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The Scope for Global Cooperation**

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Presentation

Capital Flows and the Impossible Trinity

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Outline

Introduction & Motivation

- Developing countries witnessed sharp swings in capital flows during the past two years, largely due to factors outside their control. ▸ Capital Flows

- Such sharp swings create several problems for these countries, and have rekindled the debate on management of international capital flows.

- A country wants to actively manage international capital flows for two main reasons.
  - Unbridled capital flows tend to exacerbate financial fragilities, which can lead to a crisis.
  - Creates difficulties in macroeconomic management – "Impossible Trinity"

- To counter these issues a number of countries have introduced additional measures regulating the flow of international capital.

India's Approach to Capital Account Liberalization

- India's overall management of capital flows can be characterized by its calibrated and gradualist approach towards capital account liberalization.

- India prioritized certain kinds of flows and agents in the liberalization process.
  - Shift away from debt to non-debt-creating flows.
  - Enforce strict regulation of ECBs.
  - Dissuade volatile flows from NRIs.
  - Gradual liberalisation of outflows.

Foreign Direct Investment

- The policy for FDI inflows has been significantly liberalized over the past two decades.

- Currently, barring a few sectors, FDI is universally allowed.

- Sectors which need an industrial licence or are reserved for small scale sector are constrained in getting FDI.

- Some of the sensitive sectors also have sectoral caps.

- FDI inflows in India increased from $4.5 billion in 2003-04 to over $36.3 billion in 2008-09 resulting in India's share in FDI to developing countries increasing to 6.7% from 1.2%.

- In recent years there has been a jump in outbound FDI resulting from Indian companies acquisition of foreign companies.

- Overall FDI outflows jumped from $2.0 billion in 2003-04 to $18.7 billion in 2008-09 leading to a rise in India's share in developing countries' outbound FDI to 6% from 0.2%.

- India has adopted a gradualist approach and liberalized outbound FDI in an incremental manner.

Portfolio Investment

- Portfolio investment has also witnessed a strong increase since 2004-05 and reached a peak of $236 billion in 2007-08.

- India has been more cautious in terms of liberalizing portfolio investment.

- There are separate investment caps on sub accounts of FIIs, individual FII and aggregate FII investment in a company.

- NRIs are allowed to invest in Indian companies subject to caps at an aggregate and an individual level.

- Outward portfolio investment by Indian companies has been liberalized in an incremental manner.

Debt Flows

- India has been more conservative in terms of liberalizing debt flows.

- ECBs are constrained by borrowers and lenders having to satisfy eligibility criteria, cap on borrower per financial year, minimum maturity period, cap on all in cost ceilings and end use restrictions.

- The outflows on account of ECBs are also subject to certain restrictions, with there being limits on the amount that can be prepaid.

- Despite these restrictions ECB inflows have increased from $5 billion in 2003-04 to over $30 billion in 2007-08.

- Foreign investment in government securities, treasury bills and corporate debt is also heavily regulated.

- Only NRIs and FIIs registered with SEBI can invest in these instruments.

- There is cap on the amount FIIs can investment in corporate and government bonds.

Cross Country Comparison

- As a consequence of this cautious and gradualist approach, India's extent of liberalization has been relatively low compared to other emerging markets

- In terms of *De Jure* openness measures there has been a significant increase among emerging markets. ▸ De Jure Openness

- However, India has not kept pace with the liberalization process. ▸ De Jure Openness

- India has also been on the lower end of the spectrum when openness is measured according to the extent of capital flows. ▸ De Facto Openness

- China, which started as lagging behind India in the 1980s, has outstripped India during the last two decades.

India's Tryst with Impossible Trinity

Definition (Impossible Trinity)

A country can simultaneously achieve only two of the following three objectives: free capital flows, an independent monetary policy and a fixed exchange rate.

- India, as other countries, seeks to attain these three objectives with varying degrees.
  - Capital flows aid growth by providing external capital to sustain an excess of investment over domestic savings or by financing the current account deficit.
  - A competitive exchange rate helps Indian exports, a large part of which is labour intensive.
  - An independent monetary policy stabilizes the economy in the face of domestic and exogenous shocks.
- Focus on this issue by following the methodology outlined in Aizenman et al. (2010).

Quantifying Impossible Trinity

- Monetary independence is measured as the inverse of the annual correlation of the monthly interest rates between India and the United States.

$$MI = 1 - \frac{corr(i, i^*) - (-1)}{1 - (-1)} \tag{1}$$

- The index for Exchange Rate Rigidity is calculated using the annual standard deviations of the monthly exchange rate between India and the United States.

$$ERR = \frac{0.01}{0.01 + \sigma(\Delta(\epsilon))} \tag{2}$$

Quantifying Impossible Trinity

- Aizenman et al (2008) use *de Jure* measure developed in Chinn and Ito (2008) to calculate the extent of capital account openness.

- However, it is the actual quantum of flows that creates a conflict between monetary independence and exchange rate rigidity and not just the regulations.

- We use the *de facto* measure based on the ratio of absolute value of net capital flows to GDP.

$$CapOpen = \frac{|NetFlows|}{GDP} \qquad (3)$$

- We use to diamond charts to look at the Impossible Trinity and measure monetary independence, exchange rate rigidity, capital account openness and accumulation of international reserves (as a share of GDP) on the four vertices. ▸ Example

