer to most of the questions, even though through my limitations I will not be able to do justice to many of the serious points that were brought up. Let me start first with deep gratitude to the former discussion and to the various kind words that some of you have expressed.

You actually need experience to be described, not criticised, but described as being more Keynesian than my discussions; and actually I don't even need defense, since I have no defense for it. I will not try, but I only realize now on what weak grounds are those Keynesians that are more typically attacked by me.

But to put things in perspective and this has to do indirectly also in reply to Mr. Robichek and also to a point Ron McKinnon made. The part of the modified model of the final problem which I presented was not to present to you the vintage of 1980s, rather to present some of the implications of the 1970s to the analysis of the 1960s. Put differently, the Keynesian model for what I believe to be a correct viewpoint because whether you are in the 60s and I mean 1860, 1460 or 1260s, it is always the case that you cannot control money supply under fixed rates and, therefore, I put "D" on the axis and this is always true. Now, I don't of course support the specifics of the model and that is why we are now in the 1980s. So to put it in perspective my purpose was to modify as much as possible within the framework of the Keynesian model; and I think that is all and therefore

criticisms on the model itself are shared by me. In particular, and it also relates to the point Profesor Rodríguez made, there is no way that by increasing government spending you can make somebody better off or everyone better off. There is a basic zero, and there must be some fundamentally initial distortion that a government corrects to increase the size of the pie, otherwise it is more likely that the government introduces these distortions rather than resolve one, so there is no argument about it whatsoever.

One important point among many that Ron McKinnon made and I would like to refer to it explicitly, namely what is the role of government policy under flexible exchange rates in the face of an autonomous shift in the demand for money. Ron McKinnon stated and perfectly correctly, that if there is a clear well identified shift in the demand for money to hold, then it is perfectly sensible that the monetary authorities accommodate it by a once and for all change in the money stock and nothing else will happen. Spending will not rise because you want to hold it and exchange rates will not change because you have just cleared the market. That is fine and clear and I will subscribe to it. However I have two comments about it from the practical viewpoint. First, how do you identify such sharp changes in autonomous desire to hold money? Those are very rare occasions and I have made general prescriptions. As a matter of fact, this is exactly one of the reasons why we have studied so much the properties of the demand for money. The interest in the demand for money was not surely intellectual interest, but rather we wanted to know. Is there a stable demand for money? In what sense? in the sense of the usual fluctuations that we observe in markets due to autonomous shifts in demand for money? Or are they due to supply reasons or goods market things? If there is any single lesson from the studies in the demand for money the lesson is to allow the extent, even if not absolutely, that is relatively stable, so that as a general rule one would not expect sharp fluctuations in demand itself.

Let me just refer to you by advertising the work of one of my students which he did expanding the framework I presented to you in the last section; and the reason why I want to mention it is in response to Sr. Rodríguez. One of the points that I made explicitly in the paper was that the concept and the framework for the analysis of the in-between system was constructed under the assumption that there is no one integrated capital market; and indeed, Carlos Rodríguez explained exactly why I had to make this reservation, and it was well taken. Now, it turns out that in a fundamental sense some of the basic features remain even after you have allowed for integrated world market and this is presented in a work of one of my students in Chicago, named Joshua Eisenman. But I will not allow it to elaborate here any more.

Sr. Robichek made a very important point to which I definitely will subscribe too, namely, fiscal and monetary policies are basically interrelated. And I have made it explicit by saying that indeed the government has an overall budget constraint and therefore they are interrelated, subject to the generalizations that Mr. McKinnon made, namely, that the budget constraint includes in addition to taxes and printing, issues of non monetary debt.

The first one was what is the criterion for the determination of the table that the central bank has to set, and if it is the equivalent to a complete fix. It is needless to say it is not identical to a complete fix because here something moves and here something does not move. But as an analytical matter it is very equivalent in the sense that at each point in time, the central bank is committed to defend a specific rate. If this rate moves it does not matter because tomorrow there is another rate; and again the central bank is committed to fix that rate. How does the central bank decide about the table? I believe that most probably, and here there are much greater experts about it (they design the table) but I believe that the notion expressed the central banks' expectations about world inflation; namely, the central bank decides "I want to have so much inflation in Chile; I know that foreign inflation is going to be so much; which means that if we stay fixed we will have a very specific inflation, which is the world inflation; but if we don't want world inflation we better change the exchange rate by the difference". Which means that it is constructed by the central bank's projection about future foreign inflation.

There was a very deep point that the same person made and this was echoing a point that Sr. Rodríguez made. We don't really expect the government to be able to make noise and thereby to increase the number of cakes in the economy; and he was asking if the central bank was not holding reserves maybe the private sector will hold reserves. Put differently, if the central bank holds reserves it maybe just displaces private holdings of reserves and there is no net increase of reserve holdings. And this is the difference of our point which is more general. It came out in the discussion of cattle, stocks, in agriculture, in economics in all price stabilization and as a matter of fact the economists instincts are that indeed to allow to extend private inventory holdings will realize that the public will do something for them and they will cut down their holdings. That is true; the key issue is: is it a one for one or not? Presumably it is not one for one; but this leads us to the question of who should hold the stocks? should the private sector do it? or the government's central bank?

As always the key criterion for deciding whether something should be done by the private sector or by the public sector; the key criterion has to do with externalities. With differences between private and social costs. Wherever private and social costs are the same there is a presumption that the private sector is going to do it better; now, is there an externality in holding international reserves? Is there a public good to stable currency to the extent that we believe that money and instability of value provides public good to the community? Then there is a case for the public to do something about it that the private sector will not do sufficiently; so this is the answer to that question.

There was another question and I must say there is no doubt that people in the audience are extremely well read on papers that were just written yesterday elsewhere in the world; which tells us about how integrated, at least human capital market is. And let me refer to the question

raised about the issue of currency substitution. The question was: what limitation does the existence of currency substitution exert on the operations of flexible exchange rates? Indeed the argument was if we are going to depreciate our currency it is very likely that our own incidence will escape away from our currency by holding a foreign currency, and thereby take care of that particular depreciation of the currency. Well, I want to make two points about this question. First; is it a problem or is it a virtue? I would say it is a virtue of currency substitution under flexible exchange rates. We are always saying that a fixed rate is a system which is good because it makes the central banks discipline. It exerts discipline on the system because if the central banks does not behave reserves will blow out. And the argument was that under flexible exchange there is no discipline. As a matter of fact your question shows us that under a flexible exchange rate there is a very strong disciplinary feature, namely, if the central bank is interested in having its own money used, it is better to keep his own home in order, otherwise people will not hold that particular currency.

The second point I want to make on this is to put it in some empirical perspective. Namely, while it is true that the degree of currency substitution exists and that the discipline that is exerted by it exists, it is also true that the currency substitution is never and has never been complete. If we take the most extreme case of the German hyper inflation, where the currency depreciated in unprecedented degrees, there was not room enough to write zeroes on the note bills, inflation was extraordinary, and still domestic persons in Germany held a lot of marks. As a matter of fact, Keynes who speculated on the mark, lost his shirt in speculations; so foreigners also held marks during that particular extraordinary period; thus currency substitution is there, but let's not panic.

Let me move to the question of Reinaldo of the Catholic University. Here were two questions. First he said the monetary thoughts had its roots in the early history of doctrines and our two questions were: a) what have we learned and what is the explanation for the renewed interest in it in the 1970s.

It is very easy and tempting to say the old dictum that it is all in Marshall; everything is in Marshall, and as a matter of fact, if you are generous enough you can find everything in Marshall. But the question is not what it means that all generations before Marshall did not add anything; the issue is not whether one man can see it or not; or whether in your own eyes you can interpret one who manages to be extremely wise; but rather the question is if it is a well received doctrine. And the answer is it has not been, and I believe it now is. And what is responsible for the emergence of it in the 70s? I believe there are three basic arguments. First, the 1970s, following the 60s, has witnessed extraordinary increase in integration of world capital markets. You could not escape anymore by thinking that you are a close economy; world capital markets integrated and you just saw by looking at a balance sheet that you pump in and something goes out. You try to increase and something goes down; there is no way to avoid this

particular truth. It also means that our "indexes" of openness and integration have to be rethought. ¿What do we mean by an integrated market in the U.S.?

We find statements that say "to a first approximation we are closed" And why? Because we have only such a tiny fraction of G.N.P. engaged in trade; we have 80/o, 100/o, 120/o, in the past it was 50/o, it is very little; so we are closed. There are two basic mistakes in this criterion; first the extent of actual trade is completely irrelevant to the notion of how integrated you are because what matters is what is the potential trade. The distinction between trade, actual trade and tradable goods, is a key distinction in this context.

The second issue-and that is when the 70s come in is that the integration among markets is by far larger and faster when you take account of capital markets. When you look at capital markets the trade account is completely immaterial, almost. This is where integration is, and that is why the 70s brought it home to everyone, including in North America.

Second: World inflation. And this is the topic of Sr. Harberger tomorrow, so I will not say much about it now. But it is clear if you look at the 60s and at the 70s up to the end of fixed rates, you see world inflation, you know that you are integrated, you know that you should better have a model where the foreign trade sector is not an appendix but is sitting somewhere in front of the stage.

Third. This may be a little more polemic and therefore I just want to say it, without elaborating on it. The third reason for the emergence on the 70s I believe is the general implications of the war for independence from Keynesian economics. Thus, so one of the aspects is that you notice that the General Theory of Keynes was written for a closed economy and that you really want to go to the Pre-Keynesian Keynes. The Keynes of the 1920, where the "Tract on monetary reform" and even the "Treatise on money" show how important the foreign trade sector is. It is a great irony that the General Theory that was produced for a close economy became so important when it happens to deal with, when it is applied to, the foreign trade sector. And I also believe that great monetary theoreticians failed significantly when they spoke about open economy because they were raised on the General Theory.

The next question was of Sr. Cambiaso and the question was, here I had a little problem in the translation, but I believe the question was "how do I know to whom to peg"; an "easy and trivial question". And my answer is, it is not a trivial question. It is as tough a decision as to whom to marry. Suppose you make a mistake? Well, you know what you do.

There is another important point concerning the effects of growth; and again I believe that indirectly I touched on it in providing the perspective for this new Mundellian model, by saying that I obviously did not support this model for the 80s. I think, however, putting this in perspective that your criticism —and it is very well taken— is not on the assignment problem per

se, but rather on the size of government. You don't like large government and whether they do it through the fiscal side of the monetary side that Sr. Robichek reminded us that are the same, it does not matter. You don't like them to do something for you and I sympathize with you. Finally Sr. Corbo. He asks. How are other markets incorporated in the analytical framework of the monetary approach to the balance of payments? That is a very important question.

The answer to it is the same that I gave when I was asked whether the monetary approach to the balance of payments asserts that only money matters; and the answer that I gave is it obviously is not. Anyone who tells you or anyone who was in Chicago one time knows how many questions we have that we say "we never do this" and then you know that anyone who says "never" must be wrong. And whenever somebody says "only" he must be wrong. One example suffices. That only money matters is obviously wrong. The question is therefore "what is the monetary approach? The monetary approach should be understood as the convenient analytical framework for the analysis of international money flows; and I emphasize "convenient" and I emphasize "framework". Namely, we can analyse-Learner told us in the 30s-that we can analyse the price of peanuts in terms of the demand and supply of peanuts; but we can also analyse the price of peanuts in terms of demand and supply for all other goods except for peanuts. Including haircuts and including all the rest, because of the budget constraint. When I say a convenient analytical framework I say it is so easy to go to Rome directly rather than to go indirectly; so you will reach Rome if you do it right. And therefore I think, and here I want to conclude, I think that it is very important to realize that a monetary approach to the balance of payments is not another horse in a horse race. It is not an alternative to some other approaches where one man must be right and the other must be wrong. That is not the case. If you keep your identities right you get to Rome. The only question is how much gasoline you bear; and I would rather go in a direct route, in particular in view of the world energy crisis, than on the indirect route. If I want to analyse money flows I want to look at money markets.

**INDICATORS OF PERFORMANCE IN
MONETARY POLICY IN OPEN
ECONOMIES: THE HISTORICAL RECORD**

Expositor: Profesor Arnold C. Harberger (*)
y Sebastián Edwards

Moderador: Sr. John Lipsky

Comentaristas: Profesor Jacob Frenkel
Sr. Manuel Guitián

(*) University of Chicago.

Indicators of Performance in monetary Policy in Open Economies: The Historical Record

I. Introduction

This paper can be looked upon as a progress report on a broad and general study of inflation²⁶ throughout the world, in the period since the second world war. The study has several facets to which successive sections of the paper will be devoted. In Section II we present evidence on the world inflation; in Sections III and IV, two types of deviation —chronic and acute— from the world inflation are identified and explored; in Section V some data on recent inflations are analyzed and compared with earlier results. In Section VI the phenomenon of devaluation crises is explored, and the conditions giving rise to it are compared with those associated with chronic and acute inflation. Finally, in Section VII we introduce a new indicator of the nature of monetary policy. Using it, we explore the policy patterns that have been associated with the successful maintenance (by small countries) of a fixed exchange rate, and we contrast them with those associated with devaluation crises. The results demonstrate a rather sharp contrast of policies between these two types of cases. They also amply confirm the usefulness of our indicator.

²⁶ The first paper in this sequence was "A Primer on Inflation", *Journal of Money, Credit, and Banking* 10, N° 4 (November 1978): 505-521. (Lecture delivered at Ohio State University, March 9, 1978).

II. *The World Inflation, 1952-1976*

Table 1 presents data on the average rates of inflation for the major industrial countries, for three subperiods. The most notable attribute of this table is the tendency for inflation rates to be similar across the countries, within each of the different periods. Indeed, as is shown at the bottom of the table, ranges can be chosen so as to include, in each subperiod, 80 percent of the observations, in such a way as to leave the ranges for the different subperiods completely disjoint (i.e., without any overlap). The picture is one of a common inflationary process, accelerating as one moves from one subperiod to the next.

Table 2 shows that this same attribute applies to a wide range of less-developed countries. The ranges for the LDC's span those for the industrial countries, but there seems to be no systematic tendency for the LDC's to have higher average rates of inflation than the countries in Table 1.

What is left to be pondered here is the relevance of thinking about these inflations as being in any sense "national" phenomena. Are these 44 inflations the creatures of 44 different central banks and/or ministries of finance? Or are they rather separate reflections of a single process of world inflation? Personally, we strongly incline to the latter interpretation. As evidence, consider the following: all 44 of the countries in the two tables shared in the progression from medium inflation to high inflation as one moves from 1967-72 to 1972-76. That is to say, all 44 inflation rates increased. Now if these were independent phenomena, with a 50 percent probability that the inflation rate would increase or decrease from one period to the next, the probability of this result occurring would be equal to that of getting 44 heads in 44 consecutive tosses of a coin. That probability is less than one in eighteen quadrillion! !

TABLE 1

Industrial Countries Average Annual Inflation Rates
(Percent per Annum)

Country	1952-67	1967-72	1972-76
United States	1.5	4.6	9.5
Canada	1.7	3.9	9.2
Japan	4.3	5.9	13.9
Australia	2.5	4.3	13.2
New Zealand	3.2	6.6	12.7
Austria	3.1	4.3	8.2
Belgium	1.9	4.0	10.3
Denmark	3.9	6.1	11.0
France	3.7	4.7	10.5
Germany	1.9	3.5	6.1
Italy	3.1	3.9	15.9
Netherlands	3.0	6.0	9.2
Norway	3.3	6.1	9.4
Sweden	3.5	5.1	9.2
Switzerland	2.1	4.3	6.7
United Kingdom	2.8	6.6	16.4
Median	3.0	4.6	9.9
Range encompassing 80 percent of observations	1.7 - 3.7	3.9 - 6.1	8.2 - 13.9

TABLE 2
Selected Less-Developed Countries Average Annual Inflation Rates
(Percent per Annum)

Country	1952-67	1967-72	1972-76
Costa Rica	1.8	3.8	16.2
Dominican Republic	0.8	3.4	12.6
Ecuador	2.2	6.4	15.5
Egypt	1.4	3.3	8.8
El Salvador	1.4	1.5	12.2
Guatemala	0.6	1.3	13.6
Haiti	1.8	3.3	15.7
Honduras	1.3	2.9	7.3
India	4.8	3.7	9.9
Iran	4.7	4.3	12.0
Iraq	0.5	4.2	8.2
Jamaica	2.8	6.9	18.3
Malaysia	-0.2	3.2	8.6
Mexico	4.3	4.4	16.6
Morocco	2.7	2.5	9.5
Nigeria	3.4	8.3	18.1
Pakistan	3.8	4.0	19.2
Panama	0.3	2.7	7.7
Philippines	2.7	8.5	14.2
Portugal	2.4	8.8	18.5
Spain	6.3	5.9	15.4
Sri Lanka	0.9	5.6	7.4
Sudan	2.7	3.9	16.4
Syria	0.9	2.7	16.5
Taiwan	6.7	4.4	14.5
Thailand	2.7	2.2	10.7
Trinidad and Tobago	2.4	5.2	16.0
Venezuela	0.9	2.5	7.5
Median	2.3	3.8	13.9
Range encompassing 80 percent of observations	0.8 - 4.8	2.2 - 6.9	7.4 - 16.5

The progression from low to medium inflation (that from 1952-67 to 1967-72) was shared by only 38 of the 44 countries. But the probability of its happening by chance under 44 separate causal mechanisms is still astounding—the probability of 38 or more heads in 44 tosses of a coin is less than one in a million.

Without here stopping to analyze these results, let us simply point out that we as a profession have not devoted enough attention to the world inflation as a single interconnected process. We have too much taken the country as our sole object of analysis. We badly need more work trying to identify the underlying, common causes of the 44 inflations recorded in the tables, plus those of many other countries (not listed above) that shared the same experience. The world money supply is a meaningful concept here, and its movements broadly “explain” the world inflation. But then we must still ask, what lies behind the speeding up of the rate of expansion of the world money supply, from the first to the second, and from the second to the third subperiods?

III. *Chronic and Acute Inflations*

Tables 3 and 4 present evidence on two important types of behavior that deviates from the world pattern. In defining the category of chronic inflation, we imposed the criterion of an inflation rate of 20 percent or more, for at least five consecutive years. For acute inflation the criterion was a rate of 80 percent or more, for at least two years. It is worth noting a) how few are the cases of such deviations, and b) how concentrated they are in the southern cone of South America. Additional points of interest are c) that in chronic inflation, the money supply tends to rise faster than prices—as the demand function for real cash balances shifts outward with income and population growth, while the cost of holding money, though high, does not rise dramatically, and d) that in acute inflation, prices rise faster than money, the movement along the demand curve for real balances, reflecting a sharp rise in the cost of holding money, being sufficient to dominate whatever rightward shift of the function might be taking place over the relatively short acute phase of the inflation disease.

