

## FX Insight

# FX Misalignment Matters

### Expensive Dollar, Cheap MYR

The US-Iran scare at the start of the year reminds us of the importance of fundamentals-grounded asset valuations. Academic research has shown that misalignments between current and “fair” valuations tend to correct over time. Hence the extent of misalignment can provide valuable information for market participants.

#### A) Maybank Behavioral Effective Exchange Rate Panel (**Maybank-BEER**)

Leveraging on macro features of an economy including its net foreign assets, trade openness, as well as productivity and real rate differentials relative to trading partners, we find that on a **trade-weighted, medium-term basis**:

- USD REER is most overvalued, followed by THB and CNY;
- Among AxJs, MYR is significantly undervalued, followed by SGD
- Misalignments in IDR and PHP are quite modest

Nonetheless, we acknowledge that a different set of more cyclical factors could drive near-term outcomes; hence the need for a higher-frequency tracking model.

#### B) Maybank Augmented Tracking Models (**Maybank-AT**)

This model aims to capture shorter-term dynamic changes in market yield and inflation differentials, the state of world equities and bonds, as well as movements in relevant commodity prices etc., and is estimated on an USD basis. Given the supposed elevated nature of the USD, we note that **findings on short-term, relative USD basis could differ from medium-term, basket basis results above**. We find that:

- Most USD-XX pairs have room to decline, again reiterating the overvalued nature of the dollar. In G7-space, EUR, GBP and CHF could see most short-run gains vs. USD.
- MYR and SGD could head higher against USD, with tracking USDMYR and USDSGD valuations at 4.04 and 1.33 respectively.
- Tracking values for USDTHB and USDPHP are at 30.5 and 51.0, not too far from spot. Longer-term misalignment in THB that our BEER model revealed could take time to correct.
- USDIDR's tracking value is estimated at 14,200. We are cautious of this result, as the model would be unable to incorporate positive sentiments relating to BI's newer stance on allowing more IDR appreciation on sound economic outlook.

For ease of interpretation, insights extracted from both sets of models will be presented in the form of **four key FX ideas** in the report.

ASEAN FX Pairs	Spot Value (9 Jan)	Model Tracking Value
USDMYR	4.09	4.04
USDSGD	1.35	1.33
USDTHB	30.3	30.5
USDPHP	50.7	51.0
USDIDR	13,850	14,200

Source: Maybank FX Research & Strategy Estimates

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## Off to a Volatile Start

Just when we thought we were making some progress on the US-China trade conflict, we are greeted at the start of 2020 with renewed US-Middle East tensions (although signs of tentative de-escalation have emerged). Amid the market uncertainty and accompanying volatility, we take the opportunity to introduce two new sets of workhorse models to help us navigate FX markets in 2020.

- Maybank Augmented Tracking Models ([Maybank-AT](#); Supplementing 6-12 Months View)
- Maybank Behavioral Effective Exchange Rate Panel ([Maybank-BEER](#); Supplementing 3-5 Year Medium-term View)

More details will be provided on the models later, including specifications and valuation estimates (miscellaneous information in Appendix). For ease of interpretation, insights extracted from both sets of models will be presented in the form of **four key FX ideas** later.

It is important at this point to remind readers of the usual caveats. Empirically-derived “equilibrium” or “fair” FX valuations provide the most value added when they are used to supplement existing understanding of market conditions. They are not meant to provide point forecasts for fixed durations, and it is common for long stretches of time to pass before spot values converge towards their supposed “equilibrium”.

Still, when severe misalignments exist between spot levels and valuations suggested by key drivers, there can be significant informational relevance to subsequent FX moves. I.e., the more overvalued or undervalued a currency is relative to cyclical drivers or fundamentals (depending on the model in question), the more likely that some form of reversion is likely to occur.

Before moving on to the results though, we take stock of some recent developments. In particular, we take a look at how views espoused in our [2020 Annual Outlook](#) (released on 3 Dec 2019) have performed thus far. This will also help set the macro context for some of the valuation discussions later.

### Recap of 2020 Outlook Views

#### 1) Carry FX CAD, IDR, PHP to Outperform in Environment of Low Growth & Rates

Compared to 3 Dec 2019, CAD, IDR and PHP have gained around 2.0%, 1.9% and 0.6% respectively against the USD, affirming our broad directional bias in Dec. In the interim though, we are cautious that any signs of re-escalation in the US-Iran conflict could lead to sporadic pockets of risk-off sentiments in markets, in which case, oil-linked CAD could potentially perform better (among the three) if crude oil prices remain supported.

#### 2) Signs of Trade & Tech Recovery Benefitting SGD, KRW, TWD

Confirmation of the US-China phase-1 deal around mid-Dec eventually translated to more sanguine sentiments with regards to Asia’s growth outlook in 2020. Compared to 3 Dec, SGD, KRW and TWD have gained around 1.0%, 2.4% and 1.7% respectively, against the USD. There are signs that the tech recovery is beginning to gain traction—World Semiconductor Trade Statistics forecasts the global semiconductor market to recover by 5.9% in 2020, following an estimated decline of 12.8% in 2019, with activity in all regions expected to rise. This should further buttress tech-linked FX valuations.

