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Estimates of Fundamental Equilibrium Exchange Rates, November 2022

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This study updates estimates of Fundamental Equilibrium Exchange Rates (FEERs) using October 2022 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, 2022a, b). I apply the real effective exchange rate series of the Bank of International Settlements (BIS, 2022a) to take account of changes in real exchange rates subsequent to the base period used in the WEO.

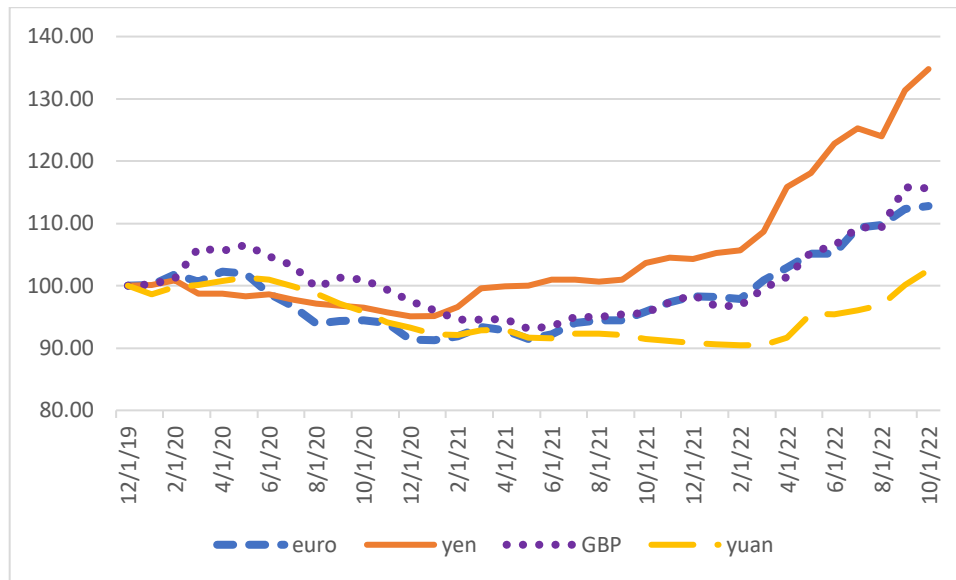
Trends in Exchange Rates

In the six months ending October, the US dollar continued its substantial rise against major currencies. The dollar at least briefly passed through parity against the euro, strengthening from \$1.16 per euro in October 2021 to \$1.08 in April 2022 and \$0.98 in October 2022 before easing to \$1.02 in late November (BIS, 2022b; Reuters). An even more dramatic rise occurred against the yen: from 113 yen per dollar in October 2021 to 126 in April and 147 in October 2022 (with a moderation to 142 by late November).

Since the beginning of the pandemic, there have been three phases for the dollar. In the first, in early 2020 there was a safe haven effect that strengthened the dollar. In a second phase, the growing evidence of lagging US performance in combating Covid-19 dragged the dollar down. In the third phase, a move toward monetary tightening in the US, combined with the shock to energy prices from the Russia-Ukraine war pushed up the dollar. Figure 1 shows these successive phases for the dollar against four currencies: the euro, the yen, the pound sterling, and the Chinese renminbi yuan. For the yuan, in recent months the rise in the dollar has also reflected a reversal from perceived strength to perceived weakness in China's zero-Covid approach to the pandemic, with its recurrent lockdowns.

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Figure 1
Strength of the US Dollar against the Euro, Yen, Pound Sterling, and Chinese Yuan
(Dec. 2019=100)



