RBC Capital Markets®

Total FX

September 2, 2016

Table of Contents

KEY TOPICS

FX Strategy: Why FX carry may be back in fashion

- Selective FX carry trades are starting to make sense again as the yield on conventional assets sinks to ever lower levels.
- Rising sensitivity to *outright yield* may go a long way in explaining why AUD has been so robust to a negative interest rate *dynamic* in 2016.
- And SEK's persistent weakness in the face of otherwise better fundamentals may reflect its status as the most efficient funder in G10 carry trades, a role filled by CAD for many years previously.
- Against high yield EM, however, shorting CAD still makes more sense than the "default" position of funding in USD.

FX Strategy: What happens to USD if the Fed hikes in September?

- A 2016 hike is increasingly consensus, with Fed fund futures pointing to a ~70% probability by year end, from close to zero two months ago. USD has benefited but remains range-bound against most currencies.
- The sensitivity of DXY to rate differentials has dropped, though it is not just a USD phenomenon (see page 2). On top of this, the beta of the slope of the forward curve to the very front end has also dropped, capping the impact of 2016 expectations on 2017 and limiting follow-through for the currency.
- So even if the Fed were to hike in September, ahead of consensus, USD gains should be limited. This week we booked the premium on our short 1.30 Cable put which expired OTM. We still like selling 1m GBP/USD downside and buying longer-dated puts.

Disseminated: September 1, 2016 19:04ET; Produced: September 1, 2016 19:04ET

FX Strategy: Why FX carry may be back in fashion

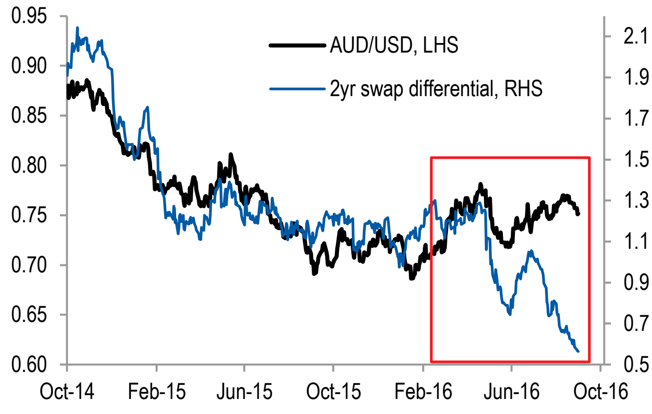
2 September 2016, **Adam Cole**

- Selective FX carry trades are starting to make sense again as the yield on conventional assets sinks to ever lower levels.
- Rising sensitivity to *outright yield* may go a long way in explaining why AUD has been so robust to a negative interest rate *dynamic* in 2016.
- And SEK's persistent weakness in the face of otherwise better fundamentals may reflect its status as the most efficient funder in G10 carry trades, a role filled by CAD for many years previously.
- Against high yield EM, however, shorting CAD still makes more sense than the "default" position of funding in USD.

Is carry trading back in fashion?

Is carry trading back as a viable FX strategy and a driver of FX market returns? That is a possible explanation for the robust performance of AUD in particular in 2016, despite a consistently negative interest rate *dynamic* (particularly relative to the US) as markets have priced in ever more RBA easing (Figure 1). It is plausible that, in a risk-positive environment and with yield increasingly hard to find in liquid markets (blue line in Figure 3, for example), AUD's *outright yield* is propping the currency up, irrespective of whether yields are rising or falling. In other words, carry is back as an FX market driver.

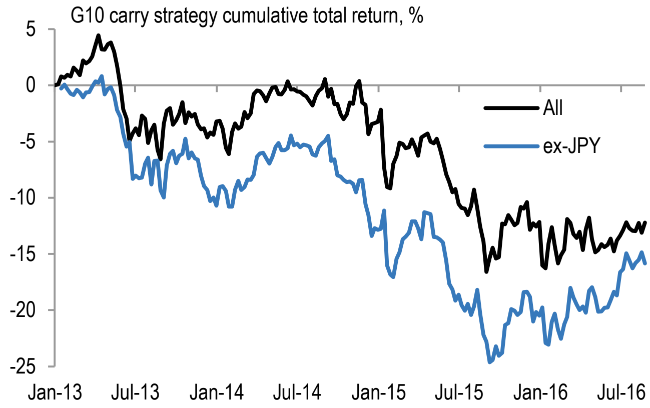
1. AUD defies negative rate expectations



Source: RBC Capital Markets, Bloomberg

The fly in the ointment for this argument is of course JPY. How can we be in a carry-driven environment when JPY is by far the best performing currency in G10 this year and is up 12% against AUD and 9% against NZD? As we argue below, using our carry trade barometer, the answer is that JPY is not an efficient funding currency for carry trades in a world with so many other low or negative yielding candidates and should never be part of the funding side of a carry trade. As Figure 2 shows, if we exclude JPY from the G10 universe, carry has been a consistently successful investment strategy for the last year. A simple basket of long the three highest-yielding G10 currencies and short the three lowest-yielding would have been up 8% over the last year after three years of consistently negative returns.

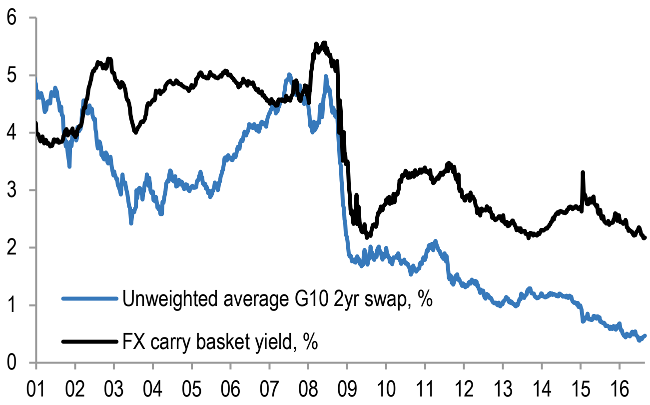
2. Carry strategies work, ex-JPY



Source: RBC Capital Markets, Bloomberg

Also worth noting in this context, despite consistently falling global yields, the yield on FX carry trades appears to have hit a floor and is still above post-crisis lows (Figure 3). This is a simple consequence of the removal of the zero bound in so many markets. The fact that investors are paid to short a number of G10 currencies has compensated for the decline in yields on the long side of carry trades. Although the yield on FX carry trades is not far from the lows, it has risen *relative* to the yield most other asset classes.

