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**The Impossible Trinity and Capital  
Flows in East Asia**

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**Abstract**

The Impossible Trinity doctrine still holds a powerful sway over policymakers, advisors (particularly the International Monetary Fund [IMF]) and academia. In East Asia over the past decade, however, most countries have been able to maintain open capital markets, monetary policy independence, and a fair degree of management over their exchange rates. This is because the Impossible Trinity model does not fit the actual circumstances very closely. Capital flows are dominated by factors other than interest differentials, external inflows have been successfully sterilized, the connection between base money and monetary policy settings is not close, and the authorities' management of the exchange rates has been aimed at keeping the rate close to the medium-term equilibrium, not susceptible to speculators.

This is not to deny that there are difficult policy issues in the interaction between capital inflows, monetary policy, and the exchange rate. These interactions do in fact make good policymaking very challenging. The key problem is that the Wicksellian "natural" interest rate will differ quite substantially between developing and mature countries, presenting a structural problem rather than the cyclical problem envisaged in the Impossible Trinity. Rather than base the policy mind-set on the Impossible Trinity, it would be better to have in mind something along the lines of the Williamson band/basket/crawl and a notion of the fundamental equilibrium exchange rate.

**JEL Classification: F21, F31, F32**

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# 1. INTRODUCTION: THE IMPOSSIBLE TRINITY AND CAPITAL FLOWS IN EAST ASIA

While the initial certainty and stark simplicity of the Impossible Trinity have fuzzed and softened over time, this idea still holds a powerful sway over analysis of exchange rates and in the policy debate on capital flows. Whenever capital flows are discussed, it is rare to go without a genuflection in the direction of the Impossible Trinity.<sup>1</sup>

Yet the practical evidence suggests that the constraints on policy implicit in this doctrine are greatly exaggerated. This disconnect between the analysis and the practical world seems a major limitation on developing suitable policies for addressing the very real problems which large volatile capital flows are causing emerging countries. Foreign capital flows present near-insuperable problems for emerging countries, but the nature of these problems is not caught in the Impossible Trinity paradigm. The Impossible Trinity argument has been an unhelpful element in developing an effective policy framework to address these foreign capital inflows.

## 2. THE REAL WORLD

Let us look first at a couple of examples where the Impossible Trinity does not seem to explain what is going on.

**Exhibit 1** is Singapore. Singapore is undoubtedly open to capital flows: it would be hard to image an economy more open to inflows of capital. Singapore is, incidentally, relatively small, so if small countries are easily overwhelmed by capital flows, it does not show here. Just as self-evidently, Singapore runs its own independent monetary policy. The key test of this (which would be acknowledged by most theoreticians) is that it intentionally and successfully runs a rate in inflation different from (lower than) the rest-of-the-world (represented by, say, the United States [US]). Singapore claims to manage its exchange rate, and on all evidence is extremely successful in this. It is not a fixed rate, but it is quite precisely managed within a band (with the authorities intervening inside the band, as well as enforcing the edges of the band). This band is shifted in accordance with macro-policy needs (the exchange rate is in fact the instrument through which the Monetary Authority of Singapore operates its monetary policy). To achieve its objective of price stability, it has not been necessary to make dramatic shifts in the instrument—the exchange rate. The nominal rate and real rate have both been quite stable, so the price signals (tradables versus non-tradables) have been gratifyingly stable.

Singapore has increased its foreign exchange reserves so that they are now larger than annual gross domestic product (GDP). Yet it has not been overwhelmed by capital inflow, nor has the huge increase in foreign reserves frustrated its monetary policy.

Singapore is, to be sure, an unusual and special case, where monetary policy is implemented via the exchange rate rather than via a short-term policy interest rate (see (McCallum 2006)). Singapore does not attempt to control its interest rates, which generally move closely with US interest rates, although somewhat lower to reflect the consistently lower inflation in Singapore.<sup>2</sup> For those wishing to restore some role for the Impossible Trinity in the face of the example of

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<sup>1</sup> For a recent example, see Magud et al. (2011: 5): “But a trinity is always at work. It is not possible to have a fixed (or highly managed) exchange rate, monetary policy autonomy, and open capital markets.”

<sup>2</sup> Policy is administered not just through the exchange rate, but through a variety of more direct controls and persuasion which can be brought to bear to encourage or discourage banks from lending.

Singapore, instead of embodying “monetary policy autonomy”, this could be replaced by the narrower specification of “independent interest rate setting”.

**Exhibit 2** is, essentially the whole of the rest of East Asia since the Asian Crisis, excluding the special cases like Hong Kong, China which has a fixed rate. Let us take a few examples. The People’s Republic of China (Henceforth, PRC) has seen its foreign exchange reserves rise to over 50% of GDP, and yet the mechanism of the Impossible Trinity does not seem to be overwhelming the policy of sterilizing the impact of the rise in foreign reserves<sup>3</sup> or setting interest rates where the authorities want them to be. Of course the PRC has capital controls, and rather than get into an argument about how effective they are (if they are not effective, of course, the Impossible Trinity should be in full play), it might be enough to observe that capital controls have not been used to prevent the rise in foreign exchange reserves. On the contrary, the PRC has been able to successfully sterilize the huge increase in reserves, in a way inconsistent with the Impossible Trinity.

