Macroeconomic Insurance and Hedging

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Center for Global Development

IMF-IGC CONFERENCE:

MANAGING VOLATILITY AND INCREASING RESILIENCE IN LOW-INCOME COUNTRIES

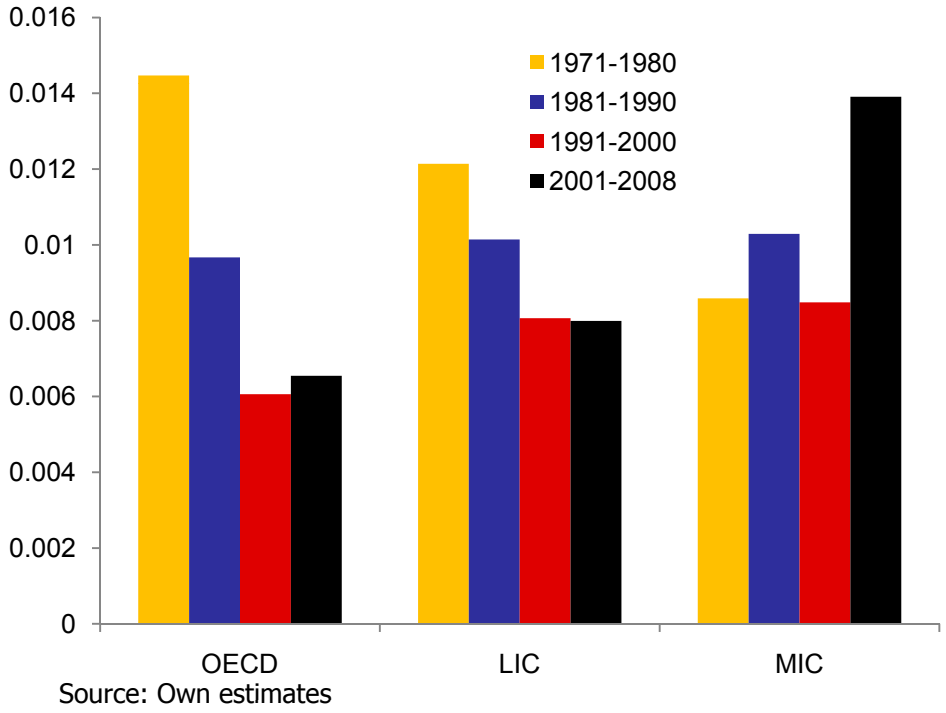
APRIL 27, 2010

This Presentation

1. High volatility in LIC's and MIC's:
   - High exposure to exogenous shocks
   - Financial markets and policy amplifiers
2. Theory: the role of market insurance and hedging
3. Facts: Limited access of LIC's and MIC's
4. Market and policy failures and the role of IFI's

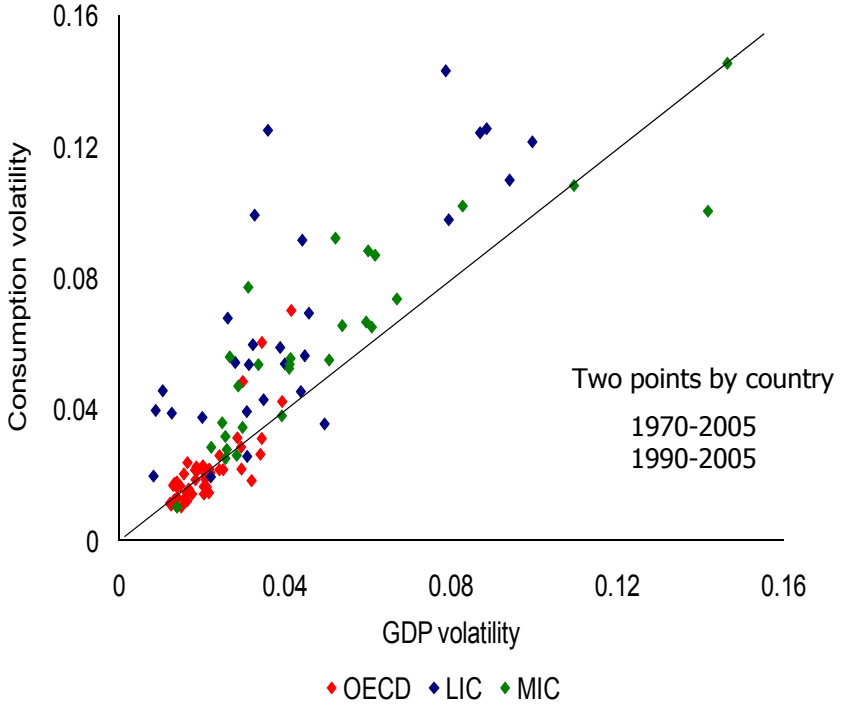
1. High volatility in LIC's and MIC's

GDP Volatiliy, by region (1971-2008)