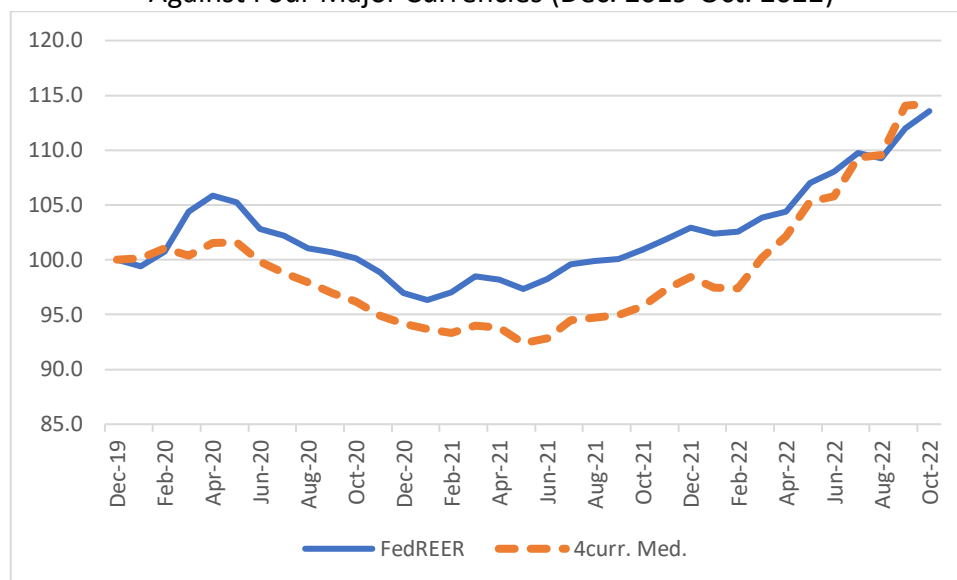
Source: FRED (2022)

Although these four major currencies are predominant for purposes of financial markets, and especially for official reserves, they are not necessarily representative for US trade.² Nonetheless, as shown in Figure 2, the real effective exchange rate of the dollar as measured by the Federal Reserve has moved similarly. From December 2019 as the pre-pandemic base, in the initial phase the dollar rose about 6 percent to the peak in April-May 2020 as measured by the Fed's REER, and by about 2 percent as measured by the 4-currency median. In the second phase, by January-February 2021 the dollar had fallen against its pre-pandemic base by about 3 percent in the REER and about 6 percent in the 4-currency median. In the third phase there was a relatively steady rise in the dollar to a level about 14 percent above the pre-pandemic base by October 2022.

² In September 2022, global foreign exchange reserves amounted to \$12 trillion. Of \$11 trillion for which the currency allocation was known, 59.5 percent was in US dollars; 19.8 percent in euros; 5.2 percent in yen; and 4.9 percent in pounds sterling (IMF, 2022c). The USDX financial markets index, which was begun in 1973 and is tracked in leading exchange traded funds, has a 58 percent weight for the euro, 14 percent for the yen, 12 percent for the pound sterling, 9 percent for the Canadian dollar, 4 percent for the Swedish krona, and 4 percent for the Swiss franc. Dan Bezek, "What is the Dollar Index?" *Seeking Alpha*, August 18, 2022.

Figure 2

Real Effective Exchange Rate of the US Dollar^a and Median Index of the Dollar
Against Four Major Currencies (Dec. 2019-Oct. 2022)



a. Converted from Jan 2006 = 100 to Dec 2019 = 100.

Source: US Federal Reserve (2022); Figure 1

Table 1 shows the exchange rates against the US dollar for the countries covered in this FEERs series for October 2021, April 2022, and October 2022. The country detail shows that there was already a generalized decline of exchange rates against the dollar from October to April, for 28 of the 32 currencies. However, whereas the median size of the decline in that period was modest, at 2.4 percent, in the most recent 6-month period the median decline against the dollar reached 10.7 percent.

Table 1 also shows the influence of political shocks. In Russia, the rouble fell 8 percent from October 2021 to April in the face of financial sanctions, but in the second period it rose 28 percent against the dollar. The rouble is now “the world’s best performing currency this year, supported by capital controls and an initial collapse in imports as a result of Western sanctions ...”.³ In the United Kingdom, the change in government briefly brought the pound sterling as low as \$1.06 in late September as markets reacted to announced tax cuts, forcing a change in leadership and policies.

³ Reuters, November 22, 2022. The initial decline of the rouble was more severe than shown in table 1, as the currency reached a low of 145 per dollar in early March.

