

# Currencies in Safe Haven Status: Renminbi, Yen, Euro, and Dollar

Yuki Masujima, Bloomberg L.P.

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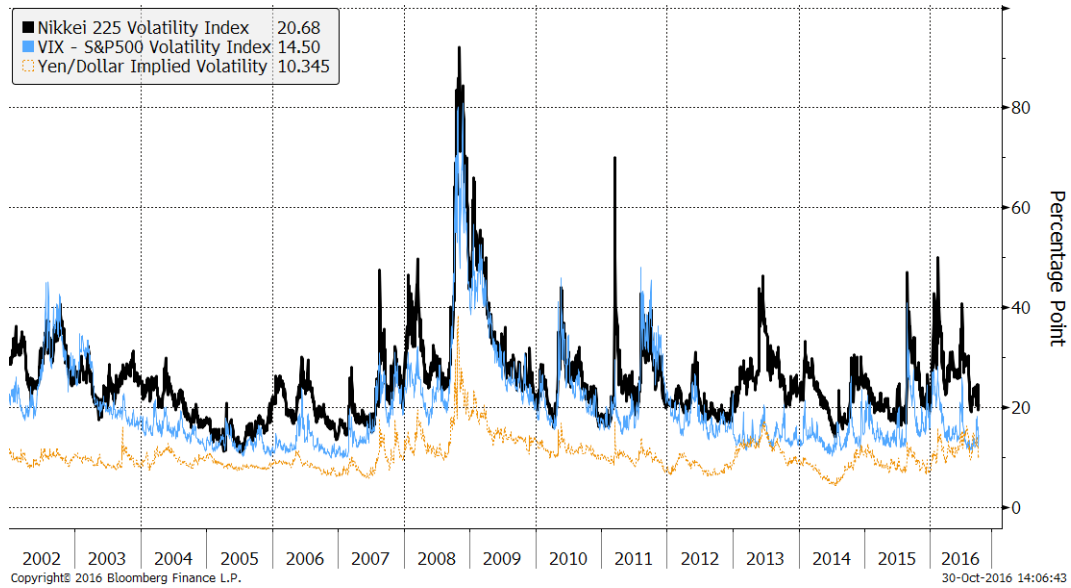
## MOTIVATION AND QUESTIONS

### Why Does Safe Haven and Vulnerable Status in Currency Matter?

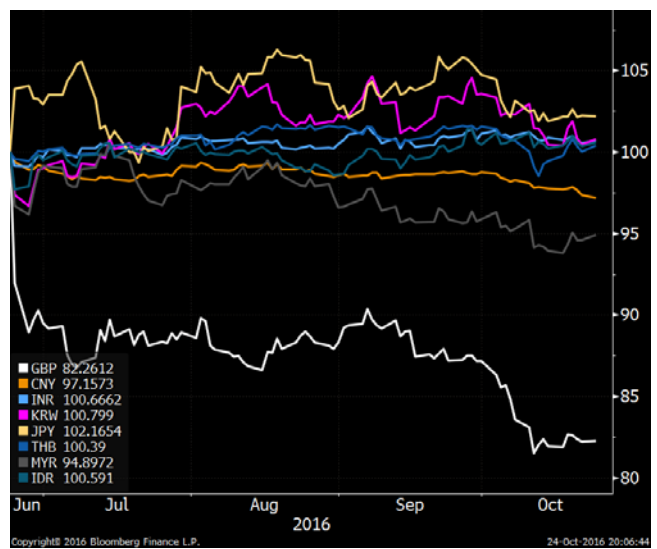
- Avoid excessive appreciation/depreciation of currency –GFC, Swiss Shock etc.
- Short-term safe haven status would damp the business sentiment and export-driven recovery
- Long-term safe haven or safe asset status may contribute to stability in government and private sector finance
- Is the yen safe haven currency? (Short-term Perspective)
- Is the yen safe asset? (Long-term Perspective)
- Has the yuan been safe haven currency during the internationalization process?