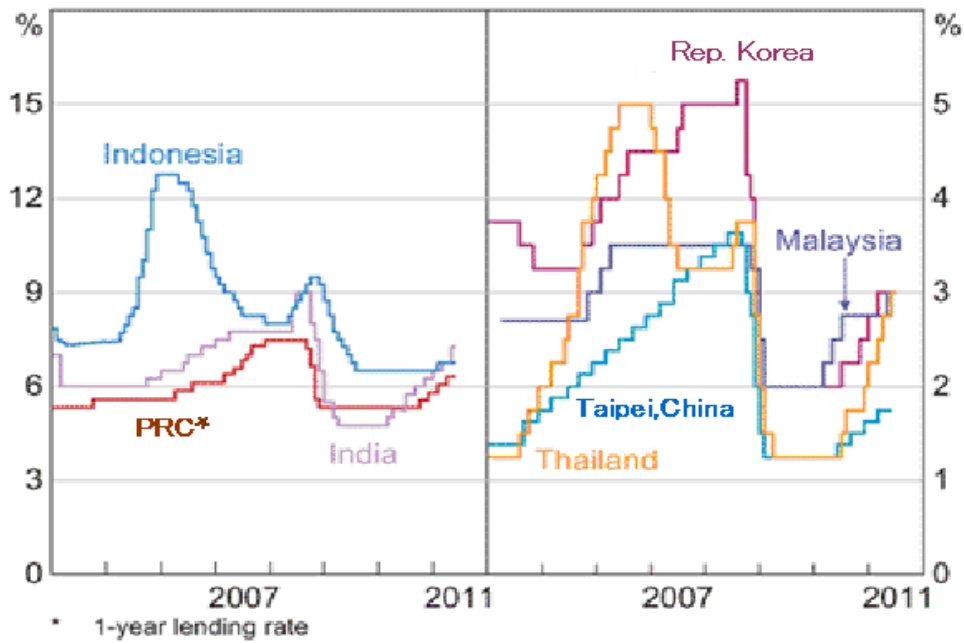
Thailand has also increased its foreign reserve holdings, to around half of annual GDP. It has run an interest rate which is consistent with its needs (it is an inflation targeter and has achieved its target quite consistently). It has at times intervened heavily to resist large movements in its exchange rate. Malaysia, too, has intervened heavily (both to smooth out fluctuations and resist appreciation since it moved from a fixed rate in 2005), without losing control over its domestic monetary policy. Among the East Asian countries, Indonesia probably has the widest interest differentials, but has intervened to keep its exchange rate somewhere near what the central bank perceives to be equilibrium. Each of these countries has clearly pursued its own monetary policies, with large interest differentials (e.g., Indonesia) being quite common.

Figure 1 shows that East Asian nominal short-term interest rates (i.e., the ones set by policy) have been quite varied, demonstrating clearly independent monetary policy. The exchange rates of these countries (see Figure 2) have shown a good degree of stability (more so in real terms, which is what matters for stable signals to the tradables sector). True, there has been a tendency to appreciate (consistent with the idea that capital inflows were driving up real rates), but the appreciations have not be large. The authorities have shown a readiness to intervene heavily to resist the appreciation. As we do not know the counter-factual, we cannot know how successful these policies were, but from the viewpoint of assessing the Impossible Trinity, what matters is that the large rise in foreign exchange reserves should have weakened monetary policy (i.e., efforts to sterilize the effect of the reserve increase would have failed).

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<sup>3</sup> Or, more recently, raising required reserves to neutralize the impact of the intervention.

**Figure 1: Policy Interest Rates**



Source: central banks

Note: this figure was obtained from RBA Chartpack

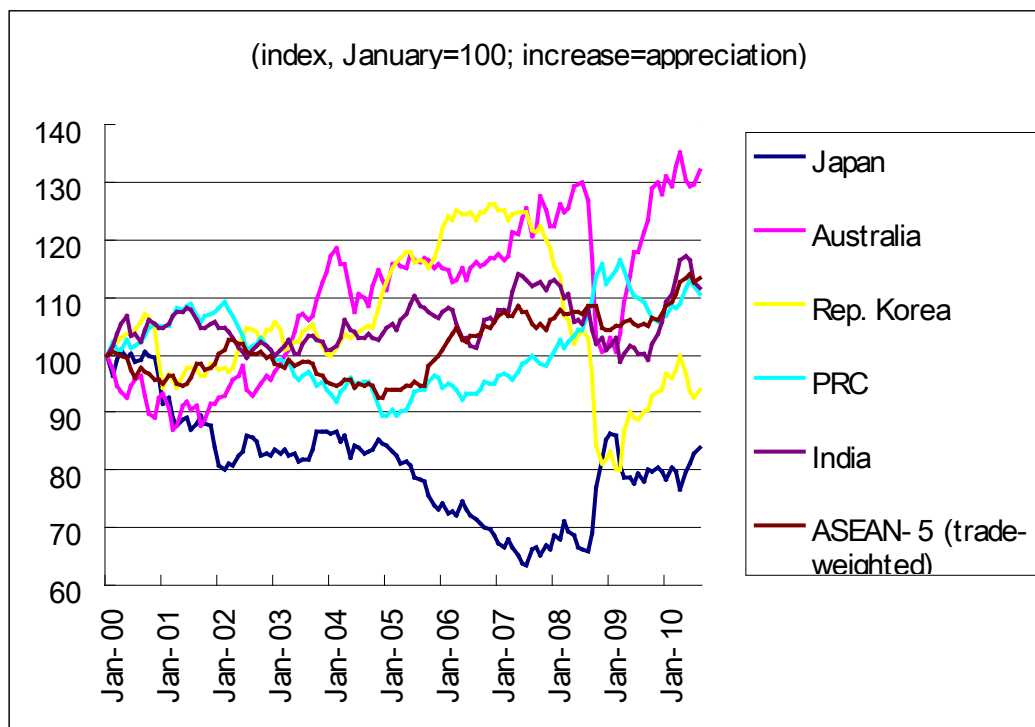
**Figure 2: Selected Asian Currencies against US Dollar**



Source: Bloomberg

Note: this figure was obtained from RBA Chartpack

**Figure 3: Real Effective Exchange Rates of Selected Asian Countries**



Source: IMF Regional Economic Outlook October 2010

The anecdotal evidence is the opposite of the Impossible Trinity mechanism: sterilization is effective, even when the rise in foreign reserves is large. The countries with the largest rise in foreign exchange reserves (e.g. Thailand) have been the most successful in sterilizing these. Where sterilization is incomplete, it seems to be in those countries with the smallest rise in reserves (e.g., Indonesia), and in no case does the rise in reserves seem to have led to abnormal credit growth. The Republic of Korea (henceforth, Korea) shows the largest credit growth over the past decade, but its starting point (credit/ GDP) was low considering its stage of development.

**Exhibit 3.** Emerging countries (by and large implementing independent monetary policies) now hold large reserves. This suggests they think they can manage their exchange rates. Why else hold foreign reserves?

