The Aftermath of Currency Crises: Exchange Rates, Money Growth, Inflation and Interest Rates in Asia and Latin America

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ABSTRACT

After a fixed exchange rate regime is abandoned during a financial crisis, policymakers in crisis-hit countries face the challenging task of managing exchange rates and conducting monetary policies conducive for growth while combating inflation. This paper studies how crisis-hit countries respond differently in the aftermath of currency crises by analyzing exchange rates, money supplies, inflation and interest rates in two Asian countries—Korea and Thailand—and two Latin American countries—Argentina and Mexico. Their post-crisis policy responses result in three different scenarios: (1) an appreciating currency in a low interest rate and low inflation environment as in the Asian economies; (2) leaving the currency depreciated in a low interest rate and extremely high inflation environment as in Argentina; (3) further currency depreciation in a high interest rate and inflationary environment as in Mexico. This paper emphasizes that currency appreciation is a necessary pre-condition for attaining a low interest rate and low inflation environment in the aftermath of deep currency devaluation.

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1. Introduction

With increased capital mobility, the financial crises during the 1990s and the beginning of the 2000s hit emerging market economies in Asia and Latin America with remarkable speed and force. Collapses in investors’ confidence, sudden reversals of capital, large exchange rate devaluations, and insolvencies of the banking systems left these economies with negative income growth. Not long after these crises erupted, however, the crisis-afflicted economies in both Asia and Latin America exhibited signs of impressive recovery. Three years after the onset of the Asian Financial Crisis, Paul Krugman praised the recovery process of the East Asian countries:

The amazing thing to me—if you leave Indonesia out—is how similar the performances are. Korea took the IMF’s advice and it’s bouncing back. Thailand took the IMF’s advice and it’s starting to come back. Malaysia defied the IMF and it’s coming back fast. The truth is the natural resilience of economies did it (cited in Sharma 2003).

Compared to East Asian countries, Latin American countries are known for their weaker economic fundamentals, such as a history of high inflation, an undisciplined fiscal policy, and a low investment rate. However, several crisis-hit countries in Latin America have also shown promising evidence of recovery. The experience of Argentina in the aftermath of the Argentine crisis in 2001 is perhaps the most remarkable. The Executive Board of the IMF’s Article IV consultation with Argentina concluded in 2005:

Reflecting buoyant domestic demand, [Argentina’s] real GDP grew close to 9 percent in both 2003 and 2004 bringing real output level back to the peak level achieved prior to the crisis. From early 2003, confidence rose steadily, and both private consumption and investment rebounded. International reserves have recovered, and bank deposit and external payments restrictions have been progressively dismantled.
The crises forced all of these countries to abandon their exchange rate pegs, and the subsequent floats of those currencies were often followed by sharp depreciations and fluctuations in their values. This absence of a currency anchor posed a challenge for monetary authorities in managing the movements of the exchange rates in order to stabilize the economy and restore growth. How did these emerging market countries recover so impressively from currency crises that caused severe damages to their economies? How did the monetary authorities in the crisis-hit countries in Latin America and Asia respond similarly or differently to such crises?

This paper addresses these issues by investigating the means with which the monetary authorities in four crisis-hit countries—Argentina, Mexico, Korea, and Thailand—responded in the aftermath of having their currencies attacked. The selection of the crisis-hit countries is intended to be demonstrative rather than comprehensive. Understanding monetary management and its effects on the economy will shed light upon the policy instruments that foster sustainable growth in a country once hit by a financial crisis. To achieve that end, this paper first reviews literature on the post-crisis macroeconomic management in Asia and Latin America. It then presents some exchange rate theories which are used as a framework for the analysis. Next, the paper provides a comparative analysis of key monetary variables in the four countries, focusing specifically in the post-crisis periods. The last section investigates monetary management through exchange rate policy, interest rate policy, and money supply in each individual country. The study ends with a concluding remark addressing policy implications of the study.

2. Literature Review

A substantial body of literature has focused on identifying potential causes of financial crises in emerging market economies. However, the recovery paths of crisis-affected countries have been given much less attention. Existing literature on post-crisis periods examines either on
how pre-crisis macroeconomics determines the pace of the recovery or on how effective the post-crisis policy instruments are. This paper focuses only on the latter; in essence, it investigates how different monetary managements shape recovery paths of crisis-hit countries. McKinnon (2002) argues that the relatively quick recovery of Asian crisis-hit countries has been the result of monetary restraint resulting in low interest rates and low inflation as their exchange rates appreciated back to normal. Ito and Sato (2006) use a VAR analysis to determine the effects of changes in the exchange rate on domestic prices in Asian crisis-hit countries. They find that Indonesia’s accommodative monetary policy and high degree of CPI responsiveness to exchange rate changes resulted in spiraling effects on domestic prices and a sharp depreciation of the exchange rate in the post-crisis period. Goldfajn and Baig (1998) study the relationship between the real interest rate and the real exchange rate in the aftermath of financial crises in emerging market countries. They find that from July 1997 to July 1998, a higher real interest rate was associated with a weaker currency in Korea and Thailand while the reverse was found in Mexico during July 1994 to July 1995.

In order to systematically understand monetary management in the aftermath of a crisis, I examine four key monetary variables: the exchange rate, money growth, price levels and interest rates in a country. The exchange rate is of primary interest because a sharp devaluation of domestic currencies is a common characteristic of financial crises across Asia and Latin America. In fact, the Asian financial crisis is often characterized as a currency crisis, and its onset was marked by the devaluation of the Thai Baht in July 1997. The Korean Won, the Malaysian Ringgit, the Indonesian Peso, and the Philippine Peso all experienced deep devaluations a few months afterwards. The economies of Latin America have also experienced similar deep devaluations—though to a larger degree. The Mexican Peso was devalued in

The money supply and price levels are also a main focus of this paper for several reasons. First, exchange rates, money growth and prices are theoretically inseparable issues. The monetary view of exchange rates links changes in the exchange rate with changes in the supply of money; and the supply of money is empirically associated with price levels especially in the long run. In fact, a great deal of research shows evidence of the long-term correlation between rapid money supply growth and rising inflation in emerging market economies of Asia and Latin America (Diz 1970, Vogel 1974, Hansan 2002, Gillman and Nakov 2004). Additionally, the notion of exchange rate pass-through to price levels has often been tested empirically. Rogers and Wang (1993) find a statistically significant relationship between exchange rates and price levels in Latin America. Specifically, they argue that a systematic undervaluation of the domestic currency is one of the main causes of chronically high inflation in Latin America in the second half of the 1980s. Ito and Sato (2007) find a high degree of exchange rate pass-through to import prices but a lower degree of pass-through to the CPI in the crisis-hit Asian economies.

Additionally, money supply growth and inflation are particularly important in the context of our study because Latin American economies have had a history of rapid growth in money supplies and persistent inflation especially in the 1980s and 1990s. In fact, their adoption of a fixed exchange rate regime is often viewed as an effort to control inflation and to gain credibility in the global markets. Therefore, the abandonment of currency pegs particularly complicated the Latin American monetary authorities’ task in containing money supply growth and inflation because the currency pegs used to anchor prices were broken. For the above-mentioned reasons,
money supply growth and price levels are essential components in understanding the monetary adjustments after currency crashes.

