

Inflation Targeting in Emerging Economies: What Have we Learned?

Vittorio Corbo

Centro de Estudios Públicos

Santiago, Chile

23 de Noviembre del 2009

Presentación en Seminario Internacional “Brazil: Ten Years of Inflation Targeting and Flexible Exchange Rate. What Have we learned?” , Insper, Sao Paulo, Noviembre 23, 2009



I. Macroeconomic Policy in Developing Countries

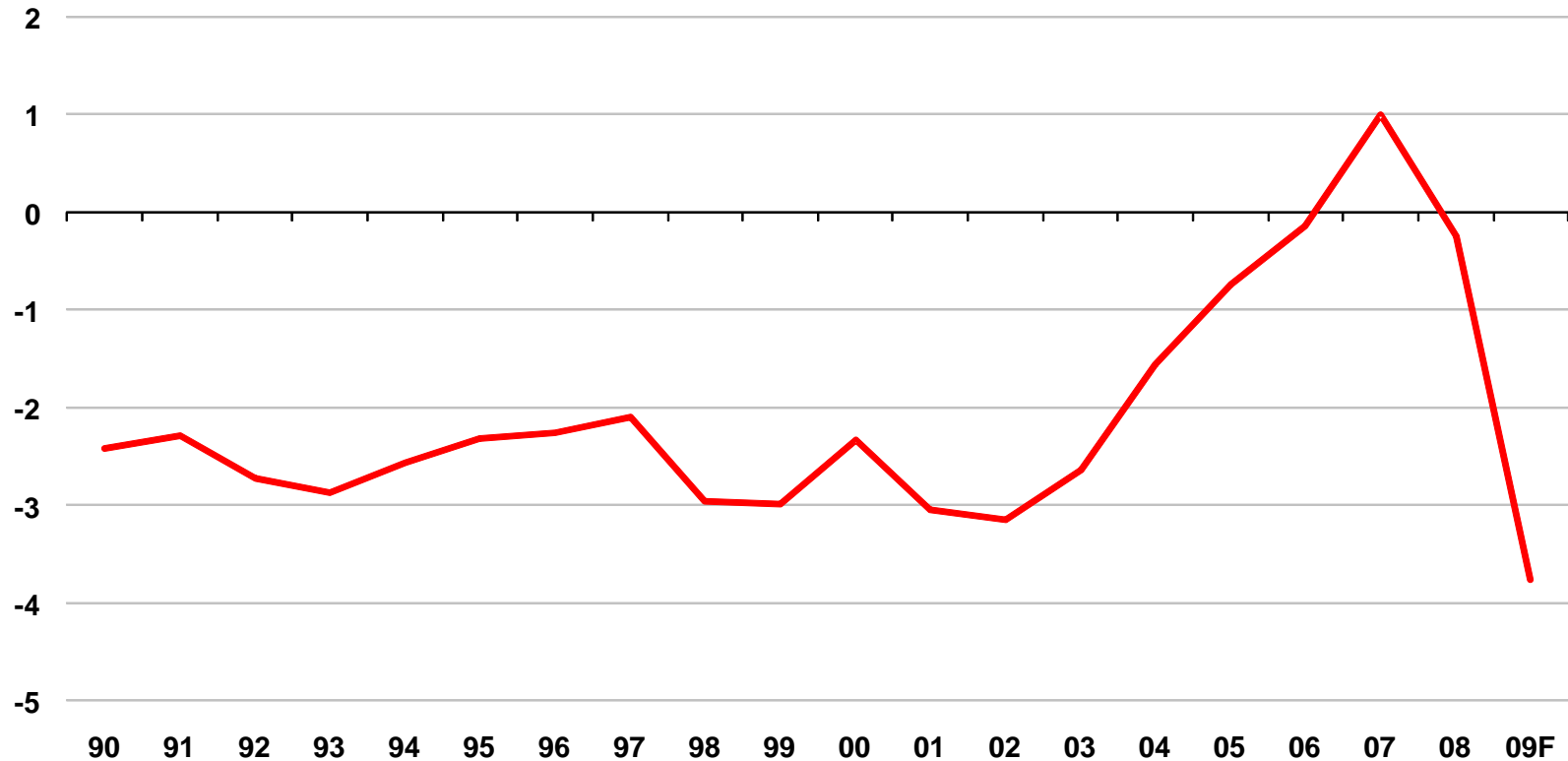
Macroeconomic Policy in Developing Countries

Improvements in four key areas

- The macroeconomic policy framework in developing countries, and especially in some emerging market economies, has improved substantially during the last twenty years.
- Progress is most notorious in four areas:
 - Fiscal responsibility;
 - More flexible exchange rate regimes;
 - Institutional and monetary policy frameworks oriented towards achieving and maintaining low inflation;
 - Policy anchors have shifted from exchange rates and monetary aggregates to inflation targeting (IT).
 - Development of a more sound and safe financial system.

Macroeconomic Policy in Developing Countries

Central government balance of emerging economies, (% of GDP)



Macroeconomic Policy in Developing Countries

De facto exchange rate regimes and monetary policy frameworks*

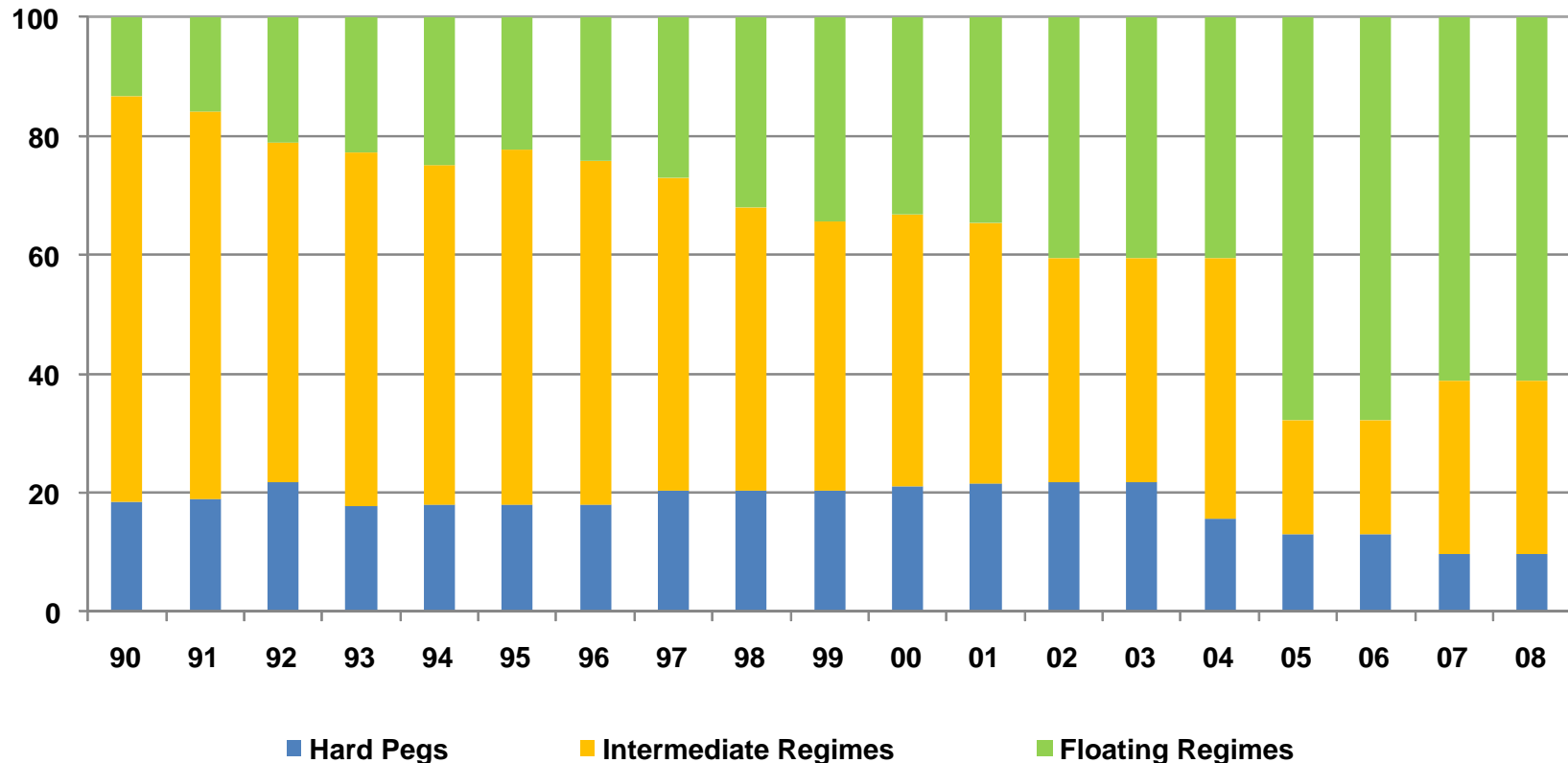
Exchange rate arrangement	Monetary Policy Framework								
	Exchange rate anchor					Monetary aggregate target	Inflation targeting framework	Other*	Total
	U.S. dollar	Euro	Composite	Other	Subtotal				
Exchange arrangement with no separate legal tender	7	2		1					0
Currency board arrangement	8	4		1	13				13
Other conventional fixed peg arrangement	36	20	7	5	68	4			72
Pegged exchange rate within horizontal bands		1	2		3				3
Crawling peg	6		2		8				8
Crawling band	1		1		2				2
Managed floating with no pre-determined path for the exchange rate	8		3		11	17	10	6	44
Independently floating					0	1	34	5	40
Total	66	27	15	7	105	22	44	11	182

*Data as of April 31, 2008.

