Issues in monetary and exchange rate policy (Based on remarks at a conference of Latin American Central Banks sponsored by FLAR)

By Arnold C. Harberger*

When Dr. Bolaños invited me to address this conference, he suggested following the tone and spirit of a paper ("Letter to a Younger Generation") that I had written a little over a decade ago, for presentation at a conference celebrating CEMA University's tenth anniversary. That paper was one in a series of "messages to the economics profession", in which I express profound beliefs, both positive and negative, concerning the directions in which our teaching and research have gone, and might appropriately go in the future. The present paper can be thought of as another entry into that series.

This paper and its predecessors can probably best be characterized as a call for a major reorientation of our profession's teaching and research --giving much more emphasis to economic fundamentals, and correspondingly placing less weight on novel, often highly technical approaches and techniques. In part at least, my messa ge is reminiscent of the main ideas of what I think of as the "Chicago School" of the period from, say, 1955 to somewhere around 1980. My own capsule definition of the Chicago School's approach emphasizes three pillars-- first, that if we are to improve our understanding of an almost infinitely complex world, we must necessarily work with a theoretical structure which both simplifies (I would say necessarily greatly oversimplifies) and orders that reality. Second, that no theory, however elegant, is worth very much if it is not useful in helping us understand, interpret, and up to a certain point predict the forces and events of the real world. And third, follow the maxim "When in doubt, assume that market forces work" --not that markets are perfect, not that everybody ends up a winner, but simply that the forces of the market are just that-- forces. They are like the wind and the tides-- to be understood, taken advantage of, sometimes feared, but definitely not to be ignored, belittled, or (worst of all) defied. I believe these principles were the centerpiece of a great flowering of economic teaching and research at the University of Chicago in that period. Modern agricultural economics (T.W. Schultz and D. Gale Johnson), modern labor economics (H. Gregg Lewis and Sherwin Rosen), the rebirth of human capital analysis (Schultz, Gary Becker, James Heckman), came on top of the monumental contributions of Milton Friedman in monetary

* University of California, Los Angeles, August 2009.

analysis and many other fields. Most of the work of these and others had direct relevance to and important implications for economic policy. And at the same time it was profound, and firmly based on theory, not frilly or fancy.

I contrast that era with what I sense to have been the trend and fashion of the last 20-odd years. There are several highly-ranked graduate economics departments where students can go through a full year of graduate macro courses, without receiving any serious grounding in monetary analysis, or in the interaction between money and credit. Reacting to this trend, I chose as my title for this presentation "Issues in Monetary and Real Exchange Rate Economics". In what follows, I will first say a few words about each of these broad themes, and then proceed to a sequence of vignettes that illustrate the power of a fundamentals-based approach.

Key Elements in Monetary Economics

The one-line capsule that I like best with respect to monetary economics, it is that "The authorities can set, or at least strongly influence, the nominal size of a country's money supply, but it is the people who determine the real quantity of money. The key to this statement is that the relevant dependent variable on the demand side (for money) is *M/P* and not just *M*. This does not mean that a crude quantity theory equation (i.e., $MV = PT$) is the best we can do. Far from it. In our own work my graduate students and I have gravitated over time to a formulation like

$$M/P = a_0 + a_1 y + a_2 \pi^e + a_3(i_m - \pi^e) + a_4(i_o - \pi^e)$$

Here: y = a measure of real output or income
π^e = a measure of the expected rate of inflation
i_m = the nominal interest rate paid on monetary balances
i_o = the nominal interest rate paid on substitute financial assets outside the monetary system.

Obviously, we expect $a_1 > 0$, $a_2 < 0$, $a_3 > 0$, and $a_4 < 0$. $(i_m - \pi^e)$ and $(i_o - \prod^e)$ are, of course, real interest rates, which makes sense when the variable to be explained is real monetary balances. The rate of expected inflation π^e, also has a real connotation, since it is the fraction of real monetary balances that is lost due to inflation. (Note that this formulation does not accept the idea that somehow the full effects of inflation are already incorporated in the nominal interest rate). As to π^e, we have found that a fairly arbitrary declining weighted average of current and past inflations is adequate in most cases -- probably better than the difference between market interest rates on real and nominal assets, since

the demand for money extends to the whole population of people, business firms and institutions, most of whom are very unlikely to derive their inflation expectations from the bond market.

The demand function for real monetary balances should be thought of in "static" terms. It should tell us the level of real balances that people would like to hold under given circumstances. Their actual holdings are likely to be different from what is desired, mainly because both the nominal money supply M^s and the price level P are subject to independent shocks. This vision gives rise to the key variable of monetary dynamics, which is

$$(M/P)^d - (M^s/P),$$

the difference between desired and actual real monetary balances. This variable is the critical force that drives "prices to double when the money supply is arbitrarily doubled". If people just held the extra money, nothing would happen to prices. It is by spending that money that they drive prices up. This force is not a mechanical one, whose speed and duration are easily predictable. No, many people may on one occasion spend half of their excess monetary balances over a period of a year or two, maybe only a quarter another time, and maybe 100% a third time. Also, when they do spend, only part of that spending will be on the currently produced goods and services that constitute the GDP, and whose prices enter into our main price indexes -- the CPI and the GDP deflator. Thus not only is the fraction of excess balances that is spent difficult to predict; so also is the fraction of that spending that goes to buy CPI or GDP items (the rest can go for paper assets, for existing buildings or vehicles, etc.) All this uncertainty is what gave rise to Friedman's famous and oft-repeated dictum that monetary policy definitely has the effects that good theory expects, but that these effects take place with a "long and variable lag".

The excess demand for real monetary balances (which can, of course, be positive or negative) also directly suggests a straightforward rule for monetary policy. "When people want more real balances than they have, the authorities should expand the money supply, because otherwise the actions of people would work in a deflationary way, trying to achieve the same result. Similarly, when people want smaller monetary balances than they have, the authorities should reduce the nominal money supply M^s; otherwise the real (M/P) will be reduced via inflation."

A final key point to be made in this brief synopsis emphasizes the importance of economists focusing on a broad measure of money (like M_2 or even M_3) rather than in a narrower concept (like M_0 or M_1). The worst sin a Central Banker can commit is to think only in terms of the Central Bank's own monetary assets and liabilities. Central Bankers must think of these things, of course, but they must be thought of as instruments that can help serve a broader purpose, not as ends in themselves. The health of the overall

economy is what good policy should try to promote, and of this the balance sheet of the Central Bank is not a good indicator.

