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Real Exchange Rate, Monetary Policy and Employment*Roberto Frenkel and Lance Taylor*

Abstract

The exchange rate affects the economy through many channels and, consequently, has diverse macroeconomic and development impacts. Five are analysed in this paper: resource allocation, economic development, finance, external balance and inflation. The use of the exchange rate as a developmental tool in conjunction with its other uses (often in coordination with monetary policy) is at the focus of the discussion.

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Real Exchange Rate, Monetary Policy and Employment

Roberto Frenkel and Lance Taylor

The exchange rate affects any economy through many channels. It scales the national price system to the world's, influences key macroprice ratios, such as those between tradable and non-tradable goods, capital goods and labour, and even exports and imports (via the costs of intermediate inputs and capital goods, for example). The exchange rate is an asset price, it partially determines inflation rates through the cost side and as a monetary transmission vector, and it can have significant influences (in both the short and long run) on effective demand.

Correspondingly, the exchange rate can be targeted towards many policy objectives. In developing and transition economies, five of these objectives have been of primary importance in recent decades:

- *Resource allocation:* Through its effects on the price ratios just mentioned, the exchange rate can significantly influence resource allocation, especially if it stays stable in real terms for an extended period of time. Through effects on both resource allocation and aggregate demand, a relatively weak rate can help boost employment, which has been an area of concern in light of stagnant job creation in many developing economies over the past 10-15 years;
- *Economic development:* The exchange rate can be deployed, often in conjunction with commercial and industrial policies, to enhance overall competitiveness and thereby boost productivity and growth;
- *Finance:* The rate shapes and can be used to control expectations and behaviour in financial markets. Exchange-rate policy 'mistakes' can easily lead to highly destabilizing consequences;
- *External balance:* The trade and other components of the current account usually respond to the exchange rate, directly via 'substitution' responses, and (at times, more importantly) to shifts it can cause in effective demand;
- *Inflation:* The exchange rate can serve as a nominal anchor, holding down price increases via real appreciation and/or maintenance by the authorities of a consistently strong rate. As will be seen below, it can also serve as an important transmission mechanism for the effects of monetary policy.

All of these objectives have played a role in recent policy experience. Use of the exchange rate to try to improve external balance has been central to countless stabilization packages over the decades, especially in small, poor economies. The inflation objective became crucial in middle-income countries in the last quarter of the twentieth century (and has become notably less urgent as of 2005). Along with capital market liberalization, fixed rates were significant contributors to the wave of financial crises in the 1990s.

In many ways, however, the resource allocation and developmental objectives can be the most important in the long run—and this is the central point of this paper. We trace the reasons for this in the following section on channels of influence. We then take up the policy implications, contrasting the use

of the exchange rate as a development tool in conjunction with its other uses (often in coordination with monetary policy) in maintaining external balance, containing inflation and stabilizing asset markets,

Resource allocation, labour intensity, macroeconomics and development

Following Frenkel (2004), in this section, we trace three ways in which the exchange rate can have medium- to long-term impacts on development. We begin with overall resource allocation and then move on to the labour market and macroeconomics.

Resource allocation

The traditional 2 x 2 trade theory model is a useful starting point. While this model *does* focus on the key role of relative prices, it *does not* take into consideration important non-price components of industrial and commercial policies. Both themes are woven into the following discussion.

The Lerner Symmetry Theorem (1936) is a key early result. Its basic insight is that if only the import/export price ratio is relevant to resource allocation, it follows that it can be manipulated by *either* an import *or* an export tax-cum-subsidy. There is ‘symmetry’ between the two instruments, so that ‘under appropriate conditions’ (at hand in the textbooks) only one need be employed.

A now obvious extension is to bring three goods into the discussion: exportable, importable and non-tradable, in a ‘Ricardo-Viner’ model. Two price ratios—say, importable/non-tradable and exportable/non-tradable—in principle guide allocation. The real exchange rate (RER or ρ) naturally comes into play as the relative price between the non-tradable and a price-weighted aggregate of the two tradable goods.¹ These observations lead to two important policy puzzles.