TABLE 3

Examples of Chronic Inflation

Country	Period	Average Annual Rates of Increase (Percent)	
		in Consumer Prices*	in Money Supply ⁺
Argentina	1949-75	27	29
Brazil	1957-76	35	42
Chile	1952-70	32	38
Uruguay	1958-65	26	34

SOURCE: International Monetary Fund, *International Financial Statistics*, principally 1977 *Supplement*, augmented where needed by data from other issues.

* Basic data were yearly averages of monthly price levels.

⁺ Basic data were end-of-year money supply figures.

TABLE 4

Examples of acute inflation

Country	Period	Average Annual Percentage Increase	
		in Prices*	in Money Supply ⁺
Argentina	1974-76	293	262
Bolivia	1952-59	117	100
Chile	1971-76	273	231
Indonesia	1965-68	306	223
Paraguay	1951-53	81	54
South Korea	1950-55	102	101
Uruguay	1965-68	95	66
Uruguay	1971-74	83	63

SOURCE: See Table 3.

* See note to Table 3.

⁺ See note to Table 3.

IV. *Looking Beyond the Money Supply*

In this section we take for granted that expansions in the money supply were the proximate causes of the chronic and acute inflations reported above. But what lay behind those monetary expansions? They surely were not the result of pure whim of central bankers. In a very exploratory effort, we defined three variables that in one sense or other may help explain movements in money and hence in prices. These variables are:

β = net increase, during the year, of banking system credit to the public sector, expressed as a percentage of the year's GDP. Thus, if the public sector's borrowings from the banking system stood at 200 at the beginning of the year, and went to 300 by year's end, the net increase would be 100. If GDP of the year were 800, then β would be 12.5 percent (= 100/800).

γ = fraction of total banking system credit going to the public sector. Thus, if at the beginning of the year total bank credit were 400, and if at the end it were 500, then (using public sector credit figures from above) γ would be .50 (= 200/400) at the beginning of the year and .60 (= 300/500) at the end. In the tables presented in this paper γ is always measured from end-of-year data. Whenever the public sector is a net lender to the banking system, γ is simply recorded as < 0 .

λ = percentage increase during the year in total domestic credit of the banking system. This, with the figures just presented, would be 25 percent [= (500/400) - 1].

These three variables have the great virtue of being strictly policy variables, regardless of whether the country in question is on a fixed or fluctuating exchange-rate system. By contrast, the money supply itself, and its rate of increase, are endogenous variables under a fixed exchange rate system. These variables have the added advantage of being readily calculated from the data regularly presented, for nearly all IMF member countries, in International Financial Statistics. We also define

π = rate of inflation (usually of consumer prices) during the year, also taken from IFS.

Tables 5 and 6 give median values of β , γ , λ , and π for the acute inflation countries, the chronic inflation countries, and for a control group of countries which successfully maintained stable exchange rates during the period of observation. The comparison across groups is made in Table 7, where it is seen that the acute inflation cases exhibit a higher frequency distribution for each of the four variables than the chronic inflation countries, and these latter in turn have higher frequency distributions than the control group of stable exchange rate countries.

TABLE 5

CASES OF ACUTE INFLATION

(Data are median observations of indicated
variable during period specified)

Country	β	γ	λ	π
Indonesia (1966-68)	2.0%/o	.542	145%/o	128%/o
Bolivia (1954-57)	4.4%/o	.800	81%/o	120%/o
Chile (1973-76)	33.0%/o	.850	433%/o	365%/o
Uruguay (1966-68)	1.7%/o	.215	40%/o	89%/o
Uruguay (1972-75)	3.0%/o	.234	95%/o	80%/o
Argentina (1975-76)	13.3%/o	.394	220%/o	310%/o
Median	3.7%/o	.467	120%/o	124%/o

CASES OF CHRONIC INFLATION

Argentina (1954-74)	2.6%/o	.333	27%/o	26%/o
Uruguay (1954-65, 1969-71)	1.2%/o	.120	26%/o	21%/o
Chile (1959-72)	2.9%/o	.477	41%/o	28%/o
Brazil (1954-76)	2.0%/o	.300	43%/o	29%/o
Median	2.3%/o	.316	34%/o	27%/o

TABLE 6

CONTROL GROUP — STABLE EXCHANGE RATE COUNTRIES

(Data are median observations of indicated
variables during period specified)

Country		β	γ	λ	π
Taiwan	(1960-72)	0.50/o	.267	.186	.030
Honduras	(1954-70)	0.20/o	.288	.121	.012
Haiti	(1954-70)	0.50/o	.680	.077	.014
Jamaica	(1954-65)	0.30/o	< 0	.218	.021
Iran	(1960-70)	1.80/o	.345	.202	.016
Thailand	(1954-70)	0.10/o	.251	.119	.021
Portugal	(1954-70)	0.20/o	.164	.110	.030
Guatemala	(1954-70)	0.30/o	.174	.114	.006
El Salvador	(1954-70)	0.50/o	.093	.103	.015
Dominican Republic	(1954-70)	0.60/o	.379	.157	.003
Morocco	(1960-70)	0.30/o	.439	.102	.030
Iraq	(1954-70)	1.40/o	.246	.266	.082
Nigeria	(1960-70)	1.80/o	.248	.417	.052
Malaysia	(1954-70)	0.80/o	.017	.190	-.001
Sudan	(1954-70)	2.60/o	< 0	.254	.024
Trinidad/Tobago	(1954-65)	0.40/o	.070	.143	.021
Median		0.50/o	.247	130/o	2.10/o
First Quartile		0.30/o	.082	110/o	1.30/o
Third Quartile		1.10/o	.317	210/o	3.00/o

TABLE 7

Comparison of Inflationary Countries with Control Group

	Acute Inflation Countries		Chronic Inflation Countries		Control Group of Stable LDC's
$(\beta = \text{Net Increase in Banking System Credit to the Public Sector, expressed as a percentage of GDP})$					
First Quartile	2.0%	>	1.6%	>	0.3%
Median	3.7%	>	2.3%	>	0.5%
Third Quartile	13.3%	>	2.8%	>	1.1%
$(\gamma = \text{Public Sector Bank Credit/Total Bank Credit})$					
First Quartile	.234	>	.210	>	.082
Median	.467	>	.316	>	.247
Third Quartile	.800	>	.405	>	.317
$(\lambda = \text{Percent Increase in Total Bank Credit})$					
First Quartile	81%		26%		11%
Median	120%		34%		13%
Third Quartile	220%		42%		21%
$(\pi = \text{Percent Increase in Price Level})$					
First Quartile	89%		23%		1.3%
Median	124%		27%		2.1%
Third Quartile	310%		28%		3.0%

V. Recent Inflation Experience

Table 8 presents data on the experience of several countries that have just recently joined the group whose experience deviates significantly from the world inflation. On the whole, their recent inflation rates have either been similar to those of the cases classified above as chronic inflation, or somewhat above those rates. For the sake of comparison, we have provided in Table 9 data from a "control period" for each of these countries. The control period was chosen as the longest available recent period during which the country in question had maintained a low inflation rate.

TABLE 8
Recent Inflation Countries

Country	Years	Median Value of			
		π	β	γ	λ
Ghana	1974-78	52.7o/o	7.5o/o	.579	52.1o/o
Zaire	1974-78	58.3o/o	8.5o/o	.681	42.3o/o
Nigeria	1975-77	22.0o/o	n.a.	.185	147.2o/o
Portugal	1974-77	22.8o/o	6.5o/o	.089	26.7o/o
Colombia	1973-77	24.4o/o	0.1o/o	.15	28.4o/o
Turkey	1975-76	23.2o/o	5.2o/o	.29	39.8o/o
Perú	1974-78	33.5o/o	3.0o/o	.353	42.8o/o
Israel	1974-77	37.0o/o	6.0o/o	.284	58.0o/o

π = rate of inflation.

β = net public sector borrowing from banking system as percent of GDP.

γ = bank credit to public sector as fraction of total bank credit.

λ = rate of credit expansion.

TABLE 9

"Control Period" for Recent Inflation Countries

Country	Years	Median Value of			
		π	β	γ	λ
Ghana	1956-60	1.9o/o	2.4o/o	n.a.	13.2o/o
Zaire	1969-72	2.1o/o	2.1o/o	.698	29.9o/o
Nigeria	1957-59	0.8o/o	n.a.	n.a.	n.a.
Portugal	1966-69	5.7o/o	-0.8o/o	.012	13.2o/o
Colombia	1967-71	8.2o/o	.02o/o	.210	17.2o/o
Turkey	1969-72	10.0o/o	0.9o/o	.280	19.0o/o
Peru	1969-73	6.8o/o	1.9o/o	.376	23.7o/o
Israel	1966-70	2.6o/o	5.4o/o	.291	29.7o/o

 π = rate of inflation. β = net public sector borrowing from banking system as percent of GDP. γ = bank credit to public sector as fraction of total bank credit. λ = rate of credit expansion.

Table 10 compares the results for the recent inflation countries with those for the earlier two classifications, and with the two control situations. These results clearly show that the value of β and λ are discriminatory between inflationary and other situations. Of these two variables, λ is in a sense the less interesting, because of its quasi-monetary character. We therefore in Tables 11-15 explore the predictive capacities of β . Table 11 lists the countries for which this exercise was performed, while Tables 12-15 show how inflation rates have varied in situations characterized by different β 's. Note that the relationships of inequality are invariably in the direction indicated by the hypothesis that a high value of β reflects a greater danger of a propensity toward an inflationary outcome.

VI. *The Devaluation Crisis Countries*

The results just reported suggest that the variables β , γ , and λ may indeed have some value in indicating the underlying conditions that produce inflationary pressures out of line with the general "world inflation". We turn now to an attempt to test this hypothesis by applying it to yet another group of countries that might be said also to suffer from a form of the

inflation disease that differs from the "general" inflation. The obvious group is the set of countries which, while attempting to maintain fixed exchange rates, find themselves ultimately forced to devalue their currencies. The thought is that the pressures that ultimately force a devaluation are likely to be similar to those that cause chronic and acute inflations in other countries. Moreover, one can extend the hypothesis a bit further to speculate that the pressures that ultimately force a devaluation do not just arise from nowhere to topple the currency, but rather build up over some significant period of time. The particular hypothesis that we will examine is that the key symptoms of inflationary pressure are present in the year prior to the devaluation, as well as in the year of the devaluation itself.

TABLE 10

Comparison of Recent Inflation Countries With Other Groups

	Median Value of		
	β	γ	λ
Acute inflation countries	3.7o/o	.467	120o/o
Chronic inflation countries	2.3o/o	.316	34o/o
Recent inflation countries	5.4o/o	.315	43o/o
Recent inflation countries, control period	1.2o/o	.287	18o/o
Control group of stable countries	0.5o/o	.247	13o/o

β = Δ public sector credit as percent of GDP.

γ = public sector credit + total bank credit.

λ = percent increase in total bank credit.

TABLE 11

Countries and Years Used for β Tests in Tables 17-20

LDC's	Years	LDC's	Years
Argentina	54-75	Iraq	54-75
Bolivia	-75	Jamaica	-76
Brazil	-75	Korea	-76
Burma	-74	Malaysia	-76
Chile	-76	Mexico	-76
Colombia	-75	Morocco	-76
Taiwan	-76	Nicaragua	-76
Costa Rica	-76	Nigeria	-73
Dominican Republic	-76	Paraguay	-76
Ecuador	-75	Peru	-76
Egypt	-74	Portugal	-75
El Salvador	-76	Philippines	-76
Guyana	-73	Syria	-76
Guatemala	-76	Spain	-75
Greece	-76	Sri Lanka	-76
Ghana	-74	Thailand	-76
Haiti	-75	Trinidad and Tobago	-76
Indonesia	-75	Turkey	-76
India	-74	Tanzania	-75
Iceland	-76	Uruguay	-75
Iran	-76	Venezuela	-75
Israel	-76	Zaire	-74

Industrial Countries

Australia	54-76	Japan
Austria		Netherlands
Belgium		New Zealand
Canada		Norway
Denmark		South Africa
Finland		Sweden
France		Switzerland
Germany		United Kingdom
Ireland		United States
Italy		

TABLE 12

Distribution of π (inflation rate)	LDC's Classified by Value of β in Year t						
	$\beta \geq 5.0$ (63 obs.)		$5.0 > \beta \geq 3.0$ (100 obs.)		$3.0 > \beta \geq 2.0$ (91 obs.)		$2.0 > \beta \geq 1$ (152 obs.)
in year t							
First quartile of π_t	4.8	>	2.1	>	2.0	>	1.8
Median of π_t	13.7	>	6.4	>	5.1	>	3.9
Third quartile of π_t	31.1	>	22.5	>	13.5	>	8.4
in year t+1							
First quartile of π_{t+1}	6.3	>	3.9	>	3.2	>	2.1
Median of π_{t+1}	16.0	>	10.7	>	5.8	>	4.4
Third quartile of π_{t+1}	42.1	>	20.3	>	15.1	>	8.0

TABLE 13

Distribution of π (inflation rate)	Industrial Countries Classified by Value of β in Year t						
	$\beta \geq 5.0$ (9 obs.)		$5.0 > \beta \geq 3.0$ (29 obs.)		$3.0 > \beta \geq 2.0$ (44 obs.)		$2.0 > \beta \geq 1.0$ (118 obs.)
in year t							
First quartile of π_t	5.9	>	2.73	>	2.70	>	2.5
Median of π_t	11.1	>	6.8	>	4.3	>	3.9
Third quartile of π_t	16.8	>	10.8	>	8.7	>	6.5
in year t+1							
First quartile of π_{t+1}	9.2	>	3.9	>	3.4	>	2.4
Median of π_{t+1}	15.2	>	6.0	>	4.9	>	3.9
Third quartile of π_{t+1}	17.5	>	10.8	>	9.2	>	6.6

TABLE 14

Frequency with which π (inflation rate) exceeded given level	LDC's Classified by Value of β in Year t			
	$\beta \geq 5.0$	$5.0 > \beta$	$3.0 > \beta$	$2.0 > \beta$
	(63 obs.)	≥ 3.0 (100 obs.)	≥ 2.0 (91 obs.)	≥ 1.0 (152 obs.)
in year t				
$\pi_t \geq 10\%$	.583	> .390	> .308	> .191
$\pi_t \geq 20\%$	.367	> .270	> .139	> .086
$\pi_t \geq 30\%$	.267	> .140	> .066	> .046
in year t+1				
$\pi_{t+1} \geq 10\%$	.635	> .510	> .385	> .197
$\pi_{t+1} \geq 20\%$	.413	> .250	> .165	> .066
$\pi_{t+1} \geq 30\%$	.317	> .150	> .055	> .033

TABLE 15

Frequency with which π (inflation rate) exceeded given level	Industrial Countries Classified by Value of β in Year t			
	$\beta \geq 5.0$	$5.0 > \beta$	$3.0 > \beta$	$2.0 > \beta$
	(9 obs.)	≥ 3.0 (29 obs.)	≥ 2.0 (44 obs.)	≥ 1.0 (118 obs.)
in year t				
$\pi_t \geq 10\%$	.556	> .276	> .136	> .093
$\pi_t \geq 20\%$	0	.034	0	.017
$\pi_t \geq 30\%$	0	0	0	0
in year t+1				
$\pi_{t+1} \geq 10\%$	.667	> .241	> .182	> .093
$\pi_{t+1} \geq 20\%$	.111	.069	0	0
$\pi_{t+1} \geq 30\%$	0	0	0	0

Table 16 lists 29 cases of devaluation during the period 1952-76. The criterion for inclusion was that the devaluation had to be of at least 20 percent, and that it had to be preceded by at least four years of exchange stability. As can be seen, several countries managed to qualify twice under criterion.

Table 17 compares the chronic inflation countries with the devaluation countries and with the control group of stable exchange rate LDC's. The case is quite clear. With respect to β and γ , the devaluation countries are quite like the chronic inflation countries. Only with respect to λ are they more like the control group. This, in turn, is to be expected, since λ , a credit expansion variable, is almost certain to be higher in a chronic inflation setting than in countries that have for some time been maintaining (however precariously) a fixed exchange rate.

Table 18 reports the status of the devaluation countries, one year prior to their devaluation crisis, and Table 19 compares them a) to themselves in the year of the crisis and b) to the control group of stable LDC's. Here there is no perceptible difference between the devaluation countries in the year before as compared with the year of the crisis.