*Includes countries that have no explicitly stated nominal anchor, but rather monitor various indicators in conducting monetary policy.

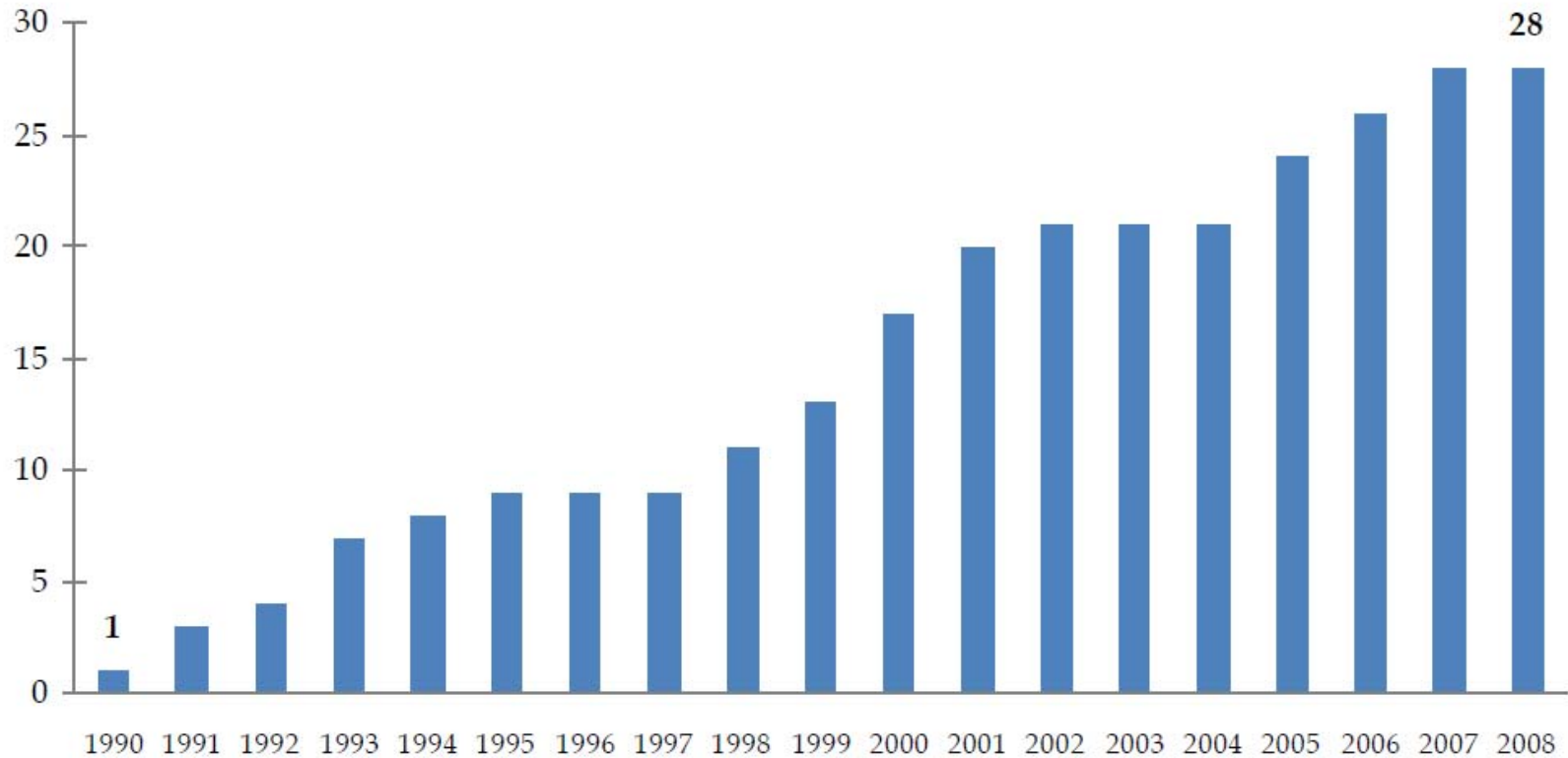
Macroeconomic Policy in Developing Countries

Exchange-rate regimes in developing countries (*de facto*, 1990-2008)



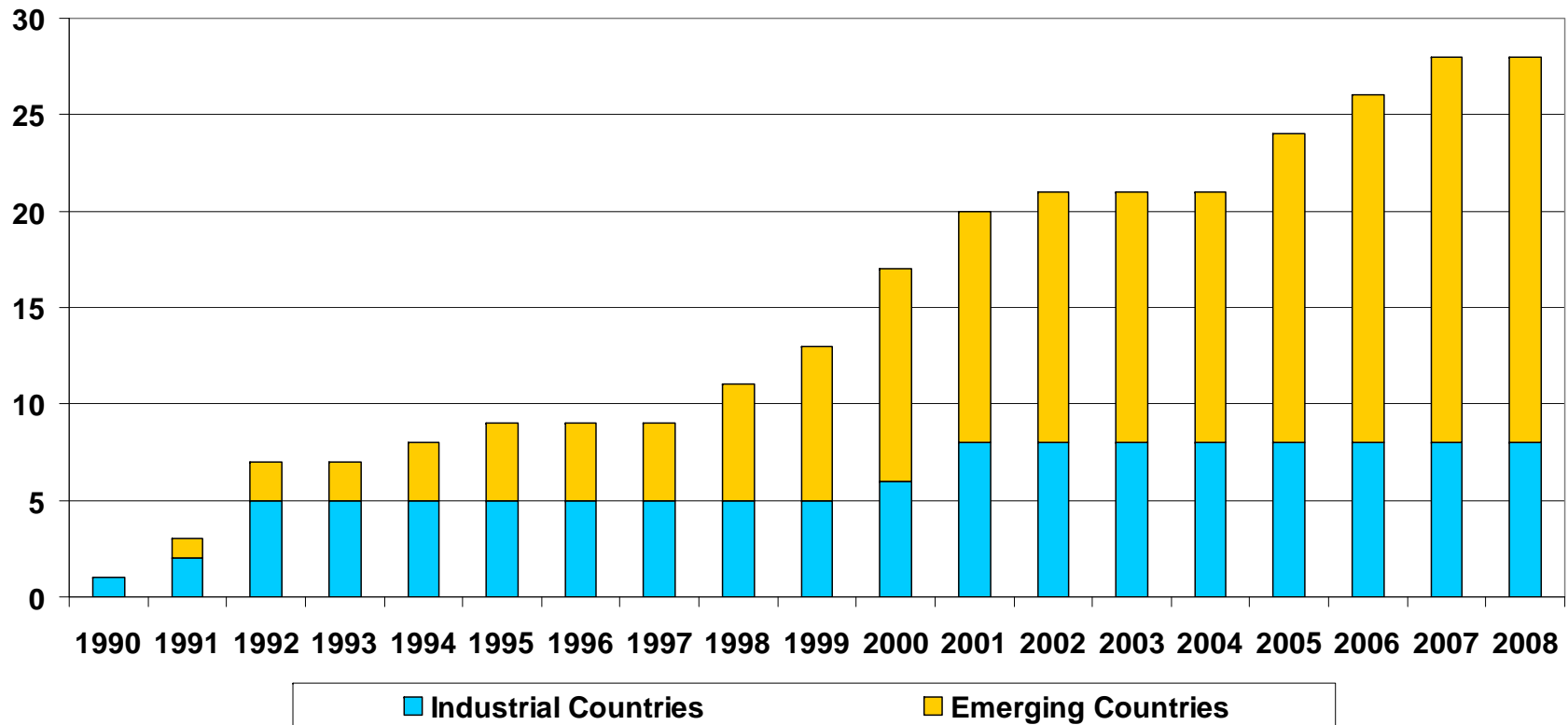
Macroeconomic Policy in Developing Countries

Number of inflation-targeting countries*, 1990-2008



Macroeconomic Adjustment in Developing Countries

Number of Inflation-Targeting Countries by Country Group, 1990-2008





II. Monetary Policy Results in Developing Countries

Monetary Policy Results in Developing Countries

The effects of inflation targeting (IT)

- Most countries, developed and developing, have experienced a significant decline in inflation in the post-1980s period. This coincided with the introduction of inflation targeting.
 - The inflation reduction has gone hand-in-hand with a decrease in the volatility of output growth and inflation.
- Because the Great Moderation and the adoption of IT occurred simultaneously, it is difficult to identify the marginal contribution of the IT monetary policy regime to economic performance.
 - Luck could have played an important role (Stock and Watson, 2003).
- Studies for industrial countries find little marginal contribution of IT on outcomes in terms of average inflation or the volatility of inflation.
 - However among the industrial countries IT countries have had lower sacrifice ratios and lower output volatility (Corbo et.al. 2002).

