Maybank

FX Insight

Hard Up for Hedges and Havens

Swings, Again & Again

Sharp swings in market sentiments, precipitated by Trump tweets, sudden tariff retaliations and then bouts of goodwill moves, have made it difficult to focus on the structural aspects of the macro-economy. Add in confusion in oil markets, and we have a volatility party.

As outcomes of trigger events (Brexit, US-China trade talks, Middle East geopolitical risk, Japan-South Korean trade spat) remain fluid, continue to watch for our FX Insight or Flash pieces, which are meant to capture more dynamic shifts in views. E.g., "Are The Stars Aligning?" on 5 Sep discussed signs of various factors coming into play to potentially nudge markets towards more near-term risk on behavior—this preceded the sharp Asian FX rally in the following week. Subsequently, "This Leg of Rally Almost Done" on 16 Sep cautioned for a pullback in Asian FX sentiments, akin to developments over the past few days.

Optimal Hedges and Havens for Equity Portfolios

In such an environment, it can be critical to enhance our understanding of ways to fight uncertainty in markets. Do conventional haven/hedge assets really fulfill their perceived functions? In the case of Yen, which cross outperforms in its haven/hedge role? We explore a variety of approaches (i.e., GARCH modelling, historical episode analysis) in evaluation. The summary table below lists our recommendations.

USD Behavior in Crises is Changing; Hedging for Oil Volatility

It is an understatement to say that there is keen interest in understanding how USD behaves. For the past year, USD has broadly trended up, despite a turnaround in expectations of Fed policy. We leverage partly on the analysis above and hypothesize that there is a shift in how USD behaves under market stress, compared to the past.

Oil volatility is also one key development to watch out for, with recent attacks on Saudi Arabia oil facilities underscoring the underlying tensions in the Middle East. Holding positions in oil-linked currencies could be one hedging approach. We evaluate USDCAD, USDNOK, USDMYR and USDRUB.

Summary of Results

Issue Explored	Findings	Comments
Suitable hedges for investors with global equity exposure…	Consider JPYEUR and US 2Y, 10Y Treasuries.	Strong hedges are negatively correlated to portfolio returns, across broad periods.
Suitable havens for investors with global equity exposure…	Consider Gold, US Treasuries, JPYSGD.	Strong havens are very likely to be negatively correlated with portfolio returns under severe market stress.
USD behavior during times of market stresses…	USD tendency to strengthen in crises is moderating.	Some form of US-China deal possible before US 2020 elections. DXY could ease to 96 by end-2020.
Suitable hedges for investors with oil exposure…	USDCAD, USDNOK. (USDMYR and USDRUB are inferior.)	Supply-side disruptions likely temp. Build-up in underlying tensions could support Brent >$60 in 2H.

Note: For Yen pairs, we adopt JPY as the base currency, for easy interpretation.

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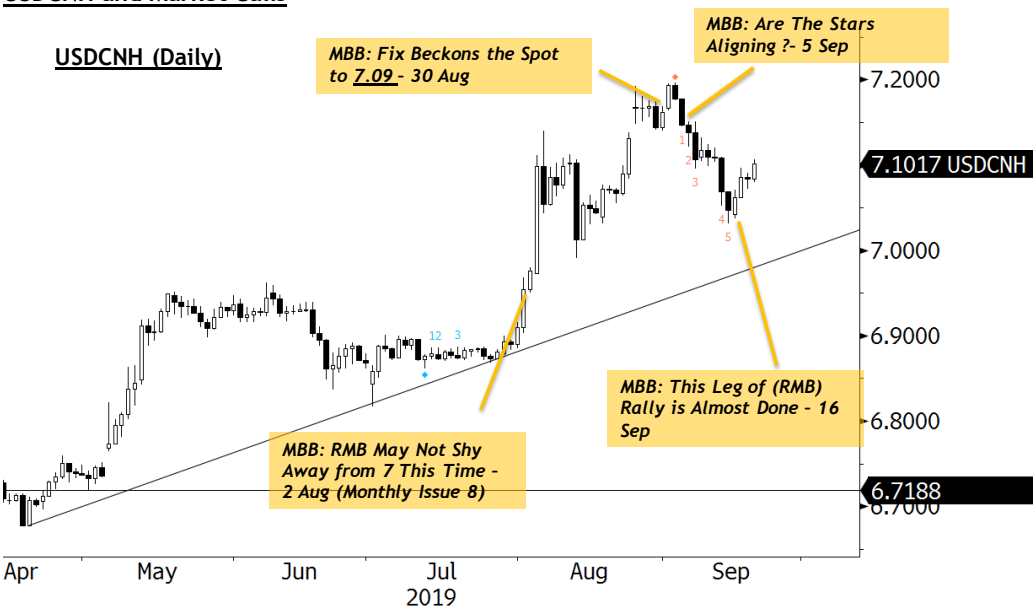
Volatility is the Name of the Game

It's an understatement to say that sharp swings in market sentiments, precipitated by Trump tweets, sudden tariff retaliations and then bouts of goodwill moves, have made it difficult to focus on the structural aspects of the macro-economy. Add in a sharp spike in oil (% change magnitude at multi-decade high) and a sudden reversal again as supply concerns ease, and we have market watchers on their toes wondering what each new day could bring.

To this end, as market conditions and outcomes of trigger events (Brexit, US-China trade talks, Middle East geopolitical risk, Japan-South Korean trade spat) remain fluid, we continue to monitor market developments closely. Watch for our FX Insight or Flash pieces, which are meant to capture more dynamic views of immediate market developments. E.g., "Are The Stars Aligning?" on 5 Sep discussed various factors coming into play to potentially nudge markets towards more risk-on behavior. This preceded the sharp Asian FX rally in the following week. Subsequently, "This Leg of Rally Almost Done" on 16 Sep cautioned for a pullback in Asian FX sentiments, akin to developments over the past few days.

USDCNH and Market Calls



Source: Bloomberg, Maybank FX Research & Strategy Estimates

In this issue, we take a step back from soothsaying, and focus more on ways to handle uncertainty and volatility in markets. More specifically, we utilize a variety of approaches (i.e., GARCH modelling, historical episode analysis) to look more closely at the suitability of multiple Yen FX pairs in performing hedging or safe haven functions. Gold, Silver and US Treasury assets are added in for comparison. While we are at it, we also consider two other related and pertinent questions:

1) Can we still expect USD to strengthen during times of market stress?