3. Carry trade yields seem to have troughed



Source: RBC Capital Markets, Bloomberg

What defines a good funding currency?

So if we accept there is a case for taking a more positive view on carry trades generally, what makes a *good* carry trade? The efficacy of FX carry trades is determined by the trade-off between the return (interest rate spread) and risk (spot volatility). Our carry trade barometer uses options prices to objectively assess this trade-off and screen for efficient carry trades. The criterion is based on the affordability of options protection against the spot trade going wrong – lower vol and wider rate spreads both make protection more affordable and so increase the attractiveness of a currency pair as a carry trade.

Take the current arithmetic for AUD/JPY as a numerical example. The 3m interest rate spread between AUD and JPY is currently 2.4%, so an investor that goes long and holds the position for three months earns 0.60% of carry (non-annualised). Suppose, at the beginning of the three month period, the investor used all of the 0.60% to buy an AUD/JPY put option, also on a three month horizon, so insuring against an adverse spot move. At current vol levels, that much premium would buy an option on a 69.43 strike, ie 11.11% out-of-the-money relative to spot. This is our criterion of the attractiveness of the pair as carry trade. The closer to at-the-money such an option becomes, the better the trade-off between vol and spread.

4. RBC Carry Trade Barometer

	Buying downside protection in...								
vs...	**AUD**	**NZD**	**BRL**	**CLP**	**MXN**	**TRY**	**ZAR**	**INR**	**IDR**
USD	8.82	8.56	3.38	4.85	8.19	3.16	8.61	1.13	2.71
JPY	11.11	10.38	4.40	7.16	7.59	5.30	4.84	2.89	4.05
CAD	5.37	5.37	2.77	3.86	5.14	2.70	3.24	2.24	3.90
GBP	6.71	7.06	3.62	5.58	7.57	2.33	7.15	1.38	5.25
EUR	5.34	5.41	3.35	4.85	6.34	2.21	6.96	1.87	4.55
CHF	4.82	5.24	3.95	5.06	6.19	1.73	7.20	0.79	1.91
SEK	4.15	4.46	2.97	4.50	6.77	2.64	6.83	2.69	1.96
CZK	5.49	5.29	3.17	5.11	6.68	2.83	6.08	1.46	2.32

Rank	**AUD**	**NZD**	**BRL**	**CLP**	**MXN**	**TRY**	**ZAR**	**INR**	**IDR**
USD	7	7	5	3	8	7	8	2	4
JPY	8	8	8	8	7	8	2	8	6
CAD	4	4	1	1	1	5	1	6	5
GBP	6	6	6	7	6	3	6	3	8
EUR	3	5	4	3	3	2	5	5	7
CHF	2	2	7	5	2	1	7	1	1
SEK	1	1	2	2	5	4	4	7	2
CZK	5	3	3	6	4	6	3	4	3

Source: RBC Capital Markets

Figure 4 shows the same arithmetic for a range of potential carry trades as it looks now. The first panel is again the % out of the money a three month option is, if the three month carry is used to pay the premium. **The smaller the numbers in the table, the better the trade-off.** The second panel simply ranks the funding currencies for each high yielder, with the first and second most efficient highlighted in blue and grey.

Several key points stand out, as do a number of changes since we last updated this table:

- **JPY** is by far the worst funding currency amongst the low-yielders. This is simply a consequence of the risk on/risk off nature of FX markets currently and JPY's status as a safe haven, maximizing volatility against the (typically risky) high yielders. This has been true for most of the post-crisis period and funding currency status should never have been a reason to be negative-JPY in that period.
- **SEK** has jumped up the rankings to now be the first choice funding currency in **G10 carry trades** (ie on the other side of AUD and NZD longs). Although it is unlikely direct positioning in these pairs has become extended, it is likely that investors using similar yield/vol optimisations in overlay strategies will have been "forced" into shorter and shorter SEK positions in aggregate. This may help explain SEK's persistent weakness, despite what are rapidly improving fundamentals, and also leave SEK vulnerable to a squeeze if carry trades start underperforming.
- SEK's rise up the G10 funding currency rankings is the counterpart to **CAD**'s decline. For most of the post-crisis period, when FX/risk correlations have been high, short CAD has been by far the most efficient way to fund long positions in AUD and NZD and its slippage to fourth in both cases is a significant change that reflects CAD's now relatively high rates. In itself, this is not a reason to be bullish CAD, but it raises the hurdle for being bearish.
- **CHF** is also starting to creep up the ranking as funding currency, which may help explain its steady underperformance against most G10 currencies this year (GBP and SEK being the only exceptions).
- Against **high yield EM**, **CAD** remains the highest ranked funding currency where commodity prices are the link. For investors with a prior positive view on BRL, MXN, CLP or ZAR, shorting CAD on the other side of long positions still brings a better vol/yield trade-off than "defaulting" to short **USD**, which generally does not work as a funding currency anywhere.
- Perhaps surprisingly, and despite significantly negative yields, **EUR** does not feature as a good funding currency (except against TRY). This may change if EUR continues to shed the status of safe haven (EUR/USD is risk neutral currently) that it had until recently and starts to trade as a risky asset again.

FX Strategy: What happens to USD if the Fed hikes in September?

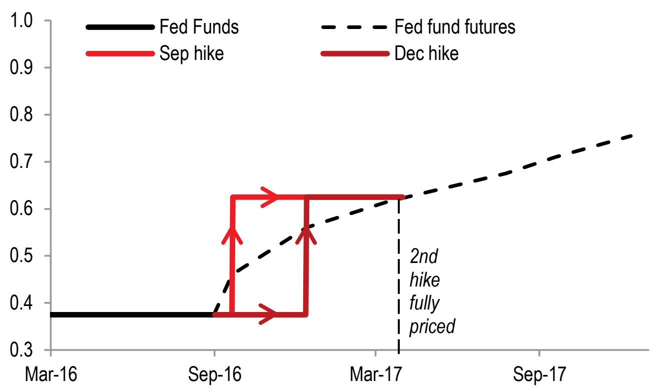
2 September 2016, **Elsa Lignos**

- A 2016 hike is increasingly consensus, with Fed fund futures pointing to a ~70% probability by year end, from close to zero two months ago. USD has benefited but remains range-bound against most currencies.
- The sensitivity of DXY to rate differentials has dropped, though it is not just a USD phenomenon (see page 2). On top of this, the beta of the slope of the forward curve to the very front end has also dropped, capping the impact of 2016 expectations on 2017 and limiting follow-through for the currency.
- So even if the Fed were to hike in September, ahead of consensus, USD gains should be limited. This week we booked the premium on our short 1.30 Cable put which expired OTM. We still like selling 1m GBP/USD downside and buying longer-dated puts.