**Exhibit 4.** If the Impossible Trinity were true, we would expect to see it applying more strongly over time (i.e., becoming a greater constraint on policy) as countries became better integrated. In East Asia we note the opposite, with countries moving over time towards the three allegedly-inconsistent states: closer financial integration, more managed exchange rates, and greater monetary independence.

### 3. WHAT IS WRONG WITH THE IMPOSSIBLE TRINITY STORY?

The central mechanism of the Impossible Trinity story goes like this. If a fixed-exchange-rate country open to foreign capital flows tries to have an independent monetary policy (e.g., sets its interest rates higher than overseas), it will receive substantial capital inflows which will persist as long as the interest differential remains. The combination of interest differentials and a fixed exchange rate set up an arbitrage opportunity which is irresistible (cf Uncovered Interest Parity). If



the authorities try to hold down the exchange rate through intervention, this will increase base money and hence lower interest rates, frustrating the authorities' attempt to have an independent monetary policy. The corollary of this is that if they let their exchange rate float, an equilibrium is achieved in which they can maintain higher interest rates, although exactly what happens to the appreciating exchange rate is not specified.

The problems with this story are:

- Capital flows responding strongly to interest differentials are the core element in this story, frustrating a country's ability to set monetary policy independently. But in practice different currencies are not close substitutes and capital flows are mainly driven by forces other than interest differentials.
- Intervention to prevent these capital flows from bidding up the exchange rate are seen as being fully reflected in base money changes which will, in turn, thwart the authority's attempts to set interest rates as desired. This does not correspond with the way monetary policy works in a deregulated system, with the authorities setting the policy interest rate directly via announcement, while managing liquidity in the short-term money market through open-market operations, including a very effective capacity to sterilize foreign exchange intervention.
- The Impossible Trinity envisages that any official intervention in foreign exchange markets will be taking the exchange rate away from its equilibrium, opening up arbitrage opportunities which will be profitable when the exchange rate returns to its equilibrium. In practice, official intervention to manage the exchange rate is often maintaining the equilibrium in the face of market volatility and misalignment. Intervention is not creating arbitrage opportunities.
- There is a much deeper structural problem, not addressed by the Impossible Trinity. If a country has a Wicksellian "natural" interest rate substantially higher than the rest-of-the-world (e.g., because it is an emerging country with intrinsically strong profit prospects), there will be longer-term persistent structural (not cyclical) capital inflows, seeking to benefit from these higher returns. No simple combination of domestic interest rates and exchange rate (even a free float) will provide macro stability.

Each of these points needs elaboration and substantiation.

## 4. WHAT DRIVES CAPITAL FLOWS?

The policy-overwhelming capital flows central to the Impossible Trinity story imply a degree of substitutability between domestic and foreign assets which is rarely seen in the real world. Even well-traded currencies are not considered by the financial market to be close substitutes: there is too much uncertainty and risk in the elements which separate different currencies.

The exchange rate is of course the most obvious de-linking factor, and in practice it does not exhibit the sort of stability (and hence predictability) which textbook analysis implies. Harry Johnson (1972) promised: "A freely flexible exchange rate would tend to remain constant so long as underlying economic conditions (including government policies) remain constant; random deviations from the equilibrium level would be limited by the activities of private speculators".

In the early days of floating, it seemed that Uncovered Interest Parity (UIP) would firmly link exchange rates together. An investor would know that the interest differential would be a good guide to where the exchange rate was heading. It is now abundantly clear that UIP offers feeble guidance for the exchange rate/interest rate nexus (see (Engel 1996). UIP often gets the direction wrong, let alone the quantity (Cavalo 2006). The fluctuations in the yen/US dollar rate during the 1990s illustrate the issue. Any investor wanting to arbitrage the often substantial interest

differential between these two currencies would have been taking a huge risk that sharp currency fluctuations would nullify the interest gains (on this, see discussion on the carry trade, below). Instead of well-formed views on how the different currencies will behave over time, there are fluctuating (sometimes wildly fluctuating) assessments of risk attached to cross-currency holdings.

It is not just exchange rates which cause this uncertainty: think of Greece or Ireland, where the market's assessment of country risk has been radically and suddenly revised for reasons not limited to the exchange rate. Assets denominated in different currencies also carry other differentiating attributes. Financial assets are embedded in different institutional structures, with different regulatory regimes and different legal systems offering different degrees of property rights and legal protection. The risks associated with each asset are far more complex than simple interest differentials, and the market's assessment of these other factors often changes abruptly over time.

It is worth noting, too, that foreigners will be less sure of their property rights (perhaps with good reason), and will know less about the specifics of assets, than domestic investors. One only has to look at the home-bias of Japanese investors to see how imperfect is the substitutability of domestic and foreign assets in the eyes of investors.

A back-of-the-envelope calculation emphasizes how modest is the role of interest differentials, compared with other factors impinging on capital flows. Suppose a country wanted to set its interest rate 2% above the US dollar rate and the market expects this interest differential to last for two years. A modest appreciation (4%) would be enough to balance the portfolio forces operating here: so modest that these could easily be overwhelmed by other factors impinging on the exchange rate, such as changing risk assessment.

The same point could be put another way. Suppose an emerging country raises the interest rate on a short term (six month) bond so that the interest differential is two percentage points (say, 6% in contrast to 4% overseas). A tiny exchange rate depreciation (just 1%) at any time in this six-month period would wipe out the interest rate gain. The interest differential would be subject to eager arbitrage if the exchange rate was predictable (e.g., if UIP worked). But it does not. This is not the sort of risk/reward trade-off most investors are looking for.

Perhaps the simplest evidence that interest differentials are not the main determinant of capital flows is to observe that gross capital flows are far larger than net flows. If interest rates were the main game, we would expect to see net and gross flows much the same, and there would be trivial flows in the "wrong" direction, against the interest differential. What we see in practice is gross flows much larger than net flows, with net capital flowing "uphill" from the high-return developing countries to the mature economies.

