Maybank

Macro | FX Research and Strategy

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FX Insight

ASEAN Neutral Rates: Ammunition Unravelled

Neutral Rate Used To Estimate Limits For Rate Hikes

US neutral rate has received considerable amount of attention. We explore the same approach for ASEAN. In particular, how relatively constrained central banks in the region are in removing policy accommodation before it becomes restrictive on the economy and potentially weigh on asset prices. Our study provides insights to this question by modelling the neutral rates of interest in ASEAN to estimate the limits for their rate hikes. Broadly, neutral rates above the policy rates suggest that further hikes by central banks will not be contractionary to the economy, while interest rate hikes with neutral rates below the policy rates will not be stimulative for the economy.

BI, BoT & BNM Have Policy Space To Hike Rates If Needed

Our results show that the current policy rates in ASEAN remain below our estimates for their neutral rates, indicating that further moves by central banks to tighten policy may not be contractionary. Second, not all central banks in ASEAN have the same leeway in raising interest rate. Third, neutral rates for ASEAN central have largely been declining since 2000, driven by both a decline in the trend growth rate and other factors such as global decline in inflation and interest rates.

Bank Indonesia, Bank of Thailand and Bank Negara Malaysia have the breathing space to move on policy rates if necessary (whether to arrest inflation or prevent capital outflow). Bangko Sentral ng Pilipinas (BSP) though may not have the same luxury as its peers as its policy rate is at risk of surpassing its neutral rate of interest soon.

Bias To Long IDR & THB, And Short PHP

It is this differential in the ability of central banks to hike policy rate that may translate into trading opportunities for ASEAN FX. We express our bias in a basket FX trade by being long in IDR and THB and short PHP. We expect the basket FX trade to test higher towards 100.56 (38.2% Fibonacci retracement of the Feb high to Oct low), 100.95 (50%), 101.34 levels (61.8%). The reference basket index as we write (dated 15 Nov 2018) was seen at 99.5. Stop-loss is placed at 98.6-level (the recent low recorded) with a 1:2 risk reward ratio.

Table: ASEAN Central Banks' Ammunition

	Indonesia	Thailand	Malaysia	Philippines
Nominal Neutral Rate Estimation (a)	7.3%	2.7%	3.7%	5.0%
Current Policy Rate (b)	6.0%	1.5%	3.25%	4.75%
Ammunition ((a) - (b); in bps)	133	116	45	25

Source: Maybank FX Research & Strategy Estimation

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Neutral Rates Suggest Room for Central Banks to Manoeuvre

Central banks in ASEAN have mostly begun the process of removing policy accommodation. Malaysia lifted its policy rate once in Jan and Singapore raised the slope of the SGD NEER policy band twice this year in anticipation of inflationary pressures. Indonesia and Philippines raised their policy rates by 175bps each since May as emerging-market angst and expectations of Fed rate hikes increased the volatility of their currencies. The Philippines has the added pressure of record inflation. Only Thailand has yet to move on its policy rate, standing pat on policy since Jun 2015. Most of the ASEAN central banks have removed some accommodation from policy, but this does not necessarily mean they no longer have any room to manoeuvre.

The neutral rate can be used as a benchmark against the policy rate to determine whether the policy rate can be lifted further or if they have surpassed the neutral rate. **Neutral rate estimates above current policy rates suggest room for policy to be tightened without triggering growth concerns. In fact our study on neutral rate estimation suggests there is still ample room for Bank Indonesia, Bank of Thailand and Bank Negara Malaysia to tighten policy rates if the need arises** (whether to arrest inflation or prevent capital outflow).

This suggests that even if the Fed continues to hike rates a few more times, and ASEAN central banks follow suit, BI and BoT have the policy space to keep pace with the Fed moves. BNM still has some room to hike but BSP may be at risk of surpassing its neutral rate of interest soon.

We will explore this in two parts via (1) **policy slack ratio** to assess if a central bank is behind the curve taking into consideration its inflation projection, target and monetary transmission lag and (2) **neutral rate estimation** to assess how much "ammunition" (or policy space) central banks can tighten without being restrictive on growth and yet achieve its inflation goal.

1. Policy Slack Ratio to Assess Whether Central Bank is Ahead or Behind the Curve

Recall in our earlier report, *FX Asia Fortnightly - Room for Central Bank Support* dated 24 September 2018, we explored which of these ASEAN central banks – BI, BNM, BoT, BSP and MAS – can afford to wait or may have to tighten further, in respect of their monetary policy mandates, inflation expectation and monetary policy transmission lag.