The first has to do with ‘level playing fields’. As applied in East Asia and elsewhere, industrial policy often involved both protection of domestic industry against imports by the use of tariffs and quotas, and promotion of exports through subsidies or cheap credits. In the case of a tariff on imports, the domestic price P_m becomes

$$P_m = e(1+t)P_m^* \quad (1)$$

where e is the nominal exchange rate (defined as units of local per unit of foreign currency), t the tariff and P_m^* the world price. Similarly, if the internal price P_e for exports is set from abroad, we have

$$P_e = eP_e^* / (1-s) \quad (2a)$$

where P_e^* is the world price and s is the subsidy rate.

The level playing field rests on the trade theorists’ ancient obsession with setting the internal and external relative prices of tradable goods equal: $P_m / P_e = P_m^* / P_e^*$. This situation can be arranged if $t = s = 0$, or more generally, $(1+t) = 1/(1-s)$. The mainstream argument asserts that if all that industrial policy does is give more or less equal protection to both imports and exports, then its costs, administrative complications and risks of rent-seeking and corruption are unjustifiable. One might as well set $t = s = 0$ and go to a free trade equilibrium.

¹ Just to be clear, we will treat the RER as the ratio of tradable to non-tradable price indexes. Real devaluation or weakening of the RER means that ρ increases. Equation (3) below gives this formal expression.

In a Ricardo-Viner set-up, where P_n is a price index for non-tradables, the price ratios P_e / P_n and P_m / P_n become of interest. Positive values of t and s move domestic relative prices in favour of tradable goods. From a mainstream perspective (Woo, 2005) this outcome can be interpreted as a justification for industrial policy.

The world, however, is a bit more complicated than that. If the home country is exporting a differentiated product, for example, a more appropriate version of (2a) is

$$P_e^* = P_e(1 - s) / e \quad (2b)$$

so that the foreign price of home exports is set by the subsidy and exchange rate. Presumably, a lower value of P_e^* stimulates sales abroad. Moreover, if the economic bureaucracy has the requisite motivation and organization, it can tie export subsidies to the attainment of export, productivity and other targets, and so pursue a proactive industrial policy. In such a context, import protection and export promotion serve different purposes: the former allows domestic production to get started along traditional infant industry lines, while the latter enables national firms to break into international markets.²

Now let us focus on the exchange rate. An increase in the nominal rate e would also switch incentives toward production of tradables, without the need for extravagant values of s and t . This simple observation is in fact a strong argument in support of the use of a depreciated RER as a developmental tool. If we define ρ as

$$\rho = [\mu P_m + (1 - \mu)P_e] / P_n \quad (3)$$

where μ is the weight in a tradable goods price index, then a high value of e means that the real rate ρ will also be weak or depreciated.

Of course, a weak RER may not be a sufficient condition for long-term development. For example, it may usefully be supplemented by an export subsidy or tariff protection to infant industries with their additional potential benefits mentioned above. Even without an effective bureaucracy, generalizing Lerner symmetry to a Ricardo-Viner world suggests that more than one policy instrument may be helpful because there are two relative price ratios that can be manipulated. The rub is that a strong exchange rate implies that commercial/industry policy interventions also have to be strong, with correspondingly high intervention costs. A weak RER may be only a necessary condition for beneficial resource reallocation to occur, but a highly appreciated RER is likely to be a sufficient condition for ‘excessive intervention’ in a situation in which development cannot take place. It is hard to find examples of economies with strong exchange rates that kept up growth for extended periods of time.

Labour intensity

Continuing with the allocation theme, it is clear that the exchange rate will affect relative prices of imported intermediates and capital goods, on the one hand, and labour, on the other. Moreover, the RER largely determines the economy’s unit labour costs in terms of foreign currency.

To explore the implications, we can consider the effects of sustained real appreciation on different sectors. Producers of importables will face tougher foreign competition. To stay in business, they will have to cut costs, often by shedding labour. If they fail and close down, more jobs will be

² Again, these are old arguments. Ocampo and Taylor (1998) provide a recent summary.

destroyed. If the home country's export prices P_e^* are determined by a relationship like (2b), similar logic will apply to that sector. In non-tradables, which will have to absorb labour displaced from the tradable sectors, jobs are less likely to open up insofar as cheaper foreign imports in the form of intermediates and capital goods substitute for domestic labour. On the whole, real appreciation is not likely to induce sustained job creation and could well provoke a big decrease in tradable sector employment. Reasoning in the other direction, RER depreciation may prove employment-friendly.