### 3) USD Strength Unsustainable in 2020

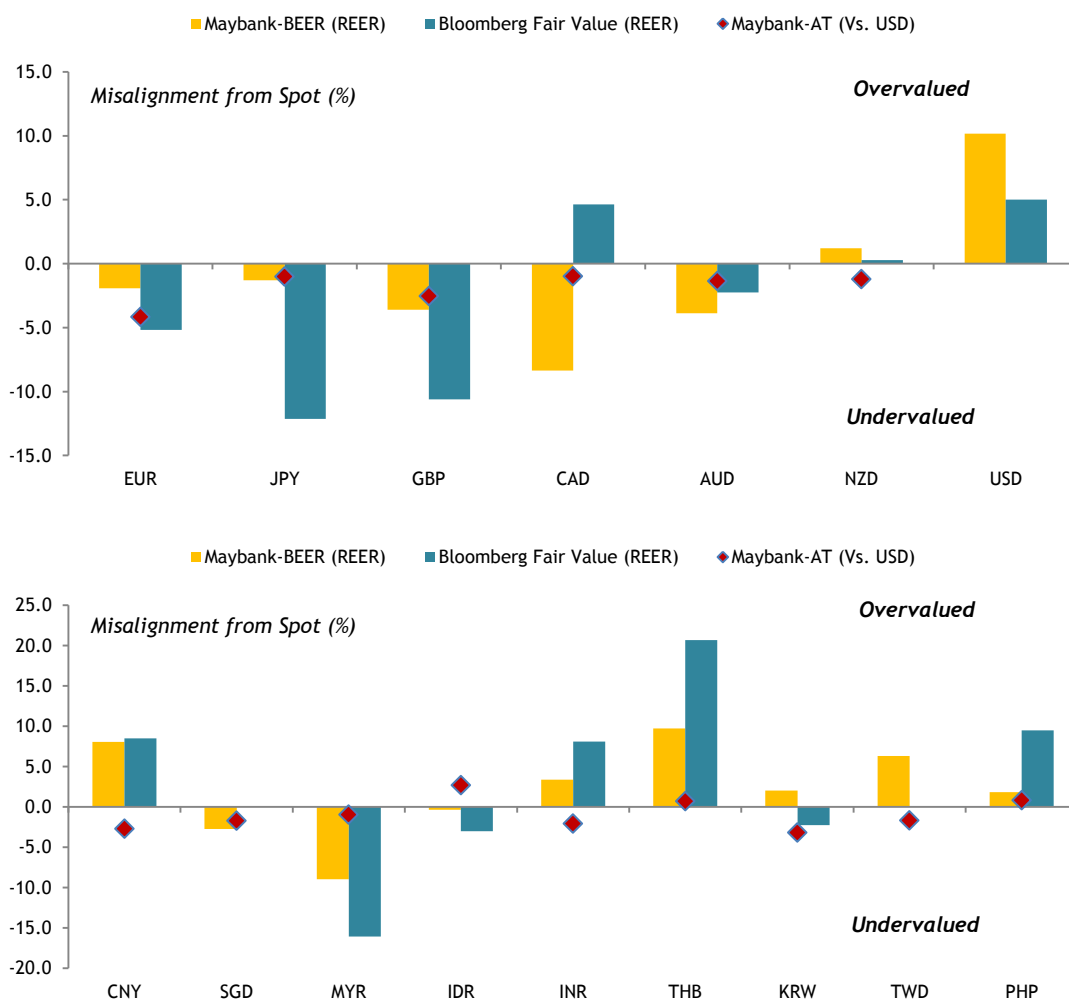
DXY has also softened by around 1% since 3 Dec, in part due to signs of weakness in US manufacturing activity in recent data releases. We continue to expect the USD to drift broadly lower in 2020 as US growth outperformance fades, especially if Fed tones remain asymmetric (i.e., more ready to ease than hike). Uncertainty tied to Trump impeachment proceedings as well as the potential for US-Iran conflict to be protracted (despite current signs of de-escalation) could also contribute to dollar underperformance over time.

## FX Misalignments – 3 Measures

We first provide a snapshot of the estimated FX valuation misalignments for both DM and Asian currencies, according to our two proprietary models. To avoid confusion, it is necessary to emphasize that the **Maybank-AT** models track **misalignments in nominal currency values relative to the USD**, while the **Maybank-BEER** panel tracks **misalignments in REERs** (i.e., relative to trading partners).

We add in a set of *Bloomberg Economics'* fair value REER estimates (*modified replication of the IMF's REER Index Model*) for reference.

### FX Misalignments—Maybank-AT, BEER & Bloomberg Fair Values



Source: Bloomberg, Maybank FX Research & Strategy Estimates

Note: Bloomberg Fair Values are not available for SG and TW.

Most of the estimated biases of both Maybank models (i.e., red dots and yellow bars) end up being **directionally consistent** for DM currencies.

However, among Asian FX, there are several instances where a currency can be **deemed undervalued relative to the USD, and yet be deemed “fairly” valued or even overvalued on a REER basis**. This can be reconciled by pointing to the likely significant overvaluation in the USD.

The following figure shows a quick overview of the key features of the Maybank-AT and Maybank-BEER models, to aid readers’ understanding of model interpretation, before we delve into more detailed discussions of our five key findings.

