Economics International Inc

Estimates of Fundamental Equilibrium Exchange Rates, November 2024

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This study updates estimates of Fundamental Equilibrium Exchange Rates (FEERs) using October 2024 as the base month. These new estimates take as their point of departure the most recent issue of the World Economic Outlook (WEO) of the International Monetary Fund (IMF, 2024a). I apply the real effective exchange rate (REER) series of the Bank of International Settlements (2024a) to take account of changes in real exchange rates subsequent to the base period used in the WEO.

Trends in Principal Exchange Rates

The US dollar has been relatively strong against other major currencies over the past three years. This strength reflected in part the earlier and more sizable US increase in interest rates to deal with the pandemic inflation shock that peaked in 2022, but also the impact of Russia's invasion of Ukraine.[2] The Federal Reserve's broad real exchange rate index for the dollar, with a base of 100 in January 2006, stood at an average of 107.4 during 2019-21, and rose to an average of 115.2 for January 2022 through October 2024 (Federal Reserve, 2024).

The election of Donald Trump as the 47th President of the United States has boosted the dollar further. Thus, from the last full week before the election to the first full week after it, the dollar rose by 2.5 percent against the euro, 2.0 percent against the pound sterling, and about 1.5 percent against the Japanese yen and Chinese yuan (FRED, 2024). Figure 1 shows the path of weekly exchange rates for these currencies as well as the Canadian dollar and Mexican peso over the past year.

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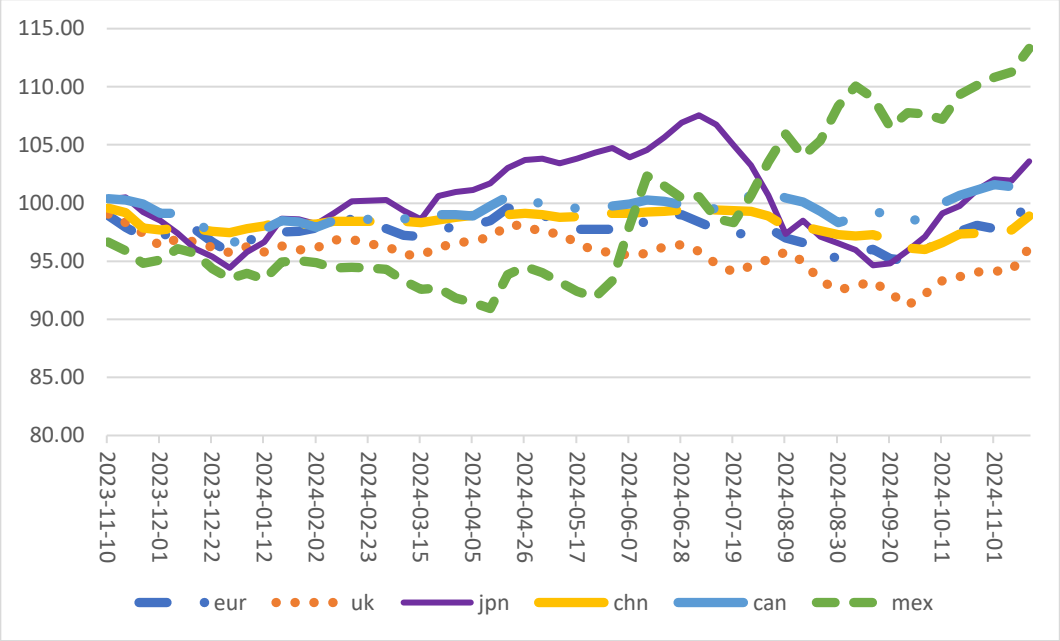
[2] From February 2022 when Russia invaded, the euro fell from $1.13 to a low of $0.98 in October 2022, before recovering to a plateau of about $1.07 by January of 2023. FRED (2024).

Figure 1

Strength of the US Dollar against 6 Major Currencies
(Weekly; October 2023 = 100)



Exchange Rate Implications of Trump's Return

Tariffs – Trump's campaign pledged generalized import tariffs of 10 to 20 percent, and 60 percent on imports from China (CRFB, 2024, p. 24). There are two reasons to expect such tariffs to cause upward pressure on the US dollar.

