



Global
Macroeconomic
Working Group

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During the summer of 2013, the Reserve Bank of India ("RBI"), which controls the money supply of India, issued a statement that it was going to set policy that would sacrifice economic growth in order to stabilize the country's currency, the Rupee. When the RBI made this statement, many investors were upset that the RBI would not focus on growth. But, why did the RBI find it necessary to choose between growth and a stable currency? For most U.S. citizens, this is never really a discussion – the U.S. dollar is never really in peril if the central bank chooses to focus on increasing growth. Why can't India pursue a policy that endorsed both growth and a stable currency? Sensing these types of questions from the press, the RBI governor quickly reminded everyone that India was caught in a classic "Trilemma."

THE TRILEMMA

The Trilemma refers to a monetary policy problem where any country that wants to have a policy to control exchange rates, control interest rates, and keep outside capital flowing freely can only choose two of those three policies at a time. As it turns out, how a country responds to the Trilemma is a very important factor in the expected future growth of that country. During periods of global financial stress, the consequences of the Trilemma become clear in the capital markets, most recently with the reaction of many emerging market debt and equity markets to expectations of U.S. Federal Reserve tapering.

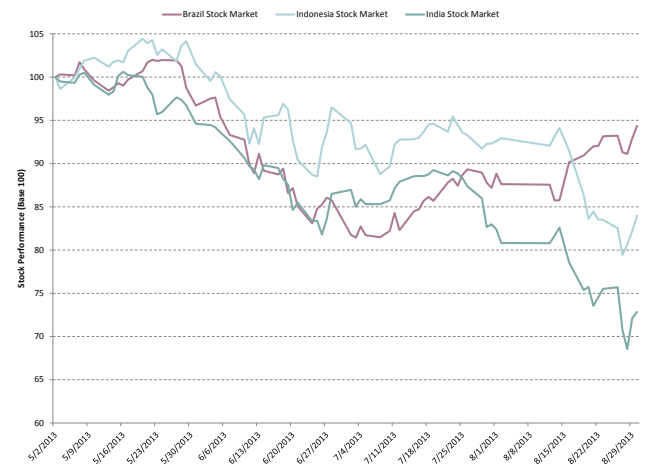
Understanding the Trilemma

As countries trade with one another, money begins flowing from one border to another. This money is transferred between countries using an exchange rate, and then kept in a local bank where it earns an interest rate. Ideally, countries could control both interest and exchange rates in a way that maximizes their economic health. In addition, any country would prefer to keep outside capital flowing freely into their country, which helps to maximize growth opportunities.

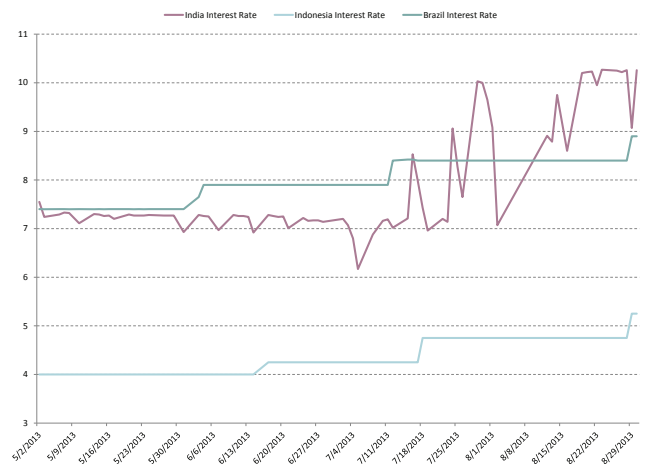
Unfortunately, countries (or more specifically, their central banks) cannot do all three things at once – use monetary policy to control exchange rates, use monetary policy to control interest rates, and keep capital flowing freely. Instead, there is a Trilemma (also known as the "Impossible Trinity"), which states that any country can only have two of these three policies at the same time.

So, in the case of India, the RBI chose to have

As Equity Markets Were Falling...