We first establish the various central banks' monetary policy mandates – its policy target or target range. Next we forecast the future path of inflation for Indonesia, Malaysia, Thailand, Philippines and Singapore from 3Q 2018 to 3Q 2021 (12-quarters), based on time series, using Autoregressive Integrated Moving Average (ARIMA) modelling. We then compare the forecasts to the respective central banks' inflation targets and estimate the time period (in quarterly terms) for inflation to get to target. Accounting for monetary policy transmission lags, we estimate which central banks can afford to wait for longer before tightening or is potentially at risk of behind the curve in tightening. We then devise a ratio call policy slack to assess the extent a central bank is ahead or behind the curve in a policy move.

Our study shows that inflation in Indonesia is expected to hit the BI's target in 1 quarter; Malaysia inflation by 5 quarters. Philippine inflation

has already reached the BSP target in the previous two quarters. Inflation for Singapore and Thailand are projected to hit their inflation target in 9 and 15 quarters respectively (Table 2).

The transmission lag of monetary policy varies between central banks as suggested by various studies[1]. These studies proposed that the transmission lag for Malaysia is around three quarters; Singapore about four quarters; Indonesia and Philippines by five quarters each; and Thailand by about six quarters.

Now that we have derived the average policy transmission lag and the time period for inflation to get to target, we can estimate which **central banks can afford to wait for longer before tightening or are potentially at risk of being behind the curve in tightening**.

We devise a ratio defined by time forecasted to get to inflation target / transmission policy lag (or z/y for short). We call this the policy slack ratio.

Table 2: BSP Is Slightly Behind the Curve, While BoT Has Room to Be Patient

	Time for Inflation to get to Inflation Target (z) – by Quarters	Median Policy Transmission Lag (y) – by Quarters	Policy Slack Ratio (z/y = x)
ID / BI	1	5	0.2
MY / BNM	4	3	1.3
PH / BSP	-2	5	-0.4
SG / MAS*	9	4	2.3
TH / BoT	15	6	2.5

Note: (1) that forecast of the future path of inflation was estimated using an ARIMA model:

$$\Delta X_t = \theta_0 + \sum_{i=1}^{p} \phi_i \Delta X_{t-i} + e_t - \sum_{i=1}^{q} \theta_i e_{t-i},$$

(2) * MAS uses exchange rate policy as a monetary policy tool rather than interest rates.

(3) Colours used are indicative of the policy space that central bank has to adjust their policy rates: (a) yellow suggests an imminent policy adjustment is forthcoming; (b) red is indicative that the central bank is behind the curve in raising rates; and (c) green highlights that central banks can be patient in raising policy rates.

Source: Bloomberg, Maybank FX Research & Strategy

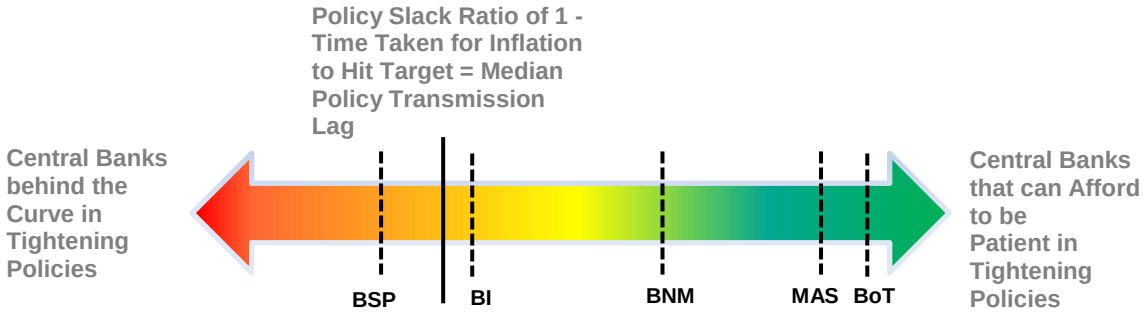
A ratio of 1 suggests that a policy tightening is imminent in the current quarter or the next; a ratio greater than 1 suggests that there is policy space for the central bank to be patient in tightening policy; a ratio less than 1 points to the central bank being slightly behind the curve in

[1] Nurliana, Linda; Wimanda, Rizki Ernadi and Satyanugraha, Redianto (2016): "Evaluating Monetary Transmission In Indonesia Using A Structural FAVAR Approach". SEACEN's Monetary Policy Transmission in the SEACEN Economies (Chapter 2).
Dacio, Jasmin E. and Cruz, Christopher John F. (2012): "Tenets of Effective Monetary Policy in the Philippines". Bangko Sentral Review 2012.
Bank of Thailand Website: MPC Knowledge – Transmission mechanism.

tightening policy; and a negative ratio suggests the central bank is behind the curve in tightening policy with inflation overshooting target.