The focus on broad money is important because it automatically leads one to the consolidated balance sheet of a nation's monetary system. This consolidated balance sheet has been available for all of us to see and to use, ever since the late 1940s. In an act which I can only call a stroke of complete genius, International Financial Statistics has reported on the monthly, quarterly and yearly evolution of each country's monetary system. Their "monetary survey" (lines 30-34) presents the consolidated balance sheet, in which currency demand deposits, and time and savings deposits are the main liabilities and in which the main asset categories are: a) net foreign assets, b) obligations of the public sector, and c) obligations of the private sector. This monetary survey provides a critical link between the monetary and the credit sides of the financial network, and it also brings in, at the system level, the main link between the domestic economy and the rest of the world. This link is, of course, the net foreign assets (NFA) of the banking system. In most developing countries, NFA consists mainly of the international reserve holdings of the Central Bank but cases where it diverges drastically from the Central Bank's reserves are worthy of serious attention. Such cases occur either because commercial banks are accumulating lots of foreign assets (which weakens the capacity of the Central Bank to influence their actions), or because the commercial banks are piling up big debts to foreign banks, which can be a danger signal for the whole economy.

Just to illustrate the usefulness of the consolidated balance sheet, let us link it to the demand for real monetary balances, say M_2/P, using a concept of broad money. Every single case of major inflation that I am aware of has led to a big contraction in the demand for real monetary balances. In the consolidated balance sheet the counterparts of real M_2 are real net foreign assets, real credit to the government, and real credit to the private sector. For many reasons, it seems almost inevitable that real credit to the private sector bears most of the weight of the reduction in (M_2/P). This has been confirmed in nearly every outbreak of high inflation. A major, but inadequately appreciated consequence of high rates of inflation!

Elements of Real Exchange Rate Economics

The one-line introduction to real exchange rate analysis is that the real exchange rate is "neither bilateral nor symmetrical". In terms of its main function, it serves as "the key equilibrating variable of a country's trade and payments." In this role it provides signals for a country to adapt either to an abundance or scarcity of foreign exchange. In a peso country, an abundance of foreign exchange (usually measured in U.S. dollars) causes the dollar to be cheap in real terms; in the reverse case of dollar scarcity, the result is a high peso price of the dollar.

It should be obvious from the preceding brief description that the real exchange rate's main function concerns the linkage between one country (or currency area) and the rest of the world. The key relative price that the RER embodies is that between the grand aggregate of tradable goods and that of nontradables. Many theoretical expositions work just with these two broad categories and define the real exchange rate as P_t/P_n (or its inverse). We and many others have found this a useful variable at the theoretical level, but a painfully difficult one at the practical level. It is difficult because most final goods and services tend to contain a mixture of tradable and nontradable components. Thus, P_j, the price of a final good, might reflect a cost structure equal to $\sum_i \alpha_{ij} P_i + \sum_h \alpha_{hj} P_h$ where α_{ij} is the fraction of total costs of j represented by tradable good i, and α_{hj} is the corresponding fraction for inputs into j of nontraded good h. While it is a total mess to try to individually trace all these input-output relations and all the input prices, a wonderful solution is found through aggregation. Thus a general price index which is defined as

$$\bar{P}_d = \sum \beta_j P_j,$$

can be broken down into

$$\bar{P}_d = \sum_j \beta_j \left(\sum_i \alpha_{ij} P_i + \sum_h \alpha_{hj} P_h\right),$$

which in turn can be simplified into

$$Pd = \gamma_t P_t + \gamma_n P_n,$$

i.e., a weighted average of two main sub-indexes, covering, respectively, tradable and nontradables. So when we define the real exchange rate as

$$RER = EP^*/P_d,$$

it fits well with the theoretical definition of P_t/P_n, in the following sense

a) if P* refers to the dollar price level of tradables, and E is the peso price of the dollar, then EP* is a measure of the peso price level of tradables, P_t.

b) So, using the above definition of the RER we have

$$RER = \frac{\bar{P}_t}{\gamma_t \bar{P}_t + \gamma_n \bar{P}_n} \quad t$$

and

$$RER = \frac{1}{\gamma_t + \gamma_n (P_n/\bar{P}_t)}$$

RER thus defined moves up and down monotonically with P_t/P_n. It thus serves as a perfectly sound empirical proxy, even though we can never in practice isolate and observe P_n.

But this whole line of reasoning would be inapplicable if P* were built up of the CPI indexes or the GDP deflators of partner countries, and thus treated the relative price adjustment $\bar{P}^*/\bar{P}d$ as "symmetrical".

The imperative is that $\bar{P}^*$ should ideally refer to tradable goods. And where this is not feasible it should explicitly try to refer to tradable goods. Most specialists have gravitated to a $\bar{P}^*$ built up of wholesale price indexes, on the ground that these tend to be dominated by tradable components. I and my students have for many years used what we call the SDRWPI, which was originally built up from the wholesale price indexes of U.K., Germany, France, Japan and the U.S., using the same weights as the IMF used in each period to define the SDR (and, of course, using the exchange rates for the Pound, DM, Franc and Yen with the U.S. dollar to convert each of their wholesale price indexes to dollar terms. Later, of course, the Euro exchange rate with the dollar was used for both Germany and France.

I have long urged that the IMF or some other institution take it upon itself to build a general world price level of tradables that could be widely used as a "tradables numeraire" in all sorts of international economics analysis. But in the absence of a carefully constructed index of this type, the best advice is to use wholesale price indexes as a rough proxy for tradable goods prices; (import and export price indexes are notably partial in their coverage, noncomparable in design among countries that have them, and simply nonexistent for many countries).

The question quite naturally arises, if the RER is such a critical variable for economic analysis and understanding, why isn't it much more widely appreciated and used? The answer, I think, lies in the wide variety of forces that influence it. Thinking of a peso country, the peso price of the dollar will tend to rise if a capital inflow is spent on tradables, but to remain constant if the inflow is spent on nontradables. That price will fall if there are productivity increases in the tradables sector, but will rise as a consequence of productivity increases among the nontradables. The peso price of the dollar will fall as a result of import restrictions, but rise as consequences of export restrictions. It is the same with economic growth. Growth in tradables output will cause the price of the dollar to fall (the impact of the output growth outweighs its induced rise in tradables demand). The opposite happens when nontradable output autonomously increases. But an autonomous shift in demand from nontradables to tradables will cause the peso price of the dollar to rise. Finally, a rise in the world price level of a country's exports will make the dollar cheaper; a fall in that price level will make the dollar more expensive.