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The Early 1980s

- Limited extent of international capital movement and reserve accumulation.
- Allowed policymakers to retain both monetary independence and exchange rate stability.
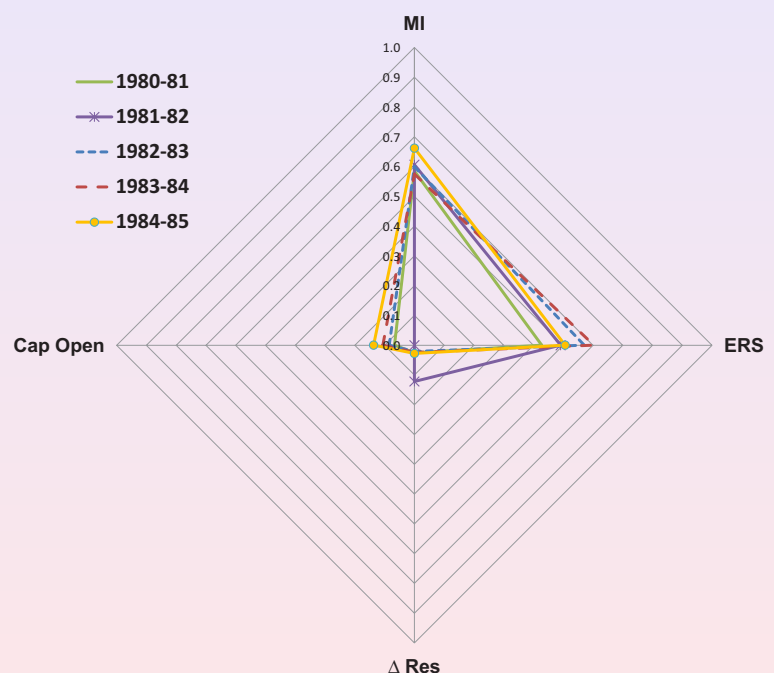
The Late 1980s

- Towards the end of the decade, India's macroeconomic health began to deteriorate significantly.

- The current account deficit increased sharply due to partial liberalization of imports, a sharp spike in oil prices due to the Gulf crisis and economic deterioration in India's major export markets.

- To finance the deficit some of the capital controls were relaxed, and the current account deficit started being financed by non-resident remittances and borrowings at commercial terms.
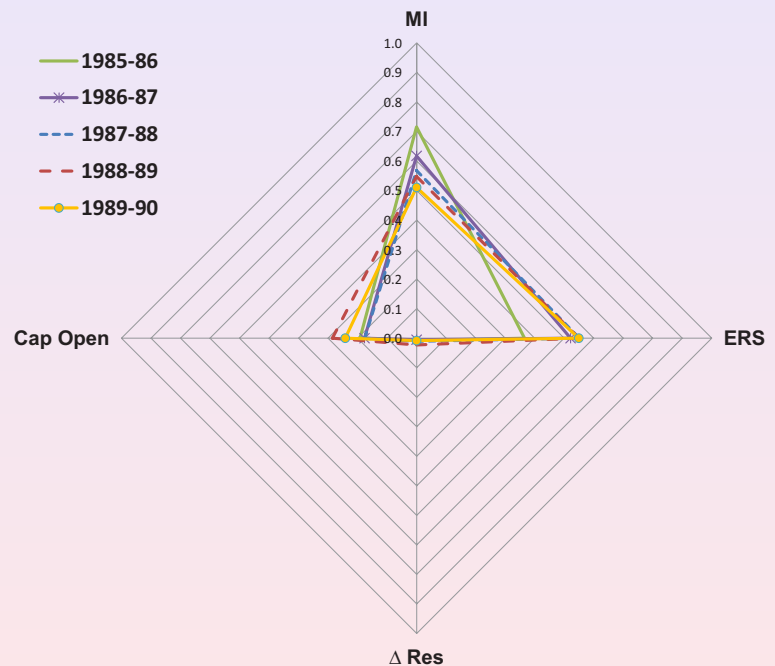
Confronting the Trinity: 1993 to 1995

- India witnessed a surge of global capital inflows with Cap Open rising to 0.34.

- Policymakers faced a choice of either allowing nominal exchange rate to appreciate or allowing the money supply to change.

- The Indian authorities chose stabilizing the exchange rate over monetary independence.

- The Rupee-Dollar exchange rate remained steady at Rs. 31.4 per dollar from Apr 1993 to Aug 1995 leading to an ERS of 1.

- The RBI intervened heavily in the foreign exchange market causing NFA to rise significantly reflected in ΔRes rising to 0.48 in 1993-94 and 0.32 in 1994-95.
  ▸ Management

- Due to paucity of instruments and an illiquid bond market, the RBI could not sterilize the foreign inflows, which led to a sharp increase in reserve money, and a fall in MI index.
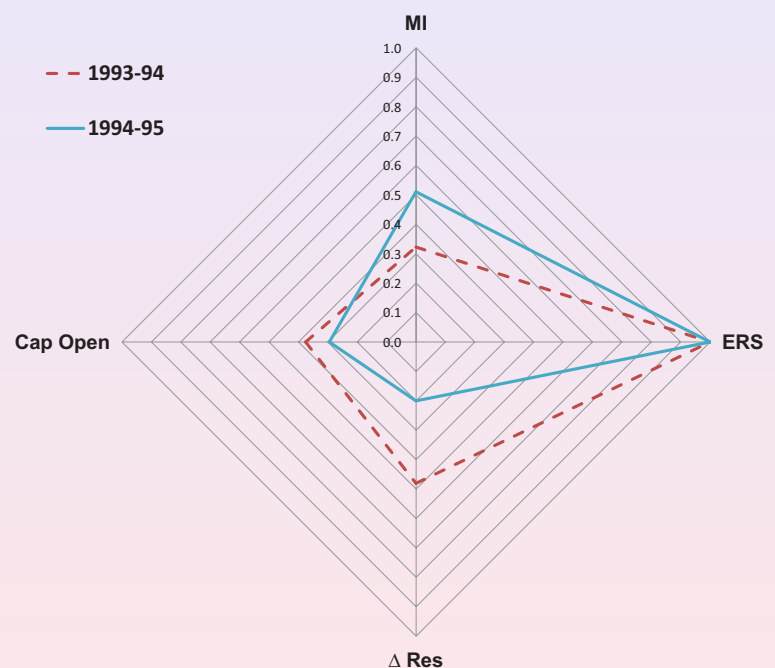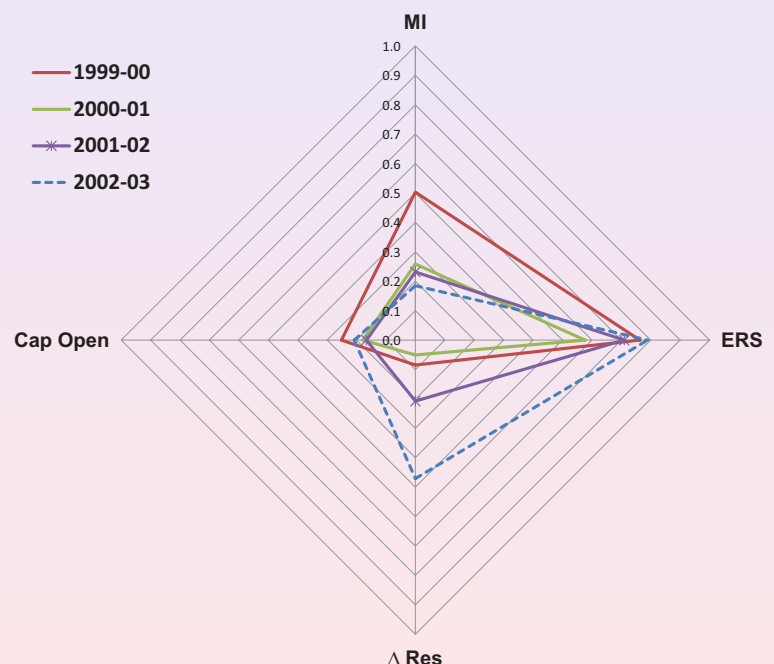
Limited Capital Flows and Exchange Rate Variation: Late 1990s