Table 1
Exchange Rates against the US dollar: October 2021, April 2022, and October 2022

Country	Oct 2021	Apr 2022	Oct 2022	%change:	
				Oct21-Apr22	Apr22-Oct22
Pacific					
Australia*	0.74	0.74	0.64	0.0	-14.0
New Zealand*	0.71	0.68	0.57	-4.0	-16.1
Asia					
China	6.42	6.43	7.19	-0.2	-10.6
Hong Kong	7.78	7.84	7.85	-0.8	-0.1
India	75.0	76.2	82.4	-1.6	-7.5
Indonesia	14179	14389.2	15441.8	-1.5	-6.8
Japan	113	126	147	-10.5	-14.3
Korea	1182	1237	1428	-4.4	-13.4
Malaysia	4.16	4.27	4.69	-2.5	-9.0
Philippines	50.7	52.0	58.8	-2.5	-11.5
Singapore	1.35	1.37	1.43	-1.1	-4.2
Taiwan	27.9	29.1	32.0	-4.0	-9.0
Thailand	33.5	33.8	38.0	-1.0	-10.9
Middle East/Africa					
Israel	3.21	3.25	3.54	-1.0	-8.4
Saudi Arabia	3.75	3.75	3.75	0.0	0.0
South Africa	14.85	15.05	18.14	-1.3	-17.0
Europe					
Czech Republic	22.0	22.59	24.97	-2.7	-9.5
Euro area*	1.16	1.08	0.98	-6.8	-9.2
Hungary	311	346.59	425.82	-10.3	-18.6
Norway	8.46	8.89	10.58	-4.9	-15.9
Poland	3.96	4.30	4.89	-7.9	-12.1
Russia	71.3	77.9	61.1	-8.4	27.5
Sweden	8.67	9.54	11.15	-9.1	-14.4
Switzerland	0.92	0.94	1.00	-2.2	-5.3
Turkey	9.21	14.73	18.59	-37.5	-20.8
United Kingdom*	1.37	1.29	1.13	-5.6	-12.7
Western Hemisphere					
Argentina	99.25	113.33	152.59	-12.4	-25.7
Brazil	5.53	4.75	5.26	16.6	-9.7
Canada	1.24	1.26	1.37	-1.4	-8.0
Chile	814	815.1	955.9	-0.1	-14.7
Colombia	3773	3793	4712	-0.5	-19.5
Mexico	20.5	20.1	20.0	1.9	0.4
median				-2.4	-10.7

*dollars/currency

Source: BIS (2022b)

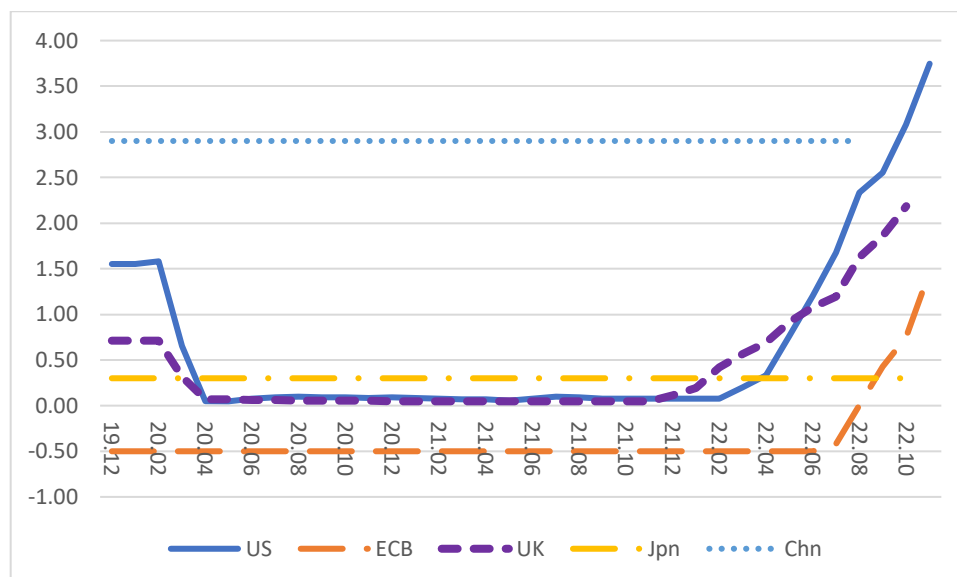
It is important to recognize that because of the generalized rise of the dollar against most currencies, the real effective exchange rates of most economies have fallen much less than might be inferred from table 1. For example, although the Australian dollar fell against the US dollar by 14 percent from April to October, its REER fell only 4.7 percent (BIS, 2022a).