With an easing of capital movement across borders and increasing sophistication of financial technology, returning to a fixed exchange rate regime in the aftermath of the crisis while adjusting interest rates according to the country’s economic environment is difficult, if not impossible. Therefore, the decision of whether and how much currency appreciation is allowed after a deep devaluation determines the extent to which the interest rate policy is autonomous. The autonomy of the monetary policy is particularly important in the post-crisis context because a well-conducted monetary policy can help stabilize the exchange rate, curb inflation and restore growth.

The question of how interest rate policy should be conducted in the aftermath of the crisis has been a particular concern among central bankers. On the one hand, a tight monetary policy could help ameliorate speculative attacks, stabilize the exchange rate, and facilitate exchange rate appreciation. In this regard, Goldfajh and Gupta (2003) find that tight monetary policy facilitates the reversal of currency undervaluation through nominal appreciation. However, the results are not robust when the economy also experiences a banking crisis. On the other hand, high interest rates could encourage more rounds of hot capital flows especially when the confidence in the country is reestablished and/or when a fixed exchange rate regime is readopted. This tradeoff complicates the decision on whether domestic interest rates should be raised in the aftermath of the crisis, and if so, when, and to what extent. Through a close examination of interest rates in the aftermath of the crises, this paper analyzes how monetary authorities in the crisis-hit countries have tackled this interest rate dilemma.
3. Theoretical Framework

Because exchange rates, money supplies, price levels, and interest rates are interrelated and are endogenously determined by one another, an analysis of these variables cannot be done separately. To investigate the four monetary variables systematically, this paper applies the following theories of exchange rate determination as a framework for the analysis.

3.1 Purchasing Power Parity

The theory of purchasing power parity is one of the most traditional models of exchange rate determination. The theory is based on the law of one price which states that identical goods should have only one price given a perfect capital market (no transaction costs, no taxes, complete certainty). In its absolute version, the purchasing power parity states that in the long run the equilibrium exchange rate equals the ratio of domestic to foreign prices. Purchasing power parity is commonly expressed as:

\[ e = \frac{p}{p^*} \]

where \( e \) is the nominal exchange rate expressed as units of domestic currency per one unit of foreign currency; \( p \) is the domestic price level; and \( p^* \) is the foreign price level. An increase in \( e \) represents depreciation while a decrease in \( e \) represents appreciation of the domestic currency against the foreign currency.

To test the theory of purchasing power parity empirically, economists need to make a decision on issues such as which goods should be included in the price index and what year should be used as a base year. In the context of this paper, the CPI and WPI will be used as representations of price levels. Moreover, this paper assumes that real exchange rates are at equilibrium during the pre-crisis period and that deep devaluations are shocks that cause
exchange rate parity to break down. In the aftermath of a crisis, a restoration of parity can be achieved in two ways—nominal currency appreciation or higher inflation at home than abroad.

3.2 Asset Market Approach to Exchange Rate Determination

Discussions of the link between prices and exchange rates provide little insights into what determines exchange rates because prices and exchange rates are generally endogenous and are determined simultaneously (Frenkel 1986). A more modern approach to exchange rate determination incorporates asset markets and treats the exchange rate as a relative price of two countries’ monies traded in the asset markets. Another important building block of the asset market approach to exchange rate determination is the role of expectations. Like the demand for any other assets, the demand for domestic and foreign monies is forward looking and depends on the expected rates of returns. This asset market approach is based on two important building blocks: the monetary model and the principle of uncovered interest parity.

3.2.1 Monetary Model of Exchange Rate Determination

The monetary model of exchange rate determination emphasizes the relationship between exchange rates and price levels via the national money market. According to Frenkel and Mussa (1985), today’s changes in the exchange rate reflect the expectation of future changes in relative monetary policies. The reason is that any substantial exchange rate changes can only be sustained by future monetary adjustments that allow price level changes at home (or the opposite change aboard). Following Qiao (2007), the building blocks of the monetary model of exchange rate determination can be represented as:

\[ \hat{p} = \beta(e - p) \] (price expectation)

\[ m - p = L(Y, i, \hat{p}) \] (money market)
where \( p \) is the domestic price level; \( \dot{p} \) is the price level change between the current period and the next; \( e \) is the nominal exchange rate expressed as units of domestic currency per US dollar; \( m \) is the domestic money supply; \( Y \) is the real GDP; \( i \) is the domestic interest rate; and \( \beta \) and \( L \) are function symbols. Note that \( \dot{p}, p, m, Y, \) and \( i \) are endogenous while \( e \) is exogenous.

All else equal, a depreciation of a currency is associated with an expectation of higher price levels in the future (\( \dot{p} \) is positive). According the money market equation, this expectation translates to higher domestic money supply today or in the future. As the economy approaches a new steady state, the money supply would have to increase in proportion to \( e \) (and to \( p \)). If this is not the case, \( e \) will have to appreciate back to its initial level since the monetary policy is inconsistent with expectations of future changes in price. In the long run, the change in the nominal exchange rate is washed away as higher domestic price levels restore the real exchange rate equilibrium (PPP holds). After the restoration of purchasing power parity, money supply and prices stay at higher levels.

In other words, a depreciated currency cannot be sustained unless money growth is expanded relative to the output growth and vice versa. As a result, an exchange rate policy and money supply are jointly determined. Intuitively, a monetary authority needs to sell domestic currency and accumulate dollar reserves in order to keep the domestic currency depreciated against the dollar. The sales of domestic currency in open market operations encourage the expansion of the domestic money supply which can be offset by complete sterilization. If sterilization is not complete, money supply expands relative to real income growth. Based on the monetary model, countries which maintain depreciated exchange rates after the crises should experience the growth in money supply.
3.2.2 Uncovered Interest Parity

Uncovered interest parity (UIP) or Fisher’s Open is also incorporated in the asset market approach to exchange rate determination. UIP is based on the notion that the exchange rate moves so that there is no advantage in borrowing or lending in one country’s asset market as opposed to another country’s asset market. This open interest parity condition can be represented as:

\[ i - i^* = \frac{s_e - S}{S} \]

where \( i \) is the domestic nominal interest rate; \( i^* \) is the foreign interest rate; \( s_e \) is the current expectation of the future value of the domestic currency against the foreign currency; and \( S \) is the current value of the domestic currency. Therefore, \( \frac{s_e - S}{S} \) is the expected depreciation of the domestic currency against the foreign currency.

UIP is not directly testable because market expectations of future exchange rates are difficult, if not impossible, to observe. Some argue that exchange rates quoted in futures markets can be used as a proxy for the expectation of future exchange rates; however, liquid forward or futures exchange rates do not yet exist for most developing countries, and forward rates only reflect the expectations if domestic currency assets are perfect substitutes for foreign-currency assets (no exchange risk premium). Moreover, UIP is based on simplified assumptions regarding the international financial markets. It assumes no transaction cost, no taxes, an equal risk of default from holding foreign and domestic currency denominated assets, a perfect capital flow across international borders, and investors’ risk neutrality.