In both cases, it is important to recognize that a new set of relative prices must be expected to stay in place for a relatively long period if these effects are to work through. Changes in employment/output ratios will not take place swiftly because they must come about via changes in the pattern of output among firms and sectors, by shifts in the production basket of each firm and sector, and adjustments in the technology and organization of production. Gradual adjustment processes are necessarily involved.

Finally, in the long run, if per capita income is to increase, there will have to be sustained labour productivity growth with employment creation supported by even more rapid growth in effective demand. Macroeconomics thus comes into play.

Macroeconomics

The question is how a weak exchange rate (possibly in combination with other policies aimed at influencing resource allocation among traded goods) fits into the macroeconomic system. Much depends on labour market behaviour in the non-traded sector. Following Rada (2005), we work through one scenario here to illustrate possible outcomes.

Assume that output in the tradable sector is driven by effective demand, responding to investment, exports and import substitution, as well as fiscal and monetary policy. The level of imports depends on economic activity and the exchange rate (along with commercial/industrial policies). A worker not utilized in tradable sectors must find employment in non-tradables, become under- or unemployed or leave the labour force. For concreteness, we assume that almost all labour not employed in tradables finds something to do in non-tradable production as a means of survival. Typical activities would be providing labour services in urban areas or engaging in labour-intensive agriculture.

If workers in neither of the two sectors have significant savings, their behaviour does not strongly influence overall macroeconomic balance, which is driven by investment, exports, saving from profits and changes in the magnitude of the import/output ratio via import substitution.

Now let us consider the outcomes of a devaluation. It will have impacts all over the economy, including a loss in national purchasing power if imports initially exceed exports, redistribution of purchasing power away from low-saving workers whose real wages decrease, a decline in the real value of the money stock and capital losses on the part of net debtors in international currency terms. Presumably, exports will respond positively to an RER depreciation, but that may take time if 'J-curve' and similar effects matter. Another positive impact on the demand for tradables will come from import substitution.

One implication is that for a given level of output, the trade deficit should fall with devaluation. If devaluation forces output to contract, as often appears to be the case in developing economies, import demand will decrease and reduce the trade deficit further still. In this case, real devaluation should presumably be implemented together with expansionary fiscal and monetary policies. As discussed in detail below, exchange-rate strategies must be coordinated with other policy moves.

If export demand and production of import substitutes are stimulated immediately or over time by a sustained weak RER, aggregate demand should rise and drive up economic activity and employment in the medium to long run.

So far, the analysis has taken labour productivity as a constant. Longer-term considerations have to take into account the evolution of productivity. Following Rada and Taylor (2004), and ultimately Kaldor in his 1966 Inaugural Lecture (published in Kaldor, 1978), one can show that the growth rate of employment must equal the growth rate of output *minus* the growth rate of labour productivity,

$$\hat{L}_t = \hat{X}_t - \xi_{Lt} \quad (4)$$

where \hat{L}_t is employment growth in the tradable sector, \hat{X}_t is output growth and ξ_{Lt} is productivity growth.

Suppose that ξ_{Lt} responds to \hat{X}_t along a ‘Kaldor-Verdoorn’ schedule of the form proposed by Verdoorn (1949) and Okun (1962),

$$\xi_{Lt} = \bar{\xi}_{Lt} + \gamma \hat{X}_t \quad (5)$$

in which the productivity trend term $\bar{\xi}_{Lt}$ could be affected by human capital growth, industrial policy, international openness, population growth and other factors.

Finally, more rapid productivity growth may make output expand faster, for example by reducing the unit cost of exports. Combined with (4) and (5), this response means that we solve for the three variables in question. In this context, what will be the effects of real devaluation? If a depreciated RER stimulates net export growth, then ξ_{Lt} , \hat{X}_t , and \hat{L}_t will all tend to increase.

Outcomes may be less favourable if a new set of relative prices induces an exogenous upward shift in the trend productivity growth rate $\bar{\xi}_{Lt}$. If the direct effect of productivity growth on tradable output growth is weak, then it can be seen from (4) that that sector’s employment growth could decrease in an example of productivity-induced labour-shedding.