EM Countries Were Raising Interest Rates



free capital flow with a monetary policy that raised interest rates to support their currency, thereby sacrificing its ability to stimulate their economy through lower interest rates.

Why is it impossible for countries to have all three? The Trilemma exists because investors, over the long term, tend to arbitrage exchange rates and interest rates across countries. This means that free capital flows tend to move to



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countries with higher real interest rates (also known as the carry trade), putting upward pressure on that country's exchange rate independent of central bank policy. For example, if Korea has a 5% interest rate while Mexico has a 10% interest rate, one would expect the Korean won to depreciate by 5% relative to the Mexican peso as people sell won and buy pesos in order to earn a higher interest rate.

The three scenarios below serve to explain the Trilemma relationship:

Scenario 1:

Free Capital Movements	Use Monetary Policy to Fix Exchange Rate	Use Monetary Policy to Manage Interest Rates
X	X	

If a country decided to control its exchange rate through a currency peg (while keeping capital flowing freely), then this country would need to dedicate its monetary policy to defending the price of the peg (through changing the level of interest rates) as traders would continually put pressure on any currency whose pegged price was too high or too low relative to the interest rate difference among countries. So, in this situation, this country loses its ability to use monetary policy to control interest rates independent of the exchange rate.

Scenario 2:

Free Capital Movements	Use Monetary Policy to Fix Exchange Rate	Use Monetary Policy to Manage Interest Rates
X		X

If a country wanted to use its monetary policy to control interest rates, say through lowering the policy rate to stimulate lending and economic activity (while keeping capital flowing freely), this country would lose its ability to use monetary policy to keep its currency value fixed since traders would move the exchange rate by the amount of the new interest rate differential as interest rates moved lower.

Scenario 3:

Free Capital Movements	Use Monetary Policy to Fix Exchange Rate	Use Monetary Policy to Manage Interest Rates
	X	X

Finally, if a country cut off the ability of traders to trade its currency through the use of capital controls, it could have a monetary policy that both controls exchange rates and controls interest rates, as investors could not buy or sell securities to equilibrate exchange rates and interest rates. But, they achieved this by not allowing free capital movement. And this is a potentially costly trade-off because this country will likely have a higher cost of capital and lower growth opportunities as money from foreign investors is restricted from getting into their country, Forbes (2005)¹.

Looking at our world today, most modern industrial economies have chosen to have a monetary policy that manages interest rates and free capital movements at the expense of a monetary policy that focuses on fixing exchange rates.

Country	Free capital Movements	Use Monetary Policy to Fix Exchange Rate	Use Monetary Policy to Manage Interest Rates
Developed Countries	X		X
China		X	X
Argentina in the 1990s	X	X	

Why is This Important?

While the Trilemma is an economic reality for all countries, some handle it better than others. How a country manages the Trilemma is often a large factor in determining the growth expectations for that country. This is particularly true for emerging market countries, which are most affected by the dynamics of the Trilemma because of their reliance on foreign capital (like start-up companies that rely on outside capital to fund new projects, emerging markets often rely on developed markets' funding to fuel their growth).

So, what does it mean for a country to manage the difficulties of the Trilemma well?

Managing the Trilemma requires the pursuit of four main goals: avoiding capital controls, keeping large foreign currency reserves, avoiding foreign denominated debt, and keeping a current account surplus.

¹ Forbes J., Kristen (2005). "The Microeconomic Evidence On Capital Controls: No Free Lunch." National Bureau of Economic Research





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Managing the Trilemma Well

(1) Avoid Capital Controls

It is very tempting for a country caught in the hardship of the Trilemma to decide that capital controls are the solution. As described earlier, capital controls allow a country to have more monetary control over both interest rates and exchange rates, providing a sense of stability. It does this by hindering the potential for "hot money" to come in from other countries, which can cause big swings in exchange rates and local asset prices.