2) Oil prices could see some near-term volatility due to tensions in the Middle East. Which FX pairs could be potential hedges for this purpose?

FX Trade Ideas: Cumulative Return of ~10% YTD

Date	Trade	Entry/[SL]	Objective(s)	P&L	Open/Closed	Remarks
26 Jul	Long IDRSGD	0.9702 [0.9615]	0.9940		Open	RV trade on growth and carry [Link]
3 Jul	Short S$NEER (vs. long USD, CNH, MYR, IDR, PHP)	+1.7% above implied-mid	To-par		Open	Position for MAS easing [Link]

Date	Trade	Entry/[SL]	Objective(s)	P&L	Open/Closed	Remarks
6 Sep	Short AUDNZD	1.0700 [1.0800]	1.0500	-0.9%	Closed at 1.08 (16 Sep)	Rising Wedge Bearish Reversal {Link}
11 Jan	Short CNYSGD	0.2000 [trailing SL at 0.1970]	0.1900	+1.5%	Trailing SL at 0.1970 hit (14 Aug)	Triple-top bearish setup [Link]
5 Aug	Long AUDNZD	1.0380 [1.0350]	1.0550	-0.28%	Stopped at 1.0350 (6 Aug)	Position for RBA-RBNZ policy divergence [Link]
30 Jul	Short USDJPY	108.90 [109.70]	107	+1.7%	Closed at 107 (2 Aug)	Technical bearish reversal [Link]
26 Jul	Long AUDCAD	0.9146 [0.9050]	0.9350	-1.04%	Stopped at 0.9050 (31 Jul)	Expectations for BoC to cut rate vs. RBA on hold [Link]
8-Mar	Short USDJPY	111.70 [114.50]	108, 105	+1.97%	Closed at 109.50 (14 May)	Narrowing yield differentials and slowing growth concerns [Link]
8 Mar	Long USDKRW (3m call)	1129 spot ref	Strike at 1140; B/E at 1148.2	+3.10%	Closed at 1186 (14 May)	Cheap hedge against equity sell-off [Link]
8 Mar	Long IDRKRW	0.0800 [0.0780]	0.0860	+2.80% (excl. carry returns)	Closed at 0.0826 [14 May]	RV trade on monetary policy space, growth divergence [Link]
16 Nov	Long THB, IDR vs. Short PHP (basket)	99.5 [98.60]	101.34	+1.85% (excl. carry returns)	Closed at 101.34 (4 Jan)	RV trade in monetary policy space to tighten [Link]
			Cumulative P/L	+10.7%		

Demand in Uncertain Times

Terms like "hedge" and "safe haven" are often used loosely in markets. There is, however, a subtle difference between the two. **A strong hedge is usually negatively correlated to our main portfolio's performance, on average, and across broad periods**. When we employ a hedge, we are trying to protect against sustained periods of weakness in our main portfolio, and we are willing to forgo a certain portion of the returns in exchange for the "insurance".

On the other hand, **a strong safe haven asset has a high likelihood of being negatively correlated with the main portfolio's outcomes in times of severe market stress**. Investors pile into it when a negative spiral in sentiments and real-economy developments take hold, knowing that others likely will as well. This provides credible support to prices. They are assets which have the highest chance of seeing supported or increased valuations during extreme market conditions.

JPY, Gold, US Treasuries are some commonly cited safe haven assets, and are thought by most market participants to have some hedging properties as well. Some investors attribute safe haven characteristics to Silver too. In recent years, the USD is perceived to be somewhat "dual-nature", i.e., strength emerges in both rallies and stresses—with strength during market stresses associated with flows to safer USD-denominated assets. Some also view it as a higher-carry DM currency that can outperform in periods of positive risk sentiment.

Descriptive Statistics of Selected Assets / FX Pairs (%)

	MXWO	SPX	MXASJ	Gold	Silver	T2Y	T10Y	BBDXY	JPY USD	JPY EUR	JPY SGD	JPY MYR	JPY IDR	JPY CNY	JPY THB	JPY KRW	JPY PHP
Mean	0.023	0.033	0.024	0.025	0.037	0.000	0.004	0.006	0.004	0.008	0.002	0.012	0.040	-0.001	0.008	0.014	0.016
Std Dev	0.90	1.09	1.22	0.98	1.74	0.11	0.40	0.42	0.67	0.76	0.65	0.82	1.47	0.70	0.83	1.07	0.88
Skew	-0.26	-0.09	-0.06	0.05	-0.68	-4.85	-3.31	-0.06	0.44	0.34	0.35	0.44	2.03	0.20	2.13	0.68	0.439

Source: Bloomberg, Maybank FX Research & Strategy Estimates

Note: Descriptive statistics are computed across daily returns of assets from 2 Jan 1992 to 30 Aug 2019, except for the BBDXY series starting in Jan 2005, and JPYCNY series starting in Jan 1995 (to avoid sharp CNY devaluation in 1994).

Simple descriptive statistics for the assets we shall be examining in this report are shown in the table above. Three equity indices: MXWO (MSCI World), SPX (S&P 500) and MSASJ (MSCI Asia ex Japan) are added for reference since we're presumably worried about equity portfolio risk. Gold and Silver are in USD-denominated forms. T2Y and T10Y refer to US 2Y and US 10Y Treasuries (proxied by generic futures) respectively.

BBDXY, the Bloomberg Dollar Spot Index, is a representation of USD strength vs. a basket of 10 global currencies, with weights based on trade & liquidity, and is used here instead of the usual DXY index, which has fewer (6) constituents. For instance, the weight of EUR is around 58% in DXY, but only around half that in BBDXY (31.5%). BBDXY would presumably be less susceptible to swings in specific currencies, especially EUR, compared to DXY, and could be more suited for the type of longer-term analysis we're conducting. For most of the analyses in this report, we note that results do not usually vary significantly regardless of whether DXY or BBDXY is used.

For Yen pairs, we adopt JPY as the base currency, for easy interpretation later on. I.e., when JPY-XXX rises or falls, yen value rises or falls. Besides key JPY-AxJ crosses, we also add in the usual JPYUSD and JPYEUR pairs.