TABLE 16

Devaluation Countries: Key Variables in Year of Devaluation

Country	Year	β	γ	λ
		Δ Pub. Sect. Credit as Percent of GDP	Pub. Sec. Credit Total Credit	o/o Increase Total Credit
Bolivia	1972	2.1o/o	.58	28.2o/o
Burma	1975	3.0o/o	.87	14.2o/o
Colombia	1957	1.8o/o	.24	21.8o/o
Costa Rica	1974	1.6o/o	.16	50.6o/o
Ecuador	1970	3.0o/o	.32	22.4o/o
Egypt	1962	3.6o/o	.50	17.0o/o
Finland	1957	< 0	.06	3.0o/o
Finland	1967	0	.03	14.2o/o
Ghana	1967	5.9o/o	.76	18.5o/o
Greece	1975	3.3o/o	.24	25.0o/o
Iceland	1960	< 0	.01	7.1o/o
Iceland	1967	2.0o/o	.09	15.2o/o
India	1966	1.5o/o	.59	8.7o/o
Indonesia	1968	2.1o/o	.47	145.0o/o
Israel	1962	< 0	.03	< 0
Israel	1971	5.6o/o	.43	27.9o/o
Italy	1976	7.2o/o	.36	22.1o/o
Korea	1960	< 0	.35	< 0
Mexico	1976	1.7o/o	.63	21.3o/o
New Zealand	1967	1.2o/o	.29	7.0o/o
Pakistan	1972	2.9o/o	.48	17.4o/o
Peru	1958	1.5o/o	.28	9.7o/o
Peru	1967	1.6o/o	.38	13.0o/o
Philippines	1962	< 0	.23	12.1o/o
Philippines	1970	0.3o/o	.32	12.4o/o
Rwanda	1966	2.2o/o	.83	50.2o/o
Spain	1958	2.4o/o	.42	15.0o/o
Sri Lanka	1967	3.6o/o	.68	17.9o/o
Venezuela	1964	< 0	< 0	4.2o/o
First Quartile		0.15o/o	.200	9.2o/o
Median		1.80o/o	.350	15.0o/o
Third Quartile		3.00o/o	.490	22.25o/o

TABLE 17

Comparison of Devaluation Countries (In Year of Devaluation)
With Chronic Inflation Countries and Control Group

	Chronic Inflation Countries		Devaluation Countries (Year of Devaluation)		Control Group of Stable LDC's
$(\beta = \text{Net Increase in Banking System Credit to the Public Sector, Expressed as a Percentage of GDP})$					
First Quartile	1.6%	>	0.2%	~	0.3%
Median	2.3%	>	1.8%	>	0.5%
Third Quartile	2.8%	<	3.0%	>	1.1%
$(\gamma = \text{Public Sector Bank Credit/Total Bank Credit})$					
First Quartile	.210	~	.200	>	.082
Median	.316	<	.350	>	.247
Third Quartile	.405	<	.490	>	.317
$(\lambda = \text{Percent Increase in Total Bank Credit})$					
First Quartile	26%	>	9.2%	~	11%
Median	34%	>	15.0%	~	13%
Third Quartile	42%	>	22.3%	~	21%

TABLE 18
Key Variables in Year Prior to Devaluation

Country	Year	β	γ	λ
		Δ Pub. Sect. Credit as Percent of GDP	Pub. Sect. Credit Total Credit	\$ Increase Total Credit
Bolivia	1971	1.8o/o	.61	21.2o/o
Burma	1974	7.0o/o	.90	17.8o/o
Colombia	1956	1.9o/o	.20	32.7o/o
Costa Rica	1973	0o/o	.16	10.5o/o
Ecuador	1969	2.2o/o	.26	19.4o/o
Egypt	1961	2.7o/o	.50	10.9o/o
Finland	1956	0.2o/o	.07	5.9o/o
Finland	1966	0.8o/o	.03	14.7o/o
Ghana	1966	3.6o/o	.68	16.9o/o
Greece	1974	3.0o/o	.23	23.0o/o
Iceland	1959	< 0	.01	17.8o/o
Iceland	1966	< 0	< 0	13.2o/o
India	1965	1.6o/o	.60	12.1o/o
Indonesia	1967	1.0o/o	.54	91.0o/o
Israel	1961	< 0	.28	13.3o/o
Israel	1970	5.4o/o	.41	28.1o/o
Italy	1975	11.3o/o	.36	23.5o/o
Korea	1959	0.6o/o	.54	7.7o/o
Mexico	1975	3.0o/o	.66	27.1o/o
New Zealand	1966	0.1o/o	.24	5.3o/o
Pakistan	1971	5.9o/o	.51	14.7o/o
Peru	1957	1.2o/o	.23	17.7o/o
Peru	1966	1.9o/o	.35	13.8o/o
Philippines	1961	1.9o/o	.28	34.5o/o
Philippines	1969	3.3o/o	.35	16.6o/o
Rwanda	1965	4.2o/o	.87	108.0o/o
Spain	1957	3.0o/o	.43	15.8o/o
Sri Lanka	1966	0.5o/o	.67	4.7o/o
Venezuela	1963	<0	.02	3.5o/o
First Quartile		0.35o/o	.215	11.50o/o
Median		1.90o/o	.350	16.75o/o
Third Quartile		3.15o/o	.570	23.25o/o

TABLE 19

Comparison of Year Prior to Devaluation Crisis With Year of Crisis,
as Well as With Control Group

	Devaluation Countries Year of Devaluation		Devaluation Countries One Year Earlier		Control Group of Stable LDC's
(β = Net Increase in Banking System Credit to the Public Sector, Expressed as Percentage of GDP)					
First Quartile	0.2%	~	0.4%	~	0.3%
Median	1.8%	~	1.9%	>	0.5%
Third Quartile	3.0%	~	3.2%	>	1.1%
(γ = Public Sector Bank Credit/Total Bank Credit)					
First Quartile	.200	~	.215	>	.082
Median	.350	=	.350	>	.247
Third Quartile	.490	<	.570	>	.317
(λ = Percent Increase in Total Bank Credit)					
First Quartile	9.2%	~	11.5%	~	11%
Median	15.0%	~	16.8%	>	13%
Third Quartile	22.3%	~	23.3%	~	21%

VII. *Reserves Policy and the Ability to Defend a Fixed Exchange Rate*

In this section we inquire as to the characteristic of monetary policy in those LDC's that have been successful at maintaining fixed exchange rates, as compared with those that have failed.

To help answer this question we have constructed a policy indicator (μ), which attempts to discriminate between situations in which a monetary

target is being pursued, and those in which the target variable is the level of international reserves. The chosen indicator distinguishes very sharply between the two types of policy when the initial shock is one affecting international reserves. It also distinguishes reasonably well between the two types of policy when the initial shock is one affecting domestic credit. The indicator has been constructed taking into account the basic policy responses of the monetary authority and of the public under different classes of shock.

In order to illustrate the nature of our indicator (μ) we here present some simple examples. Let us first consider a fixed exchange rate country that experiences a positive reserves shock, so that its international reserves increase above a certain desired level (that is, this country has a reserves target). In this case the monetary authority will respond by increasing domestic credit in the amount necessary to restore the desired level of reserves. This means that in the short run, when the country has a reserves target and there is a reserves shock, domestic credit and international reserves will move in the same direction.

On the other hand, if the central bank has a certain monetary target (i.e., a certain rate of growth of money) and there is an undesired increase in the level of reserves, we will observe a corresponding decrease in the level of domestic credit, so as to bring the total quantity of money back to its desired level. In this case reserves and domestic credit move in opposite directions and, if the central bank fully offsets the effect of the increase of reserves, both domestic credit and reserves will move by the same absolute amount. This means that $|\Delta D| = \Delta R$ or that $|\Delta D|/\Delta R = 1.0$. However, if in the short run the central bank only partially offsets the effect of the autonomous increase in reserves we will have that $|\Delta D| < \Delta R$ or $|\Delta D|/\Delta R < 1$.

Our policy indicator takes into account this basic type of relations for yearly observations. It is defined as:

$$\mu = \frac{B}{A}$$

where $|B| = \min (|\Delta D|, |\Delta R|)$

$A = \max (|\Delta D|, |\Delta R|)$

and sign $B > 0$ if sign $\Delta D = \text{sign } \Delta R$

sign $B < 0$ if sign $\Delta D \neq \text{sign } \Delta R$.

Our indicator, then, is bounded by the values of -1.0 and 1.0 . It takes a value of -1.0 when there is a completely offsetting credit policy ($|\Delta D| = \Delta R$) and will take values between zero and -1.0 when in a certain period the credit policy falls short of completely offsetting the autonomous change in reserves. It is interesting to note that if the disturbance is a shock in the level of domestic credit, and the central bank has a monetary target, the indicator will presumably have a value of zero, as long as it is domestic

credit itself that has to move to undo the original shock. However, if the central bank does not pursue an active monetary or stabilization policy and there is a domestic credit shock, our indicator will have a negative value (and if we take a long enough period it will presumably be equal to -1.0). The reason for this is that it will be the public that will pursue the "monetary policy", by getting rid of the excess money through the balance of payments.

With respect to the reserves policy, our indicator μ will unmistakably take on a positive value when this type of policy is pursued. The value of the indicator will tell the degree to which the authorities react to shocks that disturb the reserves equilibrium. The closer the indicator is to one the stronger is the central bank reaction.

Two different yearly indicators were constructed. The first one (μ_1) was calculated using yearly changes in reserves and domestic credit. The second indicator (μ_2) was constructed using the four quarterly changes observed within each year. In that sense μ_2 is defined as

$$\mu_2 = \frac{\sum_{i=1}^{IV} B_i}{\sum_{i=1}^{IV} A_i}$$

where B_i and A_i have the same meaning as before but now refer to each quarter within a year.

Even though the examples presented above to illustrate the nature of the indicator consider that the targets (either reserves or monetary) are certain levels of these variables, the indicators work equally well when we consider that there is a desired composition of reserves and domestic credit that is sought but not instantaneously achieved.

To perform the analysis it was necessary to determine critical values of the indicator that would give us the limit for defining a certain policy. Two sets of such critical values were considered; the first set was .3 and $-.3$. Under this definition we considered a country to have a reserves target when $.3 \leq \mu \leq 1.0$, and to have a monetary target when $-1.0 \leq \mu \leq -.3$. Values of μ between $-.3$ and $.3$ were disregarded and not considered as reflecting either a reserves or a monetary target. The results obtained when these critical values of μ_1 were used are reported in tables 21 to 24. The second set of critical values was .10 and $-.10$. It reduced the number of cases failing to qualify as reflecting either a monetary or reserves target. The results obtained for μ_1 and μ_2 using .1 and $-.1$ as critical values are given in Appendix A. They basically confirm all of the results obtained when .3 and $-.3$ were used as critical values.

Once we have calculated our indicator we ask the following question: Whenever μ indicates that a country has followed a reserves policy can we say anything about the circumstances that triggered it? In general one would expect that when the level (or ratio) of reserves reaches a certain low level, countries will react by trying to rebuild them to the desired level²⁷. Then, this being the case, it is interesting to test whether the ratio of reserves that triggers a reserves policy differs as between the group of successful fixed exchange countries on the one hand and the group of devaluation crisis countries on the other.

For this exercise crisis countries were defined as in Section VI and the countries actually considered are those presented in Table 24. On the other hand, successful fixed exchange rate countries were defined as those countries that have maintained an exchange rate within a limit of annual variation of 2 percent for at least ten consecutive years²⁸. The period considered for the analysis of successful countries was 1954-1970, in order to avoid the problems related to the oil crisis and to the collapse of the Bretton-Woods system. In Table 20 we have a list of the successful countries considered in this study. The median values of the β , γ , λ and π indicators are also included. (This is basically an expanded version of Table 6).

In table 21 we have the distribution of the ratio $(R/R+D)_{-1}$ of total reserves of the monetary system to the quantity of money on January 1 of each year when a reserve target is indicated. (Actually, the figures refer to December 31 of the previous year). In column (1) we have the distribution of this ratio for the successful countries, where for each country we have taken the period during which it met the requirements of our definition of success (see Table). In column (2) we have the corresponding distribution for the crisis countries for 1954-77. Finally, in column (3), we have the distribution of $(R/R+D)_{-1}$ in the year previous to the devaluation for the crisis countries.

Table 22 is similar to Table 21 but deals with the distribution of a different variable: the ratio of foreign assets of the central bank to high powered money $(FA/H)_{-1}$ on December 31 prior to a reserves policy year. In a sense this is a measure of official reserves, while $(R/R+D)_{-1}$ is a measure of total reserves²⁹.

²⁷ Consider the analogy between the level of reserves and the level of inventories in a manufacturing or retailing operation. Let there be a desired (optimum) level (L_d) of inventories (reserves) such that, if attained, it will tend to be maintained, and such that when inventories are away from this level and conscious adjustments are made, this is the level that will be approached. Now consider a cost function $C(L-L_d)$. One assumption is that where excess inventories (reserves) exist, the costs per unit of excess is modest and not sharply increasing. When shortfalls exist, however (i.e., where $L < L_d$), the costs per unit are higher, and increase with the amount of the shortfall. This leads to behavior in which the agent is more-or-less indifferent to a situation of excess inventories (reserves) but is goaded to action by shortfalls, especially when they are large. This type of behavior has been explored in the context of the demand for money by Miller and Orr (1966).

²⁸ The only exception to this rule is Trinidad-Tobago, who had a 2.6 percent devaluation in 1958.

²⁹ All of the data has been taken from the IMF tape. Total reserves of the monetary system R correspond to line 31N of the IFS and is a net concept. Foreign assets of the central bank correspond to line 11 of the IFS and is a gross concept.

Both tables give us a very clear result. The critical ratio of reserves that triggers a reserve policy in successful countries is substantially higher than the critical level in crisis countries. If we compare columns (1) and (2) of Table 21 we can see that the median of $(R/R+D)_{-1}$ for crisis countries during the total period (.093) is much smaller than even the first quartile for the successful countries (.180). Similarly, the third quartile (.140) for crisis countries is much smaller than the median (.280) for the successful countries. These results tell us that the crisis countries reacted later than successful countries to the erosion of the level of international reserves, and that they only began to take measures to rebuild these reserves after a lower ratio of reserves to money had been reached.

Column (3) of Table 21 shows the distribution of $(R/R+D)$ for December 31 of the year previous to the devaluation in the crisis countries³⁰. Comparing this column with column (2) we can see that the year before the devaluation the reserves ratio is even lower than the critical level (col. 2) that "normally" triggers a reserves—target policy for the same crisis countries. In general we can say that crisis countries have devalued when they "ran out of reserves", and the fact that the distribution of $(R/R+D)_{-1}$ is significantly lower the year previous to a devaluation (col. 3) than the year prior to a reserve policy measure (col. 2), suggests that in a sense devaluations are used as a last resort measure, after the reserves ratio has fallen to a level too low to allow a reserve policy to be a viable solution.

The results in Table 22, where official reserves ratios $(FA/H)_{-1}$ are analyzed, confirm the conclusions drawn from the previous table. There is a clear difference between the distribution of the ratio of official reserves to high-powered money the year before a reserves policy for successful and crisis countries. In addition, the distribution of (FA/H) for the year before the devaluation is very sharply to the left of the distribution for the whole period for the crisis countries.

³⁰ Note that by choosing December 31 of the prior year as the date for this variable, we avoid the confusion that might be caused by the automatic effect of a devaluation in raising the value of R (and therefore the ratio of $R/R+D$), when all variables are expressed in domestic currency.

TABLE 20

Successful Fixed Rate Countries:¹ Value of Median of Indicators

Country	Years	β	γ	λ	π
Nigeria	1954-70 ²	1.8o/o	.248	.417	.052
Trinidad/Tobago	1954-65	.4o/o	.070	.143	.021
Iraq	1954-70	1.4o/o	.246	.266	.082
Morocco	1960-70	.3o/o	.439	.102	.030
Dominican Republic	1954-70	.6o/o	.379	.157	.003
El Salvador	1954-70	.5o/o	.093	.103	.015
Guatemala	1954-70	.3o/o	.174	.114	.006
Thailand	1954-70	.1o/o	.251	.119	.021
Jamaica	1954-65	.3o/o	< 0	.218	.021
Iran	1960-70	1.8o/o	.345	.202	.016
Haiti	1954-70	.5o/o	.680	.077	.014
Honduras	1954-70	.2o/o	.288	.121	.012
Taiwan	1960-70	.5o/o	.267	.186	.030
Malaysia	1954-70	.8o/o	.017	.190	< 0
Sudan	1954-70	2.6o/o	< 0	.254	.024
Portugal	1954-70	.2o/o	.164	.110	.030
Greece	1954-70	1.1o/o	.250	.158	.025
Sri Lanka	1954-65	1.8o/o	.630	.140	.014
Burma	1954-69	1.3o/o	.763	.092	.003
Mexico	1954-70	.3o/o	.247	.129	.038
First Quartile		.3o/o	.123	.112	1.3o/o
Median		.5o/o	.249	.142	2.1o/o
Third Quartile		1.4o/o	.362	.196	3.0o/o

¹ In addition to the countries included here the following countries classify as successful fixed rates countries: Cyprus (1954-65), Singapore (1954-70), Malta (1954-65), Yemen (1954-65), Jordan (1954-70), Paraguay (1960-70), Nicaragua (1954-70) and Bolivia (1959-70).

² Even though Nigeria was a "fixed rate" country from 1954 to 1970, data were only available for 1960-1970.

TABLE 21

Distribution of $(R/R+D)_{-1}$ for Successful and Crisis Countries Where
a Reserves Policy is Being Pursued ($\mu_1 \geq .30$)¹

	Successful Countries (1)		Crisis Countries (2)		Crisis Countries Year before Devaluation (3)
First Quartile	.180	>	.038	>	.010
Median	.280	>	.093	>	.085
Third Quartile	.335	>	.140	>	.110
n	50		82		20

¹This table is only reported for the annually based indicator (μ_1), as long as for the quarterly based (μ_2) the number of observations was small. However, in Appendix A a calculation using μ_2 is reported.

TABLE 22

Distribution of $(FA/H)_{-1}$ For Successful and Crisis Countries Where
a Reserves Policy is Being Pursued ($\mu_1 \geq .30$)

	Successful Countries (1)		Crisis Countries (2)		Crisis Countries Year before Devaluation (3)
First Quartile	.321	>	.190	>	.110
Median	.470	>	.258	>	.190
Third Quartile	.784	>	.323	>	.260
n	50		82		20

In general, it appears that when we use (FA/H) as the critical variable (as an alternative to $R/(R + D)$), we sharpen the degree of discrimination a) between the general results (col. 1) for the successful countries and the general results (col. 2) for the crisis countries, and b) between the latter results and those (col. 3) for the crisis countries immediately prior to their devaluation.

While in Tables 21 and 22 we have analyzed the distribution of the reserves ratios for the year before a reserves target is pursued, there are also periods when each country follows a monetary target ($\mu_1 \leq -0.30$) and years when neither target is pursued ($-0.30 \leq \mu_1 \leq 0.30$). Our hypothesis with respect to the conditions under which a reserves or a monetary target is followed are that, in general, whenever a reserves target is pursued ($\mu \geq 0.30$) the reserves ratio (measured either for total or for official reserves) will be lower than whenever our indicator suggests a monetary target ($\mu \leq -0.30$). In addition, one would expect that the distribution of the reserves ratios for crisis countries under both monetary and reserves policies, will be to the left of the distribution of the same ratios for successful countries.

In Tables 23 and 24 the medians of the reserves ratios for each country (in both the successful and the crisis categories) under reserves and monetary targets are presented. These distributions were calculated using the yearly-based indicator (μ_1) and, as in the previous tables, using critical values of -0.30 and 0.30 for μ_1 to define the policies.

In table 23 we can see that for the successful countries the reserves ratio ($(R/(R+D))_{-1}$) generally has the expected characteristic of being higher when a monetary target is being pursued than when a reserve target is indicated. The distribution of the individual country medians (shown at the bottom of the table) confirms this conclusion. In particular, the median of the reserves ratio for the monetary target cases is $.340$ while the median for the reserves policy cases is $.280$.

Table 23 also shows that the same basic relationship between the distributions under monetary and reserves targets holds when reserves are measured from the standpoint of the monetary authority, i.e., by $((FA/H)_{-1})$. On this definition there are only three individual cases where the relationship of the medians is opposed to our expectations. In addition, the distributions for the total group behave as expected, except for the fact that the third quartile is essentially the same under both types of targets ($.780$).

In Table 24 the same experiment is carried out for crisis countries for the complete period. We can see that for the total reserves ratio, in only three of sixteen cases the ratio is larger under reserves targets than under monetary targets. Moreover, as is shown at the bottom of the table the distributions for the total group of countries relate to each other in the expected way. The reserves ratio is lower under reserves targets than under monetary targets, regardless of whether this ratio is defined as $[R/(R+D)]_{-1}$, columns (1) and (2), or whether it is defined as $(FA/H)_{-1}$, as

in columns (3) and (4). It can be seen that in only two of the sixteen individual cases for $(FA/H)_{-1}$ is the relationship different from the expected one.

When one compares the distributions across groups of countries (as shown at the bottom of Tables 23 and 24), one finds that in general the successful countries hold higher reserves than the crisis countries, regardless of whether they are pursuing a monetary or a reserves target. This is true, also, regardless of whether the reserves ratio is measured in the total $[R/R+D]_{-1}$ or the official $[FA/H]_{-1}$ sense.

