Currency Misalignment, Export Prices and Growth in the Manufacturing Sector

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Outline

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  - Indicator (2) – RER misalignment
- Results
- Conclusions

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Motivation

Conflicting views on RER undervaluation

- Is currency undervaluation good or bad for growth?
- … good, by making the economy competitive and enhancing exports
  - Competitive devaluation
  - Symmetric
- … bad, because resource allocation is not consistent with fundamentals
  - "Washington Consensus" (Williamson, 1990)
  - Asymmetric; non-linear

Mixed results: RER undervaluation has …

- No (convincingly) significant effect
  - Razin and Collins (1999); Nouira and Sekkat (2012)
- Negative growth effect
  - Schröder (2013)
- Negative effect when the size is large
  - Aguirre and Calderón (2005); Couharde and Sallenave (2013)
- Positive effect on economic growth
  - Berg and Miao (2010); Béreau *et al*. (2012)

What is done in this analysis

- Uses different misalignment measures
  - Two measures based on PPP, the other three related to the IMF EBA framework
- Takes the non-linearity into account
- Focuses on the manufacturing sector
  - Mitigates an issue of endogeneity (Eichengreen, 2008)
- Includes price differentials in export activities
  - Buffer against negative impacts
  - Profitability

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Empirical Specification

Model (1)

- **Main specification:**

$$\ln y_{i,c,t} - \ln y_{i,c,t-1} = \alpha_1 \ln y^{ppp}_{i,c,t-1} + \alpha_2 p_{i,c,ma(4)} + \alpha_3 mis_{c,t-1} + \alpha_4 mis^2_{c,t-1} + \alpha_5 \left(p_{i,c,ma(4)} \times mis_{c,t-1} \right) + \alpha_6 \left(p_{i,c,ma(4)} \times mis^2_{c,t-1} \right) + \delta dummies + \varepsilon_{i,c,t}$$

$y_{i,c,t}$: real value-added in industry *i*, country *c*, year *t*

$p_{i,c,ma(4)}$: relative export price (moving average of values in years *t*-3, *t*-2, *t*-1 and *t*)

$mis_{c,t-1}$: measure of RER misalignment

- **Non-linearity is captured by the quadratic terms**

Model (2)

- Quadratic terms, α_4 and α_6, determine the estimated curve
- When the predicted growth (y-axis) and misalignment (x-axis) are plotted…,
  - If asymmetric view: Concave (inverted U-shaped)
  - If symmetric view: Little bent or convex
- Significant coefficient, α_6, indicates the existence of interactive effect

Data

- 88 countries and 57 industries over the period of 1995–2010 (annual)
- Industry classification: ISIC Rev. 3 (3-digit-level data)
- Data sources:
  - UNIDO INDSTAT 2013 edition
  - UN Comtrade
  - A number of country-level data (e.g., IMF WEO; World Bank ICP and WDI; PWT)

Indicator (1) – relative export price

- Unit value ratio
  - Unit value = value / quantity (kg-equivalent)
- Bilateral basis, then aggregated with export weight
- Expressed in log
  - Negative = price lower than the competitors
- Partly reflects the product quality, but a rough proxy
  - Reviewed in Hallak and Schott (2011); Henn *et al.* (2013)

Indicator (2) – RER misalignment

- Five misalignment measures
- Two based on PPP
  - PWT
  - Big Mac Index, *The Economist*
- Three measures related to the IMF EBA concept
  - REER Filtering
  - External Sustainability Approach
  - EBA Current Account Analysis

PPP – PWT and Big Mac Index

- **Equations estimated:**

$$\ln rer_{c,t} = \alpha + \beta \ln y_{c,t} + \gamma_t + u_{c,t} \quad (PWT)$$

$$\ln rer_c = \alpha + \beta \ln y_c + u_c \quad (Big\ Mac\ Index)$$

$rer_{c,t}$: real exchange rate in country c, year *t*

$y_{c,t}$: PPP-adjusted GDP per capita (Balassa-Samuelson effect)

- **Difference between actual and predicted values**
  - **PWT: undervaluation**
  - **Big Mac Index: overvaluation**

IMF EBA framework

- Three methods
- Current account analysis
  - Macroeconomic balance / FEER
  - "EBA Current Account Analysis"
- REER analysis
  - Equilibrium RER / BEER
  - "REER Filtering"
- External sustainability approach
  - External sustainability / NATREX
  - "External Sustainability Approach"

REER Filtering

- Deviation between actual REER and its long-run trend
  - Obtained by Hodrick-Prescott (HP) filter
- Unlike EBA/BEER, no regression estimations
- Country-specific calculation

External Sustainability Approach (1)

- Compare two current account balances
  - Expected over the medium-term
  - Stabilizing NFA position at a benchmark level
- The second term, cab^s, is defined as:

$$cab^{s}_{c,t} = \frac{g^{p_t}_{c,t+5}}{1+g^{p_t}_{c,t+5}} \cdot nfa_{c,t-1}$$

$nfa_{c,t-1}$: net foreign assets as a share of GDP in country *c*, year *t-1*

$g_{c,t+5}$: growth rate of nominal GDP in US dollars five year ahead, projected in IMF WEO in year *t* (p^t)

External Sustainability Approach (2)

- Misalignment, *mis*, is obtained from:

$$mis_{c,t}^{es} = \left[\frac{1}{\eta_{c,t}} \cdot \left(cab_{c,t+5}^{p_t} - cab_{c,t}^{s} \right) \right] - mc_t$$

