Monetary and Exchange Rate policies for Economic Development

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Main message

1. The RER is a key relative macro price for economic development and employment
2. Macroeconomic policy can influence the RER
3. Plan of the presentation
   - An important problem: *central banking*
   - Empirical evidence on the relationship RER—growth
   - Mechanisms
   - Policy issues: RER management

1. Mainstream macro-policy and the RER

Mainstream macro-policy in developing countries

- Vision: The best contribution that macroeconomic policy can do to economic development is provide stability: 1) low inflation; 2) fiscal balance; 3) non-explosive balance of payments.
- The preferred macro-policy regime is **FIT** (Floating + Inflation Targeting)
  - **Inflation targeting**
    - ★ Taylor rule but with a heavy weight on the nominal exchange rate
  - **Free floating**
    - ★ It is actually not such; central banks *fear of floating* and thus managed their exchange rate.
- Due to their (almost) exclusive focus on inflation, monetary policy leads to:
  - An RER overvaluation *bias* (Libman, 2016)
  - High exchange rate volatility
- **RER overvaluation** and **volatility** are **bad for economic development/growth**

2. The RER and Economic Growth: Empirical Evidence

Empirical evidence: Growth Regressions

- Several econometric studies have found a **positive** association between RER levels and economic growth and a **negative** association between RER volatility and economic growth. The associations have been especially relevant for **developing countries**.

- The most common empirical strategy has been to run growth regressions of the Barro-type:

$$growth_{it} = \alpha_0 + \alpha_1 \ln y_{it-1} + \beta \ln Underval_{it} + kX_{it} + v_{it}$$

with $Underval = RER/RER^*$. The **main hypothesis** is that $\beta > 0$.

- RER^* is either estimated as a **PPP** adjusted for the **Balassa-Samuelson effect** or as a **fundamental equilibrium RER**.

PPP adjusted : $\quad \ln RER_{it} = \gamma_0 + \gamma_1 \ln y_{it} + \varepsilon_{it}$

FERER: $\quad \ln RER_{it} = \delta_0 + \delta_1 \ln y_{it} + \rho Z_{it} + e_{it}$

Empirical evidence: Main findings

1. A long list of growth-regression studies have found a **positive association** between *RER levels* and *economic growth*

2. Evidences suggests that:

   1. The association is stronger for **developing countries**.
   2. The effect is symmetric: *overvaluation hurts growth* and *undervaluation accelerates growth*.
   3. RER **volatility** affects growth **negatively**.
   4. The finding is robust to changes in the independent variable [as well as the dependent variable
   5. The finding is robust to changes in: i) the estimation methodology: cross-section, panel data, dynamic panels (GMM), cointegration panels, non-linear techniques), ii) periods, iii) regions, iv) extreme values.

Dependent variable: GROWTH (GDP per capita growth)[a,b]

	(1) Baseline	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Ln RGDPCH$_{t-1}$	-0.030***	-0.047***	-0.051***	-0.059***	-0.038***	-0.100***	-0.032***	-0.032***	-0.032***
	(-6.57)	(-8.90)	(-9.29)	(-8.77)	(-4.61)	(-4.20)	(-6.92)	(-6.93)	(-7.07)
Ln UNDERVAL	0.015***	0.010***	0.007**	0.008**	0.003	0.025	0.086***	0.409***	3.179***
	(4.44)	(2.72)	(2.12)	(1.97)	(0.49)	(1.27)	(3.53)	(2.88)	(3.39)
Government Consumption (share of GDP)		0.011	0.010	0.091*	-0.119**	-0.155**			
		(0.23)	(0.23)	(1.77)	(-2.15)	(-2.00)			
Ln (CPI$_t$/CPI$_{t-1}$)		-0.005***	-0.004***	-0.005***	-0.003**	-0.013***			
		(-4.21)	(-4.04)	(-5.12)	(-2.24)	(-2.65)			
Gross Domestic Saving (Residuals)		0.126***	0.117***	0.111***	0.103***	0.103*			
		(5.76)	(5.61)	(6.13)	(2.60)	(1.89)			
Openness (Exports+Imports as share of GDP)			0.025***	0.022**	0.020*	-0.009			
			(3.16)	(2.46)	(1.75)	(-0.57)			
Ln (RER volatility)			-0.003**	-0.003**	-0.002	0.001			
			(-2.21)	(2.51)	(-1.50)	(0.31)			
Average years of Education				0.004**					
				(2.13)					
Ln Terms of Trade					0.002				
					(0.29)				
Rule of Law						-0.001			
						(-0.15)			
Ln (RGDPCH)xLn(UNDERVAL)							-0.0088***	-0.088**	-1.129***
							(-3.04)	(-2.58)	(-3.26)
(Ln(RGDPCH)^2) xLn(UNDERVAL)								0.0048**	0.133***
								(2.35)	(3.16)
(Ln(RGDPCH)^3) xLn(UNDERVAL)									-0.005***
									(-3.08)
Time Dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country Dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
Adjusted R-squared	0.34	0.52	0.53	0.58	0.55	0.69	0.348	0.351	0.360
Number of countries	181	155	155	98	117	151	181	181	181
Observations	1303	856	853	548	451	293	1303	1303	1303