Consensus for a 2016 hike

Since early July, US rate expectations have risen significantly. In the days just after the UK referendum, markets were briefly priced for a small probability of a cut this year. Since then, two much stronger than expected payrolls reports (>250k), coupled with some 'hawkish' Fed rhetoric has seen a hike by year end now 70% priced in and the chances for September peak around 40%, though it has retraced to ~30% on a weak ISM survey. USD has benefited from the rise, though it remains range-bound. In the last two months, EUR/USD has traded a 400pt range; it is now just 30pts off the midpoint. The same is true for AUD/USD (400pt range; 20pts off the midpoint) and USD/JPY (a wider range of 800pts, but again spot is 30pts off the midpoint). GBP/USD and USD/CAD are slightly firmer than the middle of their respective ranges, but the theme of sideways USD trading is hard to shake.

1. A 2016 Fed hike is close to fully priced by markets

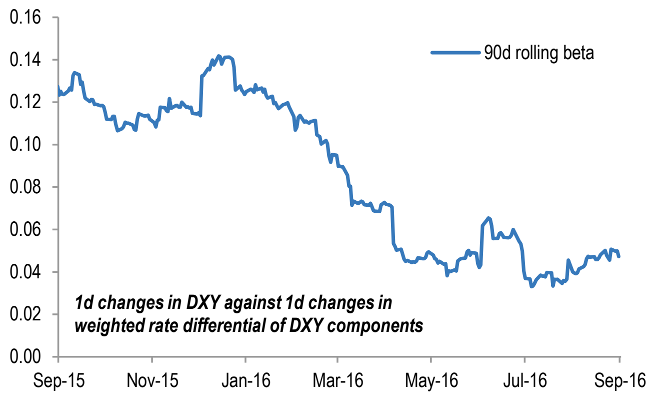


Source: RBC Capital Markets, Bloomberg

Markets have spent all year waiting for the second Fed hike. Policy is still easy or easing further across the rest of G10 so why is USD not doing better as a 2016 hike gets priced in?

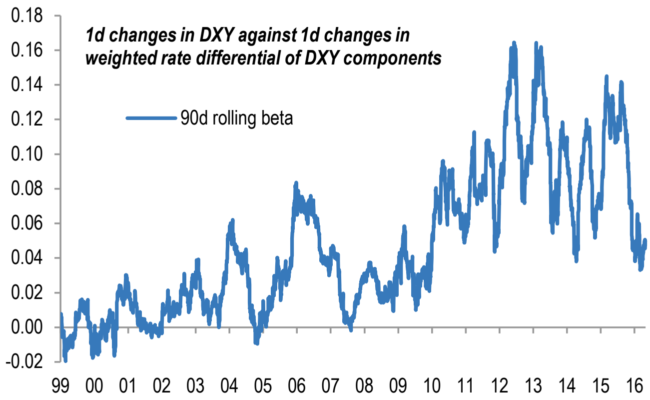
This is not just a USD story. In fact, there is a more obvious breakdown between the currency and rate dynamics in other currencies (e.g. AUD). We looked into the reasons for that in the previous article (pages 2-3). Figure 2 shows how the sensitivity of DXY to interest rate differentials has fallen since late last year. [1] It is now back at pre-crisis levels (Figure 3), though back then the elasticity was lower as rate moves were considerably bigger.

2. The elasticity of DXY to rate differentials has fallen...



Source: RBC Capital Markets, Bloomberg

3. ...Back to pre-crisis levels

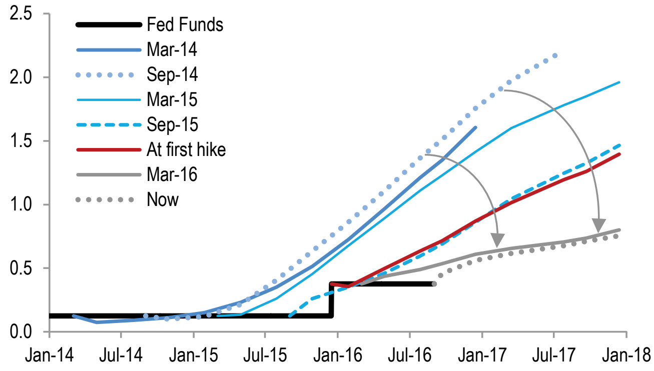


Source: RBC Capital Markets, Bloomberg

[1] We look at the difference between US 2y swaps and the weighted 2y swap rate of the DXY components, then estimate the beta of daily changes in DXY to daily changes in the rate differential.

Part of the answer lies in the apparent importance of outright yield over rate dynamics discussed on pages 2-3. But there might be another factor that is more US specific. Markets, analysts and the FOMC have almost consistently over-estimated the pace of future Fed rate hikes. Two years ago, futures were priced for Fed funds at 1.5% in September 2016. This time last year, markets thought we would have reached 0.7%. Instead we are still debating the second hike. At the same time, investors have adjusted their expectations for the terminal Fed funds rate. Figure 4 shows that progressive flattening in the US forward curve.

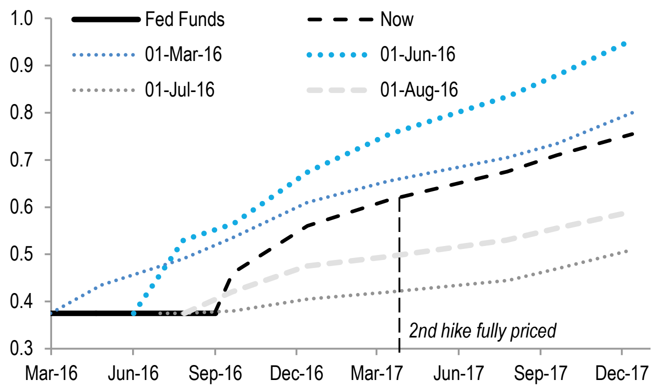
4. Fwd curve has flattened almost consistently since 2014



Source: RBC Capital Markets, Bloomberg

But in recent months, the forward curve has been shifting almost in parallel. That is to say, even when expectations have risen for 2016, there has been limited follow-through for 2017. Figure 5 shows how the Fed fund futures curve has evolved over the last six months. While it steepened from March to June and flattened into early July, moves since then have been closer to parallel shifts. As markets have priced in a 2016 hike, expectations for 2017 have factored in that 2016 hike, but not risen much incrementally, i.e. a 2016 hike is taken as less of a signal for a follow-on hike in 2017. It seems markets are increasingly buying into the Fed's claim that it is data-dependent and there is no pre-set path for interest rates.