$cab_{c,t+5}$: current account balance as a share of GDP in country c, year *t*+5, as projected in WEO in year *t*

$\eta_{c,t}$: trade elasticity (export: -0.71, import: 0.92)

$$\eta_{c,t} = \eta^{xp} \cdot xp_{c,t+5}^{p_t} - \left(\eta^{mp} - 1 \right) \cdot mp_{c,t+5}^{p_t}$$

mc_t : multilateral consistency adjustment term (Isard and Faruqee, 1998; Vitek, 2014)

EBA Current Account Analysis

- Equation is:

$$cab_{c,t} = \alpha + \beta \cdot policy + \gamma \cdot nonpol + v_{c,t}$$

$cab_{c,t}$: current account balance as a share of GDP
policy : policy-related variables
nonpol : non-policy fundamentals and cyclical factors

- Policy variables
  - Cyclically-adjusted fiscal balance
  - Change in foreign exchange reserves
  - Change in private sector credit
  - Capital control

EBA – normative evaluation

- Current account gap, cab^g, is:

$$cab_{c,t}^{g} = \sum_{j=1}^{4} \beta_j \cdot \left[\left(policy_{j,c,t} - policy_{j,c,t}^{wld} \right) - \left(policy_{j,c,t}^{*} - policy_{j,c,t}^{*wld} \right) \right] + v_{c,t}$$

policy* : benchmark level of policy-related variables

$policy^{wld}$: policy variables in other countries

- Misalignment, *mis*, is defined as:

$$mis_{c,t}^{eba} = \left(\frac{1}{\eta_{c,t}} \cdot cab_{c,t}^{g} \right) - mc_{c,t}$$

Identifying policy* (1)

- Cyclically-adjusted fiscal balance
  - WEO vintages
  - Benchmark in year *t*: cyc.-adj. fiscal balance for year *t* projected in WEO *t*-5
  - Not desirable level but the one could have been reached
- Change in foreign exchange reserves
  - Reserve adequacy ratio > 150% → 0
  - Ratio < 100% and change in reserves < 0 → 0
  - Otherwise → actual change

Identifying policy* (2)

- Change in private sector credit
  - Long-run trend obtained by HP filter
  - Deviation from it as financial policy gap
- Capital control
  - Whichever smaller: actual level or cross-country sample average in each year
  - For capital account openness, whichever larger is chosen

Correlation

Table 5. Correlation between RER misalignment measures

	PWT PPP	REER Filtering	ES Approach	EBA CA Analysis	Big Mac Index
PWT PPP	1.000 8,104				
REER Filtering	-0.123*** 4,469	1.000 5,500			
External Sustainability Approach	0.028 3,122	0.049*** 3,619	1.000 3,752		
EBA Current Account Analysis	-0.111*** 1,646	0.144*** 1,825	0.279*** 1,831	1.000 1,845	
Big Mac Index	-0.521*** 445	0.228*** 558	-0.023 558	0.100** 478	1.000 558

Note: The numbers of observations are presented below the corresponding coefficients. ** and *** denote statistical significance at the 5 percent and 1 percent levels, respectively. From each misalignment measure, observations at the top and bottom 1 percent of the distribution are dropped, unless they are smaller than 100 percent in the case of the top segment and greater than -100 percent in the bottom part.

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Results

Main specification

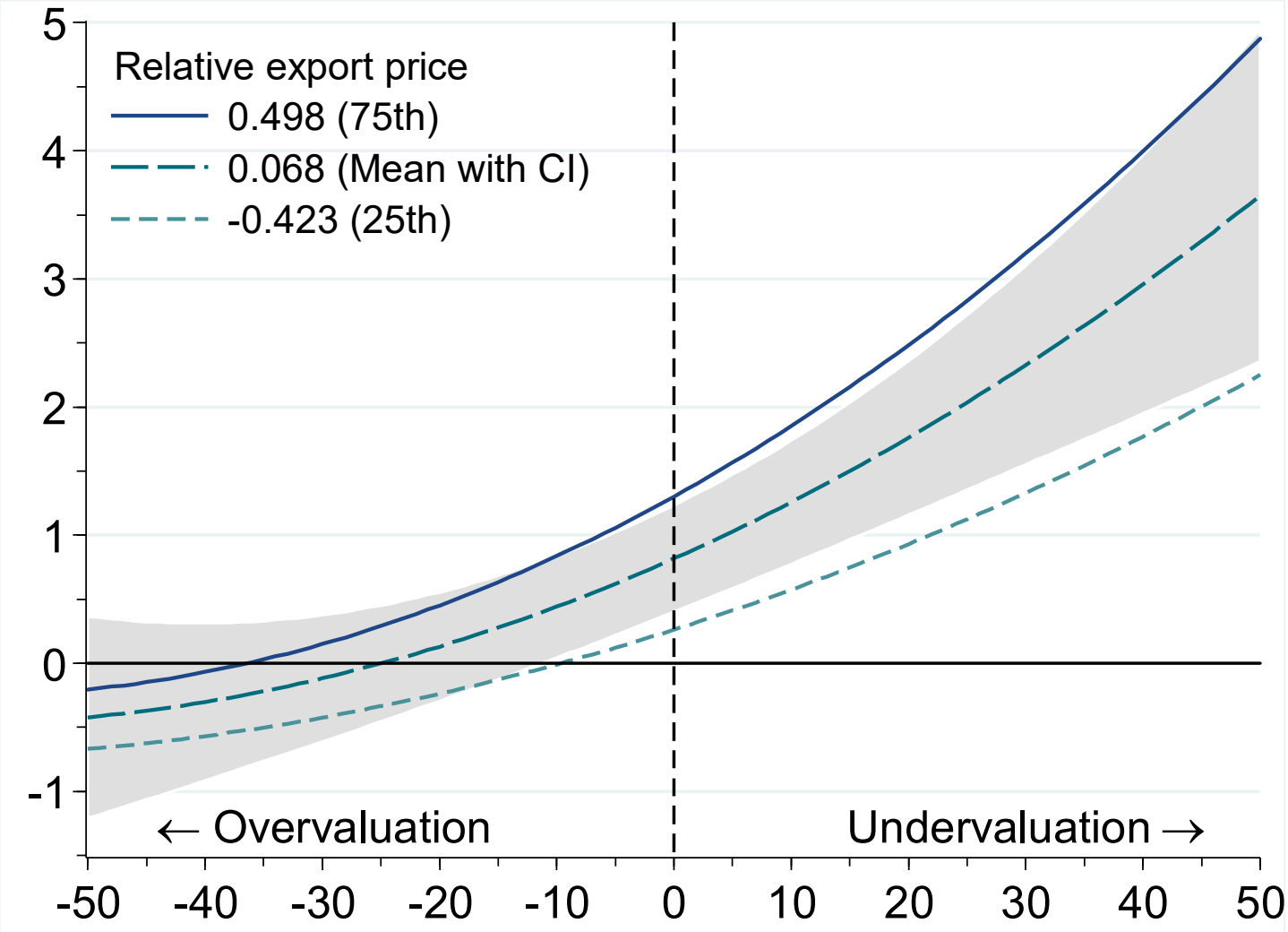
Table 2. Results with PWT misalignment measure