# BACKGROUND: YEN'S SAFE-HAVEN STATUS



# SAVE HAVEN YEN VS. VULNERABLE ASIAN CCYS



# CAPITAL FLOWS AND FX MOVEMENT PUZZLE

Botman et al. (2013) find that changes in market participants' risk perceptions trigger derivatives trading, which in turn lead to changes in the spot exchange rate without capital flows, rather than capital inflows nor expectations of the future monetary policy stance

Rinaldo and Söderlind(2010)

The Japanese yen appreciates against the US dollar when US stock prices decrease and US bond prices and FX volatility increase

De Bock and de Carvalho Filho (2013)

The Japanese yen and the Swiss franc are the only two currencies that on average appreciate against the U.S. dollar during risk-off episodes. Safe haven currencies tend to have low interest rates, a strong net foreign asset position, and deep and liquid financial markets. Japan meets all these criteria. After controlling for the carry trade,

Habib and Stracca (2012)

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.

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4

## IS YEN SAFE ASSET?

5

# MEASURING EXCHANGE MARKET PRESSURES

The exchange market pressure index (Girton and Roper, AER 1977) for country c at time t is:

$$EMP_t^c = (1 - \omega_t^c) \dot{e}_t^c + \omega_t^c \frac{dr_t^c}{GDP_t^c}$$

Goldberg and Krogstrup (2013) modified the standard EMP used in the literature, adding new weights that weigh the component which best captures exchange market pressures highest:

$$\omega_t^c = \frac{\text{var}\left(\frac{dr_t^c}{GDP_t^c}\right)}{\text{var}(\dot{e}_t^c) + \text{var}\left(\frac{dr_t^c}{GDP_t^c}\right)}$$

# SAFE ASSET INDEX: DEFINITION

The SAI, following Goldberg and Krogstrup (2013), in turn measures the correlation between the EMP and the VIX during the period t - n and t:

$$GRR_t^c = \rho_{EMP, VIX} = \frac{E_{i=t-n, t}[(EMP_i^c - \mu_{EMP^c})(VIX_i - \mu_{VIX})]}{\sigma_{EMP^c} \sigma_{VIX}}$$

- GRR > 0: Period and country specific "safe haven" type movement.
- GRR < 0: Period and country specific "vulnerable currency" type movement.
- NB! The GRR does not reflect the average direction of capital flows, only the implied correlation of these with the VIX.

**This index is re-defined as Safe Asset Index, which shows the medium- to long- term currency status as safe asset**

# SAFE ASSET INDEX: DATA

- Monthly data for panel of 13 emerging and advanced economies, areas, 1996-2015.
- Sources: IFS and Bloomberg
  - Bilateral USD exchange rates to capture appreciation pressures (exception US).
- n = 5 years, 5 observations per country or area.

# SAFE ASSET INDEX: RESULTS

	Global Safe Asset Index			
	1997-2001	2007-2011	2012-2015	Mean
Switzerland	0.35	0.05	0.25	0.15
Japan	0.23	0.20	0.23	0.13
United States	▲0.02	0.47	0.25	0.10
Hong Kong	▲0.16	0.19	▲0.01	▲0.03
United Kingdom	0.08	▲0.44	▲0.19	▲0.05
Phillipines	▲0.11	▲0.23	▲0.22	▲0.06
Singapore	▲0.11	▲0.23	0.20	▲0.06
EMU	▲0.02	▲0.17	▲0.17	▲0.07
China	0.06	▲0.44	▲0.16	▲0.10
Thailand	0.05	▲0.02	▲0.11	▲0.11
Indonesia	▲0.01	▲0.50	▲0.20	▲0.13
Malaysia	0.15	▲0.59	▲0.06	▲0.16
Korea	▲0.18	▲0.50	▲0.23	▲0.20