Monetary Policy Results in Developing Countries

The effects of inflation targeting (IT)

- However, empirical evidence for developing countries indicates that IT has had a significant effect on average inflation and on the volatility of inflation.
 - Countries that adopted IT have experienced lower average inflation and a lower volatility of inflation than they did before adoption (Corbo, Landerretche, and Schmidt-Hebbel (2002) and Mishkin and Schmidt-Hebbel (2007)), with inflation converging to the level of industrial countries.
 - Furthermore, Schmidt-Hebbel and Werner (2002) and Mishkin and Schmidt-Hebbel (2007) find that inflation targeting has been the main driver of this convergence (Granger causation test).
 - Emerging countries in which inflation has stabilized and converged to the target rate have a similar IT performance (deviation from the target) to that of industrial countries (Schmidt-Hebbel (2009)).
- In developing countries there is evidence that flexible IT has also reduced the volatility of output growth (Goncalvas and Salles (2008)).

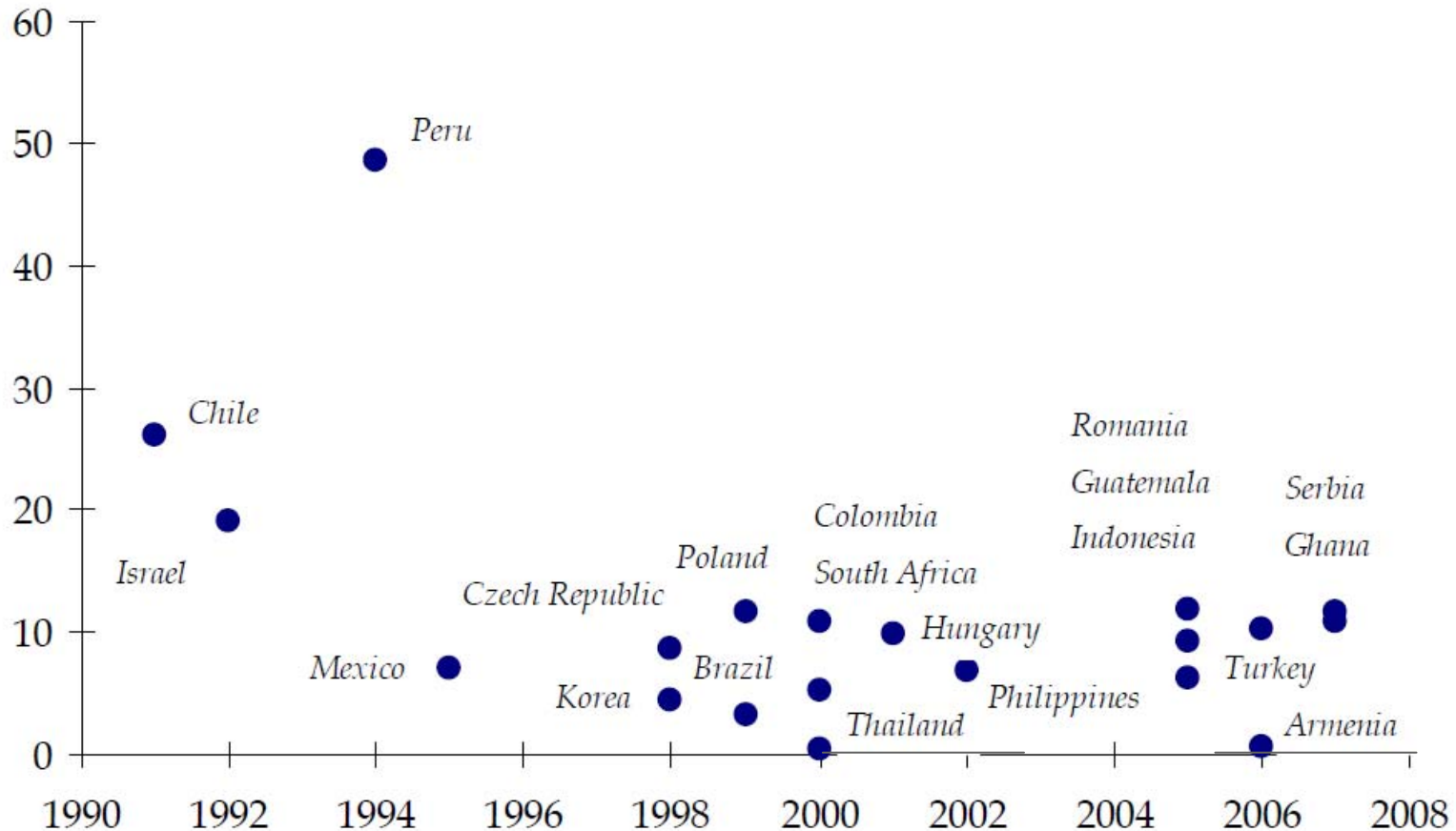
Monetary Policy Results in Developing Countries

IT and macroeconomic stability

- Most developing countries have experienced reductions in the volatility of both inflation and output.
 - However, the decrease in volatility has been more pronounced in IT countries than in non-IT countries.
- Two factors explain most of the volatility reduction in IT countries: shocks have had a smaller effect on the economy—the Great Moderation—, and monetary policy has become more efficient (Mishkin and Schmidt-Hebbel, 2007).
- Furthermore, IT countries have made substantial progress in communication and transparency. This has improved the accountability of autonomous central banks, and made monetary policy more effective.
 - IT has created a new norm in transparency. As a result, non-IT countries have also made progress in this area.

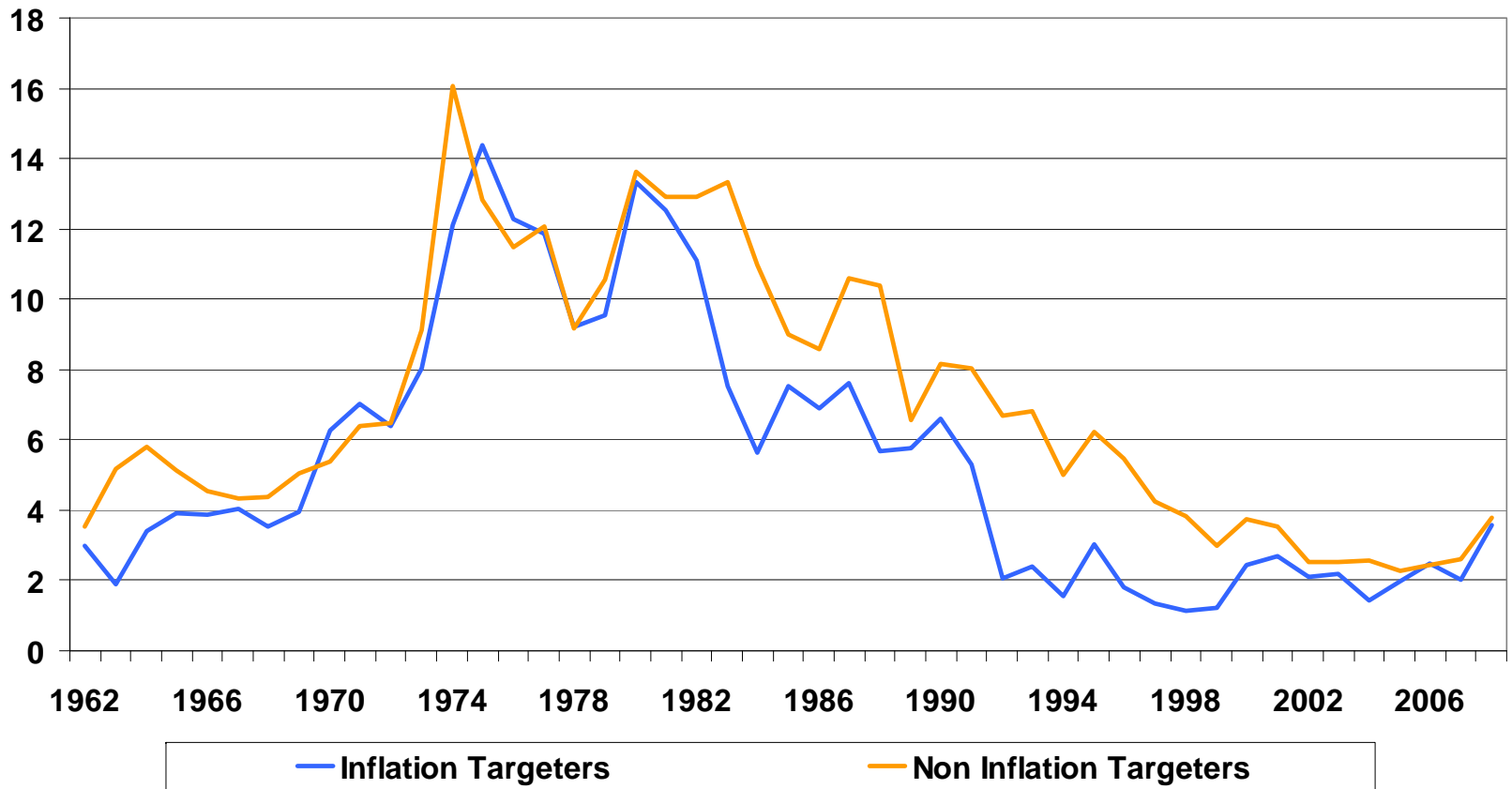
Monetary Policy Results in Developing Countries