Monetary Tightening

The rise of the dollar relative to other leading currencies since mid-2021 has been driven in part by more forceful monetary tightening in the United States than in the euro area, the UK, and especially Japan. Figure 3 shows the monetary policy rates of these economies as well as China since December 2019.⁴ In addition to the highest policy rate, by October the United States also had quantitative tightening that amounted to approximately an additional 200 basis points in one measure of a “proxy” federal funds rate (Choi et al, 2022).

Figure 3

Monetary Policy Rates in the United States, Euro Area, United Kingdom, and China
(percent, December 2019–November 2022)



Source: FRED (2022)

The most extreme manifestation of the influence of widening monetary policy rate gaps is the decline of the yen in the face of the government’s commitment not to raise interest rates even as inflation rises. In October the yen stood 23 percent below its level against the dollar a year earlier.

⁴ The FRED (2022) series are: DFF, ECBDFR, IRSTCI01GBM156N, IRSTCB01JPM156N, and IRSTCB01CNM156N.

No New Plaza Agreement

In mid-October, G7 finance ministers issued a statement “Recognizing that many currencies have moved significantly this year with increased volatility” but did not undertake an agreement for joint intervention or other monetary policy coordination. Asked at a news conference whether it was time for a new Plaza Accord, US Treasury Secretary Janet Yellen responded that the dollar’s strength was “a natural result of different paces of monetary tightening” and that “a market-determined value for the dollar is in America’s interest”.⁵

The US current account deficit was only 2.7 percent of GDP in 1985 when the Plaza Accord adopted joint intervention to curb the strong dollar. The deficit peaked at 3.3 percent in 1987 and returned to zero by 1991 (IMF, 2022a). However, a US deficit was a new phenomenon that followed a century of nearly unbroken current account surpluses (Cline, 2005a, p. 2). By the early 2000s, even a deficit of 4 to 5 percent of GDP, reaching 5.9 percent in 2006, was insufficient to mobilize joint intervention (Cline, 2005b).

In the current context of exceptionally high inflation in the United States and in other major economies, it would be counterproductive for the United States and the world economy to implement a coordinated set of policies that would have the effect of reversing the recent moderation in the monthly path of US inflation; and in particular, by prematurely reducing US interest rates.

The Inflationary Outbreak of 2021-22

The driving force behind the need for monetary tightening has been the worst inflationary outbreak over the past two years since the 1970s. The surge in inflation reflects the combination of pandemic-reduced supply with pandemic-induced fiscal stimulus, substantially augmented by the Russia-Ukraine war and its impact on food and energy prices.

As shown in table 2, consumer price inflation measured from beginning to end of calendar year surged in the United States from 1.5 percent in 2020 to 7.5 percent in 2021. In the 12 months ending September 2022, it reached 8.2 percent. The acceleration was even greater in the euro area, from approximately zero in 2020 to 5 percent in 2021 and 10 percent in the 12 months ending September 2022. These rates are almost the same for the UK.

Trends in recent months are somewhat more encouraging. For the United States, the 6-month rate of inflation converted to an annual rate fell to 6.3 percent by October 2022 (BLS, 2022). However, this rate remains unacceptably high, and the key question is whether it will be possible to reduce the rate below, say, 3 percent without provoking a painful recession.

⁵ Leika Kihara, “G7 fails to reach intervention deal to ease pain of soaring dollar,” *Reuters*, October 16, 2022.

Table 2
Consumer Price Inflation, 12 Largest Economies, 2019-2022
(percent, Dec/Dec)

	2022 GDP (\$ bn)	Dec/Dec Inflation (percent)			
		2019	2020	2021	2022a
US	25,035	2.1	1.5	7.4	8.2
Euro area	13,974	1.3	-0.3	5.0	10.0
Japan	4,301	0.5	-0.9	0.5	2.6
UK	3,198	1.3	0.6	5.4	10.1
Canada	2,200	2.1	0.7	4.7	6.8
Korea	1,734	0.7	0.6	3.7	5.6
Australia	1,725	1.8	0.9	3.6	7.7b
7 adv	52,167				
China	18,321	4.5	-0.3	1.8	2.4
India	3,469	6.7	4.9	6.3	6.8
Russia	2,133	3.0	4.9	8.4	...
Brazil	1,895	4.3	4.5	10.1	7.1
Mexico	1,425	2.8	3.2	7.4	8.7
5 eme	27,243				
Rest of World	22,151				
World	101,561				

a. Sep/Sep. b. Forecast for Dec/Dec
Source: BIS (2022x); IMF (2022)

Results of the Main Calculations

Table 3 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 2022 in the October 2022 WEO. The second column reports the Fund's projection of the current dollar value of GDP for each economy in 2027.