# SAFE ASSET INDEX: RESULTS

## Share of Turnover of OTC foreign exchange instruments, by currency

Currency	1995 %	1998 %	2001 %	2004 %	2007 %	2010 %	2013 %	2016 %
USD	83	87	90	88	86	85	87	88
EUR	...	...	38	37	37	39	33	31
JPY	25	22	24	21	17	19	23	22
GBP	9	11	13	16	15	13	12	13
CHF	7	7	6	6	7	6	5	5
CNY	...	0	0	0	0	1	2	4
SGD	0	1	1	1	1	1	1	2
HKD	1	1	2	2	3	2	1	2
KRW	...	0	1	1	1	2	1	2
TWD	...	0	0	0	0	0	0	1
THB	...	0	0	0	0	0	0	0
MYR	...	0	0	0	0	0	0	0
IDR	...	0	0	0	0	0	0	0
DEM	36	30	...	...	...	...	...	...

Source: BIS(2016)

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10

## ARE YEN AND RENMINBI SAFE HAVEN CURRENCY?

# THE MODEL, DATA, AND GAUGE

## 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 Oct. 23, 2016, with a 250 business day window, using daily data from Bloomberg

## Measurement

The Safe Haven Index (SAI) : The coefficient 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.

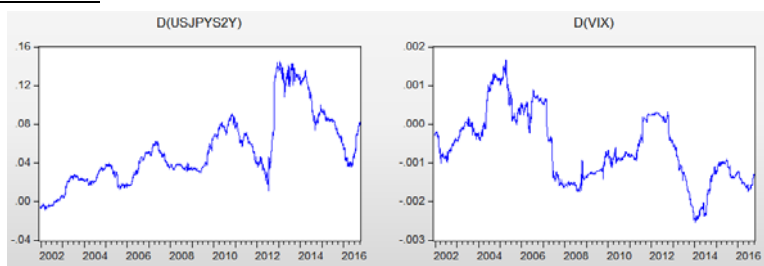
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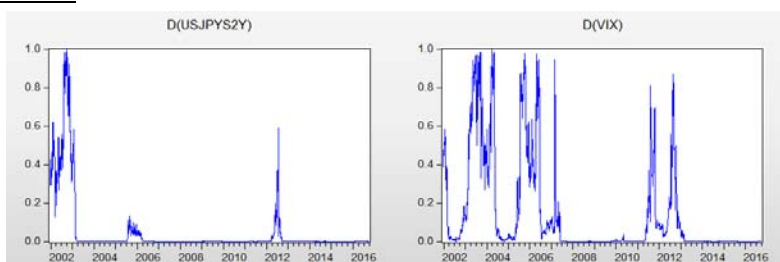
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## YEN'S **SAFE HAVEN** EFFECTS: SHORT-TERM YIELD