**Figure: Overview of Models**

#### Maybank-AT Models

- Tracks Misalignments Against USD (i.e., estimated using USD-XX pairs)
- Relevant for 6 to 12 Month View
- Augmented in-house FX tracking models with customized supplementary variables.
- Monthly Data, OLS, Individual Estimations for each FX pair
- E.g., USDMYR specification incorporates:
  - Differentials in MY-US (i) Current Account as % of GDP, (ii) 10Y Bond Yields, (iii) Inflation
  - Reflation proxy (World Equities / World Sovereign Bonds)
  - Palm oil (this augmented variable **varies** according to FX pair to improve model fit)

#### Maybank-BEER Panel

- Tracks Misalignments in REER terms (i.e., basket of trading partners’ currencies).
- Relevant for 3 to 5 Year View
- Based on BEER literature (Clark & MacDonald, 1999)
- Quarterly Data, Dynamic OLS Panel Estimation
- Data used in Panel for *Country I* include:
  - Net Foreign Assets (% of GDP)
  - Trade Openness (Total Trade as % of GDP)
  - Productivity Relative to Trading Partners’ Weighted Avg. (Balassa-Samuelson Effect)
  - Short-run Real Rates (%-Pt Deviation from Trading Partners’ Weighted Average)

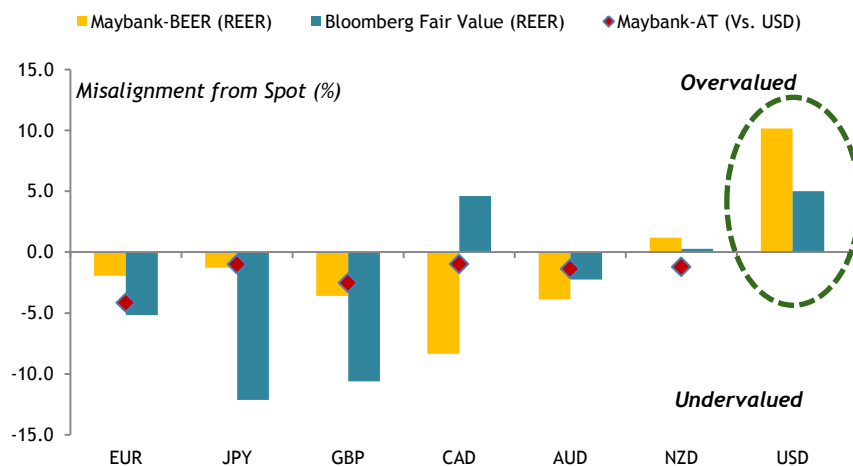
Reference Indicator: Bloomberg Economics’ Fair Value Estimates

*Replication of the IMF’s REER Index Model extended to take into account unconventional monetary policies. These valuations are provided for additional reference due to higher-frequency of updates vs. IMF Article IV reports.*

## Main Finding 1: US Dollar is Just Too Dear

Our model estimations suggest that the USD is simply too dear. The Maybank-BEER Panel estimates the USD REER to be overvalued by about 10%. Concerns on valuation based on fundamentals should thus not be a barrier for USD to depreciate over the course of 2020. Apart from NZD, non-USD currencies (EUR, JPY, GBP, CAD and AUD) are also undervalued from the REER perspective, adding to the weaker USD story.

### USD is Overvalued Based on Different Metrics of Fair Value



Source: Bloomberg, Maybank FX Research & Strategy Estimates

IMF Article IV report also estimated the USD REER to be around 9.0% overvalued (6% to 12% range) in 2018. The USD REER has hardly moved since end-2018, suggesting that a large part of this overvaluation is likely still intact.

Bloomberg Economics' estimate (modified version of IMF's REER Index Models, blue bars) puts the USD REER at around 5% overvalued. In addition, they estimated that JPY, GBP and EUR REERs are likely the most undervalued in the DM space. Their potential for appreciation in the medium term underscores the likelihood for USD weakness ahead.

We also look across the Maybank-AT Model results and found that most non-USD DM currencies are undervalued against the USD (red dots in chart above). This suggests that USD weakness could come within the next few quarters.

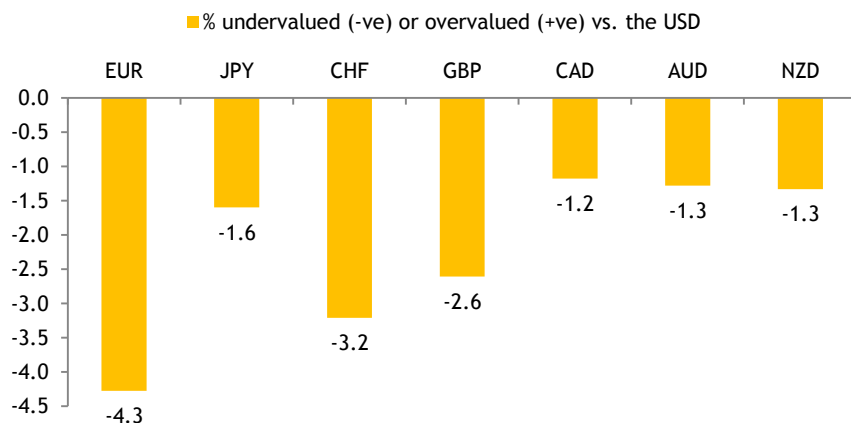
The evidence of overvaluation in the USD gels with our view that the greenback could weaken in 2020 alongside 1) activity momentum peaking at home, 2) asymmetric patience from the Fed on policy responses to inflation and 3) heightened political uncertainty in the US owed to sporadic episodes of impeachment developments (that have yet to reach the Senate) as well as the Presidential election 2020, in contrast to lighter political events in the rest of the world.