With such a long list of causal variables, some causing the RER to rise, others causing it to fall, I think it is quite understandable that the subject remains confusing to many observers. Even the IMF has not been able to settle on a clear empirical definition of the RER (at one time that organization published five different measures of the RER --all of them, by the way, symmetrical). Among the general public, the confusion is even greater-- the most frequent error being the failure to understand the distinction between real and nominal exchange rates.

Obviously, we should welcome any approach or concept that helps us distill the effects of at least some of the many different forces that operate on the RER. Happily, there is such a simplification, and it is, moreover, well grounded in economic theory. The concept in question is the net resource transfer (NRT) into or out of a country. This net resource transfer is a fundamental concept in national income accounting, where it appears as a famous threefold identity:

(imports minus exports) has to be the same as
(tradables demand minus tradables supply), which in turn must be the same as
(total domestic demand minus total domestic supply of currently produced goods and services),

i.e., $(Im\text{-}Ex) \equiv (T^d - T^s) \equiv (y^d - y^s) \equiv NRT$.

The NRT measures, three times over, a gap between demand and supply!!

Thinking in terms of the basic underlying theory, in any case where T^d exceeds T^s we must find the relative price Pt/Pd below its equilibrating level (the crossing point of the demand and supply functions for tradables). And the larger is the excess of T^d and T^s, the farther the RER will be below its equilibrium level.

But of what does the NRT[$(\equiv(T^d - T^s)$] consist? It is in fact a bundle of all sorts of things -- capital movements into or out of the country (both direct and portfolio investment), foreign aid flows, emigrant remittances and other private transfers, payments of interest and dividends, and, very importantly, the movements of money into or out of the foreign reserves held by the country's Central Bank. The net effect of all these items is found, in local currency, in the excess of imports over exports in a country's national accounts. In foreign currency (dollars as reported by the IMF), it is found in the country's balance of trade in goods and non-financial services.[1]

[1] Obviously NRT equals the negative of this balance of trade, which is an "exports minus imports" concept. International Financial Statistics now distinguishes three current account items in its balance of payments display. These are labeled merchandise trade, trade in services, and income items. The NRT in foreign currency is the sum of the first two of these. The easy way to remember how this works is to note that interest and dividend payments out of a country operate to offset capital flows, etc. into that country. Thus if a country received a net capital inflow of $100 million, but simultaneously paid out $100 million in interest, dividends and repatriated profits, there would be no need for that country to have either an export or an import surplus.

The fact that the NRT combines so many different elements, capital flows in one direction or another, remittances and transfers, ups and downs of international reserves, etc. -- leads one to expect that there will be little correlation between the NRT and any one of its components. Obviously, some positive correlation has to be there, since the parts add up to the whole, but there need be no statistically significant correlation between any one part and the overall NRT. My advice is that when dealing empirically with the influence of these financial flows on the RER, the best strategy is to work with the NRT (the net flow) and to impute that result to each of NRT's components. Thus, if the aggregate result says that each $100 million of financial inflow that is spent on nontradables will cause a fall of 1% in the real peso price of the dollar, then this result should be applied to any financial component that is spent on nontradables.[2]

Because of the many variables that influence the RER, and even some that influence it one way some of the time and another way at other times, empirical work with this variable can be quite treacherous. One way to gain confidence in the validity of real exchange rate economics is to work with big disturbances, so that we know in advance what the main disturbing force was. Good examples are the Latin American debt crises of the early 1980s and the East Asian crises of 1997-1998. In these cases the story was a big shift from a large inward net resource transfer to a fairly large outward transfer, or else to simply a "sudden stop" of the net inward transfer. The natural expectation in such circumstances is that a major rise in the real price of the dollar will be required, in order to bring about a new equilibrium. And in fact that is what has happened in all such cases -- something that I consider to be a powerful verification of real exchange rate theory.[3]

On the Vignettes to Follow

Much as I would like to say more about the theoretical and conceptual issues that one faces in the areas of monetary and real exchange rate economics, neither the available time

[2] The issue concerning nontradables is quite subtle, but also quite basic. Consider an inflow of 200, half spent on tradables, half on nontradables. The part that is spent on tradables will disappear, being actually spent on added imports, or else, if spent on exportables, displacing that amount of the country's exports. So that means that in the present example there is only an excess supply of foreign exchange of 100, the part that has to be converted to pesos in order to, say, pay wages in the local marketplace. It is the sale of these dollars that depresses the real exchange rate. At the "old" exchange rate (the equilibrium rate without this added supply), there is now an excess supply of foreign exchange of 100. The price of the dollar then falls, with the "new" equilibrium reflecting an induced increase in imports and a displacement of exports, adding up to 100. Thus in the ending equilibrium the observed NRT, in this example, is 200, but only half of that amount had an effect on the real exchange rate. The bottom line is, new inflows spent on tradables do not affect the RER; those spent on nontradables cause the real price of foreign currency to fall.

[3] For other examples of big disturbances having the expected effects, see my "Applications of Real Exchange Rate Analysis," Contemporary Policy Issues, vol. VII, No. 2 (April, 1989), 1-26.

nor the nature of this conference seem to favor that choice. So in its place I decided to focus on a series of real-world examples - stories that in my opinion reflect and illustrate how the approaches and concepts sketched in the preceding sections can really help us as we try to analyze and understand the complex realities that we face. These sketches will necessarily be brief but I will try in each case to draw the message to be extracted from the story.

Sawtooth Real Exchange Rates Under Chronic Inflation

There is obviously no reason why the true path of the real exchange rate should exhibit jagged up-and-down movements, just because a country is experiencing chronic inflation. One sees very little of such patterns in recent years. However, in the late 1950s and into the 1960s, and even to some degree into the 1970s, that was a common phenomenon in those Latin American countries experiencing chronic inflationary pressures. The reason for this rather strange behavior was the constant attempt to hold to a fixed exchange rate. A fixed exchange rate would be established, but internal inflation would go on, fueled by large budget deficits, which were financed by bank credit and monetary expansion. As the price level went up and up in response to these pressures, the real exchange rate would suffer a continuing erosion (the real price of the dollar fell, even though its nominal price remained constant, because the deflating price level $\bar{P}_d$ kept rising). This naturally tended to squeeze tradables production and expand the demand for imports, and also to induce speculation against the local currency. Sooner or later this would lead to a big devaluation to a new higher price of the dollar -- which, however, was not the initiation of a flexible exchange rate regime, but rather was conceived of as simply a new, higher level of the fixed exchange rate. So while the nominal exchange rate E moved up in large discontinuous steps, the domestic price level $\bar{P}_d$ climbed up pretty continuously. This led to the real exchange rate taking discontinuous big jumps at each successive devaluation point, and then being eroded by the ongoing inflation until the situation became intolerable and a new big devaluation ensued, giving the real exchange rate another big upward bounce.