Based on our estimation, the Philippines was behind the curve with inflation having overshot its target in the past two quarters. Since then, the BSP has started its tightening cycle in May. For Indonesia, inflation remains muted but the central bank has already moved to hike policy to counter volatility in the IDR and it remains pre-emptive and ahead of the curve. Malaysia's inflation is manageable and within BNM's target and the central bank already started the policy normalisation process in Jan. Singapore has already begun to remove accommodation in policy by increasing the slope of the SGD NEER policy band twice this year in anticipation of an acceleration in core inflation. Thailand though has yet to begin its normalisation process given muted inflation, strong reserves and fiscal position.

Chart 2: Need for Policy Adjustment Varies Across Different Central Banks



Source: Maybank FX Research & Strategy

Our analysis of the slack ratios for ASEAN suggests that the **need for monetary policy adjustment varies across ASEAN central banks**:

— BSP was slightly behind the curve even with the rate hikes to date. Further rate hikes cannot be ruled out for the remainder of the year;

— BI should continue on its strategy of being pre-emptive and continue to front-load its rate hikes, even as inflation remains contained, to keep pace with the Fed moves;

— BNM, MAS and BoT all have policy space to keep policy on hold based on our study. Still, we cannot rule out further policy normalisation moves by the MAS should core inflation continue on its northbound trajectory. BoT is likely to follow suit within the next 10 quarters, even though inflation trails the central bank's target, to provide itself with policy space as insurance for possible shocks. BNM is likely to be the exception among the ASEAN central banks. It should be on hold for now in the absence of significant inflationary pressures and the insurance of having already normalised policy earlier in the year.

2. How Much Policy Space (or "Ammunition") Do ASEAN Central Banks Have?

Our analysis of the slack ratio then begs the question of the **quantum that ASEAN central banks can raise their policy rate without stunting growth and yet achieve their inflation goals**.

Raising policy rate too much could be contractionary for the economy as it curbs investment decision and consumer spending. We aim to estimate the neutral rates for Indonesia, Malaysia, Thailand and Philippines to assess whether the current level of policy rate is stimulative or contractionary for the economy. This serves as a gauge to estimate how much ammunition these central banks have before their monetary policy becomes contractionary.

What is the Neutral Rate of Interest?

A metric commonly used by monetary policy makers is the **neutral rate of interest** – also sometimes referred to as the natural or equilibrium rate of interest. The neutral rate of interest can be broadly defined as the real short-term rate of interest that is consistent with a zero output gap and stable inflation rate at its target. The neutral rate plays a pivotal role as a benchmark against which to gauge monetary policy's stimulative or contractionary impetus (Laubach and Williams, 2003). This implies that:

- Real interest rate above the neutral rate of interest would contract economic growth through lower consumption and investment expenditure, and weighs inflation in the absence of shocks to the economy (Brzoza-Brzezina, 2003);

- Real interest rate below the neutral rate of interest would stimulate economic growth through higher consumption and investment expenditure, and lift inflation in the absence of shocks to the economy.

However, it must be noted that there are many factors that influence the level of activity in an economy; real interest rate is but one of those factors. There are challenges to policy makers that use the neutral rate in deciding policy, namely that it is an unobservable variable and cannot be measured, only estimated. It must be derived from other data and with it all the uncertainty that it entails.

Estimating ASEAN Neutral Rates of Interest

This study seeks to generate the estimates of the neutral rate of interest for ASEAN, namely Indonesia, Malaysia, Philippines, Thailand and even Singapore, in order to create a benchmark that the current levels of policy rates can be measured against policy makers' desire for macroeconomic and price stability.

From this, we can determine if policy rate can be lifted further or whether they have already surpassed the neutral rate of interest. This is important to policy makers as further adjustments to lift policy rate above the neutral rate of interest can be contractionary to the economy and policy makers may need to resort to other tools in their arsenal instead such as macroprudential measures (including required reserve ratio hikes, lower loan-to-value for properties etc.).

Alternatively, should the policy rates be below the neutral rates, this suggests that policy makers have the policy space to raise policy rates if necessary to remove policy accommodation and anchor inflationary expectations.

Methodologies to Determine Neutral Rate of Interest

There are several methodologies that can be used to generate estimates of the neutral rate of interest.

1. Bzoza-Brzeina (2003) estimates the neutral rate of interest in the US (from 1960 to 2002) using a Structural Vector Autoregressive (SVAR) model. His study showed that the neutral rate of interest varies over time and is positively correlated with the economic cycle.
2. In contrast, Ophanides and Williams (2002) estimated the short-term neutral rate of interest in the US (1969-2002 by quarters) using univariate filters such as the Hodrick-Prescott (HP) and Band-ass filters as well as multivariate filters such as the Kalman filter. Their analysis revealed that the neutral rate varies over time as it is influenced by variables such as trend income growth and fiscal policy.
3. Others such as Edge, Kiley, and Laforte (2008), Barsky, Justiniano, and Melosi (2014) and Curdia et al. (2015) use Dynamic Stochastic General Equilibrium (DSGE) models to estimate the short-run neutral rate of interest for the US.