Source: Own estimates

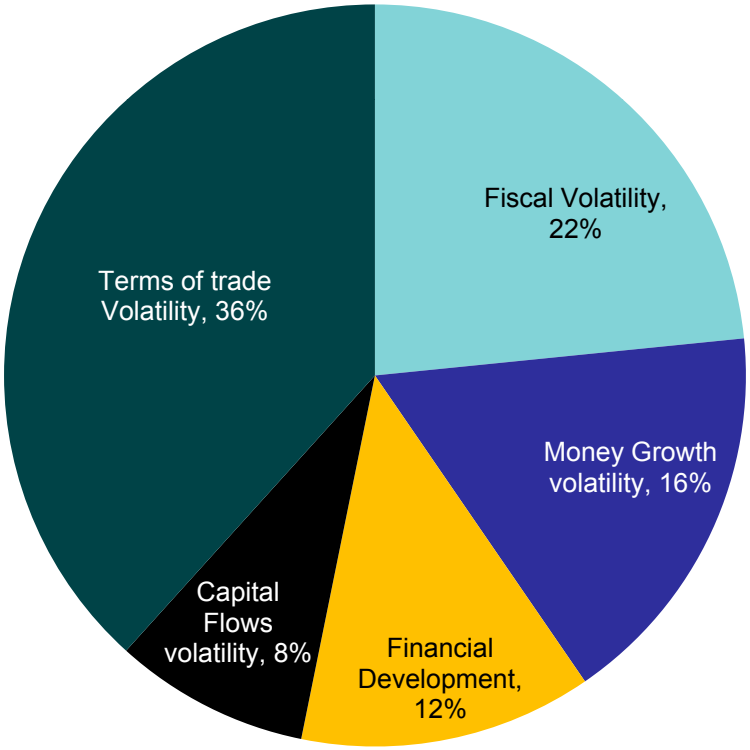
GDP Volatility and Consumption, by country groups



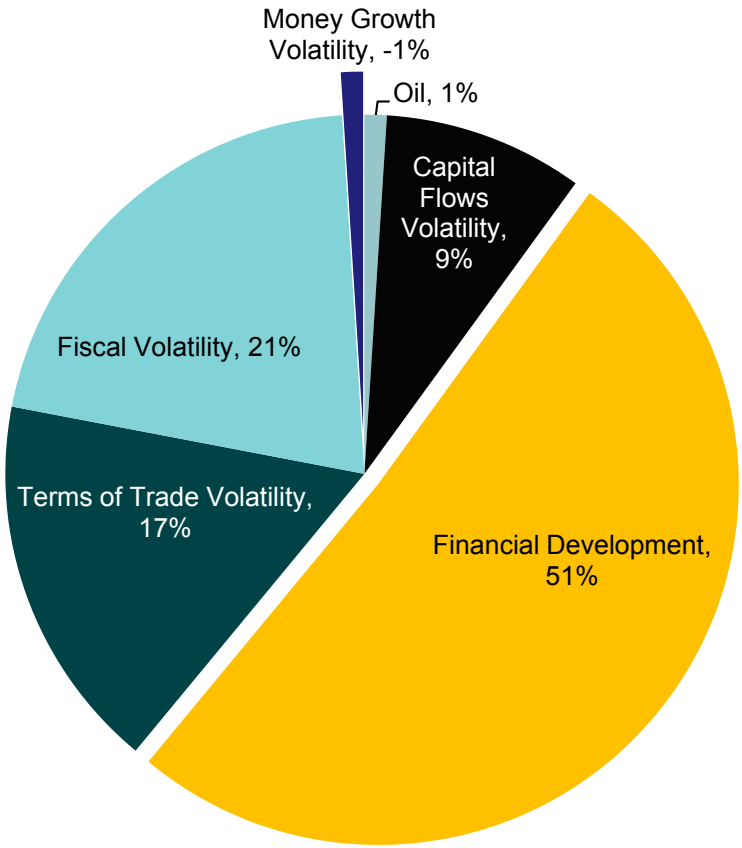
Source: own estimates based on WDI and IFS.

1. Developing Countries excess volatility is due to exogenous and endogenous causes

1975-2005



1990-2005

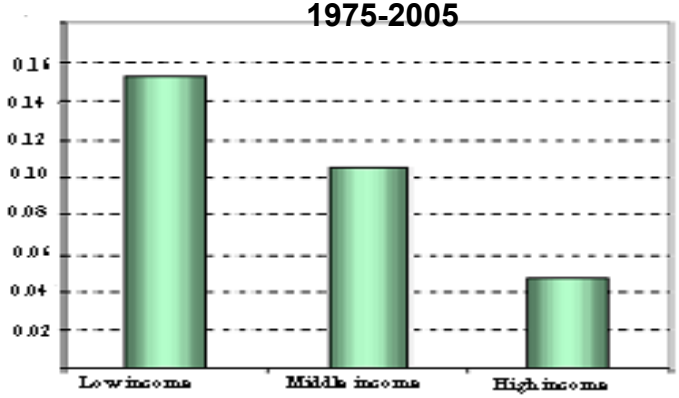


Source: Own calculations.