	[1]	[2]	[3]	[4]
Real value added, PPP (*t*-1)	-18.818	-18.802	-18.842	-18.842
(2011 international dollars, in logs)	[0.445]***	[0.445]***	[0.445]***	[0.444]***
Relative export price (MA(4))	1.329		1.421	1.129
(unit value ratio, in logs)	[0.418]***		[0.424]***	[0.459]**
RER undervaluation (*t*-1)	0.032	0.030	0.033	0.039
(percent)	[0.009]***	[0.009]***	[0.009]***	[0.010]***
RER undervaluation, squared		0.205		0.304
(percent, in thousands)		[0.130]		[0.137]**
RER undervaluation			0.018	0.023
× Relative export price			[0.007]**	[0.008]***
RER undervaluation, squared				0.219
× Relative export price				[0.132]*
Number of observations	34,035	34,035	34,035	34,035
Number of countries	88	88	88	88
Number of industries	57	57	57	57
R^2	0.33	0.33	0.33	0.33

Note: Robust standard errors are presented in brackets below the corresponding coefficients. *, ** and *** denote statistical significance at the 10 percent, 5 percent and 1 percent levels, respectively. All estimations include country-industry, industry-year, country, industry and year dummies but the coefficients are not reported.

Graphically presented

Figure 1. Growth effect of RER misalignment



Note: On the vertical axis, the predicted growth rate (in percent) is presented. The horizontal axis shows RER undervaluation (in percent) and ranges from the 5th to the 95th percentiles or from –50 to 50 if the 5th (95th) percentile is smaller (greater) than –50 (50) percent. The shared area is the 95 percent confidence interval (CI) for the curve computed with the average value. Initial output and dummy variables are fixed at the average levels.

Source: Author's calculations.

Using alternative misalignment measures…

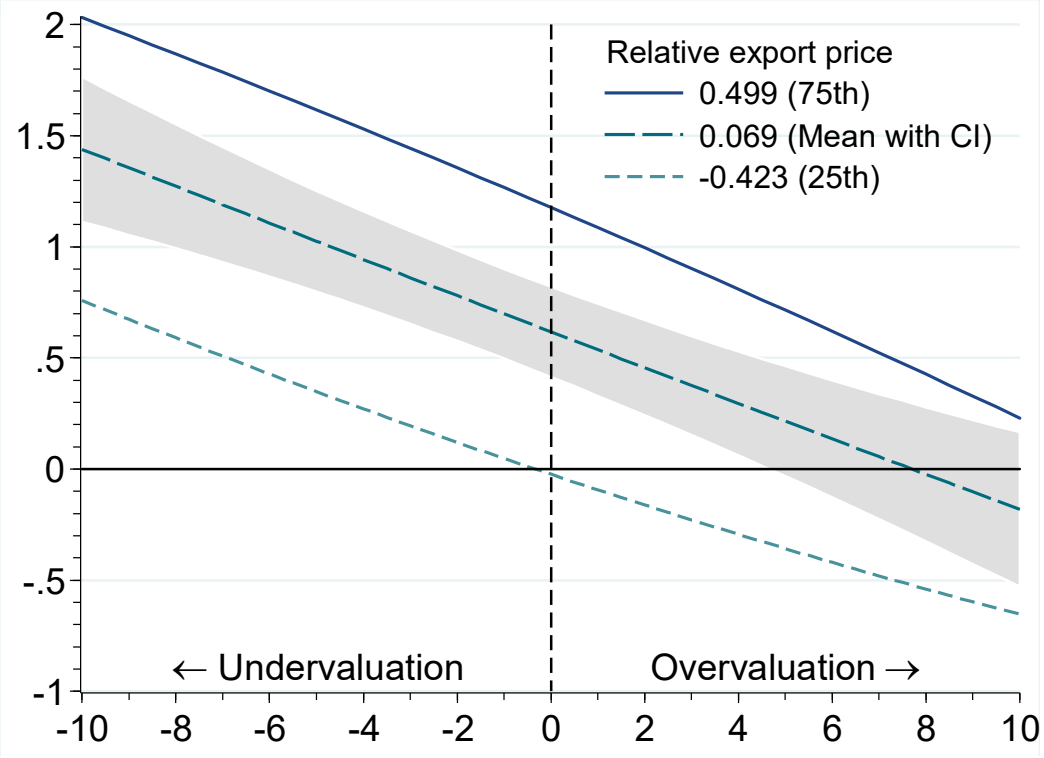
Table 6. Results with alternative misalignment measures