5. Recent moves are closer to parallel shifts…

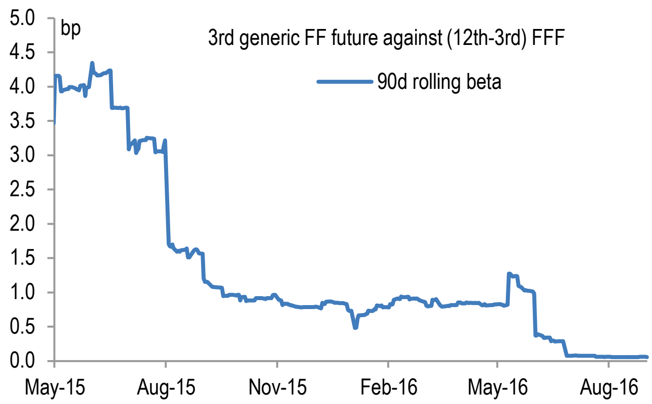


Source: RBC Capital Markets, Bloomberg

Figure 6 shows a different way to look at this. It shows the sensitivity of the slope of the Fed funds futures curve to expectations at the very front end. Specifically it is the beta of daily changes in the difference between the 12th and 3rd generic contract to daily changes in the 3rd contract.

The sensitivity of the slope to the level of near-dated rate expectations has fallen materially over the last 18 months – in part this was down to the market building in expectations for a slower cycle and lower terminal rate. But in the last few months that beta has approached zero, indicating expectations for the next three months have had almost no incremental effect on 2017.

6. … And changes at the very front end are not driving bigger moves further out the curve



Source: RBC Capital Markets, Bloomberg

In previous work on how USD responds to Fed tightening cycles, we argued that there is no standard response (see ***Total FX: USD and Fed tightening***, 7 Aug 2015). Unsurprisingly it depends on the pace of tightening and interest rate dynamics in the rest of the world. If a hike in 2016 does not lead to a material increase in rate expectations for 2017 & 2018, it limits USD's scope for gains. That is not to say USD won't react to a Fed decision to hike or not hike this year – the 70pt reaction to a weak ISM manufacturing number in both EUR/USD and USD/JPY is testament to how almost every data release is shifting expectations for the Fed and how those expectations still drive the currency. But the big difference is the *elasticity*. If that has fallen as we suspect it has, a hike (or no hike) will limit USD gains/losses to well-worn ranges.

One trade we have recommended before is selling 1m GBP/USD downside and buying a longer-dated put (see ***Total FX: GBP – This is not 1992***, 28 July 2016) for the original trade idea and rationale and this week's ***Thematic Trade of the Week*** for our short-term tactically positive GBP view. The GBP/USD vol curve remains relatively flat and we still see value in selling 1m downside, even though the FOMC meeting falls within that 1m window. Our US economists do not expect the Fed to raise rates this month, but even if wrong on the Fed call, we would not look for USD to break to new highs. We are looking for a dip in GBP/USD to re-establish the 1m/6m calendar spread.

FX Trading Tools: Economic Surprises & Risk Appetite

29 August 2016, **G10 FX Strategy**

ESI Trading Signals

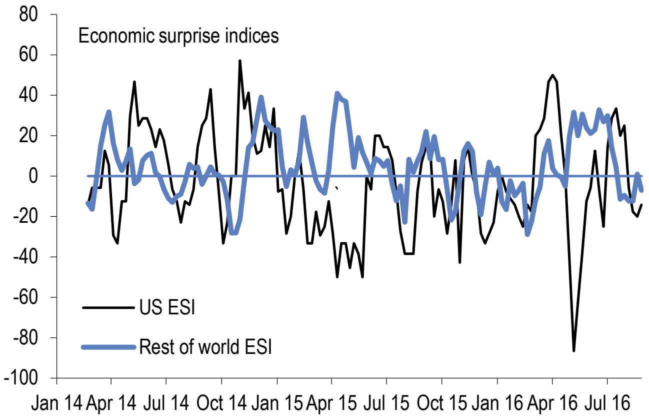
The model is again slightly net short USD this week, with short positions against JPY and GBP partly offset by a long position against CAD. The US ESI rose slightly to -14 from -20. The RoW ESI slipped slightly to -7 (previously +1). The model was down 0.3% last week and is down 3.6% year-to-date.

ESI Trading Signals and Returns

Week:	26 Aug-2 Sep	19-26 Aug	12-19 Aug	5-12 Aug
EUR/USD	Neutral	Long	Long	Neutral
USD/JPY	Short @ 101.83	Short	Short	Short
GBP/USD	Long @ 1.3137	Long	Neutral	Neutral
USD/CAD	Long @ 1.3004	Long	Long	Long
AUD/USD	Neutral	Neutral	Short	Short
Weekly ESI Portfolio Return		0.1%	0.4%	-0.3%
YTD Return		-3.3%	-3.4%	-3.7%

Source: RBC Capital Markets, Bloomberg

Economic surprise indices – US vs RoW



Source: RBC Capital Markets, Bloomberg

Comments on ESIs

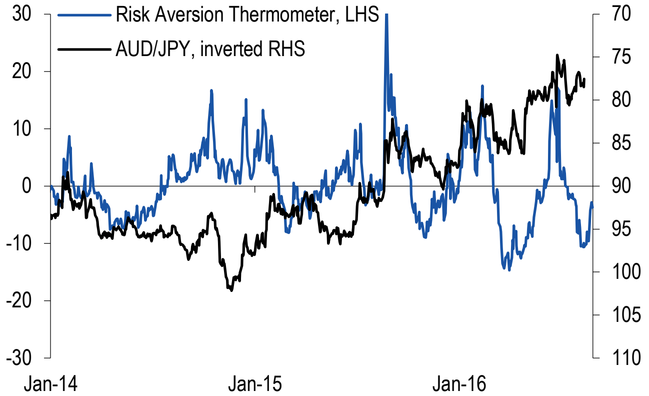
		Comment
US	-14	Stronger durables and home sales
Eurozone	-7	Weaker M3 and German/French confidence
UK	14	No significant data released
Japan	43	No significant data released
Canada	-43	No significant data released
Australia	-43	No significant data released