The third column of the table reports the Fund's 2027 current account projections, as a percent of GDP. The fourth column then adjusts the 2027 outlook to take account of the change in exchange rates from the July-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

⁶ The October 2022 WEO uses July 22-August 19, 2022, as its base period (IMF, 2022b, p. 97). The adjustments apply weights of 0.32 and 0.68 to the July and August periods respectively. Changes in the real effective exchange rate (REER) from July-August to October use the Bank of International Settlements "broad" series (BIS, 2022a).

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

In view of large recent exchange rate changes, the adjustments from the July-August base to October warrant further attention. In this period the REER rose by 4.0 percent for the dollar and by 2.7 percent for the euro, but fell by 4.5 percent for the yen. These changes widened the medium-term current account deficit from 2.1 percent of GDP to 2.4 percent for the United States; narrowed the euro-area surplus from 2.6 percent of GDP to 2.4 percent; and widened the Japanese surplus from 3.2 percent of GDP to 3.7 percent.⁸

The FEERs methodology sets ± 3 percent of GDP as the permissible external imbalance.⁹ 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 2 accordingly shows the target current account as either ± 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.

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 example, for Japan the current account impact parameter is -0.16. Applying the 4.5 percent decline in the REER, and applying the one-half fraction for moderating short-term swings, the result is to boost Japan’s medium-term surplus by nearly one-half percent of GDP.

⁹ For a summary of the FEERs methodology, see Cline and Williamson (2012), Appendix A.

Table 3: Target Current Accounts (CA) for 2027

Country	IMF Estimate of 2022 CA (percent of GDP)	IMF 2027 GDP forecast (billions of US dollars)	IMF 2027 CA forecast (percent of GDP)	Adjusted 2027 CA (percent of GDP)	Target CA (percent of GDP)
Pacific					
Australia	2.1	2,082	-0.1	0.3	0.3
New Zealand	-7.7	307	-4.3	-3.8	-3.0
Asia					
China	1.8	26,438	0.4	0.8	0.8
Hong Kong	8.6	471	7.4	6.2	3.0
India	-3.5	5,366	-2.6	-2.7	-2.7
Indonesia	2.2	1,901	-1.5	-1.6	-1.6
Japan	1.4	5,172	3.2	3.7	3.0
Korea	3.2	2,137	4.1	5.0	3.0
Malaysia	1.6	615	3.6	3.9	3.0
Philippines	-4.4	573	-1.8	-1.7	-1.7
Singapore	12.8	537	12.0	11.8	3.0
Taiwan	-5.7	1,354	8.5	9.0	3.0
Thailand	14.8	1,045	3.3	3.5	3.0
Middle East/Africa					
Israel	2.5	679	2.2	2.8	2.8
Saudi Arabia	16.0	1,116	4.6	4.0	4.0
South Africa	1.2	491	-2.0	-1.4	-1.4
Europe					
Czech Republic	-4.3	401	-0.5	0.0	0.0
Euro area	1.0	16,963	2.6	2.4	2.4
Hungary	-6.7	257	0.5	0.3	0.3
Norway	19.4	523	10.4	11.0	11.0
Poland	-4.0	979	-2.0	-2.0	-2.0
Russia	12.2	2,236	3.1	3.1	3.1
Sweden	3.8	809	3.6	4.2	3.0
Switzerland	6.2	1,003	7.0	4.6	3.0
Turkey	-0.5	732	-1.6	-2.1	-2.1
United Kingdom	-4.8	4,450	-3.5	-3.2	-3.0
Western Hemisphere					
Argentina	-0.3	662	0.7	0.7	0.7
Brazil	-1.5	2,568	-2.1	-2.2	-2.2
Canada	0.5	2,728	-1.8	-0.7	-0.7
Chile	-6.7	408	-2.5	-2.5	-2.5
Colombia	-5.1	445	-3.9	-3.4	-3.0
Mexico	-1.2	1,719	-1.1	-0.9	-0.9
United States	-3.9	30,282	-2.1	-2.4	-2.4
Venezuela (a)	4.0	87	6.0	...	...