	REER Filtering		External Sustainability Approach		EBA Current Account Analysis		Big Mac Index	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Real value added, PPP (t-1)	-19.462	-19.468	-18.922	-18.935	-20.546	-20.552	-25.162	-25.129
(2011 international dollars, in logs)	[0.425]***	[0.425]***	[0.441]***	[0.441]***	[0.541]***	[0.541]***	[0.838]***	[0.837]***
Relative export price (MA(4))	1.200	1.303	1.368	1.539	1.709	1.910	5.050	5.442
(unit value ratio, in logs)	[0.418]***	[0.419]***	[0.421]***	[0.426]***	[0.493]***	[0.498]***	[0.873]***	[0.902]***
RER overvaluation (t-1)	-0.061	-0.080	-0.060	-0.060	-0.017	-0.017	-0.050	-0.050
(percent)	[0.013]***	[0.014]***	[0.010]***	[0.011]***	[0.004]***	[0.004]***	[0.013]***	[0.013]***
RER overvaluation, squared		0.199		0.022		-0.029		-0.577
(percent, in thousands)		[0.632]		[0.164]		[0.062]		[0.273]**
RER overvaluation		-0.021		0.018		0.002		0.044
× Relative export price		[0.019]		[0.009]*		[0.006]		[0.012]***
RER overvaluation, squared		-1.344		-0.331		-0.149		-0.489
× Relative export price		[0.642]**		[0.148]**		[0.079]*		[0.218]**
Number of observations	33,905	33,905	33,856	33,856	28,554	28,554	10,505	10,505
Number of countries	88	88	86	86	80	80	35	35
Number of industries	57	57	57	57	57	57	57	57
R^2	0.33	0.33	0.33	0.33	0.36	0.36	0.45	0.46

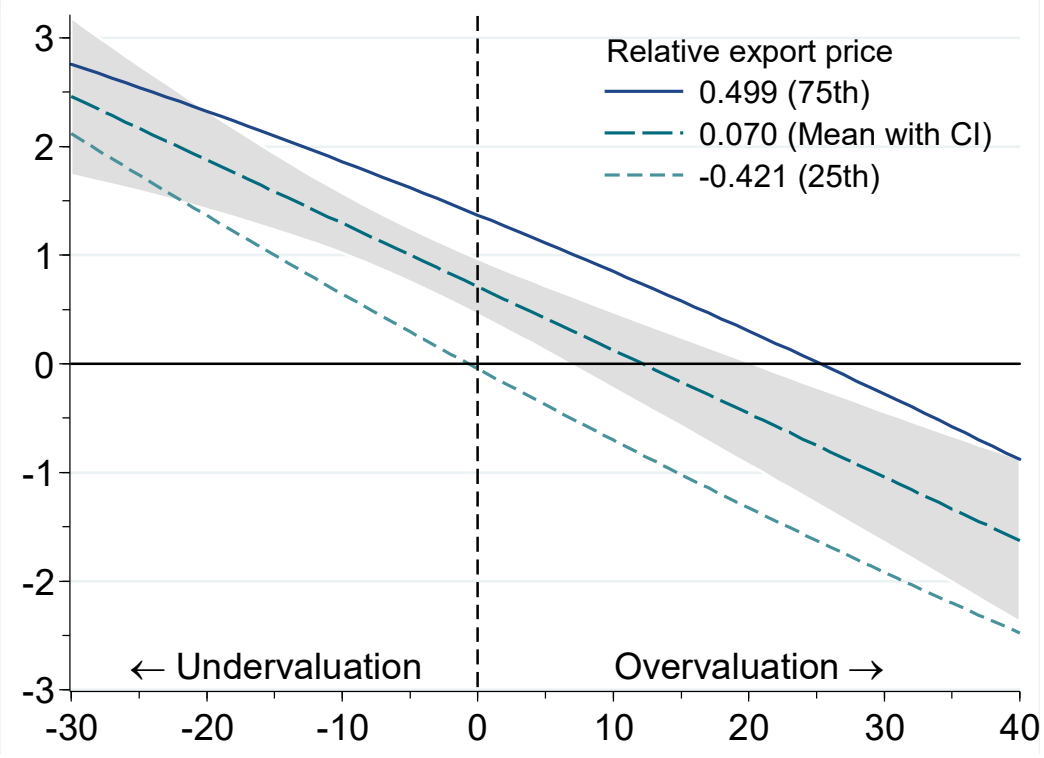
Plotting the results (1)