Dates of IT adoption and annual inflation before IT adoption in EMEs, (%)



Macroeconomic Adjustment in Developing Countries

Annual Inflation in OECD inflation targeters and non - inflation targeters



Macroeconomic Adjustment in Developing Countries

Inflation Outcomes Relative to Targets, 1990-2008 *

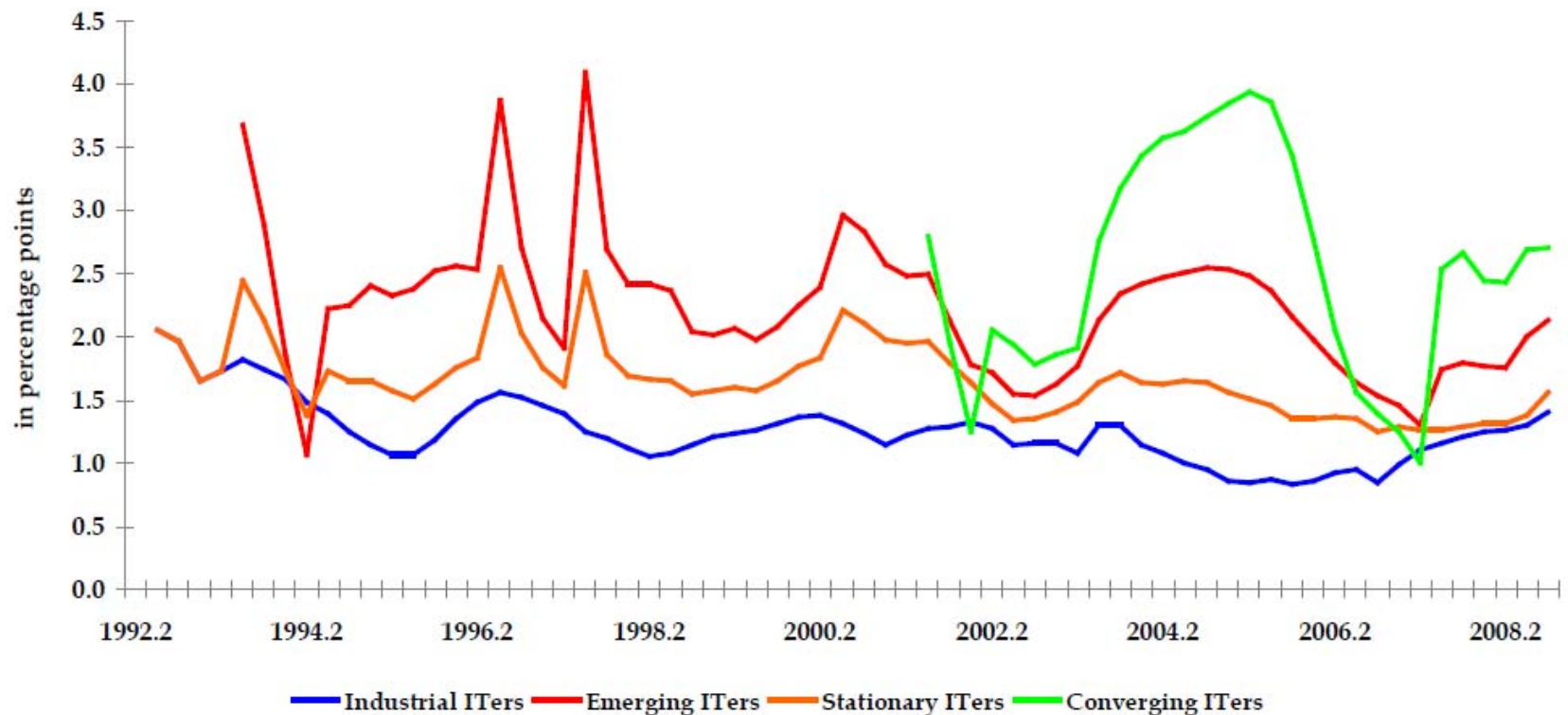
	Inflation Rate at IT Start (percent)	Target Range Width (+/-) (percent)	Mean Deviation from Range Center (percentage points)	Standard Deviation around Mean Outcome (percentage points)	Frequency of Target Range Misses Total/below/above (percentage of outcomes)	Average Absolute Magnitude of Misses (percentage points)	Persistence of Deviations from Range Center (months)
All countries	5.7	1.1	1.0	1.9	54.5/ 18.3/ 36.3	1.5	8.5
High income 2/	4.8	1.0	0.1	1.3	49.1/ 23.9/ 25.3	1.2	7.3
Low income 3/	6.5	1.2	1.8	2.4	59.6/ 13.0/ 46.6	2.3	10.3
Disinflation Phase							
All countries	7.2	1.2	1.4	2.1	64.0/ 17.0/ 47.0	1.8	10.2
High income 4/	6.3	1.0	0.1	1.7	59.6/ 29.4/ 30.2	1.2	8.3
Low income 5/	7.9	1.3	2.3	2.4	66.9/ 8.8/ 58.1	2.4	12.8
Stable Inflation Target Phase							
All countries	3.1	1.1	0.4	1.4	42.7/ 17.9/ 24.8	1.0	6.9
High income 6/	3.2	1.0	0.4	1.3	46.6/ 21.4/ 25.2	0.9	7.1
Low income 7/	3.0	1.3	0.5	1.6	35.5/ 11.3/ 24.2	1.2	6.9

2/ 14 countries: Australia, Canada, Czech Rep., Finland, Hungary, Iceland, Israel, Korea, New Zealand, Norway, Slovakia, Spain, Sweden, United Kingdom. 3/ 15 countries: Brazil, Chile, Colombia, Ghana, Guatemala, Indonesia, Mexico, Peru, Philippines, Poland, Romania, Serbia, South Africa, Thailand, Turkey. 4/ 8 countries: Canada, Czech Rep., Hungary, Iceland, Israel, New Zealand, Slovakia, Spain. 5/ 12 countries: Brazil, Chile, Colombia, Ghana, Guatemala, Indonesia, Mexico, Philippines, Poland, Romania, Serbia, Turkey. 6/ 13 countries: Australia, Canada, Czech Rep., Finland, Hungary, Iceland, Israel, Korea, New Zealand, Norway, Spain, Sweden, United Kingdom. 7/ 7 countries: Brazil, Chile, Mexico, Peru, Poland, South Africa, Thailand.

* Data calculated as equally-weighted averages of corresponding statistics for individual countries in relevant groups. Individual country figures are based on monthly data (quarterly for Australia and New Zealand).
Sources: Roger (2009).

