

Macroeconomic Management in Emerging-Market Economies with Open Capital Accounts

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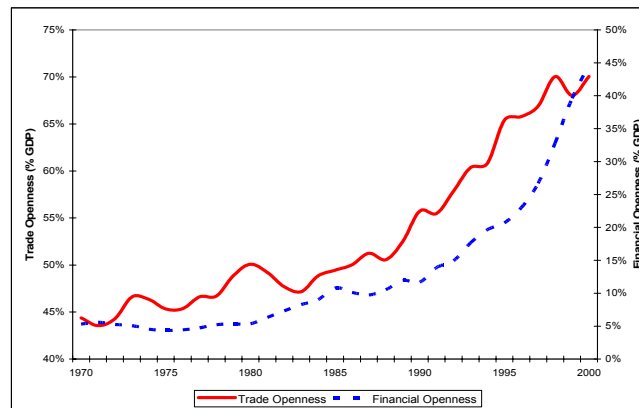
Outline

- 1. Why open capital accounts? Reaping growth and stability benefits**
 - 2. Exchange-rate and monetary regimes: A changing world**
 - 3. Counter-cyclical macro policies**
 - 4. Does inflation targeting make a difference?**
 - 5. Chile’s counter-cyclical fiscal policy**
- References**

1. Why open capital accounts? Reaping growth and stability benefits (Calderón, Loayza, and Schmidt- Hebbel 2006)

World trend of rising TO and FO

Figure 1
Trends in Openness, 1970-2000



Note: Openness measures are defined as the ratio of real exports and imports to GDP (trade) and equity-based foreign liabilities to GDP (financial). World medians are calculated from data for 76 countries.

Old issues and new findings

- World trend toward larger trade openness (TO) and financial openness (FO) leads to more integration of world goods and capital markets
- Potential gains in growth and welfare
- Literature shows non-monotonic relationship between openness and growth – yet results are neither conclusive nor systematic
- And: there is little research on external exposure
- This paper measures external exposure as sensitivity of first and second moments of growth to openness and foreign shocks
- Extends literature by estimating effects of openness, foreign shocks, and their interaction on GDP growth and growth volatility in the world.

Empirical analysis

- *We conduct two symmetrical empirical analyses for:*
 - Growth (average per capita GDP growth in 5-year periods)
 - Growth volatility (standard deviation of per capita GDP growth in 5-year periods).
- *For each of them, we measure:*
 - simple (linear) effects of openness and external shocks
 - dependence of the effect of openness on per capita GDP
 - amplification of effects of external shocks depending on openness

→ 5 tables, 18 regressions.

Sample and methodology

- Pooled data set:
 - 76 countries
 - 5-year periods, 1970-2000
- GMM estimator for panel data:
 - dynamic specifications
 - unobserved country- and time-specific effects
 - joint endogeneity.

Measures of openness

- Outcome measures of openness:
 - Trade: volume of trade / GDP
 - Financial: portfolio and FDI liabilities / GDP
- (Exogenous) Shocks:
 - Trade:
 - Terms of trade growth
 - GDP growth of trade partners
 - Financial:
 - Regional capital inflows (to ensure exogeneity)
 - Change in international interest rate
- Growth regressions: average shock
- Volatility regressions: standard deviation of shock.

Linear effects of openness and shocks

- Regression equation:

$$y_{i,t} = \beta_0' CV_{i,t} + \beta_1' OPE_{i,t} + \beta_2' EXT_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t}$$

y : either GDP growth or growth volatility

- Standard robust control variables in panel-data growth studies (CV): initial per capita GDP, education, financial depth, lack of price stability, government burden
- OPE : vector of FO and TO
- EXT : vector of ToT, trade partners' growth, capital inflows (world interest rate).