[a] Robust t statistic are in parentheses, *p<0.10, **p<0.05, ***p<0.01
[b] All regressions exclude observations for Iraq, Democratic Rep. of Korea and Laos

Dependent variable: GROWTH (GDP per capita growth)[a,b]

	(1) RGDPCH <$2,500	(2) RGDPCH <$4,000	(3) RGDPCH <$6,000	(4) RGDPCH >$6,000	(5) RGDPCH >$8,000	(6) RGDPCH >$9,000	(7) RGDPCH >$11,000	(8) RGDPCH >$12,000	(9) RGDPCH >$15,000	(10) RGDPCH >$16,000
Ln RGDPCH$_{t-1}$	-0.052	-0.044	-0.039	-0.054	-0.059	-0.057	-0.065	-0.067	-0.073	-0.077
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ln UNDERVAL	0.035	0.030	0.024	0.002	0.012	0.016	0.030	0.031	0.027	0.025
(p-value)	(0.000)	(0.000)	(0.000)	(0.812)	(0.185)	(0.091)	(0.005)	(0.009)	(0.082)	(0.153)
Time Dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country Dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Number of countries	80	108	131	90	72	67	56	52	46	43
Observations	451	624	790	513	404	373	309	289	216	196

[a] Robust p-values are in parentheses

[b] All regressions exclude observations for Iraq, Democratic Rep. of Korea and Laos

Figure :

Dependent variable: GROWTH (GDP per capita growth)[a,b]

	(1) Baseline	(2)	(3)	(4)	(5)	(6) 1950-1979	(7) 1980-2004
Ln RGDPCH (t-1)	-0.031***	-0.054***	-0.047***	-0.068***	-0.114***	-0.067***	-0.060***
	(-8.08)	(-8.08)	(-4.89)	(-6.74)	(-4.53)	(-5.68)	(-6.22)
Ln UNDERVAL	0.018***	0.023***	0.018***	0.017***	0.022	0.030***	0.013**
	(4.60)	(4.46)	(2.60)	(2.62)	(1.13)	(5.13)	(1.98)
Government Consumption (share of GDP)		-0.064	-0.088*	0.006	-0.176**		
		(-1.65)	(-1.72)	(0.11)	(-2.10)		
Ln (CPI$_t$/CPI$_{t-1}$)		-0.004***	-0.002**	-0.004***	-0.011**		
		(-3.58)	(-2.37)	(-3.80)	(-2.01)		
Gross Domestic Saving (Residuals)		0.118***	0.082**	0.144***	0.160***		
		(4.46)	(2.16)	(5.62)	(2.99)		
Openness (Exports+Imports as share of GDP)		0.017**	0.022*	0.017	-0.007		
		(2.11)	(1.92)	(1.61)	(-0.40)		
Ln (RER volatility)		-0.003**	-0.001	-0.003	-0.002		
		(-2.24)	(-0.59)	(-1.61)	(-0.56)		
External Debt (share of GNI)		-0.018***	-0.022**	-0.020**	0.014		
		(-3.15)	(-2.50)	(-2.28)	(0.99)		
Ln Terms of Trade			-0.001				
			(-0.13)				
Average years of Education				-0.001			
				(-0.23)			
Rule of Law					-0.004		
					(-0.59)		
Time Dummies	yes	yes	yes	yes	yes	yes	yes
Country Dummies	yes	yes	yes	yes	yes	yes	yes
Adjusted R-squared	0.32	0.55	0.58	0.56	0.72	0.58	0.40
Number of countries	158	112	85	66	110	128	158
Observations	1077	540	332	315	213	371	706