TABLE 23

Median Value of $(R/R+D)_{-1}$ and $(F/H)_{-1}$ (When .30 is Critical Value)
For Successful Countries

Country	Total Reserves Ratio $(R/R+D)_{-1}$		Official Reserves Ratio $(FA/H)_{-1}$	
	Monetary Target (1)	Reserves Target (2)	Monetary Target (3)	Reserves Target (4)
Honduras	.355	.180	.645	.400
Haiti	.110	< 0	.150	.070
Portugal	.340*	.330	.870*	.830
Greece	.280*	—	.340*	—
Guatemala	.310	.190	.460	.420
Mexico	.360*	.335*	.640*	.333*
El Salvador	.240	.250*	.490	.470*
Nigeria	.650*	.290*	.885*	.690*
Morocco	.250	—	.640	—
Malaysia	.770*	.680	.970*	.980
Sudan	.260	—	.510	—
Thailand	.410*	.555	.665*	.825
Iran	.250*	.235*	.380*	.295*
Iraq	.560	.990*	.710	.770*
Burma	.325	.335*	—	—
Sri Lanka	.470	.660*	.800	.980*
Taiwan	—	.270	—	.330
Jamaica	.590	< 0*	.880	.720*
Dominican Republic	.090	< 0*	.420	.180*
Trinidad	.715	—	—	—
First Quartile	.250	> .180	.430	> .321
Median	.340	> .280	.640	> .470
Third Quartile	.493	> .335	.778	> .784
Number of Observations with higher reserves ratio				
a) for monetary target	10		10	
b) for reserves target	5		5	
Probability (2 tailed)	.053		.030	

* These medians were computed from three or less observations.

TABLE 24

Median Value of $(R/R+D)_{-1}$ and $(FA/H)_{-1}$ (For Critical Value of .30) For Crisis Countries

Country	Total Reserves Ratio $(R/R+D)_{-1}$		Official Reserves Ratio $(RA/H)_{-1}$	
	Monetary Target (1)	Reserves Target (2)	Monetary Target (3)	Reserves Target (4)
Ecuador	.270	.220	.440	.360
Costa Rica	.090	.110	.280	.270
Peru	.170	.150	.320	.260
Philippines	.200	.030	.470	.290
Greece	---	.060*	---	.190*
Ghana	.260	.010*	.390	.185*
Bolivia	.115	.080	.220	.190
Colombia	.090	.010	.340	.280
Sri Lanka	.155	.400*	.215	.575
Pakistan	.155	.105	.185	.255
Mexico	---	---	---	---
New Zealand	.250	.210	.420	.380
Iceland	.105	.130	.405	.421
Israel	.290	.250*	.610	.460*
Korea	.250	.045	.385	.255
India	.220*	.060	.340*	.180
First Quartile	.110	> .038	.250	> .190
Median	.185	> .093	.363	> .258
Third Quartile	.250	> .140	.413	> .323
Number of observations with higher reserves ratio				
a) for monetary target	11		11	
b) for reserves target	3		3	
Probability (2 tailed)	.013		.013	

Finally, let us call attention to the probability calculations at the bottom of Tables 23 and 24. These are based on the null hypothesis that it is equally likely for a country to have a higher median $[R/(R+D)]_{-1}$ during the times when we attribute to it a reserves target as during the times when we ascribe to it a monetary target. That is, we consider the expected distribution to be a binomial with $p = .5$. We then calculate the probability, in a drawing from such a binomial distribution, of an outcome as extreme as the one observed. These probabilities are .053 for the successful countries and .013 for the crisis countries, when $[R/(R+D)]_{-1}$ is used as the criterion. The joint probability of these two outcomes is less than .0007. In the cases where $(FA/H)_{-1}$ is used as the criterion, the probabilities within each group of countries are .030 for the successful countries and .013 for the crisis countries, and the joint probability of the combined outcomes is less than .0004.

We interpret these results as giving positive confirmation of the usefulness of μ as a policy indicator.

APPENDIX

RESERVES RATIOS DISTRIBUTIONS UNDER CRITICAL VALUES OF INDICATORS OF $-.10$ AND $.10$

In this appendix we basically present tables equivalent to Tables 21 to 24 in the text, but constructed for lower critical values of the policy indicators. In the calculations presented here we have classified cases with $\mu \leq -.10$ as reflecting a monetary target, and cases with $\mu \geq .10$ as reflecting a reserves target.

Tables A1 and A2 are the equivalents to Tables 21 and 22 in the text. However, in Tables A1 and A2 in addition to the distribution using a yearly based indicator μ_1 we have the calculations using the quarterly based indicators (μ_2). The results obtained when μ_2 is used confirm those obtained under μ_1 . In general, Tables A1 and A2 support all the results previously presented and discussed in the text.

Tables A3 and A4 are the equivalents of Tables 23 and 24 in the text. Table A3 for successful countries completely confirms the results obtained in Table 23, when the critical values of μ were taken as $-.30$ and $.30$. For the complete group, the reserves ratios are clearly higher when we identify a monetary target as being pursued than when a reserves target is indicated.

Table A4 is equivalent to Table 24 in the text, and presents for the crisis countries the median of the lagged reserves ratios per country and the distribution of these medians for the group, when the critical values of μ are

taken to be $-.10$ and $.10$. It can be seen that here the results are not the same as those obtained in Table 24. In particular it can be seen that for the distribution of the group as a whole, in four out of six cases the inequality signs are in the wrong direction. As a matter of fact, as can be seen in the bottom of Table A4, the values of the reserves ratios throughout the distributions are very similar under monetary and reserves policy. From this it would seem that when the definition of monetary and reserves policies is expanded, the crisis countries do not discriminate very sharply with respect to the level of reserves in choosing which type of policy to pursue.

TABLE A1

Distribution of $(R/R+D)_{-1}$ For Successful and Crisis Countries When a Reserve Policy is Being Pursued

	Successful Countries (1)		Crisis Countries (2)		Crisis Countries Year Before Devaluation (3)
<i>A. Annually based indicator: $\mu_1 \geq .10$</i>					
First Quartile	.137	>	.050	>	.010
Median	.220	>	.103	>	.085
Third Quartile	.402	>	.180	>	.110
n =	82		132		20
<i>B. Quarterly based indicator: $\mu_2 \geq +.10$</i>					
First Quartile	.185	>	.055	>	.010
Median	.280	>	.120	>	.085
Third Quartile	.385	>	.200	>	.110
n =	34		70		20

TABLE A2

Distribution of $(FA/H)_{-1}$ For Successful and Crisis Countries
When a Reserves Policy is Being Pursued

	Successful Countries (1)		Crisis Countries (2)		Crisis Countries Year Before Devaluation (3)
<i>A. Annually based indicator: $\mu_1 \geq +.10$</i>					
First Quartile	.420	>	.190	>	.110
Median	.560	>	.260	>	.190
Third Quartile	.700	>	.370	>	.260
n =	82		130		20
<i>B. Quarterly based indicator: $\mu_2 \geq +.10$</i>					
First Quartile	.280	>	.200	>	.110
Median	.380	>	.290	>	.190
Third Quartile	.80—	>	.430	>	.260
n =	34		68		20

TABLE A3

Median Value of $(R/R+D)_{-1}$ and $(F/H)_{-1}$ For Reserves and
Monetary Policies For Successful Countries

Country	For Annual Observations (μ_1)			
	$(R/R+D)_{-1}$		$(F/H)_{-1}$	
	Monetary	Reserves	Monetary	Reserves
Honduras	.355	.190	.645	.425
Haiti	.055	< 0	.110	.070
Portugal	.340*	.345	.879*	.885
Greece	.250	.190	.330	.310
Guatemala	.290	.160	.460	.415
Mexico	.325	.240	.505	.470
El Salvador	.270	.155	.520	.430
Nigeria	.650	.195*	.785	.500*
Morocco	.215	.080*	.495	.222*
Malaysia	.770*	.620	.990*	.970
Sudan	.380	< 0	.600	.210*
Thailand	.410	.545	.665	.805
Iran	.250*	.220	.380	.295
Iraq	.520	.510	.700	.660
Burma	.340	.365	---	---
Sri Lanka	.430	.660*	.700	.980*
Taiwan	.300*	.270*	.375*	.330
Jamaica	.630	.790*	.895	.98 *
Dominican Republic	.150	< 0	.470	.18
Trinidad	.700	---	---	---
First Quartile	.260	> .137	.420	> .259
Median	.340	> .220	.560	> .428
Third Quartile	.575	> .402	.700	> .733

TABLE A4

Median Value of $(R/R+D)_{-1}$ & $(FA/H)_{-1}$ (For Critical Value of [.10]) For Crisis Countries

Country	For Annual Observations (μ_1)			
	$(R/R+D)_{-1}$		$(FA/H)_{-1}$	
	Monetary	Reserves	Monetary	Reserves
Ecuador	.200	.185	.420	.355
Costa Rica	.135	.100	.280	.250
Peru	.175	.150	.280	.260
Philippines	.055	.050	.225	.290
Greece	.050	.060*	.190	.190*
Ghana	.160	.010	.330	.185
Bolivia	.120	.090	.210	.200
Colombia	< 0	< 0	.200	.280
Sri Lanka	.130	.400*	.180	.575*
Pakistan	.110	.105	.240	.290
Mexico	.080*	.180*	.150*	.410*
New Zealand	.250	.230	.420	.385
Iceland	.065	.130	.370	.400
Israel	.290	.250	.570	.460
Korea	.120	.100	.385	.370
India	.085	.050	.170	.105
First Quartile	.055	> .050	.190	< .200
Median	.120	> .103	.260	< .290
Third Quartile	.160	< .180	.370	< .385

REFERENCES

- Harberger, Arnold C. "A Primer on Inflation". *Journal of Money, Credit and Banking* 10, N^o 4. (November 1978): 505-521. Lecture delivered at Ohio State University, March 9, 1978.
- Miller, Merton H. and Orr, Daniel. "A Model of the Demand for Money by Firms". *Quarterly Journal of Economics* 80. (August 1966).

I'm extremely thrilled to see so many of our students here and I would like to put it all in the right perspective. When he counted 30 students from 7 countries he counted me among them, and very rightly so, and I am privileged to be counted there. Also since I'm leaving this evening, I will not have the opportunity to thank the organizers and the sponsors of this extraordinarily pleasant conference; and I would also like to use this opportunity to say: ¡muchas gracias!

Let me return to my task this morning and deal with several important issues that are raised by Professor Harberger's paper.

First I would like to make some points concerning the methodology. The reason why I would like to start with the statement about the methodology that this paper follows is that it is an extremely unusual methodology. It is a methodology which is in a way novel for the 1980s and I believe very appropriate for the problems at hand. What are the characteristics of the methodology followed in this line of research? First, it is a broad sweep over a large body of data. This is a proper econometric tool. In other words, rather than massaging the data until they whisper what you want them to say, the approach in this paper is to look over a broad set of data, not looking with a microscope in order to understand the size of the elephant, but rather in order to hear either some loud voice that comes, either harmony in the voice. Of course in each choir there is a soprano there is a tenor. They differ but they are basically in harmony; and that is the basic message that the first part of the paper brings us. That inflation is a world phenomenon; and let's not be worried about 20/o or 40/o, the issue is what are the big waves that characterize the world.

Second point of methodology is the perspective that the world is a unified entity which means from the econometric viewpoint that you have a valid sample when you look at the countries. They are points which basically belong to the same population. Therefore you can infer from this sample about the population at large. We do not talk about each country drawn from different distributions and that each country requires therefore a specific theory. That is the essence of economic theory which is general. A theory is right if it is general, it becomes a tautology if it is particular.

The third issue relates to the question of why it is interesting. Of course a scientist should not be shy to say it is interesting because I am intellectually curious, but from the policy perspective it is interesting to the extent that history repeats itself. Therefore studying past records of countries and behaviour would help in terms of the future behaviour. Important to determine basically the key forces of those economies particularly the government sectors. And why is it so important? Because if it is basically

individuals all along, then history does not repeat itself so much because individuals learn from mistakes; governments learn less from mistakes. And therefore it is likely that understanding the behaviour of the public sector will be giving us some mileage for preventing future mistakes. Finally, still on the methodology, seeing an economy like an organism rather than a machinery is extremely fundamental. A machinery can be controlled, organisms cannot; consequently there are obvious policy implications. Don't try to manipulate too much because people are basically smart and they will undo you; with machinery you can.

But I will use also this particular analogy to explain why I am not going to be so deep as I would have liked to in my comments because we have here a paper of 24 tables in the text; and 4 tables in the Appendix; and I need, like all organisms, I need some time for digestion. So what I will do, I will be a little more superficial but I still hope to be useful.

What is the key element that emerges from the first part of the paper? The key element about world inflation is extremely important because it provides new perspective about basic elements in monetary theory. Under fixed exchange rates, when one country increases its money supply, prices will go up; prices everywhere; in the market. Which market? The only market that exists in the open economy: the world market. So we have country "A" that increases its money supply and prices go up in country "B". Then comes the economic researcher that was born in a closed economy mind and sees that prices go up even though the money supply did not go up. As a matter of fact, we know that after a while money will flow to this country and then the economic researcher that was born in the closed economy mind will say "not only prices went up without money preceding it, prices are going up and money follows it". Well, we have a cost push theory, it's beautiful, prices go up and the monetary authorities can do nothing but validate it; and we chickens and eggs, the usual story of prices causing money and everyone says in such a case let us understand the central banker. That is not precisely the point. The open economy gives us a very different perspective, namely, it is still the case that prices in the world go up because money in the world went up. Well, money goes up, it is not relevant for the price effect, of course, it is relevant for the adjustment process; the country whose money supply has gone up will find itself having a deficit; and another country will find itself having a surplus because its prices went up without money and therefore money will start flowing into the rest of the world, and will be distributed. According to what? That is what Ricardo told us many years ago; the reason is the natural distribution of species that any student of physics knows.

The second important perspective that emerges from this discussion is concerning the adjustment process itself in the open economy. Let me take you again to the example I gave you. When country "A" increases its money supply prices in country "A" and in country "B" went up; and therefore the

price level which went up created an excess demand for money in country "B", and an excess supply in country "A", and money flows. Did we have any change in relative prices between countries? Did we have any change in relative price between goods? No. Exports-imports, their relative prices need not change, of course they may change, but it means that changes in relative prices cannot be the center core of the adjustment mechanism. It does not mean that they will not appear in the process, but the key issue is the relationship between total spending and total income.

This leads Professor Harberger to conclude that a concept of world money supply is a very useful concept. The question that one has however is in what way it is useful. There are two meanings to a useful concept. One meaning is, it is useful because it helps me understand processes; and there is no doubt that this concept is useful because it just helps us understand these processes. The second question is it is useful because we can use it; and we can use it for policy. Put differently, it is controllable. Now let me bring you back to the concept of what is money in the close context, in the economic analysis at standard text books. All we know is that everything in the world has moneyness in it. A house has moneyness it has because you can sell it; it is not so liquid but there is moneyness in it. It is a store of value. And many commodities, each one of them, has some moneyness in it. Cognac in the German hyper inflation had a lot of moneyness because it was the medium of transaction. Cognac was the very liquid money during this period. What this means is that it leads us to the question of what is money. And here Professor Friedman contributes a lot to our understanding. He came up with a practical answer: money is this thing that is controllable and helps us to predict income behaviour. Well when he comes to the open economy it backs the question, this usefulness of money controllable is one problem, we have many central banks. What do we mean by world money? How do we compute world money when we change the exchange rates between moneys? They are conceptual problems, but so I will agree it is useful to understand it but the policy controllability aspect has still to be further developed. Indeed, during the 60s or during the days of the Bretton Woods System the U.S. dollar was the best major world money; and why was it useful? It was useful as long as the U.S. played the role of the banker of the world that is controlling world money and, therefore, as long as the U.S. took charge of the responsibility of the controller of the money supply, by ensuring price stability, the Bretton Woods system worked. Once this role was discharged the Bretton Woods system collapsed. It is very important that we know who controls what.

Let me turn now to the distinction between chronic inflation and acute inflation. The very interesting statistics that are reported in the paper, in chronic inflation, those inflation rates which are high but not too high, typically the nominal money supply is growing faster than the price level; while in an acute inflation the price level is growing faster than the nominal money supply. What it means is that in chronic inflation real balances are

going up, nominal balances deflated by the price level; while in the acute inflation they are going down.

What does it mean as far as the possibility to use inflation tax? We know that a government can use inflation as a means to mobilize resources. And what is the tax base? The tax base is the existing real stock of money supply. And what is the tax rate? It is the rate of inflation, the rate at which the existing stock is depreciated. Well, in the acute inflation scenario we have a situation where when inflation goes up, when the tax rate goes up, the tax base also goes up. It is a very frightening situation because it means that it may provide incentives to overuse this particular tax phenomenon so as to roll a chronic inflation country into an acute inflation country; and reinforces the importance of discipline in such situations.

I would like to turn now to the discussion of devaluation in the paper. There are several statements that deserve mention. First, the paper reports evidence that the same pressures that are responsible for the emerging of high inflation are also likely to be the same pressures that are responsible for the emergence of a devaluation crisis. And that is a very attractive framework. It is a very attractive phenomenon because it does explain to us that we are having basically two manifestations of the same problem: when you are eroding your money supply it depreciates; and you don't have to say in terms of what, it depreciates in terms of everything; it depreciates in terms of goods and that is the inflation rate; and it will depreciate in terms of foreign goods or foreign exchange and that is the necessity to devalue. But it does help in understanding the policy implications. In the U.S. there has been a month ago a hearing, a special hearing in Congress, on the question of whether there is a conflict between policies that the U.S. should pursue in order to bring inflation down; and policies that the U.S. should pursue in order to help the external value of the U.S. dollar. When I got the invitation to these hearings I was surprised that the question was even asked, because many of the arguments were to ease the fundamental conflict; and you have to make a terrible choice between fighting inflation and helping the dollar. And this perspective tells us that basically we have the same fundamental symptoms to the same fundamental disease.

There is however one point where I would suggest modification, which has to do with the changes in exchange rates on the one hand, and inflation at home and abroad on the other hand. We know that if inflation at home equals inflation abroad there will be no change in the exchange rate, nor will there be a need for any changes in the exchange rate. Therefore we may find the situation where all the world is inflating or all the world is deflating or high inflation or medium inflation without any need of changes in exchange rates. I would suggest therefore to define the context of chronic or acute inflation, not in terms of the numerical value of the inflation rate, 200/o or 800/o, but rather in terms of the deviations of a given country's inflation rate from some measure of world inflation.