We also look for a window of recovery for trade should the US-China deal stick and RCEP signing take place this year. Stronger growth momentum in trade and economies in other parts of the world vs. the weaker growth in the US supports the case for a softer USD.

## Main Finding 2: GBP, EUR and CHF have the Most Room to Gain Vs. the USD

The Maybank-AT models estimate GBP, EUR and CHF to be most undervalued against the USD (short-term cyclical perspective), supporting our views of (i) a constructive GBP recovery as balance of risks are shifting in favor of a soft and swift Brexit (with transitional agreement), and (ii) EUR's slow bottoming and subsequent gradual recovery underpinned by the shift in ECB's focus towards a "policy mix". CHF is known as a safe haven in the FX space and can be used as a hedge in the late cycle portfolio.

### Maybank-AT: EUR, CHF, GBP have the Most Room To Gain vs. the USD

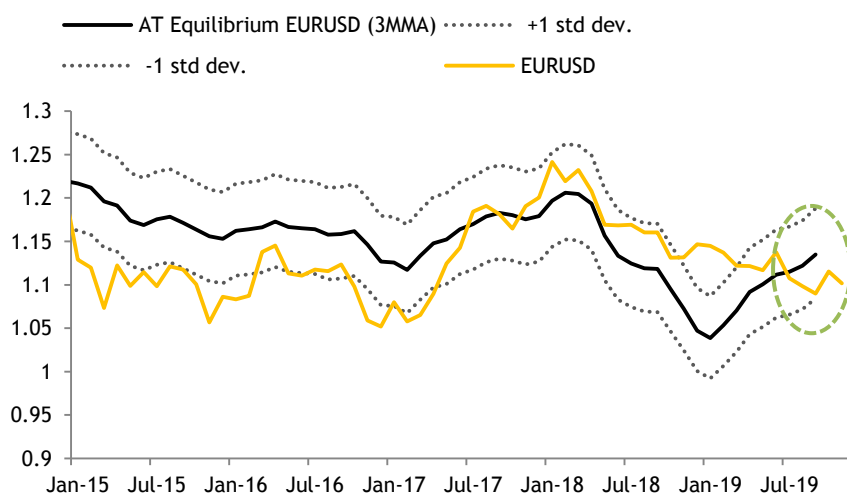


Source: Maybank FX Research & Strategy Estimates

Note: EUR is estimated to be around -4.3% undervalued vs. the USD. In other words, the AT Model for EURUSD estimates that the "equilibrium" value for the pair could be around 1.16, 4.3% above recent spot values.

The Maybank-AT estimate for EURUSD equilibrium value (black line) has been on the rise in the past year even as actual spot (yellow line) drifted lower, resulting in EUR shifting from being overvalued to being undervalued, relative to the dollar. The rise in the equilibrium valuation was due in part to narrowing interest rate differentials between the Eurozone and the US, as US rates fell. This misalignment could potentially be adjusted as we look for the ECB to shift its focus from outright monetary easing towards "policy mix" under Lagarde.

### The EUR Went from Being Overvalued to being Undervalued vs. the USD



Source: Bloomberg, Maybank FX Research & Strategy Estimates

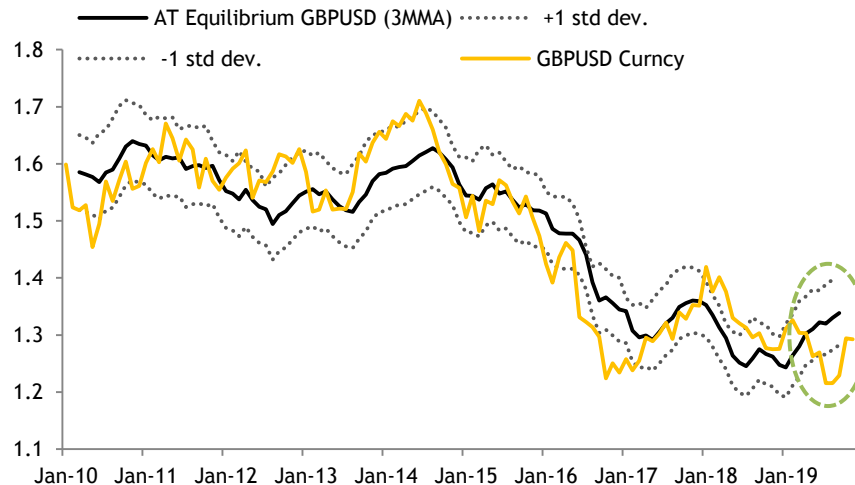
Note: Estimated equilibrium levels lag actual by a few data points due to data availability.

## Pound Has Started to Adjust

GBPUSD has been swung by 3 years of Brexit wrangling but 2019 shows a turn in the short-run equilibrium valuations estimated by Maybank-AT.

Spot has turned higher in recent months, notably shortly after the time actual GBPUSD slipped past the -1 standard error band in the chart, providing a signal for reversion. With the almost-10% appreciation in GBPUSD, the gap to the Maybank-AT equilibrium value has narrowed substantially, and is relatively modest now at around 3% (undervaluation).