If we believe that market participants are risk averse and, thus, require risk premiums to hold uncovered foreign currency positions, UIP can be extended to include an expression for currency risk premium:
\[ i - i^* = \frac{S^e - S}{S} + \rho \]

where \( \rho \) is the currency risk premium. According to McKinnon (2002), the currency risk premium represents an extra return required by investors to hold domestic rather than foreign currency assets, as well as any unidirectional expected movement in the exchange rate. In this context, the risk premium can be regarded as domestic financial volatility—in interest rates or domestic price levels—measured against similar risk(s) in the markets of the United States. Although UIP is based on several simplified assumptions and has not yet been tested successfully using econometrics tools, the parity is, after all, based on the unhedged-interest-parity condition. For the purpose of the analysis, I believe that UIP is still appropriate in providing insights into the relationship between exchange rate expectations and interest rates.

This paper applies the above-mentioned exchange rate theories to examine the relationships between exchange rates and price levels, between exchange rates and money supplies, and between the expectations of future exchange rates and nominal interest rates. The paper first presents a comparative analysis of the monetary variables in the four countries—Argentina, Mexico, Korea and Thailand. It then investigates an exchange rate policy, an interest rate policy and money supply in each individual country for a comprehensive understanding of how its monetary authority responded to the crisis.

4. Data

The data of macroeconomic variables in Argentina, Mexico, Korea and Thailand are from the IMF’s International Financial Statistics (IFS), April 2008. In the comparative analysis, the paper compares the data of the four economies so that the pre-crisis, crisis, and post-crisis periods are aligned. The beginning of a crisis is defined as when the government officially abandoned an \textit{ex post} currency peg in Mexico, Korea and Thailand or when the government
abandoned the currency broad in Argentina. The dates that mark the onset of the crises are January 2002 in Argentina, December 1994 in Mexico, December 1997 in Korea and July 1997 in Thailand. Each country’s data spans approximately from one year before the devaluation into ten years onwards. However, because the financial crisis in Argentina is the most recent one, Argentina’s data spans only six years after the crisis. Thus, the time periods compared are January 2001 to January 2008 for Argentina; January 1994 to January 2005 for Mexico; and January 1997 to January 2008 for Korea and Thailand.

All of the macroeconomic variables used are reported on a monthly basis with the exception of GDP which is reported on a quarterly basis. One time interval for analysis that involves GDP refers to one quarter while one time interval for analysis that does not involve GDP refers to one month. All exchange rates are expressed as units of domestic currency per one US dollar. Short-term money market interest rates are used as a proxy for nominal interest rates because they are comparable to the US federal funds rate.

5. Comparative Analysis

In following section, I will apply the above-mentioned exchange rate theories to compare exchange rates, money supplies, price levels, and interest rates among the four crisis-hit countries. The examination is primarily based upon the four variables and their interdependence; however, other relevant macroeconomic variables are also discussed. The order of each variable examined is dictated by the theoretical framework rather than by chronology.
5.1 Improvement in Trade Balance

Figure 1: Nominal Exchange Rates and Trade Balances: All Countries

A rapid improvement in trade balance following deep currency devaluation is an evident commonality among the countries in the sample. The magnitude of the reversal was most substantial in Korea where quarterly trade balances jumped from a $5 billion trade deficit to a $13 billion trade surplus within two years. The improvement in trade balance in the aftermath of
currency crises was driven by two forces. First, the devaluation of the domestic currency made exports cheaper in dollar terms, thus allowing for an improvement in export competitiveness. Second, the crises brought about collapses in domestic investment and consumption which in turn reduced demands for imports. According to Qiao (2007), the dramatic reduction in domestic absorption was the predominant cause of the quick improvement of trade balance in the Asian countries after the deep devaluation. In essence, because the debt of these countries was largely denominated in US dollars, the deep devaluation led to a negative private wealth effect and thus a slump in consumption. Even though the devaluation made investment cheaper, foreign investors opted not to invest in the countries due to the fears of a collapse of the economy. Because domestic absorption declined faster than the decrease in output, the balance of trade rapidly improved.

Without capital controls, the surplus in trade left the monetary authorities with two options regarding the management of their domestic currencies. The monetary authority could accommodate the appreciation pressure from trade surpluses and allow the currency to regain its value. Alternatively, the monetary authority could intervene in the foreign exchange markets to keep the currency at a depreciated level and arguably maintain export competitiveness. This latter policy option, according to the theory of purchasing power parity, will lead to a rise in domestic price levels in the economy.
5.2 Exchange Rates

Figure 2: Nominal Exchange Rates

![Nominal Exchange Rates](image)

<table>
<thead>
<tr>
<th></th>
<th>Argentina</th>
<th>Mexico</th>
<th>Korea</th>
<th>Thailand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start*</td>
<td>1.0</td>
<td>3.1</td>
<td>861.3</td>
<td>25.9</td>
</tr>
<tr>
<td>Peak</td>
<td>3.8</td>
<td>10.2</td>
<td>1695.0</td>
<td>54.9</td>
</tr>
<tr>
<td>% change (start to peak)</td>
<td>275%</td>
<td>227%</td>
<td>97%</td>
<td>112%</td>
</tr>
<tr>
<td>End**</td>
<td>3.1</td>
<td>9.7</td>
<td>1173.7</td>
<td>39.2</td>
</tr>
<tr>
<td>% change (start to end)</td>
<td>212%</td>
<td>211%</td>
<td>36%</td>
<td>52%</td>
</tr>
</tbody>
</table>

* one year before deep devaluation  
** six years after deep devaluation

The comparison of the currencies during the period of one year before deep exchange rate devaluations until six years afterwards reveals two remarkable differences between the Latin American and the Asian economies. First, currency devaluation was much deeper in Argentina and Mexico than in Korea and Thailand. At the peak of currency devaluations, the Argentine Peso and the Mexican Peso were 275% and 227% less in value compared to their pre-crisis
levels. Korea and Thailand did not experience such sharp devaluations: the Korean Won and the Thai Bath depreciated by 97% and 112% respectively at the peak of their devaluations.

The second important difference is that Latin American exchange rates have stayed depreciated level while their Asian counterparts have gradually appreciated in the aftermath of the crisis. The exchange rate data reveals that the Asian monetary authorities allowed their exchange rates to gradually appreciate, while the Argentine monetary authority maintained its exchange rate at a depreciated level and the Mexican monetary authority allowed for further depreciation in the aftermath of the currency crises. Six years after deep currency devaluations, the Argentine Peso and the Mexican Peso were 212% and 211% less than their pre-crisis values while the Korea Won and the Thai Baht were only 36% and 52% less than their pre-crisis values. At the end of 2007 the Korean Won finally appreciated back to its pre-crisis level whereas the Thai Baht stood at only 30% lower than its pre-crisis value.