At the time I do not recall any economist-observer of these events giving a correct diagnosis. All of us (myself included) interpreted these events as the natural consequences of using an inflationary method (expanding the money supply) of financing a chronic fiscal deficit. None of us, to my knowledge, went further than that.

My own epiphany on this matter came in the very early 1970s, as I was internalizing the messages of the so-called "monetary approach to the balance of payments". What was the message here? It was not that the whole price level would tend to rise in response to monetary expansion. That is what should happen with a flexible exchange rate. But here we had fixed exchange rates most of the time. But here, in a fixed exchange rate setting, the big story was that excess monetary balances $[(M^s/P)-(M/P)^d]$ would tend inevitably

to be spent, with just part of the spending hitting tradables. This part would lead (unless offset by other forces) to balance-of-payments deficits and to a continual drain of the international reserves of the Central Bank. This drain would cause base money to contract, leading (at least in textbook cases) to the full offsetting (through a chain of subsequent reserves losses) of any initial autonomous monetary expansion.

Why did one not see the above-discussed scenario? Why was the upward drift of the price level not interrupted by major losses of international reserves as people spent, depleting their excess monetary holdings? The answer is that an additional set of forces was present, cutting short the natural equilibrating process that would normally work itself out via successive losses of reserves.

These additional forces were import restrictions of all shapes, sizes and kinds. As the drain of reserves was perceived, or at least as it reached a scary level, the authorities would respond with one restriction after another -- tariffs, import surcharges, licenses, protected lists, permitted lists (for imports, when the prohibited lists got to be too long), prior deposits. These restrictions stimulated the growth of black markets, which in turn incited and were vehicles of speculation against the country's currency. This was the scenario that in the end resulted in a big devaluation, allowing for a rationalization (however temporary) of the country's incentive structure, a major relaxation of the restrictions, an elimination or great reduction of the black market premium, etc.

Once this scenario is recognized, oldtime observers quickly see its relevance. They also appreciate how much richer is the story it tells, how much more subtle the underlying economics, than the simplistic "fiscal deficits → monetary expansion → inflation" story that most economists were telling at the time.

An Early Example of Inflation Targeting

This example comes from the first three years (1964-1967) of the presidency of Eduardo Frei Montalva in Chile. USAID at that time worked with the concept of a long-range assistance strategy (LAS) vis-a-vis each partner country. I was the lead economist on a USAID team that was to recommend a LAS for Chile. The key members of the Chilean team were Sergio Molina, Carlos Massad, Edgardo Boenninger and Jorge Cauas -- figures who are still known and remembered by Central Bankers throughout Latin America. Our meetings were models of cordiality and cooperation -- the main reason being that both sides entered the room with essentially identical diagnoses of what was wrong, and virtually identical suggestions for policy reform. The background problem was, how to deal with an ongoing inflation fueled by fiscal deficits largely financed through monetary expansion. The answer, in the broadest of terms, was -- we must learn to live with the inflation we have, while at the same time taking measures to control it.

The outcome was a set of coordinated policies, in which the coming year's inflation rate was programmed to be compatible with the expected fiscal deficit and its financing; in which the rate of exchange rate devaluation was programmed to be compatible with that inflation rate, and in which the key interest rates in the economy were to be managed (or influenced) by the Central Bank in such a way that they ended up positive in real terms.

This early exercise in inflation targeting was implemented for the years 1965 through 1967, with what I consider to be spectacular success. Over that period, inflation was brought down from its 1964 rate of over 40% to its 1967 rate of under 20%, while at the same time the country's real GDP grew at close to 5% per year. The unfortunate sequel, however, is that this pattern was broken in the 1967-70 period, largely because of populist policies that were adopted in spite of strong resistance from the economic team.

In spite of the fact that it did not last, the Chilean policy package of that period was, in my opinion, a fine example of inflation targeting "in practice". The key feature that made it outstanding was the conscious linkage between the fiscal budget expectations on the one hand, and the inflation and monetary targets on the other. I feel that some of today's Central Banks (those which consider inflation targeting to be a matter of concern only to them) would be well advised to heed the Chilean example of coordination between the Central Bank's targeting plans and the fiscal prospects and policies of the government.

"A Tiger in the House"

This story deals with the linkage between real exchange rate economics and monetary policy. The setting is El Salvador during the late 1970s. That country, along with its Central American neighbors, was the beneficiary of a long coffee-price boom which covered most of the decade. El Salvador had at that time a fixed exchange rate and thus was operating under the rules of a fixed-rate system. Under these rules, the Central Bank was required to (and did) buy, at the established rate of 2.5 Colones per dollar, all the dollars that were brought to its foreign exchange window. This obviously resulted in a big expansion of the supply of base money, and in a rise in the general price level. How high that price level rise would tend to be would depend significantly on the government's policy of import restrictions.

The easy way to see this is to think of the restrictions as if they were out-and-out import prohibitions. This helps focus attention on the fundamentals of the analysis.

Start with an equilibrium of the balance of trade with coffee at $1 a pound, and then let the world price of coffee rise to $2. This, for a major coffee exporter like El Salvador, would cause a huge jump in the supply of dollars that becomes available to the country per year or other period. The natural consequence of this increased supply is to reduce the real price of the dollar. With a flexible exchange rate, this might happen by the nominal price of the dollar falling, but with a fixed exchange rate it can only happen through a rise in the general price level $\bar{P}d$.

Assume that the price level would have to rise by 80% if the country's prohibited list were to remain unchanged. This would be the price-level rise that the Salvadorans were observing, and noisily complaining about!!

Now assume that the government decides to cut its prohibited list in half. This would shift to the right the country's annual flow demand for dollars (to pay for imports), and it would naturally lead to a new and higher equilibrium real price of the dollar. Hence, liberalizing import restrictions would directly operate to offset the coffee-induced rise in $\bar{P}_d$. This will be so for any liberalization, not just one that cuts a pre-existing prohibited list.

The title of this section comes from a lecture that I gave in San Salvador at a moment when the extent of price-level rise was a burning political issue. What I said was "If you suddenly find that a tiger (escaped from the zoo, say) was roaming around in your house, what should you do? Answer - open the doors, open the windows, to give the animal the biggest chance of finding its way out!!" The analogy with opening windows and doors is opening the country's markets to a much bigger flow of imports. When I have gone to El Salvador on subsequent visits, people have still commented (most recently on my last visit in 2007) on the analogy of the "tiger in the house".