Since 2009, many emerging market countries have actively added capital controls in response to the massive quantitative easing of the U.S., Japan, and Europe, which has sent "hot money" flooding into their economies:

Country	Restrictions on portfolio flows		Restrictions on banking flows		
	Tax on foreign investments	Restricted by asset type or maturity	Tax on short-term external borrowing	Quantitative limits on banks' FX exposure	Required reserves on FX liabilities
Brazil	Oct, Nov 09 ^R Oct, Dec 10 ^R Jul, Dec 2011 ^R		Mar-Apr- Jul-Aug 11, Mar-Jun-Dec 12		Jan, Jul 11, Dec 12
Indonesia		Mar, Jun 10, Apr 11		Jun, Dec 10	Dec 10 ^R
South Korea	Nov 10 ^R Jan 12 ^R	11-Jul	11-Apr	Nov 09 ^D , Jan 10, Jun 10 ^D , Jun 11 ^D , Nov 12 ^D	
Taiwan		Nov 09 ^R Nov 10 ^R		Dec 10 ^D	Jan, Dec 10 ^R
Thailand	Oct 10 ^R				

Source: Ahmed (2013). "R" denotes measures that discriminate by residency and "D" denotes limits on banks' FX derivatives positions.

Adding capital controls as a way of managing the Trilemma is nothing new. Over the years, many countries have found cause to either restrict capital from flowing into the country, or restrict capital from flowing out of the country. The U.S., hoping to avoid using contractionary monetary policy, restricted capital outflows from 1963-1974 by using an interest equalization tax¹. Chile, hoping to have more monetary control as hot money flooded into their country, restricted capital inflows (through taxes) from 1991-1998 through its encaje program. During the 2008-2012 Icelandic financial crisis, Iceland, hoping to not lose control over its currency and economy, enacted strict capital controls, which included a full suspension of all official currency exchange (and this control is still in place today, albeit, less extreme).

Unfortunately, most capital controls, while a temporary solution to gain more monetary control, end up compromising the growth prospects of the country. The Federal Reserve Bank of St. Louis summarized numerous academic studies, Neely(1999)², that point towards the following costs of implementing capital controls: (1) limiting risk sharing, diversification, growth, and technology transfer, (2) lower returns on their savings for capital exporters with less investment and slower growth for capital importers, (3) inconsistent/poor government policies that remain longer than they otherwise would be given the lack of discipline of the market, (4) possible increase in corruption, and (5) high administrative costs. Johnston (1998)³ argues that restrictive capital regimes lead to low levels of economic development, high tariff barriers, large black market premia, and high volatility of the exchange rates.

¹ A tax on the purchase of foreign securities, making it less profitable for U.S. investors to invest abroad.

² Neely, Christopher, 1999, "An Introduction to Capital Controls." Federal Reserve Bank of St. Louis.

³ Johnston, Barry and Natalia Tamirisa, 1998, "Why Do Countries Use Capital Controls?" IMF Working Paper.