a. 2023 except 1st column

Table 4 reports the results of running the Symmetric Matrix Inversion Model (SMIM) 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 2027 if it is outside this limit. As usual in this series, there are large required reductions in the surpluses of Singapore (by 8.8 percent of GDP) and Taiwan (by 6.0 percent of GDP). There are also required reductions of 3.2 percent of GDP for Hong Kong, 2 percent for Korea, 1.6 percent of GDP for Switzerland, 0.9 percent for Malaysia, 1.2 percent for Sweden, and 0.7 percent for Japan.

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 0.8 percent of GDP), Colombia (by 0.4 percent of GDP), and the United Kingdom (by 0.2 percent of GDP). There are no required corrections for the United States, the euro area, or China.

The second column of table reports the actual changes in the current accounts achieved in the globally-consistent simulation. There is a strong asymmetry between sizable surplus reductions required for several economies but only modest deficit reductions required for just New Zealand, Colombia, and the United Kingdom. As a consequence, the globally-consistent solution under-adjusts for excess surplus countries by 0.8 percent of GDP for Singapore; 0.7 percent for Malaysia and Thailand; 0.5 percent for Hong Kong and Taiwan; 0.4 percent for Korea, Sweden, and Switzerland; and by 0.2 percent of GDP for Japan. The simulation correspondingly generates an improvement of typically 0.2 to 0.4 percent of GDP for economies not needing any improvement.

The third column shows the change in the REER implied by the target change in the current account. Thus, for Singapore, the target reduction in the current account surplus by 8.8 percent of GDP requires an appreciation of the REER by 17.5 percent in view of the “gamma” coefficient (constrained to the maximum allowed in the model, 0.5 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 1.7 percent REER depreciation needed for the United States for this global adding-up, even though for its own equilibrium the US does not need any depreciation.

Table 4: Results of the Simulation: FEERs Estimates

Country	Changes in Current Account as Percentage of GDP		Change in REER (percent)		Dollar Exchange Rate		FEER-consistent dollar rate
	Target Change	Change in Simulation	Target Change	Change in Simulation	Oct 2022	Percentage Change	
Pacific							
Australia*	0.0	0.3	0.0	-1.4	0.64	2.1	0.65
New Zealand*	0.8	1.1	-3.1	-4.4	0.57	-1.4	0.56
Asia							
China	0.0	0.3	0.0	-1.5	7.19	2.1	7.04
Hong Kong	-3.2	-2.7	6.3	5.5	7.85	9.1	7.20
India	0.0	0.3	0.0	-1.4	82.4	0.4	82.0
Indonesia	0.0	0.3	0.0	-1.4	15442	3.6	14909
Japan	-0.7	-0.5	4.3	2.9	147	6.0	139
Korea	-2.0	-1.6	5.1	4.0	1428	6.7	1339
Malaysia	-0.9	-0.2	1.9	0.5	4.69	6.6	4.41
Philippines	0.0	0.3	0.0	-1.2	58.8	3.3	56.9
Singapore	-8.8	-8.0	17.5	16.0	1.43	19.8	1.19
Taiwan	-6.0	-5.5	13.8	12.8	32.0	16.9	27.3
Thailand	-0.5	0.2	1.1	-0.4	38.0	3.4	36.7
Middle East/Africa							
Israel	0.0	0.3	0.0	-1.0	3.54	0.1	3.54
Saudi Arabia	0.0	0.4	0.0	-1.0	3.75	1.3	3.70
South Africa	0.0	0.2	0.0	-0.9	18.14	0.1	18.12
Europe							
Czech Republic	0.0	0.4	0.0	-0.8	25.0	-1.0	25.2
Euro area*	0.0	0.4	0.0	-1.8	0.98	-0.7	0.98
Hungary	0.0	0.3	0.0	-0.7	426	-0.8	429
Norway	0.0	0.3	0.0	-1.0	10.58	-0.8	10.66
Poland	0.0	0.3	0.0	-0.9	4.89	-0.2	4.90
Russia	0.0	0.3	0.0	-1.0	61.1	-0.1	61.2
Sweden	-1.2	-0.8	3.4	2.2	11.15	2.2	10.91
Switzerland	-1.6	-1.2	3.6	2.8	1.00	3.5	0.96
Turkey	0.0	0.3	0.0	-1.0	18.59	-0.9	18.75
United Kingdom*	0.2	0.4	-0.6	-1.7	1.13	-1.1	1.12
Western Hemisphere							
Argentina	0.0	0.2	0.0	-1.6	152.6	-1.1	154.34
Brazil	0.0	0.2	0.0	-1.7	5.26	-0.6	5.29
Canada	0.0	0.1	0.0	-0.5	1.37	0.1	1.37
Chile	0.0	0.4	0.0	-1.2	956	0.1	955
Colombia	0.4	0.6	-2.4	-3.5	4712	-2.8	4848
Mexico	0.0	0.1	0.0	-0.5	20.0	0.1	20.0
United States	0.0	0.3	0.0	-1.7	1.00	0.0	1.00
Venezuela	0.0	0.2	0.0	-0.9	...	...	...