Regarding the \textit{ex post} exchange rate appreciation in Asia, if the Asian monetary authorities had explicitly stated at the onset of the crisis that they would allow their exchange rates to appreciate in the foreseeable future, the loss in confidence and the devaluation of the Asian currencies could have been less severe. McKinnon (2006) argues that the experience of the Asian countries hit by the financial crisis in 1997 was similar to that of the countries operating under the gold standard faced with liquidity crises, except that the gold standard was governed by the restoration rule—if a country’s mint parity is ever temporarily suspended, it needs to be restored as soon as possible. He suggests that this rule had ensured investors’ confidence in the come-back of the currencies after periods of liquidity crisis and that it contributed to the relatively stabilized exchange rates in the countries operated under the gold standard. Following this logic, without the restoration rule or any credible promises from the governments of future
exchange rate appreciation, forward-looking investors would expect the currencies to continue losing value, resulting in series of speculative attacks and sharp devaluation of domestic currencies. All in all, the *ex post* currency appreciation in the Asian countries in the aftermath of the Asian currency crisis should at least signal to international investors that if future crises erupted, their currencies would eventually regain their values. This signaling effect should not apply to the Latin American countries because their currencies have not been allowed to appreciate since the recent crises.

Some may argue that currency appreciation in the aftermath of the crisis should inherently happen much earlier or more readily in the Asian economies than the Latin American economies because the initial crash was less severe in Asia than in Latin America. In this regard, Goldfajn and Gupta (2003) studies currency crises of 80 emerging market countries between 1980 and 1998. They find that the magnitude of the overshooting of exchange rates at the onset of the crises does not significantly affect the chance of reversing currency devaluation through appreciation. Following this logic, the exchange rate appreciation in the aftermath of the currency crashes should not be contingent upon the magnitude of the initial devaluation but is dependent upon the decision of each country’s monetary authority, among other things. Thus, the comparison of exchange rates between the Latin American countries and the Asian economies is instructive and is an essential component in understanding the post-crisis monetary management in those countries.
5.3 Money supply

**Figure 3:** Normalized M1

The data on money supplies of the four crisis-hit countries appears to support the monetary view of exchange rate determination: a country’s exchange rate and money supply are jointly determined. While the Argentine Peso has been maintained at a depreciated level and the Mexican Peso continued to depreciate, money supplies (M1) in the two Latin American economies have expanded rapidly relative to the two Asian economies. For instance, six years after the currency crises, the supplies of money in Argentina and Mexico grew by 410% and 221% respectively. In Korea and Thailand, the nominal money supplies increased by 55% and 57% respectively during the same timeframe. The monetary theory and the data on money supplies in the four economies suggest that countries which allow for currency appreciation in face of current account surpluses should be better able to curb the growth in money supply. It is important to note that the control over money supply in the Asian and the Latin American economies could not be achieved up to these levels without their sterilization efforts.
5.4 Price Levels and Inflation

Figure 4: CPI and CPI inflation; WPI and WPI inflation

The data on price levels in the crisis-hit countries appear to support the conventional wisdom that a growth in money supply is associated with a rise in price levels; that is, countries with higher growth in M1 (such as Argentina and Mexico) have experienced a more rapid rise in price levels. For instance, six years after the crashes, WPI in Argentina and Mexico rose by 220% and 233% respectively compared to their pre-crisis levels whereas in Korea and Thailand, the WPI only increased by 18% and 26% respectively. Correspondingly, the rates of inflation in
Latin American rose sharply at the onset of the crisis and stayed persistently higher several years after the crises as compared to the Asian economies. In Korea and Thailand, the WPI and CPI inflation rates plummeted to lower than 10% within a year since the crisis.

The data on price levels and inflation of these four countries substantiates the theory of purchasing power parity: countries that allow their exchange rates to appreciate in the aftermath of deep devaluation, such as Korea and Thailand, have experienced a slower rise in domestic price levels relative to foreign price levels while countries that have not allowed their exchange rates to regain their values, such as Argentina and Mexico, needed to inflate rapidly to restore the long-term exchange rate equilibrium.

5.5 Banking System

A rapid growth in money supply and high inflation could hurt the expansion of the banking system in the aftermath of the crisis because the unusually high inflation reduces the real value of future paybacks on bank deposits as well as the real value of currency. In this context, an unusually high rate of inflation can be viewed as a tax on money holders and can discourage banks’ extension of domestic credits. Therefore, the banking system in an inflating economy should not recover as readily as that in a low inflation economy. Note that M2/GDP is used as a proxy for the size or potential lending capacity of the banking system as compared with the size of the economy.
The comparison of M1/GDP and M2/GDP among the four economies supports the view that a rapid rise in narrow money (M1) leading to inflation hurts the recovery of the banking system, especially when the banking sector was initially small relative to the size of the economy. With the fastest rise in money supply (M1), Argentina is the only country in which the growth of M1/GDP was faster than that of M2/GDP. From a year before the deep devaluation to six years after, Argentina’s M1/GDP has grown by 5.5 percentage points while its M2/GDP has...
grown by 5.3 percentage points. This pattern implies that items which are included in M2 but not in M1, such as saving deposits and time deposits, shrunk relative to GDP during this period. On the opposite end of the story, Korea’s banking system expanded most rapidly. Its M2/GDP has grown by 31.2 percentage points while its M1/GDP has been stable. A year before the crisis, Korea’s M2 was 34% of GDP—a figure comparable to that of Mexico. However, Korea’s M2 grew to 65% of GDP while Mexico’s rose to 42% of its GDP six years after the crises. The data on M1/GDP and M2/GDP suggests that a rapid growth in narrow money supply (M1), among other things, has disrupted the expansion of domestic credits and slowed down the recovery of an already small banking system.

5.6 Nominal Interest Rates

Figure 6: Short-term Money Market Nominal Interest Rates

As uncovered interest parity (UIP) would have it, the escalation of interest rates in all countries when the crises loomed was associated with *ex ante* expectations of exchange rate devaluation. Ongoing depletions of foreign exchange reserves and enormous foreign currency-denominated debt caused investors to lose belief in the credibility of the pegs and subsequently
mount a series of speculative attacks on currencies. In Mexico, the hike in interest rates
continued most persistently after the official announcement of exchange rate devaluation,
signifying that the expectation of further currency devaluations persisted even after the initial
Crish in the late 1994. Because the magnitude of currency devaluations in Argentina and Mexico
was larger than in Korea and Thailand, it is not surprising to see a more dramatic upswing of the
Latin American interest rates compared to their Asian counterparts at the onset of the crises. For
instance, the interest rates in Argentina and Mexico reached 91% and 85%, respectively, four
months after the deep devaluation of the domestic currency, compared with 21% in Korea and
19% in Thailand during the comparable period.

The abnormally high interest rates in all countries at the onset of the crisis could also be
viewed as those countries’ attempt to stabilize their exchange rates and to slow down the large-
scale outflow of funds. In fact, during the Tequila crisis and the Asian Financial crisis, the IMF
required Mexico and the crisis-hit Asian countries to tighten their monetary policies as a
precondition for receiving aid. The IMF reasoned that high interest rates would halt the
downward spiral of currency depreciation and stem the outflow of capital (Fisher 1998). This
prescription is controversial because the rise in interest rates arguably deepened post-crisis
recessions. Moreover, substantial amount of funds continued to flow out of these economies
despite the widening interest rates differentials between the domestic interest rates and the US
interest rates. Stiglitz (2003) argues that the IMF’s interest rate demands led to a full-blown
collapse of the banking systems, killed investment and lengthened recessions in the crisis-hit
countries in Asia.