Figure 2. Growth effect of RER misalignment – alternative measures

A. REER Filtering



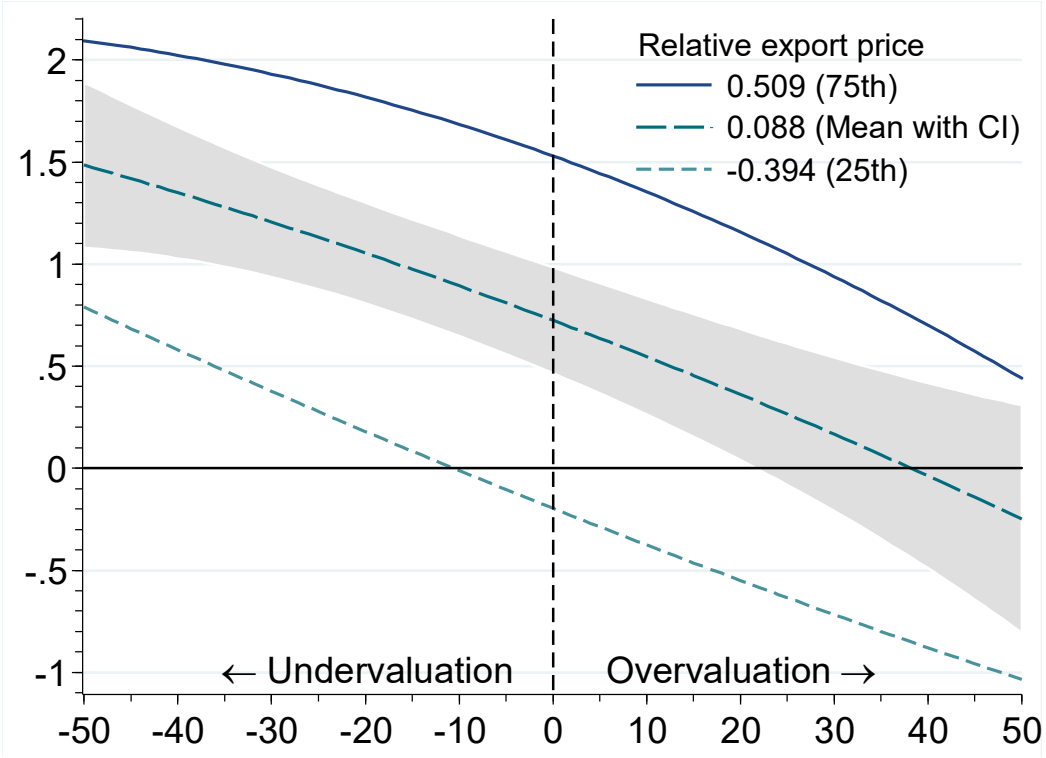
B. External Sustainability Approach



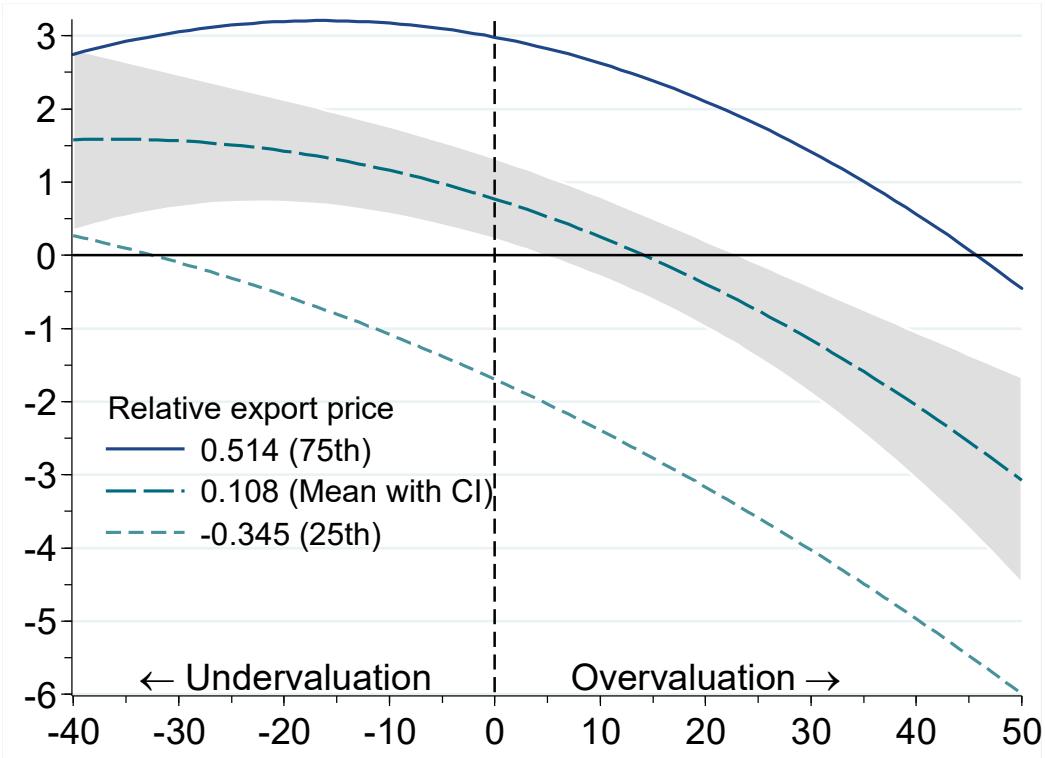
Plotting the results (2)

