Global Macro Views – The Engine Room of our FX Fair Value Model

February 28, 2019

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- We have been updating our EM FX fair value estimates recently, …
- where Argentina and Turkey look only mildly expensive at this point, …
- with India, Indonesia and South Africa still more significantly overvalued.
- Our update prompted lots of questions on the inner workings of our model, …
- which we lay out in a series of equations and a summary table in this piece.
- These show how we map current account imbalances into REER adjustment, …
- which is what differentiates our work from standard PPP-type models.

We unveiled our EM FX valuation framework just over a year ago, where the cornerstone is a mapping of current account imbalances into needed real exchange rate adjustment. At the time, large and rising current account deficits in Argentina and Turkey mapped into substantial overvaluations – 15 percent – and both currencies fell sharply during 2018. Our valuation framework ended up being a central guidepost in a turbulent year, helping us shift constructive in September, at the peak of the EM sell-off. Our recent ***Global Macro Views*** have been updating our fair value estimates, starting two weeks ago with Argentina and Turkey, and a broader update last week. Argentina and Turkey are now only slightly overvalued, while India, Indonesia and South Africa remain expensive. EM Asia continues to be significantly undervalued, anchored by China's RMB that is close to 10 per cent cheap. We received many questions on the details of our model, which we address here.

$$\frac{X_t}{Y_t} = \rho - \left(\frac{\bar{X}}{\bar{Y}}\right)\beta_x(0.6R_t + 0.25R_{t-1} + 0.15R_{t-2}) + \left(\frac{\bar{X}}{\bar{Y}}\right)\psi_x YGAP_t^* \quad (1)$$

$$\frac{M_t}{Y_t} = \gamma + \left(\frac{\bar{M}}{\bar{Y}}\right)\beta_m(0.6R_t + 0.25R_{t-1} + 0.15R_{t-2}) - \left(\frac{\bar{M}}{\bar{Y}}\right)R_t + \left(\frac{\bar{M}}{\bar{Y}}\right)\psi_m YGAP_t \quad (2)$$

We assume the same equations for export and import volumes of goods and services across countries, following Isard et al. (1998), a summary of the IMF's current account-based FX valuation model. M, X and Y are the nominal, domestic currency values of imports, exports and GDP. $YGAP$ is the domestic output gap, $YGAP^*$ is the trade-weighted foreign output gap, derived using a recursive HP filter with $\lambda = 100$. R is the logarithm of the real effective exchange rate, rising with appreciation. β_x is the long-run exchange rate elasticity of exports (0.7), β_m is the same for imports (0.9). ψ_x and ψ_m are elasticities of real exports and imports with respect to activity (both 1.5). Appreciation weighs on exports and boosts imports, with lagged effects spread over several years. Appreciation also lowers the domestic currency price of imports.

$$\frac{CA_t}{Y_t} = \alpha - \left[\left(\frac{\bar{M}}{\bar{Y}}\right)\beta_m + \left(\frac{\bar{X}}{\bar{Y}}\right)\beta_x\right](0.6R_t + 0.25R_{t-1} + 0.15R_{t-2}) + \left(\frac{\bar{M}}{\bar{Y}}\right)R_t - \left(\frac{\bar{M}}{\bar{Y}}\right)\psi_m YGAP_t + \left(\frac{\bar{X}}{\bar{Y}}\right)\psi_x YGAP_t^* \quad (3)$$

$$\left[\frac{CA_t}{Y_t}\right]^{und} = \alpha - \left[\left(\frac{\bar{M}}{\bar{Y}}\right)\beta_m + \left(\frac{\bar{X}}{\bar{Y}}\right)\beta_x\right]\bar{R} + \left(\frac{\bar{M}}{\bar{Y}}\right)\bar{R} \quad (4)$$

Subtracting (2) from (1) yields a reduced form current account equation (3). Assuming all variables are in equilibrium, i.e. domestic and foreign output gaps are closed and exchange rates stable at their long-run averages, allows us to derive an expression for the underlying, cyclically- and FX-adjusted current account (4). Subtracting (4) from (3) gives (5), which is how we derive the underlying current account.

$$\left[\frac{CA_t}{Y_t}\right]^{und} = \frac{CA_t}{Y_t} - \left[\left(\frac{\bar{M}}{\bar{Y}}\right)\beta_m + \left(\frac{\bar{X}}{\bar{Y}}\right)\beta_x\right][(\bar{R} - R_t) + 0.4(R_t - R_{t-1}) + +0.15(R_{t-1} - R_{t-2})] + \left(\frac{\bar{M}}{\bar{Y}}\right)(\bar{R} - R_t) + \left(\frac{\bar{M}}{\bar{Y}}\right)\psi_m YGAP_t - \left(\frac{\bar{X}}{\bar{Y}}\right)\psi_m YGAP_t^* \quad (5)$$

In short, our estimate of the underlying current account feeds through lagged exchange rate changes, in addition to closing domestic and foreign output gaps. Exhibit 1 shows how all this looks in practice, using annual data for 2019 and prior years. It shows our current account forecasts for this year in column (1), followed by the domestic (2) and foreign (3) output gaps as well as REER appreciation (+) since 2015. We adjust the headline current account for these different things using equation (5), yielding our estimate of the underlying current account in column (8). We then use our exchange rate elasticities, β_x and β_m, to calculate how much the REER needs to rise or fall to close the gap with our estimate for current account equilibrium (10), where we also give the IMF's estimates for this number in column (9).