- The situation reversed in the second half of the 1990s.

- A series of crisis in Latin America and East Asia resulted in a reduction in capital inflows.

- Domestic events also exacerbated the reduction in capital inflows with Cap Open ranging between 0.11 and 0.25.

- These events led to sporadic downward pressure on the Indian rupee during this period, in response to which the RBI allowed the rupee to depreciate moderately with the ERS index indicating a relatively low value during 1995-96 to 1998-99, ranging between 0.27 and 0.41.

- Flexibility in the exchange rate and the limited volume of capital flows allowed the policymaker to reassert monetary independence wih the MI ranging between 1995-96 and 1998-99.

Legend:
- —— 1995-96
- —✳— 1996-97
- - - - 1997-98
- – – 1998-99

Radar chart axes: MI, ERS, Δ Res, Cap Open (scale 0.0 to 1.0)
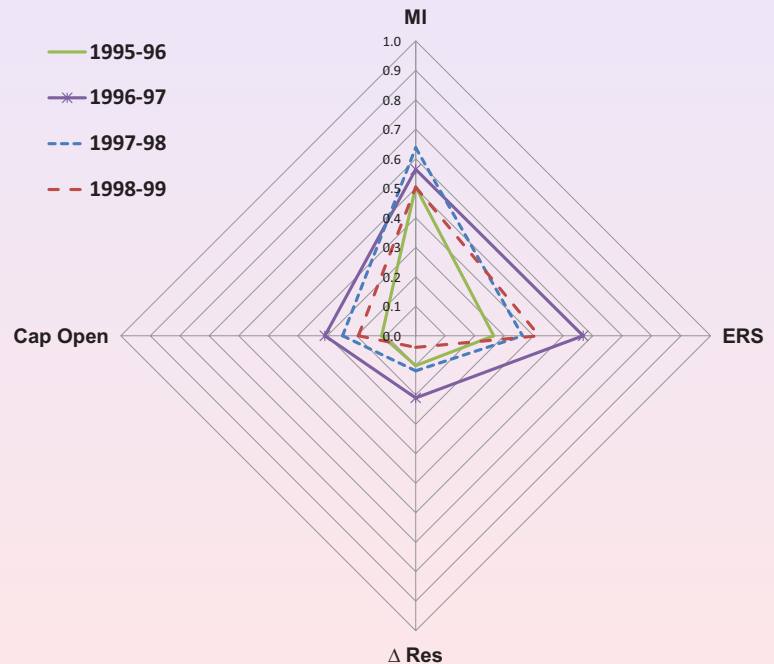

Limited Capital Flows and Exchange Rate Management: 1999-00 to 2002-03

- The decline in capital inflows continued in early 2000s and showed signs of revival only in 2002-03.

- The exchange rate was managed by engineering a moderate depreciation in these years to achieve a competitive REER. The ERS index ranged between 0.57 and 0.79.

- Revival of capital flows and a current account surplus was countered by by active intervention by the RBI in the foreign exchange market, as it accumulated $40 billion of reserves.

- Despite attempts to sterilize these intervention by depleting stock of NDA, there was a steady increase in the growth rate of reserve money. ▸ Management

- There was a sharp decline in the MI index over this period

Legend:
- —— 1999-00
- —— 2000-01
- —✳— 2001-02
- - - - 2002-03

Radar chart axes: MI, ERS, Δ Res, Cap Open (scale 0.0 to 1.0)

Surge in Capital Flows: 2003-04 to 2007-08

- The policy trade offs got exacerbated since 2003 due to a surge in capital inflows with the Cap Open index rising to 0.54 in 2006-07 and 1 in 2007-08.

- The RBI attempted to achieve an 'intermediate regime'.

- To prevent the Rupee from appreciating rapidly, the RBI heavily intervened in the foreign exchange market with the ΔRes index rising 0.43 in 2006-07 and 1 in 2007-08..

- RBI resorted to sterilization to prevent this intervention from leading to a sharp increase in monetary base.
  - ▸ Management

- Towards late 2003, the RBI ran out of government bonds for sterilization, and in January 2004, a new instrument for sterilization - Market Stabilization Scheme - was introduced.

- By August 2005, the amount of outstanding MSS bonds increased to Rs. 0.71 trillion, and further to Rs. 1.4 trillion in December 2007.

