

New Estimates of Fundamental Equilibrium Exchange Rates

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The Search for Equilibrium Exchange Rates

- Some dismiss the search, but we don't
- But there are differing concepts of equilibrium and it matters which one is searching for
- “Fundamental equilibrium exchange rate” is defined as one consistent with medium-run macro equilibrium
- I.e. the rate consistent with achieving specific macro objectives, which must be sustainable (ambiguities are resolved by an appeal to utility maximization)
- Clearly a real rate, and an effective rate.

Determinants of FEERs

- Fall in two classes:
 - Assumptions about the future in the absence of policy changes
 - Assumptions about desirable outcomes
- Use of April 2008 WEO to specify likely outcomes on the basis of present policies
 - Initial assumption that we should use 2013 forecasts
 - But these are little different (except for Russia) from 2009 forecasts
 - So 2009 figures were used
 - Big change since April is rise in oil price (over 40%).

Desirable Outcomes: Current Balance Targets

- Critical policy determinant of equilibrium exchange rates, given that we are all accelerationists now and that trade policy is little used as a tool of macro policy
- 3% of GDP limit on prudent imbalances
- Capital should flow downhill
- Larger (6% of GDP) limit on deficits of Australia and New Zealand and a similar limit on the surpluses of Singapore and Switzerland
- Targets not estimated for oil exporters in the central case because these depend on changes in the oil price and savings strategies of the oil exporters.

Calculating Current Balance Targets

- Application of the preceding rules yields targets for 24 economies
- Who would have an aggregate deficit reduction of \$351b. (= \$429b. - \$78b.)
- 3% of GDP of the remaining high-surplus economies (China, Hong Kong, Japan, Malaysia, Taiwan, and Sweden) is \$430b.
- So if aggregate RoW imbalance is to remain the same, these economies need to cut surpluses by $351/430$ x (excess of their projected surplus over 3% of GDP).

Current Balance Targets

Country	Current Account (percentage GDP)		Country	Current Account (percentage GDP)	
	Forecast	Target change		Forecast	Target change
<i>Pacific</i>			<i>Europe</i>		
Australia	-5.3	0.0	Czech Republic	-2.8	0.0
New Zealand	-7.1	1.1	Euro area	-0.9	0.9
<i>Asia</i>			Hungary	-5.1	2.1
China	10.0	-5.7	Norway	20.4	0.0
Hong Kong SAR	8.3	-4.4	Poland	-5.7	2.7
India	-3.4	0.4	Russia	2.9	0.0
Indonesia	1.2	-1.2	Sweden	6.7	-3.0
Japan	3.9	-0.8	Switzerland	13.8	-7.8
Korea	-0.9	0.9	Turkey	-6.3	3.3
Malaysia	11.1	-6.6	United Kingdom	-4.4	1.4
Philippines	1.0	-1.0	<i>Western Hemisphere</i>		
Singapore	18.9	-12.9	Argentina	-0.5	0.5
Taiwan	8.1	-4.1	Brazil	-0.9	0.0
Thailand	1.3	-1.3	Canada	-1.2	1.2
<i>Middle East -Africa</i>			Chile	-1.3	0.0
Israel	1.7	-1.7	Colombia	-4.3	1.4
Saudi Arabia	24.0	0.0	Mexico	-1.6	0.0
South Africa	-7.9	4.9	United States	-4.2	1.2
			Venezuela	5.0	0.0
			<i>Rest of World</i>	3.9	0.0
			<i>WORLD</i>	0.3	0.0

- a. IMF forecast for 2009
b. Estimated NFA for 2009

Variant Simulations

- (1) Same CB targets but higher trade elasticities (to shrink the global c/a discrepancy)
- (2) Oil exporters (Saudi Arabia, Norway, Russia, Venezuela) were subject to the same rules as other countries (implies big cuts in surpluses by Saudi Arabia and Norway)
- (3) Stabilize NFA/GDP at 2009 level (IMF method 3), more demanding of adjustment by US, China, Australia...