Some brief results emerge from a quick glance of the table. Silver's longer-term average returns are higher than gold's, but it is more volatile in general. As per the generic nature of bonds/bills, returns volatility for US 2Y and US 10Y Treasuries tend to be relatively low. Notably, average returns and volatility vary significantly across different Yen crosses. Pairs such as JPYIDR with a historical upward bias (i.e., IDR depreciating for most periods) would see greater average returns and skew (i.e., how asymmetric returns are around average).

A GARCH Approach to Evaluating Hedging, Knee-Jerks and Volatility

In this part of the analysis, **we take on the perspective of an investor with exposure to global equities**, and try to establish some key guidelines or insights as we consider the potential usefulness of various assets, including yen crosses, for hedging purposes.

GARCH models are often used to take into account data volatility when conducting econometric analyses in financial time series. In particular, volatility in financial returns can be persistent, in periods of macro stresses such as trade conflicts, poor global growth or uncertain central bank monetary policy. We utilise a simple specification of the following form for hedging asset returns:

$$HReturn_t = f(HReturn_{t-1}, MXWO_t, MXWO_{t-1}, MXWO_{t-2}, BBDXY_t),$$

where error term ~ GARCH (1,1).

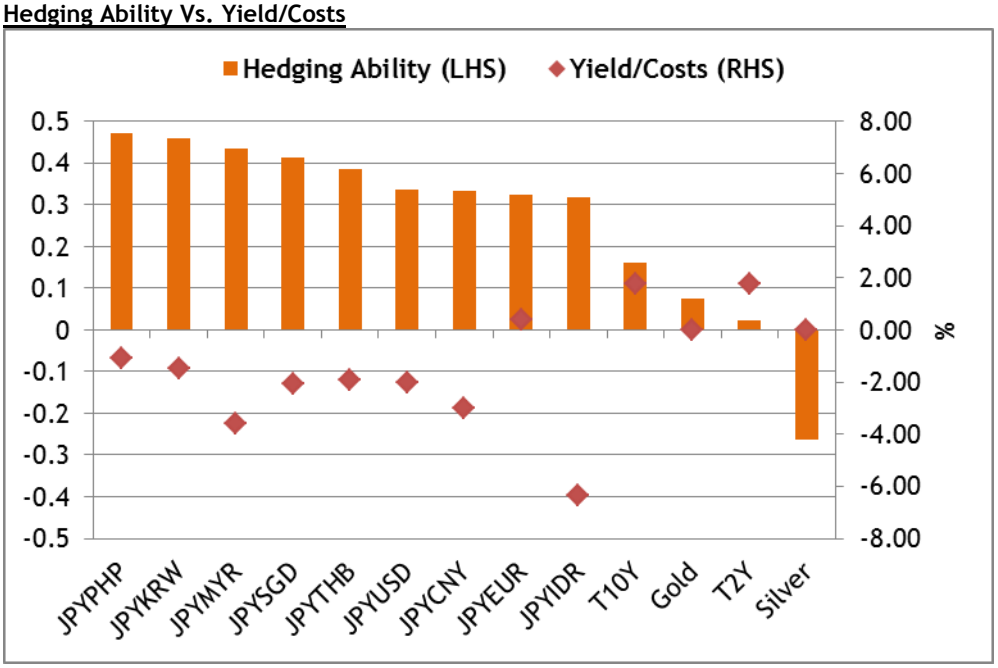
HReturn refers to returns of the hedging asset under consideration, while MXWO is the Bloomberg Ticker for the MSCI World Index. What we're doing here is essentially a **regression of the hedge asset returns on its own lags and world equity returns**.

BBDXY, the Bloomberg Dollar Spot Index, is our chosen control variable. Assets like Gold, Silver and US Treasuries are denominated in USD, and USD trajectory impacts on aggregate returns for international investors holding these assets. Even when not directly denominated in USD, i.e., in the case of certain JPY-AxJ currency pairs, USD can arguably be a proxy for global monetary/growth conditions, which influences returns as well.

This overall set-up allows us to tease out some information regarding how various hedging assets and currency pairs react alongside changes in world equity markets. For the full econometric results and other details, please refer to the Technical Appendix at the back of the report. In this section, we extract the relevant econometric results in bite-sized chunks, and discuss their interpretations.

JPYKRW, JPYEUR & US 10Y Treasuries have a Good Balance Between Hedging Ability, Yield/Costs Considerations…

Hedging Ability Vs. Yield/Costs



Source: Bloomberg, Maybank FX Research & Strategy Estimates

Note: "Hedging ability" is defined as the average %-point change in asset returns when MSCI World Index returns decline by 1%-point. Yields of 2Y and 10Y Treasuries (T2Y and T10Y) are as at 19 Sep. Cost of carry for long positions in JPY currency pairs are proxied by taking the difference between generic 12M interest rates in the respective currencies.

The negative coefficients on the contemporaneous $MXWO_t$ term in the model specification can be seen as a proxy for "hedging ability" with respect to world equity risks (i.e., as MSCI World Equity falters, hedge asset outperforms). The chart above arranges the assets under consideration by hedging ability and indicates their respective yields or costs (i.e., most yen pairs have negative carry).

Key takeaways:

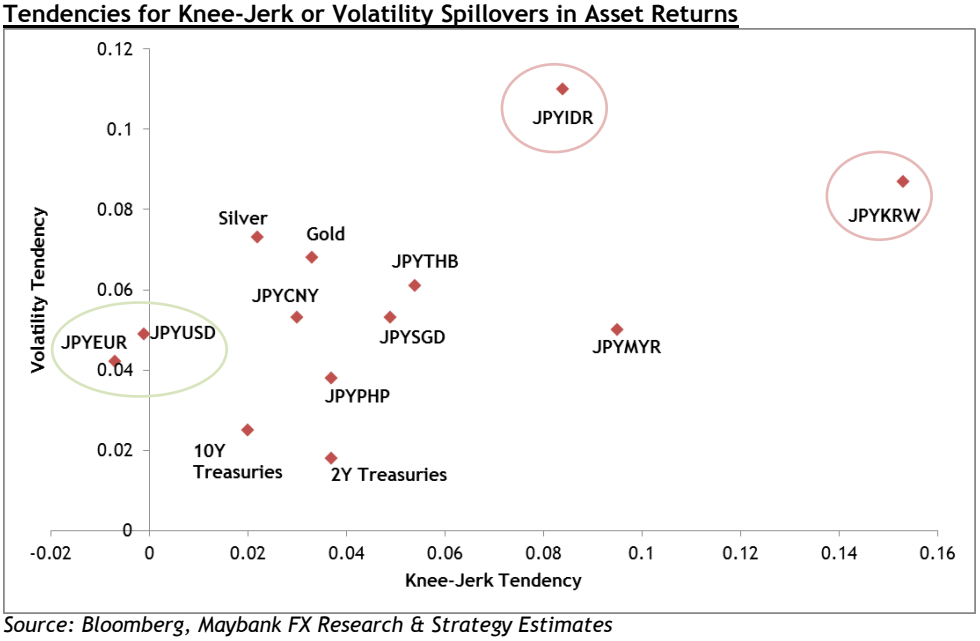
- Among benchmark assets like Gold, Silver, US 2Y & 10Y Treasuries, **10Y Treasuries are likely the better hedging instrument**. Silver returns are actually directionally similar to world equity returns on average and are not useful for hedging.

