From Dollar Dominance to Divergence

April | 2016

CAMBRIDGE ASSOCIATES

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- Since 2011, and especially since mid-2014, the dominant theme in currency markets has been a broad-based rise in the US dollar. Yet since December 2015, currency markets have become increasingly divergent, with the US dollar simultaneously weakening and strengthening against different currencies.

- As discussed in our October 2015 chart book "What's Next for the US Dollar?," we think the strong-dollar cycle has more to run if history is any guide. However, the final phase of dollar strength may not be as broad based as the initial run-up.

- Given the lack of clear trend in currency markets, investors may need to have a better understanding of how their base currency is behaving against various currencies, and may need to develop more granular views on specific currency pairs. This chart book provides a resource for doing so, presenting analysis of historical currency momentum, valuation, and fundamentals in five key base currencies: US dollar (USD), British pound (GBP), euro (EUR), Swiss franc (CHF), and Japanese yen (JPY).

- For more on developing a currency hedging policy, please see our recent report, *Strategic Currency Hedging Policy: A New Framework*.

Summary of Currency Views

- **USD: The pause before the final surge?** Weakness at this part of the market/economic cycle is typical, and may be prelude to renewed strength. However, the currency is entering the final phase of the strong-dollar cycle.

- **GBP: To Brexit or not to Brexit, that is the question.** The pound has reached multi-year lows vs the USD but is not particularly cheap and remains expensive versus the EUR and JPY. A vote to leave the EU could potentially send the GBP even lower, especially if it forces the Bank of England (BOE) to ease monetary policy.

- **EUR: Will Draghi do whatever it takes?** The EUR is undervalued vs most currencies, except the JPY. However, it is hard to expect broad EUR strength so long as the European Central Bank (ECB) is easing monetary policy. A recovery in growth and a shift to a hawkish ECB are needed to drive the EUR higher.

- **CHF: Caught in the middle.** The CHF is very expensive vs the EUR and JPY, but fairly valued vs the USD. The Swiss National Bank (SNB) wants to weaken the CHF vs the EUR, but will not be able to do so meaningfully until the ECB begins to tighten monetary policy.

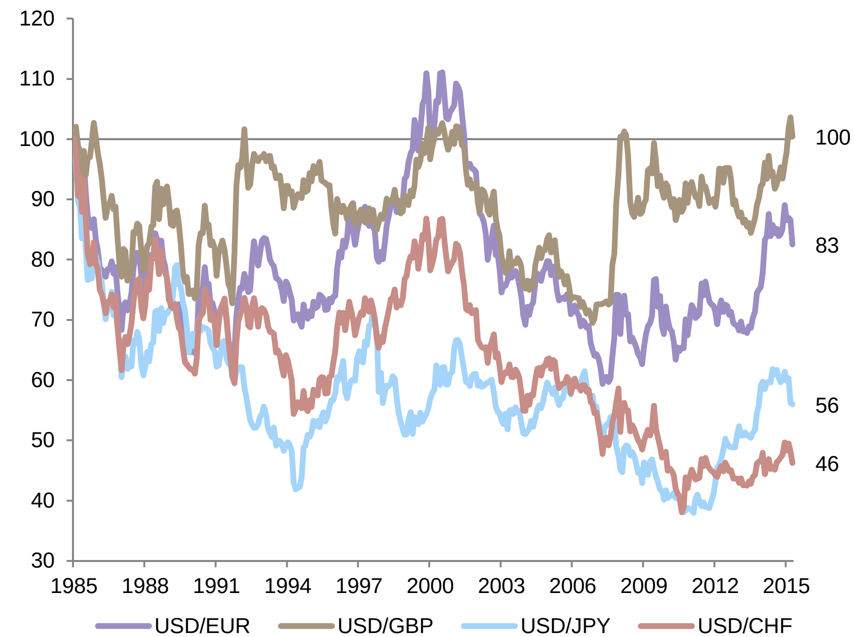
- **JPY: Can the BOJ achieve inflation?** The JPY is cheap against every major currency and has rallied strongly so far in 2016. The Bank of Japan (BOJ) may have done all it can to weaken the currency in the absence of rising inflation, a return of investor risk appetite, and/or rising rates in the United States.

USD: The pause before the final surge?

- After rising strongly over 2014–15, the USD rally seems to have stalled, with the USD weakening vs most currencies so far in 2016.
- The abrupt change in expectations for Federal Reserve tightening early this year is partly to blame. Yet a pause at this point of the market/economic cycle is typical and may be prelude to renewed USD strength.
- The USD should strengthen if the US economy gains steam in the second half of the year and market attention turns to resumed rate hikes. However, uncertainties over the US presidential election may weigh on the USD in the near term, and much depends on whether ECB and BOJ policy remains easy.
- Consensus forecasts expect the USD to appreciate versus every currency except the GBP by year-end 2016.
- Investors should still consider strategic currency hedging, although this is less pressing given the currency is entering the final phase of the strong-dollar cycle.

USD Nominal Exchange Rates

December 31, 1985 – March 31, 2016 • Rebased to 100 at December 31, 1985



Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

USD Bloomberg Consensus Forecasts

As of March 31, 2016

	USD/EUR	USD/GBP	USD/JPY	USD/CHF
Current	0.88	0.69	112	0.96
Year-End 2016 Median Forecast	0.93	0.68	119	1.03
Percent Change	5.7%	-1.4%	6.3%	7.3%

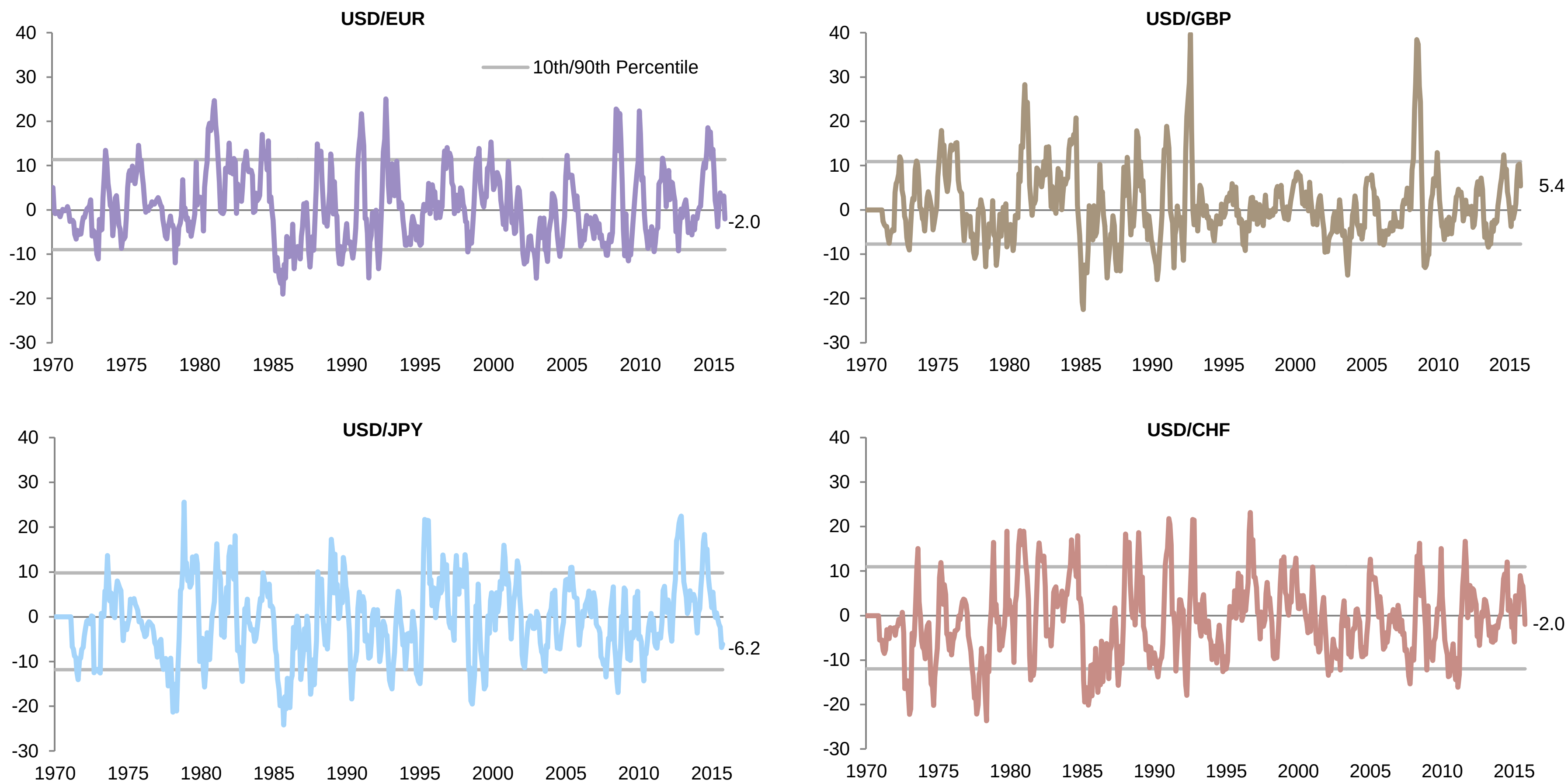
Source: Bloomberg L.P.

USD momentum does not appear stretched vs any currency, save the GBP

Sell off vs JPY is not extreme; USD has been relatively flat vs EUR and CHF over the past six months

USD Rolling Six-Month Percent Change

June 30, 1970 – March 31, 2016 • Percent (%)