The Impossible Trinity mindset on capital controls is also at variance with the real world, because it ignores these institutional differences. The Impossible Trinity envisages that without formal capital controls (laws and regulations), capital will flow freely, so measurement of capital controls is usually in terms of de jure rules. But international capital flows require substantial knowledge on the part of the foreign investors and complex institutional structure (particularly financial and legal institutions and commercial infrastructure) before capital flows smoothly. A few brave investors may venture into countries without deep institutional protection, and when they do, it will not be a modest interest differential that is tempting them into this unknown territory. Thus Indonesia removed its capital controls in the early 1970s, but did not receive substantial portfolio flows until two decades later, when the necessary information and institutional structure had developed. Any analysis not measuring this kind of time-varying de facto constraints to capital flows is missing the main game.

In summary, international capital flows can be huge and hugely disruptive (and are therefore very important for policy-makers), but the mechanism envisaged in the Impossible Trinity represent

only a small part of the explanation. Capital controls may well be a useful part of the policymaker's tool kit (as is implicit in the Impossible Trinity story). But such constraints on capital flows are rarely needed to counter the interest-rate-arbitrage flows envisaged by the Trinity. Rather, controls may be needed to counter the fluctuations in investors' volatile sentiment, motivated by factors other than interest differentials.

## 5. HOW MONETARY POLICY WORKS IN PRACTICE

Analytically, standing behind the Impossible Trinity is some version of the Investment Saving/Liquidity preference Money supply (IS/LM) framework, with LM reflecting monetary policy operating by changing the amount of base money, which alters the short-term interest rate, which affects the interest differential between countries to which the capital flows respond. As long as these interest differentials exist, there will be capital flows which will add to money supply until interest rates are driven back to the international level.

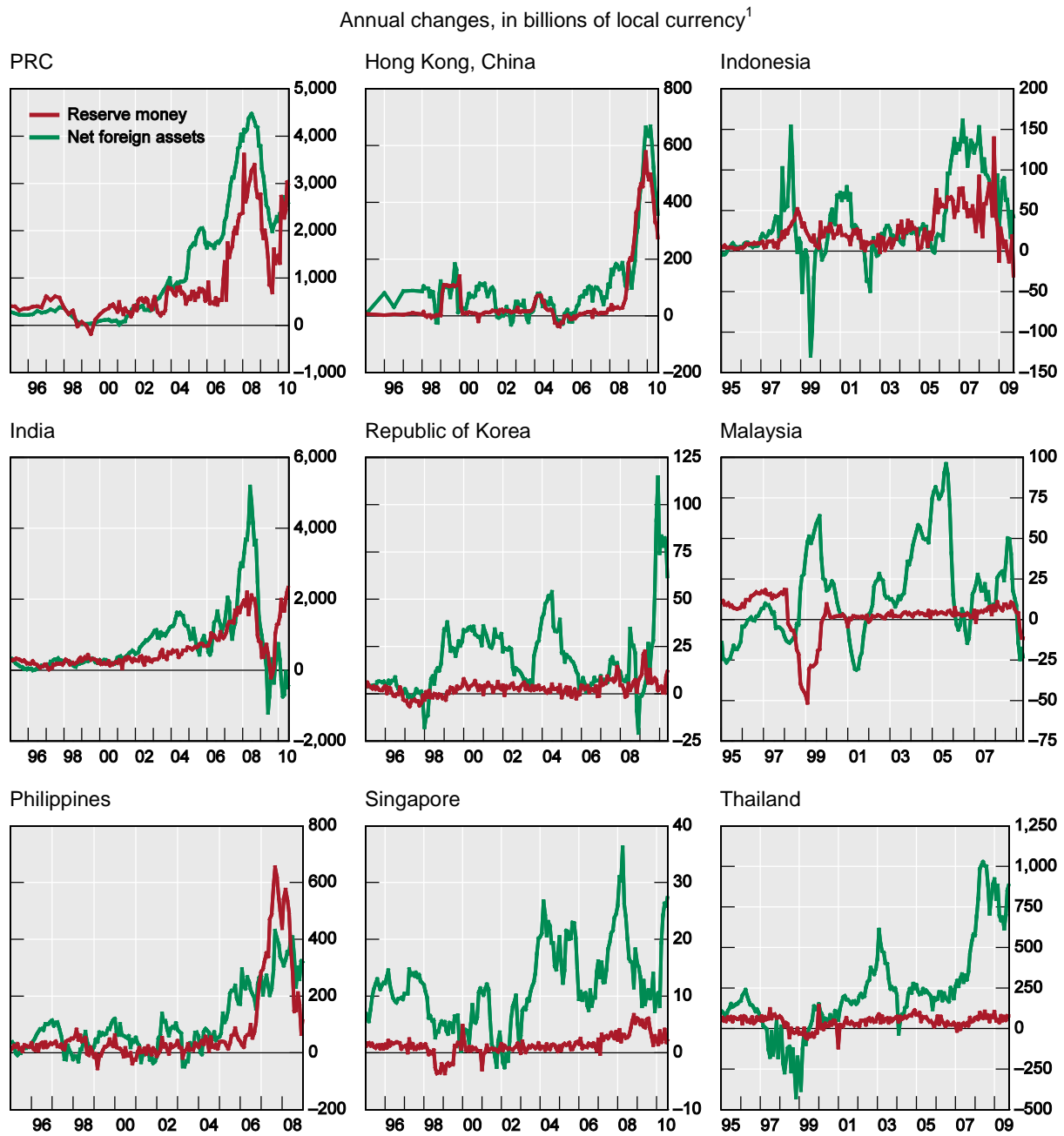
Monetary policy, however, does not work like that in a deregulated system. Interest rates are not set via an interest-elastic demand for money, or even an interest-elastic demand for bank reserves. Interest rates are announced as a matter of policy, and this rate is accepted by financial markets as the basis of their yield-curve formation because financial markets know that the authorities could, if necessary, leave the payments system (where the short-term interbank interest rate is set) short of settlement balances and this would cause such immediate and serious settlement-liquidity strains that interest rates would go up very dramatically. This almost never happens. In the other direction, does a flood of base-money liquidity (initiated, say, by capital flows which were sterilized so that they did not affect the exchange rate) lower interest rates? Again, the answer is "no". Imbalance in the short-term money market in almost all countries is avoided by having in place standing facilities which operate to equilibrate the market. When base money falls, leaving the payments system short of balances, rediscount facilities are almost universally available to relieve the shortage of payments balances. Similarly, when base money rises so that liquidity is excessive, participants in the inter-bank money market can usually place these excess reserves with the central bank, which then has the ability to prevent inter-bank interest rates from falling, by offering a return on these excess balances. Thus capital flows do not usually prevent the authorities from setting interest rates wherever they want them.<sup>4</sup>

