

# What Determines Safe Haven Currency?

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# MOTIVATION AND QUESTIONS

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Safe haven status of currency matters.

- Avoid excessive appreciation/depreciation of currency –GFC, Swiss Shock etc.
- Safe haven status would damp the business sentiment and export-driven recovery
- The yen's safe haven status could help balance capital flows within Asia, contributing to the post-crisis economic recovery in the rest of Asia
- Masujima(2017) finds safe haven/vulnerable currency status is changing overtime

If the degree of the safe have status is changing overtime, what are determinants of safe haven status?

→ Monitoring the determinants to help FX management

# LITERATURE REVIEW

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**Safe-haven currencies tend to be associated with three conditions: low interest rates, net foreign asset positions, and highly liquid financial markets.**

Habib and Stracca (2012) – Determinants

Safe haven status is robustly associated with stronger net foreign asset positions (an indicator of external vulnerability), and to a lesser extent with the absolute size of stock market (an indicator of market size and financial development). with safe haven status.

Ozturk and Sheng (2017) – Uncertainty measurement

Persistent effects on economic activity from common uncertainty and short-lived effects from idiosyncratic uncertainty.

Ismailov and Rossi (2017) – Uncertainty and UIP conditions

UIP is more likely to hold in low uncertainty environments, relative to high uncertainty ones, based on the assessment of a new exchange rate uncertainty index. Decomposing the uncertainty of a typical forecaster into common and idiosyncratic uncertainty.

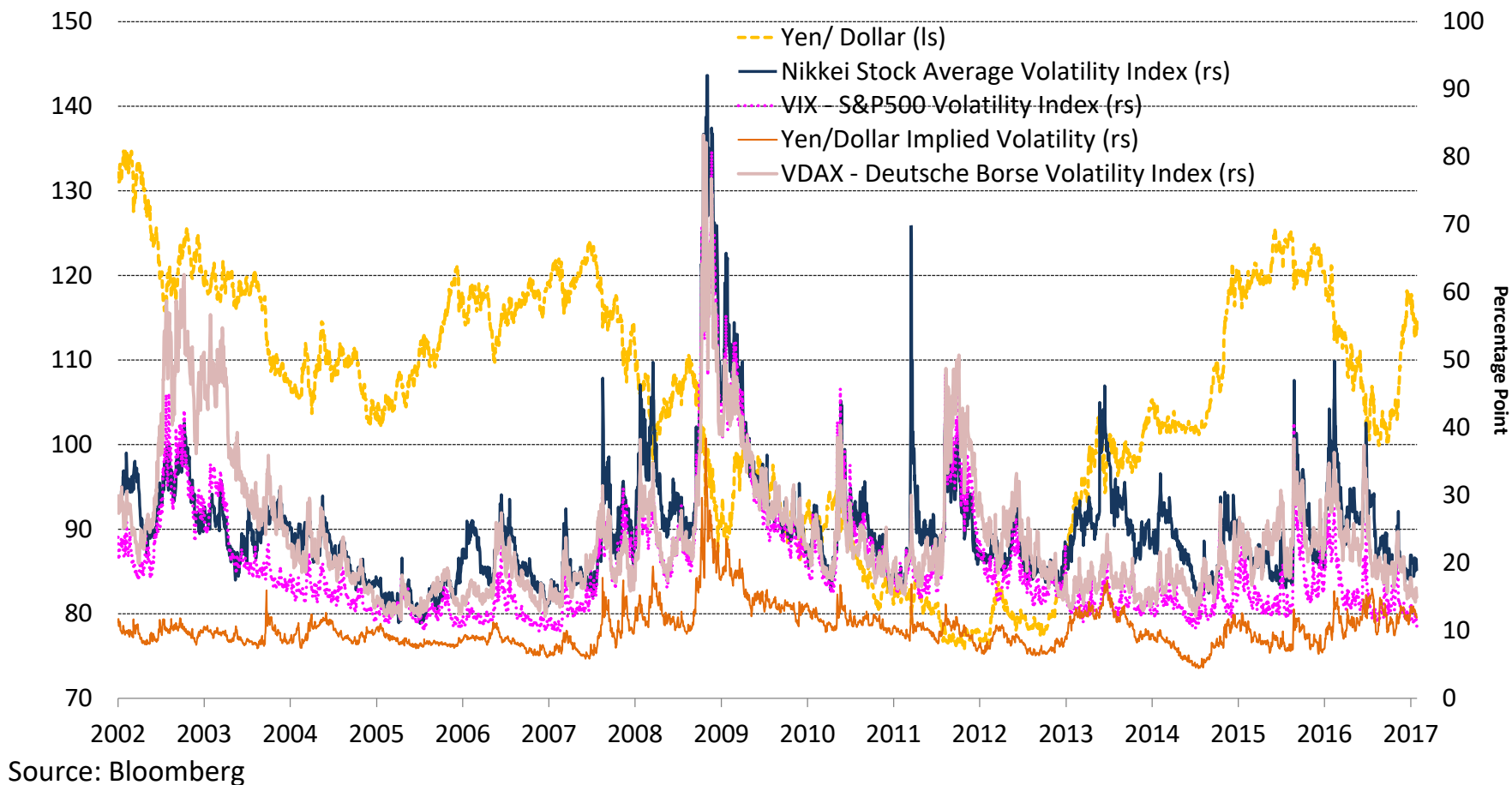
Fatum and Yamamoto (2014) – Yen's safe haven status

All currencies except the yen have significant market uncertainty thresholds.

Fatum, Yamamoto, and Zhu (2017) – Renminbi's safe haven status

Some degree of safe-haven currency behavior of the renminbi during the early part of their sample, which do not support the suggestion that the renminbi is currently a safe-haven currency.

# EQUITY, FX VOLATILITY INDEX, AND YEN'S SAFE-HAVEN STATUS



# SAFE HAVEN INDEX

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# DATA

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- ❑ Daily data for foreign exchange rates of 15 currencies, areas and 3 alternative assets such as gold, bitcoin, and crude oil from the beginning of 2001 through Nov. 3, 2017.
- ❑ Daily data for two-year government bond yields of 14 economies from the beginning of 2001 through Nov. 3, 2017
- ❑ Quarterly data for unbalanced panel economic variables (current account balance and nominal GDP, ) of 14 emerging and advanced economies, areas, 1Q 2001- 3Q 2017.