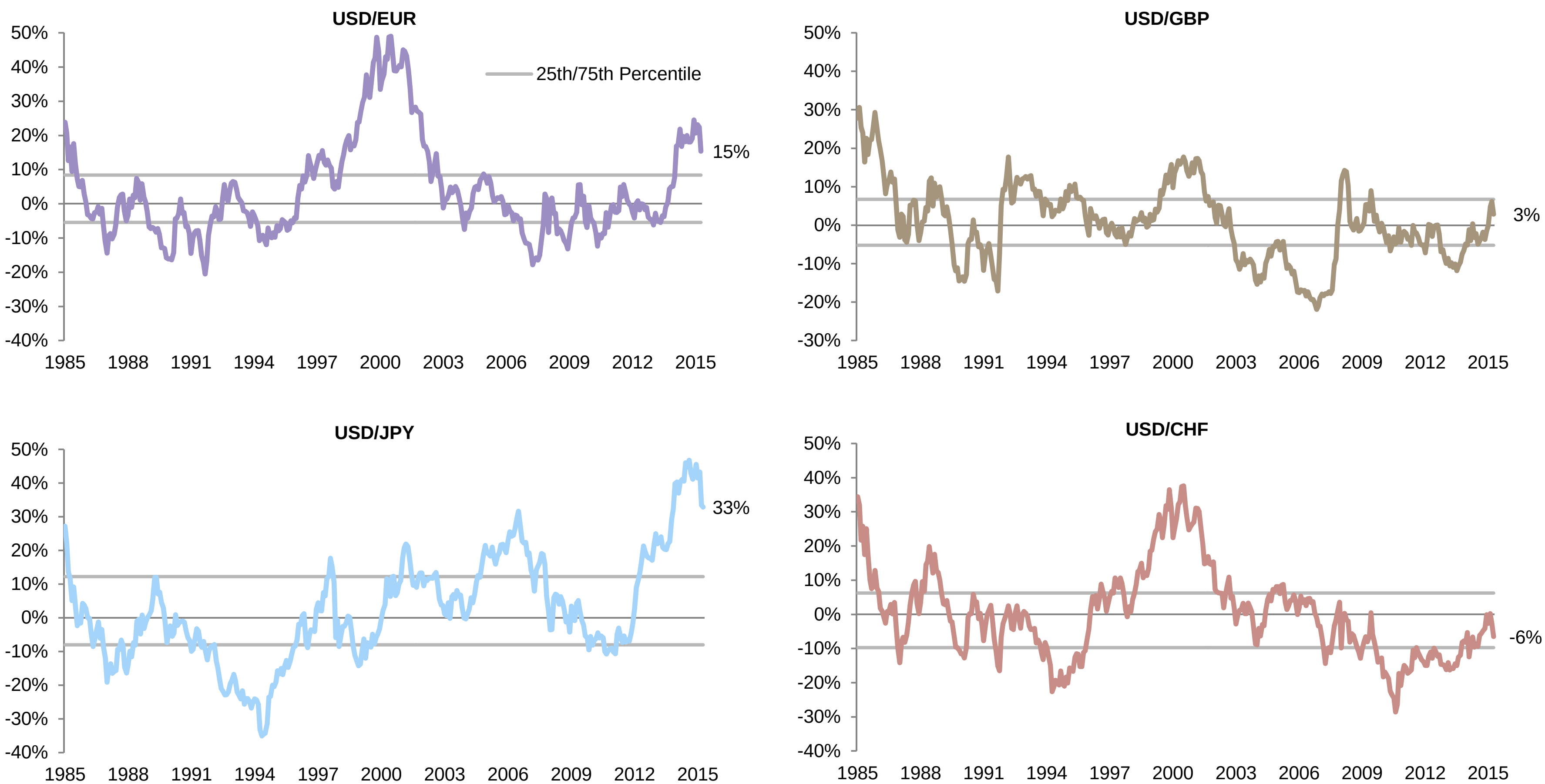
Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

USD is expensive against the JPY and EUR

Valuations well below previous peaks (ex JPY) imply potential for further upside before the strong-dollar cycle is over

USD Valuation: Percent Deviation of Real Exchange Rate From Historical Median

December 31, 1985 – March 31, 2016



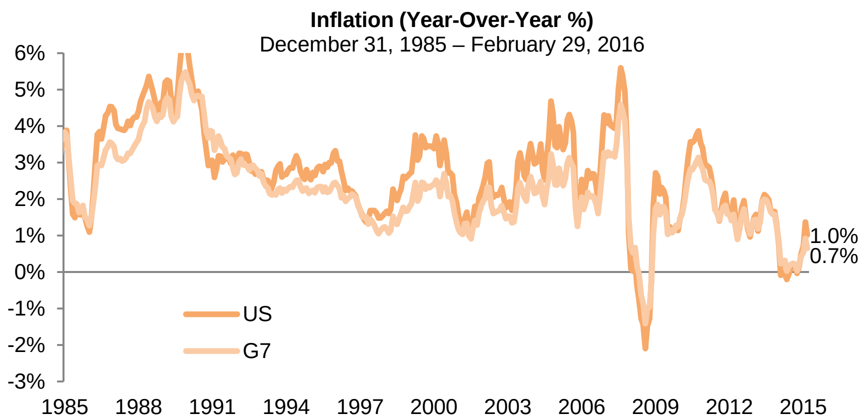
Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

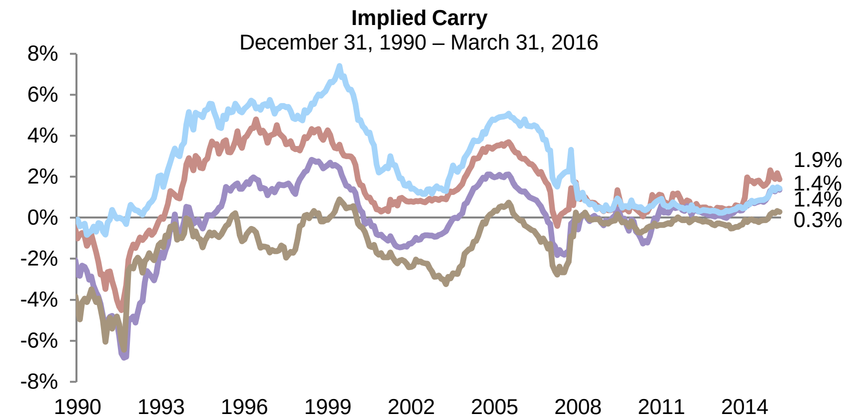
Note: Please see Notes on the Data for more information on our valuation metric.

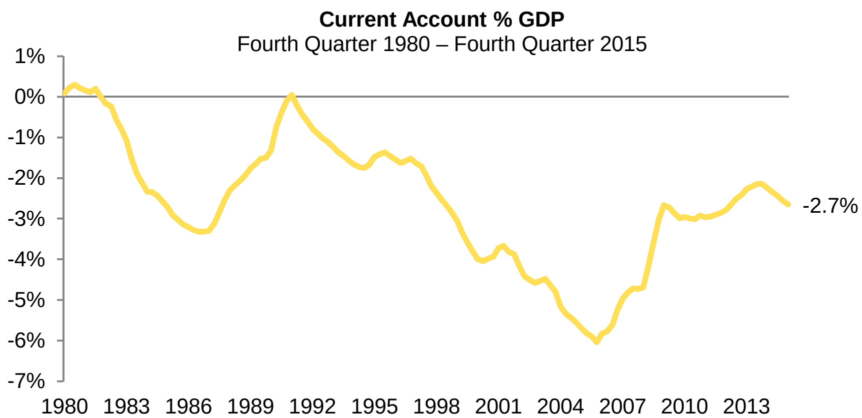
USD currency fundamentals solid as USD carry remains modestly positive

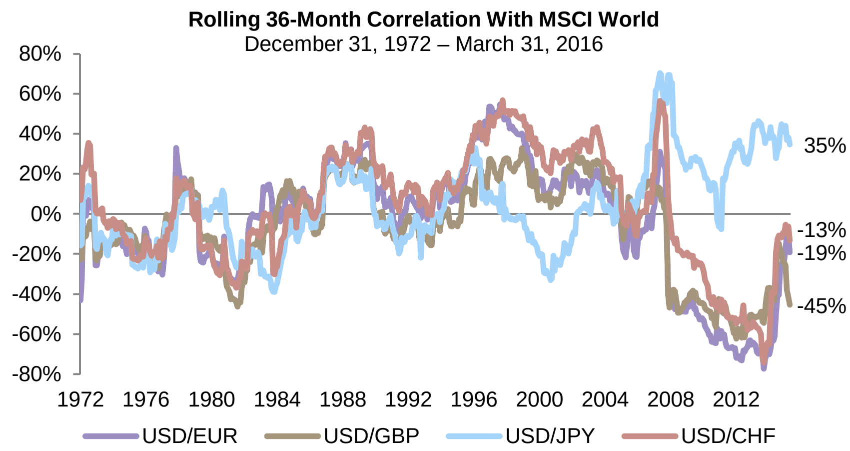
Rising positive carry and abating deflation pressures should help drive USD higher in the intermediate term; negative correlation to equity market implies volatility benefit to hedging most DM currencies, save the JPY

USD Fundamentals









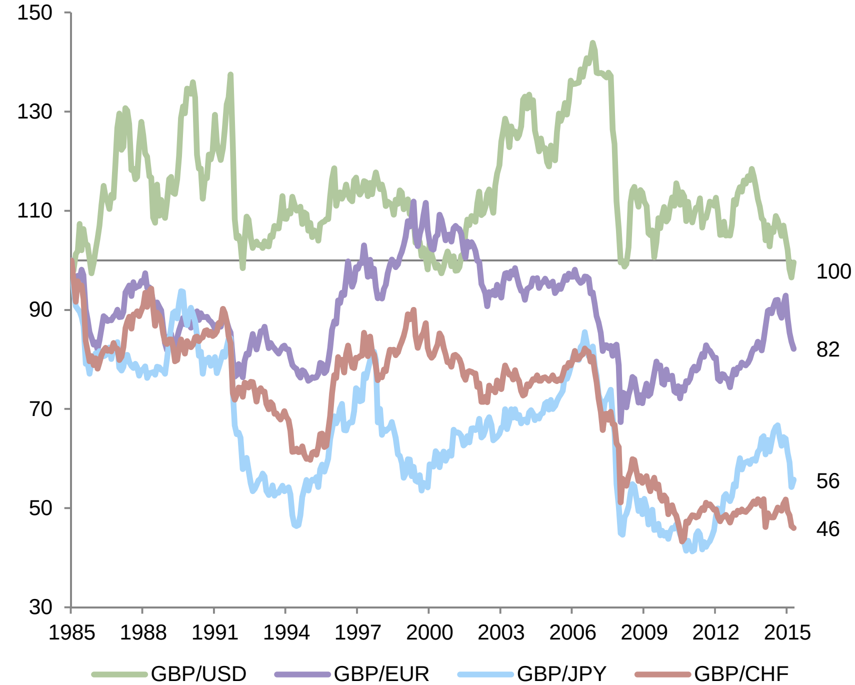
Sources: MSCI Inc., Oxford Economics, Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.
Note: Please see Notes on the Data for more on how each of these factors relates to the currency hedging decision.

GBP: To Brexit or not to Brexit, that is the question

- The GBP has weakened as concerns over "Brexit" weigh on the outlook for the currency ahead of the June referendum.
- A "leave" vote would have serious negative economic implications and may force the BOE to ease monetary policy, sending the currency down further.
- Consensus forecasts expect the GBP will rally against the major currencies by year-end, which implies Brexit will be avoided.
- While the recent sell-off seems overdone should the United Kingdom vote to remain in the EU, uncertainty over Brexit will continue to weigh on the currency, especially since the GBP remains expensive vs the JPY and EUR, and is not particularly cheap vs the USD.
- GBP-based investors should consider remaining unhedged against the major currencies.