In brief, while the Impossible Trinity assumes a firm relationship between base money and interest rates, the link is rarely apparent. Figure 4 illustrates this for a number of East Asian countries. In some (the PRC and the Philippines) there is a relationship, but in these cases the authorities have chosen to sterilize some of the reserve money increase through higher reserve requirements. In the PRC, for example, banks have to hold over 20% of their balance sheets in the form of reserves with the central bank. Hong Kong, China is, of course, a special case. Its currency board system ensured that there is a close link between foreign exchange reserves and base money but even here the next leg of the linkage—to inflation—is missing, in defiance of the Impossible Trinity mechanism. The rise in foreign reserves should have driven down the real exchange rate (via inflation) and encouraged a widening of the current account deficit. Instead, the real exchange rate has moved in the opposite direction (depreciating) and the current account is in surplus.

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<sup>4</sup> Although the implication of this, in the face of large capital inflows which cause intervention to stabilize the exchange rate, is that the central bank balance sheet expands, perhaps very substantially. This is exactly what we saw in East Asia in the 2000s.

**Figure 4: Sterilization: Quantity Interpretation**



Note: For Indonesia, and Republic of Korea, trillions of local currency

Source: IMF, IFS

## 6. OFFICIAL INTERVENTION MAY BE STABILIZING AND EQUILIBRATING

One misunderstanding embodied in the Impossible Trinity is that the Efficient Markets are doing a good job at price discovery. The presumption is that, provided that there is no interference from official intervention, the exchange rate will be at its equilibrium. The corollary of this is that if intervention succeeded in shifting the exchange rate, it would always be taking it away from its equilibrium, creating profitable arbitrage opportunities which will frustrate the authority's efforts to set the exchange rate away from equilibrium.

But what about the possibility that market forces are not always operating to maintain the equilibrium exchange rate? Suppose, instead, the authorities have a better understanding (or longer-term view) of where the equilibrium lies, and are managing the exchange rate to push it back towards its proper equilibrium or maintain it in a band around the equilibrium? If the authorities are successful in this, their actions will be profitable (they will be buying cheap and selling dear), so the private arbitrage operations which are central to the Impossible Trinity story would be unprofitable and could not be sustained for long.

Some management of the exchange rate seems to fall into this category. In 2008, during the nadir of the Global Financial Crisis, The Korean won, the Indonesian rupiah and the Malaysian ringgit all came under substantial downward pressure, resisted in each case by official intervention. In each case the fall was temporary and these interventions would have to be counted as profitable for the authorities and unprofitable for those private parties which were on the other side of these transactions. It looks as if, in these cases at least, the authorities were pushing the exchange rate in the right direction. Their active management was both feasible and effective.

An example of this kind of equilibrating exchange rate management would be the Band/Basket/Crawl (BBC) advocated by Williamson (2008). The authorities do not know exactly what the equilibrium is, but they have a good general idea. If the equilibrium lies somewhere inside the band and they are defending the rate at the edge of the band, their actions will be profitable, provided the market does not drive the rate out of the band.

Other cases will be less clear.

Let us return to the Singapore example. What if the Singapore authorities, with their vigorous management, were helping to keep the exchange rate close to its fundamental equilibrium? The Singapore dollar has been remarkably stable for the past two decades, showing modest shifts in response to macro-economic circumstances and a broad upward trend of appreciation, which might be explained in terms of Balassa/Samuelson. It may be that the equilibrium exchange rate was always inside the band and the authorities simply defended this, which was immune from speculative attack because there were no disequilibrium arbitrage opportunities for the speculators to take. There is certainly no evidence that speculators have made any profit by taking on this managed rate.

That said, the Singapore case may be more complex. It is not clear that the long-term equilibrium exchange rate falls inside the band which Singapore defends. For more than a decade, Singapore has run a large current account surplus (10–20% of GDP) and has accumulated foreign exchange reserves equal to more than its annual GDP. Thus Singapore may provide an even stronger refutation of the Impossible Trinity than the examples above, where Korea, Indonesia, and Malaysia were managing their exchange rates towards equilibrium. It seems that Singapore has been successful, for more than two decades, in maintaining a stable exchange rate (in both real and nominal terms) which may not have been the long-term equilibrium. The Monetary Authority of Singapore (MAS) has not lost money in the management (in fact they must have made a profit because they have bought Singapore dollar at the bottom of the slowly evolving band and sold

Singapore dollar at the top). With the stability of the rate maintained for such a long period, no speculators “take on” the MAS in the belief that the exchange rate is undervalued. Such success flies in the face of the Impossible Trinity story.

## **7. IS THERE A USEFUL SOFTER VERSION OF THE IMPOSSIBLE TRINITY?**

Even if the Impossible Trinity in its pure version does not seem to hold, is it still a useful concept in a looser version, as a reminder that there are interconnections and policy constraints between interest rates, exchange rates, and capital flows?

Frankel (1999: 5) suggest that trilemma can be partially achieved. “There is nothing in existing theory, for example, that prevents a country from pursuing a managed float in which half of every fluctuation is accommodated by intervention and half is reflected in the exchange rate.” This, however, does not seem consistent with the essence of the Impossible Trinity. Within the analytical framework of closely substitutable currencies, to set policy interest rates at only half of the differential required by monetary policy autonomy would be the worst of all worlds: too high to avoid capital inflows and too low to restrain the domestic economy. To set the exchange rate at an undervalued level sets off a capital inflow, even if the undervaluation is smaller than the authorities would like. The crux of the issue is that if you think that capital flows respond to arbitrage, an independently set interest rate or exchange rate sets in train capital flows which continue until the arbitrage opportunity is closed by changes in the interest rate or the exchange rate, not by “halving the difference.”