Source: RBC Capital Markets, Bloomberg

RAT

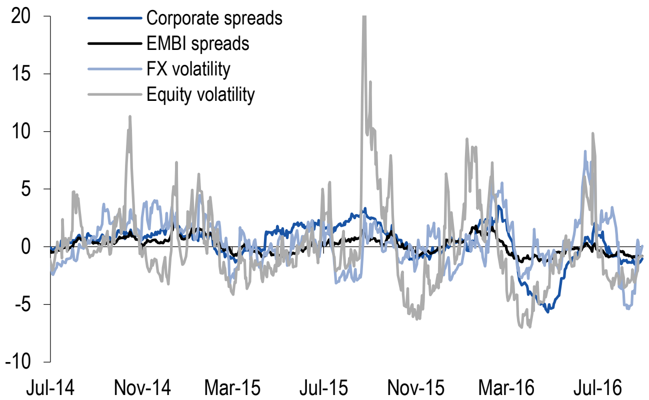
The RAT jumped in a risk-averse direction last week though it remained outright risk-seeking. The main drivers were equity and FX vol. VIX was up 2.8pts to 13.7 while the ECB's global hazard index—a blend of 1m implied vol in EUR/USD, USD/JPY, and EUR/JPY—was up 2.3pts to 14.0. Corporate spreads were unchanged at 93bps and EM spreads were 3bps tighter at 354bps.

RAT vs. AUD/JPY



Source: RBC Capital Markets, Bloomberg

Contributions to RAT – index points



Source: RBC Capital Markets, Bloomberg

Economic Events Calendar

2 September 2016

Region	Time EDT	BST	AEST	Period	Data/Event	RBC	Consensus	Prior
Mon 5								
Australia	21:30+	2:30	11:30	Q2	Nonfarm inventories, company profits q/q (%)	0.1, 2.0		0.4, -4.7
China	21:45+	2:45	11:45	Aug	PMI: services, composite index			51.7, 51.9
Spain	3:15	8:15	17:15	Aug	PMI: services, composite index	...,54.2		54.1, 53.7
Italy	3:45	8:45	17:45	Aug	PMI: services, composite index	...,51.7		52.0, 52.2
France	3:50	8:50	17:50	Aug	PMI: services, composite index ('flash': 52.0, 51.6)	52.0, 51.6		50.5, 50.1
Germany	3:55	8:55	17:55	Aug	PMI: services, composite index ('flash': 53.3, 54.4)	53.3, 54.4		54.4, 55.3
Euro area	4:00	9:00	18:00	Aug	PMI: services, composite index ('flash': 53.1, 53.3)	53.1, 53.3		52.9, 53.2
UK	4:30	9:30	18:30	Aug	PMI: services, composite index	49.5, ...		47.4, 47.5
Euro area	4:30	9:30	18:30	Sept	Sentix investor confidence index			4.2
Euro area	5:00	10:00	19:00	Jul	Retail sales m/m (%)	0.9		0.0
Tue 6								
Australia	21:30+	2:30	11:30	Q2	Current account (A$bn), net exports (ppt contr to GDP)	-19.3, 0.3		-21, 1.1
Australia	0:30	5:30	14:30	...	RBA cash rate announcement	1.50	1.50	1.50
Germany	2:00	7:00	16:00	Jul	Factory orders m/m (%)			-0.4
UK	4:00	9:00	18:00	Aug	New car registrations y/y (%)			0.1
Germany	4:00	9:00	18:00	...	Finance Minister Schaeuble to present Budget to Parliament			
Euro area	5:00	10:00	19:00	Q2	GDP q/q, y/y (%) (previous est: 0.3, 1.6)	0.3, 1.6		0.6, 1.7
US	10:00	15:00	0:00#	Aug	ISM non-manufacturing	54.5	55.3	55.5
Wed 7								
Australia	21:30+	2:30	11:30	Q2	GDP q/q y/y (%)	0.4, 3.2		1.1, 3.1
Germany	2:00	7:00	16:00	Jul	Industrial production m/m (%)			0.8
France	2:45	7:45	16:45	Jul	Trade balance (€mn)			-3440
France	2:45	7:45	16:45	Jul	Current account, sa (€bn)			-0.6
UK	3:30	8:30	17:30	Aug	Halifax House Prices, m/m (%)			-1
Sweden	3:30	8:30	17:30	Sept	Riksbank interest rate decision (%)			-0.5
UK	4:30	9:30	18:30	Jul	Industrial production m/m (%)			0.1
UK	5:15	10:15	19:15	...	BoE's Cunliffe Speaks at Brugel event in Brussels			
UK	9:15	14:15	23:15	...	BoE's Carney, Cunliffe, Forbes and McCafferty to appear before Treasury Select Committee			
UK	10:00	15:00	0:00#	Aug	NIESR GDP estimate 3m/3m (%)			0.3
Canada	10:00	15:00	0:00#	...	BoC Rate Decision (%)	0.50	0.50	0.50
Canada	10:00	15:00	0:00#	Aug	Ivey PMI			57.0

Continued...

Continued

Region	Time EDT	Time BST	Time AEST	Period	Data/Event	RBC	Consensus	Prior
Thu 8								
Australia	18:55+	23:55+	8:55	...	RBA's Lowe speaks			
Japan	19:50+	0:50	9:50	Jul	Current account (JPYbn)			974
Japan	19:50+	0:50	9:50	Q2	GDP q/q (%) (2nd estimate)			0.0
Australia	21:30+	2:30	11:30	Jul	Trade balance (A$bn)	-2.8		-3.2
China	22:00+	3:00	12:00	Aug	Trade balance (US$bn), imports, exports y/y (%)			52.3, -12.5, -4.4
France	1:30	6:30	15:30	Q2	Non-farm payrolls q/q (%)			0.2
France	2:30	7:30	16:30	Aug	BdF business sentiment index			98
Euro area	7:45	12:45	21:45	...	ECB Governing Council decision: refi rate, deposit rate (%)	0.0, -0.4		0.0, -0.4
Euro area	8:30	13:30	22:30	...	ECB President Draghi holds press conference			
Canada	8:30	13:30	22:30	Q2	Capacity Utilization Rate (%)			81.4
Canada	8:30	13:30	22:30	Jul	New Housing Price Index y/y (%)			2.5
Canada	8:30	13:30	22:30	Jul	Building Permits m/m (%)			-5.5
US	8:30	13:30	22:30	03-Sep	Initial jobless claims (K)	260		263
Canada	12:05	17:05	2:05#	...	BoC Deputy Chair Lane speaks			
Fri 9								
China	21:30+	2:30	11:30	Aug	CPI y/y (%)			1.8
Australia	21:30+	2:30	11:30	Jul	Housing finance m/m (%)	-3.0		1.2
Germany	2:00	7:00	16:00	Jul	Trade balance (€bn)			24.7
Germany	2:00	7:00	16:00	Jul	Current account (€bn)			26.3
France	2:45	7:45	16:45	Jul	Budget balance, ytd (€bn)			-61.8
France	2:45	7:45	16:45	Jul	Industrial production m/m (%)			-0.8
Spain	3:00	8:00	17:00	Jul	Industrial production m/m (%)			0.2
UK	4:30	9:30	18:30	Jul	Trade balance: total, visible (£mn)			-5084, -12409
UK	4:30	9:30	18:30	Jul	Construction output m/m (%)			-0.9
Canada	8:15	13:15	22:15	Aug	Housing Starts m/m (K)	182.0		195.0
Canada	8:30	13:30	22:30	Aug	Unemployment Rate (%), Net Change in Employment m/m (K)	6.9, 18.0		6.9, -31.2
Finland		...		...	Sovereign debt rating - DBRS			AAA, Stable