Sources: Bloomberg

# THE MODEL, DATA, AND GAUGE

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## Model

$$d\ln(\text{LCY}/\text{USD}) = c + \beta_1 (\text{U.S.} - \text{LCY two-year yield spreads}) + \beta_2 \text{VIX}$$

LCY: Local Currency

VIX: a measure of implied volatility of S&P 500 index

Implement a rolling regression from the beginning of 2001 through Nov. 3, 2017, with a 250 business day window

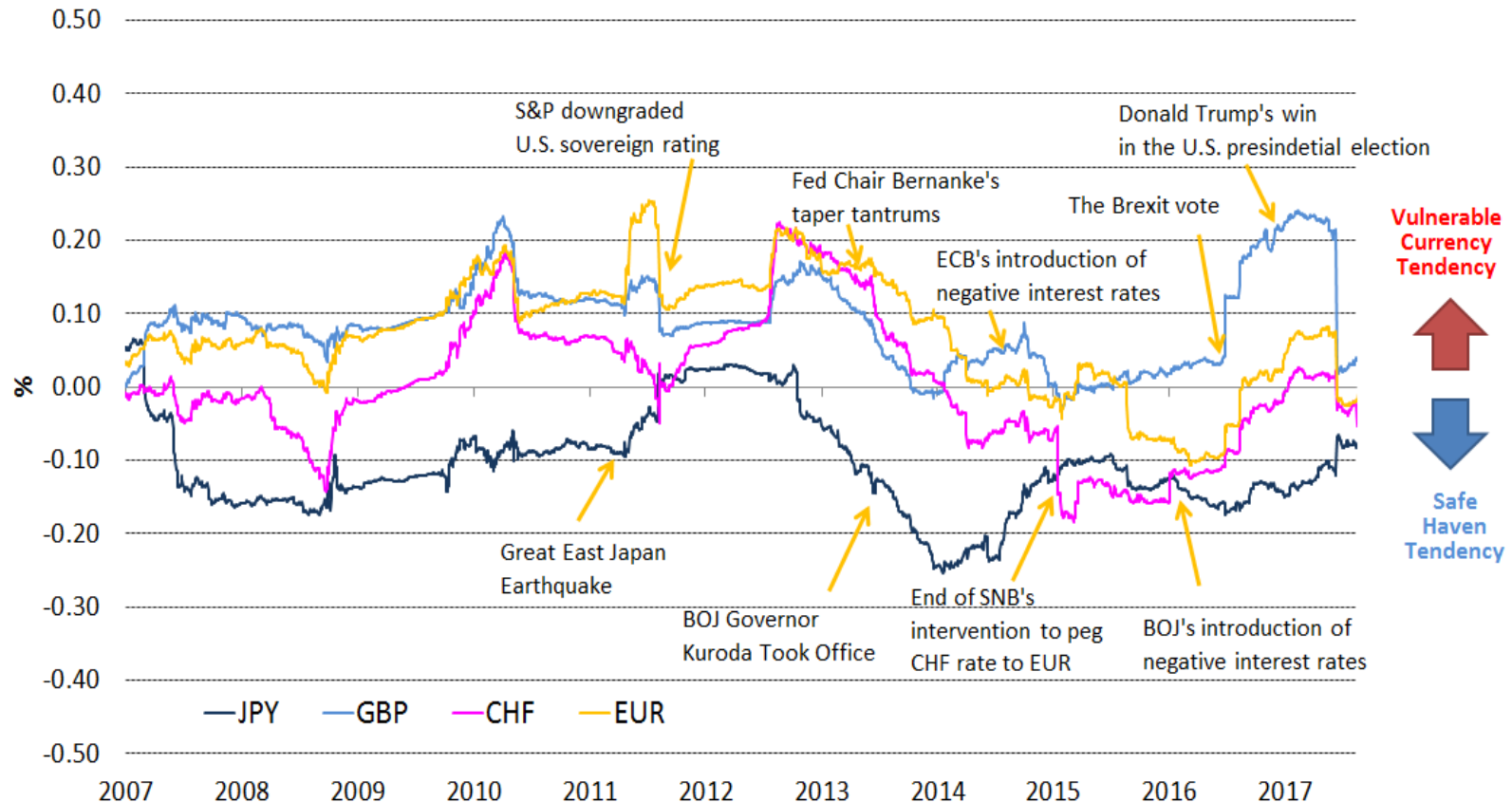
## Measurement

The Safe Haven Index (SAI) : The coefficient ( $\beta_1$ ) of VIX in the model

- SHI < 0: Period and country specific "safe haven" type movement.
- SHI > 0: Period and country specific "vulnerable currency" type movement.