[a] Robust t statistic are in parentheses, *p<0.10, **p<0.05, ***p<0.01

[b] All regressions exclude observations for Iraq, Democratic Rep. of Korea and Laos

Figure :

Dependent variable: GROWTH (GDP per capita growth)[a,b]

	Excluding countries with low quality data				-1<lnUnd<1	0.8<lnUnd<0.8	0.6<lnUnd<0.6
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ln RGDPCH$_{t-1}$	-0.027***	-0.029***	-0.028***	-0.028***	-0.032***	-0.033***	-0.036***
	(-6.85)	(-7.28)	(-7.15)	(-7.30)	(-7.00)	(-7.13)	(-7.35)
Ln UNDERVAL	0.013***	0.080***	0.359**	3.914***	2.365**	3.062**	3.703**
	(3.67)	(3.14)	(2.56)	(4.65)	(2.39)	(2.16)	(2.39)
Ln (RGDPCH)xLn(UNDERVAL)		-0.008***	-0.076***	-1.397***	-0.828**	-1.075**	-1.314**
		(-2.75)	(-2.26)	(-4.46)	(-2.27)	(-2.09)	(-2.36)
(Ln(RGDPCH)^2) xLn(UNDERVAL)			0.004**	0.165***	0.097**	0.126**	0.155**
			(2.03)	(4.33)	(2.19)	(2.04)	(2.34)
(Ln(RGDPCH)^3) xLn(UNDERVAL)				-0.006***	-0.004**	-0.005**	-0.006**
				(-4.22)	(-2.13)	(-2.01)	(-2.34)
Time Dummies	yes	yes	yes	yes	yes	yes	yes
Country Dummies	yes	yes	yes	yes	yes	yes	yes
Adjusted R-squared	0.33	0.336	0.339	0.354	0.38	0.38	0.41
Number of countries	130	130	130	130	179	177	167
Observations	1004	1004	1004	1004	1270	1229	1125

[a] Robust t statistic are in parentheses, *p<0.10, **p<0.05, ***p<0.01

[b] All regressions exclude observations for Iraq, Democratic Rep. of Korea and Laos

Figure :

Empirical evidence: Other methodologies

1. Evidence of a positive association between RER and growth also comes from other type of studies
   1. Indirect measures: FX reserve accumulation, FX intervention, Foreign savings, Capital accumulation.
   2. Studies on growth surges, export surges, investment surges.
   3. Comparative and case studies: South East Asia vs. Latin America; within Latin America.

3. The channels

Two main channels

- The literature has identified two main channels:

1. The "macro-prudential" channel

A higher RER leads to lower foreign saving, which reduces external fragility and the likelihood of sudden-stops and crises in developing countries.

2. The "tradable-led-growth" channel

A higher RER leads to higher profit rates in tradable *labor-intensive* activities and foster structural change, employment growth and economic development.

The "macro-prudential" channel

- International capital markets operate with many imperfections that lead to instability and crises, which can jeopardize long-term economic performance $=>$ Capital flows management.

- Countries that run current account deficits and RER overvaluation are prone to sudden-stops and BP crises (many times leading to twin and triple crises).
  - ► Latin America post-disinflation programs in the 1980s and 1990s
  - ► South East Asia post-liberalization experiences in the 1990s
  - ► EMU countries post-2008.

- Running current account surpluses (or small deficits), maintaining above-equilibrium RERs and accumulating FX reserves reduces macroeconomic volatility and the chances of sudden-stops and crises. This affects long-term growth positively.
  - ► **The RER is an instrument macro-prudential policy**.