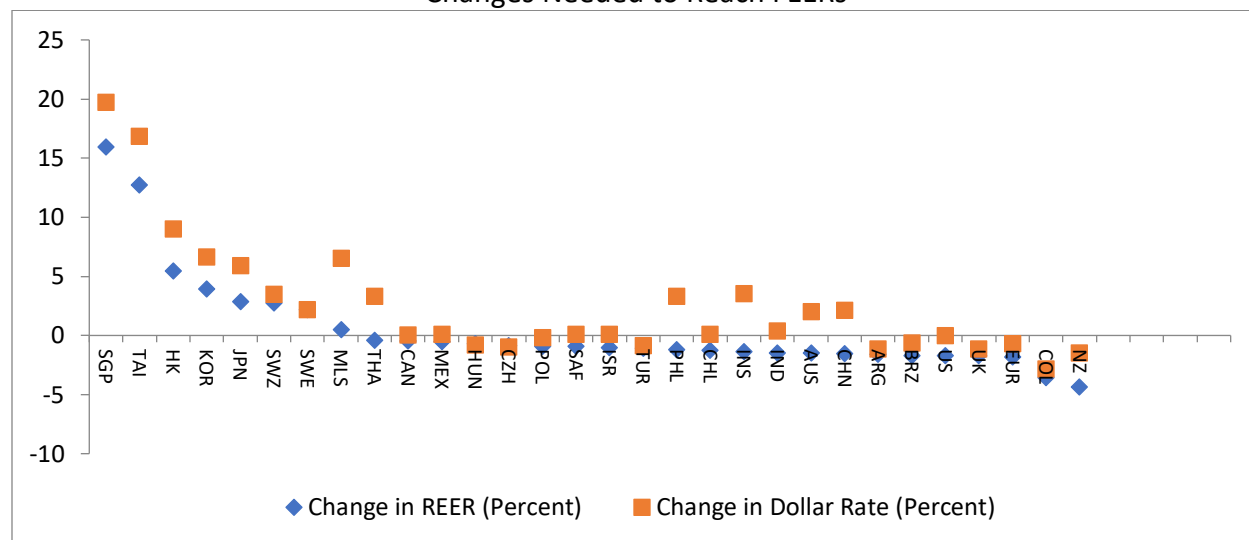
* dollars/currency

... not available

The fifth column in table 4 reports the average exchange rate for each country against the US dollar in October 2022 (BIS, 2022b). The sixth column shows the percent change in the dollar rate 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 98 US cents per euro, 139 yen per dollar, 7.04 Chinese yuan per dollar, and 1.12 dollars per pound sterling. Australia and New Zealand have FEER-consistent US dollar rates of 64 US cents and 56 US cents, respectively.¹⁰

Figure 4 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 Singapore and Taiwan) 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 4
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