A year after the currency crashes, the short-term money market rates in Argentina, Korea
and Thailand decreased to below 5% while the money market interest rate in Mexico remained
persistently higher than 20%. Not until seven years after the Tequila crisis did the money market interest rate in Mexico finally decrease to lower than 10%. The reason why Argentina, Korea and Thailand could afford lower interest rates at a much earlier stage than Mexico can be understood in two ways. First, according to UIP, the expectation of currency devaluation in the three economies dwindled much earlier as their exchange rates stabilized and, in the case of the Asian currencies, appreciated at an earlier stage compared to the Mexican Peso. After the deepest devaluation, the Argentine Peso stabilized at around 3 Peso per dollar a year and a half after the crisis. In Asia, the Won and the Bath began to stabilize at an even earlier stage than the Argentine Peso and have on average appreciated since. The stabilization and/or the appreciation of the currencies at the early stages of recovery kept expectations of future currency devaluation \((\frac{s^e - s}{s})\) low and even negative in Asia. Correspondingly, domestic interest rates plummeted and stayed low. In Mexico; however, the expectation of future devaluation must have been prolonged as the \textit{ex post} exchange rate continued to depreciate several years after the crisis. This continual exchange rate depreciation protracted investors’ worries about further depreciation which, according to UIP, translated to higher interest rates.

Another explanation of why Mexico could not afford low interest rates as early as the other three countries rests upon its high and persistent inflation, especially CPI inflation, as shown in figure 4. In essence, Mexico’s prolonged inflation forced the monetary authority to pursue a contractionary monetary policy. All in all, the high and persistent interest rates in Mexico must have contributed to the country’s better control of money supply as compared to Argentina, whose exchange rate has been kept at a depreciated level and whose interest rates dropped at the early stage of the post-crisis period.
In short, the comparative analysis suggests that in the aftermath of the crises, the sharp improvements in trade balance provided the crisis-hit countries with two options to restore their long-run real exchange rate equilibriums: either allow domestic currencies to regain their pre-crisis values or maintain the currencies at depreciated levels. The decision on which exchange rate policy option to pursue dictates money growth, inflation, and interest rates in the economy as the above-mentioned monetary variables are interrelated. The data suggests that Argentina and Mexico have kept their exchange rates at the depreciated levels while Korea and Thailand have gradually allowed for exchange rate appreciation in the aftermath of the currency devaluations. As the monetary view of exchange rate determination predicts, the two Latin American economies experienced a more rapid expansion in money supplies (M1) as compared to the Asian economies. Furthermore, this rapid growth in the money supplies was associated with a faster rise in domestic price levels in the two Latin American economies, compared with the two Asian economies. Such phenomenon supports the theory of purchasing power parity which states that a country which does not allow for exchange rate appreciation in the aftermath of deep currency devaluation needs to inflate to restore its exchange rate equilibrium.

Regarding to the conduct of monetary policy, the interest rates in all of the countries except Mexico has fallen and has been kept to single digit levels starting from a year after the crises. The Mexican interest rates stayed persistently high several years after the deep devaluation as Mexico experienced prolonged expectations of future currency devaluation and continuing inflation. The main lesson drawn from the post-crisis experiences of the four countries is that a reversal from a currency crisis through currency appreciation is a precondition for a low inflation and low interest rate environment.
6. Country-specific Analysis

While the comparative analysis provides insights into how the four crisis-hit countries in Asia and Latin America responded differently or similarly in the aftermath of the crisis, a country-specific examination of the issue will focus on the exchange rate policy, interest rate policy, and their impacts on money supply within an individual country. Thus, the analysis allows for a more comprehensive understanding of the cross-country similarities and differences learned earlier.

6.1 Argentina

6.1.1 Exchange rate policy

**Figure 7**: Argentina’s Exchange Rate, Price Levels and Inflation

The Argentine crisis caused by far the most severe damage to the value of a domestic currency. Due to the series of speculative attacks on the Peso, the Argentine government announced an abandonment of the one-to-one-dollar-peso-parity in January 2002 after having maintained the peg since 1991. The currency crash reached its peak by the mid-2002 when the Peso had lost more than 275% of its original value. Since the beginning of 2003, Banco Central
de la Republica (BCRA), the central bank of Argentina, has targeted the Peso at the band around 3 Pesos per US dollar. The Argentine government’s policy of maintaining a stable and competitive exchange rate was identified as an crucial driver for the country’s double digit GDP growth since 2003 (Cibils 2008, Frenkel and Rapetti 2007).

Assuming that the exchange rate and price levels in Argentina had satisfied the purchasing power parity during the pre-crisis period, 200% devaluation—from 1 Peso per US dollar to 3 Pesos per US dollar—should eventually translate to a 200% increase in domestic price levels. In April 2007, the WPI in Argentina rose by 200% from the level at the beginning of 2001. The CPI, however, then increased by 95% from the pre-crisis level. It is important to note that the CPI should be less responsive to the changes in currency value than the WPI because the CPI includes prices of non-tradable goods while the WPI comprises of only tradables. Provided that the exchange rate remains at the current level, the Argentine economy will most likely experience more years of rises in the CPI before achieving the new exchange rate equilibrium.

In less than a year after the currency crash in January 2002, the WPI and CPI inflation rates in Argentina escalated to their peak of over 124% and 41%, respectively. Since then, the inflation rates fell substantially and began to hover around 10% per year starting in mid-2003—approximately when the currency began to stabilize. However, due to price manipulation and price controls, many believe that the true CPI inflation in Argentina has been much higher than the reported rate. Argentina’s government has recently faced increasing criticism regarding the credibility of the inflation data it publishes. For instance, the Argentine government reported a CPI inflation rate of less than 10% in 2007. However, its supermarket index suggests that the rate of inflation should have been approximately 15% during the same period. Likewise, Tomadato Auditores de Mercadoes, an independent market research firm, estimated that Argentina’s CPI
inflation was in an upward trend in the later half of 2007 and that the annual rate of inflation in 2007 should be about 15-20% (see Appendix for the detailed debate over Argentina’s true inflation rates). If the true CPI inflation in Argentina were indeed higher than the headline inflation, the economy may not have to inflate for as many years to reach the new equilibrium as expected.