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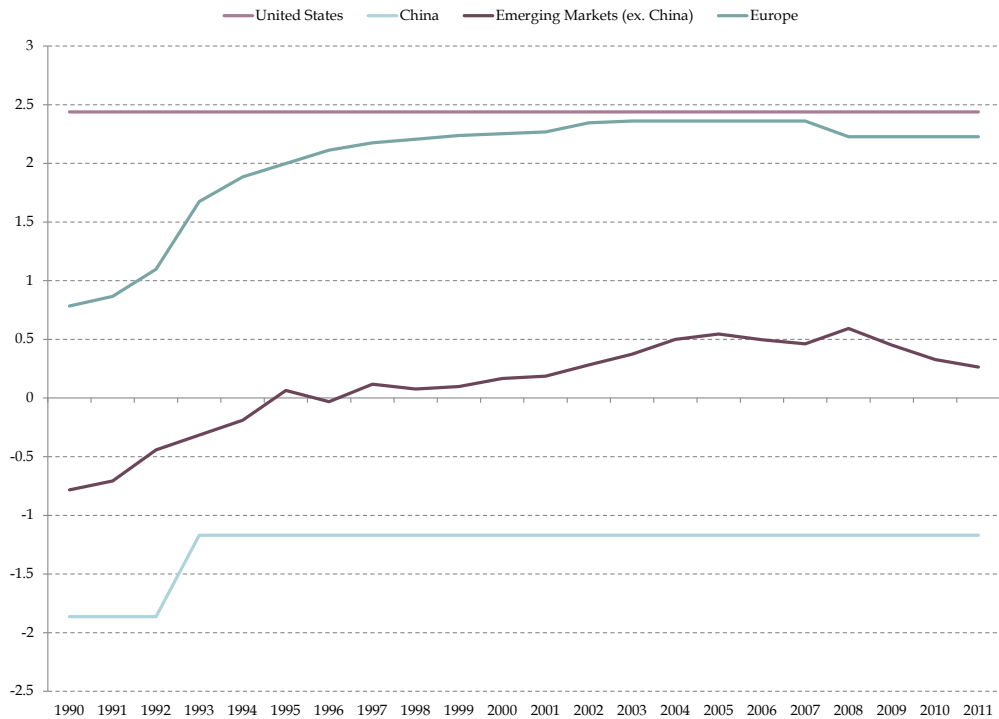
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Change in Region's Openness to Capital Flows



Source: Chinn-Ito index (KAOPEN)

Hiro Ito and Menzie Chinn developed a Financial Openness Index, which measures the openness of a country to capital flows:

The table above shows that, historically, the 1990s were a boom to capital liberalization; while, more recently, capital openness has slowed down in emerging markets.

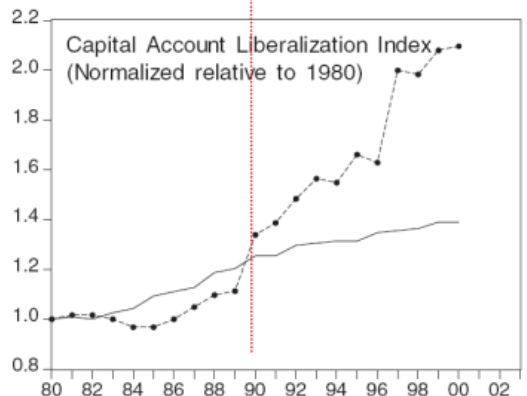
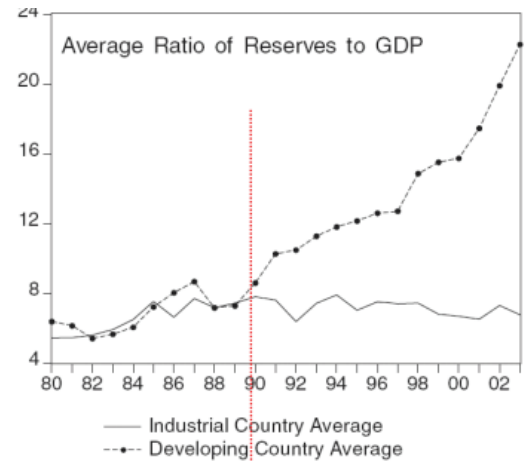
(2) Keep Large Foreign Currency Reserves

The second way a country can handle the Trilemma is by keeping large foreign currency reserves.

Since 1990, there has been an unprecedented increase in foreign currency reserves held by emerging market countries (see chart to the right)¹.

Aizenman (2010)¹ argues that countries that open up their borders to free capital flow will use reserves as a buffer against easy monetary policy initiated by foreign parties (e.g., quantitative easing) and sudden capital flight. He goes on to conclude that countries hoarding international reserves may loosen some of the Trilemma constraints in the short-run.

¹ Aizenmann, Joshua, 2010, "The Impossible Trinity," UCSC and the NBER.