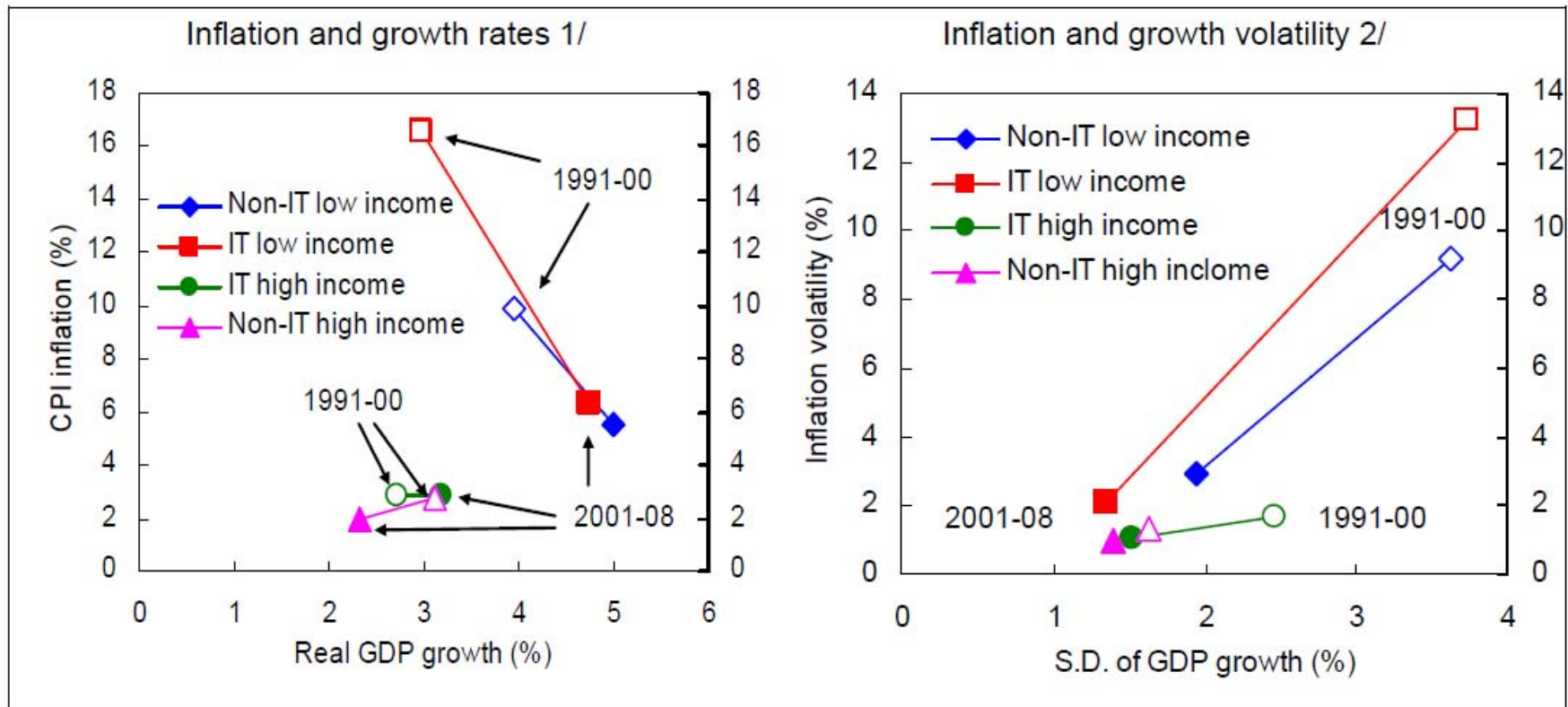
Monetary Policy Results in Developing Countries

Rolling estimation of root mean squared errors, (8-quarter windows)



Monetary Policy Results in Developing Countries

Inflation and growth performance: 2001—2008 vs. 1991—2000

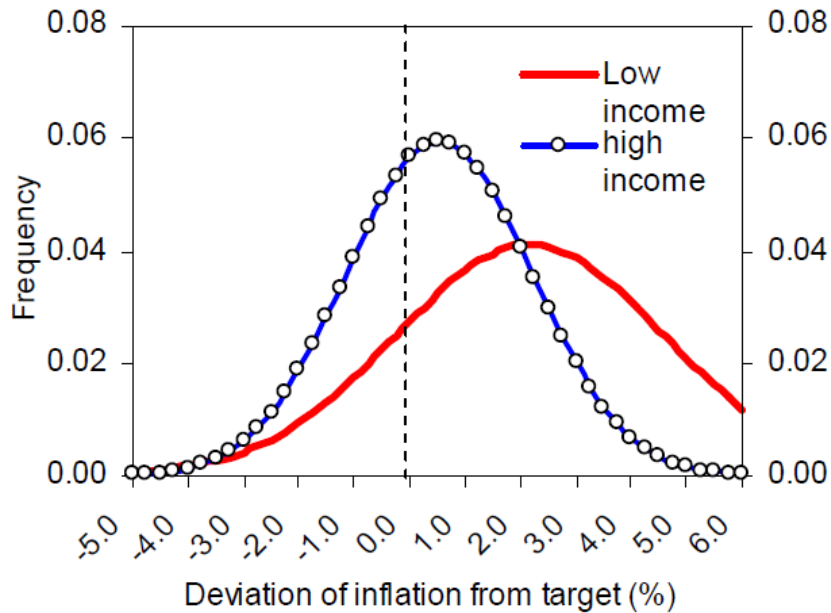


Monetary Policy Results in Developing Countries

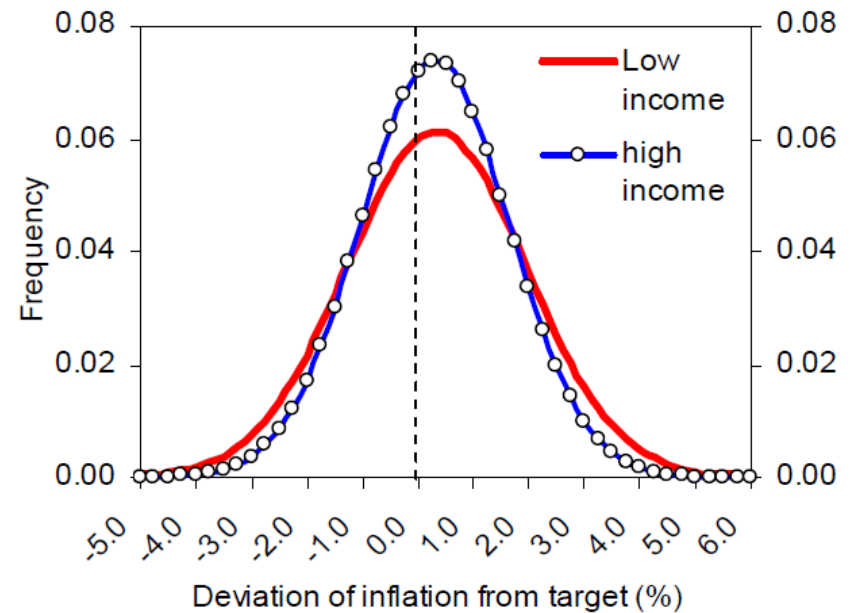
Distribution of inflation outcomes relative to targets