- The rising cost of sterilization forced RBI to incompletely sterilize the capital flows, which led to a rise in money supply growth rate.
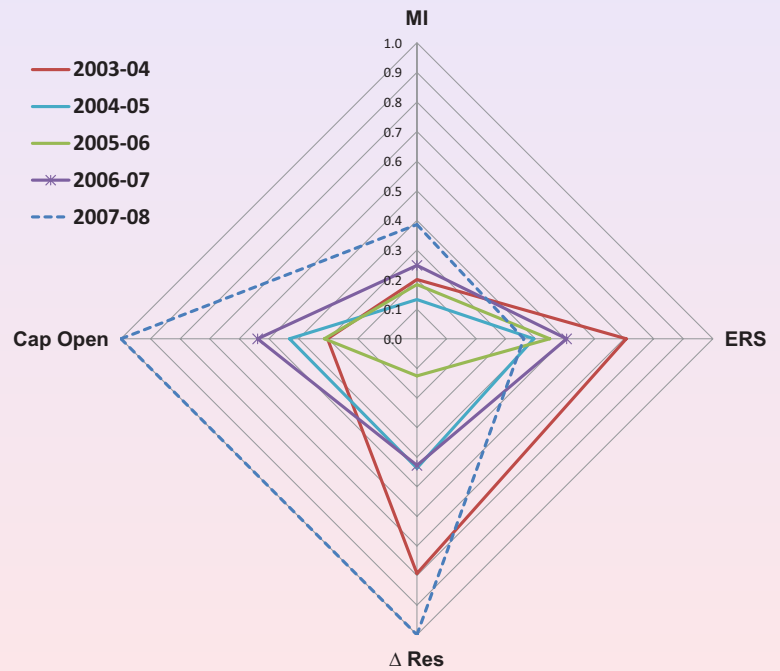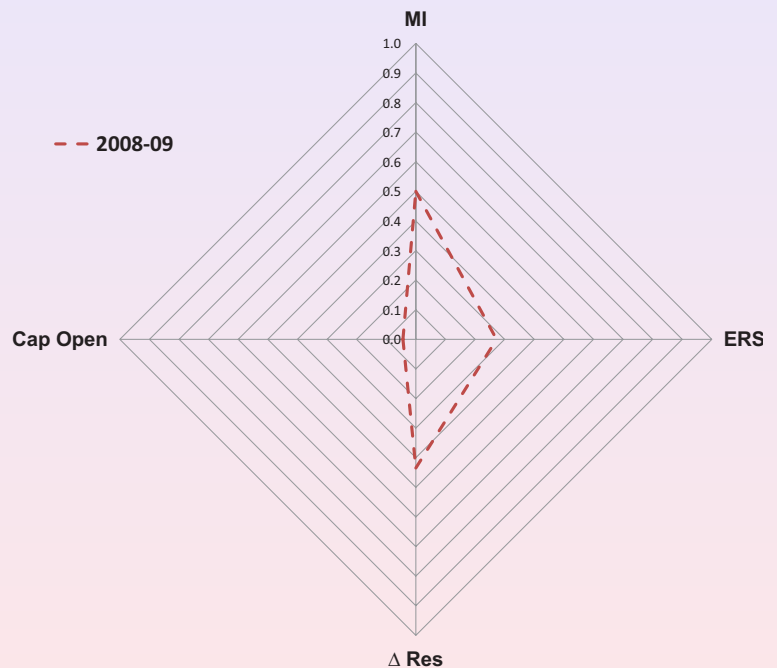

Surge in Capital Flows

- The RBI tried to control the growth in money supply through other instruments.

- A number of measures restricting capital inflows and encouraging outflows were announced.

- The Rupee was allowed to appreciate by 15% between mid 2005 and end 2007 resulting in the ERS index dropping to 0.44 in 2006-07 and 0.36 in 2007-08.
 - ▸ Management
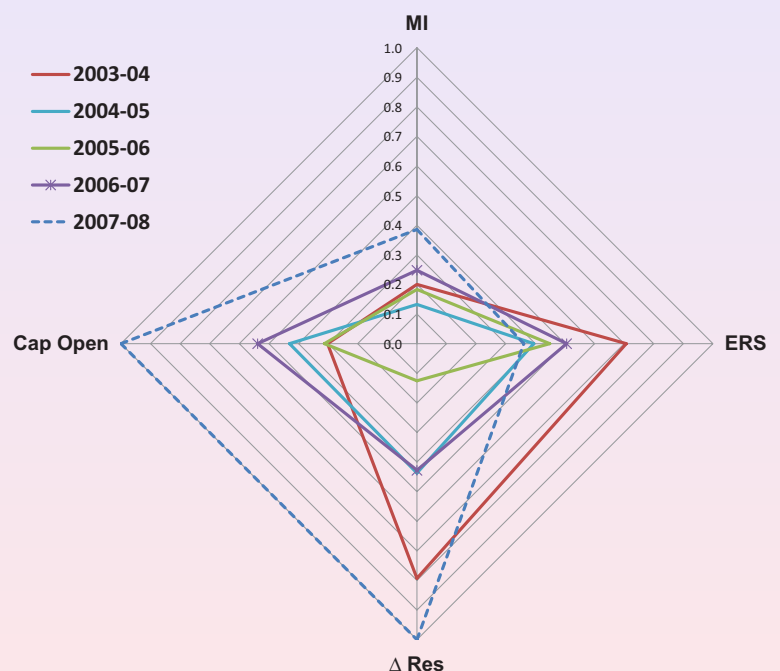
Global Financial Crisis

- The outbreak of the sub-prime crisis in the US and the 'flight to safety', capital started flowing out of the Indian economy since late 2007 with the Cap Open index dropping to 0.04 in 2008-09.

- Reserves were put into use to stem the outflow and manage pressure on the exchange rate with ΔRes index being at 0.42.

- The Rupee was allowed to depreciate by 21.2% resulting in the ERS index dropping to 0.27 in 2007-08.

- The decline in capital inflows and rise in flexibility of the Rupee allowed the authorities to pursue a more independent monetary policy, reflected by an MI index of 0.52.

Economic Revival

- Since April 2009, there has been a resumption of capital flows pushing the Cap Open index to 0.43 during 2009-10.

- This resurgence has once again forced India to make some tough policy choices with the RBI imposing certain restrictions on inflow of capital.

- The Rupee has been allowed to appreciateby nearly 17.5% between March 2009 and April 2010 ERS index of 0.35.

- Interestingly, the RBI has refrained from intervening in the forex market resulting in ΔRes dropping to 0.