Symmetric Matrix Inversion Method (SMIM) model Calculates:

- Desired changes in REERs
- Corresponding changes in exchange rates against the dollar

Current Account Change from Change in REER

$\Delta CA\%GDP =$

$\% \Delta REER \times \text{Impact Parameter}$

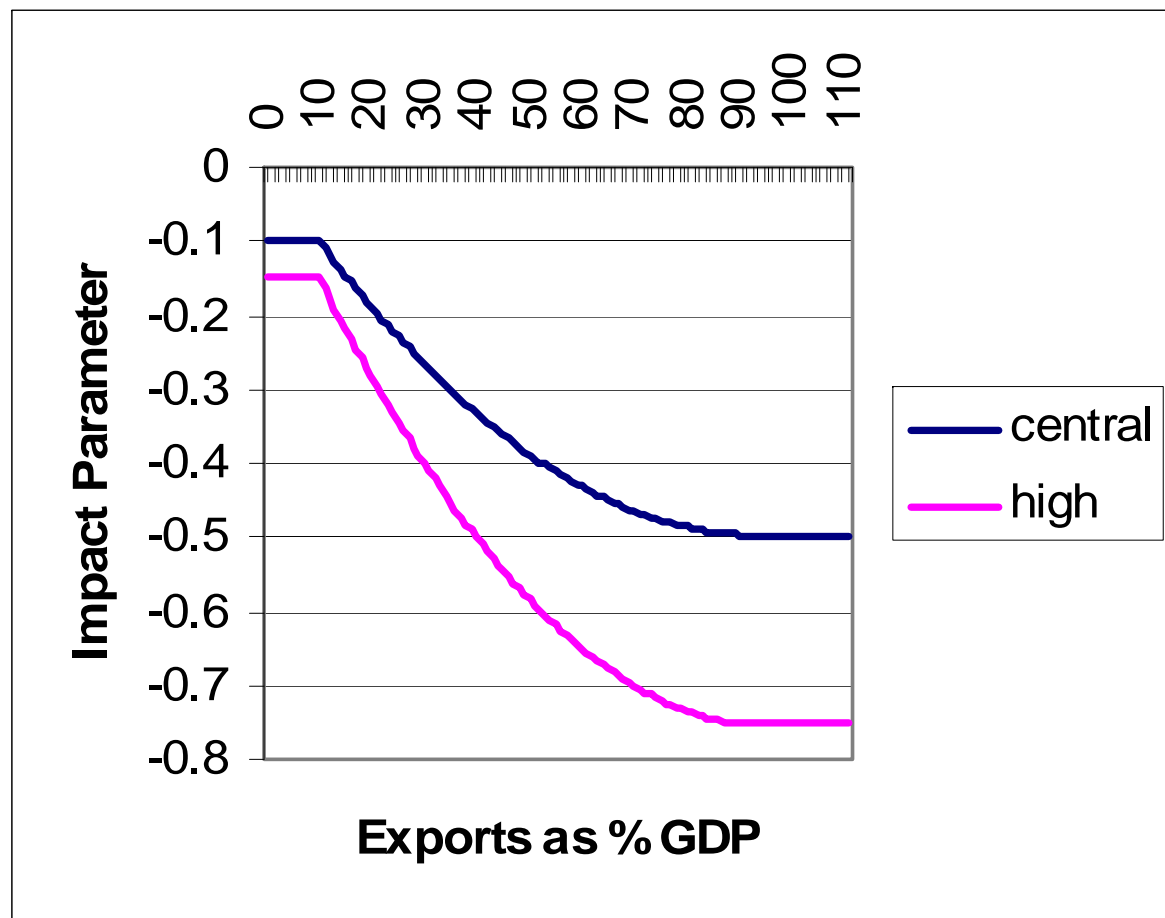
US: +1.2% GDP =

$(-7.4 \% \Delta REER) \times (-0.16)$

China: -5.7% GDP =

$(+19.2\% \Delta REER) \times (-0.30)$

Percent of GDP change in Current Account for 1% rise in REER



Desired Changes in REERs

$$\% \Delta r = \Delta CA \% GDP / \text{Impact}$$

parameter

US:	-7.4% = +1.2%Y	/	-0.16
Euro area:	-6.0% = +0.9%Y	/	-0.14
Japan:	+6.6% = -0.8%Y	/	-0.12
China:	+19.2% = -5.7%Y	/	-0.30
Singapore:	+25.8% = -12.9%Y	/	-0.50

REER versus Bilateral Rate Against the Dollar

- %Rise in REER = %Rise against dollar
minus trade-weighted % increases of
partner exchange rates against dollar