Outcomes during disinflation

Headline inflation

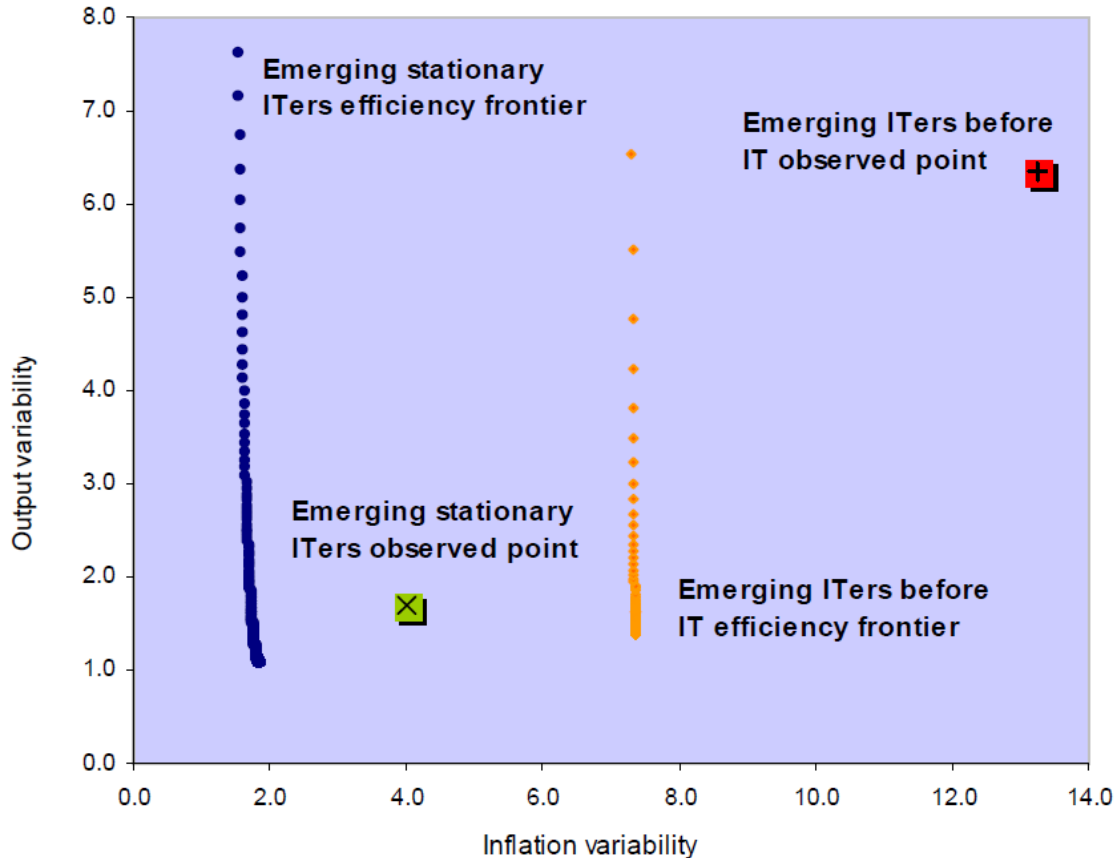


Outcomes during stable IT



Monetary Policy Results in Developing Countries

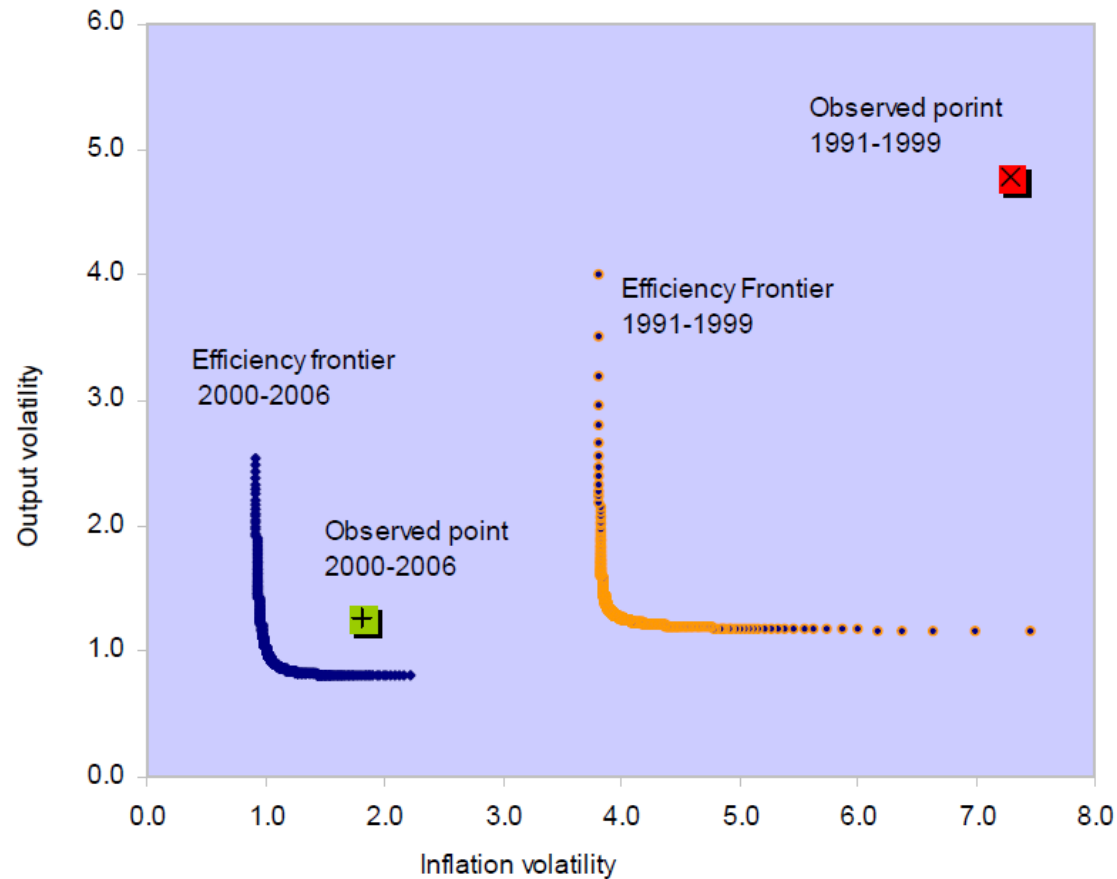
Inflation and output volatility and MP efficiency in emerging IT economies



- 58% of the increase in performance is explained by a decrease in the effect of shocks.
- 42% of the decline in volatilities is explained by monetary policy improvements.

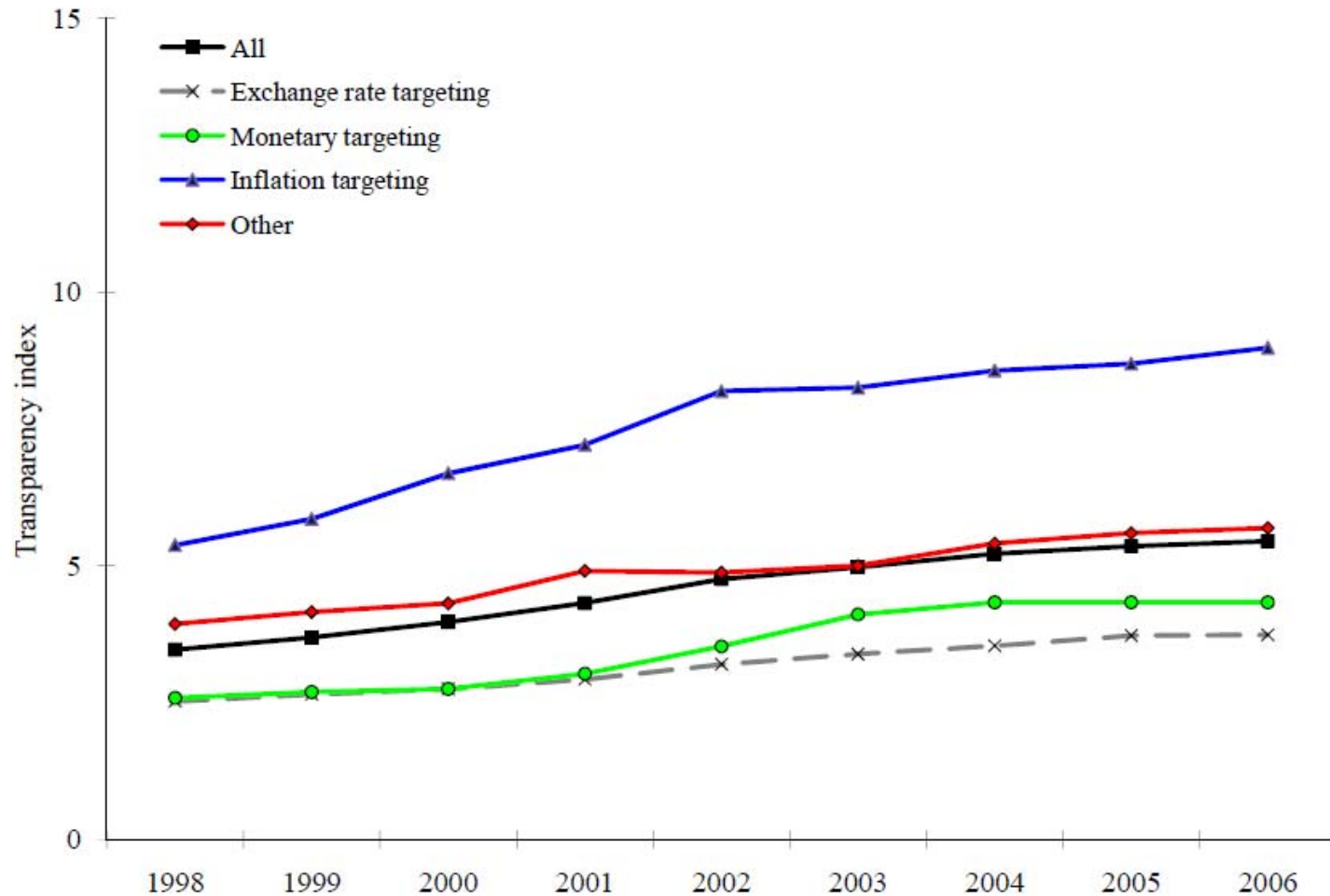
Monetary Policy Results in Developing Countries