  - RBI has to manage record borrowing requirements of the government in 2009-10 and 2010-11, and sterilization can drive the interest rates up, which will have negative consequences for government borrowing.
  - Incomplete sterilization will increase the money supply and exacerbate inflationary pressure, which the RBI is keen to prevent.
  - A strong currency is going to help moderate inflation by reducing the cost of importables.
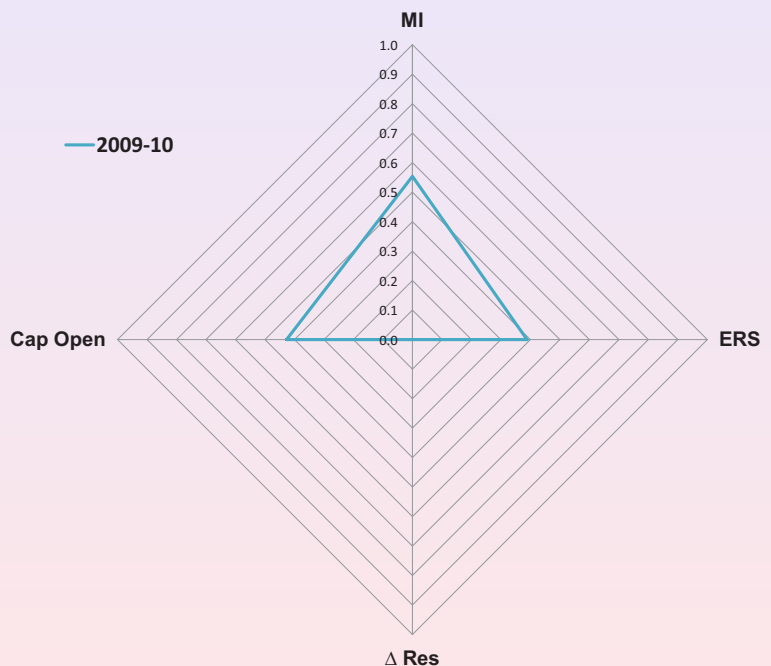
Policy Choices under Impossible Trinity

- What is the extent to which India faced trade-offs among the various policy choices?

- The absence of a functional form of the nature of trade-offs under impossible trinity can be an obstacle.

- What is the extent to which India faced trade-offs among the various policy choices?

- Following Aizenman et al. (2010) we test the validity of the linear framework.

$$1 = \alpha MI_t + \beta ERS_t + \gamma CapOpen_t + \kappa_t \qquad (4)$$

- A high goodness of fit indicates that the linear specification explains well the trade-offs among the policy dimesions. ▸ Policy Tradeoffs

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Policy Choices under Impossible Trinity

- The contribution of the various policy choice implemented by the policymakers are given by $\widehat{\alpha}MI$, $\widehat{\beta}ERS$ and $\widehat{\gamma}CapOpen$. ▸ Policies

- In the early 1980s monetary independence was given the highest preference followed by exchange rate stability and financial openness.

- Towards the end of the 1980s there was a decline in the extent of monetary independence, which bottomed out in 1993-94. This was associated with an increase in preference for exchange rate stability and a marginal increase in capital account openness.

- There was a reversal of trend in the mid 1990s with a resurgence of monetary independence associated with a dip in exchange rate stability.

- The late 1990s and the early 2000s witnessed a secular decline in monetary independence as the RBI managed the exchange rate to maintain a constant REER.

- The rise in net capital inflows from 2003-04 was initially associated with a decline in both monetary independence and exchange rate stability.

- Since 2007 several events resulted in the RBI asserting greater monetary independence, while at the same time allowing greater exchange rate flexibility to counter increased financial openness.

Policy Choices under Impossible Trinity

- To obtain inference about the extent to which the trilemma is "binding" we look at $\widehat{\alpha}MI + \widehat{\beta}ERS + \widehat{\gamma}CapOpen$. ▶ Impact
- A linear specification implies that the predicted value should be closer to 1.
- During the early 1980s the prevalence of the policy combination of independent monetary policy and exchange rate stability pushed the predicted values close to unity.
- The balance of payments crisis in 1991 resulted in a sharp drop in the predicted values in 1991-92 and 1992-93 as there was a sharp drop in all the three indices.
- Rising net capital flows and a quest for a stable exchange rate regime meant that the predicted values rapidly increased to close to 1 in the mid 1990s.
- Reduced capital flows as well as lower level of monetary independence meant that the impossible trinity was not binding for the Indian economy during the late 1990s and early 2000s.
- Since 2003-04 onwards when rising capital account openness and a resurgence in monetary policy independence pushed the predicted values to be close to 1.

Conclusion

- India has adopted a gradualist and calibrated approach towards integration with the global capital market.

- In recent years there have been a sharp rise in capital flowing in to and out of India.

- This has exacerbated the problem of policy choices under impossible trinity.

- India has resorted to the multiple instrument approach while dealing with capital flows and adopted an intermediate regime – juggling capital flows, exchange rate stability and monetary independence.

- This has suited India well as it has been able to maintain a healthy growth rate, targeted monetary and credit growth rates, moderate inflation rate through most of the period and a sustainable current account deficit.

THANK YOU !!

Appendix Outline

6   Appendix
- Global Capital Flows to Emerging Market Economies
  - De Jure Measures of Openness
  - De Facto Measures of Openness
- Trinity
  - Example
- Intervention, Sterilization & Money Supply
- Testing the Validity of the Linear Framework

Global Capital Flows to Emerging Market Economies

	2008	2009	2010f	2011f
External financing, net:				
Private flows, net	594.4	581.4	825.0	833.5
Equity investment, net	422.3	490.4	553.0	549.5
Direct investment, net	508.5	341.8	366.5	406.5
Portfolio investment, net	-86.2	148.7	186.5	143.0
Private creditors, net	172.1	91.0	272.0	283.9
Commercial banks, net	29.1	-44.3	84.9	111.6
Nonbanks, net	143.0	135.3	187.1	172.3
Official flows, net	62.0	62.8	53.2	42.5
International Financial Institutions	26.0	46.0	29.8	22.4
Bilateral creditors	36.0	16.9	23.4	20.1
Resident lending/other, net	-543.6	-233.1	-349.1	-354.7
Reserves (- = increase)	-475.1	-536.5	-515.2	-345.5