GBP Nominal Exchange Rates

December 31, 1985 – March 31, 2016 • Rebased to 100 at December 31, 1985



Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

GBP Bloomberg Consensus Forecasts

As of March 31, 2016

	GBP/USD	GBP/EUR	GBP/JPY	GBP/CHF
Current	1.44	1.27	163	1.39
Year-End 2016 Median Forecast	1.47	1.35	175	1.51
Percent Change	2.1%	6.3%	7.6%	8.6%

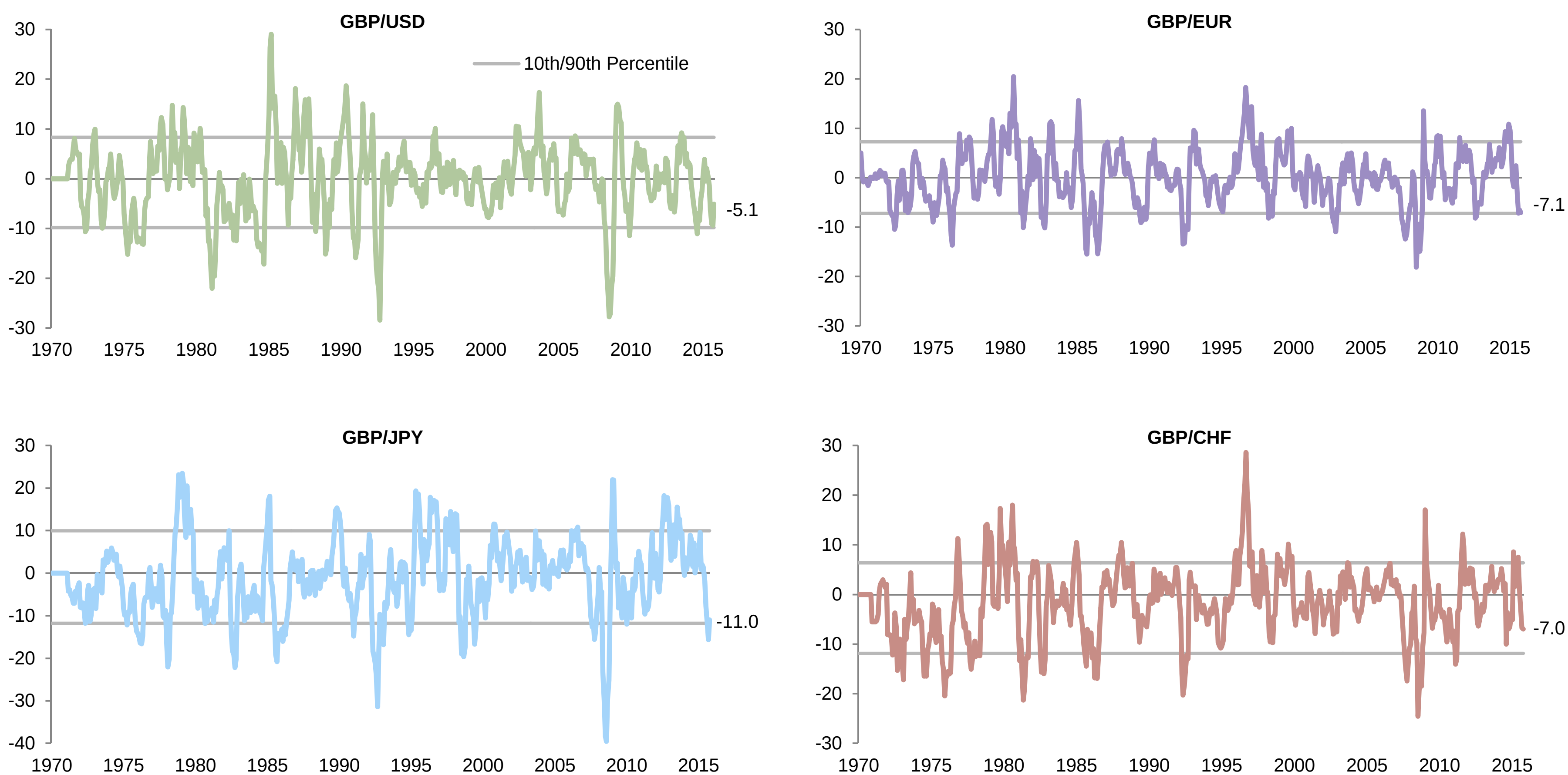
Source: Bloomberg L.P.

GBP sell-off appears stretched, implying potential for a reversal

The sell-off is not yet as extreme as 2008 or 1994, implying possible further downside from Brexit

GBP Rolling Six-Month Percent Change

June 30, 1970 – March 31, 2016 • Percent (%)



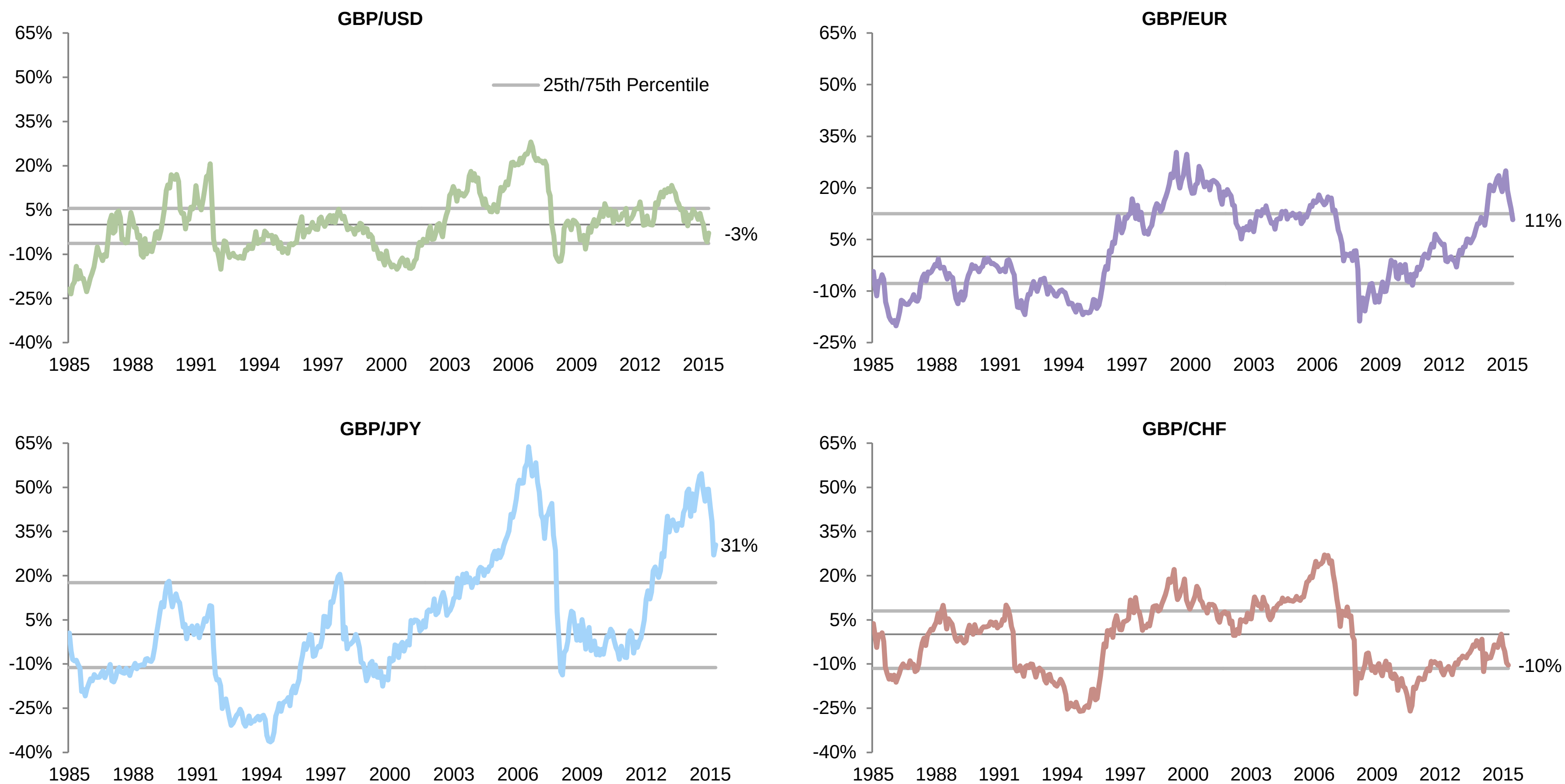
Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

GBP remains expensive vs EUR and JPY and not particularly cheap vs USD

This also implies further downside for the GBP is possible amid Brexit, even against CHF

GBP Valuation: Percent Deviation of Real Exchange Rate From Historical Median

December 31, 1985 – March 31, 2016



Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

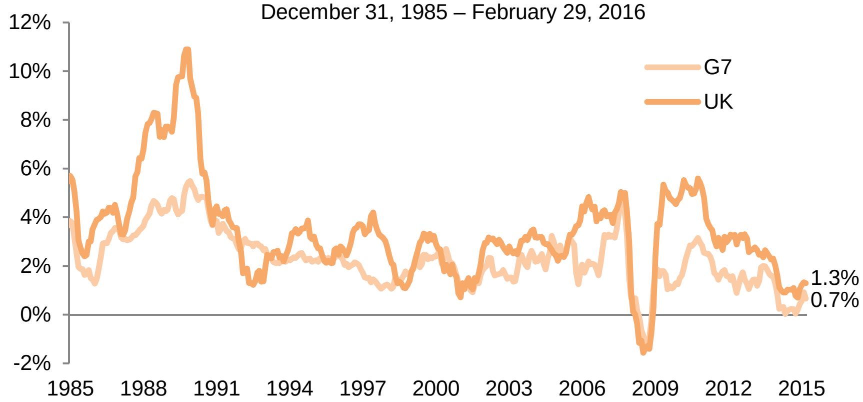
Note: Please see Notes on the Data for more information on our valuation metric.

GBP is vulnerable given large current account deficit and lack of carry

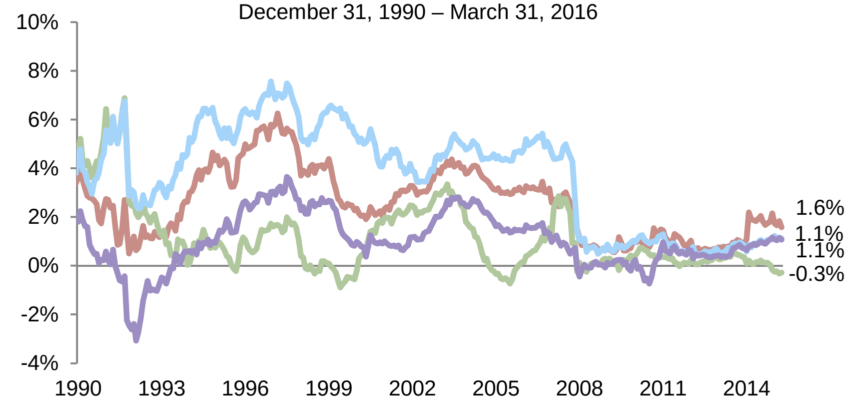
The GBP has become a very pro-cyclical currency with high positive correlation to global equities; this and lingering overvaluation imply GBP-based investors should remain unhedged

GBP Fundamentals

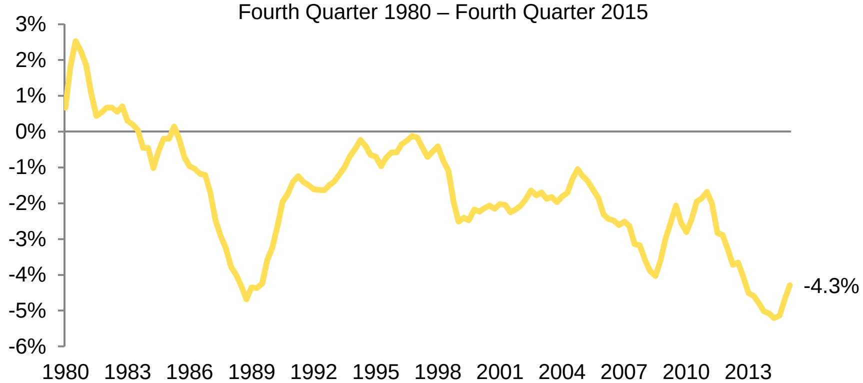
Inflation (Year-Over-Year %)
December 31, 1985 – February 29, 2016