The first reason dates back to a 1936 article by Abba P. Lerner (Lerner, 1936). The "Lerner Symmetry Theorem" postulates that if a country imposes a generalized import tariff of *x* percent, its trade will remain unchanged only if there is a symmetrical export subsidy of *x* percent. As a consequence, in the absence of an offsetting export subsidy, the import tariff will have the same effect as an export tax. The basic argument is that because the import tariff will reduce demand for foreign goods, there will be less domestic currency entering markets to purchase foreign currency. The change will bid up the international price of the now more scarce home currency and bid down the price of the foreign currency, resulting in appreciation. The volume of domestic exports will decline as they become more costly to foreigners. However, if an export subsidy is established at the same rate as the import tariff, exporters will be able to sell to customers abroad at the same foreign-currency price as before.

The second reason the dollar would be expected to rise following higher import tariffs concerns macroeconomic policy feedback. Namely, a rise in the price of imports from new tariffs will cause a rise in the price level that will confront the Federal Reserve with higher

observed inflation. The argument is that the Fed would then respond by raising interest rates to curb prospective inflation. A higher interest rate would attract more foreign capital, bidding up the dollar.

Fiscal Deficits – The Trump proposals include full extension of the Tax Cuts and Jobs Act of 2017, which would otherwise expire at the end of 2025, plus additional promises to reduce the corporate tax rate to 15 percent, eliminate taxation of overtime, tip, and social security income. The CRFB (2024, p. 2) estimates that despite some offset from higher tariff revenue, these measures could increase fiscal deficits by a central estimate of $7.5 trillion over 10 years, with a wide range of uncertainty ($15 trillion high, $1.5 trillion low estimates).[3] The same macro-economic feedback working through inflationary pressures and Federal Reserve reaction could tend to be even stronger from these fiscal pressures than from the tariff impact on prices.

Term Premium – Tighter US monetary policy to confront the outbreak of high inflation by 2022 caused the term premium between the 10-year Treasury rate and the short-term (3-month) Treasury bill rate to plunge from an average of about +1.5 percent during 2021 and a peak of 2.3 percent in early May 2022 to a trough of -1.9 percent at the end of May 2023. In the second half of 2023 through mid-September 2024 the term premium was an average of about -1.3 percent, but with the election result, by November 2022 the premium had almost disappeared (at -0.2 percent; FRED, series T1DY3M). With the 10-year Treasury rate now at about 4.4 percent (Federal Reserve, 2024), conditions favor a strong dollar.[4] However, Trump has made it clear that he prefers a weak dollar for competitive purposes.[5]

Longer Term – The US was already on a path of unsustainable public debt increases, with federal debt held by the public rising to 173 percent of GDP by 2054. The Trump fiscal plan would raise the expected debt ratio to 223 percent of GDP by 2054 (Cline, 2024). An eventual increase in perceived default risk could reduce net capital inflows and cause downward pressure on the dollar.

Main Calculations

Table 1 reports the current account projections of the IMF for the 34 countries (with the euro treated as one economy) covered in the FEERs series dating back to 2008. The first column reports the IMF's estimates of current account balances in 2023 in the October 2024

[3] Note that US merchandise imports in the 12 months ending September 2024 amounted to $3.22 trillion (BEA (2024, p. 13). US GDP for 2024 is projected at $29.17 trillion (IMF, 2024), placing merchandise imports at 11 percent of GDP. A generalized import tariff of 10 percent would be expected to raise revenue amounting to 1.1 percent of GDP if there were no reduction in the volume of imports, but likely a lesser amount as imports contracted. More fundamentally, the threat of retaliation by trading partners would make higher import tariffs an unreliable source of revenue for financing the budget.

[4] In comparison, October 10-year treasury rates were 2.22 percent for Germany, 4.2 percent for France, 0.86 percent for Japan, and 3.19 percent for Canada. FRED (2024), series IRLTLT01xxM156N, with xx = DE, FR, JP, CA respectively.