Results on linear effects of openness

			Growth	Volatility
Openness	Trade		+	+
	Financial		+	-
Shocks	Trade	ToT	+	+
		TP growth	+	+
	Financial	Cap flows	+	+

Effects of external shocks depending on openness

- Regression equation:

$$y_{i,t} = \beta_0' CV_{i,t} + \beta_1' OPE_{i,t} + \beta_2' EXT_{i,t} + \beta_3' OPE_{i,t} * EXT_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t}$$

Results on effects of external shocks depending on openness

	Growth		Volatility	
	Trade Op.	Fin. Op.	Trade Op.	Fin. Op.
ToT	↓	↑	↓	↓
TP Growth	↓	↑	↑	↓
Cap flows	↑	↓	...	↓
World rate	↑	↑	...	↓

Conclusions on FO

Financial openness:

- raises significantly and substantially growth levels
- reduces significantly and substantially growth volatility
- has significant and robust interaction effects with foreign shocks: FO amplifies growth effects of shocks (except capital flows) and dampens volatility effects of all four shock volatilities.

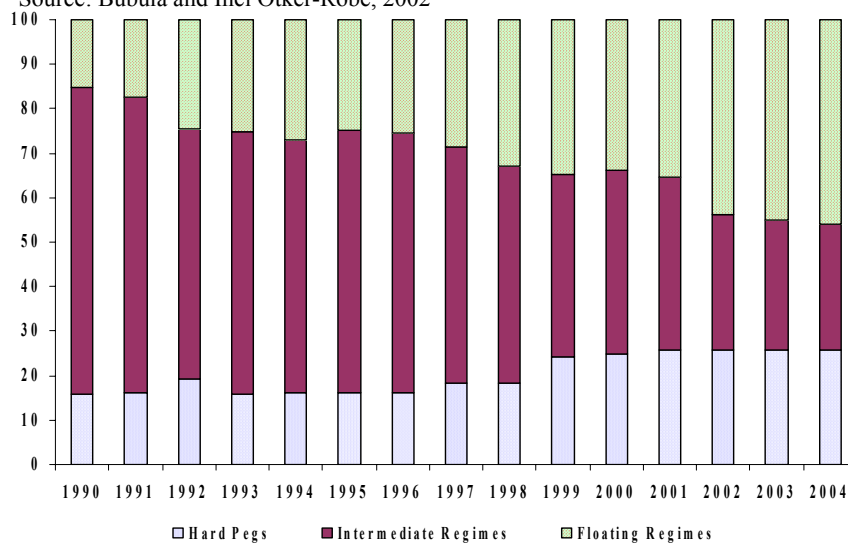
2. Exchange-rate and monetary regimes: A changing world !

Exchange-rate regimes: a shift toward the corners

The world at large and developing countries in particular are shifting away from intermediate ER regimes and toward the corners ...

Exchange-rate regimes in the world, 1990 - 2004 (*de facto*)

Source: Bubula and Inci Otter-Robe, 2002



Exchange-rate and monetary regimes

... and away from monetary and exchange-rate anchors toward inflation targeting ...

Exchange-rate and monetary regimes in the world: 2004 (1999) (*de facto*, IMF)