### The Undervalued GBPUSD has Started to Adjust

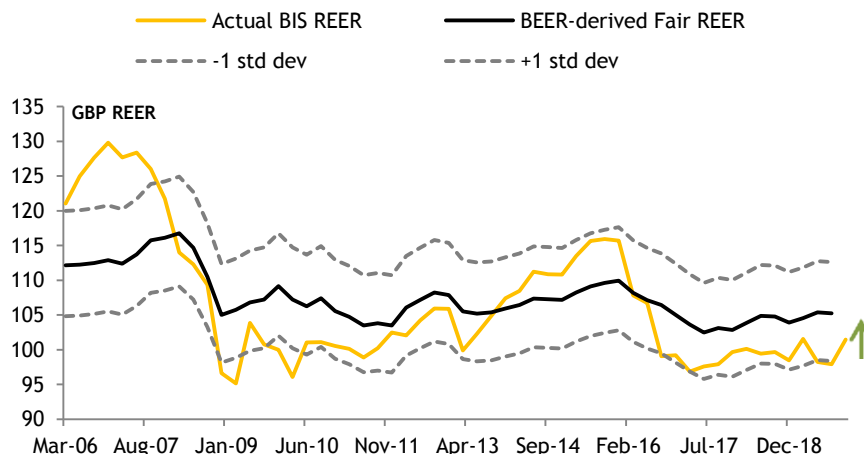


Source: Bloomberg, Maybank FX Research & Strategy Estimates

Note: Estimated equilibrium levels lag actual by a few data points due to data availability.

The Maybank-BEER panel also sees GBP to be around 4% undervalued relative to macro fundamentals, with the current REER weighed by persistent political uncertainties. This undervaluation supports our constructive view of cable. It is also interesting to note that GBP REER had a sharp decline after the EU referendum in 2016 which resulted in Brexit fears. The Maybank-BEER estimates also suggest that fundamentals did correct, albeit more gradually in the quarters after. Since then, fundamentals have recovered in support of the BEER although the actual REER spot for GBP has yet to catch up.

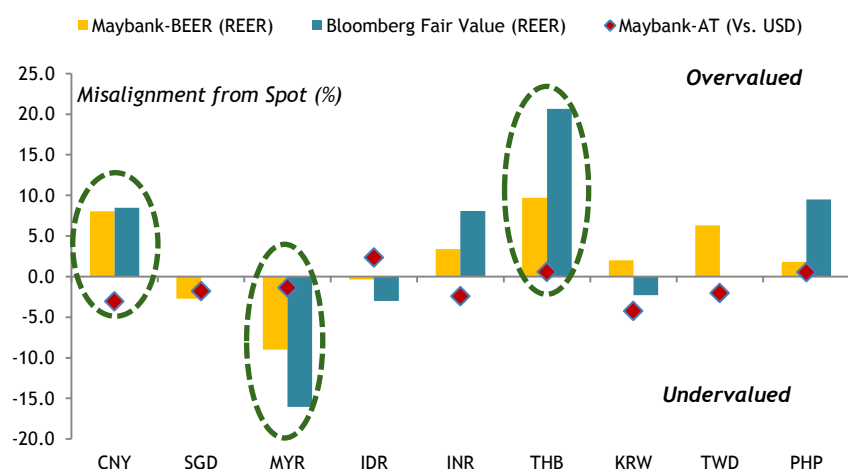
### Room for Catch-Up



Source: Bank for International Settlements, Maybank FX Research & Strategy Estimates

## Main Finding 3: A Relative Value Play in Asian FX Space with MYR Undervalued Relative to CNY and THB

### Largest REER Misalignments Likely Among MYR (-ve), CNY (+ve) and THB (+ve)



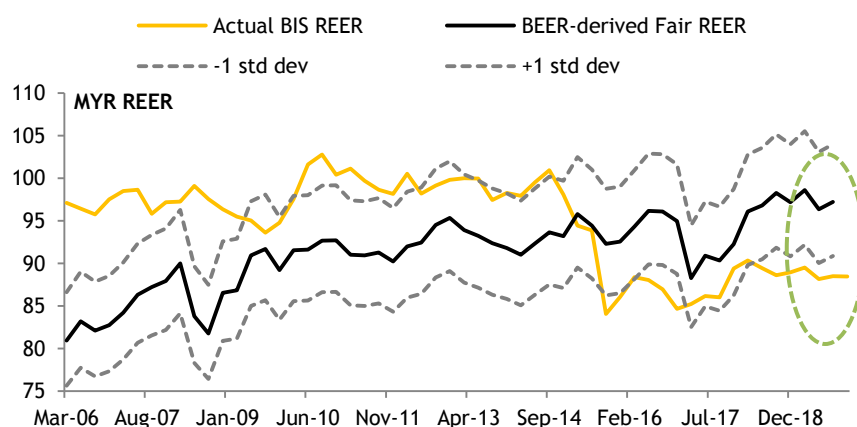
Source: Bloomberg, Maybank FX Research & Strategy Estimates

For the MYR, all indicators point to undervaluation vis-à-vis the USD as well as on a REER basis. The Maybank-BEER model estimates MYR to be around 9% undervalued currently, relative to its trading partners' currencies. Bloomberg's estimate of MYR's undervaluation is even larger, at almost 16% currently.