The second point I will touch in this context is the notion of a crisis. When someone mentions a crisis, I understand that something bad has happened. And here there is the question of what is the initial condition. It is clear that given inflation at home and abroad, for any given configurations of inflation at home and abroad, and if these inflations differ from each other, a change in the exchange rate is called for. An exchange rate adjustment; not necessarily a crisis, but these are maybe a matter of semantics, because I do know what is meant in the paper, namely it is a crisis because inflation was higher in the first place and required to take care of it.

An interesting statistic again in the paper is that the notion of devaluation can be seen a year ahead, if you just looked at the value a year ago you would have known that something is coming. That is a very important point because it illustrates the key fundamental difference between flexible exchange rate regimes and pegged exchange regimes; under a flexible exchange regime such a phenomenon could never appear; the reason is, as I mentioned yesterday, that exchange rates are fundamentally determined by anticipations about future events, so everyone sees the same handwriting on the wall that exchange rates will not wait until tomorrow; they will anticipate the tomorrow by depreciating today. Now, there is the question what does this mean about the consequences of this difference to the choice between regimes. And here the answer is not clear cut, because there is no presumption that the late adjustment by a year, as it would have been with a pegged rate, is more costly than anticipating adjustments somewhat ahead of time. The answer must be taken about the cost of fast adjustment versus slow adjustments and some countries may prefer one and the others prefer the other.

A fascinating chapter in this interesting research has to do with the relationship between international reserves on the one hand and domestic credit on the other. Here I would like to raise some minute question that might call for further interpretations. Let me summarize a major proposition. When a country has a reserve target and a shock that increases reserves, then the country will correct this shock by expending credit, and thus credit and reserves in the statistics will show co-movement, they will move together. Alternatively, if they have a monetary target, the opposite will take place, because a rise in reserves that increases the money supply will have to be upset by a decline in credit which reduces the money supply. Let me illustrate this point and in that way also raise some questions of interpretation, by using a diagram that was suggested to me eleven years ago by my friend Manuel Guitian.

We saw this picture before. So let me now put something on the axis. will put on the vertical axis international reserves; and on the horizontal axis domestic credit; and the sum of them is of course the total money supply. So, if you are having what is given as money supply there is a negative sloped schedule along which money supply speaks; if you increase reserves you better lower credit to maintain a given stock of money. So this is the money supply target. Consider now the situation in which the central bank is not

indifferent about how much reserves it holds. It has a reserves target; and they want to relate reserves to domestic credit; the simple picture is, for example, they have a desired reserves to domestic credit ratio, but the details are unimportant. If you have a reserve target says Professor Harberger, you will expand credit so as to return to the desired composition of reserve credit, namely, you will increase credit and move to point where you are back in the desired reserve ratio.

The question that I have is related to point "Q" double prime; are we going to stay there? After all even if the monetary authorities have not a monetary target the real demand for money, and the private sector has a demand for money, and it will be able to get to the desired quantity; that is the story of the pegged exchange rate, so we know that once we are at point "Q" double prime there is an excess of demand for money, and this excess demand for money will yield expenditures higher than otherwise; and the total money supply will decline and we will move back to "Q" double prime; and this is again in accord with the prediction of Professor Harberger because now the reserves and credit both go down together, for this is a positive correlation. The question that emerges is do we know that we are going to move from "A" prime to "Q" double prime? After all we are going to do it slowly, we are not going to use the helicopters, we are going to use open market operations and the equilibrium is maybe the one I have just described. The path that moves us direct to "Q" point to point "Q" through this particular phase. Now, what do we have along this path? We have along this path a phase in which reserves go down and credit goes up and then a phase during which reserves go down and credit goes down, in short, depending on the adjustment process itself, that is, the speed at which the monetary authority adjusts versus the speed at which the private sector adjusts; this may introduce some changes into this particular analysis. This is as it may. I would suggest to incorporate this body of analysis that has reserve targets as an important feature;

I would suggest to integrate this with literature on the demand for international reserves. This literature provides us with some insights. First, in my own work I found that the demand for international reserves on the part of countries depends positively on the variance of shocks; namely, countries that are facing a lot of disturbances will hold more reserves than countries that hold less disturbances. More open economies will hold more reserves than less open economies. This may provide us a clue about which countries will pursue what policy; the works of Alvaro Saieh suggest also some other sets of elements which determine reserve holdings. I would suggest to integrate these together. For example, Professor Harberger found very interesting statistics that countries are adjusting in an asymmetric way. If you have too many reserves you adjust slowly; if you have too little reserves you adjust fast. It makes sense. And in this literature on the demand for international reserves gave it a name; the name was given by Professor Machlup's, and the name was: Mrs. Machlup's Wardrobe. Why is it Mrs. Machlup's Wardrobe? Because his wife, whenever she got some extra clothes, was fine, but whenever she had only a few dresses immediately went to

buy one. That was the asymmetry of adjustment that Mrs. Machlup gave us and I wonder whether Mrs. Machlup and Professor Harberger can meet. What is the lesson? At this stage I would evaluate the paper as very informative and stimulating, because it gives a lot of room for interpretation and implications for the policy which can be developed. Suppose that I tell you another empirical regularity which is nice. Children who are dressed very well and who are going to church every Sunday, never end up in jail. Suppose I told you this empirical regularity; what is the policy implication? It means that we will take all inmates, all prisoners, will dress them up, will take them to church and we will release them? because this will solve the problem? Of course not. We have to understand why they were not dressed well in the first place; and the analysis here brings the question why some governments are large and some are small; why the share of credit to the public sector in some countries is large and in some is small; why the fiscal system in some countries is so strong that it enables us not to abuse the monetary instrument while in some countries it is so weak that it does not give choice to the use of monetary instruments. And this is the kind of questions that I am sure Professor Harberger will give us in the future.

After this performance I decided I would differentiate my intervention by keeping silent.

Es también para mí un placer comentar el trabajo del profesor Harberger e indicar que yo soy otro integrante de las siete dichas nacionalidades de sus ex alumnos que se han reunido aquí. Quizás esto pueda dar un cierto sesgo al comentario, porque uno tiende a ser un poco más favorable con la gente con que uno ha trabajado durante mucho tiempo. Encontré el trabajo interesante, en gran parte porque al principio, cuando lo vi por primera vez, que no fue hace mucho tiempo, me había preocupado un poco la cuestión de los indicadores. Siempre que veo un trabajo donde hay indicadores pienso que se corre el riesgo de que los lectores vayan a pensar que va a haber números mágicos que de antemano puedan decir cuál es la situación futura que va a ocurrir. Como siempre, el trabajo del profesor Harberger me demostró que su tratamiento de los indicadores es el más apropiado que se podía esperar. Los ha utilizado para destacar tendencias generales y en cierto modo lo que indica, que es importante, son las direcciones y no los niveles particulares de los indicadores. Lo que quiero decir con eso es que un indicador no se puede aplicar a todos los países; no hay ningún valor mágico que indique que si se pasa de ese número algo ocurre. Pero lo que sí se puede hacer es establecer tendencias, si el indicador se mueve de tal forma y se vé que la economía se mueve de tales otras formas, se puede en principio suponer que hay una cierta relación. Esto lo hace muy bien el profesor Harberger y espero que nadie piense que hay recetas para la economía. Esto me lleva a pensar en lo que mencionó de la economía como un organismo y no como un mecanismo.

Hace algún tiempo el profesor me contó una historia que le había ocurrido llegando a algún país. Al llegar a la Aduana le preguntaron cuál era su profesión y Harberger les contestó, "soy un médico de pueblo". No sé si la traducción capta lo que fue su respuesta: "I am a country doctor". En verdad la distinción que ha hecho es muy importante. El punto sobre la inflación mundial es interesante. Es cierto que en los tres períodos distinguidos en el trabajo la inflación parece que se multiplica por dos de uno al otro, por lo menos en el rango.

Mirando hacia atrás es posible que esto no sea tan sorprendente. Si uno observa la evolución de la economía mundial entre el 52 y la mitad de los años 60, el comportamiento, visto como está ahora la economía mundial, parece que era bastante bueno. Al comentar con alguno de los participantes se vio que en el primer período la inflación promedio en Estados Unidos era de 1,5, y claro, esos son órdenes de magnitud que hoy día nos parecen mínimos. Todos somos testigos de que esto puede explicarse en parte porque cuando las economías crecen y hay recursos la presión sobre esos recursos no es tan fuerte como cuando empieza

a haber una pequeña restricción de las disponibilidades de recursos en el mundo. En los años 70 uno solía interpretar que el mundo se enfrentó a la escasez de importantes productos; y esto plantea problemas de crecimiento. Reduce el crecimiento en general y surgen problemas de distribución, lo mismo que en un país en que sólo las demandas de productos exceden al producto disponible, y eso resulta en inflación. Hay problemas entre los países y si hay problemas de distribución hay presiones y hay inflación. Un punto curioso sería ver cuál es la relación de este proceso con la destrucción del sistema de Bretton Woods. El sistema de Bretton Woods funcionó muy bien cuando la economía mundial estaba creciendo bien. Hacia finales de los 60 el sistema comenzó a resquebrajarse y a principios de los 70 a causa de una serie de choques no tan marginales, pero choques, desapareció. Con ello también es posible que haya desaparecido un cierto grado de disciplina financiera. Entonces yo me pregunto, si la inflación es un fenómeno mundial, ¿hay que mirarlo desde el punto de vista global o se debe a las políticas que cada país sigue? Se me imaginó que podría ser que lo que ocurre es que si un país infla (lo que ocurre es que la inflación es en cierto modo como una enfermedad contagiosa, y aquí se habló mucho de las interdependencias de las economías nacionales, debidas a movilidad de capital) entonces parece que lo que ha ocurrido es que tenemos una cesta de manzanas que se han puesto muy juntas, y a lo mejor hay una podrida; y eso se pasa hacia las otras manzanas. Resulta difícil medir la inflación mundial, porque con la cuestión de las manzanas a mí me parece que una manzana grande con una inflación pequeña no es lo mismo que una manzana pequeña con una inflación grande. Entonces, con respecto a la sugerencia de Jacob, de medir las divergencias de países sobre el promedio, me pregunto qué tipo de ponderación habría que darle a ese promedio y si esto tiene alguna comparación con los problemas que él planteaba sobre la cesta de monedas. Recuerdo que hace algunos años Mandel mencionó que la única economía cerrada que él conocía era la economía mundial; y mientras estemos aquí y no nos vayamos a vivir a la luna, seguirá siendo la economía mundial. Entonces para la economía mundial el tipo de teoría monetaria que se le puede aplicar es la que ya se criticó, porque como la economía mundial es una economía cerrada la cantidad de dinero debería ser controlada. Pero ahí el problema también es cómo se define la cantidad de dinero mundial. No lo tengo muy claro, pero casi todas las proposiciones de teoría monetaria en economía cerrada tienen aplicación a la economía mundial, pero no tienen aplicación a las partes que forman la economía mundial. Me preocupó el observar que en los países de inflación crónica los saldos monetarios reales subían; me atreveré a preguntar por qué; y no sé; los números están ahí. Parece que crecen mucho, porque hay algunos países en que el ritmo de crecimiento, si esas son tasas anuales promedio, puede ser el 6 ó 70/o; y lo que ocurrió es que los saldos monetarios reales suben en estos cuatro países cuando la inflación está a 20 ó 300/o. ¡Qué incentivo, como decía Jacob, para explotar más el impuesto de inflación! Entonces no me sorprende que estos cuatro países también estén en los casos de inflación aguda. Los indicadores que el profesor Harberger escogió para explicar lo que hay por detrás de las expansiones monetarias me parecen apropiados. El más

importante es el Beta; la expansión del crédito al sector público como proporción del producto. Quizá yo veo este indicador como una especie de señal de cuánto el sector público absorbe, cuánta demanda pone sobre el pastel. Con la capacidad de endeudamiento de muchos sectores públicos en los años 70, quizá se pueda hacer un indicador o un parámetro que dé esa señal de una manera más completa. Porque a medida que la movilidad de capital aumenta es claro que el crédito interno y el crédito externo son sustitutos y que el sector público puede financiar grandes déficit con créditos externos, a déficit que son no sostenibles.

Ahora entraré en el nuevo indicador basado en la proporción de expansión de crédito y movimiento de reservas. Graficaré esto mediante una comparación: un banquero central es como un jugador de billar que utiliza tres bolas. Una de ellas es controlada por él —representaría el crédito doméstico— y se enfrenta a otras dos, de las cuales la segunda indica las reservas internacionales y la tercera, la cantidad de dinero. El banquero le da a la bola que él controla y dice, ¿bueno, a cuál de las dos le voy a dar primero? Entonces la teoría que ha surgido, el monetary approach, diría, yo no sé. Yo no sé la cantidad de dinero que la gente va a querer tener; pero lo que sí quiero garantizar es que sea la cantidad que yo quiero para mantener como nivel determinado de reservas; entonces le da a su bola que va a golpear primero a las reservas y de ahí pasa a la cantidad de dinero. ¿Qué es lo que ha ocurrido? Si se equivocó y ha dado más crédito que el que la gente quiere, no alcanza al objetivo de reservas, y entonces tiene que modificar su política de crédito. En cambio, si adopta la otra estrategia, la de un objetivo monetario, la presunción es que el banquero central sabe mucho mejor que el resto del sistema cuál es la cantidad de dinero que el sistema deba mantener; y eso parece que es una cuestión bastante complicada. Lo que es interesante del indicador del profesor Harberger es que señala lo que ocurre en la mesa de billar; la trayectoria de la carambola, y si las reservas son objetivo. Si es cierto, como él dice, que los países reaccionan cuando las reservas caen a cierto nivel mínimo, entonces se proponen objetivos de reservas. Pero luego, cuando las reservas están más o menos bien, se proponen objetivos monetarios. Entonces, ¿en qué siglo estamos viviendo? Cuando las reservas están bajas los banqueros centrales creen en el enfoque monetario de la balanza de pagos; y cuando las reservas son altas se vuelven todos Friedmanianos. Con esa solución no es extraño que ocurran crisis recurrentes.

Réplica del profesor Harberger a los comentarios de los señores Frenkel y Guitián a su exposición

En por lo menos dos de los comentarios se ha notado algo acerca de la situación diferente que se observa entre los países de inflación crónica y de inflación aguda. Ahora, con la ayuda del pizarrón, puedo explicar un poco mejor lo que tenía en mente en mi comentario inicial. Tenemos aquí M/P que es: saldos monetarios reales; y aquí la tasa de inflación o que podría ser la tasa de inflación más la tasa de interés real; pero en los hechos la mayor parte de los trabajos econométricos en ese tipo de relación han utilizado la tasa de inflación como variable. Pues bien, tenemos una curva de demanda así y eso va para cualquier país; puede ser un país con mucha inflación, con poca inflación, no importa, hemos medido relaciones de este tipo en muchos países. El caso de las inflaciones crónicas son más o menos así: pongamos 250/o de inflación y lo que está sucediendo a través del tiempo es que esta curva se está trasladando hacia la derecha a causa del crecimiento de población y por el crecimiento del ingreso per cápita. Lo que observamos son puntos así, en que la inflación se queda más o menos dentro de una banda y los movimientos dominantes a través de un período largo son los traslados hacia la derecha de estas curvas.

En el caso de las inflaciones agudas que terminan siendo, en los hechos, fenómenos de relativamente corto plazo, lo que observamos es más bien un movimiento a lo largo de la curva. O si es que la curva se está trasladando hacia la derecha, el cambio de inflación es tal que cuando pasamos de este punto a este otro punto el movimiento dominante es hacia lo largo de la curva y no el salto de la curva; y es así como se explica la diferencia entre estas dos cosas. En ese sentido yo no veo un caso de que al subir la tasa de inflación uno aumente la base del impuesto inflacionario como Jacob estaba interpretando. Creo que es simplemente un fenómeno de un movimiento a lo largo del tiempo, ya que en todo país que crece, todas las curvas de demandas se trasladan a la derecha y este caso no es en este sentido ninguna excepción.

En cuanto a la idea de definir inflación crónica, inflación aguda, como desviaciones de la norma, la norma siendo la inflación mundial, estoy totalmente de acuerdo. Aun en otro informe de progreso sobre este conjunto de estudios puse el título "In Step and Out of Step with the World Inflation" en que había un montón de países que tenían su proceso inflacionario con el mismo paso que la inflación mundial, después estaban los demás países que eran las excepciones, inflaciones agudas, inflaciones crónicas y los países de crisis de devaluación, que estaban fuera de paso con la inflación mundial.

En cuanto a la demanda de reservas internacionales, comparto con el profesor Frenkel el hecho de que hay ciertas implicancias de nuestro trabajo en cuanto a esa demanda. Pero creo, si yo pudiera hacer una sola apuesta, para medir la demanda de reservas internacionales y si tuviese una opción

que sería tomar los datos de todos los años, de todos los meses, de todos los trimestres y sacar una demanda de reservas internacionales de ese enfoque; y si tuviese la otra alternativa de decir, pues tenemos algunos meses, algunos trimestres, en que el país está siguiendo una política de reservas y tenemos otros meses en que no lo está y, para adivinar la demanda es mucho más importante la demanda en aquellos períodos que el país está siguiendo una política de reservas, yo optaría por la segunda alternativa. Es decir, depurar mis datos dejando de lado aquellas observaciones en que interpretamos que al país no le importan las reservas. Si yo tengo demasiadas reservas de todas maneras lo que hago es un movimiento al azar no es una cosa que tiene explicación, no tiene por qué tener explicación, no estoy persiguiendo esa meta. Pero mientras mis datos dicen que el país tiene una política de reservas entonces hacia dónde va, va a tener más sentido. Entonces haría la predicción que entre dos estudios, uno que trata con una submuestra de datos, trabajando solamente con épocas en que se persigue una política de reservas, creo que esto tendría probablemente resultados más interesantes que el caso en que se utilizan todos los datos.

En cuanto a la pregunta acerca de las causas internacionales de la inflación internacional, puse aquí la inflación internacional sólo como una especie de background, no como una parte muy fundamental del estudio. En otros trabajos en que he profundizado un poco más en la inflación internacional he aislado cuatro causas fundamentales. Una, los déficit estadounidenses conectados con la guerra de Vietnam. Segunda, la introducción, a mi modo de ver muy fuera de su tiempo en un sentido del derecho especial de giro. Recuerdo que en el año 65,66, todo el mundo se lamentaba de que había en el sistema internacional una falta de liquidez y que tuvimos una entidad internacional para crear nuevas fuentes de liquidez; y cuando uno mira desde el enfoque de hoy a esa cosa nosotros no hemos tenido nada sino una enorme aseveración de la inflación mundial, después de haber creado nuevas fuentes de liquidez. En el mismo sentido de fuentes de liquidez. Tenemos las facilidades de petróleo, que son otro tipo de dinero internacional creado por el sistema internacional; y la fuente de liquidez internacional que constituye el mercado de eurodinero que son dineros todos re-creados por bancos en países que no tienen el dólar como medio de circulante; marcos creados en otros países que no tienen el marco como medio circulante, etc. Entiendo que uno puede definir dinero en tal sentido que esas euromonedas no cuentan como dinero, porque hay activo y pasivo por un lado y por otro las cosas se cancelan en el sector privado mismo, pero de todas maneras he medido, he observado en la inflación mundial que el dinero mundial tal como lo mide el Fondo Monetario se ha acelerado a pasos más o menos iguales que la inflación mundial y no me cabe duda de que para explicar el movimiento de inflación mundial, el dinero basta y para explicar el movimiento de dinero mundial, las reservas internacionales bastan. Eso sí, yo creo que esos dólares que se crean dentro del sistema de euromercados-euromonedas-esos dineros pueden también servir de reservas para el sistema internacional, y que en ese sentido deben ser mencionados al hacerse una lista de causas de esa inflación.