* Variable release date, # Following day, + Previous day
Sources: Bloomberg, Reuters and RBC Capital Markets estimates

RBC FX Forecasts

	2016				2017			
Spot Forecasts	Q1	Q2	Q3f	Q4f	Q1f	Q2f	Q3f	Q4f
EUR/USD	1.14	1.11	1.05	1.03	0.99	1.02	1.03	1.04
USD/JPY	113	103	99	97	95	92	95	97
GBP/USD	1.44	1.33	1.25	1.21	1.15	1.19	1.20	1.21
USD/CHF	0.96	0.98	1.03	1.05	1.08	1.06	1.06	1.07
USD/SEK	8.12	8.46	8.86	8.83	8.99	8.53	8.45	8.37
USD/NOK	8.27	8.36	8.67	8.74	8.99	8.63	8.45	8.27
USD/CAD	1.30	1.29	1.36	1.33	1.31	1.31	1.30	1.30
AUD/USD	0.77	0.75	0.72	0.69	0.66	0.66	0.67	0.68
NZD/USD	0.69	0.71	0.69	0.65	0.62	0.58	0.59	0.60
USD/CNY	6.45	6.64	6.90	6.95	7.00	7.20	7.40	7.50
USD/CNH	6.46	6.67	6.93	6.98	7.03	7.23	7.43	7.53
USD/HKD	7.76	7.76	7.75	7.75	7.75	7.75	7.75	7.75
USD/INR	66	68	70	71	71	72	72	73
USD/KRW	1145	1153	1230	1250	1270	1310	1290	1280
USD/SGD	1.35	1.35	1.40	1.45	1.50	1.60	1.58	1.56
USD/MYR	3.88	3.99	4.20	4.40	4.50	4.60	4.70	4.70
USD/IDR	13148	13173	13700	13900	14100	14300	14500	14700
USD/TWD	32	32	36	37	37	37	38	38
USD/THB	35.1	35.1	38.8	39.8	40.0	40.3	40.6	41.0
USD/PHP	45.9	47.1	48.6	48.9	49.4	49.3	49.2	49.0
USD/TRY	2.82	2.88	3.40	3.20	3.14	3.18	3.22	3.26
USD/RUB	67	64	65	66	67	69	68	67
USD/ZAR	14.77	14.74	17.50	17.00	16.80	16.50	16.50	16.50
USD/PLN	3.73	3.94	4.19	4.22	4.34	4.17	4.08	4.04
USD/HUF	276	284	299	303	313	302	297	294
USD/CZK	23.8	24.4	25.7	26.2	27.3	26.2	25.5	25.0

	2016				2017			
EUR Crosses	Q1	Q2	Q3f	Q4f	Q1f	Q2f	Q3f	Q4f
EUR/USD	1.14	1.11	1.05	1.03	0.99	1.02	1.03	1.04
EUR/JPY	128	115	104	100	94	94	98	101
EUR/GBP	0.79	0.83	0.84	0.85	0.86	0.86	0.86	0.86
EUR/CHF	1.09	1.08	1.08	1.08	1.07	1.08	1.09	1.11
EUR/SEK	9.24	9.39	9.30	9.10	8.90	8.70	8.70	8.70
EUR/NOK	9.41	9.28	9.10	9.00	8.90	8.80	8.70	8.60
EUR/CAD	1.48	1.43	1.43	1.37	1.30	1.34	1.34	1.35
EUR/AUD	1.49	1.49	1.46	1.49	1.50	1.55	1.54	1.53
EUR/NZD	1.65	1.56	1.52	1.58	1.60	1.76	1.75	1.73
EUR/CNY	7.34	7.37	7.25	7.16	6.93	7.34	7.62	7.80
EUR/CNH	7.13	7.36	7.41	7.28	7.19	6.96	7.37	7.65
EUR/HKD	8.83	8.61	8.14	7.98	7.67	7.91	7.98	8.06
EUR/INR	75	75	73	73	70	73	74	76
EUR/KRW	1303	1280	1292	1288	1257	1336	1329	1331
EUR/SGD	1.53	1.50	1.47	1.49	1.49	1.63	1.63	1.62
EUR/MYR	4.42	4.43	4.41	4.53	4.46	4.69	4.84	4.89
EUR/IDR	14962	14626	14385	14317	13959	14586	14935	15288
EUR/TWD	37	36	38	38	37	38	39	39
EUR/THB	40.0	39.0	40.7	41.0	39.6	41.1	41.8	42.6
EUR/PHP	52.3	52.3	51.0	50.4	48.9	50.3	50.7	51.0
EUR/RUB	76.2	71.0	68.3	68.0	66.3	70.4	70.0	69.7
EUR/PLN	4.24	4.38	4.40	4.35	4.30	4.25	4.20	4.20
EUR/HUF	314	316	314	312	310	308	306	306
EUR/CZK	27.0	27.1	27.0	27.0	27.0	26.7	26.3	26.0

Source: RBC Capital Markets estimates

RBCCM Fixed Income & Currency Strategy Team

Europe

RBC Europe Limited:

Adam Cole	Head of G10 FX Strategy	+44-20-7029-7078	adam.cole@rbccm.com
Vatsala Datta	UK Rates Strategist	+44 20-7029-0184	vatsala.datta@rbccm.com
Sam Hill, CFA	Senior UK Economist	+44-20-7029-0092	sam.hill@rbccm.com
Cathal Kennedy	European Economist	+44(0)20-7029-0133	cathal.kennedy@rbccm.com
Peter Schaffrik	Chief European Macro Strategist	+44-20-7029-7076	peter.schaffrik@rbccm.com