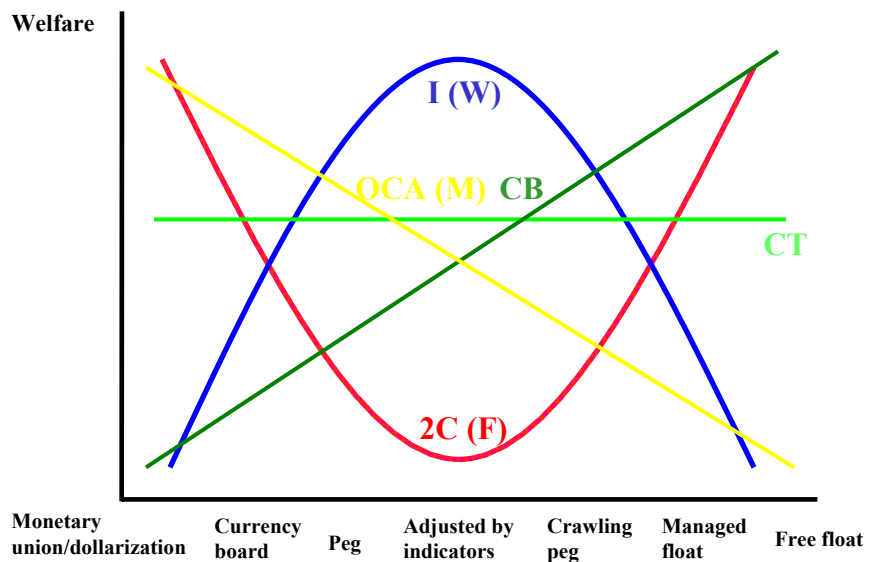
ER regime	MP Framework				Other	TOTAL
	ER anchor	Monetary aggregate target	IT framework	IMF supported or other monetary program		
Exchange arrangements with no separate legal tender	29 (26)				12 (11)	41 (37)
Currency board arrangements	7 (8)					7 (8)
Other conventional fixed peg arrangements	41 (45)					41 (45)
Pegged ER within horizontal bands	5 (6)					5 (6)
Crawling pegs	6 (5)					6 (5)
ER within crawling bands	1 (7)					1 (7)
Managed floating with no predetermined path for ER		13 (4)	4 (1)	15 (9)	19 (13)	51 (27)
Independently floating		5 (13)	17 (7)	6 (16)	7 (14)	35 (50)
TOTAL	89 (97)	18 (17)	21 (8)	21 (25)	38 (38)	187 (185)

Sources: IMF staff reports; Recent Economic Developments; and IFS

Economists' views on exchange-rate regimes

... and economists follow suit ...

Exchange-rate regimes and welfare



3. Counter-cyclical macro policies (Calderón, Duncan, and Schmidt-Hebbel, 2003, 2004)

Cyclical properties of macro policies

- Macroeconomic policies are presumably designed to stabilize business cycles
- Counter-cyclical policies are observed in industrial countries
- But cyclical properties of macroeconomic policies in emerging market economies (EMEs) are heavily disputed.

Macro policy cyclical in EMEs

- Inability of EMEs to adopt optimal (counter-cyclical) stabilization policies are hampered by:
 - *Domestic and external financial imperfection (Caballero, 2002; Caballero and Krishnamurty, 2001)*
 - *Recurring credit constraints in world capital markets, “Sudden Stops” (Calvo and Reinhart, 2000)*
 - *Political-economy constraints (Persson, 2000)*
 - *Weak institutional framework*
 - *Inappropriate exchange rate regimes*
- This results in low credibility and dynamic policy inconsistency (Calderón & Schmidt-Hebbel, 2003).

New hypothesis

- **Our prior:** Macroeconomic policies stabilize business cycle fluctuations in EMEs with stronger institutions and better fundamentals
- Differences in the cyclical stance of macro policies across EMEs could be due to differences in their levels of institutional quality
- **Our goal:** to test whether countries with strong institutions are more able to apply contractionary (expansionary) policies during booms (recessions).

Data

- Sample of 20 EMEs, 1990-2003 (annual data): 7 LAC, 7 EAP, 3 MENA, 3 SSA.
- Source: IMF's IFS, WB's WDI, ECLAC.
- *Interest rates*: Nominal discount rate or interbank interest rate. If not available, money market rate or banking rate (only CHN, IND). Expressed as $r/(1+r)$.
- *Fiscal policy*: (constant-price) fiscal balance of central government as ratio to GDP. Alternative measure: cyclical component of real public expenditure.
- *Institutions*: ICRG index = aggregate of institutional features – e.g. gov. stability, low corruption, rule of law, bureaucratic quality, democratic accountability,...

Empirical strategy

- *Monetary policy equation*: Extension of the standard policy or Taylor rule:

$$(r_{i,t} - \bar{r}_i) = \alpha_0 + \alpha_1 (r_{i,t-1} - \bar{r}_i) + \alpha_2 (\pi_{i,t} - \bar{\pi}_i) + \alpha_3 (y_{i,t} - \bar{y}_i) + \alpha_4 (y_{i,t} - \bar{y}_i) Q_{i,t} + u_{i,t}$$

- *Fiscal policy equation*:

$$(f_{i,t} - \bar{f}_i) = \beta_0 + \beta_1 (f_{i,t-1} - \bar{f}_i) + \beta_2 (y_{i,t} - \bar{y}_i) + \beta_3 (y_{i,t} - \bar{y}_i) Q_{i,t} + v_{i,t}$$

- At high level of institutions (high Q), we expect macro policies to be counter-cyclical.