Inflation and output volatility and MP efficiency in Chile



Monetary Policy Results in Developing Countries

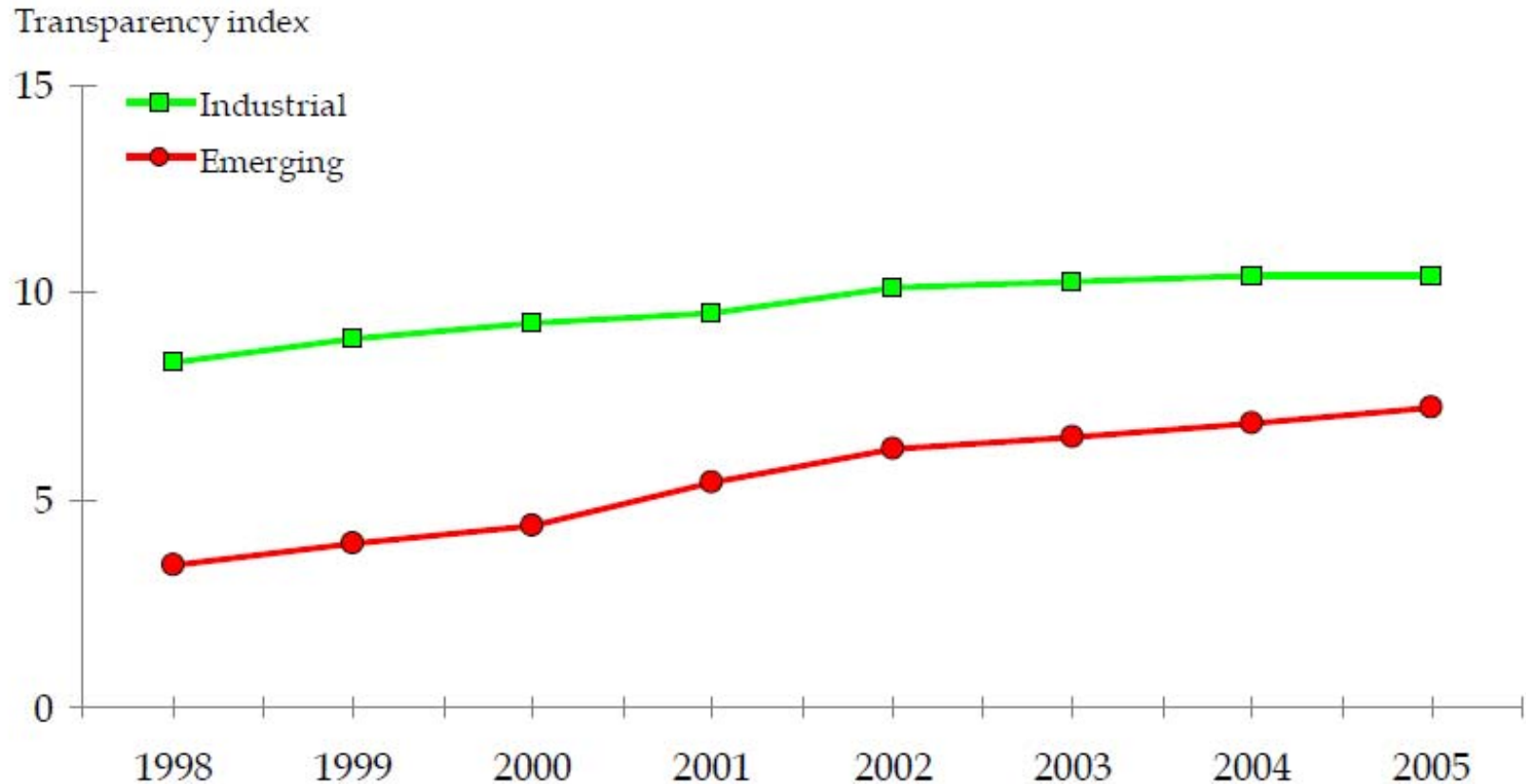
Transparency trends across monetary policy frameworks



Note: Average of Eijffinger-Geraats transparency index for sample of 98 central banks. Monetary policy frameworks based on July 2006 IMF classification. The transparency index ranges from 0 (least transparent) to 15 (most transparent). Source: Geraats (2009).

Monetary Policy Results in Developing Countries

Transparency trends across monetary policy frameworks



Note: the transparency index ranges from 0 (least transparent) to 15 (most transparent).
Source: Schmidt-Hebbel (2009).

Monetary Policy Results in Developing Countries

IT and credibility

- Adoption of IT has also contributed to building up the credibility of central banks by anchoring inflation expectations.
 - IT has helped to anchor inflation expectations at levels close to the target. Inflation expectations with IT are more stable than even in the U.S. (Ramos et al., 2007; Gürkaynak et al., 2007);
 - In the particular case of Chile, the distance of inflation expectations from inflation targets narrowed as targets converged toward the stationary 3% level and the CBCh showed strong commitment to meeting the targets (Céspedes and Soto, 2005);
 - During the 2001—2007 period inflation expectations remained close to the mid-point of the inflation target range, reflecting the high credibility of the IT regime.



III. Macroeconomic Policies and Adjustment to Shocks.

Has IT adoption made a
difference?

Macroeconomic Policies and Adjustment to Shocks

Global commodity prices and financial shocks

- Macroeconomic frameworks and monetary policy regimes have been put under stress by the large increase in asset prices and commodity prices that lasted until the beginning of 2008Q3, as well as by the financial crisis of the last two years.
- Central banks that have achieved a high degree of credibility were able to accommodate the commodity price shock with moderate rises in policy rates, as long as inflation expectations were well anchored around the inflation target.
- Furthermore, when the financial crisis hit, mature IT developing countries were able to utilize counter-cyclical policies to cushion the effects of the crisis on output and employment.

Macroeconomic Policies and Adjustment to Shocks

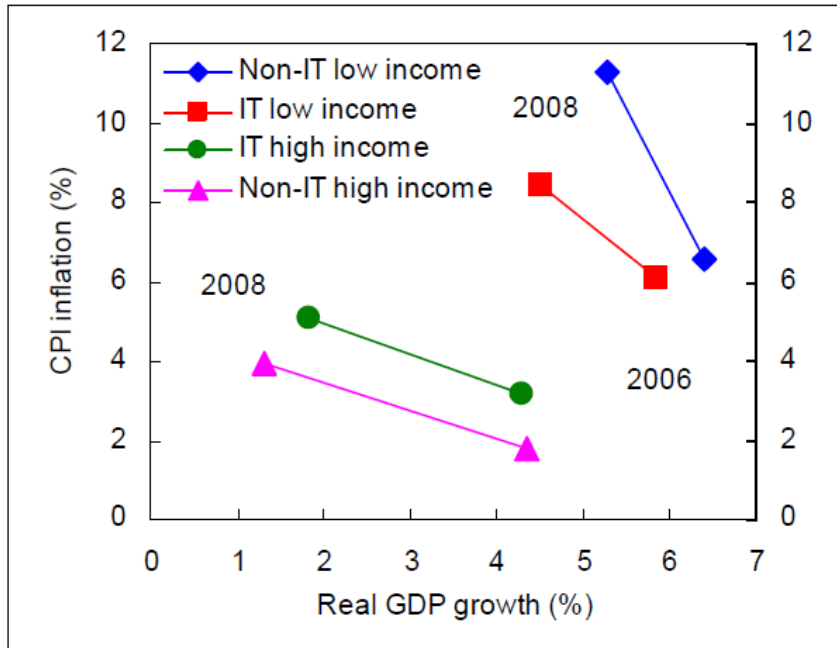
Global commodity prices and financial shocks

- Has IT delivered better macroeconomic results than alternative frameworks in response to the global commodity price and financial shocks?
- There is some evidence that IT developing countries have coped better with the commodity price and financial shocks in 2007—2009 than non-IT developing countries (Roger 2009).

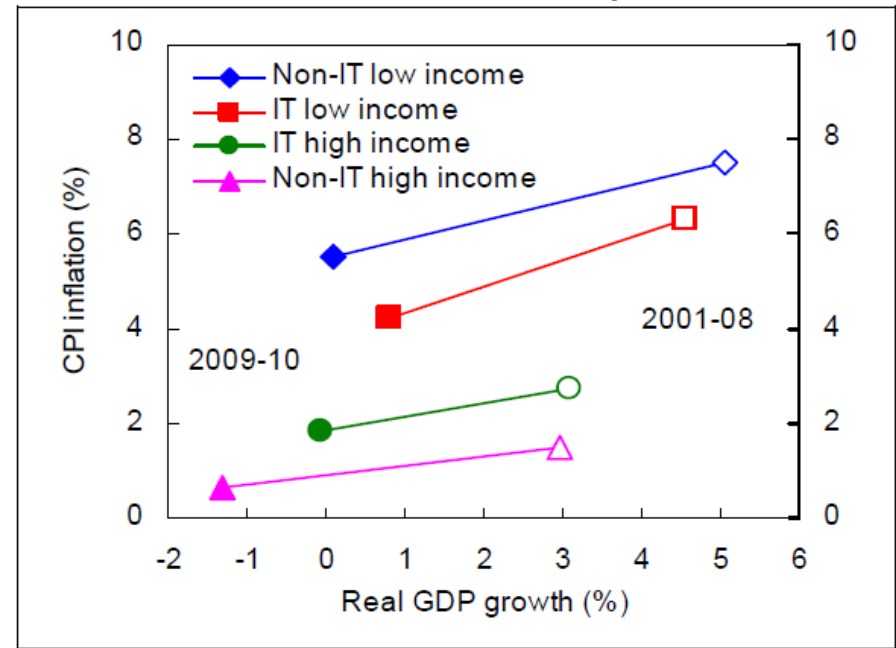
Macroeconomic Policies and Adjustment to Shocks

The resilience of inflation targeting

Inflation and growth rates, 2006-08^{1/}



Inflation and growth rates
2009-10 forecasts vs. 2001-08 performance^{2/}



1/ Averages of annual percentage changes.

2/ Median country values; forecasts use June 2009
Source: Roger (2009).

Macroeconomic Policies and Adjustment to Shocks

LatAm's ITiers adjustment to the Asian and financial crises: Is there a difference?

- Corbo and Schmidt-Hebbel (work in progress) show that Latin America was able to adjust much better to the present crisis than to the 1997—1998 Asian crisis, in spite of the fact that this crisis has been of a much larger dimension.
- Here I look just at the five LatAm ITiers (Brazil, Chile, Colombia, Peru and Mexico) to compare macro and financial performance between the late 1990s and the late 2000s in two steps:
 - Estimation of GDP growth based on short and long-term growth factors;
 - Decomposition of the amplitude of both recessions, based on structural growth equations.