Asia-Pacific

Royal Bank of Canada – Sydney Branch:

Su-Lin Ong	Head of Australian and New Zealand FIC Strategy	+612-9033-3088	su-lin.ong@rbccm.com
Michael Turner	Fixed Income & Currency Strategist	+612-9033-3088	michael.turner@rbccm.com

Royal Bank of Canada – Hong Kong Branch:

Sue Trinh	Senior Currency Strategist	+852-2848-5135	sue.trinh@rbccm.com

North America

RBC Dominion Securities Inc.:

Mark Chandler	Head of Canadian FIC Strategy	(416) 842-6388	mark.chandler@rbccm.com
George Davis, CMT	Chief Technical Analyst	(416) 842-6633	george.davis@rbccm.com
Simon Deeley	Fixed Income Strategist	(416) 842-6362	simon.deeley@rbccm.com

RBC Capital Markets, LLC:

Michael Cloherty	Head of US Rates Strategy	(212) 437-2480	michael.cloherty@rbccm.com
Elsa Lignos	Senior Currency Strategist	(212) 428-6492	elsa.lignos@rbccm.com
Chris Mauro	Head of US Municipals Strategy	(212) 618-7729	chris.mauro@rbccm.com
Jacob Oubina	Senior US Economist	(212) 618-7795	jacob.oubina@rbccm.com
Tom Porcelli	Chief US Economist	(212) 618-7788	tom.porcelli@rbccm.com
Daria Parkhomenko	Associate	(212) 618-7857	daria.parkhomenko@rbccm.com

Commodities Strategy Research Team

North America

RBC Capital Markets, LLC:

Helima Croft	Global Head of Commodity Strategy	(212) 618-7798	helima.croft@rbccm.com
Christopher Louney	Commodity Strategist	(212) 437-1925	christopher.louney@rbccm.com
Michael Tran	Commodity Strategist	(212) 266-4020	michael.tran@rbccm.com

Required Conflicts Disclosures

Conflicts disclosures

The analyst(s) responsible for preparing this research report received compensation that is based upon various factors, including total revenues of the member companies of RBC Capital Markets and its affiliates, a portion of which are or have been generated by investment banking activities of the member companies of RBC Capital Markets and its affiliates.

Conflicts policy

RBC Capital Markets Policy for Managing Conflicts of Interest in Relation to Investment Research is available from us on request. To access our current policy, clients should refer to **https://www.rbccm.com/global/file-414164.pdf** or send a request to RBC Capital Markets Research Publishing, P.O. Box 50, 200 Bay Street, Royal Bank Plaza, 29th Floor, South Tower, Toronto, Ontario M5J 2W7. We reserve the right to amend or supplement this policy at any time.

Dissemination of research and short-term trade ideas

RBC Capital Markets endeavors to make all reasonable efforts to provide research simultaneously to all eligible clients, having regard to local time zones in overseas jurisdictions. RBC Capital Markets' equity research is posted to our proprietary website to ensure eligible clients receive coverage initiations and changes in ratings, targets and opinions in a timely manner. Additional distribution may be done by the sales personnel via email, fax, or other electronic means, or regular mail. Clients may also receive our research via third party vendors. RBC Capital Markets also provides eligible clients with access to SPARC on the Firm's proprietary INSIGHT website, via email and via third-party vendors. SPARC contains market color and commentary regarding subject companies on which the Firm currently provides equity research coverage. Research Analysts may, from time to time, include short-term trade ideas in research reports and / or in SPARC. A short-term trade idea offers a short-term view on how a security may trade, based on market and trading events, and the resulting trading opportunity that may be available. A short-term trade idea may differ from the price targets and recommendations in our published research reports reflecting the research analyst's views of the longer-term (one year) prospects of the subject company, as a result of the differing time horizons, methodologies and/or other factors. Thus, it is possible that a subject company's common equity that is considered a long-term 'Sector Perform' or even an 'Underperform' might present a short-term buying opportunity as a result of temporary selling pressure in the market; conversely, a subject company's common equity rated a long-term 'Outperform' could be considered susceptible to a short-term downward price correction. Short-term trade ideas are not ratings, nor are they part of any ratings system, and the firm generally does not intend, nor undertakes any obligation, to maintain or update short-term trade ideas. Short-term trade ideas may not be suitable for all investors and have not been tailored to individual investor circumstances and objectives, and investors should make their own independent decisions regarding any securities or strategies discussed herein. Please contact your investment advisor or institutional salesperson for more information regarding RBC Capital Markets' research.

For a list of all recommendations on the company that were disseminated during the prior 12-month period, please click on the following link: **https://rbcnew.bluematrix.com/sellside/MAR.action**

The 12 month history of SPARCs can be viewed at **RBC Insight.**

Analyst certification

All of the views expressed in this report accurately reflect the personal views of the responsible analyst(s) about any and all of the subject securities or issuers. No part of the compensation of the responsible analyst(s) named herein is, or will be, directly or indirectly, related to the specific recommendations or views expressed by the responsible analyst(s) in this report.

Third-party-disclaimers

References herein to "LIBOR", "LIBO Rate", "L" or other LIBOR abbreviations means the London interbank offered rate as administered by ICE Benchmark Administration (or any other person that takes over the administration of such rate).

Options risk

Options, structured derivative products and futures are not suitable for all investors, and trading in these instruments is considered risky and may be appropriate only for sophisticated investors. Various theoretical explanations of the risks associated with these instruments have been published. Prior to buying or selling an option, and for the complete risks relating to options, you must receive a copy of "The Characteristics and Risks of Standardized Options." You may read the document at **http://www.theocc.com/publications/risks/riskchap1.jsp** or ask your salesperson for a copy. There are risks to the opportunities highlighted in this report, including events that differ from our expectations or other events that result in the share price of the stock rising or falling counter to expectations. When purchasing downside protection, the risk is that the investor loses the premium paid. When selling downside protection, without a hedge, the risk is that the investor has to settle the option for more than the cost of the option premium received. Similar risks can apply when purchasing unhedged upside. Note that a long straddle / strangle could result in a loss of premiums paid if the shares do not move outside the breakeven price range. A short straddle / strangle could result in significant losses on the short calls if the shares move outside the breakeven price ranges. We do not consider costs of commissions charged on both legs of the transactions in our breakeven analysis. In this report, we employ both statistical methods and option pricing models to estimate equity market volatility. Both of these methods are subject to the risk that undetected errors in the pricing data used could adversely affect the accuracy of the estimates. In addition, the use of an option pricing model to calculate implied volatility is obviously subject to model risk.