[5] See for example Mike Dolan, "Trump's dollar logic and confusion," Reuters, October 16, 2024.

WEO. The second column reports the Fund's projection of the current dollar value of GDP for each economy in 2029. The third column of the table reports the Fund's 2029 current account projections, as a percent of GDP. The fourth column then adjusts the 2029 outlook to take account of the change in exchange rates from the August base period used in the October WEO to the October base used in this report.[6] The adjustment applies the percent change in the real effective exchange rate (REER) to the current account impact parameter ("gamma", the percent of GDP change in the current account for a 1 percent rise in the country's REER).[7]

Notable increases in REERs from the August WEO base to October included a rise by 4.7 percent for Turkey, 3.8 percent for Thailand, and 3.6 percent for South Africa. Notable declines included a fall by 6.1 percent for Russia, 2.3 percent for Mexico, and 2.0 percent for Japan. The adjusted 2029 current account estimates (next to last column) are close to the unadjusted WEO projections (previous column).

The FEERs methodology sets $\pm$ 3 percent of GDP as the permissible external imbalance.[8] A deficit of 3 percent of GDP could eventually bring the economy to a precariously high level of net external debt. The ceiling of 3 percent on the surplus is meant to provide symmetry for the purpose of global adding-up. The final column of table 1 accordingly shows the target current account as either $\pm$ 3 percent of GDP (the limit) or the actual projected current account if it is within this limiting range. The four oil-exporting economies are exceptions, with no limits imposed because they are primarily transforming resource wealth into financial wealth rather than increasing total wealth.

[6] The October 2024 WEO uses July 30 -August 27, 2024 as its base period (IMF, 2024b, p. 85). The adjustments apply August as approximately equivalent to the WEO base period. The REERs for August and October are from the Bank of International Settlements "broad" series (BIS, 2024a).

[7] This parameter is essentially an overall export price elasticity set at unity, applied to the size of exports of goods and services relative to GDP. The relationship is less than linear and is subject to a ceiling of 0.5, such that for a small open economy with exports at 100 percent of GDP a 1 percent rise in the REER would reduce the current account by 0.5 percent of GDP. Note that for the adjustment from the WEO base month, the calculation further applies only one-half of the normal impact calculation, reflecting past experience with slowly-changing IMF projections of the long-term current account. There is also a special adjustment reducing Switzerland's estimated surplus by 3 percent of GDP to account for the fact that current account data do not separate out the portion attributable to foreign multinational companies.

[8] For a summary of the FEERs methodology, see Cline and Williamson (2012), Appendix A.

Table 1: Target Current Accounts (CA) for 2029

Country	IMF Estimate of 2023 CA (percent of GDP)	IMF 2029 GDP forecast (billions of US dollars)	IMF 2029 CA forecast (percent of GDP)	Adjusted 2029 CA (percent of GDP)	Target CA (percent of GDP)
Pacific					
Australia	0.3	2,220	-1.3	-1.4	-1.4
New Zealand	-6.9	311	-3.6	-3.6	-3.0
Asia					
China	1.4	24,590	1.2	1.1	1.1
Hong Kong	9.2	511	8.5	8.3	3.0
India	-0.7	6,307	-2.2	-2.4	-2.4
Indonesia	-0.2	2,030	-1.4	-1.5	-1.5
Japan	3.6	5,075	3.1	3.3	3.0
Korea	1.9	2,279	4.3	4.5	3.0
Malaysia	1.5	621	3.0	2.5	2.5
Philippines	-2.6	707	-1.1	-1.0	-1.0
Singapore	19.8	671	14.3	14.2	3.0
Taiwan	13.8	956	17.8	17.7	3.0
Thailand	1.4	653	2.8	1.9	1.9
Middle East/Africa					
Israel	4.8	667	4.1	4.2	3.0
Saudi Arabia	3.2	1,409	-2.7	-2.7	-2.7
South Africa	-1.6	476	-2.2	-2.7	-2.7
Europe					
Czech Republic	0.4	425	0.7	1.0	1.0
Euro area	1.6	19,509	2.3	2.4	2.4
Hungary	0.2	310	1.5	2.1	2.1
Norway	17.9	551	6.6	6.6	6.6
Poland	1.5	1,122	-1.0	-0.9	-0.9
Russia	2.5	2,413	1.7	2.5	2.5
Sweden	6.5	761	4.2	4.2	3.0
Switzerland	6.9	1,177	7.6	4.7	3.0
Turkey	-4.0	1,764	-1.9	-2.5	-2.5
United Kingdom	-2.0	4,372	-2.5	-2.6	-2.6
Western Hemisphere					
Argentina	-3.2	714	1.5	1.3	1.3
Brazil	-1.0	2,855	-1.6	-1.6	-1.6
Canada	-0.7	2,793	-2.6	-2.4	-2.4
Chile	-3.5	432	-3.0	-3.1	-3.0
Colombia	-2.5	511	-3.5	-3.1	-3.0
Mexico	-0.3	2,176	-1.0	-0.5	-0.5
United States	-3.3	35,458	-2.1	-2.2	-2.2
Venezuela	3.1	…	…	…	…