6.1.2 Interest Rate Policy

Figure 8: Argentina’s Short-term Money Market Interest Rates

Along the line of UIP, Argentina’s short-term money market interest rate shot up even before the deep devaluation of the Peso as investors grew increasingly worried about the country’s ability to pay off its enormous debt and about the credibility of its peg. The high rate of interests encouraged more debt and aggravated the country’s risk premium, which in turn led to an even higher interest rates and more debt financing before the default in December 2001. After the abandonment of currency board in January 2002, Argentina’s interest rates rose even higher while the real interest rates became negative as inflation escalated, thus encouraging the subsequent expansion in nominal money supply (see figure 9).
When the Argentine Peso started to stabilize in January 2003, the nominal interest rates plummeted and began to move in line with the US interest rates. The falling interest rates in Argentina can be understood from two different angles. First, the beginning of Argentina’s low interest rates coincided with the onset of the Argentine Peso stabilization. It is likely that the ex post currency stabilization was associated with the reduced expectation of future devaluation. As investors no longer expect the currency to depreciate further, UIP predicts that the differential between the domestic interest rate and the US interest rate is brought down. Second, the low interest rates were a product of Argentina’s expansionary monetary policy intended to restore growth and to prevent another round of hot money inflows. In October 2007, President Kirchner publicly demanded domestic banks to lower interest rates as part of the country’s plan to boost investment. This action raised concerns among critics because Argentina’s price levels have recently been on the rise and its GDP has grown by more than 10% every year since 2004 (Lynch 2007).

Whatever the case, the high inflation in Argentina had made its real interest rates stay persistently below zero, continuing to stir the growth of money supply. Only in the middle of 2007 did the short-term money market real interest rate become positive. However, this was also the time when Argentina’s inflation data faced increasing skepticism regarding its credibility. Therefore, it is highly likely that the real interest rate in Argentina was still below zero, encouraging continual expansion in money supply.
6.1.3 Money Supply and Banking System

**Figure 9:** Argentina’s M1 Growth, M1/GDP and M2/GDP

According to the monetary view of exchange rate determination, Argentina’s depreciated currency and negative real interest rates have contributed to a rapid growth in M1 relative to GDP. The substantial buildup of narrow money supply could, among other things, explain Argentina’s slow expansion of domestic credits especially those extended to the private sector. At the end of 2007, Argentina’s M2/GDP remained lower than 0.2—this figure rose only moderately from 0.13 prior to the crisis. Argentine banks’ claims on private sector shrunk from 23.3% of GDP in January 2001 to 12.5% of GDP by the end of 2007.

Even though Argentina’s recovery process has not yet completed, it is possible to conclude at this point that the Argentine economy will have to inflate further to reach the new equilibrium. Some believe that Argentina’s monetary approach—keeping an exchange rate depreciated and maintaining low interest rates while tolerating high inflation—is myopic as the condition may stir the economy’s short-term growth but may not necessarily strengthen its economic fundamentals. Others, including the Argentine government, believe that the country’s
double-digit growth over the past few years has justified any means by which it achieved such recovery.

6.2 Mexico

6.2.1 Exchange rate Policy

Figure 10: Mexico’s Exchange Rate, Price Levels and Inflation

For the purpose of the analysis, I divide Mexico’s post-crisis periods into two time intervals: the first phase lasts from the deep devaluation in December 1994 to the end of 1999 when the new exchange rate equilibrium is restored; the second phase is from the end of 1999 until the end of 2007.

The first phase or the pre-restoration period was marked by continuing Peso depreciation, rising price levels and high growth in M1. After the initial devaluation, the Mexican Peso continued to depreciate. Meanwhile WPI and CPI inflation rates escalated and reached historical highs of approximately 56% per year in 1996. By the end of 1999, the WPI and CPI eventually increased by 200% and caught up with the magnitude of the Peso depreciation. Correspondingly,
Mexico’s M1 growth was above 20% every year throughout the pre-restoration period (see figure 12).

After the restoration of PPP, the Mexican Peso went through episodes of stabilization, depreciation and even slight appreciation. During 2000-2002 was the period of “super-peso” as the Mexican Peso appreciated slightly in nominal terms, but appreciated in real term to its historical high. Gonzalez (2001) argues that the US’s falling interest rates and Mexico’s improved economic fundamentals attracted large capital inflows which exerted an upward pressure on the Mexican Peso. The devaluation of the Argentine Peso in January 2002 ended the super-peso period, and the Mexican Peso once again started to depreciate in nominal terms. Not until 2004 did the Peso began to stabilize against the US dollar. Throughout the second phase which lasted from the restoration of PPP at the end of 1999 until the end of 2007, the Mexican Peso has depreciated by only 18% in nominal terms.

With the slight depreciation of currency, the post-restoration phase was marked by the falling inflation and relatively slow expansion in M1. Especially during the super-peso period, Mexico’s CPI inflation strictly stayed around 3-5%--the figure much lower than the 14% rate of CPI inflation at the end of the pre-restoration phase. Correspondingly, the annual growth in money supply (M1), which was once above 40%, became lower than 20% almost every year throughout the post-restoration period. Mexico’s low inflation and relatively slow growth in M1 during the post-restoration phase were similar to what Korea and Thailand have experienced, though not to the same degree.
6.2.2 Interest Rate Policy

**Figure 11:** Mexico’s Short-term Money Market Interest Rates

Like the interest rates in Argentina, Korea and Thailand, Mexico’s interest rates have rose sharply when the currency suffered a massive overshooting and fell when the currency stabilized or when the expectation of currency devaluation subsided. However, the fall of interest rates in Mexico did not happen as readily as that in Argentina, Korea or Thailand. In particular, the Mexico’s short-term money market interest rate stayed persistently high above 20% for about five years after the crisis (throughout the pre-restoration phase). Krugman (1996) argues that the prolonged high interest rates in Mexico between 1994 and 1996 cannot solely be understood by the expectation of currency devaluation because Mexico’s improvement in trade balance exerted an upward pressure on its currency. In essence, a nationalist backlash against the pro-market policy direction in the past decade had stirred investors’ anxieties about the country’s economic reform. The Mexican government needed to compensate investors for this country risk by maintaining high interest rates.
Additionally, Mexico’s high interest rates during the pre-restoration phase can be viewed as the government’s attempt to curb inflation, which also stayed persistently high throughout this period. Regardless of the extent to which Mexico’s tight monetary policy was effective in combating inflation, the high interest rates had attracted capital inflows, increasing domestic money supply on top of trade surplus. Note that in the post-PPP restoration period, Mexico’s nominal money-market interest rate fell below 10% as the exchange rate began to stabilize and the need to combat inflation subsided.

6.2.3 Money Supply and Banking System

**Figure 12:** Mexico’s M1 Growth, M1/GDP and M2/GDP

The combination of high inflation and high interest rates especially during the pre-restoration phase discouraged investors to take out loans and triggered private sector’s defaults, in turn, forcing domestic banks to become reluctant to lend. Mexico’s M2/GDP grew moderately, from 35% of GDP in January 1994 to 52% of GDP in January 2007. Note that Mexico’s M2/GDP on average grew more rapidly during the post-restoration period when interest rates, M1 growth, and inflation were kept low. All in all, the growth in Mexico’s domestic credits was driven primarily by those extended to the central bank. In particular, the
domestic credits extended to the central bank rose from 3.2% of GDP in January 1994 to 9.7% of GDP in January 2007. In contrast, domestic credits extended to the private sector shrunk from 31.1% of GDP in 1994 to 14.4% of GDP in 2004, before bouncing back to 19.1% of GDP in 2007. After thirteen years, Mexico’s domestic credits extended to the private sector had not fully recovered.