### Coefficients



### P-Values

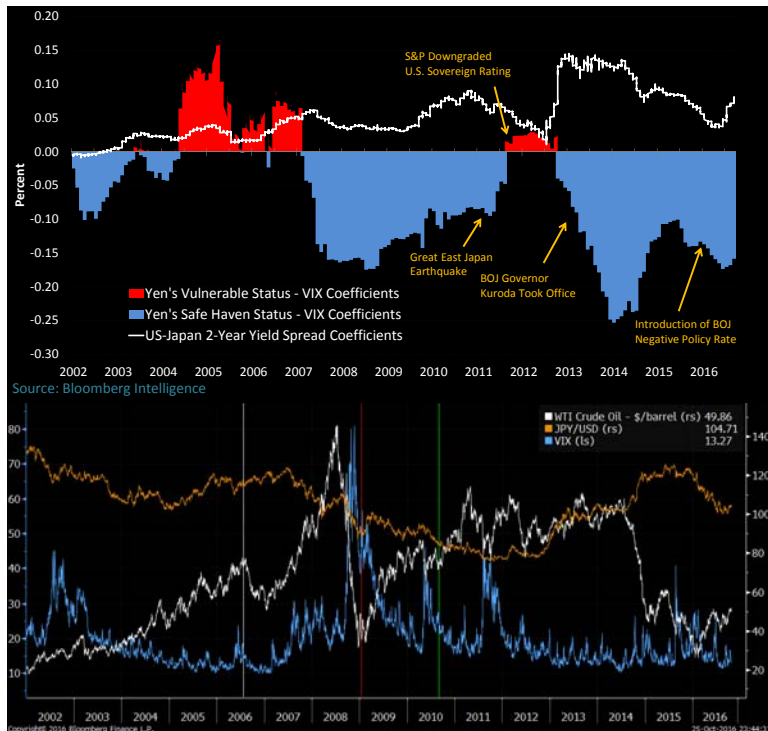


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13

# STRUCTURAL BREAKS



## Structural Breaks for All

- 7/21/2006 Take-off from 0%
- 1/13/2009 GFC
- 12/31/2013 PM Abe Took Office

## Structural Breaks for VIX

- 7/21/2006 Take-off from 0%
- 8/31/2010 Comprehensive Easing
- 1/31/2013 2% Inflation Goal, QQE

# YEN'S SAFE HAVEN EFFECTS: STRUCTURAL BREAKS

## Hall et al (2013) Information Criteria Structural Breaks for VIX

- 7/21/2006 BOJ's Take-off from the 0% Policy Rate
- 8/31/2010 Comprehensive Easing
- 1/31/2013 2% Inflation Goal, QQE

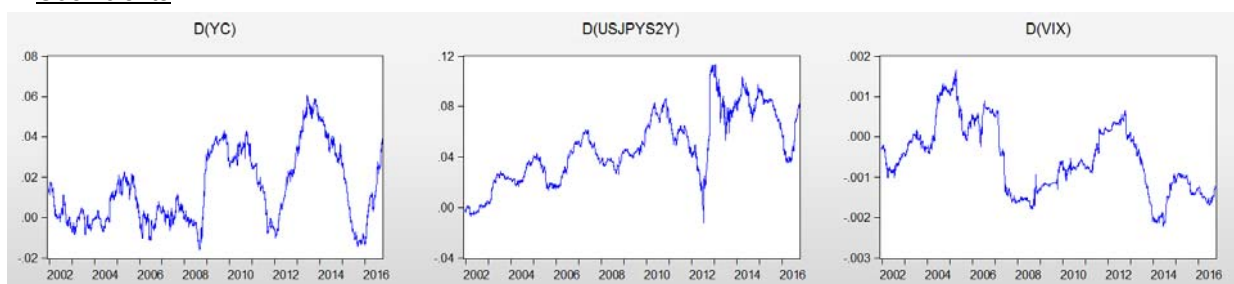
Country	Japan	Japan	Japan	Japan	Japan
Starting Date	1/5/2001	1/5/2001	7/22/2006	9/1/2010	2/1/2013
End Date	10/12/2016	7/21/2006	8/31/2010	1/31/2013	10/12/2016
<i>dln(JPY)</i>					
C	-0.00642	-0.00276	-0.0194	0.0131	-0.00534
<i>D(USDJPY_2Y)</i>	3.3506	1.5642***	4.2858***	6.1668***	7.8254***
<i>D(VIX)</i>	-0.0879	0.0148	-0.1211***	0.0117	-0.147***
Adj. R2	0.174611	0.024725	0.410671	0.084938	0.283939
F-statistic	403.1564	17.76995	349.0746	2259.897	3387.983
Durbin-Watson	2.067693	2.066312	2.131552	2.012277	1.967443
Obs.	3803	1324	1000	586	896