1. LIC's and MIC's have higher exposure to Exogenous Shocks

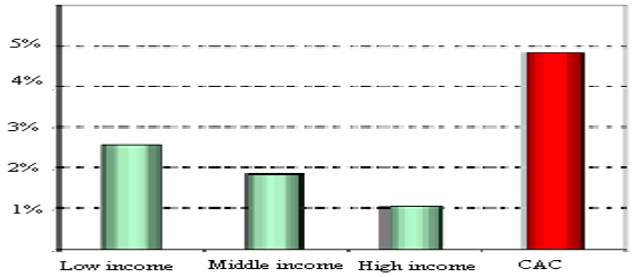
Volatility of Terms of Trade

1975-2005



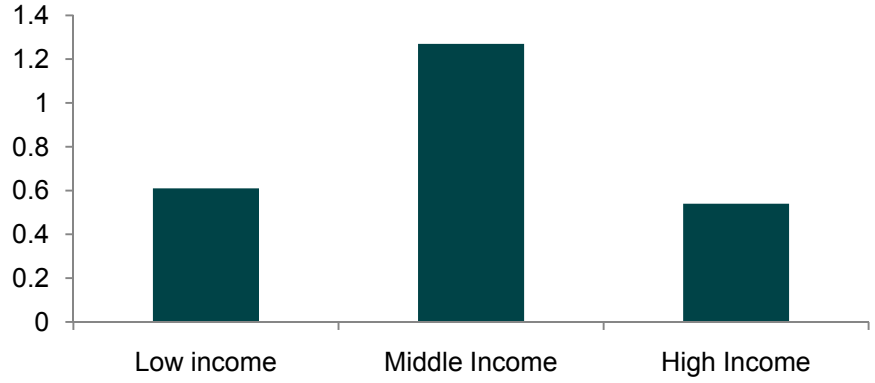
Frequency of natural disasters

1975-2005



Source: Calderón, C, WB (2007)

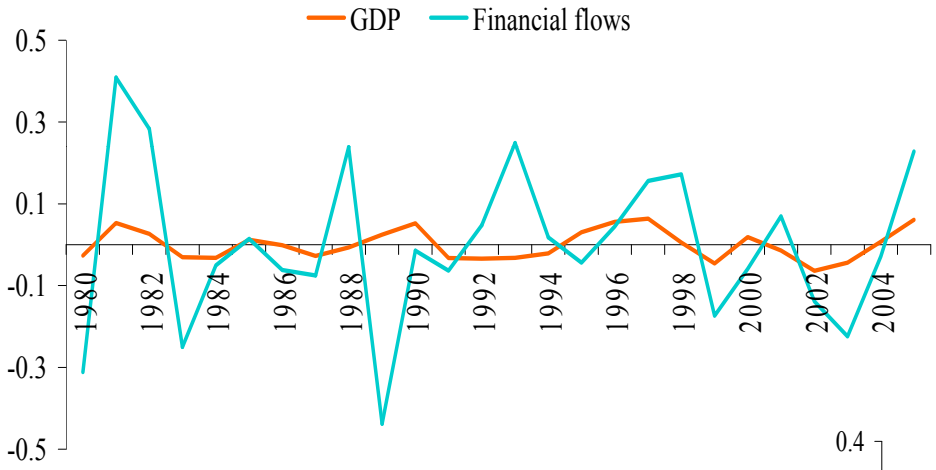
Volatility of Capital Flows



Source: Cavallo and Frankel (2006).

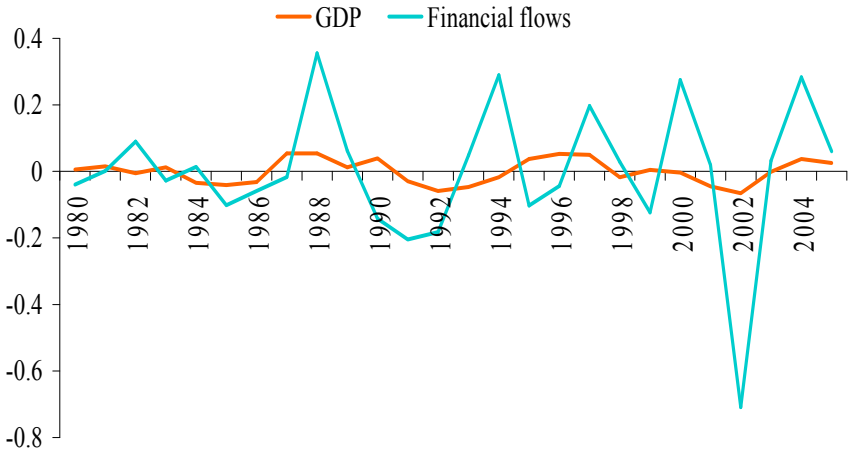
1. Which are augmented by the pro cyclicality of capital inflows

Middle Income Countries



Cross Correlation: 0.4312**

Low Income Countries



Cross Correlation: 0.455**

1. Other amplifiers of exogenous shocks

1. Balance sheet (currency) risks:
   - Composition of private and public debt
   - Weak development of capital markets in local currency

   Significant advances in some MIC's since 1998
2. Procyclical monetary policy.
   - Major change: countercyclical monetary policy in countries with inflation targeting
3. Procyclical fiscal policy:
   - With few exceptions (e.g. Chile).
   - Some LIC's: Nicaragua, Bolivia?