What would happen to wages and productivity in the non-tradable sector? Let $\lambda = L_t / L$ be the share of tradable sector employment in the total. Then $\lambda \hat{L}_t + (1 - \lambda) \hat{L}_n = \hat{L}$ where \hat{L} is overall employment growth. Non-tradable employment expansion becomes

$$\hat{L}_n = \frac{1}{1 - \lambda} [\hat{L} - \lambda(\hat{X}_t - \xi_{Lt})].$$

Let the elasticity of demand for non-tradables with respect to X_t be v . One can show that, even when taking into account the favourable effects on employment of a weak exchange rate that were mentioned above, a low demand elasticity v and fast labour force growth \hat{L} could mean that a strong export performance translates into weak or even negative wage and productivity growth in the non-traded sector. A case like this calls for fiscal and social policies intended to foster demand for non-tradables and compensate for the negative effects on income distribution and employment.

Macroeconomic policy regimes for a stable, competitive RER

For the reasons just indicated, a competitive and stable RER can make a substantial contribution to economic growth and employment creation. Programming the RER, however, is no easy task. It is most directly impacted by the nominal exchange rate, which is itself influenced by many factors, but also depends on the overall inflation rate and shifting relative prices. Moreover, the RER cannot be the only

macropolicy objective. In any economy, there are bound to be multiple and partially conflicting objectives. And all policies—exchange-rate, fiscal, monetary and commercial/industrial—are interconnected and have to be coherently designed and implemented.

The following discussion focuses on these exchange-rate coordination issues in the context of middle-income economies with at least sporadic access to private international capital markets. Although they are not addressed in detail here, somewhat similar questions can easily arise in low-income countries that receive official capital inflows, especially if they jump to levels of 10-20 per cent of GDP, as suggested in the discussion of the Millennium Development Goals (MDGs).

How, therefore, can policy-makers target the RER while at the same time controlling inflation, reducing financial fragility and risk and aiming towards full employment of available resources? Our focus necessarily has to shift from the ‘real economy’ to encompass monetary and expectational considerations. The principal emphasis is on the degrees of freedom available to the monetary authorities, if only because they have been at centre stage in recent policy debates.

What determines the nominal exchange rate?

To set the stage, it is timely to offer a few observations about how the nominal exchange rate fits into the macroeconomic system.

Theories that can reliably predict the level of the rate and its changes over time when it is not strictly pegged do not exist. (The fact that pegs not infrequently break down means they do not have 100 per cent predictive power either.) In the present circumstances of middle-income economies, it is not unreasonable to assume that a more or less floating rate is determined in spot and future asset markets: in effect, the spot rate floats against its ‘expected’ future values. The use of quotation marks around ‘expected’ signifies that we view expectations along Keynesian lines as emerging from diverse opinions on the part of market participants about how the rate may move. ‘Beauty contests’ that magnify small shifts in average market opinion and other sources of seemingly capricious market behaviour can easily come into play (Eatwell and Taylor, 2000).

With regard to the *level* of the rate, it is useful to think about a simple bond market equilibrium condition such as

$$i = f(e, \dot{e}^{\text{exp}}, M) \tag{6}$$

where i is the local interest rate, e the spot exchange rate, \dot{e}^{exp} the expected (as an aggregate of market perceptions) change in the rate over time and M an index of monetary relaxation. A high or depreciated value of e means that national liabilities are cheap as seen from abroad. It should be associated with high local bond prices or low interest rates. If expected depreciation \dot{e}^{exp} rises, on the other hand, foreign wealth holders will want to shift away from local liabilities and i will increase. Open market bond purchases will increase M and be associated with a reduction in i .

Over the past couple of decades, under conditions of external liberalization, most developing economies have been afflicted by high local interest rates and appreciated currencies. This unfavourable constellation of ‘macroprices’ is consistent with (6).

The *dynamics* of the exchange rate will be influenced by interest rates, because it is an asset price. One crucial question is whether lower domestic rates will tend to make the nominal rate depreciate or appreciate. If it tends to rise (or depreciate) over time, then exchange-rate dynamics can be a powerful

mechanism for transmitting the effects of expansionary monetary policy into inflation by driving up local production costs.

Standard arbitrage arguments as built into interest rate parity theorems imply that the expected change in the spot rate \dot{e}^{exp} should be an increasing function of the difference between domestic and foreign rates. If myopic perfect foresight applies, the expected change will be equal to the observed change (up to a ‘small’ error term). Hence a lower local interest rate should cause *appreciation* over time. On Wall Street, such an analysis of exchange-rate movements is called an ‘operational’ view.