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

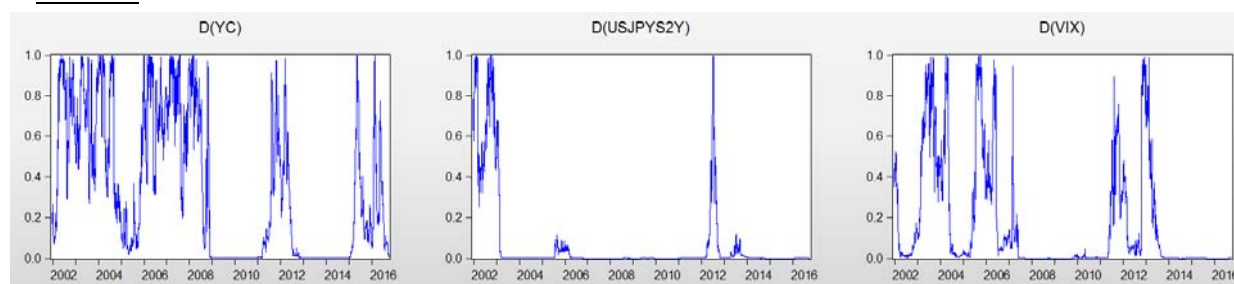


## YEN'S SAFE HAVEN EFFECTS: SHORT-TERM YIELD & YIELD CURVE

### Coefficients



### P-Values



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16

## YEN SAFE HAVEN EFFECTS: STRUCTURAL BREAKS

### Hall et al (2013) Information Criteria Structural Breaks for VIX

7/21/2006 BOJ's Take-off from the 0% Policy Rate  
 8/31/2010 Comprehensive Easing  
 1/31/2013 2% Inflation Goal, QQE

Country	Japan	Japan	Japan
Starting Date	8/24/2010	8/24/2010	1/1/2013
End Date	10/12/2016	12/31/2012	10/12/2016
<i>dln(JPY/CHN)</i>			
C	-0.0003	0.0041	-0.0042
<i>D(CHNJPY_2Y)</i>	0.0636	-0.2384	0.1313
<i>D(VIX)</i>	-0.0714***	-0.0139	-0.21***
Adj. R2	0.04	-	0.17
F-statistic	19.51363	0.61413	51.22539
Durbin-Watson	2.0529	2.077817	1.877421
Obs.	964	488	476

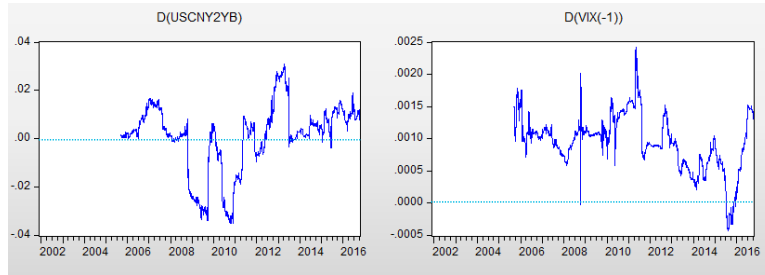
Note: \*, \*\*, \*\*\* indicate the 10%, 5%, 1% significant level.

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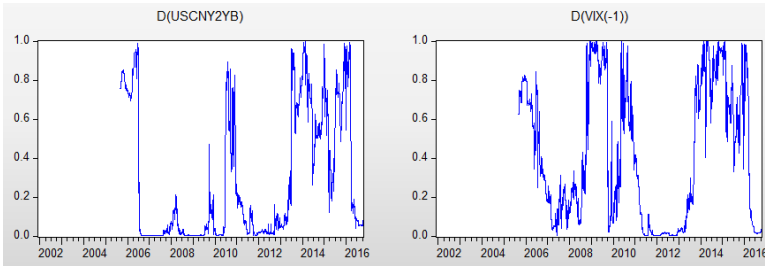
17