Managing The Real Exchange Rate In Brazil

As will become clear, managing the real exchange rate is not an easy task for a country's policymakers. However it has been done from time to time. The case of Brazil during the period of the so-called "Brazilian miracle" (1968-79) is one example. It all started when an excellent economic team settled on "export led growth" as its main strategy for the coming period. To stimulate exports they wanted to rely on market forces, not open or hidden subsidies. So to get the market itself to elicit a big export expansion, they needed a real exchange rate that was very attractive to exporters - i.e., a high real price of the dollar.

To achieve this they introduced a system of what they called minidevaluations, in which the nominal exchange rate was adjusted every few weeks (or more often) in order to keep pace with the ongoing upward drift of the general price level, $\bar{P}_d$. Each prevailing exchange rate was "validated" by the Central Bank being willing to buy and sell dollars at that rate. Obviously, this turned the Central Bank's accumulation of foreign reserves into an endogenous variable of the system. And it should come as no surprise that the Central Bank ended up buying lots of dollars, given that their real price was so high. Buying so many dollars led, however, to an expansion of cruzeiro base money that was also regarded as intolerable by the Central Bank and the rest of the economic team. What to do? The answer was "let the tiger out of the house". Brazil started this exercise with a plethora of import restrictions, so that when the Central Bank was felt to be accumulating too many international reserves, the response was to peel off, one by one or two by two, etc. more and more import restrictions.

Outside economists like Brazilian academics, and also myself, applauded the progressive trade liberalization that resulted, even though it wasn't being motivated for its own sake, but rather as an instrument for managing the real exchange rate. But we no longer applauded when circumstances led the Brazilians to apply the same policy in reverse. This occurred in the wake of the 1974 oil-price boom. Brazil was a significant net importer of oil, and its demand for foreign exchange rose dramatically as oil prices spiked. The result was a loss of dollar reserves by the Central Bank -- a loss they did not want. So in response they simply reversed their earlier policy, and put back some of the old import restrictions, or else some new ones in their stead. During the period after 1974, the Brazilians thus deliberalized their trade in order to achieve their real exchange rate target!! But they did succeed in maintaining that target, all the way up to the "maxi devaluation of 1979".

RER Management in Chile -- Two Stories

Chile had one successful period (1985-89) of real exchange rate management, but that was followed by another which ended with the effort being abandoned. The first came in a period when the Central Bank still had authorization to impose controls on capital movements. This gave it certain instruments of control that it otherwise would not have had.

The setting of the first episode was the aftermath of Chile's debt crisis of 1982-1983. The economy was still in a deep recession in 1985, and finding prudent ways of stimulating a healthy recovery had a high priority. The economic team, at the time headed by Hernán Büchi, followed the Brazilian choice of 1968 and opted for aiming at export-led growth, induced by a highly favorable (to exports) real exchange rate. They did not, however, think of using trade restrictions as an instrument for this purpose (although they did lower the country's uniform tariff rate from 35% to 15%, on quite independent grounds). Instead, they found other ways of influencing the demand for dollars, with the objective of making demand roughly equal to supply at their target real exchange rate.

The power of control over capital movements was the key - and it was used in two different ways. First, foreign investments were subject to advance approval, the pace of which could easily be modulated so as to support the authorities' target real exchange rate. The second device was more interesting, but it depended on very special circumstances. Part of the legacy of the debt crises was a lot of instruments of dollar debt which had been issued by private Chilean banks in the heady days (1979-1981) leading up to the debt crisis. These instruments were selling at a big discount (around 50% to 60% of par) in the secondary bond market in New York. The issuing banks were precluded (by the terms of the indebtedness instruments) from entering this market, but that did not prevent private speculators from doing so. The authorities at the Central Bank first noticed this when they received large batches of requests for dollars, aimed at effectuating such purchases. The

speculators could then, back in Chile, make arrangements with the debtor banks so that everybody could end up profiting from the operation. Initially, the profits to be made were so large, and the speculation so attractive, that the Central Bank feared the flood of demand would turn into a veritable Niagara. To prevent this from happening, they instituted an auction scheme, whereby the right to engage in such a transaction was auctioned off at regular intervals of around two weeks or so. Thus, if in a 2-week period the authorities wanted to create an extra demand for $100 million, they would auction off $100 million worth of those rights. If in the next period the desired extra demand was only $40 million, they would then auction off $40 million worth of rights. Using this auction instrument, together with the controls of approvals on foreign investment, the Chilean authorities were able to keep the real exchange rate within its target band throughout the 1985-1989 period.

However all (or at least most) good things must come to an end. In this case, two related developments were at work. First, and quite obviously, as more and more chunks of discounted debt were purchased and repatriated under the auction system, less and less debt remained available for the future. And second, as the remaining stock of outstanding debt was depleted, the secondary market price of the bonds moved up and up and up. So by the time the democratically elected government of Patricio Aylwin took office, little room remained for further pursuit of the "auction operation".

The new authorities, however, liked what that auction operation had accomplished, and sought other ways to accomplish much the same thing. Recognizing that the auction operation had involved a reduction of Chilean liabilities in the foreign market, they reasoned that similar results should ensue if, instead of reducing foreign liabilities, they increased the country's foreign assets.

This reasoning led to what most people think of as a more-or-less standard operation known as "sterilized intervention". The adjective "sterilized" is meant to connote that the operation does not entail any net increase in the supply of base money. In the Chilean case, the Central Bank sold purchasing-power bonds in the local marketplace, then used the peso proceeds to buy dollars, which were then added to its holdings of international reserves. The effect of this was to increase the demand for dollars, vis-a-vis which it would otherwise have been; as a consequence it helped move the RER to (or toward) the target band.

There was, however, a drastic difference between this operation and its predecessor -- the auction scheme. Whereas the auction scheme produced a steady flow of profits for the Central Bank, its later operations of sterilized intervention led to nothing but losses. The result of the sterilized interventions was an increase in the Central Bank's international reserves from around $5 billion to over $18 billion. This would not be bad in and of itself, were it not for the Central Bank losses it entailed. As it worked out, the Central Bank ended up paying a real interest rate (in pesos) of around 7% on the purchasing-power bonds it issued, while it took in nominal interest of only 2 or 3 percent in dollars on its buildup of

international reserves. The results were big Central Bank losses, which reached something near $500 million per year, and which were not just one-time losses (in the year of issuing the bonds and increasing the reserves) but were losses which repeated year after year, so long as the Chilean bonds were outstanding and the reserves continued to pay interest at very low rates.