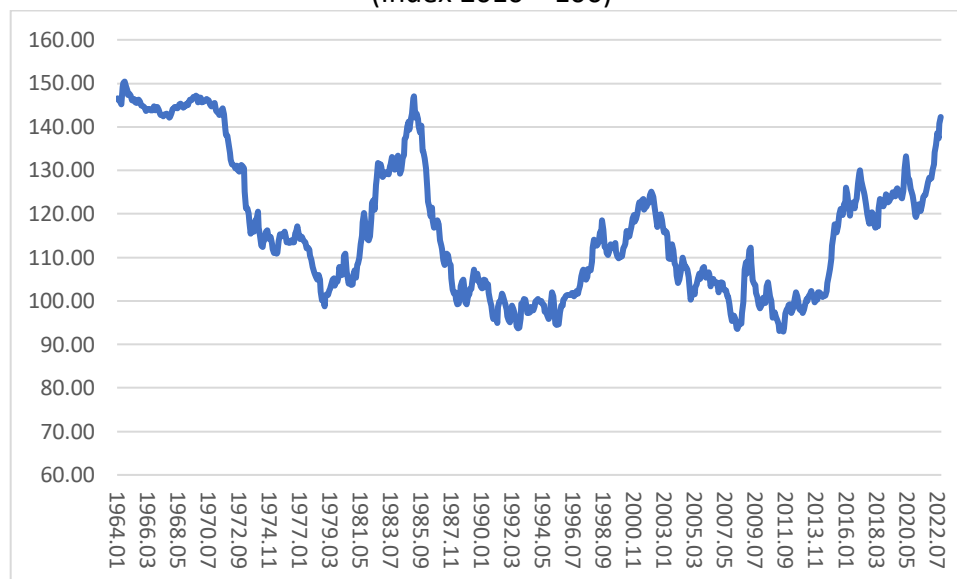
¹⁰ There is no estimate for Venezuela, where hyperinflation and import controls turn an estimate meaningless.

The Strong Dollar in Historical Context

Although the most recent IMF projections of current account imbalances do not indicate an overvaluation of the dollar based on an excessive medium-term current account surplus, it is important to recognize the exceptionally high level of the real effective exchange rate of the dollar at present. The Bank of International Settlements' "narrow" measure of the REER, which extends back to 1964 as reported in FRED (2022), shows that the dollar is stronger than at any time since 1985 (Figure 5).

An important reason for a stronger dollar in recent years is that the United States has shifted from being a net importer of oil to approximate trade balance in petroleum, as a consequence of the fracking revolution. In 2006-2012, net oil and gas imports averaged 2 percent of GDP (Cline 2015, p. 15). In 2021 there was only a slight oil trade deficit, and in the first 9 months of 2022, a slight trade surplus.¹¹ With the external balance 2 percent of GDP higher than before fracking, the REER for the US could be expected to be 12 percent stronger.¹² As shown in Figure 5, however, at present the REER is about 40 percent stronger than in 2010. These comparisons suggest that at the present time the IMF's medium-term projections may tend to err in the direction of understating rather than overstating the size of the US current account deficit.

Figure 5
Real Narrow Effective Exchange Rate for the United States
(Index 2010 = 100)



Source: FRED (2022)

¹¹ Total imports of petroleum products were \$204.8 billion in 2021 and \$223.7 billion in the first 9 months of 2022; total exports were \$196.3 billion in 2021 and \$231.4 billion in the first 9 months of 2022. (BEA, 2022).

¹² With the current account impact parameter "gamma" at -0.165, a structural reduction in the deficit by 2 percent of GDP would translate to an increase in the FEER by $2/0.165 = 12.1$ percent.

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 Singapore (by 16.0 percent), Taiwan (by 12.8 percent), and Hong Kong (by 5.5 percent)., Other misalignments are smaller and confined to just a few economies. Globally-consistent REER appreciations are estimated at 4.0 percent for Korea, 2.9 percent for Japan, 2.8 percent for Switzerland, and 2.2 percent for Sweden. The needed REER depreciations in the globally consistent solution stand at 4.4 percent for New Zealand and 3.5 percent for Colombia. In addition, global consistency imposes REER depreciations in the range of 1 to 1.8 percent for many economies even though their deficits do not exceed the allowed ceiling of 3 percent of GDP.

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