The Model

To generate the estimates of the neutral rate of interest, our study broadly applies the commonly-used methodology proposed by Laubach and Williams (2001). A state space model is used to estimate the unobservable neutral rate of interest using observable GDP and interest rate.

Lags of output gap and real interest rates (i.e. nominal interest rate less inflation – proxied by the changes in consumer price index) are used to determine the neutral rate (in real terms) in the state space model. Once the neutral rate is determined, we use the 15-year rolling inflation average for each economy to derive the nominal neutral rate. The nominal neutral rate can then be compared to the nominal policy rates to provide policy makers with answers as to whether policy rates remain accommodative or contractionary and if adjustment in monetary policy need to be made.

The model specifications can be found in the Appendix.

Data

The model is estimated using quarterly data for the ASEAN economies from 1Q 2000 to 2Q 2018. For each economy in ASEAN, we require data for real GDP, inflation and short-term interest rates. Real GDP and consumer price index data were collected from the Department of Statistics of each economy. For Indonesia, quarterly data from 1Q 2008 were used in our estimation due to the lack of consistent data for GDP. For the short-term interest rate, we use the 1-month JIBOR for Indonesia, 3-month KLIBOR for Malaysia, the 3-month T-bill rate for the Philippines, the 3-month BIBOR for Thailand and for Singapore, the 3-month SIBOR.

Key Results on Comparison of Neutral vs. Current Policy Rate

The results from our study on estimating the neutral rate for Malaysia, Indonesia, Thailand and Philippines using State-Space model show that Malaysia's nominal neutral rate stands at 3.6%, Indonesia's at 7.3%, Thailand's at 2.7% and the Philippines' at 5%.

Table 3: Neutral Rates vs. Policy Rates

	Indonesia	Thailand	Malaysia	Philippines	Singapore*
Nominal Neutral Rate Estimation	7.3%	2.7%	3.7%	5.0%	2.3%
Current Policy Rate	6.0%**	1.5%	3.25%	4.75%**	1.75%
Ammunition^ (in bps)	133	116	45	25	45

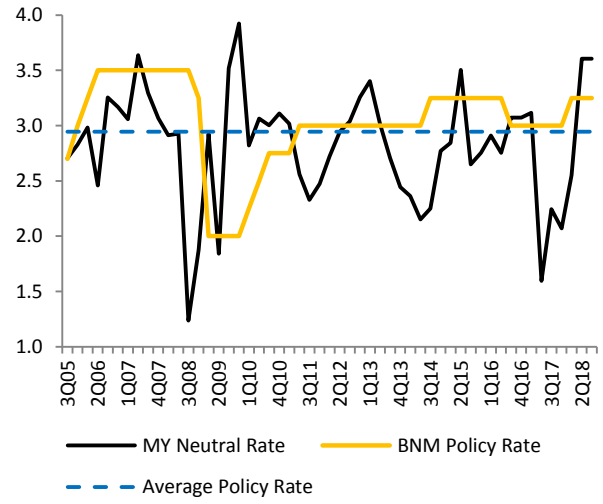
*We used the 3m SIBOR as the reference for Singapore's policy rates. Please note that this is for reference purpose as the MAS' policy tool of choice is the S$NEER exchange rate rather than interest rate.
**Both Indonesia and Philippines hiked their policy rate on 15 Nov 2018 by 25bp each.
^ Ammunition refers to the neutral rate estimates minus policy rate in bps.
Source: Maybank FX Research & Strategy

Our results cannot be seen in isolation, but should be compared to the current level of policy rate to allow monetary policy makers to determine if their actions (i.e. lifting or lowering the policy rates) will be contractionary or stimulatory. A policy rate below the nominal natural rate of interest suggests that the current monetary policy is stimulative and can put upward pressures on prices. A policy rate above the nominal natural rate is contractionary and should temper inflationary pressures. Our results suggest that monetary policy remains accommodative in ASEAN and that should inflation start to rise (possibly from rising global oil prices etc.), there is policy room for the ASEAN economies to hike their policy rates (Table 3).