The heavy Central Bank losses led the Chilean authorities to rethink their situation, and ended up first with the relaxation of the real exchange rate target, and ultimately with the complete abandonment of the attempt to prop up the real price of the dollar.

This part of the story is particularly instructive. Efforts to influence the RER typically have significant costs, and the authorities are well advised to be careful to consider these costs before embarking on any major continuing policy of RER intervention. When someone asks me in casual conversation whether it is possible for the authorities to have significant impact on the real exchange rate, my offhand answer is "Absolutely -- all they have to do is add 3 or 4 percentage points to the country's value added tax, and use the proceeds to build up asset balances in the financial markets of the world!!" With this response, they become immediately aware of the likely costs of such an intervention, and realize that it should only be seriously considered in cases where the benefits of the policy are expected to outweigh these costs.[4]

[4] I chose the example of a tax-financed intervention because I do not believe anybody would dispute its effectiveness in influencing a country's equilibrium RER. The demand for foreign currency goes up by the amount of the increase in reserves minus the fraction of the tax proceeds that is reflected in a reduced demand for tradables. The equilibrium price of foreign currency must go up, so long as the initial induced reduction in the demand for tradables is anything less than 100% of the tax proceeds. In the end, the wedge between export supply and import demand must be equal to the increment in reserves, but in order for this to happen, the real price of the dollar must rise.

The case of an intervention financed in the local capital market rather than by increased taxes is somewhat less clear. I like to deal with this through the concept of what I call the "reflux". If Chile's Central Bank buys $100 million of foreign exchange, financed by a local bond issue, it is likely that local interest rates will rise as a result of that bond issue. In turn, then, there might be a reflux flow of capital back to the country, in response to this interest rate rise. I believe that such a reflux will likely occur, and that it could in principle be anything between zero and 100% of the amount (here $100 million) transferred abroad.

I feel I have witnessed many developing countries situations where this reflux is close to zero. I doubt that I have seen any where the reflux would be at or near 100%. One must realize that this is not a story just of sterilized intervention -- it is a story of the whole capital market. We derive the economic opportunity cost of capital for a country by considering that any new demand for funds in the capital market will be met partly from displaced domestic investment, partly (probably a small part) from newly-induced domestic savings, and partly from money newly attracted, coming from the world capital market. The case of 100% reflux is one in which any and every new demand for funds in the local capital market is sourced (either directly or indirectly) 100% from abroad, in which any and every increase in savings spills over 100% into the foreign capital market, and in which every increase in investment financed directly by local issues of stocks and/or bonds ends up inducing a new capital flow from abroad, equal to 100% of its amount.

In my opinion this may be the case for an American city like Peoria, Illinois, it might be the case for a fully integrated city-state like Liechtenstein or Monaco, but it is not the case for any developing country I know.

When Devaluations Do Not Work

One message that is illustrated by the preceding two sketches is that to have an impact on the equilibrium real exchange rate, one should use real policy instruments. Purely nominal changes, like a devaluation of the nominal exchange rate, will not alter the underlying real equilibrium of the economy.

This message can be well illustrated by an experience we had in El Salvador. I was asked in mid-1988 to organize a team of experienced policy economists to come to that country during the period leading up to its 1989 presidential election. We were asked by USAID to assess the current state of the economy and the country's policy package, and then, based on our separate experiences in many other places, make suggestions that we thought the winners of the election might fruitfully consider as parts of their new economic program. In the course of numerous visits over a 6-month period, we met with all the presidential candidates, with their economic teams, and with representatives of all major interest groups -- labor, business, agriculture, finance, etc.

This story concerns our interactions with representatives of the agricultural sector, at a number of different meetings. El Salvador's farmers (whose biggest crop was coffee) were suffering from a very low real price of the dollar. Many were on the verge of insolvency, and none were happy with this circumstance. Moreover, the great bulk of them had in mind what they thought was an utterly simple and straightforward solution - the Central Bank should simply carry out a major devaluation of the Colon. If the farmers were in real trouble at 5 Colones per dollar, they thought they could be put in paradise if only the exchange rate were moved to 8 or 10 Colones per dollar!! How could the Central Bank, they asked, fail to see how simple and easy and beneficent such a devaluation would be!!

Our team had the task of explaining to these farmers that their easy solution (a major devaluation) would likely help them only in the beginning, and that in the long run a devaluation of 60 to100 percent would most likely end up causing a rise of 60 to100 percent in the country's general price level. A key lesson in monetary economics is that under a fixed exchange rate, the nominal exchange rate is the effective numeraire of the system. Double the exchange rate and (in the absence of any change in the underlying situation of the real economy) you end up doubling the whole level of prices and costs (in nominal terms).

To try to pound home this lesson, we called attention to the fact that the dollar was cheap (in real terms) in El Salvador because dollars were very abundant. Foreign aid was coming in to the tune of more than 5% of GDP, and emigrant remittances were matching or more than matching that foreign aid inflow. If the dollar were to be made more expensive in real terms, we insisted, something would have to be done to make it scarcer. Only half in jest, we suggested that the farmers urge their government to turn down next year's offers of foreign aid, and that they urge all Salvadorans to write to their relatives in the U.S., telling them please not to send any more money!!

A devaluation can work when it moves the economy from a disequilibrium situation to one of equilibrium. This happens when the initial point is clearly not an equilibrium. One example is the Argentine crisis of 2001-2002 where the economy had been suffering chronic unemployment of around 15% (or more) even since 1994. Its fixed exchange rate with the dollar meant that if a full equilibrium called for a real devaluation, that would have to be accomplished via deflation (of the general price level). But the downward rigidity of prices and wages led to the deflationary pressures being reflected mainly in a high level of unemployment. Although the Argentine crisis in itself had many bad effects, and was also badly managed, the threefold devaluation that resulted brought the economy to a new and better real exchange rate equilibrium.

Most successful devaluations depart, not from a sate of chronic unemployment lasting several years, but from a shorter-run situation of major change in the underlying real determinants of the real exchange rate. Thus we have cases like the debt crisis, of a quick reversal of capital flows coming into the country, and other crises propelled by a collapse of the world prices of a country's major export goods. In all these cases, the same underlying forces would have worked, as they in fact did in Argentina, toward deflation and high unemployment. Timely devaluations in such cases can avoid these high costs, and help the economy move more expeditiously to its new equilibrium.