# YEN'S **SAFE HAVEN** STATUS HAS ENHANCED SINCE 2007

## Safe haven indexes for advanced economies

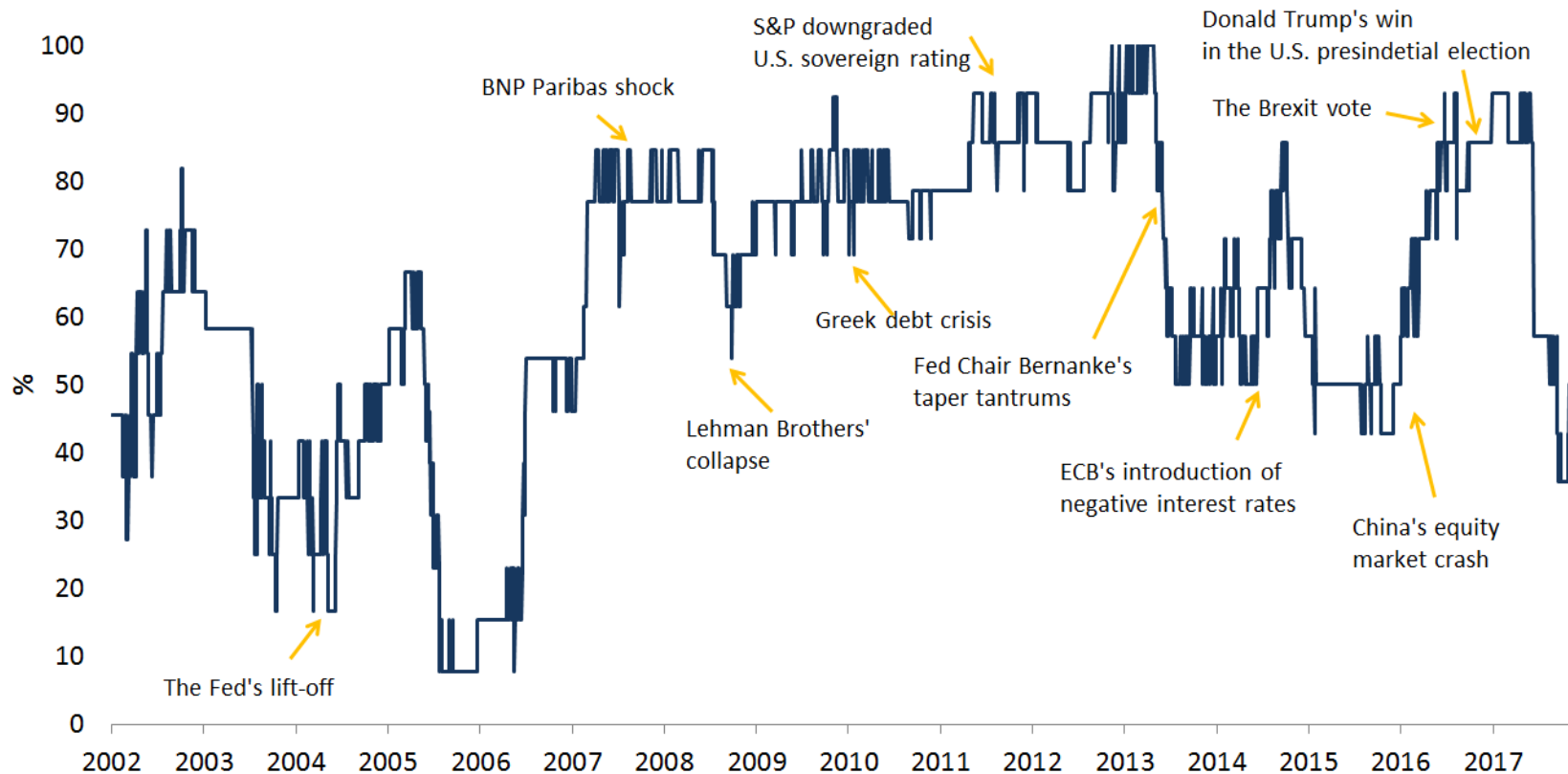


Note: Impact of a 1-ppt rise in VIX on exchange rates  
 Sources: Bloomberg Economics, author's estimation