In addition, IMF's Article IV assessment for 2018 also found MYR to be around -3 to -7% undervalued then, noting that Malaysia had experienced capital outflows and terms of trade shocks since 2013. Given that the MYR REER has been relatively unchanged since end-2018, the IMF-identified undervaluation is likely intact.

Looking at the historical BEER-derived fair values of the MYR REER (black line), we note that it has seen two-way swings since 2014, but with a mild upward creep, supported in part by improving real rate differentials relative to its trading partners. On the other hand, actual REER (yellow line) have yet to recover fully since the oil crash in the second half of 2014.

### MYR Has Been Undervalued Since the Oil Crash



Source: Bank for International Settlements, Maybank FX Research & Strategy Estimates

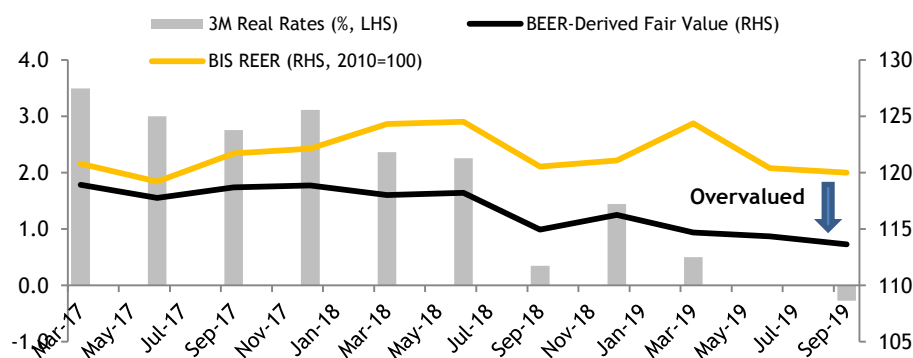


In contrast, THB and CNY are deemed to be overvalued relative to fundamentals on a REER basis. For the THB, the estimated overvaluation should not come as a surprise after the cumulative 16% run-up in REER values since mid-2016. Concerns over THB overvaluation has led the BoT to impose new measures last Nov aimed at relaxing capital outflows, including allowing exporters to keep FX proceeds overseas, and allowing settlement of gold trading in foreign currencies rather than THB. Effectiveness of the Nov announcements was mild, with the USDTHB remaining largely stable since.

As a result, further steps to ease outflow restrictions were announced just yesterday, including (i) increasing the quantum of dollar proceeds exporters can keep abroad, (ii) allowing local companies and individuals to keep foreign currencies in Thailand and (iii) relaxing rules to allow insurance companies to invest abroad. While unlikely to lead to a decisive decline in the near-term, these developments could still affect structural demand-supply dynamics for THB and influence its longer-term REER trajectory lower.

For the CNY, part of the estimated overvaluation on REER basis could be due in part to falling short-run real rates over the last two years, as declines in nominal interest rates were met with a rise in inflationary pressures in the economy. More importantly, this decline was faster relative to its trading partners, resulting in estimated “fair” values for CNY falling by almost 5% since end-2017, while actual REER values were largely stable, contributing to the positive misalignment in valuation.

#### Falling Short-Run Real Rates Contributed to Lower “Fair” CNY Valuations

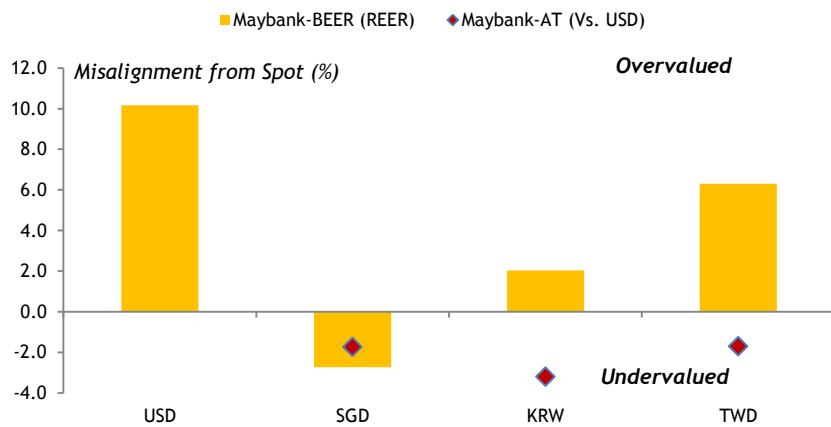


Source: Bloomberg, Bank for International Settlements, Maybank FX Research & Strategy Estimates

This fundamentals-motivated MYR REER undervaluation versus CNY and THB REER overvaluation hence provides the opportunity for a strategic longer-term position in MYRCNY and MYRTHB crosses.