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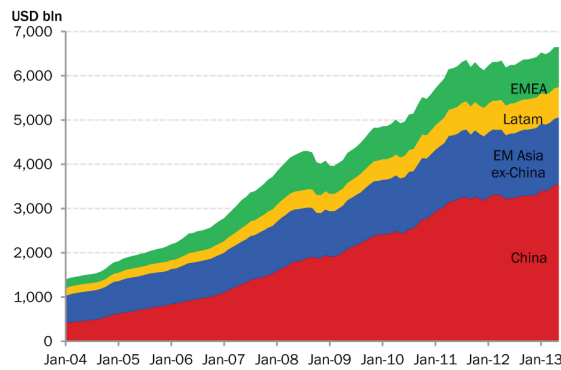
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This point can be illustrated when comparing Latin American and Asian emerging markets during the 1990s. During this time, both regions liberalized their financial markets to floating exchange rates; however, Latin America experienced a reduced ability to manage monetary policy when compared with Asian emerging market countries⁵. Why the difference? In part, Asian emerging market countries had larger foreign currency reserves than their Latin American peers, which allowed them greater monetary control since they could use these vast reserves to buy their currency when it was out of favor, thus, easing the constraints of the Trilemma.

Emerging Market Reserves



Sources: Haver Analytics
Includes Argentina, Brazil, Chile, Colombia, Mexico, Venezuela, Hungary, Kazakhstan, Poland, Romania, Russia, South Africa, Turkey, China, India, Indonesia, Malaysia, Philippines, Korea, Taiwan, and Thailand.

Looking at foreign currency reserves today among emerging market countries, all regions have been able to continue to increase their foreign currency reserves as money has flooded into these regions because of favorable investment themes, as well as quantitative easing.

When comparing the regions, the Asian emerging market countries continue to carry higher foreign currency reserves relative to their peers, and this can be a particular advantage to a country because, while any country can easily devalue their currency through the unlimited printing of their own money, only countries with other countries' foreign currency can prop-up their currency in the midst of a selling environment. So, countries with higher foreign currency reserves give their reserve banks more "fresh powder" in the event of a future market shock.

(3) Do Not Increase Foreign Denominated Debt

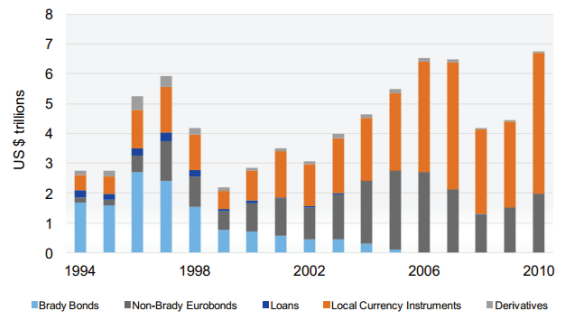
Having foreign denominated debt ("FX debt") magnifies the Trilemma problem. This is because FX debt forces a country to use monetary policy solely to try and fix the currency from falling (which increases the debt burden as their depreciating currency is less able to pay off its debt); and it does this usually when the country is eager to use monetary policy to lower interest rates in order to combat a slowing economy.

Carrying FX debt has been labeled "the original sin" by economists - and for good reason; it is largely believed to have magnified the severity of the Mexican tequila crisis (1994), Russian ruble crisis (1998), and the East Asian crisis in the late 1990s, Bordo (2009)¹.

Thankfully, most emerging market countries have moved towards more locally denominated debt over the last 20 years (see chart below).

But, emerging market countries do still have FX debt, and it is important to discount those countries that are increasing their FX debt burden. The chart below shows the following countries have been increasing their FX debt burden from 2007-2012: Chile, Mexico, South Africa, Thailand, Korea, Peru and Brazil.

Emerging Markets Debt Trading Volume



Sources: Emerging Markets Traders Association

(4) Maintain Healthy Current Account Balance

Finally, managing the Trilemma well means keeping a healthy current account surplus. Having a large current account deficit (i.e., country is importing more than it is exporting)

¹ Bordo, Michael D., Christopher M. Meissner, and David Stuckler, 2009, "Foreign Currency Debt, Financial Crises and Economic Growth: A Long Run View." National Bureau of Economic Research.