# A CRISIS TENDS TO STRENGTHEN SAFE HAVEN EFFECTS

## Share of currencies statistically significant at the 10% level

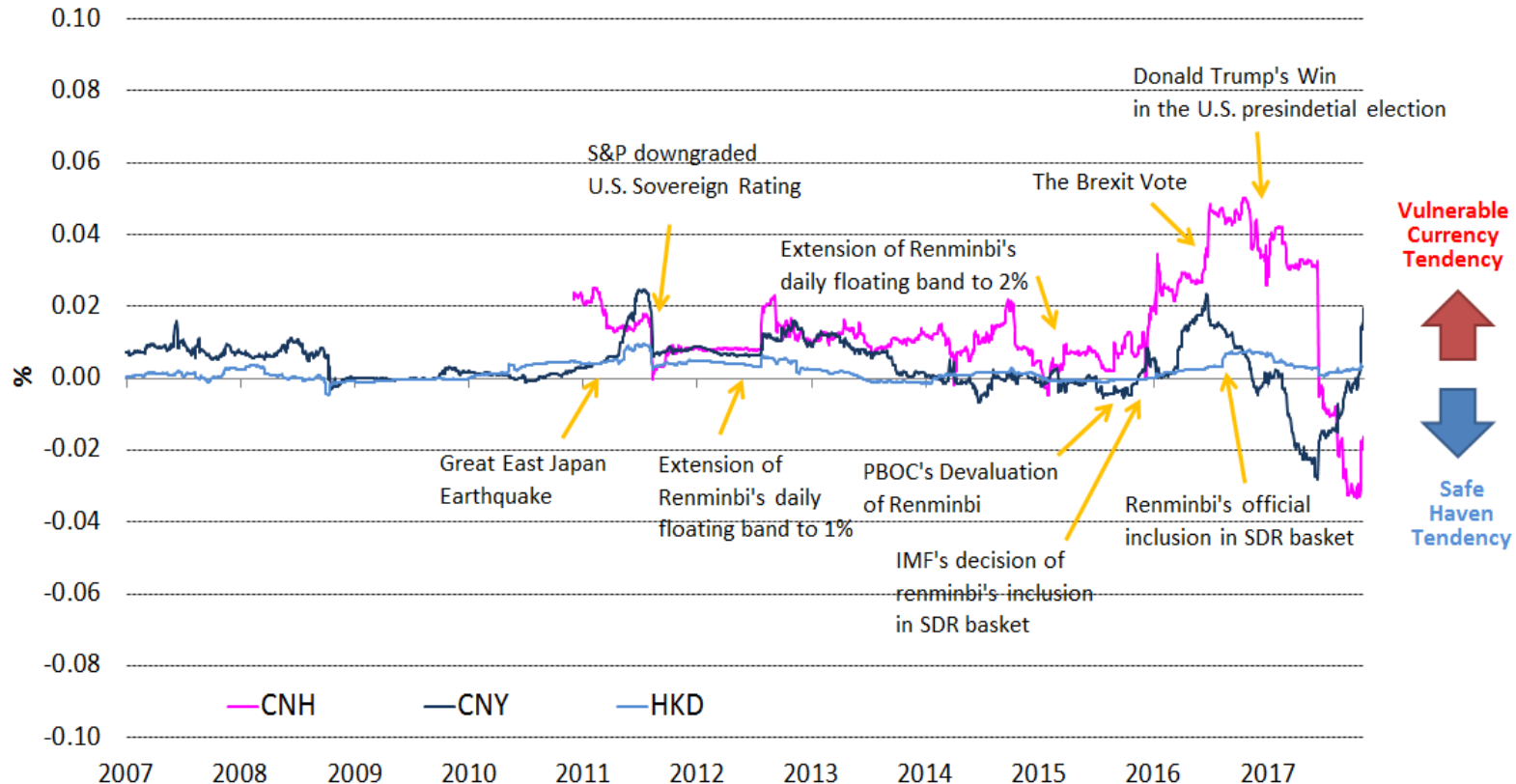


Note: Share of currencies that are statistically significant at the 10% level on their safe haven indexes.

Source: author's estimation

# SAFE HAVEN STATUS OF CNY AND CNH HAS BEEN DIVERGED SINCE 2016

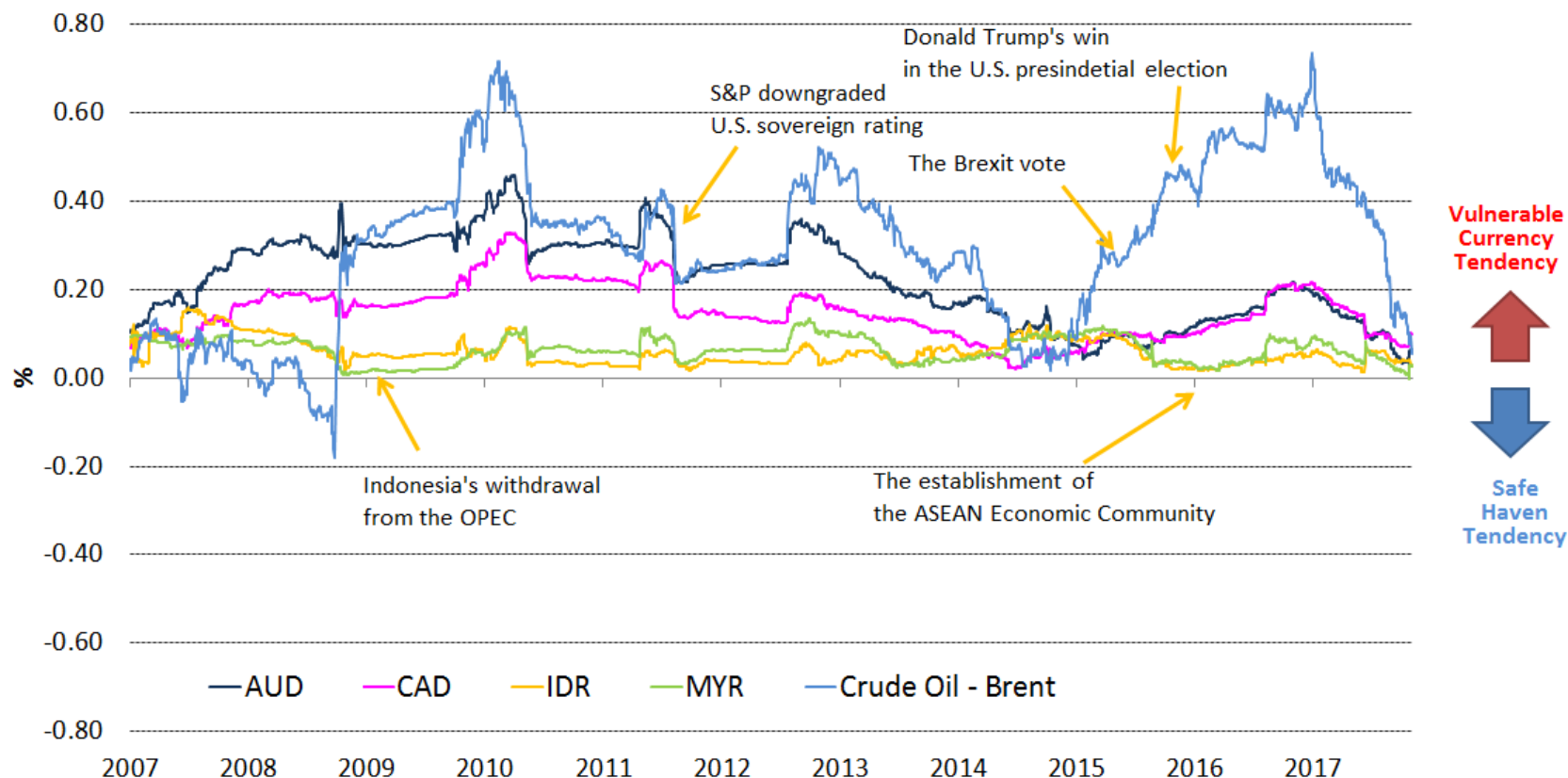
## Safe haven indexes for renminbi and Hong Kong dollar



Note: Impact of a 1-ppt rise in VIX on exchange rates  
Sources: Bloomberg Economics, author's estimation