Figure 2. Growth effect of RER misalignment – alternative measures

C. EBA Current Account Analysis



D. Big Mac Index



Additional tests

- Results are robust to additional specifications
- Splitting a misalignment measure into two variables by sign
  - No interactions: both have the same sign
  - With interactions: symmetric view holds
- Excluding crisis years
- Only with emerging markets and developing countries

Different definition – separating measures into two

- Different definition of asymmetry

$$\begin{cases} mis^{p}_{c,t} = mis_{c,t} \cdot d_{c,t} \\ mis^{n}_{c,t} = mis_{c,t} \cdot \left(1 - d_{c,t}\right) \end{cases}$$

$d_{c,t}$: Dummy = 1 if a misalignment measure is positive

- Specification:

$$\begin{aligned} \ln y_{i,c,t} - \ln y_{i,c,t-1} = {} & \alpha_1 \ln y^{ppp}_{i,c,t-1} + \alpha_2 p_{i,c,ma(4)} + \alpha_3 mis^{p}_{c,t-1} + \alpha_4 mis^{n}_{c,t-1} \\ & + \alpha_5 \left(p_{i,c,ma(4)} \times mis^{p}_{c,t-1} \right) + \alpha_6 \left(p_{i,c,ma(4)} \times mis^{n}_{c,t-1} \right) \\ & + \delta dummies + \varepsilon_{i,c,t} \end{aligned}$$

Undervalued vs. overvalued (1)

Table 7. Different definition of asymmetric growth effect

	PWT PPP	
	[1]	[2]
Real value added, PPP (t-1)	-18.835	-18.851
(2011 international dollars, in logs)	[0.447]***	[0.446]***
Relative export price (MA(4))	1.328	0.853
(unit value ratio, in logs)	[0.418]***	[0.528]
RER undervaluation (t-1)		
Undervalued (≧ 0)	0.017	0.029
(percent)	[0.016]	[0.016]*
Overvalued (< 0)	0.049	0.046
(percent)	[0.013]***	[0.013]***
Undervalued (≧ 0)		0.037
× Relative export price		[0.016]**
Overvalued (< 0)		0.000
× Relative export price		[0.011]
Number of observations	34,035	34,035
Number of countries	88	88
Number of industries	57	57
R^2	0.33	0.33

Note: Robust standard errors are presented in brackets below the corresponding coefficients. *, ** and *** denote statistical significance at the 10 percent, 5 percent and 1 percent levels, respectively. All estimations include country-industry, industry-year, country, industry and year dummies but the coefficients are not reported.

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Undervalued vs. overvalued (2)

	REER Filtering		External Sustainability Approach		EBA Current Account Analysis		Big Mac Index	
	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Real value added, PPP (t-1)	-19.464	-19.472	-18.921	-18.931	-20.546	-20.550	-25.152	-25.145
(2011 international dollars, in logs)	[0.425]***	[0.425]***	[0.441]***	[0.441]***	[0.541]***	[0.541]***	[0.839]***	[0.837]***
Relative export price (MA(4))	1.209	1.658	1.371	1.686	1.708	2.058	5.053	6.044
(unit value ratio, in logs)	[0.418]***	[0.435]***	[0.421]***	[0.459]***	[0.493]***	[0.510]***	[0.871]***	[0.977]***
RER overvaluation (t-1)								
Undervalued (< 0)	-0.041	-0.032	-0.056	-0.057	-0.021	-0.021	-0.009	-0.019
(percent)	[0.027]	[0.027]	[0.020]***	[0.020]***	[0.007]***	[0.007]***	[0.022]	[0.022]
Overvalued (≧ 0)	-0.080	-0.127	-0.061	-0.061	-0.013	-0.014	-0.087	-0.084
(percent)	[0.027]***	[0.029]***	[0.012]***	[0.012]***	[0.008]	[0.008]*	[0.020]***	[0.021]***
Undervalued (< 0)		0.047		0.038		0.015		0.086
× Relative export price		[0.035]		[0.017]**		[0.009]*		[0.019]***
Overvalued (≧ 0)		-0.116		-0.002		-0.011		-0.003
× Relative export price		[0.030]***		[0.013]		[0.011]		[0.021]
Number of observations	33,905	33,905	33,856	33,856	28,554	28,554	10,505	10,505
Number of countries	88	88	86	86	80	80	35	35
Number of industries	57	57	57	57	57	57	57	57
R^2	0.33	0.33	0.33	0.33	0.36	0.36	0.45	0.46

Robustness check (1)