Exhibit 1. FEER Valuation Model for EM Currencies: Model Inputs and Estimated Misalignments for 2019

	(1) C/A (% GDP)	(2) YGAP (% GDP)	(3) YGAP* (% GDP)	(4) REER (% 2015)	(5) YGAP (% GDP)	(6) YGAP* (% GDP)	(7) REER (% GDP)	(8) C/A Adj. (% GDP)	(9) IMF (% GDP)	(10) IIF (% GDP)	(11) Misal.^ (%)
CEEMEA											
CZK	**0.8**	1.0	0.9	11.1	1.1	-1.1	-2.5	**-1.8**	...	**-2.0**	**0.5**
HUF	**2.0**	3.1	0.7	1.4	3.7	-0.9	0.3	**5.2**	...	**-2.0**	**13.4**
PLN	**-1.4**	1.4	0.8	0.3	1.0	-0.6	-0.7	**-1.8**	-0.2	**-2.0**	**0.8**
TRY	**-1.5**	-7.0	0.5	-25.4	-2.9	-0.2	3.3	**-1.3**	-2.6	**-1.0**	**-1.9**
RUB	**5.5**	-0.5	0.1	2.7	-0.2	-0.1	0.8	**6.1**	4.5	**4.0**	**12.4**
ZAR	**-3.5**	-1.1	0.0	4.1	-0.5	0.0	-0.7	**-4.7**	-1.2	**-3.0**	**-9.4**
SAR	**8.0**	-1.8	0.8	0.6	-0.9	-0.6	0.0	**6.5**	...	**10.0**	**-12.4**
LatAm											
ARS	**-2.5**	-5.5	-0.4	-28.6	-1.1	0.1	2.1	**-1.5**	-1.7	**-1.0**	**-6.1**
BRL	**-1.2**	-0.7	-0.7	8.0	-0.1	0.1	0.2	**-1.0**	-2.0	**-2.0**	**13.8**
MXN	**-1.9**	0.5	0.8	-9.4	0.3	-0.4	-0.6	**-2.6**	-1.9	**-3.0**	**1.7**
CLP	**-3.0**	0.2	-0.7	3.3	0.1	0.3	0.1	**-2.4**	...	**-3.0**	**2.9**
PEN	**-2.1**	-0.2	-0.3	1.3	-0.1	0.1	-0.1	**-2.1**	...	**-3.0**	**6.3**
COP	**-3.3**	-0.5	-1.3	-10.0	-0.2	0.3	0.6	**-2.5**	...	**-3.0**	**5.0**
EM Asia											
CNY	**1.5**	-4.0	0.6	-5.4	-1.2	-0.2	-0.1	**0.0**	-0.3	**-1.0**	**7.4**
INR	**-2.4**	0.8	-0.1	0.9	0.3	0.0	0.4	**-1.7**	-2.5	**-1.0**	**-5.6**
KRW	**6.6**	0.0	-0.6	2.9	0.0	0.5	-0.8	**6.3**	2.9	**3.0**	**11.1**
MYR	**1.5**	1.3	-0.1	-2.7	1.3	0.2	-1.1	**1.8**	0.6	**-1.0**	**6.3**
THB	**9.5**	1.5	0.0	3.5	1.4	0.0	-2.1	**8.8**	4.1	**4.0**	**11.5**
IDR	**-3.3**	1.2	-0.3	0.9	0.4	0.1	0.6	**-2.2**	-1.7	**-1.5**	**-5.5**
PHP	**-4.2**	3.0	-0.4	-7.1	1.6	0.2	0.3	**-2.2**	...	**-3.0**	**4.8**
TWD	**10.5**	-0.3	-0.4	3.6	-0.2	0.4	-0.2	**10.5**	...	**4.0**	**15.6**

^ Estimated FEER misalignment, where -ve signals overvaluation (needs to fall) and +ve signals undervaluation (needs to rise).

Source: Haver, IIF

Column (11) gives our misalignments, where a positive reading signals undervaluation, i.e. the REER needs to rise to bring the underlying current account down to equilibrium. China (green) is an example of this. We estimate the underlying current account – factoring in our above-consensus view of the domestic output gap – at close to balance. A REER rise of 7.4 percent is needed to bring that to -1.0 percent of GDP, our view of equilibrium. The contrast between Turkey (orange) and Argentina (yellow) is worth examining as well. The former is twice as open to imports and exports as the latter. As a result, activity and exchange rate effects are more potent in the former than the latter. We estimate underlying current account deficits in both as slightly larger than 1.0 percent of GDP, which points to still a bit of overvaluation in both. Next week's ***Global Macro Views*** will conclude our series on FX valuation with back-tests of the model.