## Main Finding 4: Still Prefer to Long Trade & Tech-Linked FX Against USD

### Misalignments in SGD, KRW REERs Quite Modest



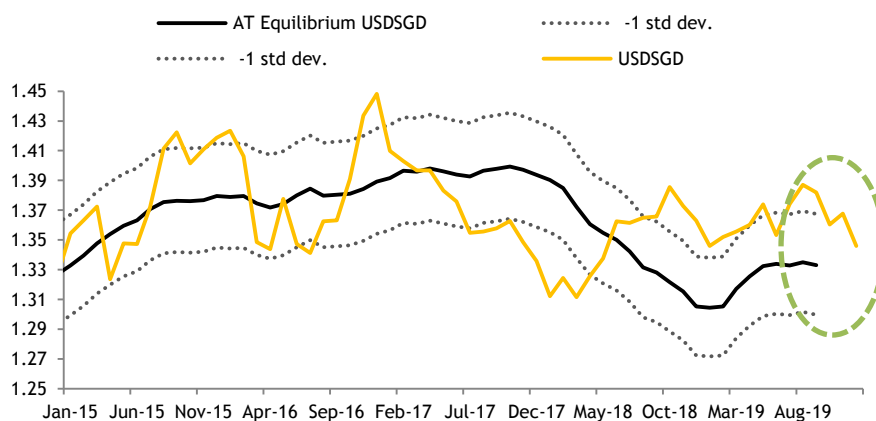
Source: Bloomberg, Maybank FX Research & Strategy Estimates

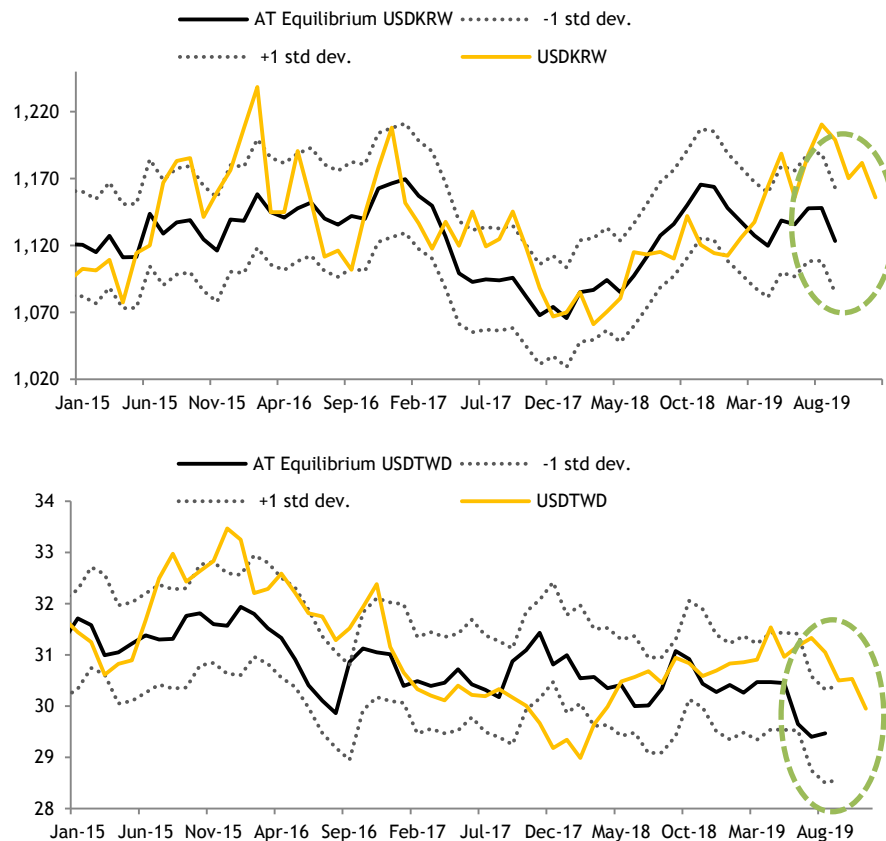
The Maybank-BEER estimates suggest that the extent of misalignments in SGD REER (-2.7%) and KRW REER (+2.0%) are relatively mild, especially compared with other Asian currencies. This suggests that there might not be significant adjustments in these REERs going forward. Meanwhile, TWD could be a tad overvalued on a REER basis.

In this instance, as regional growth prospects improve and gradual increments in domestic demand gain traction, it could be preferable to long these trade and tech-linked currencies **against the USD instead**, rather than against other Asian FX.

Besides the significant USD REER overvaluation highlighted earlier, we also note that all three Maybank-AT models suggest potential gains vs. the dollar over the next few quarters, as shown in the following charts.

### Maybank-AT Models: USDSGD, USDKRW, USDTWD





Source: Bloomberg, Maybank FX Research & Strategy Estimates

Note: Estimated equilibrium levels lag actual by a few data points due to data availability.

The spot trajectories for USDSGD, USDKRW and USDTWD pairs have seen similar profiles in recent months, and are likely to be 2-3% above levels suggested by cyclical drivers. Actual short-term equilibrium levels for USDSGD, USDKRW and USDTWD derived from the Maybank-AT models are 1.33, 1,125 and 29.5 respectively.

## Conclusion

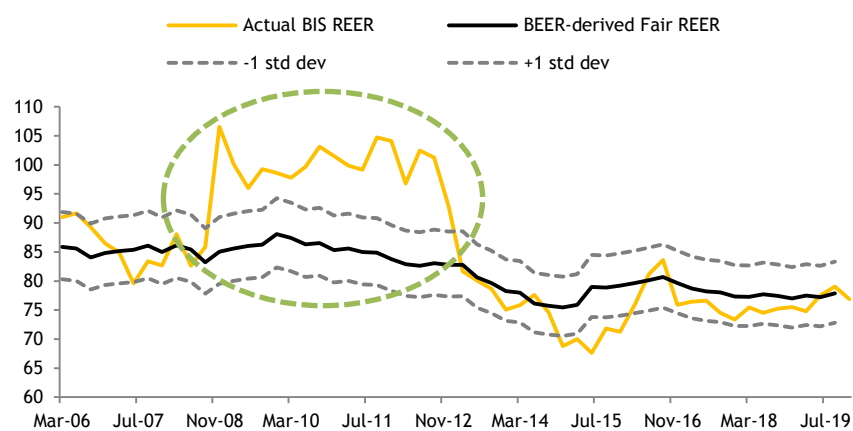
We undertook this modelling exercise with the aim of refreshing our regular toolkits to provide additional reference points for ourselves and our readers amid an environment of frequent “noisy” headlines.