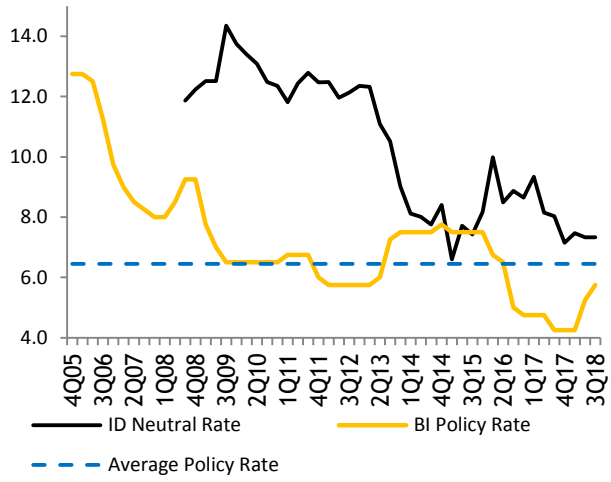
We **compare the respective central bank's policy rate to their nominal neutral rate** and added in the 10Y average policy rates for comparison to **assess the policy space central banks have in terms of monetary policies** (Chart 4).

Chart 4:

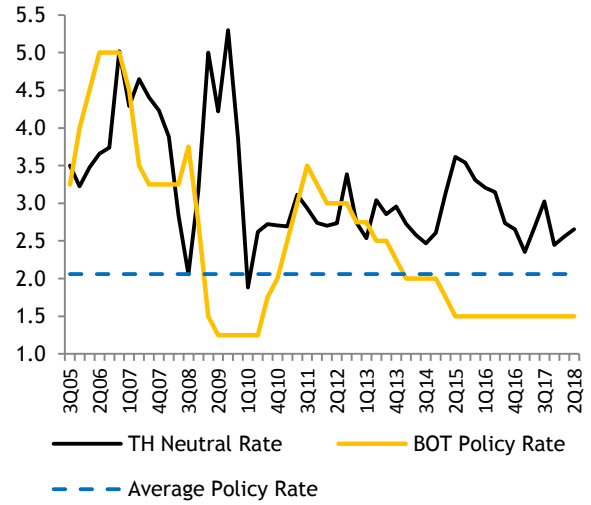
Malaysia's policy rate is below our model's estimation of Neutral rate but above 10Y average policy rate



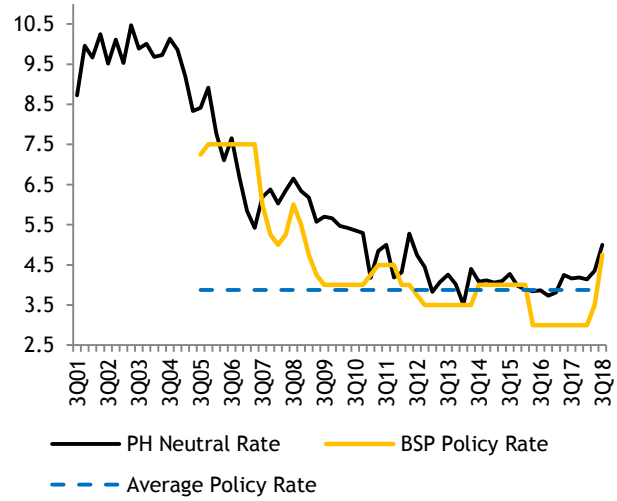
Indonesia's policy rate below our model's estimation of Neutral rate and 10Y average policy rate



Thailand's policy rate is below our model's estimation of Neutral rate and 10Y average policy rate

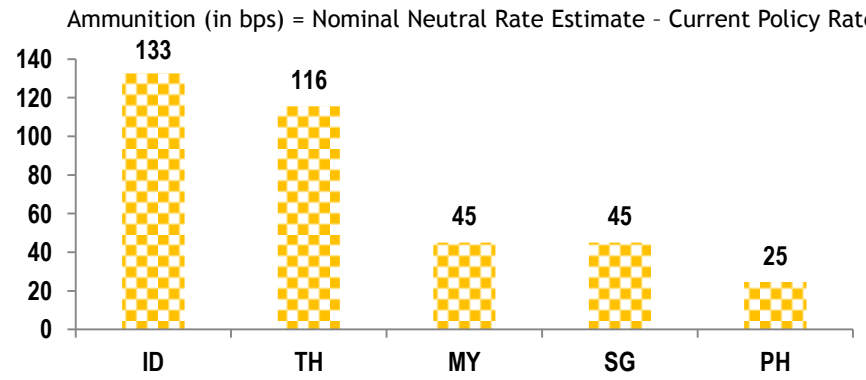


Philippines' policy rate is below our model's estimation of Neutral rate but above its 10Y average policy rate



Source: Maybank FX Research & Strategy Estimation

Chart 5: Indonesia and Thailand Have Most Policy Space to Tighten Rates



Source: Maybank FX Research & Strategy

Indonesia's neutral rate, according to our model estimation, is at 7.3%. Current policy rate of BI at 6% is below neutral rate of 7.3% and 10Y average policy rate of 6.5%. This leaves ample headroom (of about 133bps) for BI to tighten, if the need arises. Our policy slack ratio also shows that BI can afford some slack when it comes to monetary tightening.