- JPYUSD and other Yen crosses, particularly JPYKRW and JPYPHP, seem promising in their ability to hedge against downsides in world equities. However, negative carry costs might dis-incentivize their usage. From this perspective, **the JPYEUR pair offers a decent option**—a fair ability to hedge while potentially having mild positive carry.

- JPYKRW and JPYPHP might be useful alternatives to consider when regional interest rates ease further. BoJ should have limited room to lower interest rates, relative to BoK and BSP. These developments mean that negative carry in these pairs could get smaller over time, if the global easing cycle continues. Between the two, **JPYKRW is preferred** as KRW is more liquid than PHP.

But, Beware of Knee-Jerk Reactions or Volatility Spillovers in JPYIDR, JPYKRW…

Tendencies for Knee-Jerk or Volatility Spillovers in Asset Returns



Source: Bloomberg, Maybank FX Research & Strategy Estimates

Note: "Knee-jerk tendency" is defined as the coefficient on lagged own returns for assets (with sign reversed); "Volatility tendency" is defined as the estimated ARCH (1) coefficient.

If an asset's price tends to overshoot/undershoot on news releases, and retrace back the next trading day, we refer to it as having high knee-jerk tendency.

Similarly, if high volatility in an asset's movement today tends to lead to high volatility in prices tomorrow, we classify it as having high volatility tendency.

Key takeaways:

- While JPYEUR and JPYUSD may see modest, persistent volatility in movements, they exhibit almost negligible knee-jerk tendencies. **This further increases the attractiveness of JPYEUR as a hedging tool**.
- **JPYKRW and JPYIDR have high knee-jerk and volatility tendencies**. This hints that there could be some herding effects for trades in these crosses. I.e., when there are impactful news announcements, everyone rushes to the same side of the trade initially, and pushes price movements beyond what is "rational". Corrections may then be seen subsequently.
- **If exposure in to JPYKRW is undertaken with hedging in mind, perhaps some dollar-cost averaging approach can be utilized**. In particular, market participants should not attempt to "chase" prices post announcements, given retracement risks.

Evaluating Past Episodes of Stresses & Recoveries - The Search for Credible Havens

Next, to ascertain safe haven performance, we evaluate how the selected assets reacted in times of historical market stresses. While this type of analysis is common, we try to value-add via (i) a more comprehensive comparison of stress periods, (ii) adding yen pairs to the analysis and (iii) considering asset performance in subsequent periods of recoveries.

To begin, we first identify periods of historical market stresses, with varying durations and causes. We try not to select overly long crisis periods, with multiple mini-peaks and troughs in between, to avoid skewing the results. While the performance of the MSCI World Index is the primary factor for period selection, we also try to avoid periods where MSCI World and MSCI Asia ex-Japan Indices are clearly moving in opposing directions. The aim here is to **extract broad time periods where global equities as a whole are under stresses**.

Some brief information about the selected crisis periods are captured in the following Tables.

Crisis Events and Equity Indices' Performance in these Periods (%)

Start	End	Event	MXWO Index	SPX Index	MXASJ Index
9/4/1998	5/10/1998	1998 Asian Financial Crisis (Latter Phase)	-16.5	-11.0	-39.8
19/3/2002	9/10/2002	2002 Crisis - IT Bubble (Latter Phase)	-31.3	-33.6	-24.0
11/10/2007	9/3/2009	2007-09 Global Financial Crisis	-58.9	-56.5	-62.8
22/7/2011	4/10/2011	2011 European Debt/ US Debt Ceiling Woes	-20.3	-16.4	-27.8
21/5/2015	11/2/2016	2015-16 Chinese Equity Turbulence	-18.9	-14.2	-28.5
21/9/2018	25/12/2018	2018 Global Growth Concerns	-18.4	-19.7	-10.9

Source: Bloomberg, Maybank FX Research & Strategy Estimates

The most devastating event for equities was the Global Financial Crisis. Over a period of 1 year 5 months, more than half of overall portfolio values was wiped off equity markets across DMs and Asia.

Crisis Events and Selected Asset Returns in these Periods (% Change)

Event	Gold	Silver	T2Y	T10Y	BB DXY	JPY USD	JPY EUR	JPY SGD	JPY MYR	JPY IDR	JPY CNY	JPY THB	JPY KRW	JPY PHP
1998 Asian Financial Crisis (Latter Phase)	-3.8	-21.4	2.6	9.0	-	-2.0	-11.9	3.2	1.6	30.9	-2.6	-3.4	-1.9	14.3
2002 Crisis - IT Bubble (Latter Phase)	9.2	-3.7	3.1	11.4	-	7.1	-4.5	4.7	7.1	-3.3	5.7	7.3	0.7	10.3
2007-09 Global Financial Crisis	23.3	-5.8	5.5	13.4	17.6	18.7	33.6	25.5	31.3	57.6	8.1	36.6	100.4	30.9
2011 European Debt/ US Debt Ceiling Woes	1.4	-25.0	0.2	5.3	7.7	2.3	10.0	10.6	10.1	7.5	0.9	7.0	16.1	5.8
2015-16 Chinese Equity Turbulence	3.5	-8.2	0.0	3.4	4.0	7.7	5.6	12.0	23.9	11.2	14.5	13.7	18.4	14.9
2018 Global Growth Concerns	5.7	3.3	0.3	2.3	2.3	2.1	5.3	2.7	3.4	0.5	2.4	2.3	3.0	-0.3

Source: Bloomberg, Maybank FX Research & Strategy Estimates

Note: BBDXY data only available from Jan 2005. Negative returns (i.e., same direction as equity returns, denoting poor safe haven characteristics) are highlighted in red.