# YUAN'S VULNERABLE CURRENCY EFFECTS

## Coefficients

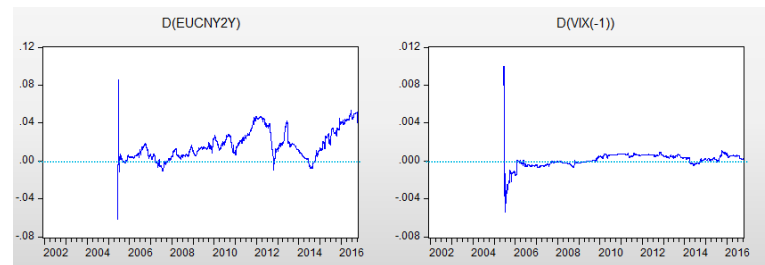


## P-Values

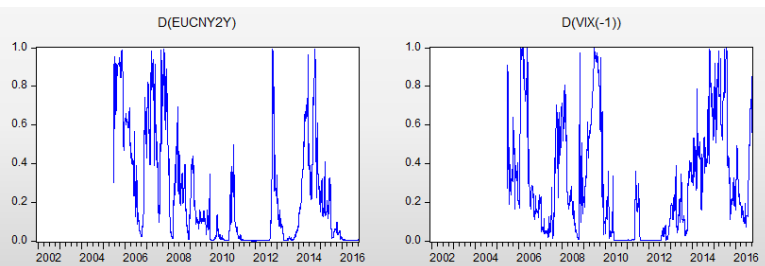


# YUAN'S VULNERABLE CURRENCY EFFECTS (AG EUR)

## Coefficients

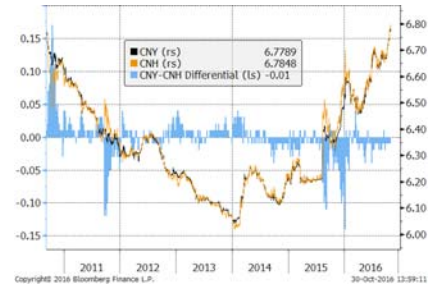
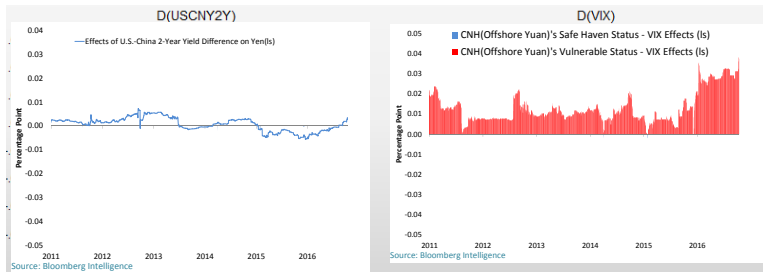