Empirical strategy

- Priors:
 - *Monetary policy*: $\alpha_3 < 0, \alpha_4 > 0$
 - *Fiscal policy*: $\beta_2 < 0, \beta_3 > 0$
- Threshold level of institutions Q^* associated with neutral policy stance to the cycle. That is, $-\alpha_3/\alpha_4$ for monetary policy, and $-\beta_2/\beta_3$ for fiscal policy.
- For values of Q above (below) Q^* , policies will be counter- (pro-) cyclical.

Results on monetary policy

Table 1
Cyclical Degree of Monetary Policy
Dependent Variable: Nominal interest rate (NIR) deviations from the long-run
Estimation Method: GMM-IV System Estimator

Variable	Deterministic Mean of NIR		Stochastic Mean of NIR	
	ICRG	I3	ICRG	I3
α_3	-1.1342 (0.095)	-1.9607 (0.024)	-2.0573 (0.039)	-1.8823 (0.139)
α_4	0.0197 (0.075)	0.1285 (0.018)	0.0367 (0.029)	0.1239 (0.124)
Q^*	57.5	15.3	56.0	15.2

Numbers in parenthesis are p-values.

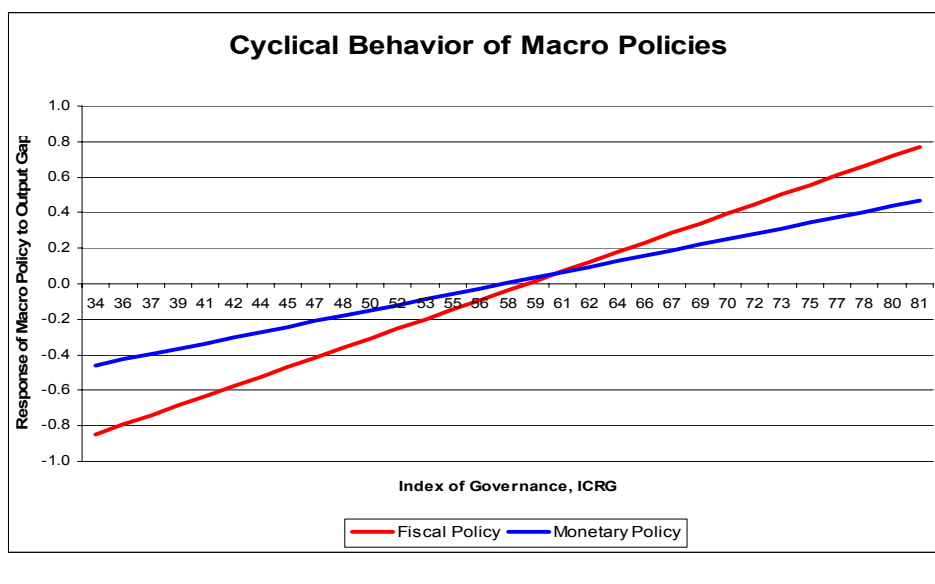
Results on fiscal policy

Table 2
Cyclical Degree of Fiscal Policy
Dependent Variable: Fiscal Balance (FB) Deviations from the long run
Estimation Method: GMM-IV System Estimator

Variable	Deterministic Mean of FB		Stochastic Mean of FB	
	ICRG	I3	ICRG	I3
β_2	-2.0256 (0.105)	-1.5478 (0.318)	-1.3947 (0.143)	-1.2942 (0.288)
β_3	0.0344 (0.078)	0.1114 (0.279)	0.0240 (0.116)	0.0931 (0.250)
Q*	57.5	15.3	56.0	15.2

Numbers in parenthesis are p-values.