▸ Capital Flows

Cross Country Comparison of De Jure Openness
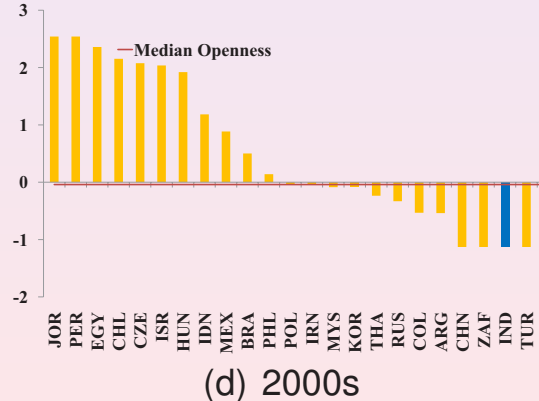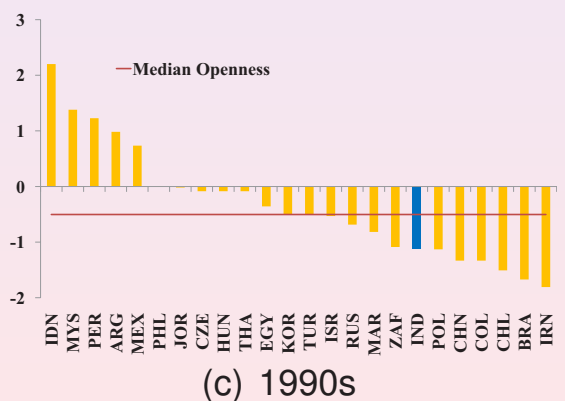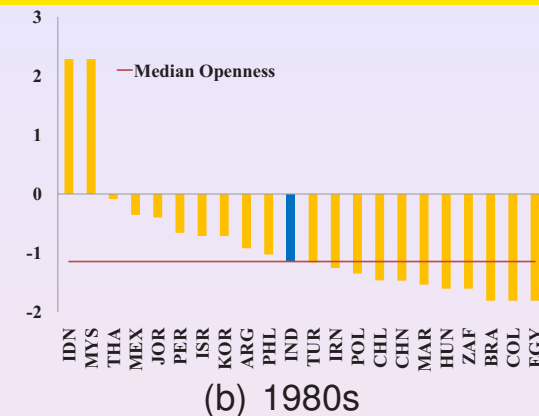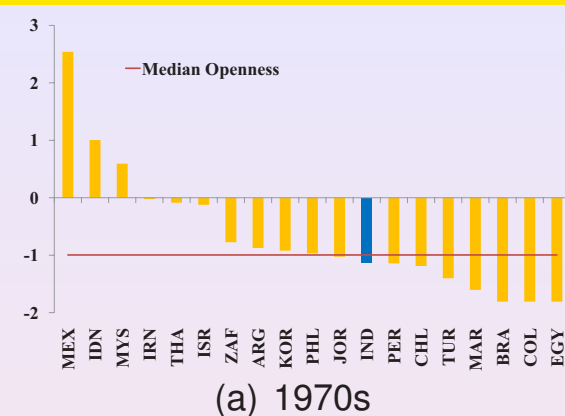
(a) 1970s

(b) 1980s

(c) 1990s

(d) 2000s

▸ Comparison

Cross Country Comparison of De Facto Openness
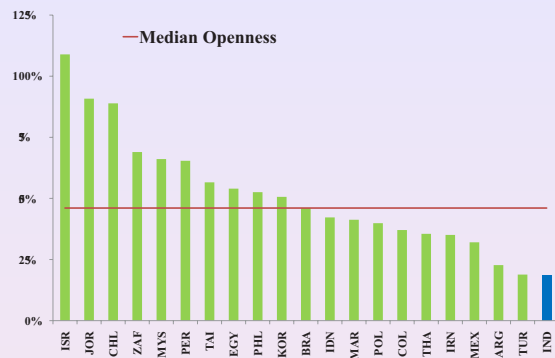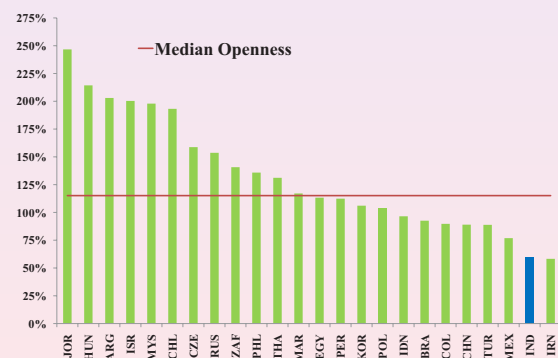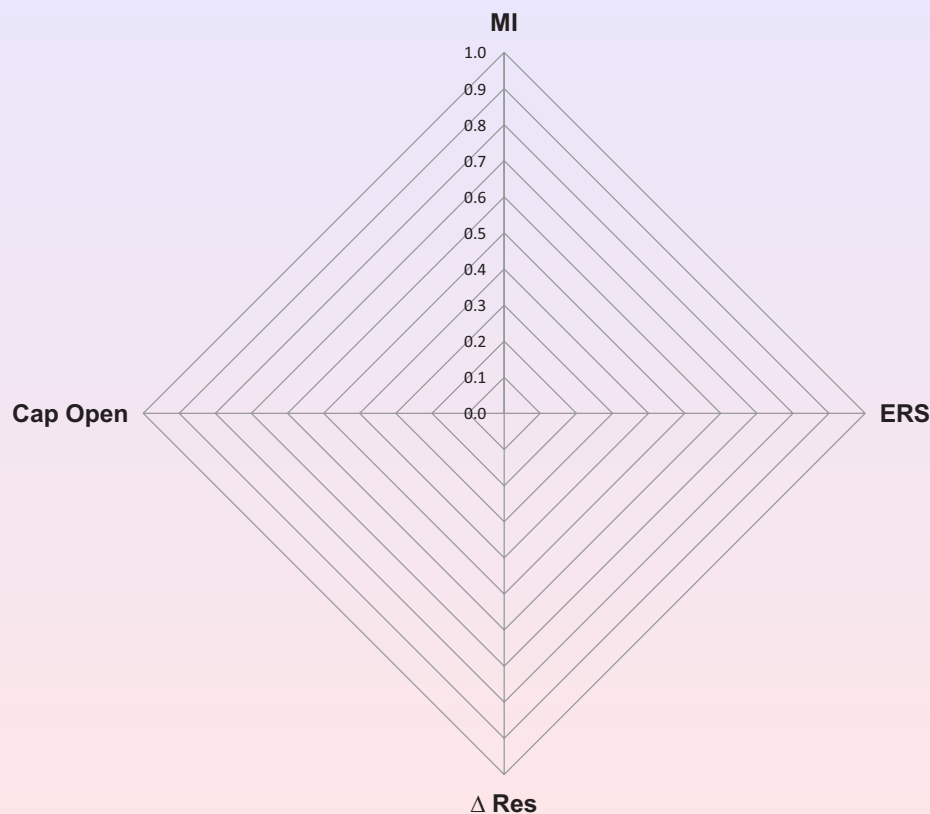