# COMMODITY EXPORTER CURRENCIES REMAIN VULNERABLE

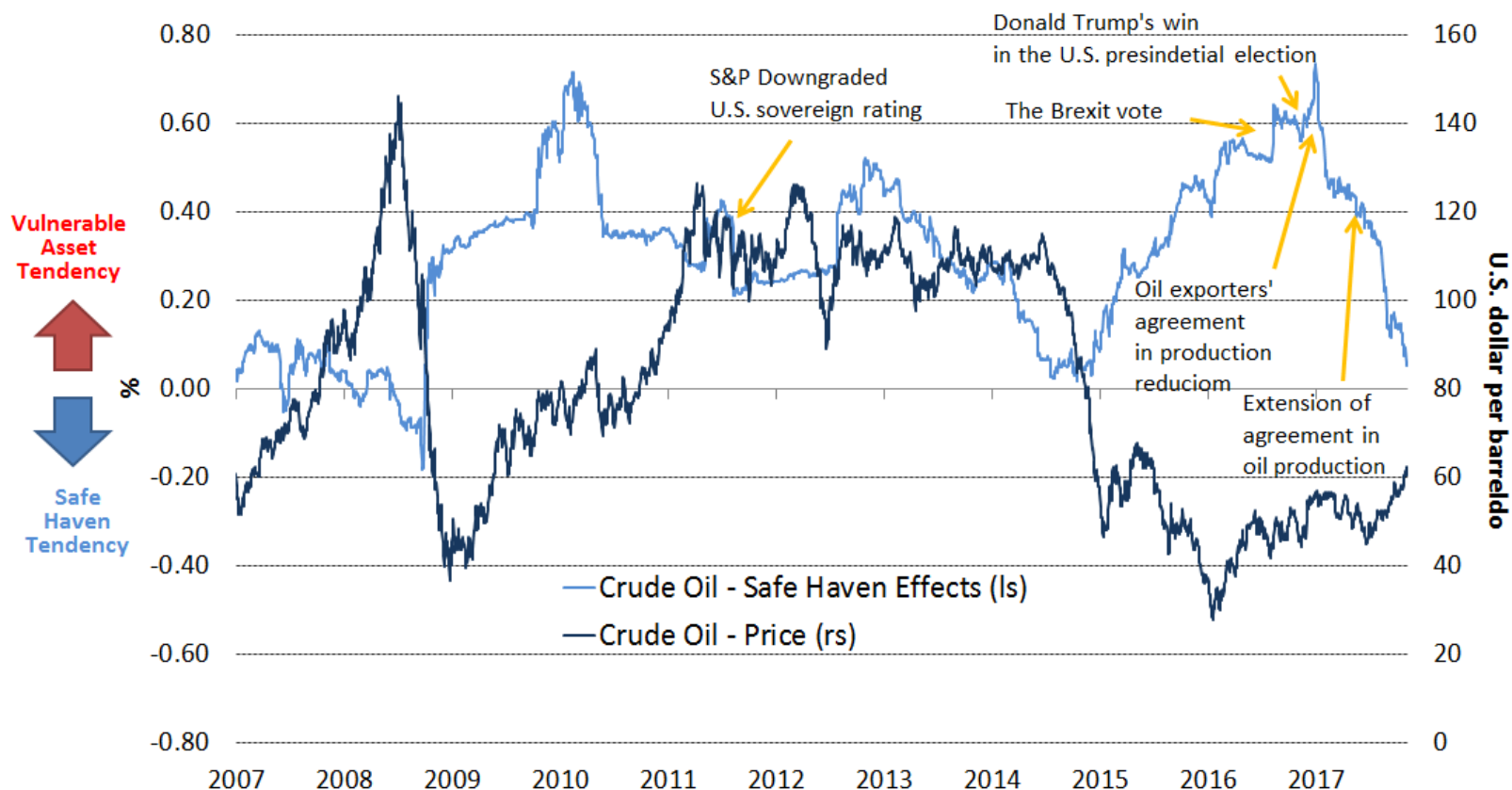
## Safe haven indexes for commodity currencies



Note: Impact of a 1-ppt rise in VIX on exchange rates  
Sources: Bloomberg Economics, author's estimation

# OIL'S SAFE HAVEN EFFECTS DEPEND ON ITS PRICE LEVEL

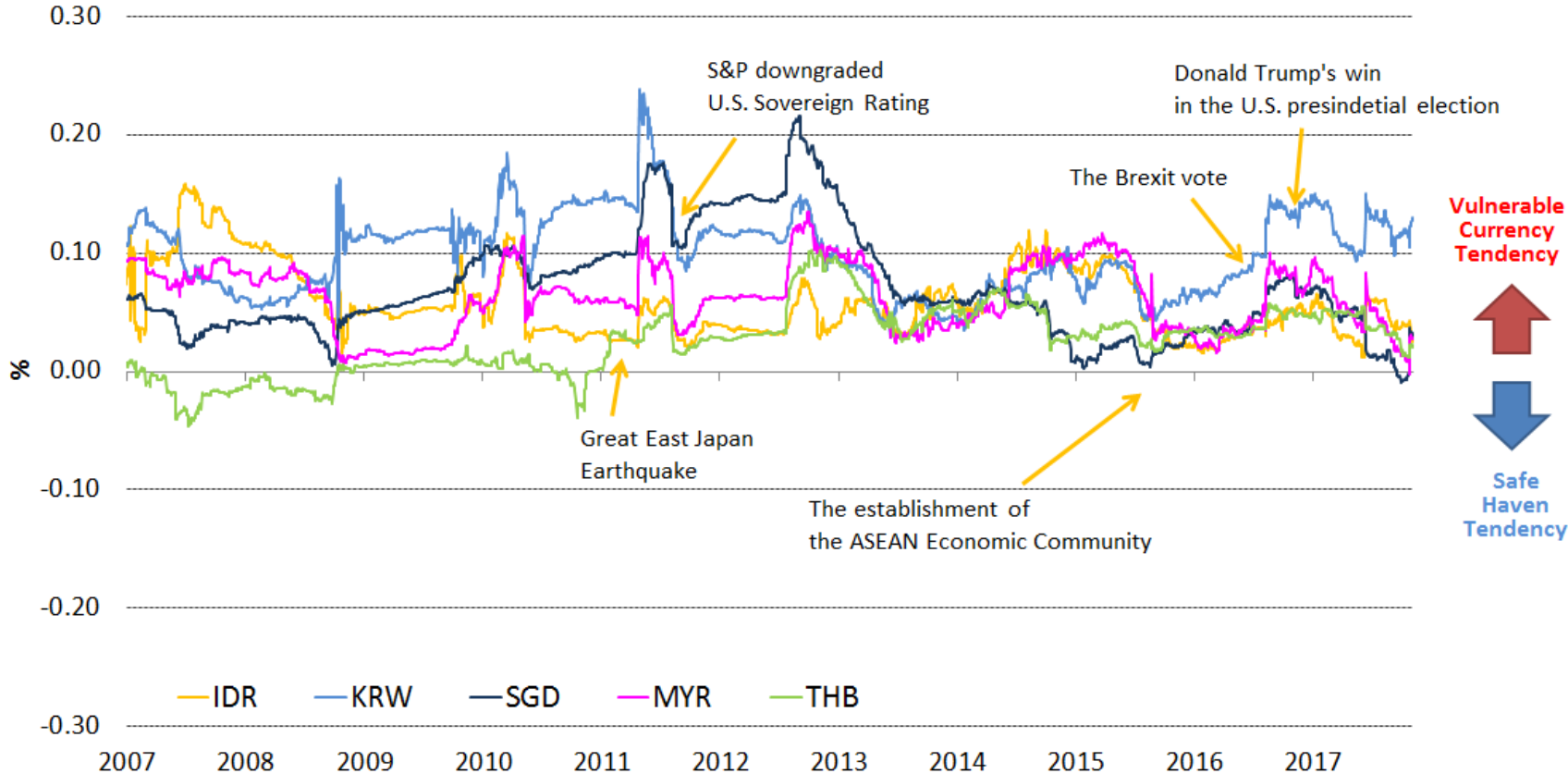
## Oil price and safe haven status of crude oil