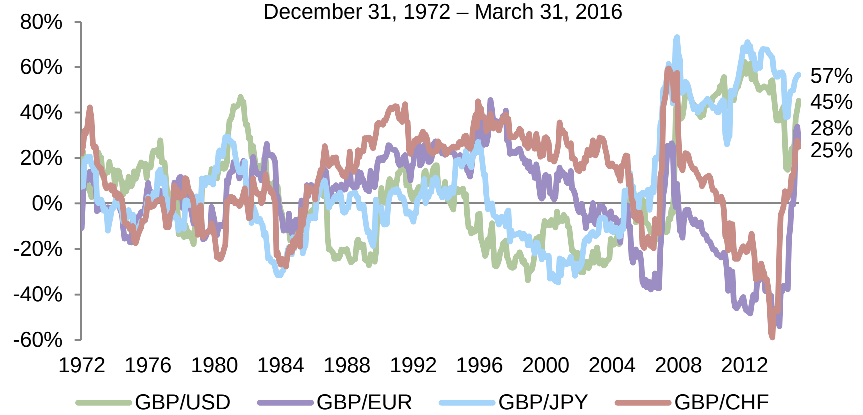
Implied Carry
December 31, 1990 – March 31, 2016



Current Account % GDP
Fourth Quarter 1980 – Fourth Quarter 2015



Rolling 36-Month Correlation With MSCI World
December 31, 1972 – March 31, 2016



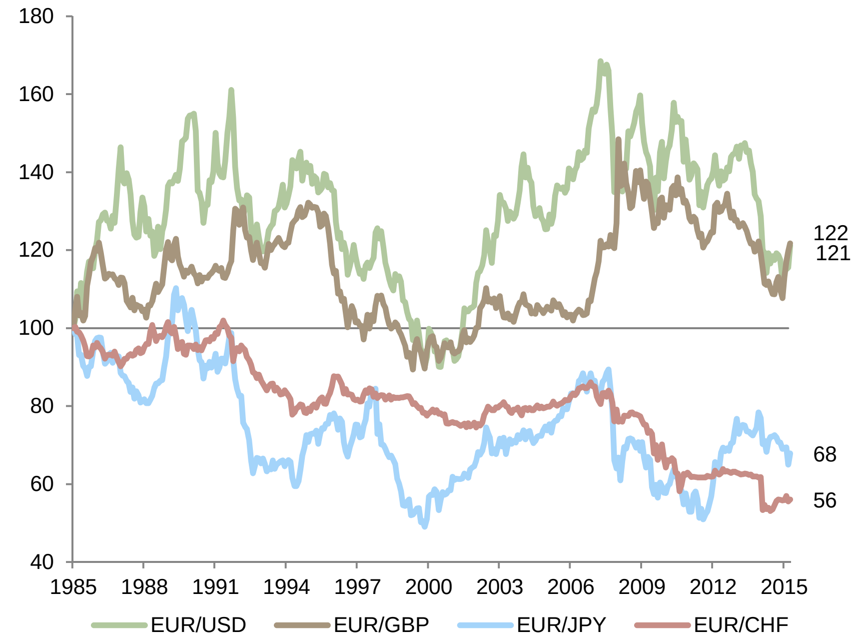
Sources: MSCI Inc., Oxford Economics, Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.
Note: Please see Notes on the Data for more on how each of these factors relates to the currency hedging decision.

EUR: Will Draghi do whatever it takes?

- The EUR has become choppy recently, rallying against the USD and GBP, but weakening against the JPY and flat vs the CHF.
- The near-term outlook is uncertain given the potential fall out from the United Kingdom's upcoming June referendum on EU membership. Consensus forecasts expect the EUR to weaken vs the USD and GBP, and remain relatively flat vs the JPY and CHF by the end of 2016.
- The EUR appears undervalued against every currency save the JPY, implying EUR-based investors should hedge exposure to USD, GBP, and CHF.
- However, it is hard to expect broad EUR strength so long as the ECB is easing monetary policy. A recovery in growth and a shift to a hawkish ECB are needed to drive the EUR higher over a multi-year horizon.

EUR Nominal Exchange Rates

December 31, 1985 – March 31, 2016 • Rebased to 100 at December 31, 1985



Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

EUR Bloomberg Consensus Forecasts

As of March 31, 2016

	EUR/USD	EUR/GBP	EUR/JPY	EUR/CHF
Current	1.14	0.79	128	1.09
Year-End 2016 Median Forecast	1.08	0.74	129	1.10
Percent Change	-5.3%	-6.3%	0.8%	0.9%

Source: Bloomberg L.P.

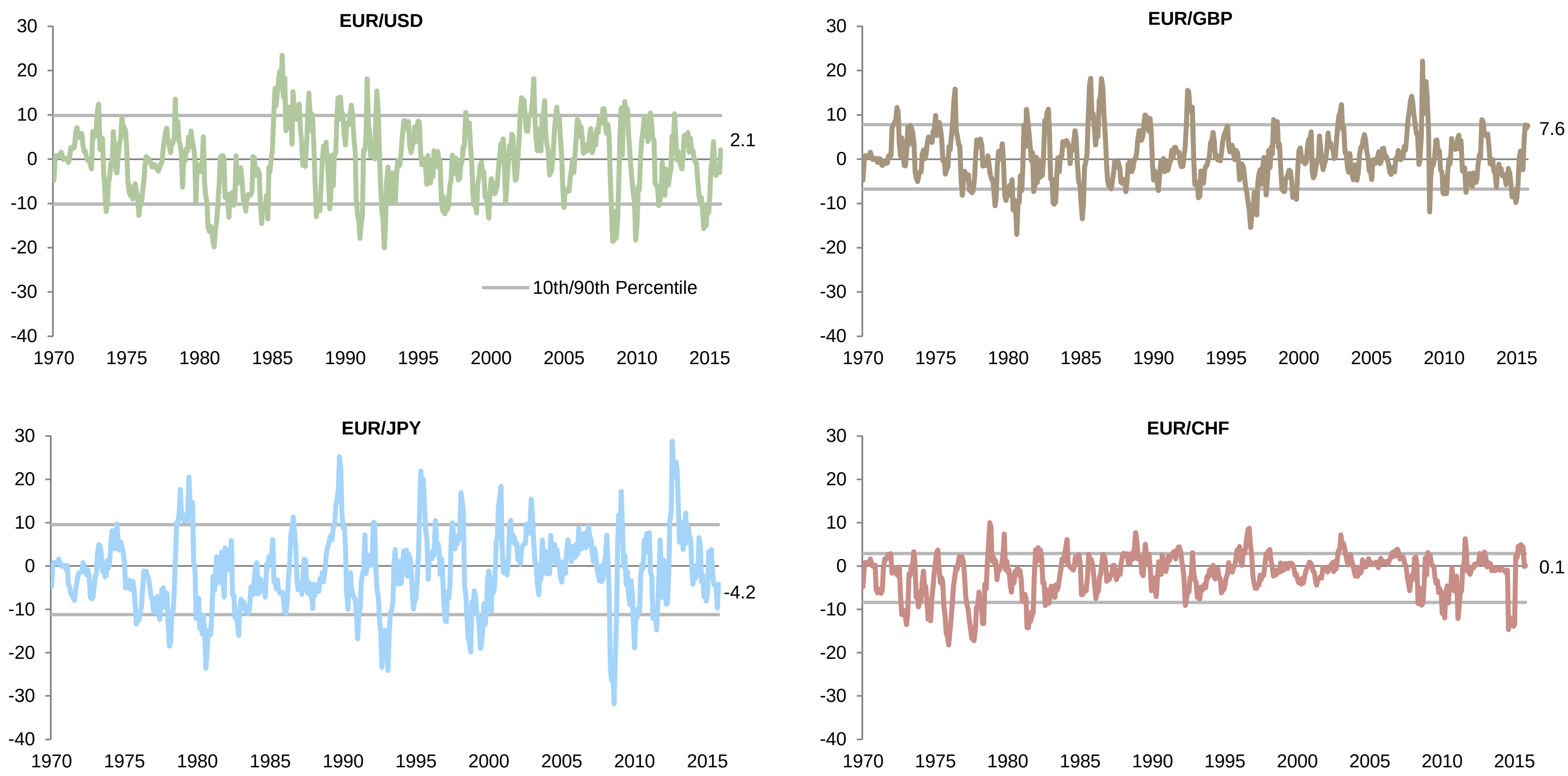
C|A

The sell-off in EUR/JPY and rally in EUR/GBP looks stretched

The moves vs GBP and JPY, while not yet extreme, may see a near-term reversal should Brexit fears recede

EUR Rolling Six-Month Percent Change

June 30, 1970 – March 31, 2016 • Percent (%)



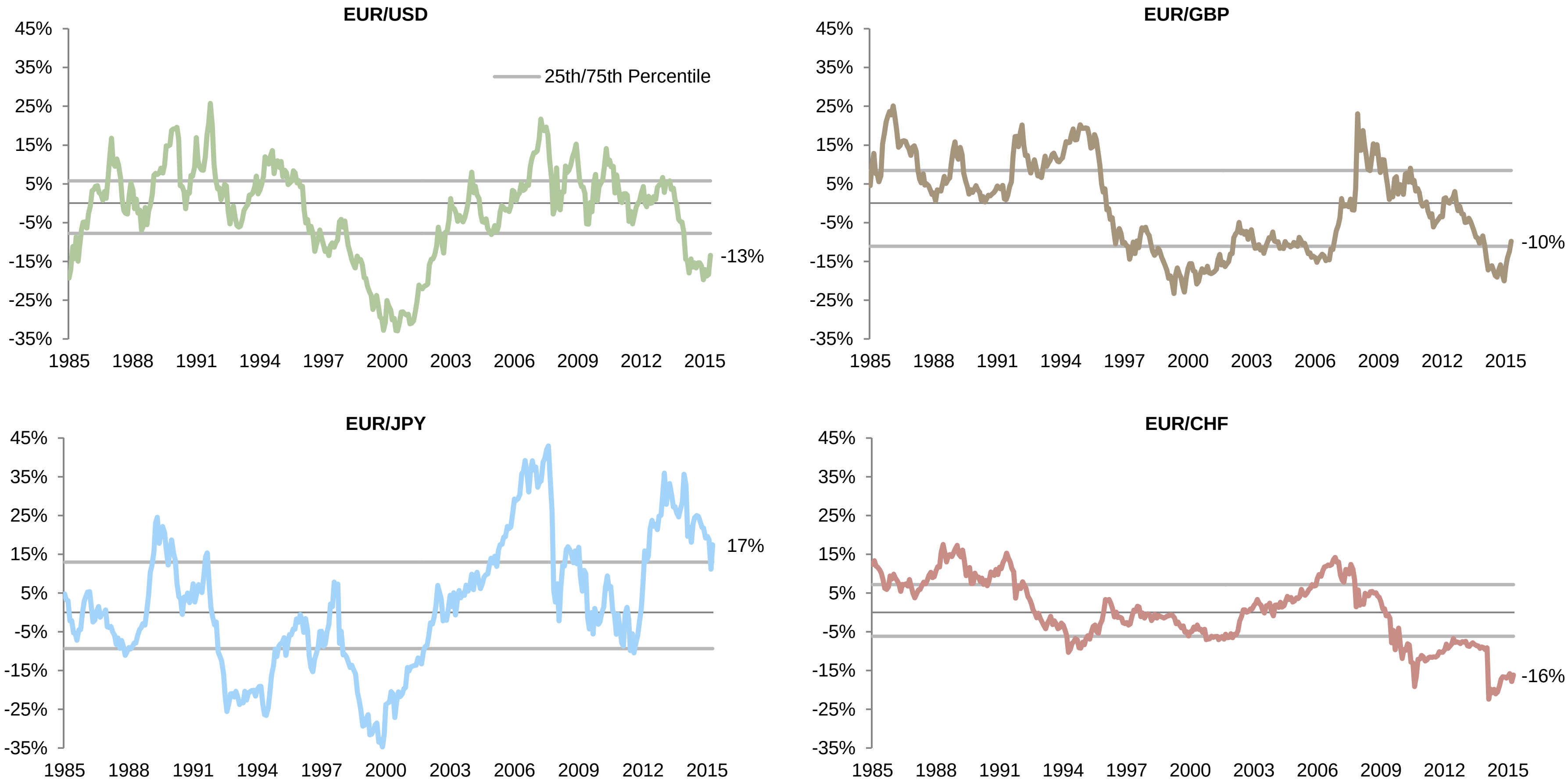
Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