If the authorities are able to achieve half of the interest differential they want, or half of the exchange rate management they want, this takes us back to the real world, but it can no longer be seen as the Impossible Trinity.

A related approach is that adopted by Aizenman, Chinn, and Ito (2009), who develop indices of monetary independence, exchange rate flexibility and openness to capital flows and explored the trade-off that various countries have chosen between there three broad policy options. The key analytical addition is to see exchange rate intervention as an extra instrument of policy: departures from the Impossible Trinity can be explained in terms of the authorities’ readiness to use exchange rate intervention. But the impact of foreign exchange reserves is already at the heart of the Impossible Trinity process. It is this which caused base money growth and loss of monetary autonomy. If this channel does not operate (and we have argued above that it does not), then what is left of the Impossible Trinity?

This “soft” version of the Impossible Trinity produces interesting results, but does not take us very far in developing optimal policy responses to the constraints of inter-connectedness. Rather than see these as three elements which can be traded off in a mechanical way (with the indices summing to one), we need to see how the different types of capital inflow responds to interest differentials. We need a more precise analysis of the merits and demerits of foreign exchange reserve accumulation and some idea of what is an optimal level of reserves.

## **8. THE IMPORTANCE OF LONGER-TERM INTEREST RATES**

The Impossible Trinity story focuses on monetary policy, as reflected in the short-term interest rate, set by the authorities. Monetary policy is a relatively short-term instrument, shifting the short end of the yield curve over the course of the cycle, putting it above the Wiksellian “natural” rate when the economy is running too strongly (an inverse yield curve) and below the natural rate

when the economy is in the weak phase of the cycle. The longer end of the yield curve reflects these short-term policy changes to some degree (through interest rate expectations) but the longer end is best seen as being anchored by the Wiksellian real rate, based on expected real returns on capital (with the nominal counterpart incorporating inflation expectations).

The key issue is that this Wiksellian rate will be substantially higher in the emerging countries than in the mature economies, and this interest differential is not a temporary phenomenon, but will be maintained for some decades.

These emerging countries, with the progressive shift towards the technological frontier requiring large increases in capital per head, have the prospect of high productivity and profitability for some decades ahead.<sup>5</sup> As they become more closely integrated internationally, foreign investors will increasingly respond to this underlying profitability differential. How can this prospect of sustained higher returns be reconciled with portfolio balance for the foreigners whose initial portfolios are in the lower-return mature economies?

Capital flows seeking to capture these higher returns do not bid down the returns. An emerging country moving towards the technological frontier has the prospect of decades of this kind of above-normal productivity and excess profits.

An overly-appreciated exchange rate might be part of the portfolio equilibrium process, along the lines of Dornbusch exchange rate over-shooting model. But this is a cyclical model (i.e., it applies to the short term). The Dornbusch overshooting mechanism implies an unrealistic exchange rate profile (a very large initial step-jump in the exchange rate followed by many years of gradual depreciation). It is hard to believe that this knife-edge path can be maintained over time. Instead, it might induce exchange rate volatility and variability which might help to discourage capital inflows. The carry trade flows might be an example of this kind of quasi-balance: medium-term periods (perhaps lasting five or ten years) when the interest differential is not offset by exchange rate losses are succeeded by short-sharp falls, before the process begins again. The risk of these falls, with their unknowable timing, keeps the inflows in some kind of equilibrium. Note, however, how different the time-profile of the exchange rate is with the carry trade: in response to higher interest differential, a long slow appreciation followed by a short sharp fall.

Some capital flows will be responding to the policy-driven changes in the short end of the yield curve (as envisaged by the Impossible Trinity). Thus short-term portfolio flows and speculative flows may fit the Impossible Trinity story. But the longer-term flows (foreign direct investment and equity portfolio flows) will be driven more by the medium-term underlying profitability of the economy, as reflected by the natural rate.

These medium-term flows may not be much deterred by short-term volatility of the exchange rate. An alternative possibility for achieving a kind of portfolio balance, particularly relevant if the authorities are essentially offsetting the excessive capital inflow with foreign exchange reserve increases) would be for the price of assets (particularly those easily accessible to foreigner investors, such as equities and property) to rise so that they are perceived as over-valued and thus susceptible to sudden price falls. The risk of such falls would balance the higher running return on the assets.<sup>6</sup> Foreign flows are inhibited not by a higher (above equilibrium) exchange

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<sup>5</sup> Some might see this same argument in terms of growth rates: interest rates will approximate the economy's growth rate (whether measured in real or nominal terms). Thus the higher prospective growth rates of the emerging countries will be accompanied by higher interest rates. Yet another way of looking at this same issue is to think of the emerging countries as having a much lower capital/income ratio, with this capital much more highly remunerated than in the mature economies.

<sup>6</sup> This story has some similarities with the carry trade, where UIP does not hold over time, investors in the high-interest currencies obtain excess returns over time from the yield differential and currency appreciation, but are subject to

rate (the Dornbusch overshooting mechanism), but by higher asset prices which are similarly above their longer-term equilibrium.

It is this sustained imbalance, rather than some temporary or cyclically-driven interest differential, which is motivating much of the inflow.

Finding a stable long-term equilibrium when the natural interest rates differ is made even more difficult by the probability that the emerging countries not only offer investors a higher interest rate, but an exchange rate which will appreciate over time in real terms, thanks to the Balassa/Samuelson effect. Patient investors are likely to get an interest differential in their favor and a favorable movement in the exchange rate

Investors in the mature economies are increasingly recognizing these opportunities. They do so, however, in waves of confidence, with retreats (“sudden stops”) when confidence evaporates and the rational investors exits, analogous to a bank run. These sudden changes in assessment are explicable in terms of the investors’ imperfect knowledge: where knowledge is not firmly based, changes of assessment can be triggered by the arrival of modest ‘news’, or by other investors’ actions.

This leaves emerging countries as the reluctant hosts to foreign capital inflows which cause over-valuation and volatility not only to exchange rates, but to asset prices as well. It is hardly surprising that emerging countries find these circumstances to be unsatisfactory, and are seeking ways to regulate and reduce the inflows.