The problem of the weak banking system in Mexico most likely lies beyond the high interest rates and high inflation. A sizable literature focuses on why Mexican banks have reduced private lending dramatically since the peso crisis. Thorne (1998) argues that the series of currency devaluation in Mexico deteriorated domestic banks’ balance sheets and made the banks become undercapitalized. Krueger and Tornell (1999) suggest that the problem was rooted in the lack of transparent and effective bankruptcy procedures that put a heavy load of past due loans on banks. In this regard, Mexican debtors’ refusal to pay back its loans, which was usually denominated in US dollar, became a common problem in the aftermath of the Peso devaluation in 1994. Most strikingly, the devaluation stirred the emergence of a massive social movement called “El Barzon,” or the debtor clout. Consisting primarily of middle-class businessmen, the members of the El Barzon collectively refused to pay back their debt to the lending institutions. Without any effective bankruptcy procedures, the Mexican banks were forced to bear the cost and thus became unwilling to lend. Gonzalez (2003) argues that the government’s bailout scheme was the main culprit of the banking failure. Specifically, the Mexican banks had no incentives to lend to non-financial private sector when they could profit from holding the Institute for the Protection of Bank Savings’s (IPAB’s) bailout bonds, which required no costs to hold and have negligible default risk. An adverse repercussion of the IPAB whose objective was
to “protect the deposits of small savers” was the collapse of bank credits extended to the private sector.

Mexico’s macroeconomic environment in the aftermath of the crisis can be categorized in two time periods—before and after the restoration of purchasing power parity. During the former period, the Mexican Peso continued to depreciate and, correspondingly, money supply and price levels rose rapidly to restore the exchange rate equilibrium. Together with the country risk premium, the expectation of currency devaluation translated to persistently high nominal interest rates. After the economy inflated and the new equilibrium was achieved, the Mexican Peso began to stabilize, money supply growth fell, inflation declined and interest rates plummeted. Although Mexico did not allow the currency to strictly appreciate in the post-restoration period, the better control of price levels and lower interest rates resembled what Korea and Thailand experienced, though much later and not to the same degree.

6.3 Korea

6.3.1 Exchange rate Policy

Figure 13: Korea’s Exchange Rate, Price Levels and Inflation
The magnitude of the Won devaluation was relatively smaller compared to that of the Argentine Peso; the Won lost “only” 100% of its pre-crisis value during the peak of the crisis. However, a remarkable distinction between the Korean Won and the Argentine Peso is that the Won has been allowed to appreciate in the aftermath of the crisis. The Korean government succumbed to currency appreciation pressure stemming from capital account surpluses (trade surplus and positive net capital flows) and allowed the Won to appreciate. The rate of appreciation accelerated at the beginning of 2003, and as of 2007 the value of the Won has risen back to its pre-crisis level.

As predicted by the theorem of Purchasing Power Parity, the appreciation of the Won allowed for a slow rise in Korea’s price levels. At the peak of the crisis in 1998, Korea’s WPI and CPI inflation rates rose to 15% and 10%, respectively, and since 1999 the rates of inflation have mostly been below 5%.

6.3.2 Interest Rate Policy

Figure 14: Korea’s Short-term Money Market Interest Rates
From December 1997 to the early 1998, the escalation of Korean interest rates did not only stem from the expectation of currency devaluation but also from the IMF policy prescription. Specifically, the IMF required Korea to pursue a contractionary monetary policy as a pre-condition for receiving financial support from the fund. The high nominal interest rates and relatively low inflation resulted in a rise in real interest rates which restrained the growth of M1 at the onset of the crisis. In mid-1998, Korea’s M1 shrunk by more than 20% while its real GDP decreased by 8% compared to that of the preceding year (see figure 15). In Argentina and pre-restoration Mexico; however, the constrained growth in money supplies at the onset the crisis were more in line with the decrease in the countries’ national incomes.

Korea’s short-term money market rate was brought down from 25.6% in January 1998 to 6.3% in January 1999. The rapid fall in interest rates can be understood as a consequence of the IMF’s relaxation of monetary policy prescription as well as the expectation of future currency appreciation. In fact, in the 5th Letter of Intent (February 7th, 1998), the IMF asked Korea to lower its call interest rates so that they could “move in line with market conditions”. Regarding the low interest rates in crisis-hit East Asian countries’ economies during 1999 - 2000, McKinnon (2002) argues that the anticipated exchange rate appreciation allowed for a “honeymoon” effect in which the nominal interest rate differentials between the East Asian debtor economies and the industrial center were narrower than before. McKinnon suggests that the tightening of the interest rate differentials between these countries and the US reduced banks’ incentives to accept unhedged foreign currency deposits to make loans in the domestic currency, allowing them space to reform the system. In fact, the “honeymoon” effect in Korea coincided with when the country’s M2/GDP expanded the fastest since the eruption of the crisis.
After the sharp drop in 1998, Korea’s money market interest rate gradually fell further—from 6% in 1999 to 3% in 2005. Comparing to the double-digit interest rates preceding the crisis, the post-crisis low and falling interest rates reflects the government’s attempt to prevent the return of hot money inflows. In fact, in the early 1997, the combination of Korea’s high interest rates, stabilized exchange rate, and financial liberalization had encouraged massive hot money inflows and foreign currency-denominated debts—both of which aggravated the economy’s financial fragility. Korea’s low interest rates in the aftermath of the crisis can be understood as a mechanism to prevent hot money inflows, which proved to be damaging in 1996-1997.

6.3.3 Money Supply and Banking System

**Figure 15:** Korea’s M1 Growth, M1/GDP and M2/GDP

The joint determination of the exchange rate and money supply is evidenced by Korea’s appreciating currency and slow growth in M1. Korea’s nominal M1 growth has been below 10% per year since 2000, and the M1/GDP ratio has been kept below 0.1 since the crisis. The low growth in money supply and the low real interest rates, among others, have contributed to a remarkable expansion of Korea’s banking system especially from 1998 to 2002. At the beginning of 1997, Korea’s M2 was 182 trillion Won, or 42.5% of GDP. Only six years
afterwards, M2 grew to reach 527 trillion Won, or 79.4% of GDP. Since then, M2 growth began to saturate and M2/GDP had stabilized around 65-70% of GDP. Moreover, Korea’s domestic credits extended to private sector increased from 63% of GDP in January 1997 to 107% of GDP in January 2007. This improvement is in sharp contrast with the falling credits extended to the private sector in Argentina and Mexico in the aftermath of the crises.

In short, the appreciation of the Won has allowed for the modest growth in M1 (as governed by the monetary view); the slow rises in price levels (as predicted by the theory of PPP); and the falling interest rates (as dictated by UIP). All of these conditions have been conducive to the expansion of the banking system in Korea.

6.4 Thailand

6.4.1 Exchange rate policy

**Figure 16:** Thailand’s Exchange Rate, Price Levels and Inflation

The magnitude of currency depreciation in Thailand is on par with that of the Korean Won and is much lower than that of the Argentine Peso and the Mexican Peso. Once the Thai government officially announced the abandonment of the peg in July 1997, the Thai baht depreciated by 112% compared to its pre-crisis level. After a few years of adjustment and
stabilization, the Thai Baht began to appreciate in 2001. The rate of appreciation accelerated at the beginning of 2006; and as of March 2007 the Baht stood at 30% less in value compared to its pre-crisis level.