Thailand is in a similar situation as Indonesia. BoT's current policy rate of 1.5% is below our model estimation of neutral rate at 2.7% and the 10-year average policy rate of 2.06%. This suggests that monetary policy is not yet restrictive in Thailand and the BoT policymakers have about 116bps of headroom to tighten, if the need arises. We also wish to highlight that the BoT is the only central bank that has not tightened amongst the five central banks in our study. This is consistent with our policy slack ratio, which ranks BoT as the central bank amongst ASEAN to have the most slack (i.e. can afford to be patient in tightening).

For Malaysia, the current policy rate of 3.25% is below our model estimation of neutral rate at 3.7% but above its 10Y long run average of policy rate at 3%. Nonetheless, BNM still has headroom of about 45bps to tighten, if the need arises. Our policy slack ratio also indicates that there is room for BNM to retain an accommodative bias.

For Philippines, BSP may not have as much headroom amongst ASEAN central banks to tighten policy rate given that current policy rate at 4.75% is only slightly below our model estimation of neutral rate of 5.0% and is above its 10-year average of 3.9%. Further tightening to arrest rising prices may soon become restrictive on growth.

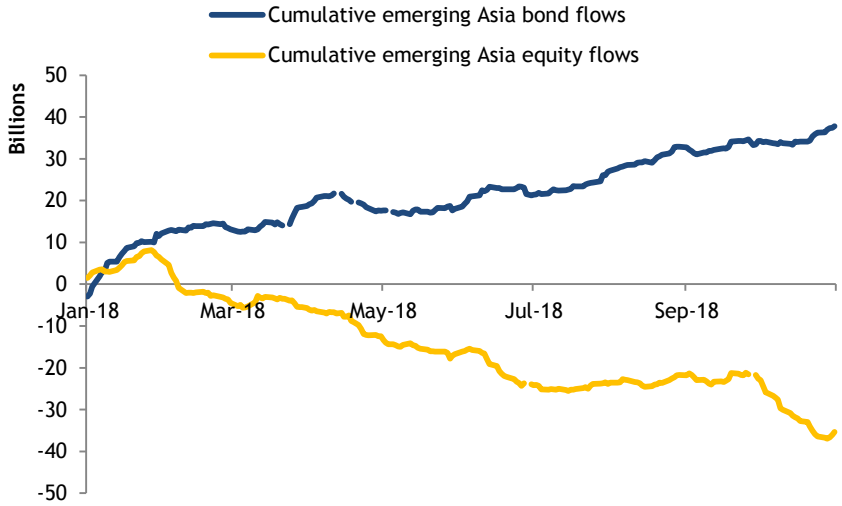
In addition, our policy slack ratio (explained in an earlier section) which looks at whether a central bank is ahead or behind the curve on monetary policy, taking into account inflation expectation and the monetary policy transmission lag mechanism, shows that BSP is behind the curve in tightening especially when inflation remains elevated at a 9-year high of 6.7%.

We stretched our study to cover Singapore for reference purposes. Our model estimation of neutral rate is about 2.2%. Current 3m SIBOR of 1.75% is about 45bps below our model-implied neutral rate. This theoretically suggests there is still modest room for Singapore to tighten. However, we stress that this study may not be as relevant in Singapore's context due to the Monetary Authority of Singapore's policy tool of choice in using the S$NEER exchange rate to achieve price stability instead of interest rate as a policy tool.

Taking stock, our findings suggest that most ASEAN central banks have ample ammunition to raise rates and most (MAS, BSP, BI, BNM) have already tightened their respective monetary policy in 2018.

Despite that, regional bond markets have been surprisingly resilient with substantial inflows seen year to date. This suggests that while investors perceive the Fed will reach the peak of its tightening cycle soon, so do they expect these ASEAN central banks to end their tightening cycle before long. This could explain why the regional bond markets are looking increasingly attractive to foreign investors in spite of rising rates whilst the higher cost of funding is more keenly felt in the equity markets (Chart 6).