LatAm's ITiers adjustment to the crises

Data

- Country Sample
 - Five LatAm IT countries: Argentina, Brazil, Chile, Colombia and Mexico (close to 80% of LatAm's GDP)
- Time Sample
 - Quarterly data, 1990:1—2009:2

LatAm's ITiers adjustment to the crises

Dating of crises

- Starting points: based on Calvo (2005) and Eichengreen and O'Rourke (2009).
- Fixed effects panel regression of GDP growth on two dummy variables for two recessions.
- Search conducted by extending end-points by several quarters.
- Final dating based on largest and most significant dummy parameter estimates.
- First quarter of LatAm recessions (Quarter "1" in subsequent figures):
 - Asian crisis: 1998Q3
 - Global crisis: 2008Q3 (note: commodity prices peaked in 2008 Q2—Q3)

LatAm's ITiers adjustment to the crises

Decomposing LatAm's recessions

- Following Corbo and Schmidt-Hebbel I compare LatAm's ITers growth during both crises.
- I decompose the amplitude of the recession during both periods.
- The average cumulative GDP decline in the 5 individual countries between the last quarter before the recession and the last quarter of the recession.
- The decomposition allows to identify the most relevant recession determinants in both crises.

LatAm's ITiers adjustment to the crises

The amplitude of the recession (% with respect to PIB before the recession)

	Asian Crisis	Global Financial Crisis
Brazil	-1.03	-1.28
Chile	-3.88	-4.61
Colombia	-6.82	-0.51
Mexico	3.37	-10.28
Peru	1.15	-0.97
Simple Average	-1.44	-3.53

LatAm's ITiers adjustment to the crises

Decomposing LatAm's ITiers recessions (1)

Amplitude of GDP Growth Decline	Asian Crisis	Global Financial Crisis		
	1998q3-1999q2	2008q3-2009q2		
	-1.44%	-3.53%		
		Structural Changes		
		<i>NO</i>	<i>Changes</i>	<i>YES</i>
Long-Term Variables	-0.60%	-0.18%		-0.03%
Private Credit	0.10%	0.30%		0.30%
Inflation	0.11%	0.25%	0.15%	0.40%
Secondary School Enrollment	0.00%	0.00%		0.00%
Fiscal Balance	-0.66%	-0.70%		-0.70%
Political Certainty	-0.15%	-0.04%	0.01%	-0.03%
Structural Variables	-0.26%	0.00%		-0.63%
Financial Openness	0.08%	-0.14%	0.10%	-0.04%
Trade Openness	-0.14%	-0.43%	-0.33%	-0.76%
Net External Assets	-0.07%	0.01%		0.01%
International Reserves	-0.14%	0.56%	-0.40%	0.16%
Exchange Rate Regime	0.00%	0.00%	0.00%	0.00%

Sources:

LatAm's ITiers adjustment to the crises

Decomposing LatAm's ITiers recessions (2)

Foreign Cyclical Variables	0.34%	-2.14%	-2.37%
Terms of Trade Growth	0.00%	-0.05%	-0.05%
Growth of Trading Partners	0.10%	-1.01%	-1.01%
Growth of World Exports	0.34%	-0.49%	-0.49%
Capital Inflows to Latin America	-0.02%	-0.42%	-0.42%
Sovereign Spreads	-0.09%	-0.19%	-0.23%
			-0.42%
Domestic Policy Variables	-0.53%	-0.66%	0.18%
Government Consumption	0.15%	0.26%	0.26%
Real Interest Rate	-0.68%	-0.92%	0.84%
			-0.08%
Interactions	0.00%	-0.05%	-0.05%
Growth of Trading Partners * Trade Openness	-0.04%	-0.49%	-0.49%
Growth of Trading Partners * Financial Openness	0.02%	0.19%	0.19%
Capital Inflows to Latin America * Financial Openness	-0.01%	0.02%	0.02%
Sovereign Spreads * Net External Assets	0.03%	0.23%	0.23%
Structural Changes post-2000		0.13%	
Explained Variation	-1.05%	-2.91%	-2.90%
Unexplained Variation	-0.39%	-0.62%	-0.62%
Total Variation	-1.44%	-3.53%	-3.53%

LatAm's ITiers adjustment to the crises

Explaining LatAm's ITiers recessions (1)

- The average amplitude of the recessions was a cumulative -1.44% of GDP in the first and -3.53% of GDP in the second.
- The explained variation is -1.05% for 1998—99 and -2.9% for 2008—09.
- 1998—99 recession: largely due to domestic factors (including pro-cyclical macro policy response), NOT to foreign cyclical variables:
 - Lower inflation and rising financial openness dampened the recession.
 - Higher political uncertainty and rising country risk spreads deepened the recession.
 - Positive growth of world GDP and exports dampened the recession.
 - Fiscal policy (fiscal balance + government consumption) deepened the recession.
 - Interest rate hikes and the use of international reserves in defense of inflexible ER regimes contributed strongly to the recession.

LatAm adjustment to the Asian and financial crises

Explaining LatAm's recessions (2)

- 2008—09 recession: in contrast to 1998—09 it was largely caused by the world recession, i.e., foreign cyclical variables:
 - All five foreign cyclical variables contributed to the recession; collapsing growth of LatAm's trading partners made the largest contribution.
 - Declining trade deepened the recession.
 - Lower inflation and rising international reserves dampened the recession.
 - Fiscal policy (fiscal balance + government consumption) was largely neutral.
 - Monetary policy was also neutral, because higher interest rates were offset by their weakened impact on growth.

IV. Inflation Targeting after the Financial Crisis

Consequences of the Crisis for IT

The role of financial stability in monetary policy

- A lot has been said about the role that financial stability should have in monetary policy in general and in IT countries in particular, beyond its monitoring by the Central Bank.
- Financial stability (FS) play a central role in the monetary transmission mechanism.
- In flexible IT monetary policy regimes, asset prices and financial variables affect policy rates only to through their effect on the forecast of inflation and of the output gap.
- From the current discussion It's likely that asset prices (and perhaps the growth of monetary aggregates and credit?) will have a greater role in the framework of monetary policy (BIS, Blanchflower, Gieve, Bean).
 - Expect to see more leaning-against-the-wind in the face of potential bubbles.
 - There is a trade-off between making mistakes in detecting false bubbles, and in making mistakes by allowing these bubbles to grow and cause a financial crisis.

Consequences of the Crisis for Monetary Policy

Macro-prudential regulation

- The discussion has focused on how to include asset prices (and monetary aggregates) in the monetary policy framework of IT countries: a separate argument in the Taylor rule? Or into a price index that is broader than CPI?
 - It should be kept in mind that the monetary policy rate is too blunt an instrument to deal with potential bubbles.
 - The complexity of the issue suggests that rather than including them in the policy rule, a better solution is to use discretion and good judgment.
- Central banks will require additional policy instruments if they are to take on greater responsibility and a more active role in financial stability beyond the supervision of macro financial stability .
 - There is a growing consensus that macro-prudential tools are the proper tools to carry out the job.

Consequences of the Crisis for Monetary Policy

Macro-prudential regulation

- There is broad agreement on some of the macro-prudential tools:
 - Dynamic provisions, capital and liquidity requirements adjusted by the cycle, loans to asset values adjusted by the cycle.
- Implementing macro-prudential regulation will not be a simple task:
 - It will require an important, explicit collaboration among the different authorities responsible for regulation and supervision and the Central Bank.
 - There may be occasions in which the use of quantitative restrictions call for by macro prudential considerations will conflict with the use of the monetary policy rate to reduce output gaps and lead inflation to the target level.
 - Example: the case of a supply shock which creates a boom in asset prices but deflation in the prices of goods.

V. Conclusions

Conclusions

Macroeconomic improvements in emerging economies

- Macroeconomic conditions have improved significantly in emerging economies since the early 1990s.
- Emerging economies show important progress in:
 - Fiscal responsibility;
 - Coherent adoption of central bank autonomy, monetary regimes based on IT, and greater exchange-rate flexibility;
 - Financial system strength.
- Adoption of more flexible exchange rates and IT regimes have contributed to lower output and inflation volatility, and stronger credibility of central bank policies.
- Low inflation and a credible monetary policy represent an essential macroeconomic achievement.

Conclusions

Increased resilience to macro shocks in Latin America

- The IT monetary policy framework was put under severe stress in the recent crisis but has proven to facilitate the adjustment to the shocks.
- LatAm's ITers suffered a mild external shock during the Asian crisis, and a very serious one during the recent financial crisis of 2008—09. Yet GDP fell by an average of 1.44% in the Asian crisis and 3.5% in the current crisis.
- Better macroeconomic management and improved structural conditions cushion the output effects of the recent crisis.
- In particular, the ITers were able to introduce counter-cyclical policies to reduce output losses. This would have been unthinkable 15—30 years ago.

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Centro de Estudios Públicos

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