Foreign savings and growth

Ahorro externo y crecimiento
20 economías emergentes entre 1975 y 2002
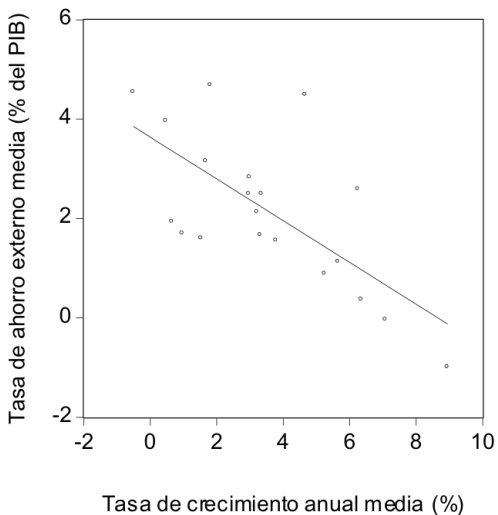
The "tradable-led-growth" channel

- This mechanism perceives economic development as a process characterized by a rapid and intense structural transformation the economy, mobilizing resources (capital and labor) from low-productivity to high-productivity activities, which are largely tradable.
- This channel can be seen as comprising three broad elements:
  1. Modern tradable activities are intrinsically more productive or operate under some sort of increasing returns to scale.
  2. Given this trait, the reallocation of (current and future) resources to these activities – i.e. structural change – accelerates GDP per capita growth.
  3. Accumulation in these activities depends on their profitability, which in turn depends on the level of the RER. Rapid capital accumulation requires a sufficiently competitive (high) RER to compensate for the market failures caused by the increasing returns.
- This kind of activities has traditionally been associated with manufactures, but there is now recognition that tradable services are also part of this group.
  - **The RER is an instrument of industrial policy.**

4. Policy Issues

Managing the RER I

1. The goal of a Stable and Competitive real exchange rate (SCRER) strategy is to provide (modern) tradable firms incentives sufficiently stable and durable to induce investment. This may likely require managing the RER beyond the short run.

2. Targeting a SCRER beyond the short run is a strategy that has a long-run goal – i.e. to accelerate growth – but needs to be compatible with the conventional short-run goals of macroeconomic policy: **internal** and **external balances**.

3. Achieving **external balance** does not seem problematic under a SCRER strategy.

   - Running current account deficits and surpluses is not symmetrical. The former is *unsustainable* (and probably desirable or "*optimal*") and the latter *sustainable* but may be *suboptimal*.
   - Intertemporal assessment —accumulate foreign assets while develop first and later spend those assets once developed— seems highly positive

Managing a the RER II

- **Monetary** and **exchange-rate** policies together: It is usually argued that exchange rate policy is not an option for an emerging market due to the constraint posed by the *trilemma*. However, a country targeting a SCRER would likely face and **excess supply of FX**. In such a case, the trilemma may not be binding
  - The government could carry out **sterilized FX interventions**. Two instruments: 1) FX interventions for the ER and 2) sterilization for the interest rate.
  - If they imply a moderate **quasi-fiscal cost**, pay it. John. Williamson
  - If too high, combine **capital controls** and **fiscal policy** to manage domestic absorption counter-cyclically.

- **Inflationary pressures** may arise even if macro-policy is adequately coordinated to manage domestic demand.
  - Try social pact and wage coordination: win-win inter-temporally but short-run losses.

Appendix

RER variation vs. RER level effects

RER *variations* and output *level* : a rise (fall) of the RER usually leads to a contraction (expansion) in the output level due to a rise (fall) in the real wage and thus in households spending. The balance-sheet effect goes in the same direction. This is a short-run relationship.

RER *level and volatility* and *rate of change* of output: A high and stable (low and volatile) RER level accelerates (decelerates) —through mechanisms discussed below— the rate of economic growth. As a result, income and real wages end up being higher. This is medium/long-run relationship.

Conclusion

Don´t confuse DEVALUATION with UNDERVALUATION!

