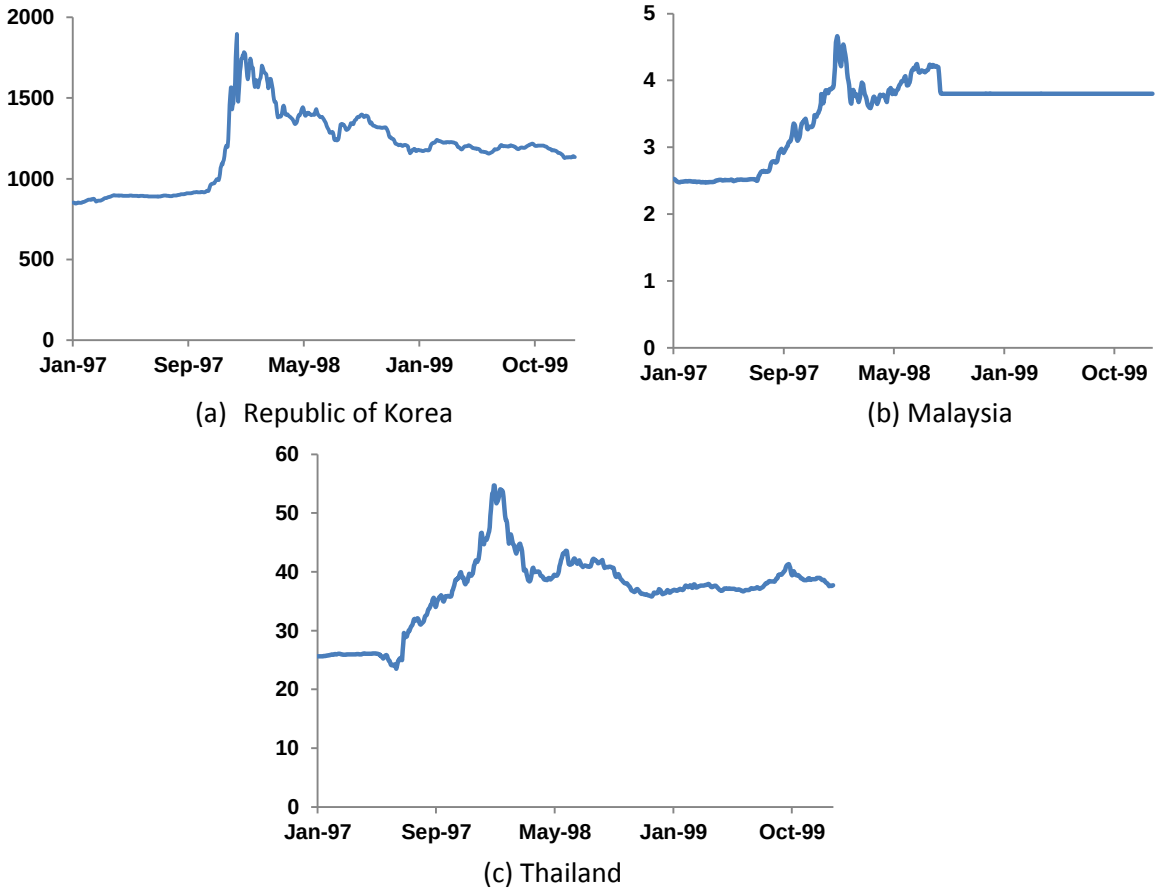
EXCHANGE RATE FLUCTUATIONS

A. Currency Overshooting

1. During the processing of the Madhya Pradesh Power Transmission and Distribution System Improvement project, the Indian rupee depreciated rapidly against other main currencies. Similar currency depreciations were observed in many emerging economies such as Indonesia and Thailand. This rapid depreciation seems to be an episode of exchange rate overshooting. Historically, there has been clear evidence of exchange rate overshooting during episodes of macroeconomic turbulence or crisis. Exchange rate overshooting refers to the phenomenon in which the initial (short-run) depreciation rate is larger than the long-run depreciation rate. In other words, the post-crisis exchange rate tends to be lower than the short-run peak level.[1]

2. Figure 1 describes the exchange rate movement in the Republic of Korea, Malaysia and Thailand between January 1997 and December 1999. The Asian Financial Crisis started in July 1997 in Thailand with the collapse of the Thai baht after the Thai government was forced to float the baht due to lack of foreign currency to support its fixed exchange rate. Soon the crisis engulfed other South East Asian economies including Malaysia, Indonesia and the Republic of Korea.

Figure 1: Exchange Rate Movement: January 1997 to December 1999



[1] Here exchange rate is being defined as the value of one unit of foreign currency in domestic currency.

3. It is evident from the movement of the Korean won, Thai baht and Malaysian ringitt that the exchange rate depreciated sharply after the outbreak of the Asian Financial Crisis in 1997. However, in all these cases there was an explicit case of overshooting as the currency depreciated much more in the immediate aftermath of the crisis and strengthened thereafter to a stable level. The extent of overshooting differed across the countries, depending on the policies that were undertaken to stabilize the exchange rate.