2. Dealing with exogenous shocks: potential options

Action / Shock	Coping after the fact	Prevention: Risk Reduction	Self Insurance: Saving	Market Insurance and Hedging
Terms of Trade	Current Account and (pro cyclical) fiscal adjustment, Aid	Diversify Exports	Stabilization Funds	•Commodity Price Futures, Forwards and Options •Indexed Debt (TOT, CP)
Natural Disasters	Aid, Fiscal adjustment	Zoning Building codes	Emergency Funds	•Insurance & Reinsurance •CAT's
Capital Flows	Current Account and (pro cyclical) fiscal adjustment, Aid	•Debt level & composition •Capital Market Development •De dollarization	International Reserves	•Contingent Credit Lines •Indexed Debt (GDP) •Currency and interest derivatives •External debt in domestic currencies

Source: Own elaboration

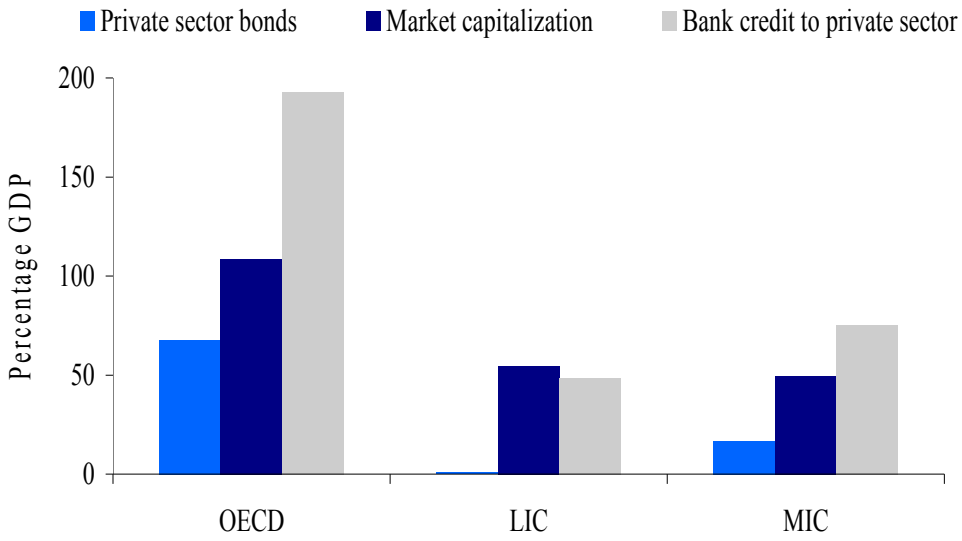
2. Dealing with exogenous shocks: "optimal mix"

- Market insurance (and hedging) is the best option when shocks are rare and costly
- Market and self insurance are largely substitutes (countries accumulate costly reserves when they have few insurance options)
- Market insurance and prevention can be complements, depending on incentive design (eligibility rules, deductions and risk sensitive fees)
- Welfare increases with more options:

  Role of Government and MDB's: overcome market failures, develop and complete markets

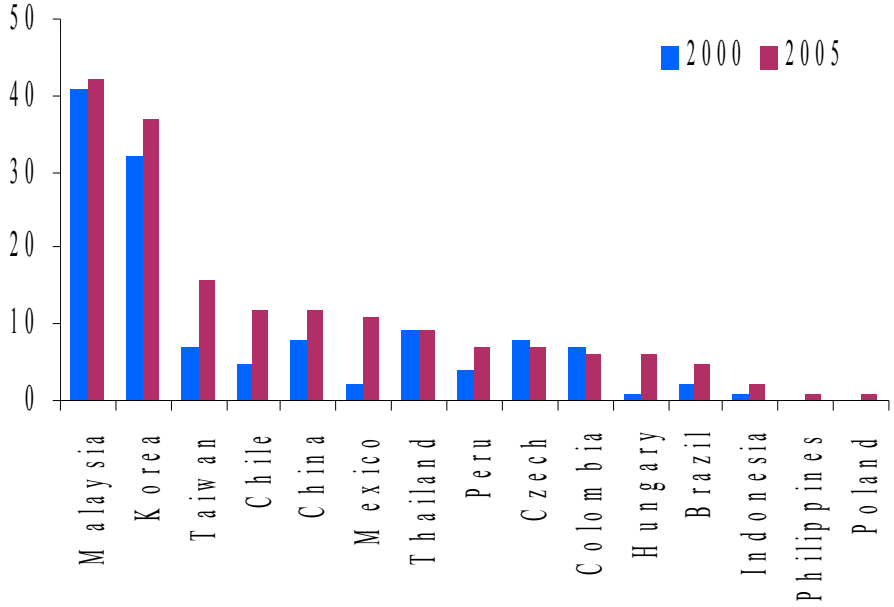
3. Domestic capital markets in EM are still shallow, especially for firms

Financial Sector Development Indexes



Source: Own elaboration based on WDI and BIS data

Domestic Corporate Bonds as % of GDP



Source: Own elaboration based on BIS. 2007.