Lessons From the Asian Crisis of 1997-1998

This sketch does not by any means attempt to deal with the Asian crisis in full detail. Rather it takes as its starting point a particular element that seems to have been common to all the countries that suffered from that crisis -- a huge asset price bubble in the period leading up to the crisis, followed by a dramatic collapse of these same asset prices. Many people, in describing this reality, seem to see something wild and irrational in the high ratios, say, of house prices to annual rents, and of equity prices to annual earnings that were observed, pre-crisis, in the Asian countries. They view the subsequent fall in asset prices as something that should "clearly have been foreseen" by economic agents at the time. Correspondingly they tend to treat the subsequent fall in asset values as something like a "return to sanity" in those markets.

I take a different view. I feel it is quite easy to have P/R (= prices to rents) and P/E (= prices to earnings) ratios of 100/1 in dynamically growing economies. So I don't attribute them to irrational exuberance or insanity. By the same token I do not feel that market participants in these countries "should" have foreseen the crisis, with its attendant collapse of asset values. But while that collapse was not something to be readily foreseen, neither did it represent a rare "outlier" type of event. Rather, it could well have come from a simple downward revision of the market's expected rate of growth of those same rents or earnings.

All this can be shown in the language of an elementary lesson in the mathematics of finance. Students there learn that a perpetuity yielding a constant annual return of *A* has a present value of A/r, where r is the relevant discount rate. Usually in the same chapter, the textbook goes on to say that if the stream of payments is expected to grow at the rate g, then its present value will be $A_0/(r-g)$, where A_0 is the first year's annual payment.

This simple framework can easily be applied to an Asian-like case. Assume the real discount rate is 5% and the expected rate of growth of real earnings or real rents is 4% per year. This gives us $P = A_0/(.05-.04)$, or $P = 100A_0$. Now consider that real GDP in the affected Asian economies had been growing for a couple of decades at average rates of 6, 7, 8 percent or even more. It is not at all crazy under such circumstances to expect that earnings and rents will continue to rise at something like 4% per year. Some would even say that 4% would be a low estimate.

Now, however, assume that expectations change -- not that they look forward to perpetual stagnation of rents and earnings, but only that their expected growth becomes 2% instead of 4% per year. Now the price equation reads $P = A_0/(.05-.02)$, or $P = .33A_0$. Even if Ao remains the same this means asset prices falling to a third of their prior level.

I am sure that, as in all crises, many mistakes were probably made by key individuals and groups in each of the Asian crisis countries. However, the present exercise is intended to demonstrate that it doesn't require lots of mistakes, in order for a collapse of asset values to occur.

An immediate corollary of the above is that big fluctuations in asset prices can occur even in a well-ordered and well-functioning market economy. Policy improvements may help eliminate the errors and correct the deficiencies that characterized the past, but even after all that has been accomplished, it is likely that we will still experience big swings in asset values.

"Sterilization by the People" -- China (1996-2003)

As previously noted, it is mainly the large number of different forces acting on the RER that account for so many people (and even institutions) having failed to grasp the essence of real exchange rate economics. Trade restrictions, world prices of export products, capital movements, remittances, productivity increases in tradables and nontradables -all working to influence the RER -- generate a scenario that leaves many people bewildered, or perceiving only fractional pieces of the complex reality of RER economics.

In this section we add yet another important force -- the public's demand for real monetary balances. This force is definitely operative in a fixed-exchange rate setting, and that is the framework that applies in the case that we will here examine, that of China during the 1996-2003 period. The starting point was a significant inflation problem in China in

the years leading up to 1995. At that point the Central Bank (The Peoples Bank of China) looked seriously for a remedy, and found one in setting a fixed exchange rate as the "nominal anchor" of the system. They may have been led to believe that this would keep the general price level from rising, but if so, they were badly advised. As we have seen, a new abundance of foreign currency will tend to make the dollar cheaper in real terms, which can only happen (with a fixed exchange rate) by a rise in the price level of nontradables.

And, amazingly, such a new abundance of foreign exchange is exactly what happened in the period after the fixed exchange rate was established. China's exports boomed, and the result was a new flood of dollars into the economy. The Central Bank, following the "rules of the game" of a fixed exchange rate system, bought all the dollars that came to its foreign exchange window, causing a doubling of the supply of base money between December 1996 and December 2003. The increment of base money (some 2.6 trillion yuan) was actually larger than the increase (2.07 trillion) in the Central Bank's net foreign assets. So it is clear then that the Central Bank, far from trying to sterilize part of its increased dollar holdings, actually went the other way and, so to speak, anti-sterilized!! Moreover, during this same period the money multiplier (the ratio of broad money to base money) grew from 2.83 to 4.19, with the result that the broad money supply tripled while base money doubled.

The natural reaction of economists to the above picture would certainly be to expect that there would have been a big rise in the price level of nontradables, reflection a cheapening of the dollar in real terms, in reaction to the huge increase in China's foreign currency receipts. There is nothing wrong with this natural reaction, but the facts of the case say otherwise. Something happened to short-circuit the "natural" reaction of the Chinese economy to the new flood of foreign exchange during the 1996-2003 period.

That event was a vast upward shift in the demand for real monetary balances by the Chinese people. If their demand for money had simply doubled, keeping pace with real GDP, the picture would include a significant rise in the general price level, as one would predict if the flood of dollars was the only important exogenous force at work. But into this picture there actually entered a new exogenous force, of a major increase in the demand for real monetary balances. This increased money demand simply short-circuited the natural mechanism by which an increase in the inflow of dollars would cause the price of the dollar to fall (via a rise in the prices of nontradables). In that mechanism, the people would perceive their monetary balances to have increased by more than they wanted. Hence they would over time try to get rid of those excess balances. In the process, this would drive up the internal price level of nontradables, and at the same time would involve an increased demand for tradables. A new equilibrium would be established when this induced increase in tradables demand was sufficient to match the increased inflow of dollars. At this point there would be no net supply of dollars being offered to the Central Bank, and the RER would have reached its new equilibrium level.

But with the observed increase in the demand for real monetary balances in China, there simply was no trigger of excess monetary holdings that would set in motion the equilibrating process described above. Many forces contributed to this increased money demand. First, of course, was the increase in real GDP itself, at a rate of around 10% per year. Second, there was the traditional conservatism of the Chinese people, which led them to save a very large fraction of the increase in their incomes. Third were the facts that China had virtually no established social security system, and that the old reliance on one's children for support during one's old age had been put in peril by the country's "one-child" policy. And finally, at least up to 2003, there was almost only one place for families to put their savings - which was in a savings account in a bank. Later, other financial assets like stocks and bonds became more generally accessible, and incremental savings no longer flowed just into a family's bank account.