We now examine whether policy has any appropriate responses.

## 9. WHAT TO DO?

The standard suggestion for countries receiving excessive inflows is to allow the exchange rate to appreciate, the current account to move in the direction of more deficit and absorb the foreign inflows (IMF 2011). This may be an important element of the response. International capital should “flow downhill” to the emerging countries with higher profit opportunities. The reaction of the exchange rate and the opening up of a current account deficit are the mechanism whereby the real resource transfer occurs, corresponding to the financial flows.

But many recipient countries find this appreciation of the exchange rate to be inconvenient (Rodrik, 2008). It causes the “Dutch disease,” whereby domestic tradable industries are discouraged by the appreciated exchange rate. More fundamentally, the foreign capital is often excessive to what the country can usefully absorb, in which case the appreciation is a poor price signal for domestic investment. “Leaving it up to the market” has not generally been a preferred policy solution in East Asia.

The only other suggestion in the IMF tool kit is to run a budget surplus to lower interest rates and take the pressure off demand (see IMF 2007, IMF 2011). Neither of these channels holds out much practical hope for dealing with the inflows. We have already noted that short-term interest rates are set by monetary policy and longer term rates largely by the Wiksellian natural rate. While the IS/LM approach suggests that a stronger budget (moving in the direction of surplus) will lower interest rates, there does not seem to be any reliable relationship in practice. There is nothing in this policy suggestion which would reduce the volume of capital inflow. It’s quite possible that the demonstration of strong fiscal probity might actually increase the inflow.

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sudden and unpredictable currency depreciation losses. The risk of these sudden losses balances (in a portfolio sense) the interest differential.



Moreover, the budget tightening may actually appreciate the exchange rate. If shifting the budget in the direction of surplus changes the savings/investment balance, the current account, by identity, also shifts in the direction of surplus. If the capital inflow is largely unchanged (and there is no reason to expect a change), this will put upward pressure on the exchange rate as the rate tries to equilibrate the current account position with the capital flows. An *ex ante* smaller current account deficit has to be equilibrated with an *ex ante* unchanged capital flow. How can this reduce upward pressure on the exchange rate?

It is possible that a budget surplus may help re-balance an economy which is growing too strongly (and it is often the case that big capital inflows coincide with a strong domestic economy—both foreign and domestic investors want to participate in the boom). In this sense, a budget surplus might help with the overall macro-problem of a booming economy. But this does little to address the problem of excessive foreign inflows. At best, it just creates room for the foreign expenditures by constraining domestic expenditure, which might well have a higher social priority.

In practice the reaction of most of the countries of East Asia has been to intervene in the foreign exchange market and sterilize the monetary effect of the build-up in foreign exchange reserves. The usual argument against this—that the quasi-fiscal cost from the interest differential between the domestic interest rate and the return on the foreign reserve asset held—has not had much relevance in the 2000s. Domestic interest rates have been low during most of the decade (initially reflecting the on-going debilitating effect of the 1997–1998 crisis), so the immediate cost of this strategy has not been great. But the very success of the strategy in holding down the exchange rate has resulted in a longer-run cost. If (or more likely, “when”) the exchange rates of these countries appreciate, there will be a capital loss to the holders of the foreign exchange reserves (usually the central bank) which will be very substantial. A 25% appreciation of the yuan, acting on reserves which are now around 60% of annual GDP, would administer a capital loss the People’s Bank of China’s balance sheet (in yuan) equal to 15% of GDP. Most central bank balance sheets would be overwhelmed by these sorts of losses. Of course these are “only paper losses”: the assets still buy the same quantity of foreign goods that they did before the appreciation. But there is a clear opportunity cost in not having used these reserves to increase investment in more productive ways than simply squirreling them away at the long returns available on foreign short-term assets. And the political problems of explaining away such huge losses may prove unhelpful for the central bank’s reputation, with adverse implications for monetary policy more generally.

## 10. A DIFFERENT MACRO CONFIGURATION

The general story which emerges here is that the build-up in foreign exchange reserves in East Asia has not caused a loss of control over reserve money. Since the Asian crisis, most of the countries of the region have been able to manage their exchange rates to retain satisfactory international competitiveness, despite their openness to capital flows (which has increased over time as the institutional and informational infrastructure to encourage flows has improved).

Foreign capital flows do, however, present a series of policy challenges not addressed in the Impossible Trinity story. The real issue is not that certain combinations of policies are impossible, but that they are not optimal. The elements of this story are:

Appreciation pressures on exchange rates are likely to rise and the current response—to resist this by accumulating foreign exchange reserves—will become increasingly costly.

The current account surpluses experienced by these countries seem inconsistent with the idea of capital “flowing downhill” in response to the high-profit-opportunities in these fast-growing countries with large productivity potential. The sterilization of existing capital inflows is, in effect, a conscious avoidance of real resource transfer which these financial flows potentially represent. An

alternative policy would recognize the benefits of a higher level of investment (with both the funding and real resources coming from overseas). This alternative would also acknowledge that (PRC aside) rates of investment have been substantially lower since the Asian Crisis and rates of GDP growth since then have been lower than before. A different macro configuration would have more-appreciated exchange rates, current account deficits, larger investment expenditure and faster growth.

The arguments against this configuration are the dangers of volatile foreign capital reversals and the disruption implicit for the tradables sector in adapting to stronger exchanger rates. But, in the face of growing pressures on the current configuration, policy could be designed to address these concerns, built around a stable and moderate current account deficit, an exchange rate managed to maintain the equilibrium rate associated with this current account deficit (CAD) and measures to match this CAD with the most beneficial types of foreign funding, which might mean discouraging some types of short-term inflow.

Let us try to spell this out in more detail.

There are unsustainable elements related to the foreign exchange reserve increases:

- Continuing build-up in reserves is not sustainable, largely because of the opportunity cost of these low-return assets.
- Any policy response needs to address both the foreign capital flows and the current account surpluses, as both are important causes of the reserve build-up.

Let's start with the current account story. One of the stylized facts of the Asian Crisis was that the pace of investment dramatically slowed after the crisis and, as the savings/investment balance shifted, by identity the current account shifted in parallel to produce sustained surpluses.