3. Limited issuing of domestic currency debt in international markets

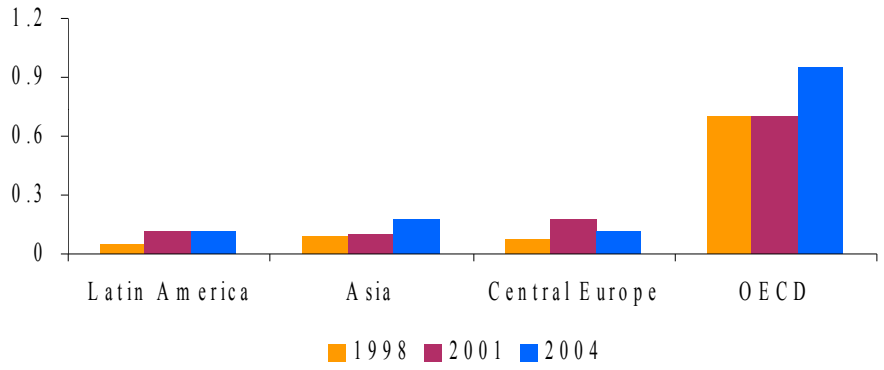
Country	Issue date	Maturity date	Currency	Amount issued[1]	Coupon rate	Rating: Fitch/Moody's/S&P	Market
Brazil	Sep 2005	Jan 2016	BRL	1,485	12.5	BB/Ba2/BB	GLOBAL
Brazil	Sep 2006	Jan 2022	BRL	1,382	12.5	BB/Ba2/BB	GLOBAL
Brazil	Feb 2007	Jan 2028	BRL	1,051	10.25	BB/Ba2/BB	GLOBAL
Brazil	May 2007	Jan 2028	BRL	371	10.25	BB+/Ba2/BB	GLOBAL
Colombia[2]	Nov 2004	Mar 2010	COP	493	11.75	BB/Ba2/BB+	GLOBAL
Colombia	Feb 2005	Oct 2015	COP	1,102	12	BB/Ba2/BB+	GLOBAL
Colombia	Jun 2007	Jun 2027	COP	999	9.85	BB+/Ba2/BB+	GLOBAL
Peru[3]	Jul 2007	Aug 2037	PEN	1,240	6.9	BBB–/Baa3/BBB–	GLOBAL
Uruguay[3,4]	Oct 2003	Oct 2006	UYU	290	10.5	B+/WR/NR	GLOBAL
Uruguay[3]	Aug 2004	Feb 2006	UYU	255	17.75	B+/WR/NR	GLOBAL
Uruguay[3,4]	Sep 2006	Sep 2018	UYU	401	5	B+/B1/B+	GLOBAL
Uruguay[3,4]	Oct 2006	Sep 2018	UYU	296	5	B+/B+/B+	GLOBAL
Uruguay[3]	Apr 2007	Apr 2027	UYU	504	4.25	B+/B1/B+	GLOBAL
Uruguay[3,4]	Jun 2007	Jun 2037	UYU	500	3.7	BB–/B1/B+	GLOBAL

Source: Serge Jeanneau and Camilo E Tovar, 2008

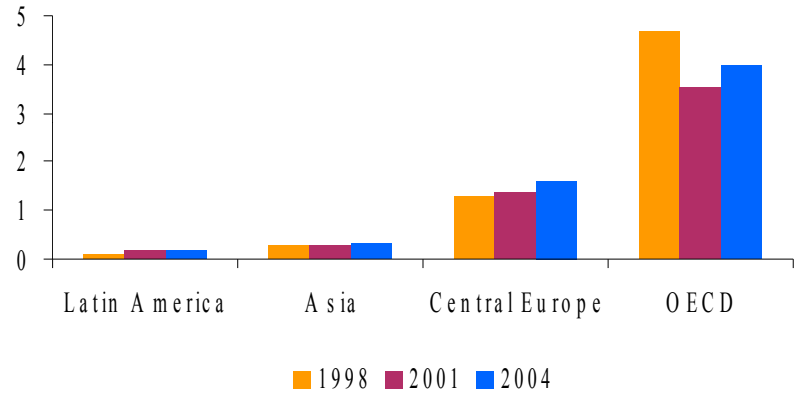
- Specific problems:
  - CB credibility and forex interventions (excessive currency risk)
  - Lack of global currency risk diversification (coordination issues)

3. Use of currency derivatives by EM's still very low

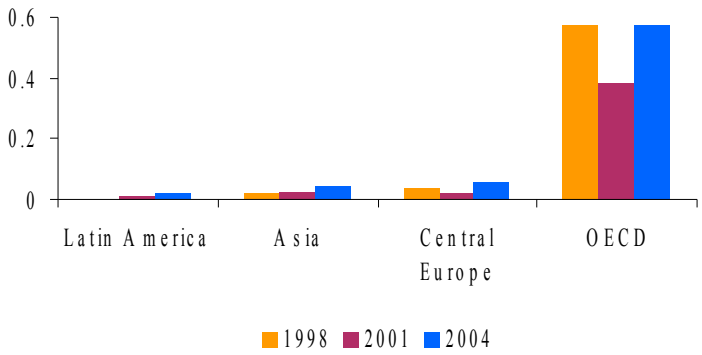
FX Forwards as % GDP



FX Swaps as % GDP



FX Options as % GDP



Source: Own elaboration based on BIS. 2007. "Financial stability and local currency bond markets".