EUR appears undervalued except against JPY

Still, valuations could remain divergent for some time, given ongoing ECB monetary easing

EUR Valuation: Percent Deviation of Real Exchange Rate From Historical Median

December 31, 1985 – March 31, 2016



Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

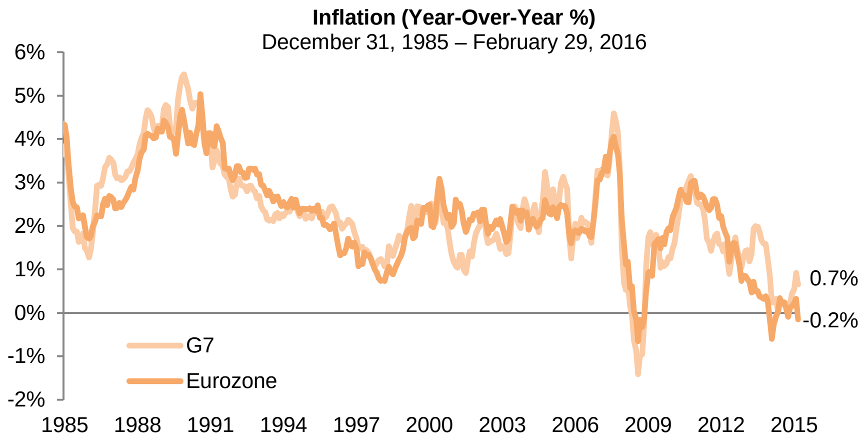
Note: Please see Notes on the Data for more information on our valuation metric.

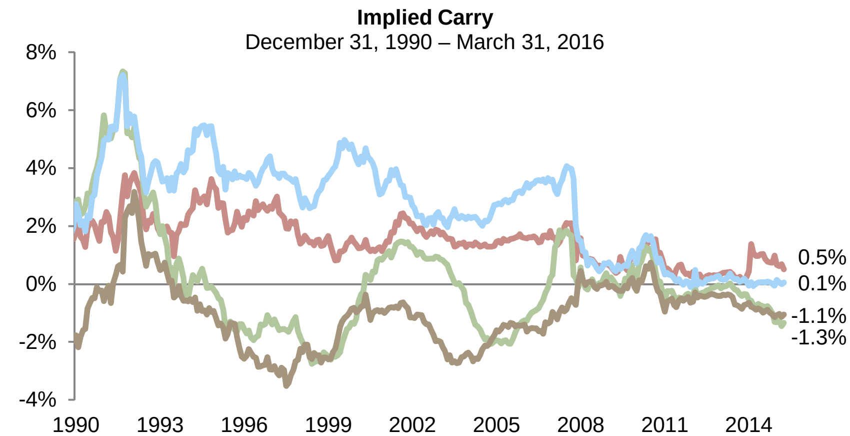
C|A

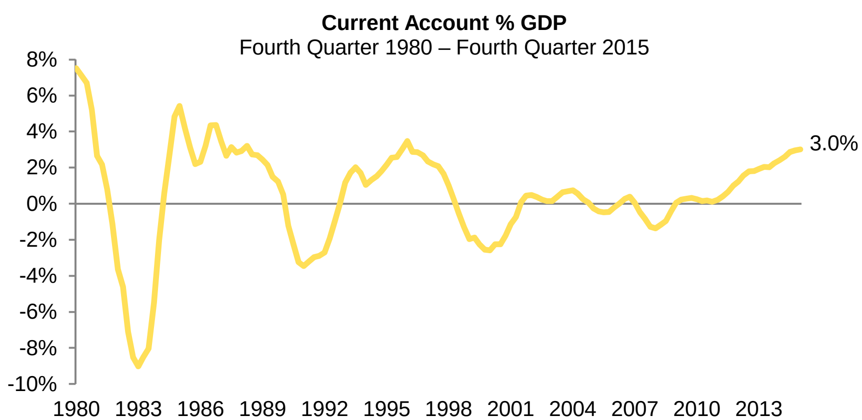
Rising current account surplus should help support EUR over the long run

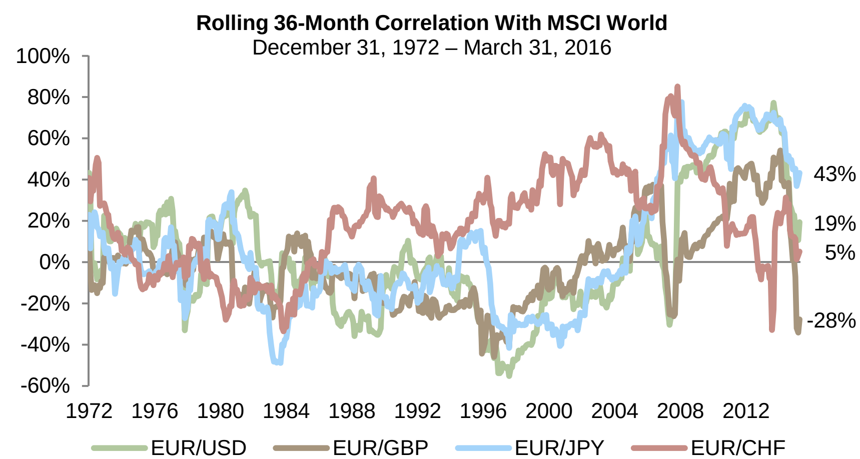
Correlations to equities have become unstable; EUR/JPY positive correlation and overvaluation imply EUR-based investors should remain unhedged vs JPY

EUR Fundamentals







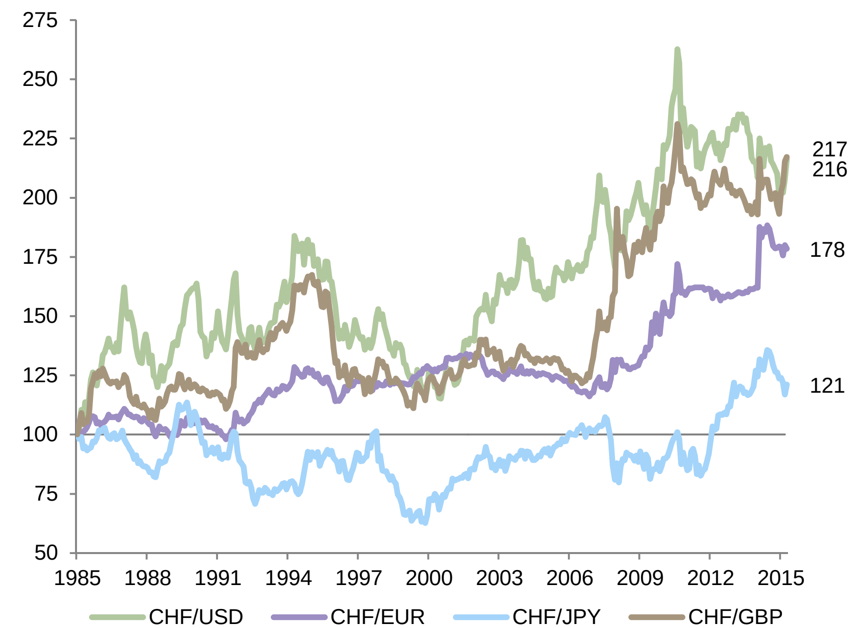


Sources: MSCI Inc., Oxford Economics, Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.
Note: Please see Notes on the Data for more on how each of these factors relates to the currency hedging decision.

- The CHF has been mixed recently, rising vs the USD and GBP, more or less flat vs the EUR, but weakening vs the JPY.
- From a valuation perspective, the CHF is very expensive vs the JPY and EUR, but only modestly expensive vs the GBP and USD.
- Consensus forecasts expect the CHF to weaken meaningfully vs the GBP and USD, but only modestly vs the EUR and JPY.
- From a long-term perspective, CHF-based investors should be partially unhedged vs the major developed currencies.
- However, the CHF will remain caught in the middle between USD strength and EUR weakness, until the ECB begins tightening monetary policy and thereby creating a larger interest rate differential vs the SNB.

CHF Nominal Exchange Rates

December 31, 1985 – March 31, 2016 • Rebased to 100 at December 31, 1985



Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

CHF Bloomberg Consensus Forecasts

As of March 31, 2016

	CHF/USD	CHF/EUR	CHF/JPY	CHF/GBP
Current	1.04	0.92	117	0.72
Year-End 2016 Median Forecast	0.98	0.91	116	0.66
Percent Change	-5.8%	-1.1%	-0.8%	-8.3%

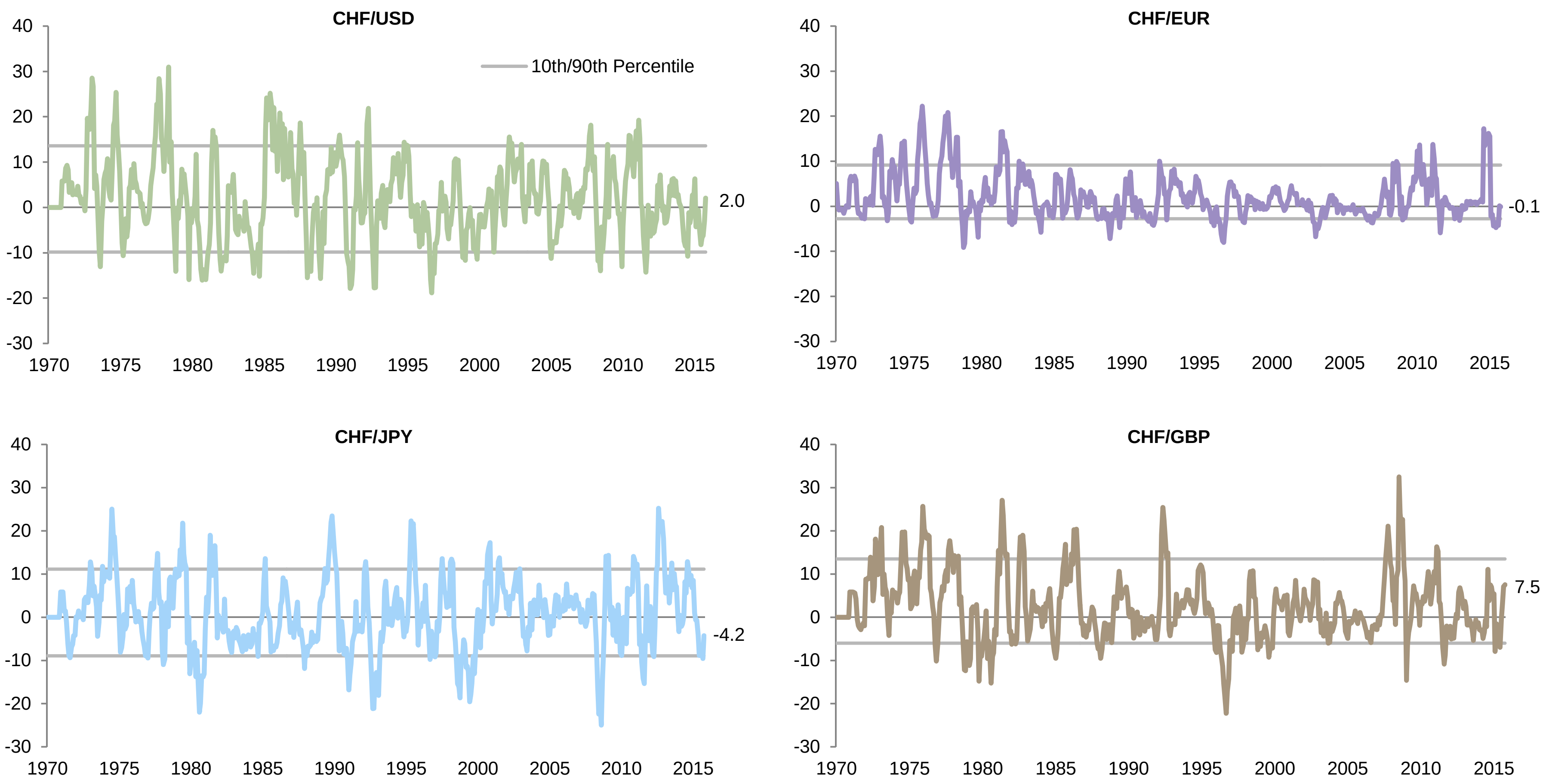
Source: Bloomberg L.P.