Chart 6: Regional Equity Markets See Outflows While Bonds Are Still Attractive



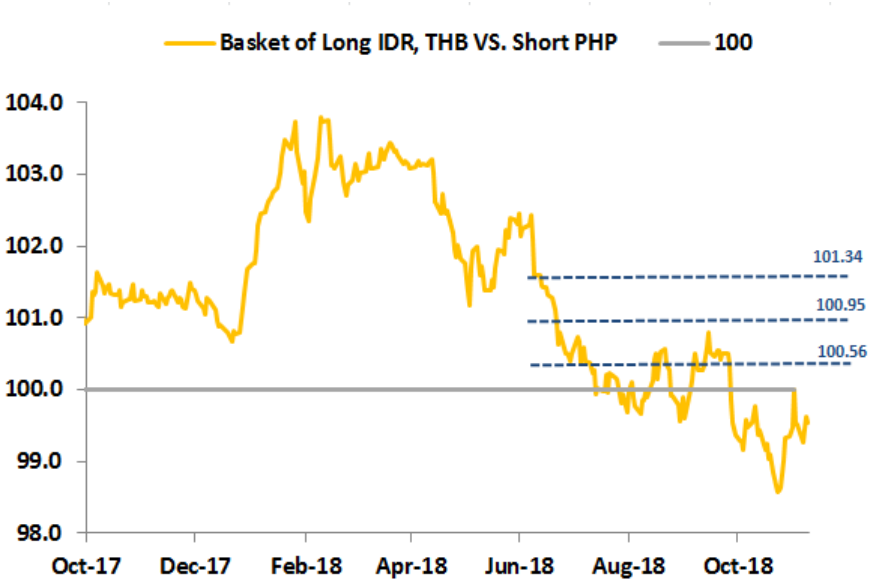
Source: Bloomberg; Maybank FX Research & Strategy

Given monetary tightening environment globally led by the US, the risk of capital outflow from ASEAN cannot be ruled out. But ASEAN central banks do have policy tools in their monetary toolkit that can help to counter outflows. One way is to raise interest rates and our study above suggests that Thailand and Indonesia have the monetary space as opposed to Philippines, which is also grappling with the fear of rising prices, slowing growth and is behind the curve in tightening monetary policy.

Trading Plays: Enter a Basket FX Trade

As such we express our bias in going long in the IDR and THB and short the PHP. We expect the basket FX trade to test towards 100.56 (38.2% Fibonacci retracement of the Feb high to Oct low), 100.95 (50%), 101.34 levels (61.8%). The reference index as we write (dated 15 Nov 2018) is seen at 99.5. Stop-loss is placed at 98.6-level (the recent low recorded) with a 1:2 risk reward ratio. The base date of the index is 7 Nov 2018, referenced to the date that we constructed this basket index (Chart 7).

Chart 7: Trading Play: Basket FX Trade of Long THB and IDR vs. Short PHP



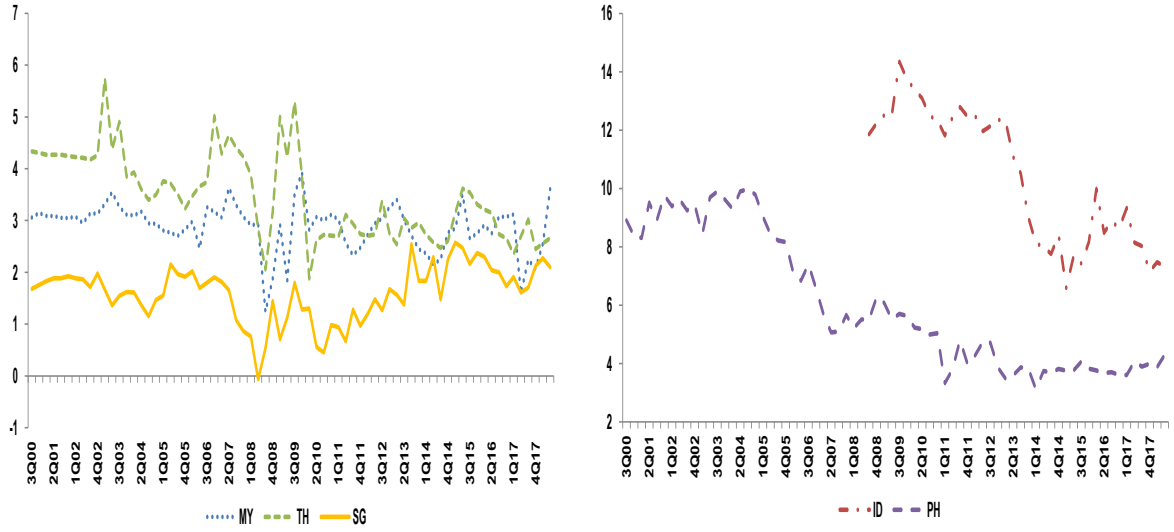
Note: 7 Nov 2018 = 100
Source: Bloomberg, Maybank FX Research & Strategy