Just as Silver is a poor hedge, it also performs poorly as a safe haven asset. One reason for this could be that a large part of Silver's value is tied to its industrial demand, and this is likely to fall during periods where global industrial activity is likely to be soft. We hence leave it out in the analyses below.

For a clearer comparison, we do several additional adjustments to the returns table above.

(1) We account for bond yields in Treasuries, and also add/subtract carry returns/costs for currency pairs.

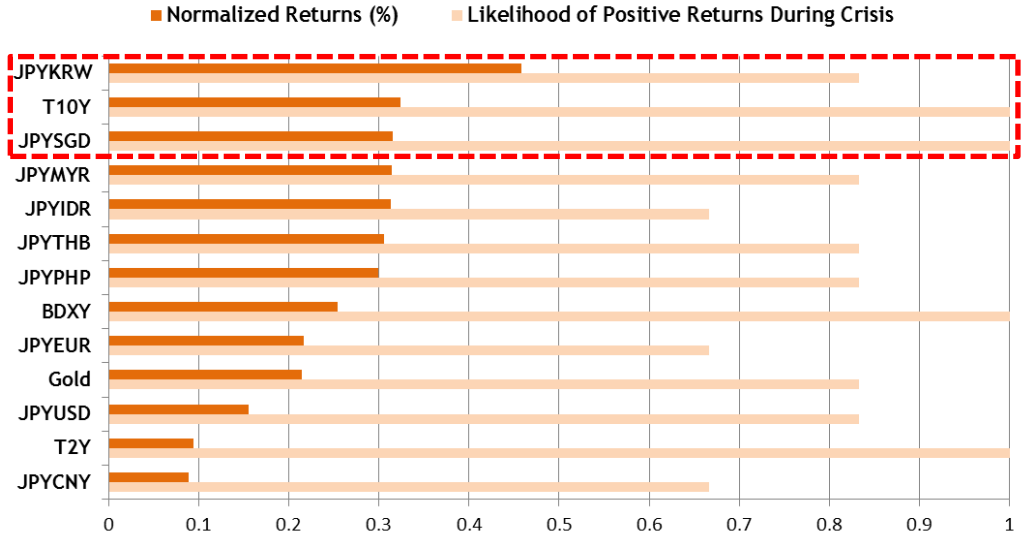
(2) We "normalize" the cumulative returns of each asset by dividing them by the extent of decline in MXWO in each period. I.e., if MXWO falls by 10% while the asset posts 20% cumulative returns, the "normalized" return of the asset is 20/10=2%.

(3) We average the normalized returns above for each asset, while removing outliers (min, max), to avoid idiosyncratic domestic factors from skewing our results.

(4) We also compute the likelihood of positive returns during crisis as: No. of Crises in which Asset has Positive Returns/Total No. of Crises.

JPYKRW, US 10 Year Treasuries and JPYSGD have Highest Positive Returns during Crises …

Average Normalized Potential Safe Haven Asset Returns (% Change)



Source: Bloomberg, Maybank FX Research & Strategy Estimates

Key takeaways:

- We note that **JPYKRW, US 10 Year Treasuries and JPYSGD have the highest positive returns as downsides in MXWO set in**. Also, JPYKRW displays positive returns in 5 out of 6 equity crises, while US 10 Year Treasuries and JPYSGD show positive returns in all 6 crises.

- It is somewhat of a surprise that the JPYSGD pair ranked so high on the list, given that SGD-denominated sovereign bonds are sometimes viewed as semi-safe havens in the region. There could be a mix of reasons why SGD consistently weakens relative to JPY in times of stress: (i) SG has a high level of trade exposure and financial linkages to other economies, so spillovers to the economy from external triggers are quick and significant, (ii) it is well known that MAS uses the exchange rate as a monetary policy tool, so there could be strong expectations for policy easing (currency weakness) during crises.

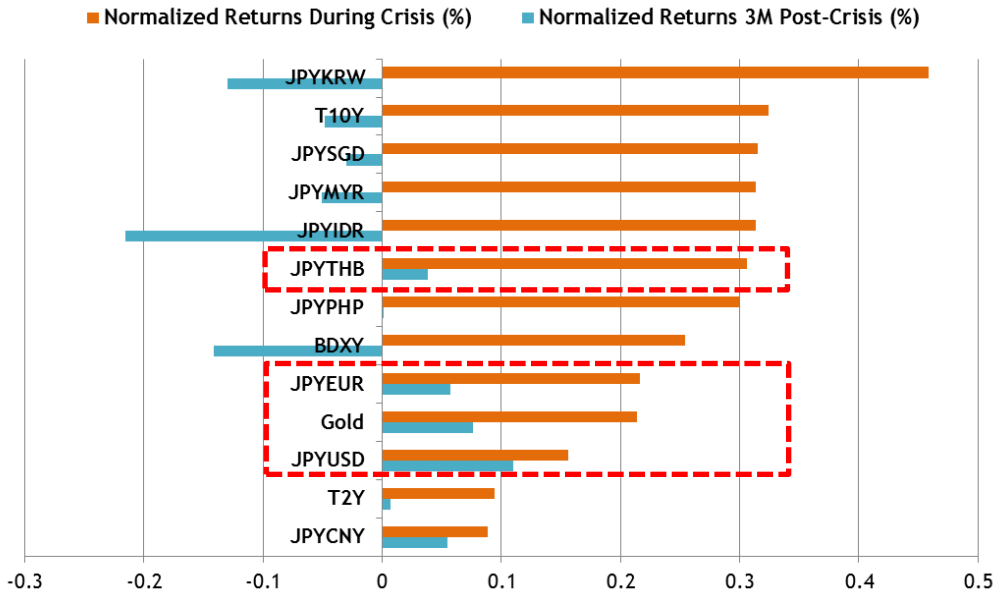
- While common safe havens such as Gold and 2Y Treasuries rank lower in the chart, they consistently deliver non-negative returns during crises (except for Gold, during 1998 Asian Financial Crisis).