CHF momentum does not appear stretched vs any currency, save the JPY

Rally vs GBP is not extreme; CHF has been relatively flat vs USD and EUR over the past six months

CHF Rolling Six-Month Percent Change

June 30, 1970 – March 31, 2016 • Percent (%)

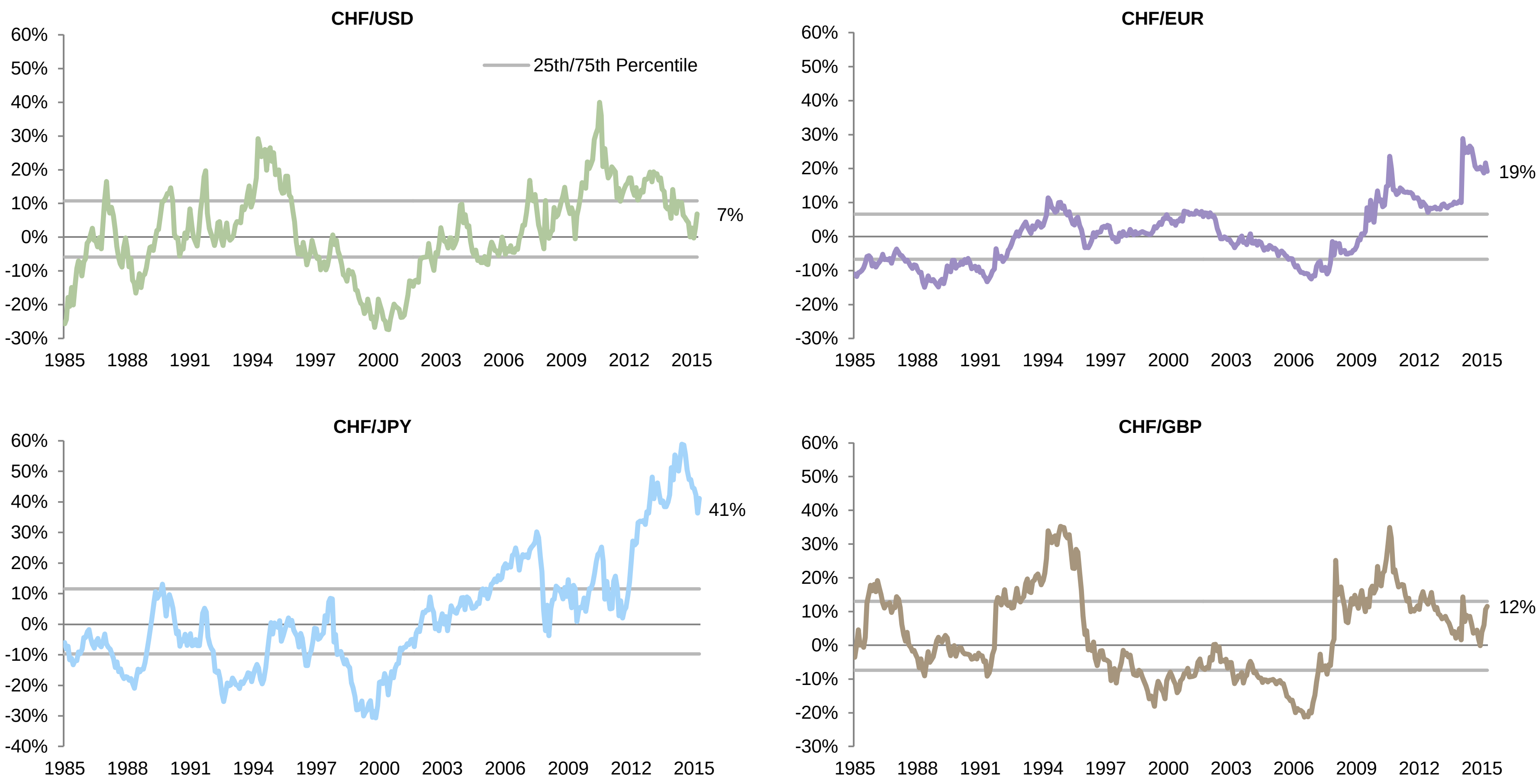


Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

CHF is very expensive vs JPY and EUR, less so vs USD and GBP

Rising rates in Europe and Japan are needed to close the CHF/EUR and CHF/JPY valuation gap

CHF Valuation: Percent Deviation of Real Exchange Rate From Historical Median
December 31, 1985 – March 31, 2016

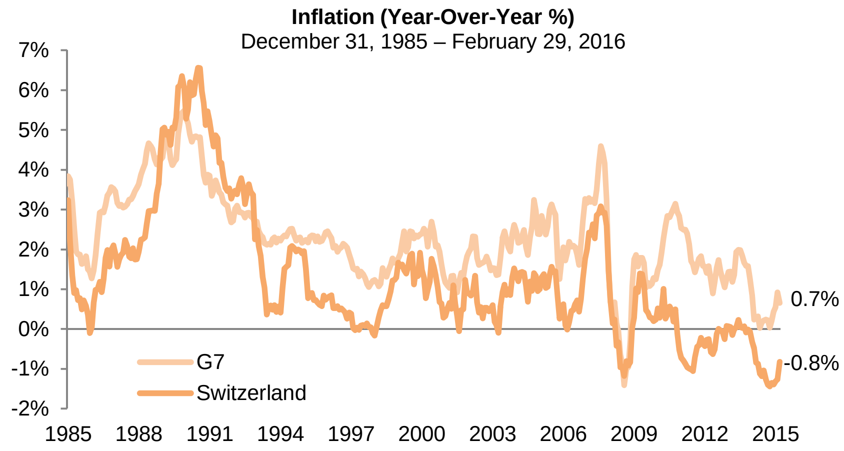


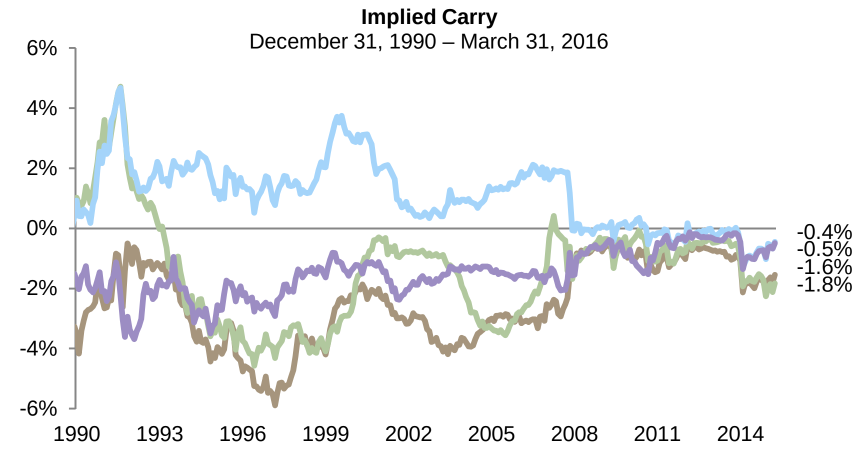
Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.
Note: Please see Notes on the Data for more information on our valuation metric.

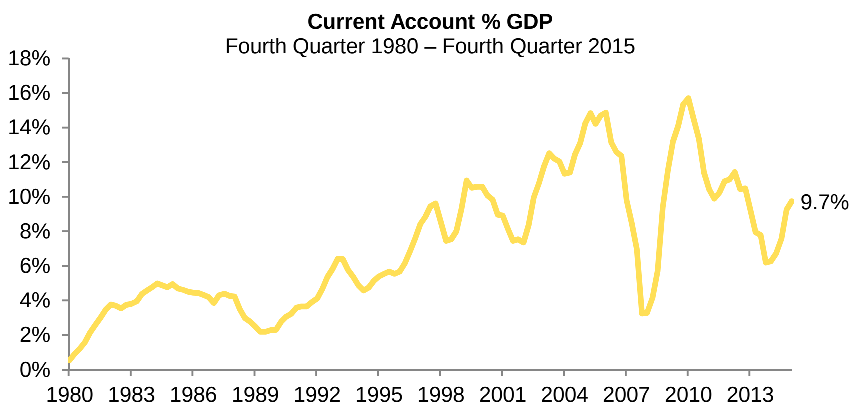
Deflation and current account surplus placing upward pressure on CHF

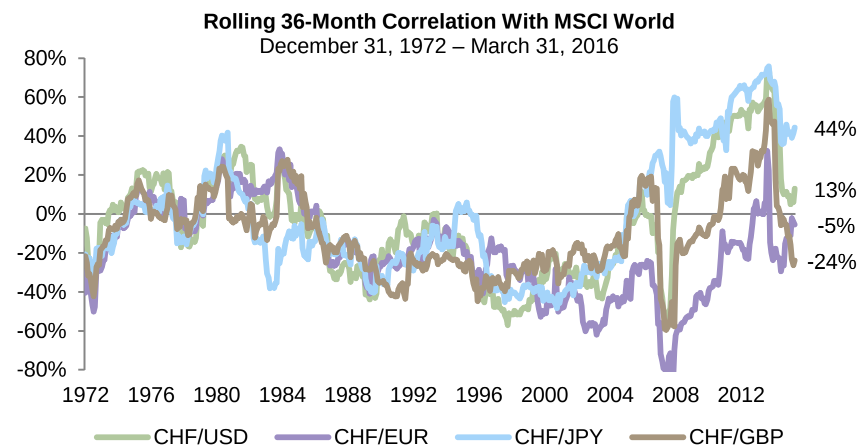
Despite reputation as a “safe haven,” the CHF has remained pro-cyclical vs the USD and JPY, and less countercyclical vs EUR given SNB focus on CHF/EUR rate. Negative carry is low compared to history