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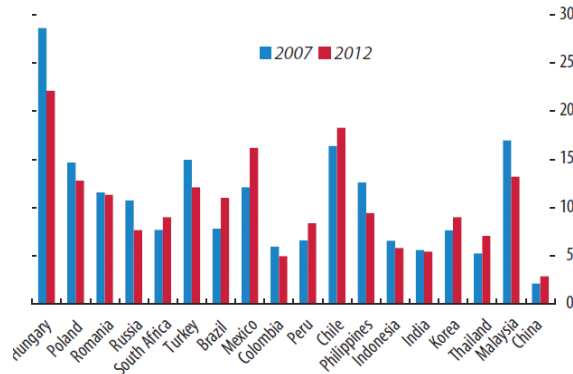
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magnifies the Trilemma problem. It does this by forcing the reserve bank to focus on defending its currency from depreciating (by raising interest rates) in order to protect its domestic residents from increasing prices, particularly if

FX Debt of Nonfinancial Corporations in Emerging Market Economies (% of GDP)



Source: Dealogic; and IMF staff estimates.

the country is reliant on importing food from other countries (e.g., Egypt).

So, just like in the foreign denominated debt scenario, having a large current account deficit prevents the central bank from being able to have independent monetary policy during adverse market shocks and forces them to focus on protecting the currency by raising interest rates when they would rather focus on increasing liquidity through the lowering of interest rates.

This is what is happening in India right now. As mentioned in the beginning of the article, the RBI chose to protect its currency over lowering interest rates. It did this because it has a large current account deficit that makes the country particularly vulnerable to currency shocks.

So, as India experienced a sudden currency shock during the summer due to capital flight towards developed countries (as quantitative easing was thought to be winding down), the RBI was compelled to protect their currency over lowering interest rates so that their import-reliant economy would not experience too much hardship as goods became more expensive.

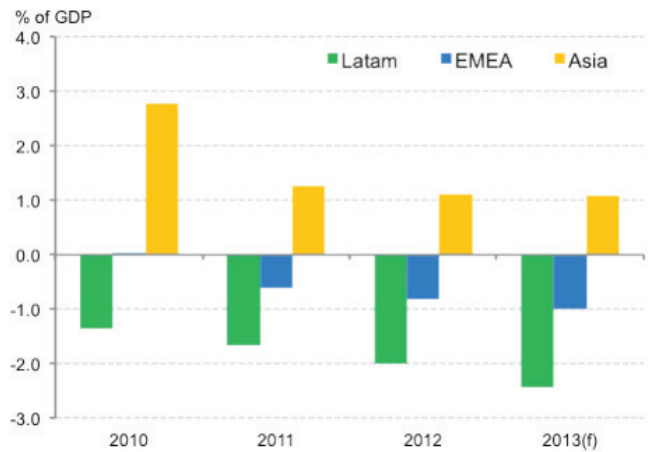
When looking at emerging market regions

today (see table below), the Latin American region has significantly higher current account deficits than other emerging market regions, which means they are more vulnerable during adverse market shocks to the tensions of the Trilemma, all-else-equal.

What about China and the United States?

For different reasons, both China and the United States never seem to face the Trilemma as a big policy dilemma. China, contrary to the gloom-scenario we painted earlier, has thrived for three decades under strict capital controls, due to its emphasis on foreign direct investment (FDI), which is very "sticky," versus portfolio (bond and stock) flows, which are very liquid. While other emerging market countries have tried to emphasize FDI over portfolio flows, Sun (2009)¹ argues that China has been more successful than other countries because of comparatively higher rates of return offered to investors. So, China is able to have both the growth benefits of foreign capital investment that flows into the

Emerging Market Current Account Balance



Sources: Haver Analytics, Stone Harbor Investment Partners LP

country without the drawbacks of sudden capital flight. The United States, due to the dollar's status as the global reserve currency, tends to have a very stable currency, even

¹ Sun, Wenkai, Xiuke Yang and Geng Xiao, 2009, "Understanding China's High Investment Rate and FDI Levels: A Comparative Analysis of the Return to Capital in China, the United States, and Japan." United States International Trade Commission. Journal of International Commerce and Economics.