Source: IMF (2024a) and author's calculations

Table 2 reports the results of running the Symmetric Matrix Inversion Method (SMIM) model to obtain the globally-consistent set of exchange rate changes that most closely approximate the target changes of REERs needed to bring the current account imbalances to their target levels (Cline, 2008). The first column shows the target change in the current account as a percent of GDP. This change is the difference between the ±3 percent limit and the baseline projection for 2029 if it is outside this limit.

As usual in this series, there are large targeted reductions in the surpluses of Taiwan (by 14.7 percent of GDP) and Singapore (by 11.2 percent of GDP). There are also targeted reductions of 5.3 percent of GDP for Hong Kong, 1.7 percent of GDP for Switzerland, 1.5 percent for Korea, and 1.2 percent for Israel and Sweden. For Japan, the needed correction is small, at a targeted decline in the current account balance by only 0.3 percent of GDP, despite the prolonged and deep decline of the real effective exchange rate of the yen.

Only three of the 34 economies show required improvements in current account balances to limit their deficits to no more than 3 percent of GDP: New Zealand (by 0.6 percent of GDP); and Chile and Colombia (both by 0.1 percent of GDP). There are no required corrections for the United States, the euro area, or China.

The second column of table 2 reports the actual changes in the current accounts achieved in the globally-consistent simulation. There is a strong asymmetry between the targeted surplus reductions required for eight economies (median reduction in column 1: by 1.6 percent of GDP) but deficit reductions required for just three (median: by 0.1 percent of GDP). As a consequence, the globally-consistent solution under-adjusts for excess surplus countries and imposes current account improvements for 23 countries needing no change (second column versus first).

The third column shows the change in the REER implied by the target change in the current account. Thus, for Taiwan, the target reduction in the current account surplus by 14.7 percent of GDP requires an appreciation of the REER by 33.9 percent in view of Taiwan's "gamma" coefficient (-0.43 percent of GDP change for 1 percent REER change). The fourth column shows the change in the REER accomplished on a globally-consistent basis in the SMIM simulation. There is a REER depreciation by about 2 percent needed for many economies (including the United States) for this global adding-up, even though they do not require depreciation to remain within the 3 percent of GDP deficit limit.