It is hard to identify market troughs definitively, until some time after the event. Ideally, **price action in safe haven assets should not reverse too quickly during recovery periods**. Otherwise, investors who are slower to react could see their safe haven gains eroded away at a fast pace.

We hence check on the performances of the above assets **in the three-month period post-crisis**, using the same approach as above.

JPYTHB, JPYEUR, JPYUSD and Gold Retain Value Relatively Well Post-Crisis…

Comparing Performances During and Post-Crisis (% Change)



Source: Bloomberg, Maybank FX Research & Strategy Estimates

Key takeaways:

- JPYTHB, JPYEUR, JPYUSD and Gold have decent average gains during crises, **and continue to see supported prices in the immediate period after the crisis**. For Gold, this could be because market uncertainty persists for a while even when market conditions are turning. Most investors probably await confirmation that the recovery is gaining momentum before shifting portfolio allocations.

- Several JPY-AxJ crosses, including JPYKRW and JPYIDR, tend to see significant reversals post-crisis, and so might not be suitable as havens. The quick strengthening in KRW and IDR could be due to investment flows betting on tech cycle or EM recoveries.

- Notably, BBDXY, representing USD strength, also softens modestly in the post-crisis period. This could partly be a reflection of global portfolio reallocations, away from safe US treasuries and defensive equities, towards other geographies or asset classes.

We summarize the findings of the two exercises above.

A good hedge asset should exhibit:

- Hedging Ability—Significant (positive) change in asset returns when MSCI World returns decline, on average.
- Yield/Costs—Positive (or small negative) yield/carry.
- Knee-Jerk Tendency—Shows no/low tendency to overshoot/undershoot on news release.
- Volatility Spillover Tendency—Volatility on any one day shows no/low tendency to spillover to market movements next day.

Aggregate Table of Hedging Properties

	Gold	Silver	T2Y	T10Y	JPY USD	JPY EUR	JPY SGD	JPY MYR	JPY IDR	JPY CNY	JPY THB	JPY KRW	JPY PHP
Hedging Ability	0.07	-0.26	0.02	0.16	0.34	0.32	0.41	0.44	0.32	0.33	0.39	0.46	0.47
Yield / Costs (%)	0.0	0.0	1.6	1.6	-1.9	0.4	-2.1	-3.6	-6.4	-3.0	-1.9	-1.4	-1.1
Knee-Jerk Tendency	0.03	0.02	0.04	0.02	0.00	-0.01	0.05	0.10	0.08	0.03	0.05	0.15	0.04
Volatility Spillover Tendency	0.07	0.07	0.02	0.03	0.05	0.04	0.05	0.05	0.11	0.05	0.06	0.09	0.04

Source: Bloomberg, Maybank FX Research & Strategy Estimates

Note: For ease of comparison, "good" hedging properties are highlighted green, "modest" hedging properties are highlighted yellow and "poor" hedging properties are highlighted red, based on subjective banding of results.

JPYEUR and US Treasuries stand out as useful hedging instruments.

Similarly, a good safe haven asset should exhibit:

- Haven Ability—Significant (positive) change in asset returns when MSCI World returns decline, in times of crisis.
- Likelihood of Positive Returns During Crisis—Asset showed positive returns consistently in most/all crises.
- Retain Value in Post-Crisis Period—Prices are most supported in three months post-crisis.

Aggregate Table of Haven Properties

	Gold	Silver	T2Y	T10Y	BBDXY	JPY USD	JPY EUR	JPY SGD	JPY MYR	JPY IDR	JPY CNY	JPY THB	JPY KRW	JPY PHP
Haven Ability	0.21	-0.47	0.09	0.32	0.25	0.16	0.22	0.32	0.31	0.31	0.09	0.31	0.46	0.30
Likelihood of Positive Returns During Crisis	0.83	0.17	1.00	1.00	1.00	0.83	0.67	1.00	0.83	0.67	0.67	0.83	0.83	0.83
Retain Value in Post-Crisis Period	0.08	0.29	0.01	-0.05	-0.14	0.11	0.06	-0.03	-0.05	-0.22	0.05	0.04	-0.13	0.00

Source: Bloomberg, Maybank FX Research & Strategy Estimates

Note: For ease of comparison, "good" haven properties are highlighted green, "modest" haven properties are highlighted yellow and "poor" haven properties are highlighted red, based on subjective banding of results.

Gold and US Treasuries are credible, albeit imperfect, haven assets. Among the currency pairs, JPYSGD and JPYTHB seem to see some potential as safe haven assets too. **But between the two FX pairs, we prefer JPYSGD.**

We had explained above why JPYSGD could perform well in this role despite some perception of SGD potentially having partial regional haven characteristics as well. Namely, SG's high level of trade exposure and financial linkages means that spillovers from external negative shocks are rapid and significant. Expectations (and realized) easing moves then exert downward pressure on SGD. We highlight that SGD has declined relative to JPY for all 6 crisis periods identified. Further, MAS tends to widen the policy band in periods of FX volatility, even up to 2.5%-3.5% (estimated) on each side of the policy mid-point. Hence, even between policy announcements, there is flexibility to adjust to market biases.

For JPYTHB, we note that it is less liquid compared to JPYSGD. THB performance is also increasingly entwined with Gold over the years—the 52-week rolling correlation between THB (using THBUSD as proxy) and Gold prices have increased from around 0.2 in 2013 to around 0.9 now, probably underscoring Thailand's recent surge in gold trade. This means that THB might not weaken as much relative to JPY in future crisis periods due to support from gold price dynamics. We hence do not recommend JPYTHB as a potential haven asset.

As mentioned earlier, once we're done with the selection of optimal hedges and havens, we proceed with quick forays into two related issues which are exceptionally relevant in today's macro-environment:

1) Can we still expect USD to strengthen during times of market stress?

2) Oil prices could see some near-term volatility due to tensions in the Middle East. Which FX pairs could be potential hedges?