CHF Fundamentals









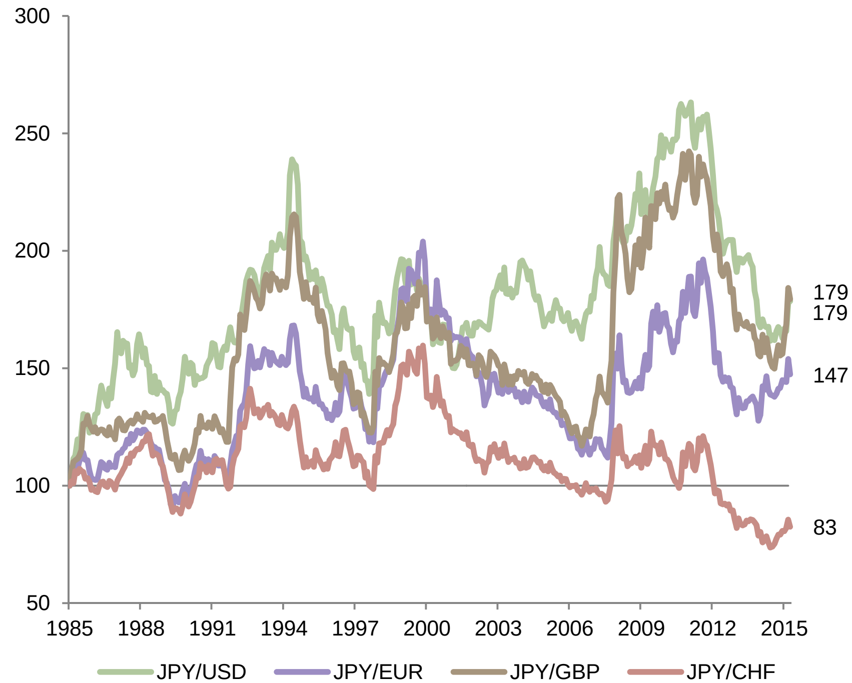
Sources: MSCI Inc., Oxford Economics, Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.
Note: Please see Notes on the Data for more on how each of these factors relates to the currency hedging decision.

JPY: Can the BOJ achieve inflation?

- The JPY was flat in 2015 and has rallied against every major currency recently, despite the BOJ expanding its QE program and moving into negative rates.
- The rally in the JPY likely reflects the risk-off nature of global markets early this year, and concern that the BOJ and Abenomics will not be able to achieve inflation in Japan.
- It may also reflect that the JPY remains very undervalued against every major currency.
- Consensus forecasts expect the JPY to weaken vs the USD and GBP but remain relatively flat vs the EUR and CHF.
- Although a return to recent lows may occur in the intermediate term, much depends on a return of investor risk appetite and/or rising rates in the United States, given the currency's deep negative correlation to global equities.
- As a result, hedging JPY exposure seems less pressing at this juncture, especially from a long-term standpoint.

JPY Nominal Exchange Rates

December 31, 1985 – March 31, 2016 • Rebased to 100 at December 31, 1985



Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

JPY Bloomberg Consensus Forecasts

As of March 31, 2016

	USD/JPY	EUR/JPY	GBP/JPY	CHF/JPY
Current	112	128	163	117
Year-End 2016 Median Forecast	119	129	175	116
Percent Change	-5.9%	-0.8%	-7.1%	0.8%

Source: Bloomberg L.P.

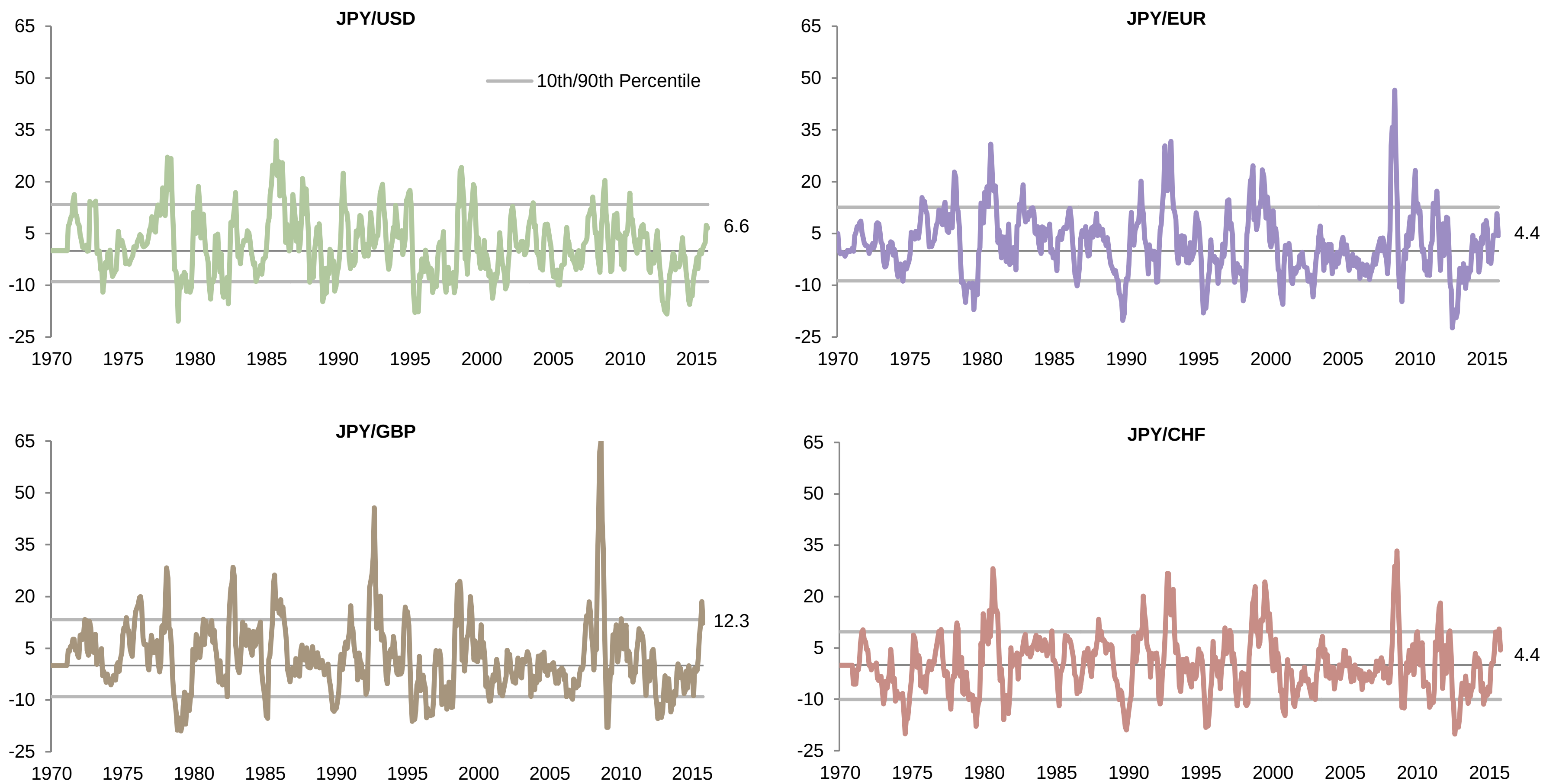
Note: Currency pairings against the Japanese yen are shown from the perspective of the foreign currency.

JPY rally appears stretched against all currencies save the USD

The recent rally may have more to run vs USD and perhaps EUR, but seems overdone vs other currencies

JPY Rolling Six-Month Percent Change

June 30, 1970 – March 31, 2016 • Percent (%)



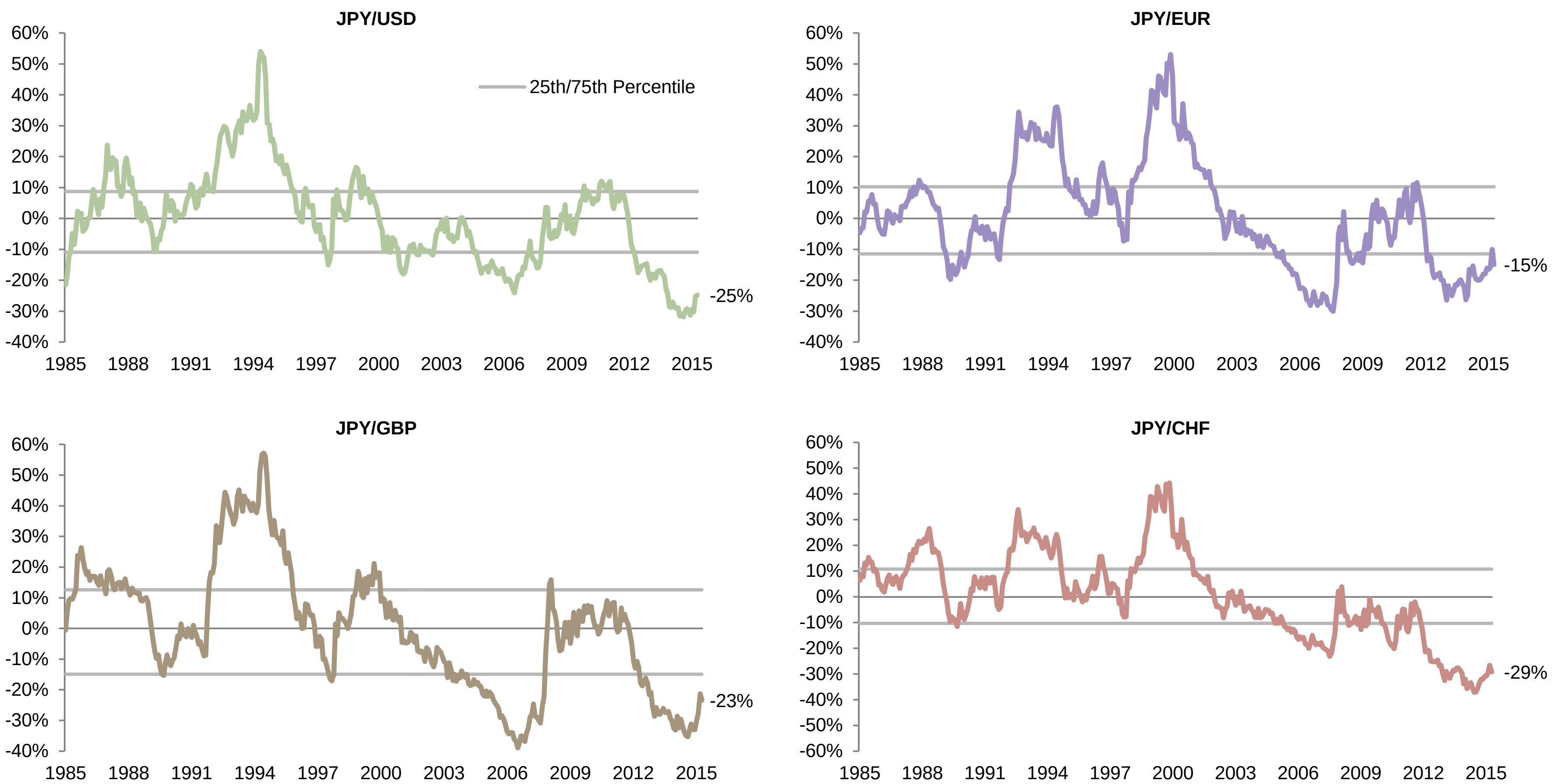
Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

JPY still cheap against major currencies despite its rally

Partly due to years of deflation, a return to inflation could see real FX valuations improve while nominal FX rates remain range bound

JPY Valuation: Percent Deviation of Real Exchange Rate From Historical Median

December 31, 1985 – March 31, 2016



Sources: MSCI Inc., Thomson Reuters Datastream, and WM/Reuters. MSCI data provided "as is" without any express or implied warranties.