All of these forces combined to keep China's consumer price index virtually constant - it moved just from 115 in December, 1996 to 117 in December, 2003.

The lesson that I draw from this experience is that it is hard to accuse the People's Bank of China of anything that looks like currency manipulation during this period. They obeyed the rules of the fixed exchange rate game, and "sterilization by the people" did the rest of the job of keeping the real exchange rate from appreciating!!

When Is An Inflation Not An Inflation? The Case of Russia, 2000-2005

One of the hardest things for a real exchange rate economist to communicate to others, even other professional economists, is the distinction between a price level rise that really reflects an adjustment of the equilibrium real exchange rate on the one hand, and a price level rise that stems from genuinely inflationary causes on the other.

To see the difference, consider two hypothetical cases, both with fixed exchange rates. In Case I we follow a standard inflation scenario, with large fiscal deficits being financed by the banking system through a rapid increase in the money supply. In this case we would expect to see important losses of foreign exchange reserves, we would see people trying to get their money out of the country, or at least putting their savings into dollars or Euros. We would see nearly everybody thinking of the possibility of a future devaluation, and in most cases we would see, the emergence of a black market currency. That is what I would call a standard inflation scenario.

Contrast that with the case R of newly abundant dollars -- from an export boom, from a surge of emigrant remittances, from a major capital inflow or whatever. Here there is a big rise in foreign exchange reserves, there is no expectation of devaluation (if anything, it would be for revaluation) of the currency, there is no flight from the local currency, and there is no black market.

The only thing that Cases I and R have in common is that in both of them the price level of nontradables has to rise. My plea, and I think the plea of all real-exchange-rate economists, is that these two types of cases should be put into two different classifications -- type I (for inflation) and type R (for real exchange rate adjustments). Type I is something one would want to fight against by fiscal and monetary prudence. Type R reflects a relative price adjustment that one should think of in entirely different terms, and certainly not try to "avoid" entirely.

Think of a situation in which tradables and nontradables each have half of the weight in the relevant price index. Consider also that the old equilibrium price levels were 100 for both tradables and nontradables. Now assume that the new equilibrium price level of nontradables will be 50% higher than that of tradables. This could happen in a whole continuum of ways, of which Cases A and B are two interesting examples

	P_t	P_n	$\bar{P}_d$
A	100	150	125
B	80	120	100

Case A is what would naturally occur under a fixed-rate system, with the world price level of tradables remaining constant. Case B is what might happen under a flexible-rate system, if the economic authorities steadfastly and successfully pursued the goal of keeping the country's general price level ($\bar{P}_d$) constant.

The first point, which I hope I have already made, is that Case A is the natural outcome stemming from a new abundance of foreign currency under a fixed exchange rate system. There is nothing "wrong" with the rise in the price level from 100 to 125.

Obviously, Case B is the same as A in real terms, but is it preferable? In a world of perfect price and wage flexibility, maybe, for there is certainly something to be said for price level stability.

But in a world where price and wage rigidities are present, one might worry about the pressures trying to drive $\bar{P}_t$ from its initial level of 100 down to 80 in Case B. If $\bar{P}_t$ really contains mainly prices which are highly flexible anyway, and which contain a high fraction of economic rents (think of most minerals prices here), then the fall from 100 to 80 would seem to present no problem. But if $\bar{P}_t$ covered mainly manufactured goods, the downward pressure on nominal prices would here probably end up creating significant unemployment, and the new "equilibrium" level of 80 might not even be reached.

I can easily imagine the authorities in such a situation voluntarily choosing to go to Case A -- even though they have a flexible exchange rate. I believe our observations show relatively few cases of a country's overall manufacturing price level falling significantly over time.

This leads one to contemplate a sort of ratchet rule of monetary policy -- keep the nominal nontradables price level from falling when its real (= relative) price is going down, and similarly keep the nominal tradables price level from falling when its real (= relative) price is going down. Such a rule would help explain the upward shift of general price levels, pretty much all over the world. So my second point is that one should probably not be automatically scandalized by the idea of such ratchet-type behavior. And, I would suggest, we should be interested in carrying out empirical studies to see how often, and to what extent, the price levels of tradables and nontradables have in fact been allowed to fall, in nominal terms, in the actual experience of countries.

Just to show that my numerical example was actually quite conservative, I offer the experience of Russia from 2000 to 2005. Russia had a flexible exchange rate during this period, but its 2005 average rate was almost the same (28 rubles per dollar) as its 2000 average rate. But during this period the general price level more than doubled. Hard to believe, but this was not inflation (I), it was instead real exchange rate adjustment (R).

And, to make the story even more surprising, the government had big fiscal surpluses during this period, greatly increased its deposits in the Central Bank, paid off many of its foreign debts, and built up big foreign balances in Russia's Oil Fund. Moreover, the Russian people increased their real monetary balances by a factor of three -- about the same as in China. Yet all this sterilizing -- by the government and by the people, was not enough to keep the general price level from more than doubling!!

I will stick with my belief that the real exchange rate is a genuine endogenous variable of the economic system, and when it is pushing hard to move in one direction, yes, other forces of sterilization will have their effect, but sometimes even huge offsetting forces of this kind are not enough to prevent a big move of the RER.

Put the question the other way. Russia's price level rose from 100 to 225 over the 2000-2005 period while the nominal exchange rate was the same at the end as at the start. What would Russia's internal economy have looked like if the nominal exchange rate had been allowed to drop from 28 to 12.4 rubles per dollar, which is what it would have to do in order to end up with the same real exchange rate as in fact prevailed in 2005, but with the general price level constant at its 2000 figure?

Concluding Remarks

I hope that these sketches have shown readers how interesting are the insights that one can garner, even from very basic, very fundamental applications of monetary and real exchange rate economics. They also show, I think, that we must be perpetually alert to the evidence as it appears. Even in the very rudimentary framework explored here, we face a multiplicity of forces -- export prices, emigrant remittances, fixed exchange rates,

sterilization by the people, sterilization by the government, etc., etc. -- that can work in a veritable kaleidoscope of combinations to produce what seem like different results every time. But beneath it all there is, I believe, a straightforward and fundamentals-based framework of good theory -- theory that helps us "understand, interpret, and up to a certain point predict the forces and events of the real world."