Table. Results excluding crisis years

	Undervaluation		Overvaluation							
	PWT PPP		REER Filtering		External Sustainability Approach		EBA Current Account Analysis		Big Mac Index	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Real value added, PPP (t-1)	-18.952	-18.982	-19.602	-19.607	-19.060	-19.073	-20.630	-20.635	-25.131	-25.096
(2011 international dollars, in logs)	[0.453]***	[0.452]***	[0.431]***	[0.431]***	[0.448]***	[0.448]***	[0.548]***	[0.548]***	[0.840]***	[0.838]***
Relative export price (MA(4))	1.379	1.158	1.272	1.348	1.434	1.617	1.730	1.926	5.041	5.428
(unit value ratio, in logs)	[0.423]***	[0.465]**	[0.423]***	[0.423]***	[0.425]***	[0.431]***	[0.496]***	[0.500]***	[0.874]***	[0.904]***
RER misalignment (t-1)	0.026	0.033	-0.053	-0.073	-0.059	-0.058	-0.018	-0.019	-0.050	-0.050
(percent)	[0.009]***	[0.010]***	[0.013]***	[0.014]***	[0.010]***	[0.011]***	[0.004]***	[0.004]***	[0.013]***	[0.013]***
RER misalignment, squared		0.234		0.513		0.003		-0.038		-0.564
(percent, in thousands)		[0.139]*		[0.616]		[0.164]		[0.065]		[0.274]**
RER misalignment		0.025		-0.024		0.018		0.002		0.045
× Relative export price		[0.008]***		[0.019]		[0.009]*		[0.006]		[0.012]***
RER misalignment, squared		0.241		-1.010		-0.344		-0.142		-0.481
× Relative export price		[0.133]*		[0.638]		[0.148]**		[0.081]*		[0.219]**
Number of observations	33,493	33,493	33,363	33,363	33,314	33,314	28,250	28,250	10,459	10,459
Number of countries	86	86	86	86	84	84	78	78	35	35
Number of industries	57	57	57	57	57	57	57	57	57	57
R^2	0.33	0.33	0.33	0.33	0.33	0.33	0.36	0.36	0.45	0.45

Robustness check (2)

Table. Results with emerging markets and developing

	Undervaluation		Overvaluation							
	PWT PPP		REER Filtering		External Sustainability Approach		EBA Current Account Analysis		Big Mac Index	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Real value added, PPP (t-1)	-20.544	-20.566	-21.063	-21.076	-20.571	-20.578	-22.546	-22.561	-27.243	-27.207
(2011 international dollars, in logs)	[0.546]***	[0.544]***	[0.560]***	[0.560]***	[0.546]***	[0.547]***	[0.628]***	[0.628]***	[1.020]***	[1.016]***
Relative export price (MA(4))	1.786	1.711	1.501	1.604	1.883	1.993	2.184	2.423	6.758	7.552
(unit value ratio, in logs)	[0.592]***	[0.625]***	[0.596]**	[0.600]***	[0.605]***	[0.621]***	[0.691]***	[0.697]***	[1.086]***	[1.120]***
RER misalignment (t-1)	0.084	0.091	-0.054	-0.078	-0.064	-0.053	-0.012	-0.012	-0.063	-0.058
(percent)	[0.013]***	[0.015]***	[0.015]***	[0.017]***	[0.013]***	[0.016]***	[0.007]*	[0.007]*	[0.017]***	[0.017]***
RER misalignment, squared		-0.131		0.796		-0.162		0.127		-1.445
(percent, in thousands)		[0.252]		[0.668]		[0.232]		[0.075]*		[0.380]***
RER misalignment		0.021		-0.009		0.027		0.001		0.049
× Relative export price		[0.017]		[0.023]		[0.015]*		[0.009]		[0.022]**
RER misalignment, squared		-0.192		-1.330		-0.430		-0.183		-0.686
× Relative export price		[0.313]		[0.692]*		[0.210]**		[0.102]*		[0.371]*
Number of observations	18,200	18,200	18,161	18,161	18,099	18,099	15,486	15,486	5,951	5,951
Number of countries	58	58	58	58	57	57	51	51	21	21
Number of industries	57	57	57	57	57	57	57	57	57	57
R^2	0.36	0.36	0.36	0.36	0.36	0.36	0.39	0.39	0.50	0.51

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Conclusions

Policy implications

- View of symmetric growth effect
- Effect of RER misalignment is conditional on export prices in industries
- Undervaluing or reducing overvaluation translates into lower growth if lower prices
  - The impact is similar across industries
- Policies that support firms to increase their export prices are key
  - Structural reforms (e.g., easing market regulations)

Currency Misalignment, Export Prices and Growth in the Manufacturing Sector

Appendices

PWT 8.0

Table 1. Balassa-Samuelson effects in different versions of PWT

PWT:	6.2 5-year period 1950-2004 [1]	6.2 Annual 1950-2004 [2]	6.3 Annual 1950-2007 [3]	7.0 Annual 1950-2009 [4]	7.1 Annual 1950-2010 [5]	8.0 Annual 1950-2011 [6]
Real GDP per capita, PPP (international dollars, in logs)	-0.231 [0.011]***	-0.228 [0.005]***	-0.220 [0.005]***	-0.074 [0.005]***	-0.046 [0.005]***	-0.118 [0.004]***
Constant	2.613 [0.094]***	2.579 [0.044]***	2.566 [0.041]***	1.120 [0.042]***	0.875 [0.038]***	6.743 [0.036]***
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,509	7,334	8,369	8,667	8,881	8,268
Adjusted R^2	0.27	0.26	0.24	0.07	0.05	0.63

Note: Standard errors are presented in brackets below the corresponding coefficients. *** denotes statistical significance at the 1 percent level.

Big Mac Index

Table 4. Balassa-Samuelson effects in the Big Mac index

	α	β	Obs.	R^2
2000	-1.626**	0.145**	26	0.16
2001	-2.182***	0.195***	26	0.32
2002	-1.361**	0.118	31	0.09
2003	-1.906***	0.174***	30	0.26
2004	-1.575***	0.132**	40	0.11
2005	-1.859***	0.168***	41	0.24
2006	-1.828***	0.166***	41	0.23
2007	-1.757***	0.160***	41	0.21
2008	-1.716***	0.166***	40	0.18
2009	-1.879***	0.175***	41	0.24
2010	-1.817***	0.172***	41	0.21
2011	-1.935***	0.190***	55	0.21
2012	-1.707***	0.154***	55	0.16
2013	-1.836***	0.169***	51	0.19

Note: Standard errors are presented in brackets below the corresponding coefficients. ** and *** denote statistical significance at the 5 percent and 1 percent levels, respectively.