Other Observations

Natural Rate has Trended Lower But May be Turning

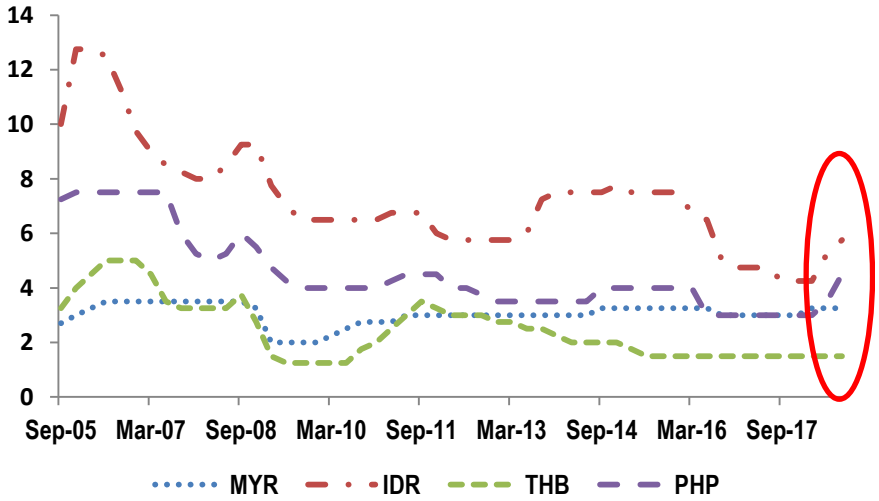
There are two observations worth highlighting from our estimation. First, our estimates showed that the natural rate for ASEAN has largely been on the decline since the start of the new millennium (Chart 8). Our results are consistent with studies done for the developed economies including US, EU and Canada by Holston, Laubach & Williams (2016), and that by Dacass (2011) for Jamaica and Perrelli & Roache (2014) for Brazil. The decline in the ASEAN natural rates over time suggests that individual domestic factors do not influence the natural rate alone but that global factors are in play as well. Aside from domestic factors like saving and investment rates, global factors are likely to have contributed to the decline as well. The global factors include lower global interest rates, lower public debt, reduced sovereign risk and an increased supply of savings that have translated into financial deepening (Perrelli and Roache, 2014).

Chart 8: Nominal Neutral Rates in ASEAN are Falling



Source: Bloomberg, Maybank FX Research & Strategy

Chart 9: Policy Rates in ASEAN are Now on the Rise



Source: Bloomberg, Maybank FX Research & Strategy

Second, while the natural rates in ASEAN may have declined since 2000, this may not represent a permanent decline. Historically low global real interest rates, due to the Global Financial Crisis that saw the developed markets cut their policy rates to zero or below zero and the expansion of liquidity in the financial system, are unlikely to stay low. Already, central banks around the world have taken steps to remove policy accommodation by rising policy rates and tapering their bond purchases, which should see global interest rates rise and liquidity tightened. This includes the ASEAN central banks, which have already begun the process of removing policy accommodation as discussed earlier (Chart 9). Thus, upward pressure on the natural rate of interest cannot be ruled out.

Appendix

The IS curve is specified as below:

$$\hat{Y}_t = \propto_y \hat{Y}_{t-1} + \propto_r (r_t - r^*_t) + \varepsilon_{\hat{Y}_t} \quad (1)$$

where the output gap ($\hat{Y}_t$) measured here difference between logarithm of the seasonally-adjusted real GDP (Y) and potential output (Y^*), is determined by its own lags, the difference between real short-term interest rate (r) and the neutral rate of interest (r^*) and a serially uncorrelated error term (ε). $\propto_y$ measures persistency of the output gap and $\propto_r$ captures the association between the output gap and the interest rate gap $r_{t-1} - r^*_{t-1}$.

Rearranging equation 1, we get the following equation to derive an estimate of the neutral rate of interest:

$$r^*_t = r_t + (\hat{Y}_t - \propto_y \hat{Y}_{t-1})/\propto_r \quad (2)$$

Using the theoretical relationship between the unobserved neutral rate of interest (r^*_t) and the growth rate of potential output as espoused by Laubach and Williams (2003), the neutral rate of interest can be specified as follows:

$$r^*_t = cg_t + z_t \quad (3)$$

where g represents the growth rate of potential output and z all the determinants of the neutral rate of interest such as time preference, fiscal policy and etc. Both g and z are unobserved variables. z_t is assumed to follow a random walk:

$$z_t = z_{t-1} + \varepsilon_{z_t} \quad (4)$$

The potential output (y^*_t) and growth rate of potential output (g_t) are specified as:

$$y^*_t = y^*_{t-1} + g_{t-1} + \varepsilon_{y_t} \quad (5)$$

$$g_t = g_{t-1} + \varepsilon_{g_t} \quad (6)$$

Equations (3)-(6) are used as state equations in the state-space models. The Kalman filter is applied to the estimate the unobservable variables by specifying them as a function of the observable variables in the state-space form. The estimation uses a recursive procedure combined with maximum likelihood techniques.

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