For country k:

$$r_k = -z_1 a_{k1} - z_2 a_{k2} \dots + z_k - z_{k+1} a_{k k+1} \dots$$

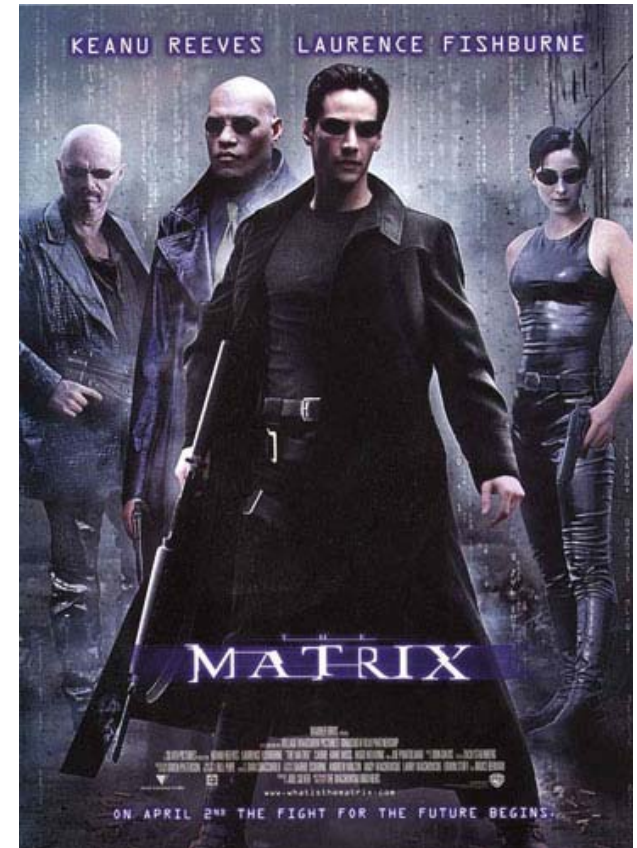
In matrix form:

$$R_{35 \times 1} = B_{35 \times 35} Z_{35 \times 1}$$

R = vector of % changes
in REER

Z = vector of % changes in bilateral
exchange rates against the dollar

$B = I - A$ where I = identity matrix and
 A = trade shares matrix



Solving for Realignment against the Dollar:

$$Z_{35 \times 1} = B_{35 \times 35}^{-1} R_{35 \times 1}$$

Averaging Results

- System Overdetermined
- # possible solutions = # countries
- Estimate = Average
- Not achieve targets exactly

Alternative Variants

- High elasticity
- Oil adjustment
- Stabilize Net Foreign Assets as % of GDP

The Central Simulation

- Figures of 2009 although adjustment takes longer than one year
- Estimate needed changes in effective rates by dividing target changes in CB by impact parameter
- Apply SMIM to get bilateral rates against dollar
- Positive numbers indicate undervaluations = need to appreciate, negative numbers indicate need to depreciate or overvaluation.

Currency Realignment Needed to Reach FEERs

	Percent change from base (a):		Currency level against the dollar:		
	Trade-weighted Average	Bilateral vs. the Dollar	FEER Equivalent	July 1-15, 2008	% Change Needed
<i>Industrial Countries</i>					
Canada	-4.1	-1.5	1.02	1.01	-0.6
Euro Area (b)	-7.2	-0.2	1.47	1.58	-7.0
Japan	5.7	19.0	90.1	106.5	18.2
Switzerland	21.4	23.9	0.88	1.02	16.3
United Kingdom (b)	-6.6	-2.5	1.91	1.98	-3.7
United States	-8.6	0.0	1.00	1.00	0.0
<i>Developing Asia</i>					
China	18.4	31.5	5.45	6.85	25.7
Korea	-3.5	11.2	850	1024	20.5
Malaysia	12.3	30.7	2.47	3.25	31.8
Singapore	24.7	41.2	1.00	1.36	36.2
Taiwan	9.0	26.0	25.1	30.4	21.2
<i>Other Developing</i>					
Mexico	-0.4	2.0	10.6	10.3	-2.5
Poland	-8.6	-6.1	2.59	2.10	-19.1
South Africa	-14.6	-6.7	8.21	7.73	-5.9
Turkey	-13.0	-8.5	1.32	1.23	-7.0

a. February 2008

b. Dollars per currency unit

Comments on Results

- Dollar is still overvalued, but solely w.r.t. most Asian currencies plus Switzerland, Sweden
- Euro has overshot, but not greatly
- Largest undervaluations are Singapore and Switzerland, even giving them larger CB targets
- Largest overvaluations are South Africa and Turkey
- US neighbors Canada and Mexico appear roughly correct
- Canada and Australia are close to parity with the US dollar, the Swiss franc is over parity
- The effective changes of the Asian countries are markedly smaller than their changes against the dollar.

Concluding Remarks

- Similar picture to PB07-4, except that euro etc have appreciated further against dollar in last year
- That is, RMB and other East Asian currencies are still seriously undervalued
- Need for bilateral appreciations against dollar by some currencies that are overvalued on effective basis.