The appreciation of the currency served Thailand well in curbing the rise in price levels and constraining inflation. Since the onset of the crisis, the increase in price levels in Thailand has been comparable to that in Korea but significantly lower than that in Argentina and pre-restoration Mexico. From the beginning of 1997 to the end of 2007, Thailand’s WPI and CPI increased by only 66% and 38%. Moreover, since the beginning of 1999, both WPI and CPI inflation rates have been low by the Latin American economies’ standard.

6.4.2 Interest Rate policy

Figure 17: Thailand’s Short-term Money Market Interest Rates

The movement of Thailand’s nominal interest rates before, during, and after the crisis is similar to that of Korea: the rate shot up at the onset of the crisis when the currency was under speculative attacks, then fell and stayed a low level when the exchange rate stabilized and began to appreciate. However, unlike the Korean short-term money market interest rate, the Thai interest rate has always been lower than the federal funds rate since the end of 1998. This
phenomenon reveals the Thai central bank’s attempt to reject tentative capital inflows—perhaps to a larger extent than its Korean counterpart.

6.4.3 Money Supply and Banking System

Figure 18: Thailand’s M1 Growth, M1/GDP and M2/GDP

Although Thailand has maintained low nominal interest rates which occasionally corresponded with negative real interest rates, the country has been relatively successful in controlling money supply growth. The annual growth in M1 was always below 15% every year during 2000-2007. Due to the modest growth in M1 as well as the slow rise in price levels, Thai banks have been able to sustain their large lending capacity in the aftermath of the crisis. Thailand’s M2 was already 82% of GDP at the beginning of 1997 and still grew to reach 104% of GDP in 1999. By 2000, the rate of M2/GDP growth slowed down. Still, since the beginning of 1997, Thailand’s M2 has always stayed above 80% of GDP.

Thailand’s post-crisis monetary management has been similar to that of Korea. By allowing for a currency appreciation, Thailand has gained a better control over inflation and the growth in money supply while maintaining low interest rates. These conditions have enabled Thailand to maintain its large banking system relative to the size of the economy.
7. Conclusion

The currency crises in Argentina, Mexico, Korea, and Thailand brought about the collapses in domestic consumption and, as a result, positive reversals of the trade balance. The surpluses of trade forced the monetary authorities of these crisis-hit countries to decide whether they should allow for exchange rate appreciation. As it turned out, the Asian economies let their exchange rates appreciate; Argentina kept its exchange rate at a depreciated level; and Mexico (during the pre-restoration phase) allowed its currency to depreciate even further. The selection of exchange rate policy option dictates the behaviors of money supply, inflation, and interest rates since these those monetary variables are theoretically inseparable.

The theories of exchange rate determination serve as a theoretical framework for the analysis of exchange rates, money supplies, inflation, and interest rates in the aftermath of the crises. Although the theories are based on simplified assumptions and, for some, have not yet been proved successfully, they have explanatory power over the post-crisis monetary phenomena in the four countries. The monetary theory predicts that a country’s exchange rate and money supply are jointly determined: a depreciated currency cannot be sustained without an expansion in money supply relative real GDP growth and vice versa. In fact, the depreciated currencies in Argentina and Mexico during the pre-restoration period corresponded with a rapid growth in money supplies in those economies. On the contrary, the exchange rate appreciation in Korea and Thailand was associated with those countries’ ability to constrain money supply growth. Moreover, the theory of purchasing power parity predicts that deep currency devaluation could be reversed either through nominal exchange rate appreciation or through faster rise in prices at home than abroad. By not allowing for exchange rate appreciation, Argentine and pre-restoration Mexico had to tolerate a more rapid rise in price levels compared to what Korea and Thailand
experienced. Lastly, uncovered interest parity suggests that the expectation of exchange rate devaluation translates to higher domestic interest rates relative to foreign interest rates. Correspondingly, the pre-restoration Mexico, whose exchange rate continued to depreciate, could not afford low interest rates in the aftermath of the crisis. The nominal interest rates in Argentina, Korea and Thailand dropped to low levels in a relatively earlier stage as their exchange rates stabilized and/or appreciated (only in Korea and Thailand) shortly following the deep devaluation.

The country-specific analysis provides insight into how the monetary authority in each crisis-hit country conducted an exchange rate policy and an interest rate policy in the aftermath of the crisis. The analysis of the monetary variables and monetary management suggests that the four economies responded differently in the aftermath of the currency crises. The monetary management in these countries can be categorized into three different strategies: (1) keeping a currency depreciated and maintaining low interest rates while tolerating extremely high inflation as in Argentina; (2) letting a currency depreciating further and raising interest rates to combat inflation as in pre-restoration Mexico; (3) allowing for currency appreciation in order to maintain low interest rates and low inflation as in Korea and Thailand. This study points out that a reversal from deep currency devaluation conditioned on low interest rates and low inflation requires an appreciation of the exchange rate.
Bibliography


Appendix: What is the true inflation in Argentina?

The inflation data used in this paper is obtained from the IMF’s database which accumulates officially-published inflation data from monetary authorities around the world. Since 2006, the Argentine government’s reported inflation has faced increasing skepticism regarding its credibility because the government has implemented price controls and price manipulation in the economy. After enacting price controls on energy, President Kirchner reportedly sought to persuade producers and stores to freeze prices of products including sugar, flour, noodles, shampoo, and pencils (Webber 2008). These practices led many to believe that the true inflation in Argentina was significantly higher than the officially-reported rate of inflation. In February 2008, the IMF asked the National Institute of Statistics and Census of Argentina (INDEC) to clarify its methodology used to calculate the economy’s inflation rates.

Various figures have been put forward to predict the true rate of inflation in Argentina. Based on an estimate of Tomadato Auditores de Mercadoes, an independent market research firm, Argentina’s rate of inflation was in an upward trend in the later half of 2007. If this trend continued until the end of 2007, the annual rate of inflation in 2007 would be approximately 15-20% (Moffett 2007).

Figure 19 Argentine’s Inflation: Headline vs. Private Sector’s Calculation

![Monthly Rates of Inflation in Argentina](image-url)
In addition, the three different types of governmentally-reported inflation have proved to be inconsistent. INDEC reports the headline inflation (made of a basket of 53% goods and 47% services), food and beverage inflation, as well as supermarket prices index. Based on the headline inflation figures, the annual reported rate of inflation from the beginning of 2006 to the end of 2007 was lower than 10%. However, starting at the beginning of 2007, the percentage change in supermarket index moved in an opposite direction from the headline inflation. Based on the supermarket index, Argentina’s annual rate of inflation could have been as high as 15% from the beginning of 2006 to the end of 2007.

**Figure 20** Inconsistencies in Argentine’s Official Inflation Figures

![Official Monthly Rates of Inflation in Argentina](image)

If the Argentine government did indeed manipulate the reported rate of inflation, its motivation most likely lay beyond a political one. In particular, around 40% of Argentine government bonds were index-linked to the headline inflation rate; therefore, lower inflation figures would mean lower cost of debt for the Argentine government (Turner 2007).