A ‘speculative’ view is that the exchange rate will *depreciate* when the local interest rate decreases.³ This view makes intuitive sense insofar as low interest rates should make national liabilities less attractive. It was perhaps first advanced macroeconomically by Minsky (1983) and can be made consistent with the parity theorems if it is assumed that there is a relatively strong positive feedback of expected exchange-rate increases into the domestic interest rate via the bond market equilibrium condition (6).

Recent macroeconomic history (Frenkel, 2004) suggests that the speculative view is the more accurate description of exchange-rate behaviour in middle-income economies.

Avoiding catastrophes

The most fundamental justification for avoiding a persistently strong exchange rate is that it is an invitation to disaster. Exchange appreciation is always welcome politically because it may be expansionary (at least in the short run), is anti-inflationary and reduces import costs (including foreign junkets for those who can afford them). However, for the reasons discussed above, it can have devastating effects on resource allocation and prospects for development. Moreover, fixed or quasi-fixed strong real rates can easily provoke destabilizing capital flow cycles, as perhaps first described analytically by Frenkel (1983) and re-enacted many times since.

The existence and severity of these cycles is in practice a powerful argument for a stable exchange-rate regime built around some sort of managed float (detailed below). A floating rate does appear to moderate destabilizing capital movements in the short run and is therefore a useful tool to deploy. At the same time, the central bank has to prevent the formation of expectations that there will be RER appreciation, which can easily become self-fulfilling along ‘beauty contest’ lines. A commitment to a stable rate, backed up by forceful intervention if necessary, is one way the bank can orient expectations around a competitive RER.

Trilemmas

Possibilities for central bank intervention are often said to be constrained by a ‘trilemma’ among (1) full capital mobility, (2) a controlled exchange rate, and (3) independent monetary policy. Supposedly, only two of these policy lines can be consistently maintained. If the authorities try to pursue all three, they will sooner or later be punished by destabilizing capital flows, as was the case in the run-up to the Great

³ To be more precise, the change over time in the spot rate $\dot{e} = de/dt$ will turn negative when i decreases if the operational view applies, and positive if the speculative view applies.

Depression around 1930 and with the difficulties faced by Britain and Italy during the European Exchange Rate Mechanisms (ERM) crisis more than 60 years later.

The trilemma as just stated is a textbook theorem which is, in fact, invalid. Even with free capital mobility, a central bank can undertake transactions in both foreign and domestic bonds (not to mention other monetary control manoeuvres) to regulate the money supply, regardless of whatever forces determine the exchange rate (Taylor, 2004).

Nevertheless, something like a trilemma can exist in the eye of the beholder. There are practical limits to the volume of interventions that a central bank can practice, along with complicated feedbacks. Possibilities for sterilizing capital inflows or outflows are bounded by available asset holdings. Volumes of flows depend on exchange-rate expectations, which in turn can be influenced by central bank behaviour and signalling.

So how does the market decide when a perceived trilemma is ripe to be pricked? The fact that no single form of transaction or arbitrage operation determines the exchange rate means that monetary authorities have some leeway in setting both the scaling factor between their country's price system and the rest of the world's, and the rules by which it changes. However, their room for manoeuvre is not unlimited. A fixed rate is always in danger of violating what average market opinion regards as a fundamental. Even a floating rate amply supported by forward markets can be an invitation to extreme volatility. Volatility can lead to disaster if asset preferences shift markedly away from the home country's liabilities in response to shifting perceptions about fundamentals or adverse 'news'. Unregulated international capital markets are at the root of any perceived trilemma. It is a practical problem that must be evaluated on a case-by-case basis, taking into account the context and circumstances of policy implementation.

Monetary and exchange-rate policies and capital flows

The implication is that, if it wishes to target the RER, the central bank has to maintain tolerable control over the macroeconomic impacts of cross-border financial flows in a world with relatively open foreign capital markets. For the sake of clarity, it makes sense to analyse situations of excess supply of and excess demand for foreign capital separately.