3. Commodity Derivative Markets are short term and shallow

Commodity derivative volumes (# of contracts)

	Up to 6 M	6 M - 1 Y	1 Y - 2 Y	2Y - 3Y	3Y - 5Y	> 5Y
	7.214	21.767	21.229	3.379	15.254	N/A
	732.721	374.969	172.138	35.367	N/A	N/A
Crude Oil	664.472	418.033	194.995	32.159	N/A	N/A
	125.657	26.603	11.635	N/A	N/A	N/A
	106.439	26.973	242	N/A	N/A	N/A
Coffee	51.075	24.804	70	N/A	N/A	N/A
	72.771	8.083	795	N/A	N/A	N/A
	1.478	264	N/A	N/A	N/A	N/A
Copper	894	675	N/A	N/A	N/A	N/A
	247.902	85.476	28.404	2.396	N/A	N/A
	103.494	47.810	1.522	N/A	N/A	N/A
Wheat	68.628	34.010	762	N/A	N/A	N/A
	550.993	524.944	153.347	17.377	N/A	N/A
	405.341	529.968	115.716	10.330	N/A	N/A
Corn	260.706	387.471	60.173	9.732	N/A	N/A

Futures/Forward (# of contracts)

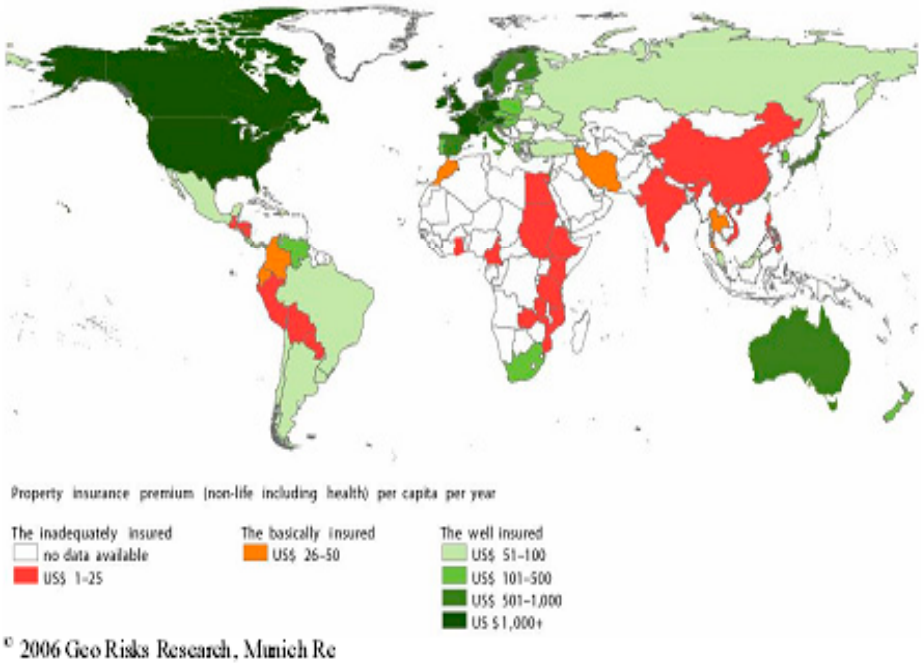
Call options (# of contracts)

Put Options (# of contracts)

Source: Cordella and Levy Yeyati, WB, (2007)

3. Low Catastrophe Insurance penetration in DC's

Global Distribution of Insurance Premiums per capita



Expected economic loss insured (Approx.)

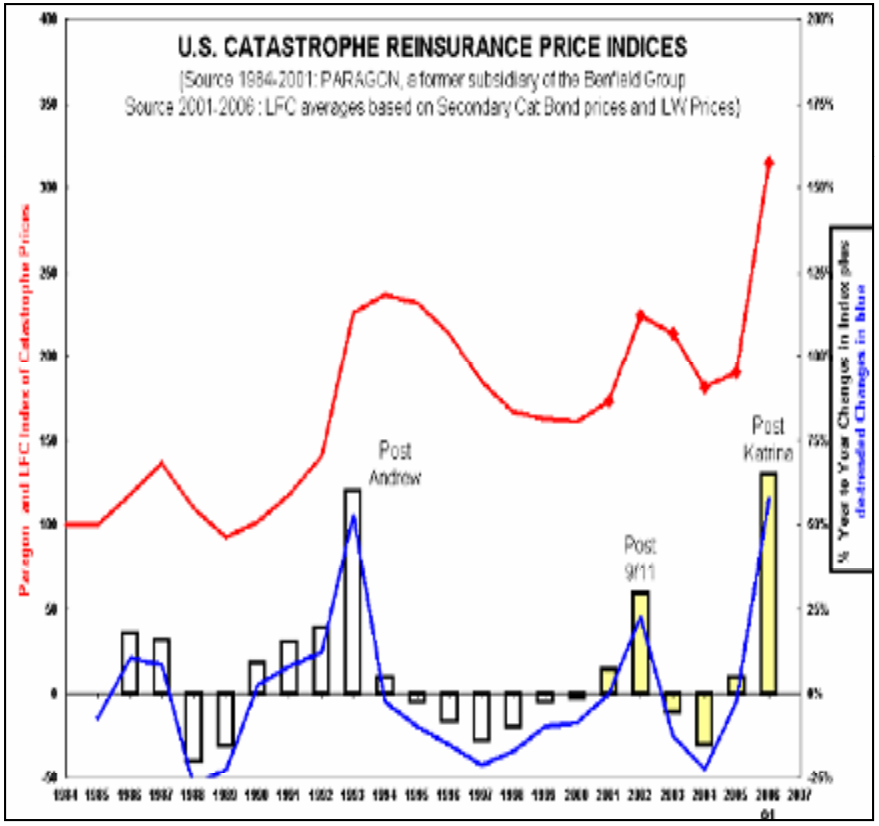
1	1980	2006
Industrial C	20%	40%
Developing C[1]	3%	3%