Any adjustment will see changes in these components: the saving/investment balance, the current account and the real exchange rate. These are policy choices to be made by individual countries. Just to illustrate the order-of-magnitudes and possibilities (not the realities, and with no prescriptive content) of a different policy configuration, we might borrow the Williamson/Cline estimates of fundamental equilibrium exchange rates (FEERs) (Cline and Williamson 2010), each associated with a current account position.<sup>7</sup>

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<sup>7</sup> The starting point of these calculations is the 2015 current account positions in the IMF WEO April 2010.

**Table 1: Fundamental Equilibrium Exchange Rates**

	Current account (% of GDP) 2010	FEER Current a/c 2015 (% GDP)	Required appreciation (%)
India	(2.2)	(2.4)	8
Indonesia	1.4	(1.6)	15
PRC	6.4	3.0	24
Hong Kong, China	12.1	3.0	24
Republic of Korea	1.6	2.0	10
Singapore	22	3	45
Malaysia	15	3	29
Philippines	3.5	(0.4)	12
Thailand	2.5	(1.1)	11

Source: Cline and Williamson (2010)

This (purely illustrative) configuration envisages current account surpluses for around half the countries in our group, so for these countries the adjustment is quite modest in objective: it does not go as far as achieve the real resource transfer that might be considered normal, reflecting capital “flowing downhill” to the emerging countries. In most cases, however, it does involve some shift of current accounts in that direction. Just as important for the current argument, this calculation suggests that, for all of these countries, an appreciation, usually quite substantial, would be consistent with these current account outcomes.

With appreciations of this magnitude (which Williamson/Cline see as achieving an approximation of the FEER for each country), this would still imply foreign exchange reserve increase. On top of this, the environment is likely to encourage an increase in foreign capital inflow.

These capital flows find their basis in structural issues, thus presenting a greater challenge for policy.

Thus this new policy configuration needs to increase investment (shift the saving/investment balance), push the current account in the direction of deficit, allow the corresponding appreciation of the exchange rate, and respond to the prospect of excessive foreign capital inflow. What does this imply? The elements of a possible approach are:

- Exchange rate policy along the lines of the Williamson BBC, with intervention when necessary to retain the rate inside the band. Variation within the band will play a helpful counter-cyclical role, supporting the cyclical movement in interest rates.
- For macro-balance this may imply higher levels of investment (or government deficits) to achieve the savings/investment balance consistent with this CAD (cf Swan diagram).
- The associated current account position might favor modest deficits (rather than the variety of outcomes shown in the Williamson/Cline table above), reflecting the logic of capital “flowing downhill” to the profitable emerging economies, who benefit by way of faster growth.

- To the extent that there are such deficits, these would be funded by the most advantageous forms of capital inflow (probably largely foreign direct investment).
- To the extent that short-term inflow leads to offsetting foreign exchange reserve increases, this seems sub-optimal policy outcome, with the public sector picking up the risk for the private sector. This implies that there may be advantage in measures to discourage these disruptive pro-cyclical shorter-term inflows.
- This equilibrium involves acceptance that some asset prices (especially equities) will tend to be over-valued. This will give a useful signal encouraging investment (issuing new equities can be done cheaply) giving investors some of the advantages of cheaper overseas funding. But this form of funding is likely to be quite cyclical.
- The financial sector needs to be insulated against spill-over from this high volatility of asset prices through strong prudential measures which prevent exposure to this asset-price volatility.
- Over-valuation of assets and volatility (in the sense of occasional sharp falls) are a part of this story so have to be countered through insulating the financial system from this volatility, rather than through a tighter setting of monetary policy.
- But this tenuous equilibrium involving over-priced assets and volatile capital flows leaves plenty of opportunities for policy misreading. There is some comfort in the demonstrated ability of monetary policy to sterilize the reserve-money impact of foreign exchange reserve increase, and in the interest-based frameworks which are an effective response. Where these do not exist (Hong Kong, China; and Singapore), more direct policy intervention seems both possible and effective.
- Where does this leave the export-oriented strategy of a highly-competitive exchange rate? Gone, unfortunately.

How does this policy configuration fit with the Impossible Trinity? On the surface, the management of the exchange rate explored here seems inconsistent and therefore infeasible. If, however, the authorities are managing the exchange rate so that it is at or close to its FEER value and return differentials are balanced by overvalued asset prices, then the speculators and capital movements which are the actors in implementing the Impossible Trinity have no valid expectation that their actions against the exchange rate will be successful. As we wouldn't expect the FEER to change dramatically over time, this might be consistent with the stability of exchange rates that seems part of the region's policy preference.

## 11. CONCLUSION

The Impossible Trinity began as an important and useful theoretical insight into the interactions of policy instruments. It was, however, adopted as a doctrinal policy rule largely because it served to support the arguments for a "free-floating exchange rate." The argument went like this: capital controls are not workable; if you want to have your own monetary policy (and which country does not want to do this?), then you have to let your exchange rates float freely. QED.

But the Impossible Trinity was a stylized insight relying on simplified assumptions. The real world was always more complex and nuanced. Of course there is some connection between interest differentials and capital flows. But there are other forces motivating capital flows, and these are much more random and non-optimizing than envisaged by the Impossible Trinity. The fickle changes in risk assessments, mindless herding, and booms-and-busts in the capital-exporting countries make international capital flows volatile in ways not envisioned in the textbooks.

Emerging financial markets are small in comparison with the huge portfolios of the developed countries, so even small changes in sentiment are disruptive. It is a legitimate policy aim for emerging countries to develop a well-founded idea of the appropriate size of inflows for their particular circumstances (and hence their long-run current account balances), to estimate the equilibrium exchange rate which goes with this, and to take measures which allow them to reap the benefits of capital inflows while minimizing the disruptive volatility. Some of these measures are intentionally market-distorting, because the market is not delivering an optimal outcome. But of course recognizing market distortions is only a first step towards finding a policy which can redress these: there is no easy presumption that intervention will be effective. Now that it is more widely accepted that markets can be imperfect and capital flows disruptive, the task of policymakers is to find operationally effective responses.

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