EBA – positive analysis (1)

Table 3. Results of EBA current account analysis

	RE [1]	Prais-Winsten [2]
Cyclically-adjusted fiscal balance, instrumented (share of potential GDP; relative to world average)	0.780 [0.085]***	0.861 [0.087]***
Change in reserves × capital controls, instrumented (share of GDP; relative to world average)	1.175 [0.266]***	0.787 [0.258]***
Change in private sector credit (MA(t-1, t, t+1)) (share of GDP; demeaned; relative to world average)	-0.178 [0.027]***	-0.185 [0.045]***
Stock market volatility index (demeaned) (t-1) × capital account openness (t-1)	0.024 [0.027]	0.039 [0.026]

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Note: Standard errors are presented in brackets below the corresponding coefficients. *, ** and *** denote statistical significance at the 10 percent, 5 percent and 1 percent levels, respectively. In both estimations, the presence of first-order autocorrelation, AR(1), is assumed. In column [2], standard errors are corrected for panel-level heteroskedasticity.

EBA – positive analysis (2)

	[1]	[2]
Net foreign assets (*t*-1) (share of GDP)	0.000 [0.002]	0.006 [0.003]**
Output per worker (*t*-1) (demeaned; relative to the United States, Japan and Germany)	0.049 [0.027]*	0.048 [0.038]
Oil and gas trade balance, adjusted by resource temporariness (share of GDP; relative to world average)	0.294 [0.074]***	0.280 [0.103]***
Old-age dependency ratio (relative to world average)	0.008 [0.054]	-0.048 [0.038]
Aging speed (relative to world average)	0.141 [0.061]**	0.258 [0.046]***
Real GDP growth forecast in 5 years (relative to world average)	-0.488 [0.100]***	-0.428 [0.144]***
Economic freedom (index ranging 0-1: higher, more freedom; relative to world average)	-0.025 [0.040]	-0.025 [0.035]
Impact of political violence (index ranging 0-7: higher, larger magnitude)	0.006 [0.002]***	0.006 [0.002]***

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EBA – positive analysis (3)

	[1]	[2]
Dummy for competitive offshore financial centers	0.115 [0.027]***	0.091 [0.017]***
Distance to the closest major banking center (miles, in logs)	-0.006 [0.007]	-0.007 [0.003]**
Output gap (relative to world average)	0.007 [0.041]	0.032 [0.060]
Terms of trade gap × trade openness	0.078 [0.024]***	0.088 [0.030]***
Constant	0.016 [0.052]	0.028 [0.023]
Number of observations	1,881	1,881
Number of countries	138	138
R^2	0.43	0.46
RMSE	0.07	0.07

Calculation of EBA misalignment

Appendix 7. Results of EBA current account analysis for selected countries, 2012

	Over-valuation (percent)	Regression residuals (percent)	Total contribution (percent)	Cyclically-adjusted fiscal balance		Change in reserves × capital controls		Change in private sector credit		Stock market volatility index × capital account openness	
				Contribution (percent)	Policy gap (percent)	Contribution (percent)	Policy gap (percent)	Contribution (percent)	Policy gap (percent)	Contribution (percent)	Policy gap (percent)
Australia	31.82	-2.59	-1.34	-1.30	-1.51	-0.17	-0.21	0.13	-0.69	0.00	0.00
Brazil	-35.45	1.71	1.07	0.79	0.91	0.23	0.29	0.09	-0.47	-0.03	-0.69
China	-32.60	0.83	4.66	3.69	4.29	0.59	0.75	0.41	-2.21	-0.03	-0.86
India	-14.48	2.20	-0.01	0.19	0.22	-0.25	-0.32	0.10	-0.55	-0.05	-1.36
Indonesia	-15.46	0.46	1.93	2.16	2.51	-0.16	-0.20	-0.06	0.32	-0.02	-0.38
Japan	-34.46	6.10	-2.79	-2.26	-2.62	-0.17	-0.21	-0.36	1.97	0.00	0.00
Korea, Rep.	2.04	-1.84	1.22	1.41	1.63	-0.17	-0.21	-0.02	0.11	0.00	-0.01
Malaysia	-13.52	5.77	1.80	2.18	2.53	0.00	0.01	-0.33	1.78	-0.05	-1.36
Mexico	1.12	-1.44	1.28	1.64	1.90	-0.17	-0.21	-0.19	1.03	0.00	0.00
Russian Federation	-7.98	-0.63	2.21	2.17	2.52	0.24	0.31	-0.19	1.03	0.00	-0.09
South Africa	12.83	-1.33	-1.01	-0.71	-0.82	-0.04	-0.06	-0.23	1.23	-0.03	-0.76
Turkey	2.46	0.65	-0.99	-0.85	-0.99	0.26	0.33	-0.37	2.02	-0.02	-0.58
United Kingdom	14.98	-1.07	-1.84	-2.32	-2.70	-0.17	-0.21	0.65	-3.49	0.00	0.00
United States	25.61	0.68	-2.80	-2.25	-2.61	-0.17	-0.21	-0.38	2.07	0.00	0.00
Coefficient					0.861		0.787		-0.185		0.039