4. A simple measure of overshooting can be used to formally look into the extent of overshooting. The initial, peak and post crisis stable values of the exchange rates during the currency crisis can be used to calculate the extent of overshooting. The initial date of each episode is selected on the basis of visually analyzing the data and identifying a break in the movement of currency. The initial level of the exchange rate is a 30 day average of the value of the currency around the initial date. The peak level and date of each crisis episode is visually clear and we select the highest level of exchange rate after the start of the crisis.

5. The extent of overvaluation depends on the percentage difference in the highest level of exchange rate achieved during the crisis from the post crisis stable value of the exchange rate. The stable value is calculated as the one month average of the exchange rate after the moving coefficient of variation of the exchange rate has dropped below 2%.[2] Table 1 lists the initial, peak and stable dates as well as the corresponding exchange rate and a measure of overshooting. In both Republic of Korea and Thailand the extent of overshooting was in excess of 35%, while in the case of Malaysia it was lower at 13.8%.

Table 1: Extent of Overshooting

	Initial		Peak		Stable		Extent of
	Date	Value	Date	Value	Date	Value	Overshooting
Rep. of Korea	Oct-97	928.98	Dec-97	1960	May-98	1407.97	39.2%
Malaysia	Jul-97	2.58	Jan-98	4.73	Jul-98	4.16	13.8%
Thailand	Jul-97	30.23	Jan-98	56.1	Jun-98	41.50	35.2%

6. A number of factors are responsible for the overshooting of exchange rate in the short run. Exchange rate is determined by supply and demand for the currencies. Economic downturns such as decline in exports, tourism or similar economic activities which decrease demand for a local currency lead to depreciation of local currency. Publicity about an economic crisis in a country leads to financial panic which is also a major driver of exchange rate overshooting. Deterioration of economic outlook results in people converting local currency denominated assets to more stable currency denominated assets. With deterioration in macroeconomic outlook creditors might be tempted to withdraw their credits if other creditors are also fleeing from the borrower, even though each creditor would have been prepared to lend if the other creditors were doing the same. A related behavior is herding whereby each individual may choose to follow others' behavior even when their own information tells them to act in another way.

7. One major policy response is tightening the monetary policy by the central banks after a country has entered into a crisis. This is done to widen the interest rate differential and attract more capital inflows, and thus a rise in interest rate is associated with an appreciation of the currency. Thus, historical evidence suggests that currency depreciation tends to be higher in the

[2] Coefficient of variation is a measure of volatility and is calculated as the ratio of standard deviation to mean.

face of macroeconomic headwinds. The currency tends to appreciate as investors recover from panic and policy measures are introduced to stabilize the currency.

8. India too has been subject to some degree of exchange rate overshooting in the recent past, although not to the extent experienced by some of the Asian economies.[3] During the Global Financial Crisis, in line with many other emerging markets' currencies, the Indian rupee depreciated by 24% between May 2008 and March 2009 (Figure 2). However, this episode was short-lived and by March 2010 the Indian rupee had appreciated by 22% (Table 2).

Figure 2: India's Currency Movement: May 2008 to March 2010

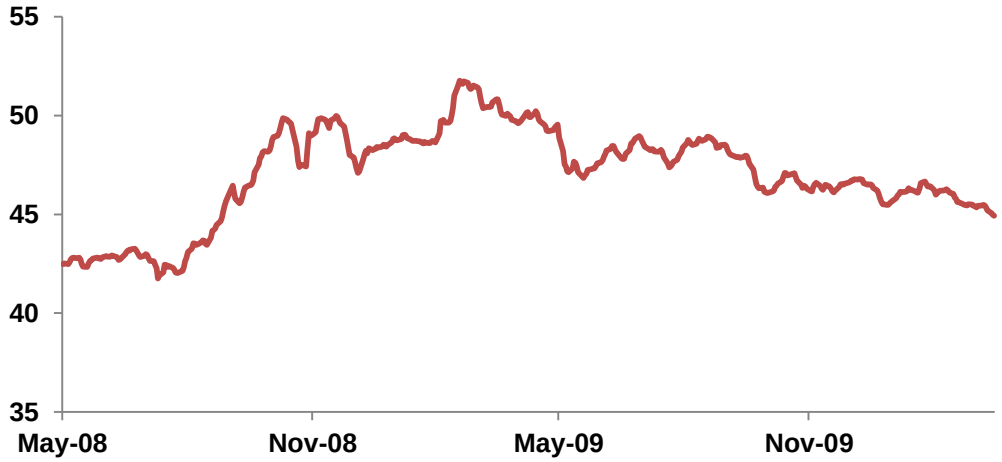


Table 2: Extent of Overshooting

	Initial		Peak		Stable		Extent of
	Date	Value	Date	Value	Date	Value	Overshooting
India	May-08	42.04	Mar-09	55.51	Mar-10	45.45	22.1%