Policy cyclical behavior and governance



Conclusions

- Tests whether institutions in EMEs play a role in their ability to conduct counter-cyclical policies
- Evidence in favor of our prior: Macro policies in EMEs can be counter-cyclical
- Countries with strong institutions tend to adopt FP and MP as tools to stabilize business cycles
- Countries with weak institutions tend to apply pro-cyclical macro policies.

4. Does inflation targeting make a difference? (Mishkin and Schmidt-Hebbel 2005)

Four issues

Open questions on comp. performance of ITers and NITers:

- 1. Is inflation lower under IT (Ball and Sheridan 2005), controlling for different country samples, dynamics, and IT regime endogeneity? (Mishkin and Schmidt-Hebbel 2002)**
- 2. Do monetary policy and macro variables respond differently to shocks under IT?**
- 3. How has monetary policy efficiency changed under IT?**
- 4. Are ITers more accurate in hitting inflation targets than NITers in achieving stable inflation?**

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Our empirical approach

- 1. Compare 21 industrial and EM ITers before and after adoption of IT to stringent control group of 13 successful industrial NITers (U.S., Japan, and 11 European countries)**
 - 2. Distinguish 2 IT regimes: Converging and Stationary ITers**
 - 3. Test for differences in group behavior of:**
 - (i) pre-IT vs. post-IT for ITers,**
 - (ii) ITers vs. NITers,**
 - (ii) converging and stationary ITers, and**
 - (iv) industrial and emerging-market economies,**
- using panel estimations, panel VARs, and impulse responses**
- 4. Use high-frequency quarterly data for 1989-2004.**

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Summary of Results

- **IT helps countries achieve over time:**
 - 1. lower inflation levels in the long run**
 - 2. smaller response to oil price and exchange rate shocks**
 - 3. stronger monetary independence**
 - 4. better macroeconomic performance (lower volatilities) and improved monetary policy efficiency**
 - 5. inflation levels closer to inflation objectives.**
- **Some benefits are larger after targets become stationary and certainly industrial-country ITers generally reflect larger gains and/or better performance than EME ITers.**
- **In general ITers do not do better than industrial-country NITers. However, industrial-country ITers perform at the level of our very demanding sample of 13 NITers.**

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5. Chile's counter-cyclical fiscal policy

Chile's structural fiscal balance rule

- Structural fiscal balance is determined according to structural or permanent changes of selected government expenditure and revenue items or of their determinants
- Government structural balance reflects the budgetary balance level that would be observed if the economy were on its trend or full-employment path
- Since 2001, Chilean fiscal policy targets each year an actual expenditure path that is consistent with maintaining a structural fiscal surplus of 1% of GDP.

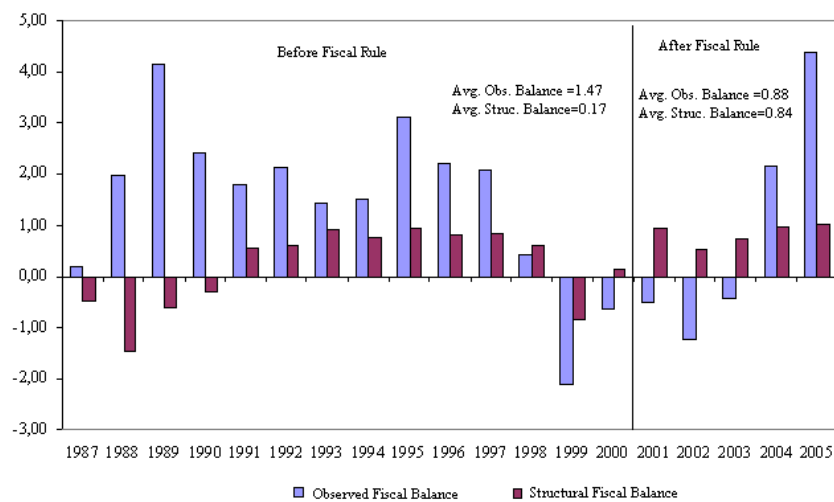
Chile's structural fiscal balance rule

- Structural balance rule isolates aggregate government spending from the cyclical effects of two key macroeconomic variables that determine government revenue:
 - Domestic GDP
 - International price of copper
- Under this rule, fiscal policy is strongly counter-cyclical, beyond the influence of traditional automatic stabilizers
- Fiscal policy is more predictable and stable than under alternative rules, avoiding costly adjustment of public expenditure over the business and/or copper cycle.