En cuanto al mecanismo de propagación es interesante, y merece estudio. En general, lo que pasa es lo siguiente: que en un sistema de este tipo de cambio fijo cualquier país que mantiene su tipo de cambio fijo va a tener tarde o temprano que compartir la inflación mundial. Entonces hay países, como por ejemplo, México, que incluso anticipó un poco la inflación; ellos estaban haciendo su emisión como el resto del mundo y han podido mantener su tipo de cambio hasta el punto que lo hicieron, solamente gracias al hecho de que el resto del mundo estaba inflando a la vez, al mismo tiempo. Entonces, por otro lado, uno tiene países como Panamá o Guatemala, que han mantenido una política monetaria más moderada y realmente han importado las reservas del mundo antes de tener su propia inflación. Y uno tiene toda la gama de países, aquellos que anticipan la inflación mundial, aquellos que van más o menos paso a paso con la inflación mundial, y aquellos que esperan hasta que la inflación mundial golpee en la puerta y entre a la casa como un huésped no muy grato.

Pues con el profesor Robichek estoy totalmente de acuerdo, es decir, en un próximo paso, una de las cosas que uno puede decir como una ventaja (una desventaja de este estudio mío), es un comentario sobre cuán observadores son nuestros colegas de la profesión de economistas; pero todo lo que está ahí sale de un libro: *International Financial Statistics*. No hay nada en mi paper que no esté dentro de ese solo libro de mayo de 1978, que tiene datos anuales de todos los países. Entonces al tener yo la oportunidad de leer otro libro más voy a incluir el aumento de crédito internacional a la par con el otro en el ejercicio.

En cuanto al comentario del señor Baliño de por qué estos países tenían Beta, Gama y Lambda alto. Yo no sé. Qué puedo decir.

Estudio la inflación; veo que yo y todos mis colegas estamos diciendo siempre que es el dinero la causa de la inflación. Entonces identificamos los países con altas tasas de inflación como aquellos que tienen altas tasas de aumento de dinero y los con bajas tasas de aumento de dinero con bajas tasas de inflación. Entonces me dije, pero por qué las altas tasas de dinero en unos y por qué las bajas en otros, yo encuentro como explicación de las altas tasas en unos países y las bajas tasas en otros países Beta, Lambda y Gama. Entonces viene Baliño y me dice, pues, por qué estos países tienen altas tasas de Beta, Gama y Lambda, y en el hecho, no tengo una buena respuesta. Lo que es muy interesante, entre paréntesis, es cuán concentrada ha sido la experiencia mundial de inflación en el Cono Sur de Sudamérica. Definiendo Brasil como parte del Cono Sur, se tiene que probablemente más del 700/o de la experiencia mundial, con inflación fuera de la inflación misma mundial, ha tomado lugar aquí, y conociendo los países, yo no veo que los procesos inflacionarios de Brasil, Uruguay, Argentina y Chile tengan mucho en común. En el hecho, entre otras cosas, la inflación chilena y la argentina han sido casi ciento por ciento de origen fiscal. Y la inflación uruguaya ha sido casi ciento por ciento de origen no fiscal. El Fisco en el Uruguay hasta en los años recientes simplemente no ha ido al mercado para pedir préstamos. En el Uruguay uno tiene una inflación

de crédito al sector privado, un crédito motivado mayormente por su segundo Banco Central; ha habido tradicionalmente otra fuente de emisión además del Banco Central que es el Banco de la República. El Banco de la República no está sujeto, o no estaba sujeto a las mismas reglas y normas de los demás bancos; y el Banco de la República tuvo la imagen de que él era como San Nicolás, Santa Klaus, para dar regalos a todos los niños necesitados. Se dio crédito a ese sector; cuando los ganaderos necesitaban algo, pues se les dio a los ganaderos; y entonces el presidente del Banco de la República siempre tenía muchos amigos en el sector privado y tenía una imagen de él mismo muy buena. Pero no cabe duda que ese Banco era responsable por el 90% de la inflación uruguaya. Yo no sé si José Huber me va a desmentir en eso, pero parece que no. Entonces en el Brasil ha sido similar. Brasil tiene el Banco do Brasil y, especialmente en los últimos años, a partir de 1967, el Gobierno del Brasil no ha pedido créditos al sector bancario. En el hecho, en los años 74 y 75 uno podía decir que el crédito nominal al sector público era menos en 1974 de lo que era en 1964. Así es que el sector público no fue la fuerza más fundamental en ese lapso, pero lo fue mayormente el aumento de crédito al sector privado.

Durante ciertas partes del período por lo menos uno de los mecanismos más fuertes para expandir el crédito en el Brasil ha sido el mismo Banco do Brasil.

Mientras los demás bancos estaban bajo reglamentación muy fuerte por parte del Banco Central, de una manera u otra el Banco do Brasil ha escapado. Eso solamente es para darles una idea de que en este Cono Sur no se trata de una sola fuente de inflación, de un sólo tipo de experiencia.

Finalmente el Sr. Sivarich hace un interesante comentario sobre la relación entre los cambios de precios relativos y la tasa misma de inflación. Esto es una cosa que yo he notado personalmente desde hace muchos años y, en el hecho, interpreto ese fenómeno como una de las grandes desventajas económicas de la inflación. Se podría decir que vemos más movimientos de precios relativos cuando tenemos 50% de inflación que cuando tenemos 5%; y eso es bueno, porque los precios relativos son señales y están operando mejor con más inflación. Yo no veo eso. Creo que los precios se ajustan con diferentes rezagos. Hay diferentes grados de flexibilidad de precios en diferentes mercados y lo que pasa en una inflación es que los precios que son rápidos para adaptarse se mueven inmediatamente con la inflación y hay otros precios como arriendos, como precios de servicios públicos, precios de transporte y cosas de ese estilo, que se mueven muy lentamente y a medida que esos precios relativos cambian están dando señales malas para la asignación de recursos. No es el hecho de que el precio de la electricidad esté bajando mientras mantenemos la tarifa fija y tenemos inflación, simplemente eso es un error del sistema. En un proceso inflacionario uno está tratando de palpar un mundo en que realmente uno no tiene una visión clara, mientras que en una situación de relativa estabilidad de precios las señales de precios relativos tienen un mensaje más acertado y mucho más claro.

SOME REFLECTIONS ABOUT EXTERNAL PUBLIC DEBT MANAGEMENT

Expositor: Sr. E. Walter Robichek(*)

Moderador: Sr. Sergio de la Cuadra F.

Comentaristas: Sr. Arnold C. Harberger

Sr. Carlos Rodríguez

(*) International Monetary Fund.

Some Reflections About External Public Debt Management

Let me begin with a proposition that is quite obvious but all too frequently ignored in discussions about external debt management: The debt of a nation is not repaid as a rule. If it were attempted to be repaid it would in all likelihood cause severe economic dislocations. In fact, debt is on the rise virtually everywhere, to the extent that it is not eroded by inflation, and in many countries not just in absolute terms, but in relation to their national income. This proposition may be more readily accepted for a nation's internal than for its external indebtedness, particularly when the external debt in question is that of the public sector. The distinction that is frequently drawn between external and internal debt is based on the exchange risks attaching to the former. The danger that domestic public debt will not be repaid must be rated as small in this era when governments have ready access to central bank financing, but the same cannot be said of public debt expressed in foreign currencies. This is so because the public sector may not make sufficient allowance for exchange risks (in cases of countries operating with fixed exchange rates the attachment of the authorities to the existing rate militates against the allowance for exchange risks on the part of the public sector) and because it may not make adequate comparisons of the rate of return deriving from the use of foreign borrowing and the cost of such borrowing. This last point is picked up later on.

In the case of the private sector, I would argue that the difference between domestic and foreign debt is not significant—barring governmental interference with the transfer of service payments or other clearly inappropriate public policies—if it exists at all. The exchange risks associated with foreign borrowing are presumably taken into account as are the other risks associated with borrowing, whether it be from domestic or foreign sources. More generally, private firms can be expected to be careful in assessing the net return to be derived from borrowed funds as compared with the net cost since their survival as enterprises is at stake. Such an assessment cannot be taken for granted in the case of public sector entities.

Increases in a nation's external indebtedness reflect net entries of savings from abroad which, together with domestic savings, finance domestic investment and which are the counterpart of deficits in the current account of the balance of payments. Leaving aside major oil exporting countries with a low absorptive capacity, the typical developing country runs a current account balance of payments deficit, which means that it is dependent on a continuous inflow of foreign savings, and with this inflow, its external indebtedness rises steadily. By definition, a country in these circumstances does not actually repay external debt. Consequently, its amortization payments cannot possibly pose a servicing problem for the nation, because

Note: The author is Director of the Western Hemisphere Department of the International Monetary Fund. This paper presents his personal views and should, therefore, in no way be construed as reflecting the official views of his employer.

they are more than financed by new external debt incurred. The only external debt service cost is the interest on this debt, and then only when the interest rate is positive in real terms. This cost is a burden on the economy only if it exceeds the value of the additional output that is obtained from the use to which the foreign savings are put; in other words, only when foreign savings have gone into financing a bad investment. It is worth stressing also that in principle it does not matter at all whether the incremental output which foreign savings helped generate is exported or consumed at home. There will be a relief for the country's balance of payments in either case—in the first by way of export growth and in the second by way of import substitution—always provided that the new production is efficient in the sense of being internationally competitive. The remittance of interest or other earnings on foreign savings cannot possibly pose a problem so long as these savings can be and are productively invested.

There is understandably greater concern with certain forms of foreign savings flows to a developing country than with others. These flows can be grouped into three broad categories, namely, flows into the private sector without official guarantee, the same flows with official guarantee, and flows into the public sector. The first category holds out the strongest presumption that the foreign savings will be profitably invested and, hence, this category should pose the least potential debt servicing problems. Bringing an official guarantee into play diminishes somewhat the force of the discipline that tends to ensure that foreign savings are profitably invested, although it minimizes the risk of governmental interference with the transfer of service payments. Overborrowing in both of these categories is, therefore, very unlikely, provided official guarantees are given on a selective basis. With this proviso, it is not necessary to distinguish in the context of this paper between the different forms which the flow of foreign savings into the private sector can take. But when dealing with flows of foreign savings into the public sector, a distinction needs to be drawn between those originating from official and those originating from private sources abroad. The danger of overborrowing from official sources abroad, including in the latter the public international financial institutions, can be dismissed simply because the supply of such funds is severely limited and hence subject, as a rule, to stricter conditionality than finance from private sources abroad. This is why it is the latter, and more particularly public borrowing on international financial markets, that poses potentially the greatest debt servicing risks.

All access by public authorities of developing countries to international financial markets essentially provides budget support even if it is strictly linked to a high—priority investment project of a state enterprise rather than a general—purpose loan to the Central Government. Even the linkage to a particular investment project in the decentralized public sector will relieve the Central Government of the need to transfer from the budget corresponding funds to the state enterprise in question, unless the investment project is curtailed or abandoned altogether if the requisite foreign financing cannot be obtained. And budget support from external sources, in this

broadest sense of the term, is tantamount to general balance of payments assistance, unless the foreign funds are put to international reserves. One might well ask whether, if this is the case, such external financing is legitimate at all. The answer surely must be that it is, but only in appropriate circumstances and on an appropriate scale. The process of determining the appropriate circumstances and scale is the main subject of this paper. Among the developing countries, the most suitable candidates for borrowing on international financial markets are the middle-income ones. They can afford to borrow on commercial terms, and thereby vacate to the poorer ones access to the bulk of the funds available on concessionary terms from public sources abroad.

The quantification of the scale on which the public authorities of a developing country could and should borrow on international financial markets is obviously difficult. The conventional debt service ratio for determining country risks should be ruled out as a guide in this regard. Lumping together amortization and interest payments in the numerator of this ratio militates against the proposition that the typical developing country needs to increase continuously its external indebtedness and hence does not repay external debt in global terms. And the denominator of the conventional debt service ratio implies a bias in favor of export promotion and against import substitution, even if the latter is efficient, a bias that was challenged earlier in this paper. What is imperative is that investment in either new export or new import substitution capacity be productive in the sense of yielding cost efficiently sufficient incremental output, and if this condition is satisfied, debt service payments will pose no transfer problem in either case.

It follows from this reasoning that a debt service ratio with the interest as numerator and the prospective national income or its prospective growth as denominator would be more relevant measures of the true external debt service cost. But this formulation should not be expected to yield a universal standard either. What might be an appropriate value of this ratio for one country may not be appropriate for another, and it may well also change for the same country over time. By way of a general rule, the value of this ratio needs to reflect the marginal efficiency of a country's capital stock, regardless of the extent to which its capital formation is being externally or internally financed. But this is a "golden rule" that does not provide much by way of operational guidance.

An assessment of a country's capacity to sustain over time a certain net capital inflow from abroad, and hence its capacity to sustain a current account balance of payments deficit, would appear to be a more promising approach to the rationalization of external debt management. Capital inflows in the form of equity investments in the country and of acquisitions of domestic financial assets are essentially spontaneous decisions of private investors abroad and determined by the recipient country's political conditions, its treatment of foreign capital, its overall economic performance, its interest rate structure, its exchange regime, etc. If these conditions

are favorable and not subject to sudden changes, one could assume that the country will experience a steady inflow of private foreign capital in these spontaneous forms. One could also assume that a debtor country will use whatever financing from official sources abroad it can muster, a wholly legitimate strategy, considering that such funds are typically available on concessionary terms, which, of course, minimizes the cost of servicing the debt.

This leaves borrowing on international financial markets as the swing source of foreign finance, and if one assumes that private borrowers from these markets will typically see to it that they obtain an adequate economic return, then the true swing element is the access to these markets by public authorities of developing countries. It is these flows that have increased so spectacularly in recent years.

A few figures will indicate the order of magnitude of this swing source of the foreign savings flow in the context of Latin America and the Caribbean. The net inflow of capital into this region (excluding Cuba, St. Lucia, and St. Vincent) over the five years following the first quantum jump in world oil prices—the period 1974 through 1978—was US\$85 billion. This net capital inflow financed a regional current account balance of payments deficit of US\$61 billion and a net official international reserve buildup of US\$24 billion; US\$20 billion net in foreign savings went to the private sector of the region and US\$65 billion net went to its public sector. Private foreign financial institutions provided more than two thirds of the latter flow, which raised their claim on public authorities of the region from US\$11 billion to almost US\$56 billion over this five-year period.

These figures tempt one to speculate whether the current account balance of payments deficit of Latin America and the Caribbean over the five year period covered was one that is or is not sustainable and whether the dependence of the public authorities of the region on international financial markets was or was not excessive. On the face of it, there is certainly no ground for judging a net inflow into the region of foreign capital equivalent to less than 4-1/2 per cent of its GDP to be unsustainable—the more so if one considers that close to 30 per cent of this inflow was put to official reserves—nor for ruling a priori that the source and destination of a little more than one half of this total net inflow of foreign savings represented an excessive dependence of the public authorities of the region on international financial markets. But considering the wide country-by-country variations of the absolute and relative magnitudes of these flows over the five years under review, and the several external debt problems faced in the region during this period, one cannot base a judgment on the global indicators just referred to.

As of the end of 1978, 92-1/2 per cent of the total exposure of private foreign financial institutions with the public authorities of the region was in seven countries—Mexico, Brazil, Venezuela, Peru, Argentina, Chile, and Panama, in the order of the absolute magnitude of this exposure—and as of the same date, these seven countries owed some two thirds of their combined global external public debt to this category of creditors.

Admittedly, this group of countries accounted for more than 85 per cent of the total regional GDP in the period under review, and if it were not for the presence of Panama in this grouping and the absence from it of Colombia, one could conclude that international financial markets have a bias in favor of the countries with the largest economies. But even if warranted, such a conclusion would not be of any operational value either.

Measures of Dependency on Official Borrowing from Private Foreign Financial Institutions (PFFI)
of Countries in Latin America and the Caribbean

Country	With a PFFI debt of US\$500 million or more as of 12/31/78	With a growth of PFFI debt of US\$250 million or more in 1974-78	With a ratio of more than			
			20% or more in the growth of PFFI debt in relation to GDP in 1974-78	3- 1/2% or more in the current account balance of payments deficit in relation to GDP in 1974-78	50% or more in PFFI debt in relation to total external public debt as of 12/31/78	50% or more in the growth of PFFI debt in relation to the growth of total external public debt in 1974-78
	(In millions of U.S. dollars)		(In per cent)			
Argentina	1,983	1,163		1/		
Bahamas				1/	88.5	
Barbados				10.7		
Bolivia	704	676	4.4	4.6		64.7
Brazil	17,900	15,380	2.1	4.5	65.0	74.2
Chile	1,601	1,576	2.6			107.5
Colombia	500	307		1/		
Costa Rica		299	2.4	10.6		
Dominica				9.5		
Dominican Republic				6.1		
Ecuador	858	804	3.0		58.8	74.6
El Salvador				3.9		
Grenada				5.0		
Guatemala						
Guyana			4.6	12.7		
Haiti				3.7		
Honduras				9.7		
Jamaica		260		6.8		
Mexico	22,286	16,721	4.3	3.8	84.9	84.9
Nicaragua		364	3.9	6.9		51.8
Panama	1,183	986	9.6	9.4	62.1	68.1
Paraguay				15.2		
Peru	2,049	1,572	2.5	7.5		52.4
Suriname				8.4	66.7	2/
Trinidad and Tobago				1/	67.6	82.3
Uruguay						
Venezuela	4,570	3,994	2.5	1/	62.9	66.0
Those with no entry	2,229	766	0.2	2.3	30.2	25.5
Region	55,863	44,867	2.3	5.0	59.5	68.8

1/ Countries with a current account balance of payments surplus in 1974-78; these are excluded from the regional ratio.

2/ Suriname's external public debt contracted in 1974-78 while its official debt to private foreign financial institutions increased.