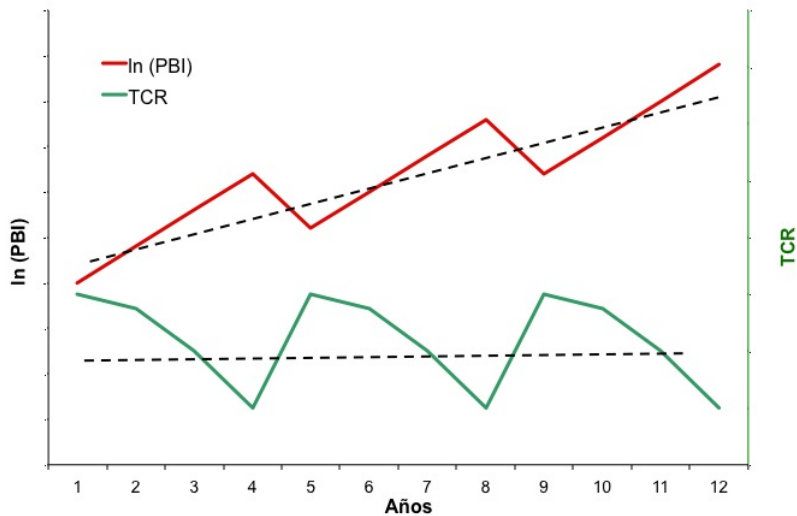# The RER and output in the short run

Figure : Short run

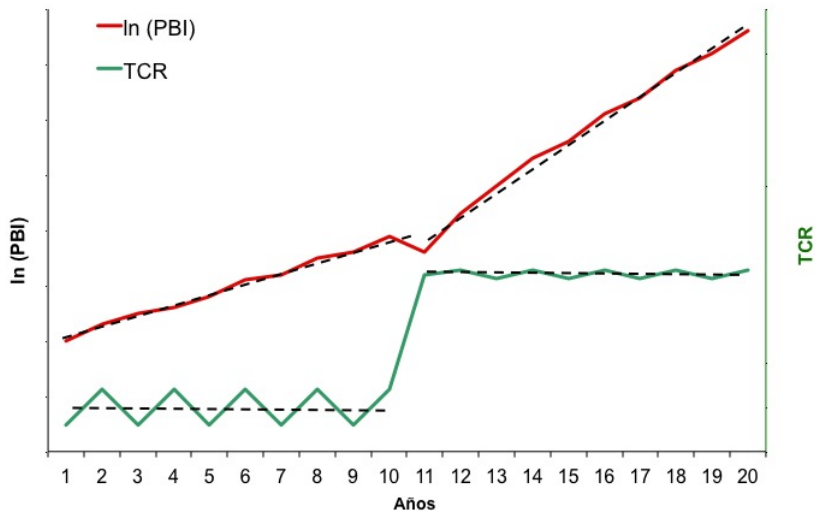# The RER and output in the medium/long run

Figure : Medium/long run

The RER and industrial policy

1. Economists tend to agree that development involves the mobilization of resources (capital and labor) from low-productivity (backward) to high-productivity (modern) sectors.

2. This does not happen "naturally" because market failures make modern activities non-profitable under "equilibrium" prices.

3. Industrial policy provide transitory extra profits (or rents) to induce capital accumulation in those activities.

4. If they are 1) tradable and 2) labor-intensive, the rate of profit is:

- $r = \frac{\Pi}{P_K K} = \frac{P_Y Y(1+s-t) - \sum w_j R_j - i P_Y D}{P_K K} = \frac{P_Y}{P_K} a_K (1+s-t-\alpha_L \frac{W}{P_Y} - \alpha_R \frac{P_R}{P_K} - \alpha_D \frac{P_Y}{P_K} i)$

- $r = \frac{P_Y}{P_K} a_K (1+s-t-\alpha_L \frac{W}{P_Y} - \alpha_R \frac{P_R}{P_K} - \alpha_D \frac{P_Y}{P_K} i)$

- $r_T = a_K (1+s-t-\alpha \frac{1}{q} - \alpha_R - i\alpha_D)$

- The RER is part of the industrial policy arsenal. Its choice should depend on the efficacy-cost trade-off. It is market-friendly, but is regressive and hard to manage.