USD's "Safe Haven" Behavior is Intact But Likely Moderating in Extent…

USD Performance in Recent Crises

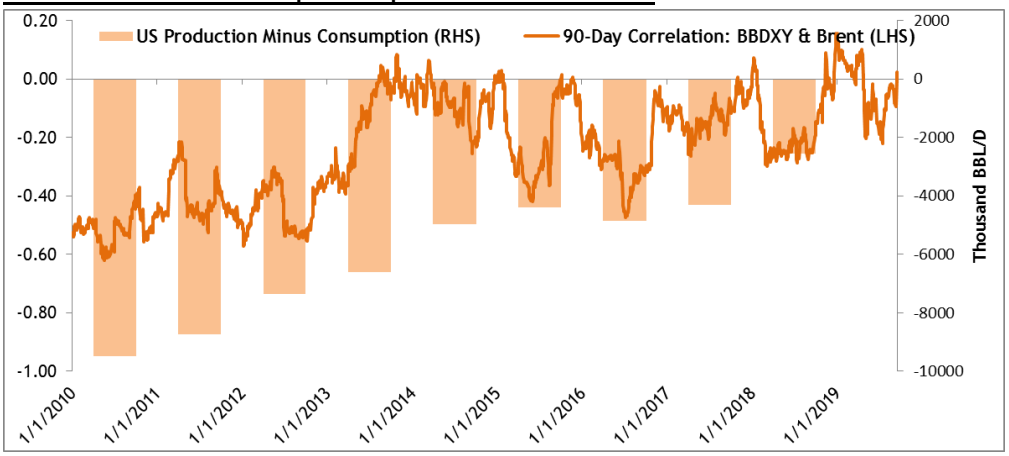
Event	MXWO Index (%)	BBDXY (%)	Normalized BBDXY (%)
2007-09 Global Financial Crisis	-58.9	17.6	0.30
2011 European Debt/ US Debt Ceiling Woes	-20.3	7.7	0.38
2015-16 Chinese Equity Turbulence	-18.9	4.0	0.21
2018 Global Growth Concerns	-18.4	2.3	0.13

Source: Bloomberg, Maybank FX Research & Strategy Estimates

Part of our earlier analysis above reveals a portion of the answer to 1). More specifically, we noted that the **magnitude of increases in the BBDXY (USD strength) over more recent crisis periods had dampened somewhat**, compared to earlier crises. This suggests that the "safe haven" nature of USD might be moderating over time.

A mix of factors could help explain this behavior.

US Oil Production-Consumption Gap & USD-Oil Correlation

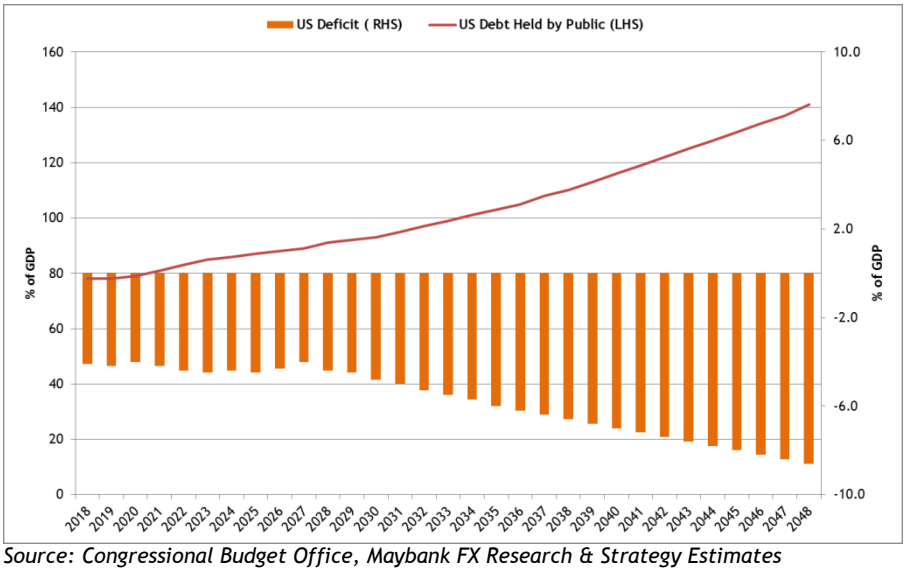


Source: EIA, Maybank FX Research & Strategy Estimates

Firstly, as the chart above shows, **the historically negative correlation between USD strength and oil prices is disappearing**, as the US becomes more self-reliant in energy production. In the past, concerns of softening global demand has a high likelihood of leading to oil price declines in times of crisis. This, in turn, can help

support the USD, with the US economy being viewed as benefitting from lower oil prices, given its net importer status. This behavior had helped to reinforce the "safe haven" characteristic of the US dollar. As the negative correlation breaks down going forward, this support may dissipate as well.

US Budget Deficit and Debt Projections

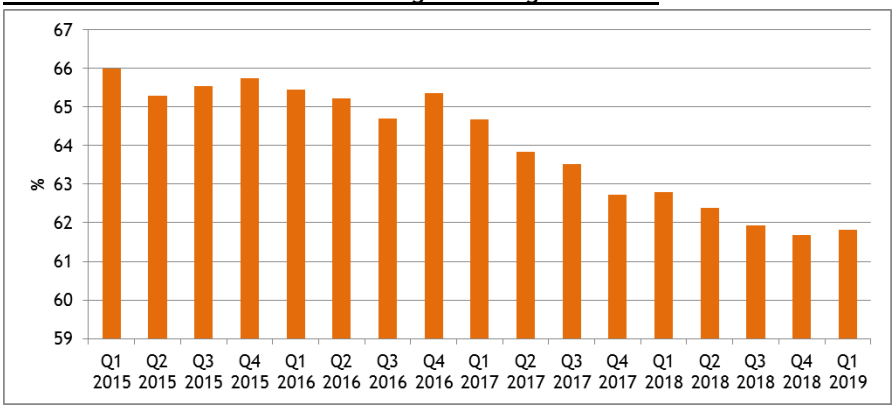


Source: Congressional Budget Office, Maybank FX Research & Strategy Estimates

Note: "Debt held by the public" refers to Treasury securities held by investors outside the federal government, including those held by individuals, corporations, the Federal Reserve System, and foreign, state and local governments.

Second, the current fiscal trajectory for US does not bode well for US dollar strength going forward. Taking into account Trump's tax cuts, the latest fiscal legislation is expected to keep the budget deficit at around -4-5% of GDP for the next decade. Instead of moderating in outer years, CBO expects this to worsen from 2030 onwards, perhaps as structural demographic effects kick in. This implies that US Debt Held by the Public (including bonds held by foreign entities) could rise from around 78% of GDP now to 93% by 2030, and 141% by 2048. There is a fair chance that new episodes of debt ceiling disputes, i.e., repeats of 2011 and 2013 incidents, could dent longer-term investor confidence in US Treasuries (and USD).