Table 2: Results of the Simulation: FEERs Estimates

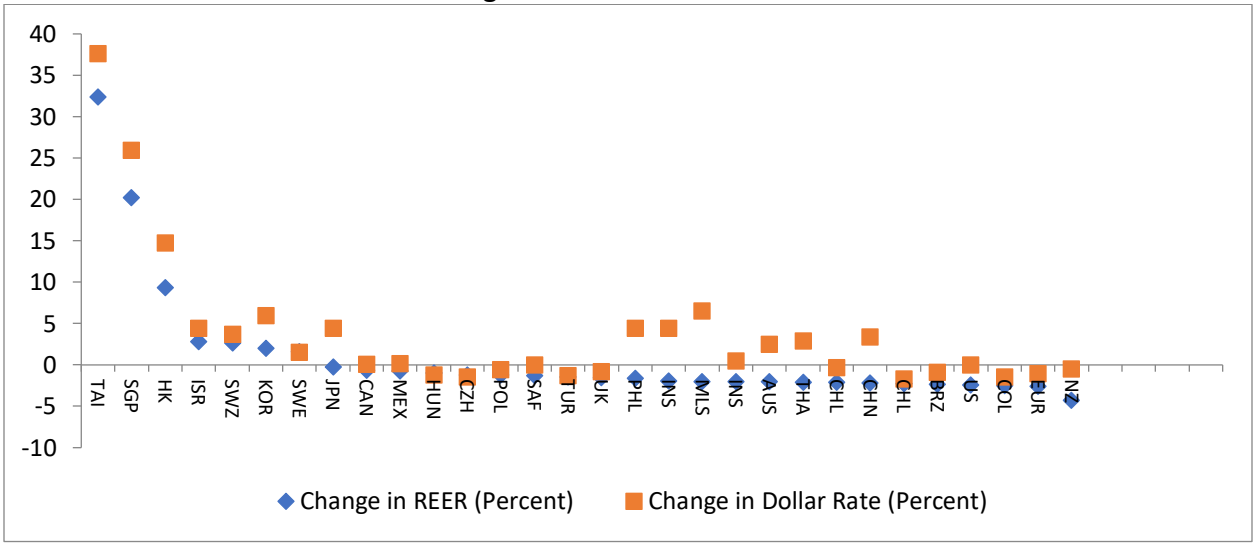
	Changes in Current Account as Percentage of GDP		Change in REER (percent)		Dollar Exchange Rate		FEER-consistent dollar rate
Country	Target Change	Change in Simulation	Target Change	Change in Simulation	Oct 2024	Percentage Change	
Pacific							
Australia*	0.0	0.4	0.0	-2.0	0.67	2.5	0.69
New Zealand*	0.6	1.1	-2.4	-4.2	0.61	-0.4	0.61
Asia							
China	0.0	0.5	0.0	-2.1	7.09	3.4	6.85
Hong Kong	-5.3	-4.7	10.6	9.4	7.77	14.8	6.77
India	0.0	0.4	0.0	-2.0	84.0	0.5	83.6
Indonesia	0.0	0.4	0.0	-1.9	15580	4.4	14917
Japan	-0.3	0.0	1.7	-0.2	150	4.4	143
Korea	-1.5	-0.8	3.7	2.0	1362	6.0	1284
Malaysia	0.0	0.9	0.0	-2.0	4.30	6.6	4.04
Philippines	0.0	0.4	0.0	-1.6	57.5	4.5	55.0
Singapore	-11.2	-10.1	22.4	20.2	1.31	25.9	1.04
Taiwan	-14.7	-14.1	33.9	32.4	32.1	37.6	23.3
Thailand	0.0	1.0	0.0	-2.0	33.4	2.9	32.4
Middle East/Africa							
Israel	-1.2	-0.8	4.2	2.8	3.76	4.5	3.60
Saudi Arabia	0.0	0.5	0.0	-1.4	3.75	1.4	3.70
South Africa	0.0	0.3	0.0	-1.2	17.57	0.0	17.57
Europe							
Czech Republic	0.0	0.6	0.0	-1.2	23.2	-1.4	23.5
Euro area*	0.0	0.6	0.0	-2.5	1.09	-1.1	1.08
Hungary	0.0	0.5	0.0	-1.0	369	-1.1	373
Norway	0.0	0.5	0.0	-1.4	10.81	-1.3	10.95
Poland	0.0	0.5	0.0	-1.2	3.96	-0.5	3.98
Russia	0.0	0.4	0.0	-1.4	96.2	-0.2	96.4
Sweden	-1.2	-0.6	3.3	1.7	10.46	1.6	10.30
Switzerland	-1.7	-1.2	3.8	2.7	0.86	3.7	0.83
Turkey	0.0	0.4	0.0	-1.4	34.25	-1.3	34.69
United Kingdom*	0.0	0.4	0.0	-1.5	1.31	-0.8	1.30
Western Hemisphere							
Argentina	0.0	0.3	0.0	-2.2	981.6	-1.6	997.99
Brazil	0.0	0.3	0.0	-2.3	5.61	-0.8	5.66
Canada	0.0	0.2	0.0	-0.6	1.38	0.1	1.37
Chile	0.1	0.6	-0.3	-2.0	934	-0.3	936
Colombia	0.1	0.4	-0.9	-2.5	4249	-1.5	4312
Mexico	0.0	0.2	0.0	-0.7	19.7	0.2	19.6
United States	0.0	0.4	0.0	-2.4	1.00	0.0	1.00
Venezuela	0.0	0.3	0.0	-1.2	0.00	…	…