Note: Impact of a 1-ppt rise in VIX on exchange rates  
Sources: Bloomberg Economics, author's estimation

# SAFE HAVEN STATUS OF EMERGING ASIA TEND TO BE VULNERABLE

## Safe haven indexes for emerging Asia



Note: Impact of a 1-ppt rise in VIX on exchange rates  
 Sources: Bloomberg Economics, author's estimation

# STANDARDIZATION OF SAFE HAVEN INDEX

## Safe Haven Ranking

Ranking	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	CHF	CHF	CHF	THB	CHF	CHF	JPY	JPY	JPY	USD	USD	JPY	JPY	JPY	JPY	JPY
2	EUR	GOLD	Crude Oil	HKD	THB	JPY	CHF	HKD	USD	JPY	JPY	Bitcoin	CHF	CHF	CHF	GOLD
3	SGD	EUR	HKD	Crude Oil	GBP	THB	THB	USD	THB	GOLD	GOLD	HKD	Bitcoin	HKD	Bitcoin	CNY
4	GOLD	THB	EUR	MYR	USD	USD	USD	CNY	CNY	Bitcoin	CNH	USD	CNY	GOLD	EUR	CHF
5	GBP	SGD	GOLD	USD	IDR	HKD	HKD	CHF	Bitcoin	CHF	CNY	IDR	USD	EUR	GOLD	Bitcoin
6	JPY	GBP	GBP	GBP	EUR	Crude Oil	Crude Oil	THB	IDR	CNH	IDR	CNY	GOLD	CNY	USD	USD
7	THB	Crude Oil	THB	CHF	Crude Oil	CNY	CNY	MYR	HKD	CNY	Bitcoin	CNH	EUR	USD	CNY	CNH
8	USD	JPY	USD	EUR	HKD	EUR	GOLD	GOLD	CNH	THB	HKD	GBP	HKD	GBP	MYR	EUR
9	HKD	USD	CAD	IDR	AUD	GBP	EUR	IDR	CHF	HKD	CHF	MYR	CNH	CNH	IDR	SGD
10	AUD	IDR	KRW	AUD	SGD	SGD	KRW	KRW	GOLD	IDR	THB	KRW	IDR	SGD	HKD	MYR
11	Crude Oil	HKD	SGD	SGD	CAD	CAD	SGD	GBP	MYR	MYR	MYR	THB	GBP	Bitcoin	SGD	IDR
12	KRW	KRW	IDR	GOLD	CNY	GOLD	GBP	EUR	KRW	Crude Oil	Crude Oil	CHF	Crude Oil	THB	CNH	THB
13	CAD	AUD	JPY	JPY	JPY	IDR	MYR	Crude Oil	EUR	GBP	KRW	GOLD	CAD	AUD	GBP	HKD
14		CAD	AUD	CAD	KRW	KRW	IDR	SGD	GBP	EUR	GBP	Crude Oil	THB	IDR	THB	GBP
15				KRW	MYR	MYR	CAD	CAD	Crude Oil	KRW	EUR	EUR	MYR	KRW	KRW	Crude Oil
16				CNY	GOLD	AUD	AUD	AUD	SGD	CAD	CAD	SGD	KRW	Crude Oil	Crude Oil	AUD
17									CAD	SGD	SGD	CAD	SGD	MYR	AUD	KRW
18									AUD	AUD	AUD	AUD	AUD	CAD	CAD	CAD

Source: Author's estimation

## Standardization

$$SSH_{i,t} = SH_{i,t} / \sqrt{\sum_{i=t-249}^t (x_{i,t} - \bar{x}) / 249}$$

where the x is daily percentage change in nominal exchange rate against dollar, the i is country ID