(a) 1970s
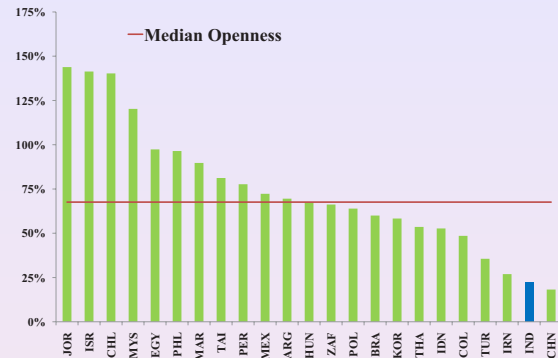
(b) 1980s
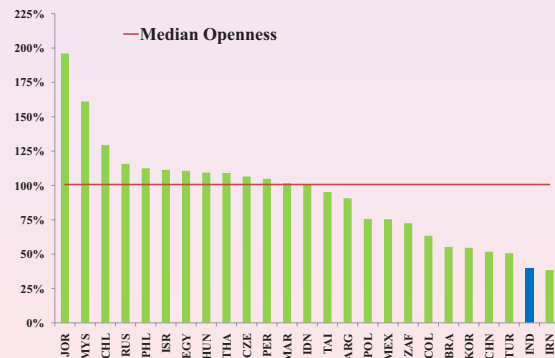
(c) 1990s

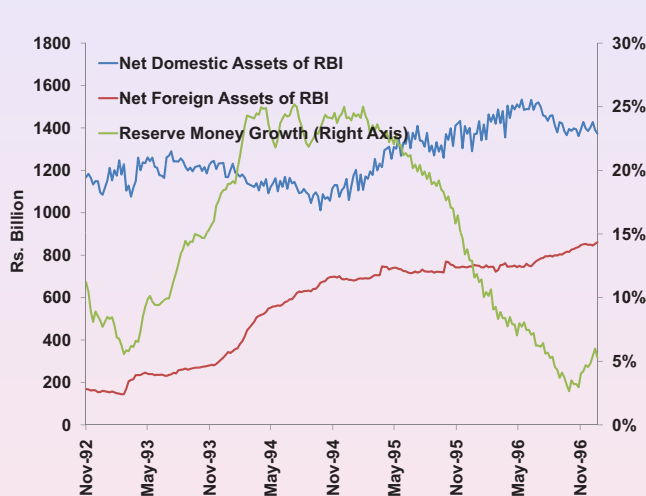(d) 2000s

▸ Comparison

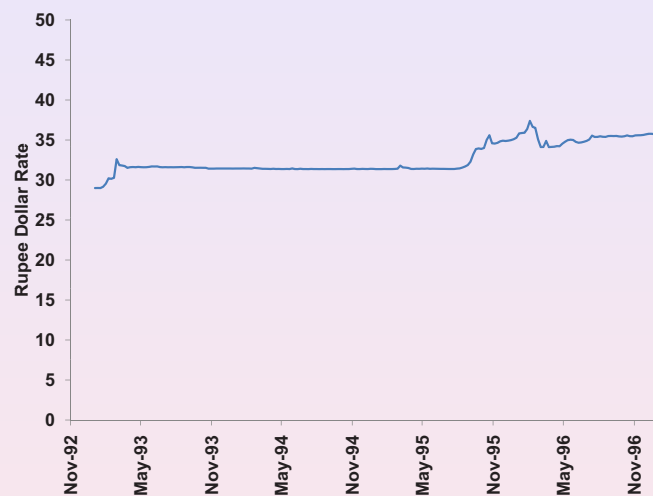# Quantifying Impossible Trinity

▸ Trinity

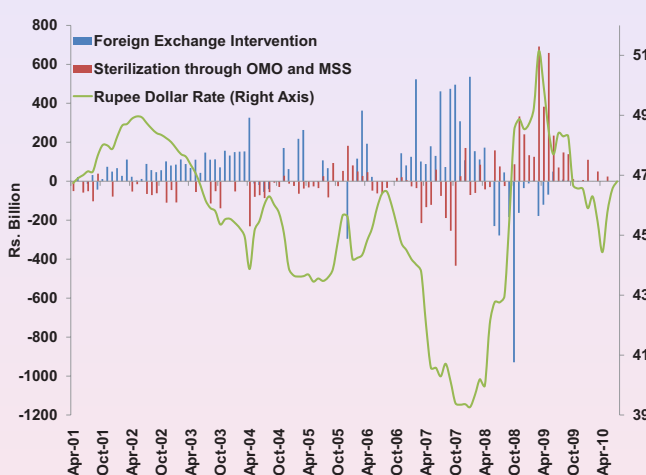# Intervention, Sterilization & Money Supply