Large capital inflows can easily imperil macrostability. Indeed, central bank attempts to sterilize them by selling domestic liabilities from its portfolio may even bid up local interest rates and draw more hot money. Preservation of monetary independence in this case may well require capital market regulation. Measures are available for this task.⁴ They do not work perfectly but can certainly moderate inflows during a boom. Booms never last forever; the point is that the authorities can use capital market interventions to slow one down to avoid an otherwise inevitable crash.⁵

⁴ For an ample menu, see the papers by Deepak Nayyar, Eric Helleiner and Gabriel Palma in Eatwell and Taylor (2002). Salih Neftci and Randall Dodd assess the possibilities of using financial engineering to circumvent controls.

⁵ This danger also exists in poor countries with a boom in MDG-driven capital inflows, which could be suddenly cut off—by no means a geopolitical impossibility. The familiar “Dutch disease” analysis of adverse effects of foreign aid enters the discussion here.

If there are capital outflows which are too large to manage with normal exchange-rate and monetary policies, the authorities certainly do not want to engage in recession-triggering monetary contraction. If the exchange rate has been maintained at a relatively weak level, the external deficit is not setting off financial alarm bells and inflation is under control, there are no ‘fundamental’ reasons for market participants to expect a maxi-devaluation. Under such circumstances, the way for the authorities to maintain a policy regime consistent with a targeted RER is to impose exchange controls and restrictions of capital outflows.

Contrary to IMF-style opinion that all runs against a currency must be triggered by poor fundamentals (even if they momentarily escape the notice of the authorities and IMF officials), it is perfectly clear that they can arise for reasons extraneous to economic policy—consider a political crisis, the fallout from mismanagement of an important bank or the impacts of financial contagion from a regional neighbour. In all such cases, outflow controls can be used to maintain an existing policy package in place, and they may not have to be utilized for very long.⁶

Monetary policy

In a developmental policy regime, monetary policy must be designed in view of its likely effects on the RER, inflation control and the level of economic activity. There is nothing very surprising here—in practice, central banks always have multiple objectives. In the United States, despite paying lip service to controlling price inflation, the Federal Reserve certainly responds to the level of economic activity and financial turmoil (witness the stock market bubble and the narrowly avoided crisis in Long-Term Capital Management (LTCM) of the 1990s). In many developing countries, central banks intervene more or less systematically in the exchange markets. The proposal here is that these interventions should help support a developmentally oriented RER for the reasons presented above. That is, the nominal rate should move to hold the RER in the vicinity of a stable competitive level for an extended period of time.

Inflation targeting, on the other hand, is the current orthodox buzzword. The nominal exchange-rate and other policies should be programmed to ensure a low, stable rate of inflation. A trilemma-like argument also comes into play here. If exchange market interventions target the RER as opposed to the nominal exchange rate, and the central bank cannot manage the money supply, there is no nominal anchor on inflationary expectations: the inflation rate cannot be controlled.

As we have seen, in practical terms the trilemma can be circumvented, allowing the monetary authorities to bring developmental objectives into their remit. But they have to take at least five important considerations into account in monetary management:

- First, many developing countries now have low to moderate inflation rates, demoting inflation control in the hierarchy of policy objectives;
- Second, are low interest rates likely to set off inflationary nominal depreciation (under ‘speculative’ exchange-rate dynamics, as discussed above)? RER targeting can help the central bank steer away from this problem;
- Third, shifts in aggregate demand likely to result from changes in the exchange-rate and monetary policy must be taken into account and appropriate offsetting policies deployed;

⁶ Argentina, for example, successfully managed exchange controls and capital outflow restrictions in mid-2002. The measures were transitory and were gradually softened as buying pressure in the exchange market diminished.

- Fourth, also as mentioned above, some mix of temporary capital inflow or outflow controls may be needed to allow the central bank to regulate monetary aggregates and interest rates rather than be overwhelmed by attempts at sterilization;
- Finally, unstable money demand and other unpredictable factors mean that the monetary authorities have to be alert and flexible. Indeed, ‘inflation targeting’ is a codeword for orthodox recognition that quantitative monetary and even interest rate targets are impractical. It is a means for giving more discretion in attempting to attain a single target.

The point being made here is that discretion can and should serve other ends. A stable competitive RER, in coordination with sensible industrial and commercial policies can substantially improve prospects for economic development. Surely that should be the overriding goal of the monetary and all other economic authorities in any developing or transition economy.

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