1. From 0.5 to 4% of households

Source: Gurenko, Paul and Zelenko (2007).

3. High and volatile fees of Catastrophe Reinsurance

US catastrophe reinsurance price indices



Mexico Insurance premia of hidrometeorological risk
As percentage of insured values

	Zoning (Insured Property Location)			
	Zone Alfa 1			
	Yucatán Peninsula	South Pacific	Gulf of Mexico	Interior
Homes	0.35% 0.60%	0.12% 0.30%	0.15% 0.30%	0.08% 0.08%
Buildings	0.35% 1.40%	0.13% 0.50%	0.15% 0.50%	0.12% 0.12%
Industrial Property	0.60% 1.60%	0.25% 0.80%	0.30% 0.80%	0.14% 0.14%

*/ -500 m from hide tide on the beach. Red numbers are values for 2004, black color for 2006

Source: Lane Financial (2007) and Cordella and Levy yeyati, WB, (2007)

4. Market failures in financial innovations

- Issuer:
  - First mover risks and costs (high externalities)
  - Lack of financial sophistication and adequate regulations
  - Political economy:
    - premiums and upfront fees for uncertain
    - long term benefit; giving up the upside in hedging

- Investor, financial intermediary:
  - Liquidity and product uncertainty (pricing)
  - First mover risks and costs (financial sector is highly competitive; patenting rare for financial products)
  - Coordination issues in attaining global risk diversification (huge gains in pooling currency, TOT, GDP and natural disaster risks)

IFI's can help solve supply and demand constraints through coordination, market development, global risk diversification and technical assistance

4. Role of IFI's: Dealing with currency risk

1. Lending in domestic currencies by IFI's:
   - Limited current practice in MDB's:

   Small fraction of the portfolio

   Limited to intermediation of Currency Risks

   Limited to countries with already developed local currency and swap markets
   - Limited initiatives using the global risk diversification potential:

   IFC Match

   The Currency Exchange Initiative
   - The global risk diversification potential: a Big-Bang approach?

   Converting debt stocks to domestic currencies?

2. Helping develop currency markets

   The GEMLOC initiative

4. Role of IFI' s in catastrophic insurance

- Sovereign Short Term Cash Needs:
  - Contingent loans: a second best solution.
  - Achieving Regional risk diversification benefits:
    - The Caribbean Catastrophic Reinsurance Facility (CCRF).
  - Achieving Global risk diversification benefits:
    - The Global CAT Mutual Bond initiative (GCMB)
- Private Sector Insurance Penetration
  - Achieving Global risk diversification benefits:
    - **The Global Catastrophic Reinsurance Facility (GCRF)**
- Issue: Shifting AID from ex post relief to ex ante insurance

4. Role of IFI's: Dealing with TOT and liquidity risk

1. IMF: Contingent facilities: mainstreaming recent initiatives

2. MDB's:
   - From pro cyclical to countercyclical lending
   - Contingent lending

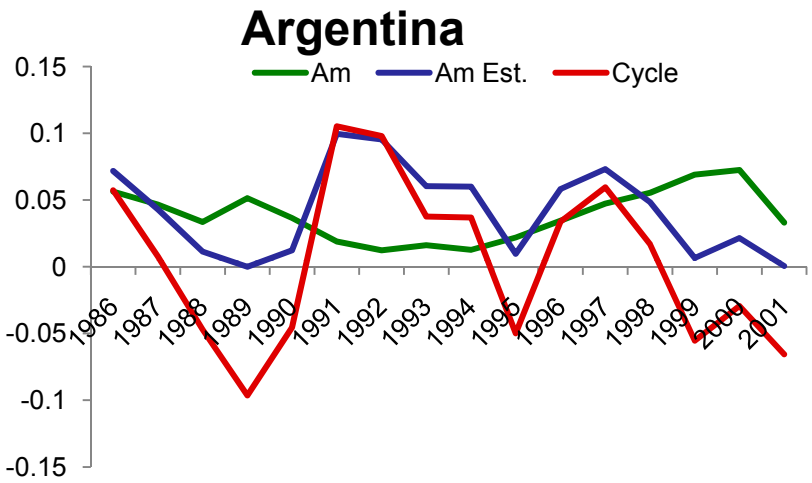
3. Helping develop GDP-linked Bond markets?
   Remember IMF and US Treasury role in CAC's