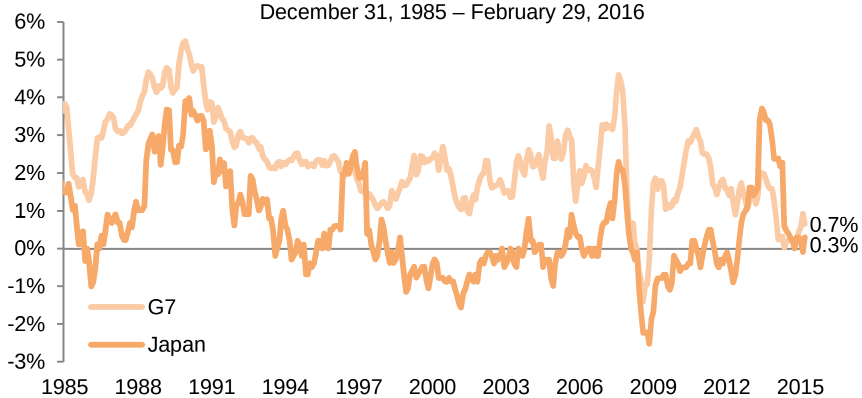
Note: Please see Notes on the Data for more information on our valuation metric.

Rising current account surplus reaffirms JPY's "risk-off" nature

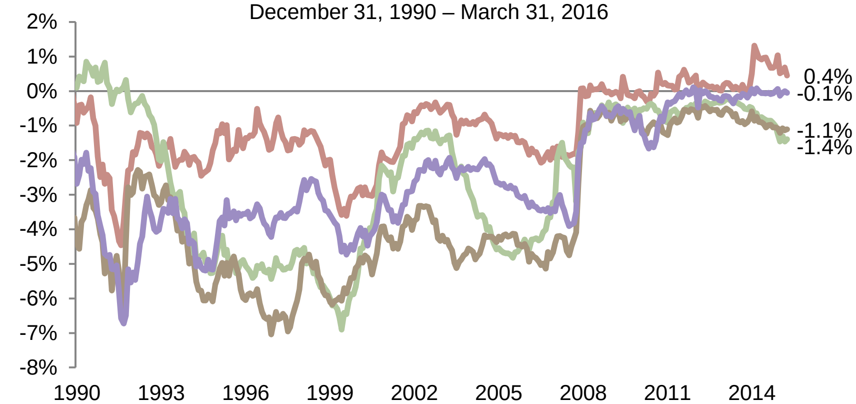
Negative correlations with equities imply volatility benefit from leaving JPY exposure unhedged for non-JPY based investors, though small interest rate differentials mean little drag from hedging JPY

JPY Fundamentals

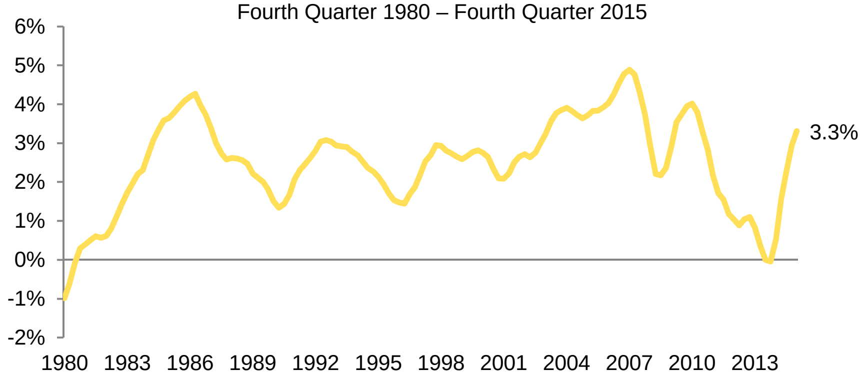
Inflation (Year-Over-Year %)
December 31, 1985 – February 29, 2016



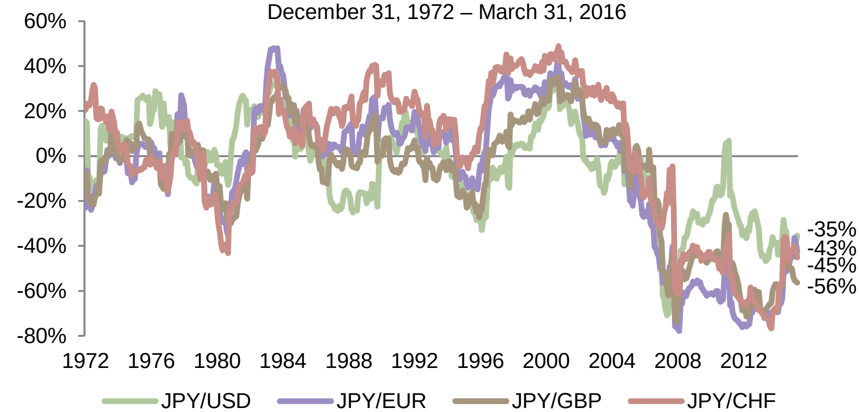
Implied Carry
December 31, 1990 – March 31, 2016



Current Account % GDP
Fourth Quarter 1980 – Fourth Quarter 2015



Rolling 36-Month Correlation With MSCI World
December 31, 1972 – March 31, 2016



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Note: Please see Notes on the Data for more on how each of these factors relates to the currency hedging decision.

Appendix

Consensus forecasts imply continued economic divergence

United States is forecasted to maintain growth and yield advantage

Economic Forecasts
As of April 4, 2016

	Real GDP (%)		Inflation (%)		Three-Month Interest Rate (%)		Ten-Year Bond Yield (%)	
	2015	2016 (f)	2015	2016 (f)	2015	2016 (f)	2015	2016 (f)
United States	2.0	2.4	0.5	1.7	0.61	1.02	2.27	2.27
United Kingdom	2.1	2.0	0.1	1.1	0.59	0.77	1.96	1.96
Europe	1.6	1.6	0.1	0.8	-0.13	-0.29	0.63	0.54
Switzerland	0.3	1.6	-1.4	-0.1	-0.76	-0.77	-0.09	-0.11
Japan*	0.8	1.2	0.3	0.4	0.08	-0.12	0.26	0.01

Sources: Bloomberg L.P., Oxford Economics, and Thomson Reuters Datastream.
* Japan real GDP growth forecast is based on Oxford Economics data. Other forecasts are based on Bloomberg consensus data.

Trade weights make some currency pairs more relevant than others

UK & Switzerland's major trade exposure is EUR; US more exposed to EUR & CAD than JPY; China is a major trade partner to all

Bank for International Settlements Trade Weights in NEER Basket
As of March 31, 2016

United States	% Weight
China	21.7
Euro Area	16.6
Canada	12.9
Mexico	12.5
Japan	8.0
Korea	3.6
United Kingdom	3.1
Chinese Taipei	2.2
India	1.9
Brazil	1.6

United Kingdom	% Weight
Euro Area	43.7
China	12.7
United States	10.7
Japan	3.5
Switzerland	2.6
Poland	2.2
India	2.0
Sweden	1.8
Turkey	1.8
Czech Republic	1.7

Euro Area	% Weight
China	17.9
United States	13.2
United Kingdom	9.9
Switzerland	5.8
Japan	5.2
Poland	5.0
Czech Republic	4.1
Sweden	3.5
Russia	3.4
Turkey	3.0

Japan	% Weight
China	31.0
United States	15.2
Euro Area	13.0
Korea	6.6
Chinese Taipei	4.2
Thailand	3.9
Singapore	2.6
Indonesia	2.4
Malaysia	2.3
United Kingdom	2.0

Switzerland	% Weight
Euro Area	48.4
United States	9.9
China	9.5
United Kingdom	5.1
Japan	3.8
Czech Republic	1.6
Poland	1.5
Hong Kong SAR	1.4
Korea	1.4
India	1.4

Canada	% Weight
United States	57.6
China	12.8
Euro Area	8.5
Mexico	4.7
Japan	3.6
United Kingdom	1.8
Korea	1.7
Chinese Taipei	1.2
Switzerland	0.9
India	0.8

Source: Bank for International Settlements.
Note: Weights based on trade over the 2011–13 period.

Exchange rates

- Historical exchange rates provided by Thomson Reuters Datastream, based on WM/Reuters closing spot rates. Data for the EUR before 1998 is based on a weighted basket of EMU legacy currencies calculated by Thomson Reuters.

Consensus forecasts

- FX and economic data forecasts provided by Bloomberg and are based on the median forecast as of March 31.

Momentum: Six-month rate of change

- The six-month rate of change is a simple momentum measure that provides context on whether recent moves in a currency pair are extreme relative to history. Implicit in this analysis is that short-term movements are mean-reverting, and therefore extreme moves are prone to reversals.

Valuation: Real exchange rate percent deviation from historical median

- Our primary valuation metric for currencies is real exchange rates. For each currency pair, we create a real exchange rate history based on nominal exchange rates divided by relative CPI inflation. This is analogous to the purchasing price parity (PPP) approach, which assumes relative inflation is the driver of currencies over the long run. However, our approach avoids reliance on a particular base year for the relative inflation calculation (which can have a meaningful impact on implied PPP) by comparing the real exchange rate to its own historical median, i.e., the level to which the real exchange rate has gravitated over time. We focus on the post-1985 period given the meaningful shifts in certain currencies following the Plaza Accords, notably the JPY, CHF, and EUR (in light of the large revaluation of the Deutsche mark).

Notes on the Data (continued)

- Fundamentals
  - Inflation: Over the long run, currencies with lower inflation should appreciate, per PPP theory. Rising relative inflation often signals a currency is becoming overvalued, unless offset by nominal FX depreciation.
  - Implied carry: The implied interest rate differential priced into one-year FX forwards. Negative carry implies a drag from hedging the currency pair back to the base currency. Economic theory states currencies with high interest rate differentials should depreciate over the long run; this is often not the case in the short run.
  - Current account: Countries with current account surpluses are less reliant on foreign inflows and are typically net creditors. Historically, currencies with persistent current account surpluses have appreciated over time.
  - Correlation to MSCI World: The rolling 36-month correlation of the percent change in the currency pair and the MSCI World Index of developed markets equities in local currency terms. A negative correlation implies a "counter-cyclical" currency pair that moves inversely to equity markets, thereby increasing the volatility of unhedged exposure (equities down, base currency up/foreign currency down, unhedged return lower). A positive correlation implies a "pro-cyclical" currency pair that moves in line with equities, thereby reducing the volatility of unhedged exposure (equities down, base currency down/foreign currency up, unhedged return higher). In theory, investors should consider hedging countercyclical currency pairs to reduce volatility. However, currency correlations are unstable, and hedging decisions should be made in conjunction with views on carry, desired overall foreign currency exposure, and underlying asset class exposure.