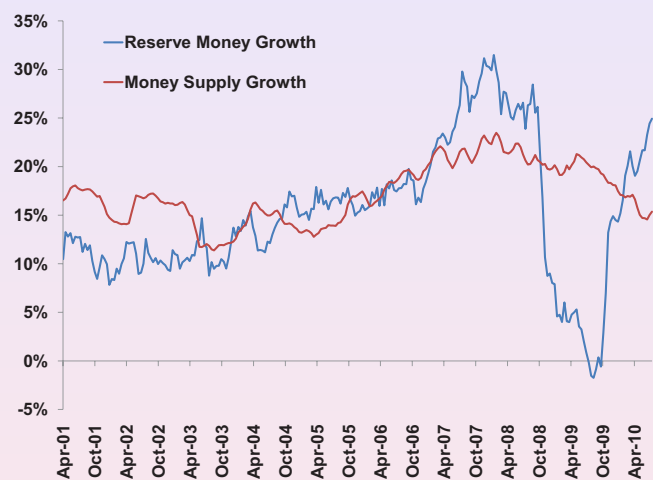(a) Reserve Money

(b) Exchange Rate

Source: Handbook of Statistics 2010, RBI

▸ Trinity

Intervention, Sterilization & Money Supply

(a) Intervention & Exchange Rate

(b) Money Supply

Source: Handbook of Statistics 2010, RBI

▸ Trinity ▸ Trinity ▸ Trinity

# Testing the Validity of the Linear Framework

|	(1)	(2)	(3)	(4)	(5)
	1980-81 to 2009-10	1980-81 to 1991-92	1992-93 to 2009-10	1980-81 to 1997-98	1998-99 to 2009-10
Monetary Independence	1.010*** [7.681]	1.160** [2.582]	1.028*** [4.615]	1.268*** [11.40]	0.886** [2.729]
Exchange Rate Stability	0.673*** [4.987]	0.381* [1.616]	0.685*** [4.843]	0.386** [2.398]	1.024*** [7.905]
Capital Account Openness	0.582*** [3.033]	0.937* [1.694]	0.546** [2.400]	0.48* [1.788]	0.418* [1.928]
Adj R-squared	0.96	0.97	0.955	0.973	0.969

▸ Framework

Evolution of Policy Choices under Impossoble Trinity
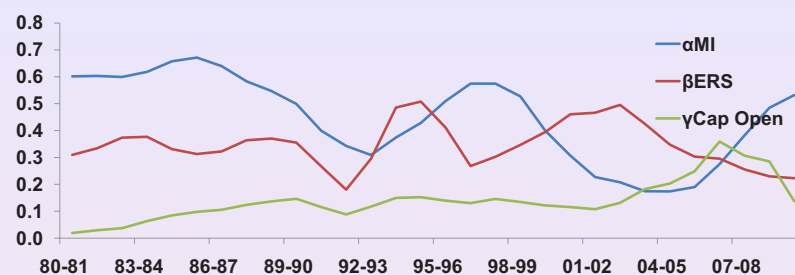
(a) Entire Period
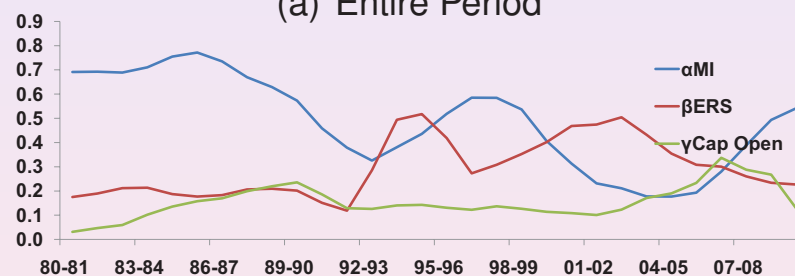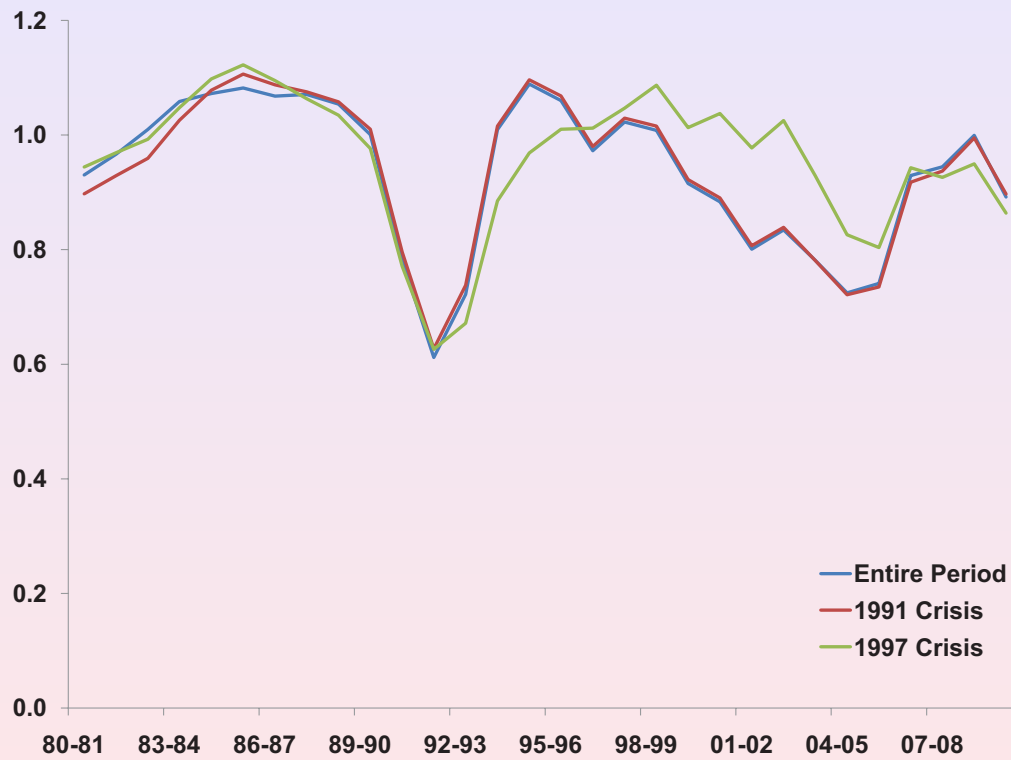
(b) 1991 Crisis
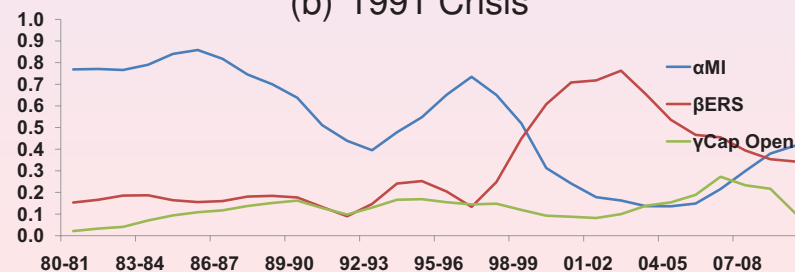
(c) 1997 Crisis

▸ Framework

Cumulative Policy Orientation under Impossible Trinity