* dollars/currency
… not available

The fifth column in table 2 reports the average exchange rate for each country against the US dollar in October 2024 (BIS, 2024b). The sixth column shows the percent change in the bilateral rate against the US dollar obtained in the globally-consistent simulation. The final column applies this percent change to the actual rate in October to arrive at the FEER-consistent dollar exchange rate for each country. This rate is $1.08 per euro, 143 yen per dollar, 6.85 Chinese yuan per dollar, and 1.30 dollars per pound sterling. Australia and New Zealand have FEER-consistent US dollar rates of 69 US cents and 61 US cents, respectively.[9]

Figure 2 shows the percent changes in exchange rates needed to bring current accounts into alignment with the FEERs targets. The economies are ordered from the largest REER appreciations to the largest REER depreciations. Following the pattern usually found, for the Asian economies there tends to be a greater (positive) difference between the amount of change needed in the bilateral rate against the dollar than in the multilateral REER. The countries with the highest needed appreciations (especially Taiwan and Singapore) tend to be in Asia, and the countries with high trade shares with these economies also tend to be in Asia. These regional trading partners tend to need to appreciate against the dollar to avoid experiencing a depreciation in the multilateral effective exchange rate as key partners appreciate against the dollar.

Figure 2
Changes Needed to Reach FEERs



ARG = Argentina, AUS = Australia, BRZ = Brazil, CAN = Canada, CHL = Chile, CHN = China, COL = Colombia, CZH = Czech Republic, EUR = Euro area, HK = Hong Kong, HUN = Hungary, IND = India, IDN = Indonesia, ISR = Israel, JPN = Japan, KOR = Korea, MLS = Malaysia, MEX = Mexico, NZ = New Zealand, PHL = Philippines, POL = Poland, SGP = Singapore, SAF = South Africa, SWE = Sweden, SWZ = Switzerland, TAI = Taiwan, THA = Thailand, TUR = Turkey, UK = United Kingdom, US = United States.
FEER: Fundamental Equilibrium Exchange Rate
REER: Real Effective Exchange Rate

[9] There is no estimate for Venezuela, where hyperinflation and import controls turn an estimate meaningless.

Conclusion

The principal misalignments of exchange rates identified in this study are highly concentrated, with the globally consistent simulations showing large real appreciations needed for Taiwan (by 32.4 percent) Singapore (by 20.2 percent) and Hong Kong (by 9.4 percent). Smaller globally-consistent real appreciations are needed for Switzerland (by 2.7 percent) as well as Israel (by 2.8 percent), Korea (by 2 percent), and Sweden (by 1.7 percent). The largest needed REER depreciation in the globally consistent solution stands at 4.2 percent for New Zealand. In addition, global consistency imposes REER depreciations in the range of about 2 percent for many economies even though their deficits do not exceed the allowed ceiling deficit of 3 percent of GDP. This consistency effect is about the same for the euro (-2.5 percent REER change) and the United States (-2.4 percent).

The election of Donald Trump returning him to the US presidency portends potentially turbulent change in fiscal, trade, and exchange rate policies. Although initially these changes seem likely to strengthen the dollar, eventually they could risk a shock to confidence and cause pressure in the opposite direction.

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