Main Components of Capital Flows as a Share of Total Flows

	Average 2001-2003			Average 1996-2000		
	FIX	Portfolio	Bank	FIX	Portfolio	Bank
Mainland China	0.518	0.168	0.314	0.636	0.126	0.239
Malaysia	0.513	0.300	0.187	0.670	0.118	0.212
Brazil	0.527	0.207	0.266	0.544	0.289	0.167
Mexico	0.590	0.139	0.271	0.522	0.292	0.183
Korea	0.156	0.472	0.371	0.255	0.379	0.366
Thailand	0.310	0.239	0.451	0.277	0.176	0.547
Chile	0.353	0.483	0.164	0.630	0.275	0.095
Argentina	0.113	0.519	0.368	0.407	0.412	0.181
Singapore	0.410	0.282	0.308	0.393	0.296	0.311
Hong kong SAR*	0.152	0.250	0.598	0.210	0.211	0.578

Note: * Cross border flows data for Hong Kong SAR began in 1998. The component of FDI as a share of total flows is obtained by dividing the sum of FDI inflows and outflows by the CBFI. The portfolio and bank components as a share of total flows are obtained in the same manner.

Source: Xiao (2006)¹

though it runs both a very large current account deficit and, currently, a near zero percent interest rate policy. The U.S. rarely needs to defend its currency value because there has rarely been capital flight from the U.S.

CONCLUSIONS

The Trilemma is an economic reality that faces policy makers in all countries. The consequences of the Trilemma are much more severe in the emerging markets, where capital flight is a regular occurrence.

While certain emerging market countries are better situated today to manage the consequences of capital flight (higher reserves, lower current account deficits, less FX debt), some countries, like India, Indonesia, and Brazil are not.

Future global macroeconomic events that cause investors to pull their money out of riskier countries (whether it is caused by Fed tapering fears, European debt concerns, dramatic slowing in China, or any other global events), are likely to much more dramatically impact countries that fail to manage the Trilemma well. Investors should be cognizant of this risk when investing in EM stocks or bonds. One way of doing this would be to follow the “trilemma indexes” put together by Joshua Aizenman,

Menzie Chinn, and Hiro Ito². These indexes track the exchange rate stability, monetary independence, and financial openness of 178 countries. As of the latest update to this index in 2010, the fragile 5/top 5 emerging market countries according to the trilemma indexes include:

Fragile 5 Emerging Market Countries (2010):

Country	Exchange Rate Stability	Monetary Independence	Financial Openness	Average Score
India	0.29	0.38	-1.17	-0.17
Thailand	0.43	0.31	-1.17	-0.14
China	0.65	0.45	-1.17	-0.02
Venezuela	1.0	0.55	-1.60	-0.01
Pakistan	0.63	0.54	-1.17	0.00

Top 5 Emerging Market Countries (2010):

Country	Exchange Rate Stability	Monetary Independence	Financial Openness	Average Score
Bulgaria	1.0	0.43	2.44	1.29
Singapore	0.42	0.73	2.44	1.20
Latvia	0.42	0.62	2.44	1.16
Peru	0.61	0.22	2.44	1.09
South Africa	0.21	0.54	2.44	1.07

¹ Xiao, Fengjuan and Donald Kimball, 2006, “Effectiveness and Effects of China’s Capital Controls.” Central University of Finance and Economics, Beijing China, working paper.

² Aizenman, Joshua, ed. “The Trilemma Indexes.” The Trilemma Indexes. Joshua Aizenman, Menzie D. Chinn, and Hiro Ito, 5 11 2015. Web. 7 Nov 2013. <http://web.pdx.edu/~ito/trilemma_indexes.htm>.