# COMPARISON OF ORIGINAL AND STANDARDIZED RANKING

## Safe Haven Ranking (The Original)

Year	Advanced Economies					Commodity Exporters					ASEAN			East Asia			
	USD	JPY	CHF	EUR	GBP	AUD	CAD	IDR	MYR	SGD	THB	KRW	HKD	CNY	CNH		
2002	7	3	1	2	4	9	11			5	6	10	8				
2003	7	6	1	2	3	10	11	9		5	4	12	8				
2004	6	11	1	2	3	12	7	10		8	4	9	5				
2005	5	12	6	7	3	10	11	9	4	8	1	13	2	14			
2006	4	12	1	6	2	13	10	5	11	8	3	14	7	9			
2007	4	1	2	8	9	14	13	12	10	7	3	11	5	6			
2008	4	1	2	8	12	14	13	11	9	7	3	10	5	6			
2009	4	1	5	10	11	14	13	8	7	9	6	12	2	3			
2010	2	1	10	11	13	15	14	7	8	9	4	12	5	3	6		
2011	1	2	7	13	10	15	14	8	9	11	6	12	3	5	4		
2012	1	4	11	14	9	15	12	6	8	13	7	10	2	3	5		
2013	3	1	12	14	7	15	13	9	8	11	6	10	2	4	5		
2014	4	1	2	6	8	15	10	14	12	11	9	13	5	3	7		
2015	6	2	1	5	7	13	15	11	14	9	10	12	4	3	8		
2016	3	1	2	4	12	15	14	8	10	11	9	13	5	6	7		
2017	4	1	2	7	12	13	15	10	11	8	9	14	6	3	5		
Total	4.4	3.7	4.1	7.5	7.9	12.9	11.9	8.8	9.4	8.7	5.8	11.1	4.8	4.9	5.8		
2002-07	6.0	7.3	2.1	4.6	4.7	10.5	10.0	8.8	9.3	6.8	3.6	10.7	6.1	7.9	-		
2008-17	3.4	1.6	5.3	9.2	9.9	14.3	13.0	8.8	9.4	9.9	7.2	11.3	3.9	4.2	5.8		

Source: Author's estimation

## Safe Haven Ranking (Standardized)

Year	Advanced Economies					Commodity Exporters					ASEAN			East Asia			
	USD	JPY	CHF	EUR	GBP	AUD	CAD	IDR	MYR	SGD	THB	KRW	HKD	CNY	CNH		
2002	7	5	1	2	4	9	11			3	6	10	8				
2003	7	6	1	3	5	10	12	8		4	2	11	9				
2004	6	11	1	3	4	12	7	10		8	5	9	2				
2005	4	11	6	7	5	9	12	8	3	10	1	13	2	14			
2006	4	12	1	6	3	9	10	5	13	8	2	14	7	11			
2007	4	1	2	7	8	14	10	11	13	9	3	12	5	6			
2008	4	1	2	7	10	14	13	12	11	9	3	8	5	6			
2009	3	1	5	11	10	14	13	8	7	12	6	9	2	4			
2010	2	1	8	11	12	15	14	6	9	13	3	10	7	4	5		
2011	1	2	3	11	10	15	13	8	9	14	6	12	7	5	4		
2012	1	2	7	12	11	15	13	5	9	14	8	10	6	4	3		
2013	2	1	11	12	7	15	14	4	8	13	10	9	3	5	6		
2014	4	1	2	5	9	14	10	8	13	15	11	12	6	3	7		
2015	6	1	2	5	7	11	15	13	14	9	10	12	3	4	8		
2016	4	1	2	3	11	14	15	7	6	9	12	13	8	5	10		
2017	4	1	2	6	12	13	15	9	8	7	11	14	10	3	5		
Total	4.4	3.66	3.74	7.0	7.7	12.6	12.1	8.2	9.5	10.0	6.1	10.8	6.0	5.4	6.5		
2002-07	6.0	7.6	2.5	4.8	4.8	10.5	10.3	8.9	11.0	7.6	3.2	11.3	6.4	9.0	-		
2008-17	3.4	1.2	4.5	8.4	9.5	13.8	13.2	7.8	9.1	11.5	7.9	10.5	5.8	4.5	6.5		

Source: Author's estimation

# WHAT DETERMINES SAFE HAVEN?

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# THE MODEL: IDENTIFY SAFE HAVEN DETERMINANT

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## Model

$$SSH_{i,t} = \alpha_{i,t} + \beta_z X_{z,i,t} + \varepsilon_{i,t} \quad (5)$$

$$SHR_{i,t} = \alpha_{i,t} + \beta_z X_{z,i,t} + \varepsilon_{i,t} \quad (6)$$

where

*SSH*: the standardized safe haven index

*SHR*: the ranking variable of the standardized safe haven index

*X*: current account balance as of nominal GDP (*CA*), two-year yields (*IR*), yield differential (*YG*), the U.S. and a country *i*'s two-year yield differentials – the U.S. yield minus the local currency yield, and the carry trade dummy ( $D\_YG = 1$  if the  $YG < 0$ , otherwise 0),  $t$  = time variable,  $i$  = country/currency

Methodology: Pooled OLS, panel regression with fixed effects

## Hypothesis

- $CA < 0$ : the hypothesis of the current account as the proxy of net foreign assets holds as the larger current account surplus enhances its safe haven status.
- $IR > 0$ : the hypothesis of the carry trade opportunity holds as lower local currency yields enhance its safe haven status.
- $YG > 0$ : the hypothesis of the carry trade opportunity holds as lower local currency yields or higher U.S. yields enhance its safe haven status.
- $D\_YG < 0$ : the hypothesis of the carry trade opportunity holds as a condition that lower local currency yields than the U.S. yields enhances its safe haven status.
- Investor perception hypothesis holds if the above hypothesis doesn't hold or if the value of R-squared in the panel regression is much greater than one in the pooled regression.

# PANEL REGRESSION OF SAFE HAVEN INDEX FOR FULL SAMPLES

	(1)	(2)	(3)	(4)	(5)	(6)
Dependant Variable	Safe Haven Index					
Country	All excluding the United States					
Starting Date	2002 Q1	2002 Q1	2002 Q1	2002 Q1	2002 Q1	2002 Q1
End Date	2017 Q3	2017 Q3	2017 Q3	2017 Q3	2017 Q3	2017 Q3
Constant	7.681***	13.139***	7.714***	10.336***	13.424***	13.092***
<i>Current account balance, % of GDP</i>	-0.149*	0.063	-0.056	0.063	0.019	0.062
<i>Two-year yield</i>	0.658***	-1.720***			-0.253	-1.713***
<i>Two-year yield differential to U.S.</i>			1.405***	-1.720***		
<i>Carry-trade dummy</i>					-10.077***	0.081
Pooled or Fixed Effects	Pooled	Fixed	Pooled	Fixed	Pooled	Fixed
R-squared	0.020	0.661	0.052	0.661	0.098	0.661
Number of country	13	13	13	13	13	13
Observations	738	738	738	738	738	738

Note: \*, \*\*, \*\*\* indicate the 10%, 5%, 1% significant level.