USD Share of Allocated Official Foreign Exchange Reserves



Source: IMF, Maybank FX Research & Strategy Estimates

Third, **USD's share of currency reserves held by central banks has been declining since 2015**. While we do not expect the USD to lose its position as the dominant reserve currency quickly, a persistent diversification away from the USD as a reserve currency of choice towards EUR, GBP, JPY and RMB, underscores the increasing relevance of these non-USD currencies.

It is also likely that Trump's frequent threats of economic sanctions or protectionist initiatives are contributing to the diversion of trade away from the US, and potentially nudging other countries to settle transactions in currencies other than the dollar. For some evidence of the former, we refer to a study linking soft power of a country's leader to export outcomes *("Agent Orange: Trump, Soft Power, and Exports," Andrew Rose, Jan 2019*), which estimated that the >20% point decline in foreign approval of American leadership between 2016 (the final year of Obama's presidency) and 2017 (Trump's first year)—presumably in part due to his perceived antagonistic stance towards US trading partners—had lowered US exports by at least 0.2%. To counter this effect, standard trade elasticities suggest that USD would have needed to depreciate by around 0.3%.

Half of international trade today is still invoiced in USD (vs. US' share of international trade at around 10%). Realistically, it will take some time before USD's dominance in global transaction usage can significantly recede. But recent developments, such as China and Russia's agreement to develop mechanisms to switch to national currencies in mutual payments, point to a clear directional bias on this front.

Shifting perceptions of longer-term USD reserve/transactional demand will similarly affect its credibility as an "asset" that can preserve value over time, or under varying market conditions. Coupled with the other factors above, our assessment is that the extent of USD's "safe haven" demand has been moderating, and could continue to moderate going forward. I.e., the curvature of the "smile" could flatten somewhat.

Reaffirm USDCAD and USDNOK as Desired Pairs for Oil Volatility Hedging…

In a last foray, we look at common oil-linked currencies and check their hedging properties vis-à-vis oil volatility, using the GARCH approach that we had utilized earlier (but swapping out MSCI World Index for Brent Oil).

Aggregate Table of Hedging Properties (Oil)

	USD CAD	USD NOK	USD MYR	USD RUB
Hedging Ability	0.07	0.07	0.03	0.03
Yield / Costs (%)	0.4	0.9	-1.6	-4.5
Knee-Jerk Tendency	0.05	0.01	-0.07	-0.03
Volatility Spillover Tendency	0.04	0.04	0.12	0.13

Source: Bloomberg, Maybank FX Research & Strategy Estimates

Note: For ease of comparison, "good" hedging properties are highlighted green, "modest" hedging properties are highlighted yellow and "poor" hedging properties are highlighted red, based on subjective banding of results.

Key takeaways:

- We reaffirm USDCAD and USDNOK as desired pairs for hedging against oil moves. Between the two, USDNOK might be preferred as it is likely to have slightly higher carry return and lower knee-jerk tendencies.

- The hedging ability (i.e., estimated rise in FX pair returns when Brent Oil returns decline by 1%-point) for USDMYR and USDRUB is roughly about half that of USDCAD and USDNOK. They are also undesirable due to negative carry costs and higher volatility spillover tendencies.

Appendix: Technical Details of GARCH Model

We take on the perspective of an investor with exposure to global equities, as we consider the potential usefulness of JPY-AxJ crosses and other assets for hedging purposes.

GARCH models are often used to take into account data volatility when conducting econometric analyses in financial time series. In particular, volatility in financial returns can be persistent, in periods of macro stresses such as trade conflicts, poor global growth or uncertain central bank monetary policy. We utilise a simple specification of the following form:

$$HReturn_t = f(HReturn_{t-1}, MXWO_t, MXWO_{t-1}, MXWO_{t-2}, BBDXY_t),$$

where error term ~ GARCH (1,1).

HReturn refers to returns of the hedging asset under consideration, MXWO is the Bloomberg Ticker for the MSCI World Index. What we're doing here is essentially a regression of the hedge asset returns on its own lags and world equity returns.

We use dollar strength as a control variable here, since assets like gold, silver and US Treasuries are denominated in USD and USD trajectory impacts on aggregate returns for international investors holding these assets. Even when not directly denominated in USD, i.e., in the case of certain JPY-AxJ currency pairs, USD can arguably be a good proxy for global monetary/growth conditions influencing returns as well. Here, we use BBDXY, the Bloomberg Dollar Spot Index, as the control variable of choice in our analysis. It is a representation of USD strength vs. a basket of global currencies, with weights based on trade & liquidity.

This overall set-up allows us to tease out some information regarding how various assets and currency pairs react alongside changes in world equity markets.

Results of GARCH Model

Coefficients on	Gold	Silver	T2Y	T10Y	JPY USD	JPY EUR	JPY SGD	JPY MYR	JPY IDR	JPY CNY	JPY THB	JPY KRW	JPY PHP
Y_{t-1} (Own Lag)	-0.033	-0.022	-0.037	-0.020	0.001	0.007	-0.049	-0.095	-0.084	-0.030	-0.054	-0.153	-0.037
$MXWO_t$	-0.074	0.263	-0.023	-0.162	-0.337	-0.324	-0.412	-0.435	-0.319	-0.334	-0.386	-0.461	-0.472
$MXWO_{t-1}$	0.023	-0.010	0.003	0.023	0.059	0.074	0.070	-0.048	-0.102	0.036	0.046	-0.138	0.058
$MXWO_{t-2}$	-0.006	0.005	0.000	-0.012	-0.025	-0.030	-0.014	-0.019	-0.026	-0.030	-0.023	-0.019	-0.020
ARCH (1)	0.068	0.073	0.018	0.025	0.049	0.042	0.053	0.050	0.110	0.053	0.061	0.087	0.038
GARCH (1)	0.930	0.920	0.982	0.970	0.947	0.951	0.942	0.945	0.856	0.929	0.932	0.898	0.956

Source: Maybank FX Research & Strategy Estimates

Note: Coefficients on $MXWO_t$ and ARCH (1) terms are mostly significant at the 1% probability level. Data used for analysis was from Jan 2005 to Aug 2019.

Discussions of results are in the main text.

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