The preceding table was prepared in an attempt to probe whether the experience of Latin America and the Caribbean over the five-year period 1974-78 might not yield a clue from which an operational guideline for a sustainable path of public borrowing on international financial markets could be derived. This table applies five tests to the countries of the region. Two tests are the measure of the exposure of private foreign financial institutions in the public sector of the countries covered—the absolute magnitude of this exposure as of the end of 1978, and the increase of this exposure over the period 1974-78. These two variables are believed to be the ones to which private international bankers give great weight in determining their country exposures. The bench mark of US\$500 million for the stock of a country's external public debt to private foreign financial institutions is nothing more than what appeared to be a reasonable round number; the bench mark of US\$250 million for the growth in the stock over the five-year

period under review was derived from the proposition that any such growth of 100 per cent in the bench mark for the stock was to be considered a significant growth. A third test relates the increases in the exposure of private foreign financial institutions in the public sectors of the countries covered to their respective GDPs over the period 1974-78, and the 2 per cent bench mark employed reflects the view that this percentage might be considered a typical contribution to the financing of typical current account balance of payments deficit in the region. The last two tests are a measure of the dependency of the countries covered in their global external public debt operations on borrowing on international financial markets—the ratio of this type of debt of countries in the region to their global external public debt as of the end of 1978, and the ratio of the increases in these two variables over the period 1974-78. The bench mark of 50 per cent for both “dependency” ratios is, of course, quite arbitrary, but it was felt that any ratio in excess of 50 per cent would normally have to be considered a high degree of dependency on private international financial markets. The table also singles out countries with current account balance of payments deficits in 1974-78 of more than 3-1/2 per cent in relation to their GDP over the same period. This is a measure of the dependence of the countries covered on foreign capital inflows in general, and was considered to be a kind of scale variable for judging how the five preceding tests performed in relation to what one might have expected a priori.

Of the 27 independent countries of the region (excluding Cuba, St. Lucia, and St. Vincent), 10 —Barbados, Dominica, the Dominican Republic, El Salvador, Grenada, Guatemala, Haiti, Honduras, Paraguay, and Uruguay— show a relatively small involvement with private foreign financial institutions on all five tests, and 4 countries —the Bahamas, Guyana, Jamaica, and Suriname— on all but one of these tests. In this group of 14 are 3 countries —Dominica, Grenada, and Haiti— with zero net public borrowing on international financial markets in this period and 2 —the Bahamas and Barbados— with net repayments of this type of external public debt. Yet, all but one of these 14 countries —the Bahamas— had current account balance of payments deficits in the period under review, and 9 of them had deficits that were equivalent to 5 per cent of their GDP or more. In fact, this group of countries includes the 3 with the largest current account balance of payments deficits in relation to GDP in this period —Paraguay, Guyana, and Barbados— and those with the fifth, sixth, seventh, and ninth largest deficits in relation to GDP—Honduras, Dominica, Suriname, and Jamaica, in declining order.

At the other extreme, five countries of the region —Brazil, Ecuador, Mexico, Panama, and Venezuela— show a relatively large involvement with private foreign financial institutions on all five tests, and three countries —Bolivia, Chile, and Peru— on all but one. Yet, only two countries in this group of eight —Panama and Peru— had current account balance of payments deficits in this period that were distinctly large in relation to their GDP, and this group includes one country with a current account surplus

—Venezuela— that put to its official international reserves the full amount of its net public borrowing on international financial markets. Three other countries that ran current account balance of payments surpluses and borrowed large absolute amounts on international financial markets in this period —Argentina, Colombia, and Trinidad and Tobago— also put to their official reserves all the proceeds from their net public borrowings of this type.

The first reaction to these findings might well be that the pattern that emerges from them was almost perverse in that countries in relatively strong current account positions tended to rely heavily on international financial markets, and countries in seemingly more precarious positions tended to eschew access to these markets. But the conclusion that the results of the foregoing empirical exercise are illogical is not warranted. The pattern that at first blush might strike one as perverse is quite consistent with a banker's general approach of looking for customers who are the most creditworthy—in this case the middle— income countries. The poorer countries, in turn, tend to qualify typically for more international finance on concessionary terms from public international financial institutions and from other governments, and hence are not all that dependent on international financial markets.

Given the great diversity of developing countries, it just is not possible to draw a line of demarcation between a sustainable and an unsustainable external public debt management by the use of a formula that could be applied to all of them. One is, therefore, forced to look for an approach that is not based on any predetermined yardstick. An alternative that suggests itself is a macroeconomic exercise of targeting the scale of net external borrowing of the public sector in general, and the scale of its net borrowing on international financial markets in particular, and then validating these numerical targets by a process of consultation with the international financial community.

The staff of the International Monetary Fund has been experimenting, in the context of a few recent extended facility programs, along this line of programing with a conceptually simple technique of quantifying current account balance of payments positions that can be judged to be sustainable in the medium term. Unlike stand-by programs for balance of payments adjustment with a typical time frame of one year, within which the distinction between consumption and investment outlays does not have much relevance, for extended facility programs with a typical time frame of three years the Fund staff is mandated to design an adjustment process that will ease a country's structural balance of payments weakness. Such an adjustment process typically calls for investment in new export and import substitution capacity, the output from which can meet the test of international competition. With the present state of the art, programs for a sustainable balance of payments performance with adequate economic growth are bound to be lacking in precision. But they do provide some approximation to the increase in a country's global external debt that it can afford on reasonable expectations concerning its economic performance.

Such programing exercises essentially involve targeting of an economic growth rate for the medium term and estimating the requisite investment effort to ensure the attainment of this growth target. Domestic savings are projected for the period ahead, and so are capital inflows from abroad in the form of equity investments, acquisitions of financial assets, and access to external public sources of finance. It is then assumed that the balance of the needed foreign savings can be raised on international financial markets.

To make these calculations operational, it would need to be ascertained whether or not the private international banking community is prepared to lend to the public sector of the country concerned on the scale envisaged. In coming to a view on this question, the foreign bankers should give the utmost weight to their readiness to provide funds on this scale for many years to come. If their response is positive, then the current account balance of payments deficit programed by the debtor country can be judged to be sustainable in the medium term. If foreign bankers are not prepared to lend to the public authorities of a developing country for years to come on the scale envisaged, then either the domestic savings target will need to be raised or the domestic investment target lowered to compensate for the difference between the amount of public borrowing on international financial markets originally contemplated and the amount that foreign bankers are prepared to lend. If the domestic investment target is lowered, then it would in all probability be necessary to lower the projected economic growth rate as well.

Whatever the scale on which foreign bankers indicate they are prepared to lend to the public authorities of a developing country, their signal would need to be interpreted as a declaration of their intention to keep on raising their lending limit for the country in question commensurately without time limit. Only in this manner can a country's current account balance of payments deficit be sustained and debt service problems avoided with certainty. The worst of all courses that the private international financial community could follow vis-a-vis a developing country is one of alternating periods of excessive lending and of ceasing all new lending. It is such a discontinuity that has been an ingredient of most of the external debt crises of the recent past.

If the private international financial community is prepared for a steady provision of new funds to a developing country, then the authorities of the debtor country will need to see to it that its creditworthiness is preserved by the pursuit of policies all along the line that promise to generate the requisite domestic savings, attract the projected spontaneous inflows of private foreign capital, and ensure the productivity of the investments financed by foreign as well as by domestic savings.

A question worth addressing is to what extent the International Monetary Fund is in a position to underwrite financially a country's medium-term economic program. The combined current account balance of payments deficits in 1974-78 of the 22 countries in Latin America and the

Caribbean (excluding Cuba, St. Lucia, and St. Vincent) with such a deficit in this period (in other words, excluding the five countries with surpluses) came close to US\$66 billion, and the combined deficit of the seven countries in this group with a public debt to private foreign financial institutions of US\$500 million or more at the end of 1978 exceeded US\$57 billion. Taking these deficits as being indicative of the period ahead, annualizing them, and relating them to the new quotas in the Fund which are expected to become effective later this year, access to the Fund's resources under three-year extended arrangements could finance slippages in the current account balance of payments performance due to errors in programming or unforeseen contingencies of approximately 15-1/2 per cent for the first combination of countries, and of approximately 13-1/2 per cent for the second combination. It is to be stressed that the scale of the Fund's financial operations assumed in these calculations would represent a quantum jump over its historical experience and would in all likelihood strain its liquidity. But then the assumption of simultaneous extended arrangements with the region's seven major debtors to private foreign financial institutions with current account balance of payments deficits in 1974-78, let alone with all the 22 countries with such deficits in this period, is distinctly unrealistic. Furthermore, one cannot rule out the possibility that the International Monetary Fund may, in future, borrow much more heavily than in the past, precisely in order to be in a position to serve better its member countries in need.

Countries with stand-by or extended arrangement with the International Monetary Fund should not have any serious problem of convincing the private international financial community that their medium-term economic programs are in fact equilibrium programs and that every effort will be made to observe them. But not all developing countries relying prominently on access to international financial markets may wish to enter into an arrangement of either kind with the Fund. What assurances can they offer that their medium-term programs are technically sound and that they have every intention of observing them? The technology involved in framing macroeconomic programs, fortunately, is not a Fund monopoly. The staffs of the World Bank and the Inter-American Development Bank are competent to perform this task as well, and it is not necessary to limit the field to international institutions with financial functions. Also, many developing countries have their own capability for macroeconomic programming, and those that need technical assistance with such exercises could be given this assistance by any competent international agency, including the Fund, even when the national authorities wish to take exclusive responsibility for the program framed.

The monitoring of performance under a program would seem to raise more difficult problems when the debtor country does not have a stand-by or extended arrangement with the International Monetary Fund. The technology involved in monitoring a program probably is not as widely diffused as the technology involved in framing it, and monitoring is costly in terms of manpower and money. The staff of the Fund has acquired over more than two decades a special expertise in this area, although its

monitoring systems depend, of course, on the full cooperation of national authorities and technicians. Indeed, in several cases the latter have adopted these or similar systems for their own use. But monitoring by the debtor country's authorities themselves will not have the same credibility as monitoring by a more disinterested party. And if the private foreign banking community were to assume the task of monitoring a program which it has underwritten with a lending commitment, it would probably have to content itself with only a partial system, involving essentially the verification of observance of the limits set on the global external public debt of the borrowing country. What would remain uncovered by such a limited monitoring system are the critical areas of demand and exchange rate management. It is to be noted, however, that the latter is a standing responsibility of the International Monetary Fund—and more explicitly so now than before under its amended Articles of Agreement—regardless of whether a country has or has not a financial arrangement with it.

Turning to operational issues, from the proposition that a developing country typically increases over time its global external debt in general and its external public debt in particular, it follows logically that the maturity structure of this debt is of no real consequence. On the assumption of a steadily rising external debt, it obviously does not matter whether in a given year a one year maturity, the first annual installment of a long-term maturity or the last installment of a medium-term maturity is "paid". Grace periods are of no real relevance either, so long as a country's external debt has been given so much attention only because maturities are seen to be bunched whenever a country encounters difficulties in servicing its external debt. And debt rescheduling or refinancing exercises have been necessary only because foreign capital inflows ceased abruptly in response to severe balance of payments difficulties typically brought about by inappropriate demand and exchange rate policies in debtor countries that were all too frequently sustained for a time by excessive foreign borrowing.

If one could assume a rational external debt management, one could even consider whether loans and credits to a developing country by private foreign financial institutions need to have a fixed maturity term at all, or whether they could not be extended for an indefinite length of time. Fixed maturity terms could be seen to offer certain advantages to the lender and the borrower. One advantage perceived by the lender is his ability to adjust his country exposure in the light of his perception of changes in the country risk; another is his ability to ensure a measure of flexibility in the interest he charges in response to changes in money and capital market conditions; and yet another is the retention of a modicum of leverage on the quality of the policy mix and on the investment climate in the borrowing country. The borrower, in turn, could see certain benefits from fixed maturity terms in that they lock in the foreign loans and credits at stable interest cost over stipulated time periods.

But fixed interest rates have been yielding to floating ones, a change that has removed the lender's and also the borrower's incentive to protect

himself against changes in market conditions. And fixed maturity terms do not give the lender in practice all that much discretion to reduce his country exposure, as has been demonstrated in several recent cases. A foreign banker can at best hope to freeze his country exposure if the debtor country passes through financial difficulties, but he cannot really hope to extricate himself in these circumstances; and when a country does well, he will not only not wish to withdraw but will be ready to increase his exposure in the country. What is of greatest relevance in the present context is that the desire to adjust the exposure in a developing country at the lender's discretion militates against the proposition that the country's external debt should be rising at a steady pace. This would seem to leave only one perceived advantage of fixed maturity terms—a lender's leverage on the policies and investment climate of a debtor country. Small though this leverage is likely to be, it alone could be a consideration of sufficient weight to justify the continuation of the conventional practice of stipulating fixed maturity terms for foreign bank loans and credits to the public authorities of a developing country. In any case, it is worth stressing that the approach to external debt management advocated in this paper is not invalidated by either a continuation or a discontinuation of the practice of fixing maturity terms.

But there is an operational problem that does bear on this approach. The practice of syndicating foreign loans among private foreign financial institutions, and particularly loans to public authorities of developing countries, is evidently spreading. It is safe to assume that, as experience is being gained in the process, the techniques of syndications are being steadily refined. But it is not at all certain that these techniques already are sufficiently developed to permit the private international banking community to give the collective commitment to a steady increase of its country exposure that is a key element in the strategy advocated. On this assumption, the critical question raised in this context is whether these syndication techniques can lend themselves to being sufficiently improved. It would not be too surprising if the bankers' initial reaction were negative, but it would be well worth the effort to insist that they give the matter the serious consideration which it is believed it deserves.

The increasing reliance on loan syndication implicit in the approach to external debt management advocated in this paper raises another question: Would there be any room left for the interplay of market forces within the scheme favored in this paper? Loan syndication does have some of the attributes of a cartel and, as such, it does imply some constraint on market forces. It could be argued, therefore, that strengthening of the syndication process will further diminish the scope for competition. But one could also argue that a syndicated commitment on country exposure could obviate syndication of individual loans, and by doing so, leave more rather than less room for competition among private foreign financial institutions. And even if substitution of syndication of a country limit for syndication of individual loans did reduce competition among lenders somewhat, most of the developing countries which are heavy borrowers on international financial

markets seem to have acquired greater bargaining power now than they used to have only some years ago.

This last observation leads to a reservation voiced when the author made his proposal for rationalizing external public debt management tentatively in another forum. This reservation essentially boils down to the propositions that the cyclical fluctuations in market conditions make impossible a commitment of a steady increase in country exposure for a period of any length of time ahead; and that changes in "investment moods" make private foreign bankers reluctant to give such a commitment even if stability in market conditions would permit them to do so. I must confess that I cannot visualize changes in "investment moods" independent of changes in the liquidity of international financial markets. And as far as the latter is concerned, there must be a close relationship between the supply of and demand for funds flowing through these markets, and even if this relationship is apt to be much looser for an individual country's demand for such funds, it must hold broadly in this case as well.

To summarize, the typical developing country is dependent on a steady inflow of foreign savings, and hence it does not repay its external debt. The flow of foreign savings takes different forms, all but one of which can be assumed to be sustainable, provided the borrowing country follows sound domestic and external economic policies and offers an attractive investment climate. The one exception is borrowing of the country's public authorities on international financial markets. Because it cannot be taken for granted that this flow, which has become so important in recent years, is sustainable in the medium term, it is the swing source of foreign funds. One is, therefore, tempted to search for an operational guideline that would indicate the scale on which such borrowing can be considered to be sustainable. The conventional debt service ratio should be discarded on grounds of logic, and alternative tests experimented with by the author yield seemingly perverse results, at least in the context of Latin America and the Caribbean over the period 1974-78. But even on a priori grounds, the search for a numerical yardstick is futile because countries differ so much and change so much over time that no number or range of numbers could possibly come close to giving general guidance in real life situations.

An alternative approach advocated in this paper involves the targeting of the part of a public investment program for which financing is to be obtained from international financial markets, followed by a dialogue with the operators on these markets to ascertain the degree of realism of the debtor country's expectations in this respect. If the international bankers agree to provide the desired financing on a continuous basis, the matter can rest there. If they do not agree, the domestic savings target needs to be raised or the domestic investment target lowered in order to make these two compatible with the scale on which private foreign bankers are willing to lend continuously to the public authorities of the country, after making due allowance for inflows of foreign savings in other forms.

The International Monetary Fund could, in principle, underwrite fairly large slippages due to errors of forecasting or unforeseen contingencies in a country's program supported financially by the private international financial community, although this would call for a quantum jump in the Fund's operations. The International Monetary Fund could also continue to assist countries with the framing of medium-term economic programs and with the monitoring of them under stand-by or extended arrangements. If the authorities of a country do not wish to enter into an arrangement of either kind, they themselves could frame a program that is technically correct, and they could also obtain technical assistance in this task from any number of international agencies even if they wished to take sole responsibility for the program framed. It would be more difficult to find a substitute for the International Monetary Fund for monitoring performance under the program. Self-monitoring by the authorities of the debtor country would not really be credible, and private international financial institutions would probably have to content themselves with a partial monitoring system confined essentially to verifying observance of global external public debt limits, but not covering the critical areas of demand and exchange rate management.

When public debt to private international financial institutions is on a steady rise, the maturity structure of this debt and grace periods are of no real relevance, which raises the question whether fixed maturity terms are needed at all. The one real advantage fixed maturity terms offer is that they give lenders a modicum of leverage on the quality of the policy mix and investment climate of the debtor country, small though this leverage is likely to be. In any case a decision either way does not affect the scheme advocated in this paper. But this scheme is affected by whether or not present techniques of loan syndication among private international financial institutions can be refined because it is on this issue that the possibility of eliciting from private foreign lenders a collective decision on the scale on which they are prepared to lend continuously to the public authorities of a country is likely to turn in the end.

Para mí es un agrado tener la oportunidad de hacer algunos comentarios acerca de las reflexiones del Sr. Robichek. Lo que me encanta en esto es que como vengo de la vida académica y allí trabajo con ecuaciones, gráficos, teoremas y cosas por ese estilo, el Sr. Robichek, en cambio, lleva toda una carrera, una vida entera, en el campo del Fondo Monetario donde se trabaja en ministerios, en bancos centrales, en que hay poco de esto de ecuaciones y teoremas o teorías y cosas por el estilo. Están luchando día a día con los problemas reales de la vida. Pues cuán grato es ver que la sabiduría que él destila de su vida de experiencia cuadra perfectamente con la sabiduría que yo saco de mi vida de académico de tanto tiempo.

Nosotros estábamos predicando hace 15 años, veinte años que el llamado Debt Service Ratio no tenía mucho sentido. Que el Debt Service Ratio tenía un componente de amortización que no cuadraba; que el Debt Service Ratio tenía en el denominador exportaciones. Así, si las exportaciones de un país estaban forzosamente condenadas a importar alimentación para su pueblo, pues esas exportaciones no están disponibles para pagar el servicio de la deuda; y, en el otro caso, si las importaciones de un país consisten de cosas muy prescindibles, entonces es muy fácil que por el lado de importaciones, uno podría llegar a un ajuste para pagar una cuota más de servicio de deuda. Pero lo que nosotros encontramos como resultado de raciocinio académico, ellos lo encontraron por otra vía de la experiencia con muchos países con muchas diferentes circunstancias; y así es que en general yo comparto totalmente su enfoque.