# PANEL REGRESSION OF SAFE HAVEN INDEX FOR SUB-SAMPLES

	(7)	(8)	(9)	(10)	(11)	(12)
Dependant Variable	Safe Haven Index					
Country	All excluding the United States					
Starting Date	2002 Q1	2008 Q1	2002 Q1	2008 Q1	2002 Q1	2008 Q1
End Date	2007 Q4	2017 Q3	2007 Q4	2017 Q3	2007 Q4	2017 Q3
Constant	11.273***	6.177***	8.261***	7.635***	13.216***	5.247***
<i>Current account balance, % of GDP</i>	-1.206***	0.356***	-1.206***	0.356***	-1.174***	0.330***
<i>Two-year yield</i>	-0.875	1.914***			-1.054	2.018***
<i>Two-year yield differential to U.S.</i>			-0.875	1.914***		
<i>Carry-trade dummy</i>					-2.811	2.323*
Poolod or Fixed Effects	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
R-squared	0.681	0.784	0.681	0.784	0.683	0.786
Number of country	12	13	12	13	12	13
Observations	239	499	239	499	239	499

Note: \*, \*\*, \*\*\* indicate the 10%, 5%, 1% significant level.

# SUMMARY

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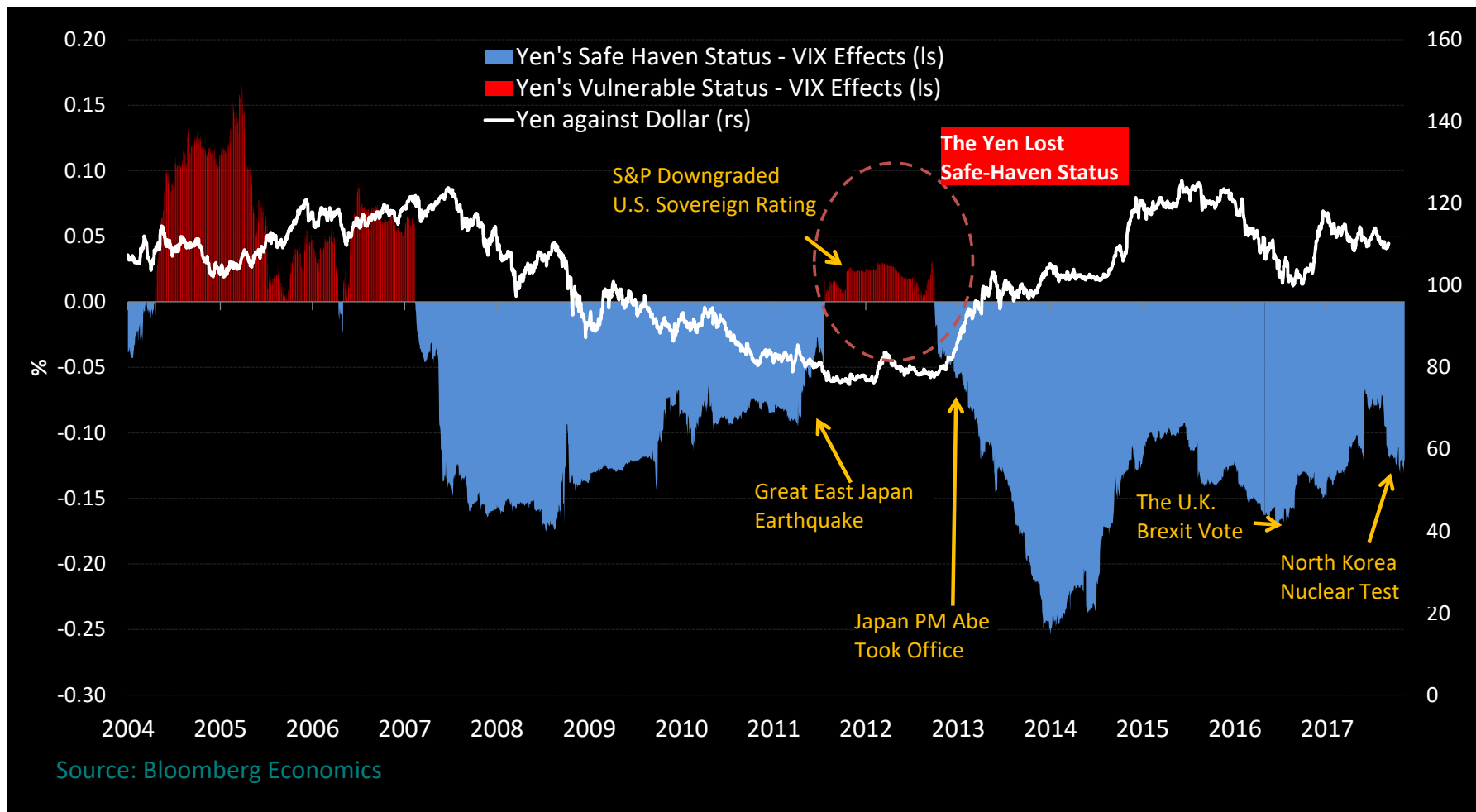
- ❖ Safe haven determinants shifted from current account surplus ( as proxy of net foreign assets) to carry trade and investors' perceptions after 2007
- ❖ Currency's safe haven tendency tends to strengthen, particularly during a crisis and a risk-off episode.
- ❖ Once some currency is regarded as a safe haven currency, investors' perception of the safe haven currency could last for a certain period, despite changing economic fundamentals

# POLICY IMPLICATION

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- A country's interest rates and a yield differential to the U.S. dollar likely affect safe haven status.  
  
→ A shift in monetary policy may affect exchange rates via two channels: a change in the yield differential and a safe have effect. That said, a ongoing or expected shift in monetary policy in the Fed's and the European Central Bank's may change the ranking of safe haven currency
- China's rapid economic and financial sector development may push the renminbi toward a safe haven currency as its internationalization proceeds.
- Japanese yen's safe haven status is robust now, but the yen could also have significant market uncertainty thresholds, e.g., the escalation of the tension between the United States and North Korea.

# POLICY IMPLICATION



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