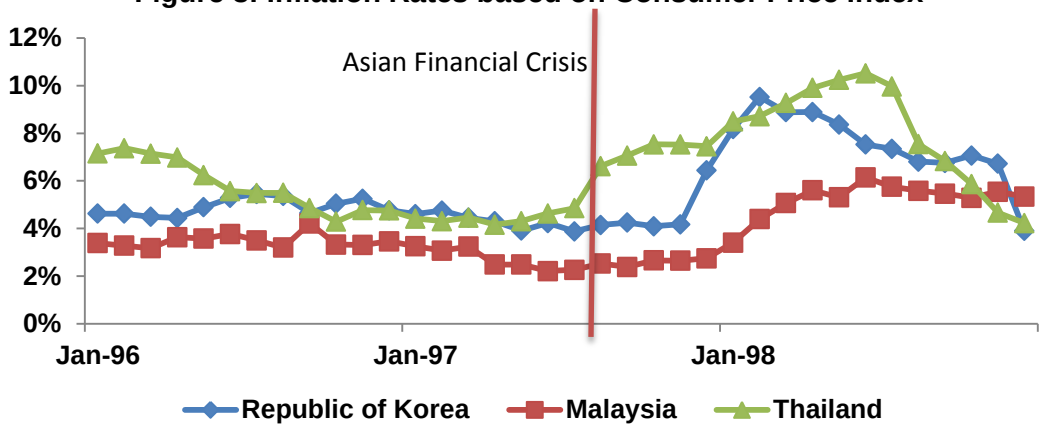
8. In the most recent episode of currency depreciation in India, there has also been evidence of overshooting. While the value of the US dollar breached 68 rupee mark in end August 2013, the rupee has appreciated by 8% since then (September 18, 2013).

B. Domestic Price Adjustments

9. Episodes of rapid depreciation of the currency tend to be associated with higher inflation rates as depreciation raises the price of imported goods, which is then transmitted across the economy. The depreciation of the Korean won, Thai baht and Malaysian ringgit in 1997 were all associated with an increase in inflation rate.

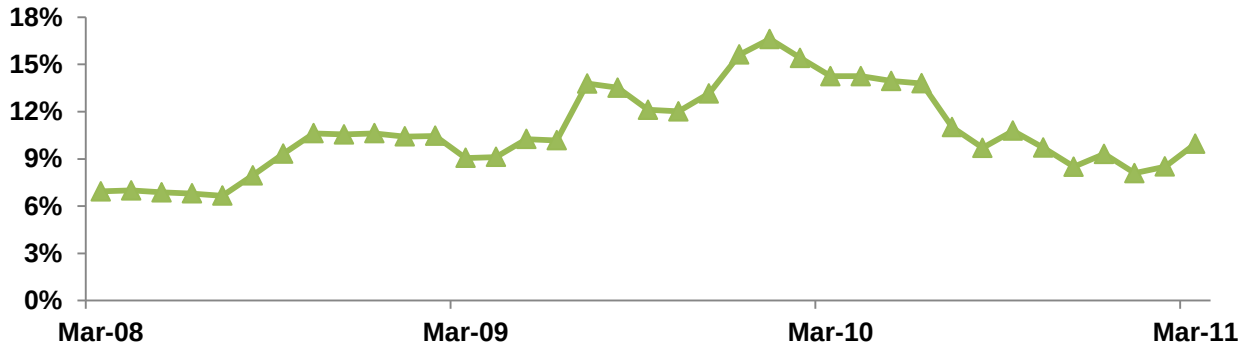
[3] The balance of payments crisis of 1991 is not analyzed as India was operating with a fixed exchange rate regime at that point.

Figure 3: Inflation Rates based on Consumer Price Index



10. While the rise in inflation rate subsided within a year, the surge in inflation rate meant that prices were permanently higher thereby escalating the cost of various projects. India also experienced a similar increase in inflation rate after the currency depreciated in the aftermath of the Global Financial Crisis.

Figure 4: Inflation Rates based on Consumer Price Index in India



11. A comparison of the average inflation rates over one year before and after the peak level of exchange rate was reached showed that inflation rate tends to be significantly higher in the post peak level period.[4]

	Korea	Malaysia	Thailand	India
Before the Peak Date	4.44%	2.67%	5.61%	8.86%
After the Peak Date	7.50%	5.24%	8.02%	13.00%

12. Although the evidence suggest the recent depreciation of the Indian currency is another episode of currency overshooting and currency will appreciate after some time, predicting the exchange with a reasonable accuracy is nearly impossible. At the project preparatory level this poses a threat of cost escalation if the overshoot currency rate is used in project cost estimates. Therefore a lower rate than the overshoot rate should be used to avoid cost over-runs. A

[4] For the peak level dates see Section 1.

professional judgment should be made considering the country specific exchange rate movement. As shown above local prices will increase as a result of currency overshooting. In the unlikely event of overshooting remains long and local prices do not adjust quickly, there will be some savings because more resources in local currency are available for the project. In this unlikely event the savings can be used to undertake additional civil work within the original scope of the project.