Notwithstanding the many caveats required in looking at FX valuation estimates, there does appear to be some evidence that exchange rates (bilateral or on REER basis) in general do appear to exhibit tendencies to be “attracted” towards some form of equilibrium valuations. Looking at the charts in this report, we note that some pre-defined thresholds, the most frequently used being  $\pm 1$  standard deviation bands, seem to be particularly useful in identifying potential points of reversion.

The challenge therefore, would be to understand the limitations of such models. We proceed to conclude this report with a chart of the historical JPY REER and its BEER-derived fair values. During and post the financial crisis in 2008, demand for yen remained elevated for a protracted period, likely exacerbated by the 2011 triple disasters of earthquake, tsunami and nuclear meltdown in Fukushima. It was not until post-2012, at the onset of Abenomics, when the yen returned to a more sustainable path.

Such examples serve as reminders to always overlay subjective judgement onto the results of empirical tools, and to be in tune with shifts in market conditions.

### JPY REER was Overvalued For a Protracted Period After GFC



Source: Bloomberg, Maybank FX Research & Strategy Estimates

## Appendix: Model Estimations & Results

### Maybank-AT Models

Individual OLS regressions were estimated for each USD-XX pair. Data periods were largely over Jan 2010 to Sep 2019, except in instances where data was unavailable or when start of estimation coincided with period of sharp FX moves.

Variables chosen were largely to reflect the cyclical state of the economy as well as international financial conditions. I.e., Differentials in (i) current account as % of GDP, (ii) 10Y bond yields, (iii) inflation, between Country *i* and the US; a deflation proxy defined as ratio of world equity to world government bonds. An additional fifth variable was used to augment the specification for FX pairs where applicable, in an attempt to improve model fit. Chosen supplementary variables for each currency as well as derived equilibrium values are as shown:

Currency	Supplementary Variable	Spot Values (9 Jan 5pm)	AT-Derived Equilibrium Values
EUR	N.A.	1.11	1.16
JPY	Gold Price	109.30	107.60
CHF	N.A.	0.97	0.94
GBP	UK Property Price	1.31	1.34
CAD	Brent Price	1.30	1.29
AUD	Iron Price	0.69	0.70
NZD	Dairy Price	0.66	0.67
CNY	Semiconductor Equity	6.93	6.74
SGD	SG Property Price	1.35	1.33
MYR	Palm Oil Price	4.09	4.04
IDR	Palm Oil Price	13,850	14,200
INR	Brent Price	71.5	70.0
THB	Gold Price	30.3	30.5
KRW	Consumer Confidence	1,159	1,125
TWD	Semiconductor Equity	30.0	29.5
PHP	Remittances	50.7	51.0

Source: Maybank FX Research & Strategy Estimates

### Maybank-BEER Panel

For the correct statistical inference under nonstationary data, we used panel dynamic ordinary least squares estimation (panel DOLS). This method allows for the inclusion of non-stationary variables in the estimation, by incorporating lags and leads of the independent variables. Data period used is from Q1 2006 to Q3 2019, for all 17 currencies.

Variables chosen were largely in line with BEER literature, and have the following interpretations and coefficients. Signs/magnitudes of coefficients are largely reasonable and comparable to those derived from other studies, including by IMF.

Variable	Form	Interpretation	Coefficient
Dependent: BIS REERs	<i>Natural Log of REER Indices</i>	-	-
Net Foreign Assets to GDP	<i>NFA as % of GDP</i>	Reflects a country's savings and investment flows.	-0.0010 (0.01)
Trade Openness	<i>Total Trade as % of GDP</i>	Trade liberalization generally lowers the domestic price of tradable goods, thus depreciating the REER.	-0.0021 (0.000)
Productivity Differential	<i>Natural Log applied to Ratio of Country's Productivity to Trading Partners' Weighted Avg.</i>	Countries with higher labor productivity growth in the tradable goods sector have higher domestic wage growth and non-tradable goods inflation, implying a more appreciated exchange rate.	0.0688 (0.006)
Real Interest Rate Differential	<i>Deviation from Trading Partners' Weighted Avg.</i>	A higher real interest rate differential should be related to a REER appreciation, and this relationship should be stronger with greater capital account openness.	0.0147 (0.000)

P-values in brackets ().

Estimated misalignments from medium-term “fair values” are as follows:

Currency	BEER-Derived Medium-Term Misalignment (% from Equilibrium; +ve: Overvalued on REER Basis & v.v.)
USD	10.2
EUR	-1.9
JPY	-1.3
GBP	-3.6
CAD	-8.3
AUD	-3.9
NZD	1.2
CNY	8.0
SGD	-2.7
MYR	-9.0
IDR	-0.4
INR	3.4
THB	9.7
KRW	2.0
TWD	6.3
PHP	1.8

Source: Maybank FX Research & Strategy Estimates

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