Ahora bien, estoy tentado a comentar sobre un fenómeno llamado "Country Risk" el riesgo que se corre con el país. Y yo no sé si exactamente, pero creo que estaríamos de acuerdo después de diez minutos de conversación, y que probablemente saldríamos totalmente de acuerdo. Lo que voy a decir no es una crítica contra el trabajo, pero tampoco lo está apoyando. Está como una ramita que sale del árbol del trabajo, y no llega arriba sino como un comentario de estímulo al trabajo. Tenemos un fenómeno en el mundo que es "country risk", estoy seguro de eso. Estoy seguro que hay países a los cuales la banca internacional no quiere prestar nada. ¿Por qué? Porque no tiene confianza en el Gobierno y no van a prestarle al Gobierno. Pero tampoco van a prestar a las entidades privadas dentro del país, salvo que esas entidades tengan para hipotecar activos en el exterior de ese país. Si uno de Birmania tiene un activo en Chicago, el Banco de Chicago estará totalmente dispuesto a prestar dinero. Pero puede ser que si Birmania está en la lista de países con menos crédito internacional y entonces él puede ser millonario dentro de Birmania pero, el Chase Manhattan o el Bank of America o el Lloyd's Bank o cualquier otro no le va a prestar nada por hipotecas en Birmania, porque no tienen confianza en que ese Gobierno les vaya a dar acceso a esos activos en el evento de que el tipo

no vaya a pagar su deuda. Entonces ese fenómeno es una realidad. Yo creo que entre los diferentes países del mundo, Chile tiene acceso muy excepcional ante la banca internacional, en que están dispuestos a otorgar créditos con un porcentaje relativamente elevado del producto interno bruto a tasas muy moderadas. ¿Por qué? Porque en un sentido tienen confianza de que la deuda va a ser pagada y que el Gobierno va a respaldar el sistema crediticio internacional en el sentido de que si algún deudor chileno no paga su deuda, el acreedor internacional tiene el mismo derecho de obtener su dinero por la vía legal que cualquier otro acreedor chileno. Pues bien, hace mucho tiempo que este problema me ha preocupado y Uds. no saben cuán fundamental es. Voy a describir aquí una curva de oferta de crédito infinitamente elástica. Eso podría ser la curva de oferta de crédito que enfrenta Chile, Argentina, Uruguay, cualquier país en algún momento dado.

Esta es la curva de oferta de un competidor, es decir, el tipo es lo que decimos en inglés un "price taker", el precio está dado en el mercado mundial, etc. Tenemos en un sentido dos interpretaciones. Si uno mira un país como Chile y se pregunta ¿puede Chile influir el nivel de interés en el mercado mundial? Nunca. Si Chile no tiene un peso, ni siquiera como el del estado de Illinois, no tiene tanta fuerza en el mercado como para influir la tasa de interés en el mercado internacional. Pero si uno hace la misma pregunta en otra forma; si Chile duplica sus préstamos que él toma como país, ¿va a tener que pagar una tasa más alta de interés? La respuesta es sí.

Entonces tenemos que en un sentido Chile no tiene poder Monopsónico en el mercado mundial; y en otro sentido, sí tiene poder Monopsónico. Nosotros en los discursos de teoría económica cuando trazamos una curva con inclinación positiva de oferta que enfrenta un comprador, decimos que ese comprador tiene poder Monopsónico. Entonces Chile tiene poder Monopsónico y no tiene poder Monopsónico. Entonces voy a tratar en los pocos minutos que me quedan quizás ayudar a resolver esa cuestión. Creo que Chile y los demás países en el mundo tienen en general un cuasi poder Monopsónico. No son Monopsonistas para influir en las tasas de Nueva York o en Londres o en Suiza; pero sí son Monopsonistas en el sentido de influir las tasas que enfrentan ellos. Tengo un ejemplo favorito de un caso que tiene mucho riesgo de no poder pagar una deuda, pero ese riesgo está totalmente comprendido en el acuerdo de antemano. Por ejemplo, supongamos que yo doy a una persona un consol que dice que le voy a pagar cada año el 31 de diciembre diez dólares; si la tasa de interés está en ese momento a 100/o ese consol va a valer \$ 100. Esa persona me va a dar \$ 100, y yo le voy a dar mi promesa que le voy a pagar para siempre yo y mis sucesores, 10 dólares al año. Voy donde ella y le digo que no me gusta este acuerdo. Lo anulamos y firmo otro papel que dice que cada año le voy a dar 20 cuando la moneda que tiramos sale cara y si sale sello no le doy nada. Entonces el valor de pago de ese arreglo es solamente 10 dólares al año; y, conociendo a tal persona, que no está a favor o en contra del riesgo, ella me pagaría los mismos 100 dólares para eso que para lo otro. Entonces es un riesgo en que sabe que con una determinada probabilidad no voy a pagar la cantidad acordada y sé con la misma probabilidad no voy a tener que pagarle; y ella toma el no recibo

como un no recibo y yo tomo el no pago como un no pago, como un beneficio mío.

Si estamos en ese tipo de relación, cuando los prestatarios ven el no pago como si fuera un beneficio de ellos, entonces ellos y los prestatarios tienen la misma actitud. Pues yo, al mirar el mundo desde la base del prestatario más pequeño, la persona que tiene una hipoteca, una casa u otra cosa por el estilo, un préstamo en el banco, yo diría que él no mira el hecho de no pagar como si fuera tanto un beneficio que recibe como un regalo de su tía. Tiene algo que huele mal por el hecho de no pagar una deuda que uno tiene. Y a medida que los prestatarios tienen esa idea ponen un menor peso sobre el beneficio de lo que el prestamista pone sobre el costo de una determinada falta de pago. Entonces, la manera en que yo miro la cosa es como sigue: verdaderamente los pequeños países del mundo enfrentan esta curva de oferta, pero esta es la curva de oferta sin riesgo, con todo, todo riesgo, ya resuelto. Entonces, todo el mundo sabe que cuanto más crédito cualquier prestatario obtiene, más riesgo habrá. Entonces la curva de oferta de crédito que enfrenta Chile, Uruguay, Argentina tiene una inclinación positiva derivada de una diferencia de percepción o de asignación de beneficio y costo a la probabilidad del no pago. Y esa cosa ya crea una situación que es semejante a un Monopsonio en el sentido de que trabajando con esa curva el costo marginal de crédito está por encima, porque al contratarse más préstamos se sube el interés; y el país paga no solamente la tasa vigente por el aumento, sino un aumento de tasa por el resto del crédito que va a irse recontratando, etc., dentro de un futuro dado. Así es que tenemos una diferencia en relación al costo marginal del crédito. Yo creo que esta es la naturaleza fundamental del riesgo de países y que es una realidad.

Ahora voy a terminar insistiendo un poco en la importancia de este punto. Si verdaderamente la curva fuera plana tendríamos una situación en que al pensar en una nueva inversión en un país, un economista tendría que decir que esa mayor inversión en el país no va a cambiar la tasa de interés, o que el financiamiento de esa mayor inversión sería 100% de fuente externa. La única fuente marginal para fondos sería la fuente externa si se tiene la curva plana; y, si la gente decide ahorrar más, todo el mayor ahorro va afuera, en términos netos; uno no puede escapar a esa conclusión y eso es teniendo la curva plana. Si tú tienes la curva inclinada la visión del mundo que sale es para mí mucho más plausible. Así cuando hay más inversión en Chile, esa mayor inversión viene en parte desplazando otras inversiones, viene en parte aumentando los ahorros de los chilenos y viene en parte de fuente extranjera. Pero se puede obtener ese resultado que para mí es más plausible, más lógico, más lindo; únicamente con la curva inclinada; nunca con la curva plana. Así es que creo que en todo este análisis de mercados internacionales, en primer lugar, es un tema que debe ser estudiado más, no hemos entrado en suficiente detalle; pero, segundo, que a medida que podemos apreciar algo, esta noción de una curva de inclinación positiva tiene mucho más plausibilidad que la otra, y que esta noción está ciento por ciento implícita en lo que dice el profesor Robichek en su discurso. Porque la idea

de que la comunidad financiera mirara para estudiar la validez o no validez de tal o cual situación no concuerda con una curva plana; concuerda con una curva de pendiente positiva solamente. Así es que les dejo ésta como un insumo para futuras deliberaciones sobre el tema.

Debo empezar por aclarar que soy bastante nuevo en este tema y me ha agradado mucho leer el trabajo. Tengo más preguntas que comentarios, como sucede siempre cuando uno se introduce en un tema nuevo.

El problema de la determinación del monto óptimo, si quisiéramos, de deuda externa de un país tiene como siempre dos lados: el de los demandantes y el de los oferentes. Es decir, hay una estrategia óptima de un endeudamiento de un país que era el tema con el que estaba familiarizado; pero el Dr. Harberger brillantemente se ha referido a ese tema, y podría sintetizarlo diciendo que el monto óptimo, desde el punto de vista del país deudor que va a tomar crédito en el exterior, es endeudarse hasta que la eficiencia marginal de la inversión para el proyecto que se va a financiar sea igual al costo marginal bien medido tomando el riesgo en consideración de obtener dicho crédito. Dicho esto, tengo que hablar del problema del oferente lo que me lleva a la microeconomía de la industria bancaria, tema en el cual no estoy interiorizado. Trataré de hacer mi pequeña contribución de cualquier manera.

Mi primer contacto con la microeconomía de la industria data de pocos meses; cuando fui a sacar una hipoteca en primer grado, por alrededor del 600/o del valor de una propiedad, o sea, que estaba dando un colateral en exceso del monto del préstamo. En el proceso de llenar el papeleo, el oficial de crédito que me atendía me dice "tiene que traerme un comprobante de que el servicio de la hipoteca no excederá el 200/o de su ingreso". Mi primera pregunta fue "y a Ud. ¿qué le importa lo que yo quiero gastar en vivienda?", me respondió: "lo siento, pero es una regulación, tiene que traer comprobante". Fui, vi a varios amigos, reuní varios papeles, que decían que el mes pasado yo había ganado un montón de plata y ningún problema. También me pidieron un seguro de vida para mi señora, que en el caso que ella falleciera el seguro sería para pagar la hipoteca de la casa. Les dije: "qué les importa; si mi señora no es la fuente de pago, soy yo la fuente de pago". A eso, me opuse bastante fuertemente y me salvé. De más está decir que éste fue el primer contacto práctico con el llamado "debt service ratio". En ese contexto no lo entiendo; ya había un colateral; ¿por qué al banco le interesa el debt service ratio? No lo entiendo, pero a los bancos les interesa y por algo debe ser; es una realidad del mercado. Creo que se debe estudiar más el fenómeno de por qué les interesa, no definiendo su aplicación, pero si lo usan es una realidad que debemos aceptar.

Ahora bien, en el caso de préstamos privados la existencia de un colateral o de una garantía, obvia desde mi punto de vista el uso de todo otro tipo de coeficientes, indicadores, etc. En el caso de deuda internacional, deuda externa, el colateral generalmente no existe, o sea, no hay un stock, la deuda es un stock que se le presta a alguien y en el caso de deuda externa no hay un stock que está condicionado como garantía de dicha deuda en la mayoría de los casos y, en particular, en los casos de la deuda pública. En este caso lo relevante es la capacidad de flujo de pago del acreedor; creo que

eso es lo relevante desde el punto de vista del que está prestando. El problema me parece a mí que es muy similar al problema muy analizado por los economistas o tiene rasgos similares, con el llamado “transfer problem” que es el problema de la transferencia. ¿Cuál era el máximo que Alemania podía llegar a pagar a los países aliados? ¿Cuál era el máximo de debt service ratio que Alemania podría soportar? Recuerdo que hace algunos años Harry Johnson dijo en clase que el problema era trivial, pues el máximo es el producto bruto; la pregunta relevante es: ¿Cuál es el máximo aceptable por el país? Y el concepto aceptable es que de alguna manera, me parece, escapa a la cuantificación numérica y en eso estoy totalmente de acuerdo con el Dr. Robichek en que el uso de estos indicadores como fórmulas matemáticas mágicas, de cuál es el máximo del debt service ratio que un país podría tener por aceptable, varía de país en país; no podemos tener una fórmula mágica para evaluar qué es aceptable. Lo que es aceptable depende de muchísimas cosas, fundamentalmente también de factores políticos que no pueden ser cuantificados normalmente con un numerito. Ahora bien, creo que en la estructura actual del mercado financiero internacional estos números se usan, eso entiendo; y, además, surge el problema —aunque no estoy muy seguro— de que el mercado es uno altamente competitivo y, por lo tanto, descentralizado. Particularmente, y es lo que más preocupa al Dr. Robichek, en lo que respecta al endeudamiento de los sectores públicos. El sector público por sí mismo es un conjunto de subsectores, tiene un conjunto de proyectos y de necesidades y, tal como está organizado el mercado ahora, va negociando individualmente con distintos bancos sus proyectos individuales. Y puede suceder, y parece que sucede, que en algún momento sin que nadie se dé cuenta, no entiendo por qué, el sector público o el país en su conjunto rompa la barrera de estos numeritos y tengamos una crisis. Todos los bancos dejan de prestar. Lo cual da lugar claramente a ciertos problemas de ajuste; y en este sentido, desde este punto de vista, la propuesta del autor de centralizar las negociaciones crediticias del sector público del país en su conjunto suena razonable para evitar este tipo de problemas debido a la toma separada de decisiones. Implícito con esto está el supuesto de que el sector público no es un agente maximizador porque si cada toma de préstamos del sector público estuviera sujeto a una evaluación racional de la rentabilidad del proyecto no habría ningún problema; el problema es cuando los entes jerárquicos dentro del sector van y se endeudan sin criterio de rentabilidad. De cualquier manera a los bancos les gusta analizar, cuando conceden un préstamo, la situación financiera global del cliente. En este caso, el sector público en sí mismo es un agente económico único y, por lo tanto, suena razonable que este agente haga su planificación financiera.

Al ser el sector público un agente único, da lugar a ciertos problemas, debido a la fungibilidad de los fondos dentro del presupuesto nacional. O sea, es bien posible, por ejemplo, que dentro de los planes de inversiones del Gobierno haya un proyecto que sea bueno y un proyecto que sea horrible; pero que por X razones el Gobierno está interesado en pasar ambos; y tiene plata para uno solo, idealmente haría uno sólo con esa plata

que tiene. Pero puede ir al sector externo, presentar, pedir un crédito por el proyecto bueno, financiar el bueno con el crédito y el malo con la plata que ya tenía y se termina financiando ambos, lo que claramente debilita la situación financiera global del sector público al haberse permitido la financiación de un proyecto no rentable. O sea, que nuevamente desde ese punto de vista estoy ciertamente de acuerdo con esa parte de la propuesta. Pero hay un problema que me preocupa con esto que es el siguiente: ¿Podemos realmente tratar al sector público como un agente económico con un presupuesto independiente, o no? O sea, ¿debería la comunidad financiera internacional preocuparse por el plan de endeudamiento externo? No sé por qué se preocupan, pero deberían preocuparse por el plan de endeudamiento externo del sector público por sí solo o del país en su conjunto. Y aquí me refiero nuevamente a la fungibilidad de los fondos en el caso de existir un mercado financiero interno. Voy a dar un ejemplo para ilustrar. Situación 1), el Gobierno tiene un déficit y lo financia mediante emisión de bonos internos que el sector privado compra porque los quiere tener en su portafolio de activos. Un día el sector público decide dejar de financiarlos internamente y pasar a financiarlos externamente; entonces no admite más bonos internamente, los admite externamente. Trae los dólares, los vende al Banco Central, y saca la plata para financiar sus proyectos. Ahora, ¿qué pasó? El sector privado no tiene más esos bonos, esos bonos que el sector público le estaba transfiriendo, tienen una demanda por ellos, tienen una demanda por activos que devengan intereses. Si el sector privado tiene acceso al mercado internacional, va a adquirir bonos afuera, va a sacar las reservas, los dólares que trajo el sector público vía el endeudamiento externo y los va a volver a colocar en bonos externos. Neto, ¿qué pasó: No pasó nada para la situación financiera del país; las reservas no cambiaron, la deuda externa neta no cambió para nada. O sea, la situación financiera de la capacidad de pago externa del país en su conjunto no ha cambiado, excepto que ahora tenemos al sector público con un mayor debt-service ratio o como queramos definirlo. Es el sector público el que está en deuda pero como contrapartida el sector privado se ha convertido en acreedor.

No es una crítica a la propuesta sino más bien una pregunta, una interrogante, y con esto termino.

Réplica del profesor Robichek a las observaciones de los señores Harberger y Rodríguez

Tengo una carga mucho menor de la que había esperado. Ojalá que siga así.

Agradezco mucho al profesor Harberger por su muy interesante exposición que me lleva a pensar que tenemos que hacer mucho más trabajo en ese campo. Sobre las preguntas del profesor Rodríguez, he anotado tres que me llamaron la atención. Lo primero fue su referencia al problema de transferencias porque él vio eso como parecido a la discusión del problema de transferencia. En ese sentido, no reconozco el problema de transferencia precisamente si se sigue una política racional en la política doméstica y en la política de manejo de la balanza de pagos. No veo cómo podría surgir un problema de transferencia. En segundo lugar, él mencionó algo sobre la fungibilidad en las operaciones del endeudamiento del sector público y ahí tiene toda la razón. Como él lo describió: las autoridades tienden a presentar a los acreedores externos los proyectos dentro del sector público que son más interesantes desde el punto de vista económico y se financian a través del crédito interno los que tienen mucho menor valor. El tercer punto fue por qué no aplicar, mirar el riesgo, el country risk, en el conjunto. Es decir, tanto el sector privado como el sector público, porque aquí también hay fungibilidad; y aquí estoy completamente de acuerdo con él.

Estoy enteramente de acuerdo con el profesor Rodríguez en que eso debe ser un cálculo conjunto y el único problema es que en cualquier cálculo macroeconómico siempre hay un residuo.

ESTUDIOS MONETARIOS VII

ALTERNATIVAS DE POLITICAS FINANCIERAS EN ECONOMIAS PEQUEÑAS Y ABIERTAS AL EXTERIOR

SEMINARIO REALIZADO POR EL BANCO CENTRAL DE CHILE,
LOS DIAS 21 Y 22 DE ENERO DE 1980



DIRECCION DE
POLITICA FINANCIERA

BANCO CENTRAL DE CHILE

Diciembre 1981

Trabajo editado por el
Departamento de Informaciones
Estadísticas y Publicaciones del
Banco Central de Chile.

Alfabeta Impresores
Lira 140 - Santiago