Chile's structural fiscal balance rule

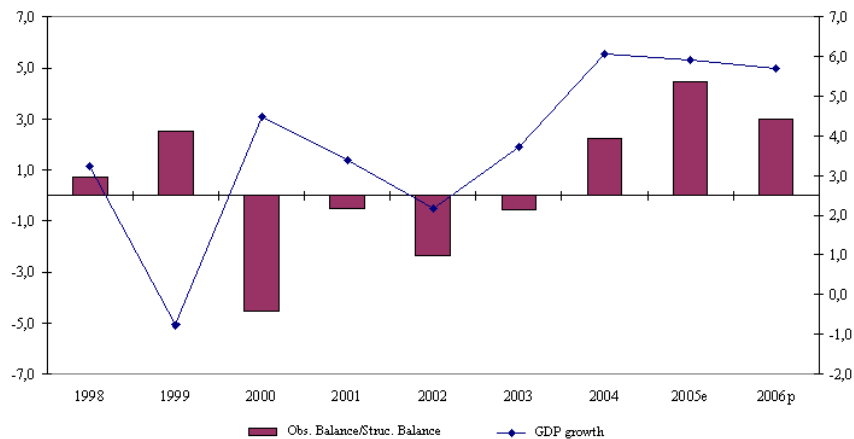
- The structural surplus level of 1% of GDP was established to allow government asset built-up to face trend rise in:
 - minimum and welfare pensions
 - minimum-revenue guarantees issued to private infrastructure concessions
 - government guarantee on bank deposits
 - quasi-fiscal losses of the Central Bank.
- Fiscal surpluses (from high copper prices) are invested abroad to contribute to portfolio diversification and avoid exchange-rate appreciation from peso conversion.

Chile's central government fiscal balance (1987-2005)



Counter-cyclicality of fiscal policy in Chile

Observed fiscal balance/Structural balance gap
and GDP growth, 1998-2006(p)



Conclusions

Chile's structural fiscal policy rule has contributed to:

- stabilizing government expenditure consistent with permanent-income behavior
- stabilizing output and inflation
- avoiding exchange-rate appreciation from peso spending and peso saving of high foreign exchange earnings during copper-price boom (2005-06) -- hence minimizing Dutch-disease effects,
- strengthening government solvency, and
- raising government creditworthiness and lowering country sovereign risk (two-notch debt rating upgrade by Moody's on July 6).

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References

References

- C. Calderón, R. Duncan, and K. Schmidt-Hebbel: “The Role of Credibility in the Cyclical Properties of Macroeconomic Policies in Emerging Economies”, **Review of World Economics**, 140 (4): 613-33, 2004.
- C. Calderón, R. Duncan, and K. Schmidt-Hebbel: “Institutions and Cyclical Properties of Macroeconomic Policies”, **Central Bank of Chile manuscript**, 2004.
- C. Calderón, N. Loayza, and K. Schmidt-Hebbel: “External Conditions and Growth Performance”, in R. J. Caballero, C. Calderón, and L. F. Céspedes (editors): **External Vulnerability and Preventive Policies**. Central Bank of Chile, 2006.
- Calderón, C. and K. Schmidt-Hebbel, K. (2003): “Macroeconomic Policies and Performance in Latin America,” **Journal of International Money and Finance** 22, 895-923.
- Mishkin, F.S. and K. Schmidt-Hebbel (2005): “Does IT make a Difference?”, **presented at Central Bank of Chile Conference on Monetary Policy under Inflation Targeting**, Santiago, October 2005.

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