Any opinions expressed in this report are subject to change without notice and may differ or be contrary to opinions expressed by other business areas or groups of RBC Capital Market as a result of using different assumptions and criteria. The analyst(s) responsible for the preparation of this report may interact with trading desk personnel, sales personnel and other constituencies for the purpose of gathering, synthesizing and interpreting market information.

Disclaimer

RBC Capital Markets is the business name used by certain branches and subsidiaries of the Royal Bank of Canada, including RBC Dominion Securities Inc., RBC Capital Markets, LLC, RBC Europe Limited, Royal Bank of Canada, Hong Kong Branch and Royal Bank of Canada, Sydney Branch. The information contained in this report has been compiled by RBC Capital Markets from sources believed to be reliable, but no representation or warranty, express or implied, is made by Royal Bank of Canada, RBC Capital Markets, its affiliates or any other person as to its accuracy, completeness or correctness. All opinions and estimates contained in this report constitute RBC Capital Markets' judgement as of the date of this report, are subject to change without notice and are provided in good faith but without legal responsibility. Nothing in this report constitutes legal, accounting or tax advice or individually tailored investment advice. This material is prepared for general circulation to clients and has been prepared without regard to the individual financial circumstances and objectives of persons who receive it. The investments or services contained in this report may not be suitable for you and it is recommended that you consult an independent investment advisor if you are in doubt about the suitability of such investments or services. This report is not an offer to sell or a solicitation of an offer to buy any securities. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. RBC Capital Markets research analyst compensation is based in part on the overall profitability of RBC Capital Markets, which includes profits attributable to investment banking revenues. Every province in Canada, state in the U.S., and most countries throughout the world have their own laws regulating the types of securities and other investment products which may be offered to their residents, as well as the process for doing so. As a result, the securities discussed in this report may not be eligible for sale in some jurisdictions. RBC Capital Markets may be restricted from publishing research reports, from time to time, due to regulatory restrictions and/ or internal compliance policies. If this is the case, the latest published research reports available to clients may not reflect recent material changes in the applicable industry and/or applicable subject companies. RBC Capital Markets research reports are current only as of the date set forth on the research reports. This report is not, and under no circumstances should be construed as, a solicitation to act as securities broker or dealer in any jurisdiction by any person or company that is not legally permitted to carry on the business of a securities broker or dealer in that jurisdiction. To the full extent permitted by law neither RBC Capital Markets nor any of its affiliates, nor any other person, accepts any liability whatsoever for any direct or consequential loss arising from any use of this report or the information contained herein. No matter contained in this document may be reproduced or copied by any means without the prior consent of RBC Capital Markets.

Additional information is available on request.

To U.S. Residents: This publication has been approved by RBC Capital Markets, LLC (member FINRA, NYSE, SIPC), which is a U.S. registered broker-dealer and which accepts responsibility for this report and its dissemination in the United States. Any U.S. recipient of this report that is not a registered broker-dealer or a bank acting in a broker or dealer capacity and that wishes further information regarding, or to effect any transaction in, any of the securities discussed in this report, should contact and place orders with RBC Capital Markets, LLC.

To Canadian Residents: This publication has been approved by RBC Dominion Securities Inc. (member IIROC). Any Canadian recipient of this report that is not a Designated Institution in Ontario, an Accredited Investor in British Columbia or Alberta or a Sophisticated Purchaser in Quebec (or similar permitted purchaser in any other province) and that wishes further information regarding, or to effect any transaction in, any of the securities discussed in this report should contact and place orders with RBC Dominion Securities Inc., which, without in any way limiting the foregoing, accepts responsibility for this report and its dissemination in Canada.

To U.K. Residents: This publication has been approved by RBC Europe Limited ('RBCEL') which is authorized by the Prudential Regulation Authority and regulated by the Financial Conduct Authority ('FCA') and the Prudential Regulation Authority, in connection with its distribution in the United Kingdom. This material is not for general distribution in the United Kingdom to retail clients, as defined under the rules of the FCA. However, targeted distribution may be made to selected retail clients of RBC and its affiliates. RBCEL accepts responsibility for this report and its dissemination in the United Kingdom.

To German Residents: This material is distributed in Germany by RBC Europe Limited, Frankfurt Branch which is regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin).

To Persons Receiving This Advice in Australia: This material has been distributed in Australia by Royal Bank of Canada - Sydney Branch (ABN 86 076 940 880, AFSL No. 246521). This material has been prepared for general circulation and does not take into account the objectives, financial situation or needs of any recipient. Accordingly, any recipient should, before acting on this material, consider the appropriateness of this material having regard to their objectives, financial situation and needs. If this material relates to the acquisition or possible acquisition of a particular financial product, a recipient in Australia should obtain any relevant disclosure document prepared in respect of that product and consider that document before making any decision about whether to acquire the product. This research report is not for retail investors as defined in section 761G of the Corporations Act.

To Hong Kong Residents: This publication is distributed in Hong Kong by Royal Bank of Canada, Hong Kong Branch which is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission ('SFC'), RBC Investment Services (Asia) Limited and RBC Investment Management (Asia) Limited, both entities are regulated by the SFC. Financial Services provided to Australia: Financial services may be provided in Australia in accordance with applicable law. Financial services provided by the Royal Bank of Canada, Hong Kong Branch are provided pursuant to the Royal Bank of Canada's Australian Financial Services Licence ('AFSL') (No. 246521).

To Singapore Residents: This publication is distributed in Singapore by the Royal Bank of Canada, Singapore Branch, a registered entity granted offshore bank licence by the Monetary Authority of Singapore. This material has been prepared for general circulation and does not take into account the objectives, financial situation, or needs of any recipient. You are advised to seek independent advice from a financial adviser before purchasing any product. If you do not obtain independent advice, you should consider whether the product is suitable for you. Past performance is not indicative of future performance. If you have any questions related to this publication, please contact the Royal Bank of Canada, Singapore Branch. Royal Bank of Canada, Singapore Branch accepts responsibility for this report and its dissemination in Singapore.

To Japanese Residents: Unless otherwise exempted by Japanese law, this publication is distributed in Japan by or through RBC Capital Markets (Japan) Ltd. which is a Financial Instruments Firm registered with the Kanto Local Financial Bureau (Registered number 203) and a member of the Japan Securities Dealers Association ("JSDA").