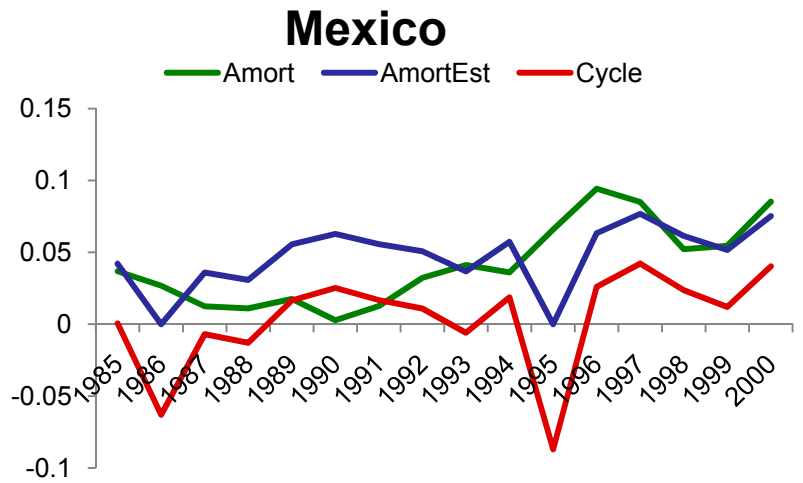
4. GDP-indexed liabilities: theoretical attractiveness

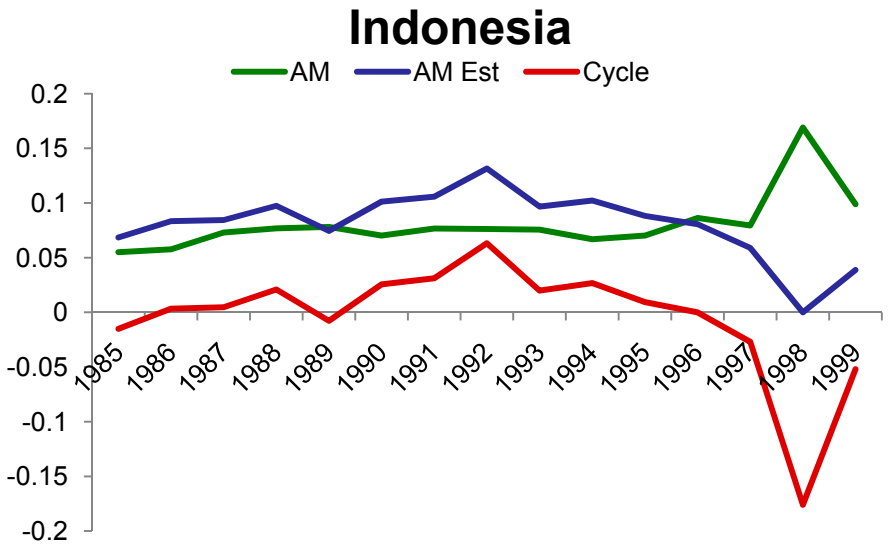
(Shiller-1993; Borensztein and Mauro- 2002, 2004)

- **For Issuers**:
  - **Stabilizing growth rates**: reduces pro cyclicality of fiscal policies, vulnerability to external shocks and probability of costly crises and default
  - **Increasing growth rates:** enhanced capital market access due to enhanced creditworthiness: lower default risk by ¼ to 1/3 (Chamon and Mauro 2005)
- **For Investors**:
  - **Lower default risk**
  - **Global risk diversification** ("ultimate risk diversification"): between 50% and 75% of 5 year household income changes due to GDP variations; low correlation among country GDP growth rates.
- **Better than alternatives**:
  - Higher GDP growth stabilization and risk diversification than with global currency or TOT-indexed bond portfolios *(TOT: 10% of GDP variations, Hoffmaister & Roldos, 97*) or Portfolio Investment portfolios *(less than 10% of GDP listed)*

4. Illustrating the High Stabilizing Potential of GDP indexed bonds







Fuente: Cálculos propios, WDI, IMF.

4. Practical problems with GDP-Indexed Bonds

1. Overstated problems:
   - Pricing and premium: not really an issue (Borensztein&Mauro; Ch &Mauro)
   - Moral hazard and data manipulation: unlikely; standards.
   - "Optimal" degree of debt indexation (Shiller 1993, Durdu 2005)

2. The Real Problem: Coordination: risk diversification is limited if few countries issue!
   - Few cases: Costa Rica, Bulgaria and Bosnia (in Brady reestructuring); Argentina (in 2003 reestructuring)

3. An IMF Role: promoting the simultaneous issue of a group of small countries GDP indexed debt (Williamson, 2008)? Remember the CAC process!

Source: Mauro and Borensztein (2004). "Reviving the case for GDP-indexed bonds".