## P-Values

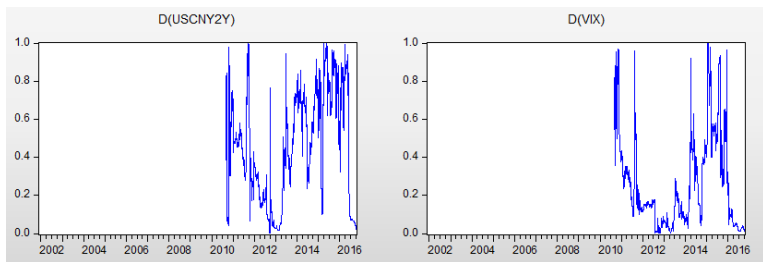


# CHN'S CURRENCY STATUS IN TRANSITION?

## Coefficients

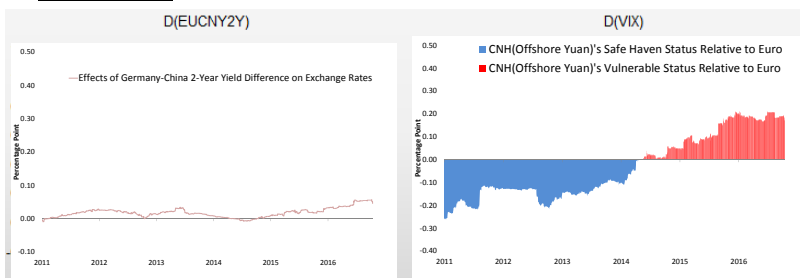


## P-Values

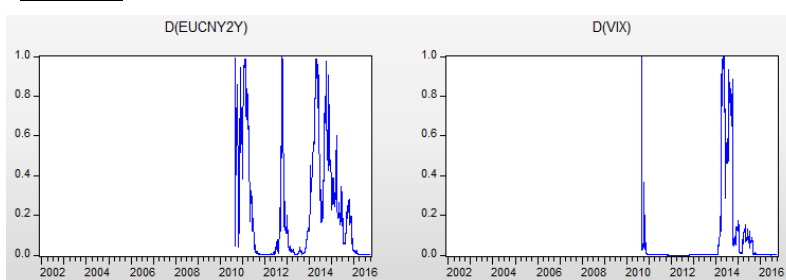


# CHN'S CURRENCY STATUS EUR?

## Coefficients



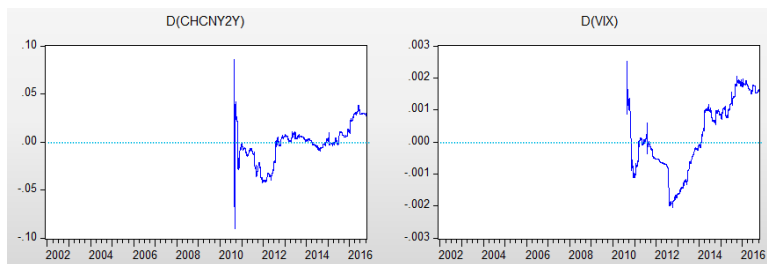
## P-Values



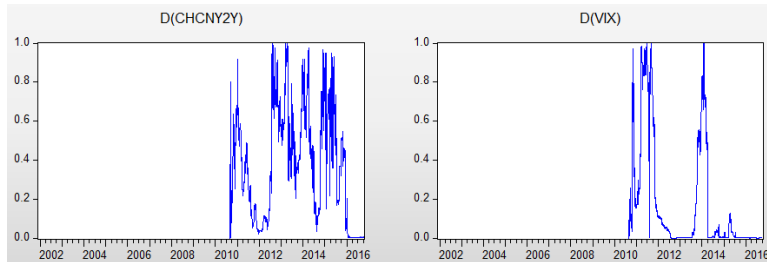
CNH's status was changed to vulnerable from safe haven when net foreign reserve became outflows.

## CHFCHN'S CURRENCY STATUS IN TRANSITION?

### Coefficients

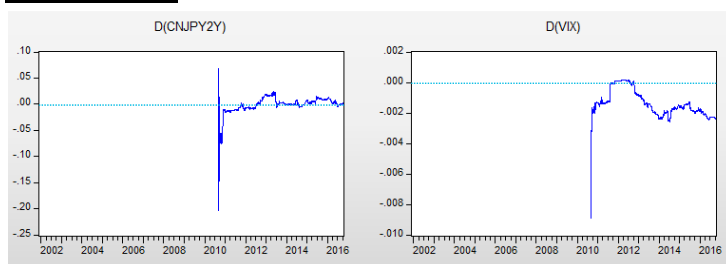


### P-Values

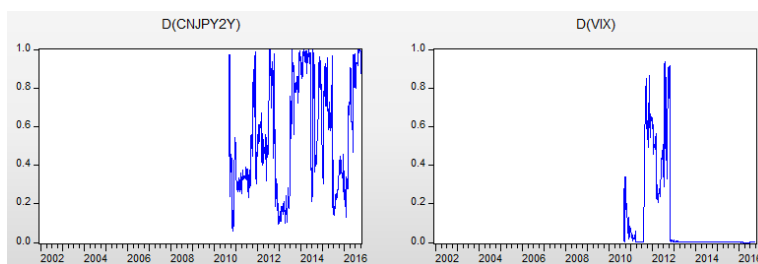


## CHNJYPY'S VULNERABLE CURRENCY EFFECTS?

### Coefficients



### P-Values



Our result is consistent with

Fatum, Yamamoto, and Zhu(2016)

Some degree of safe haven currency behavior of the Renminbi during the early part of our sample, our findings do not support the suggestion that the Renminbi is currently a safe haven currency or that the Renminbi is progressing towards safe haven currency status.

# RENMINBI SAFE HAVEN EFFECTS: STRUCTURAL BREAKS

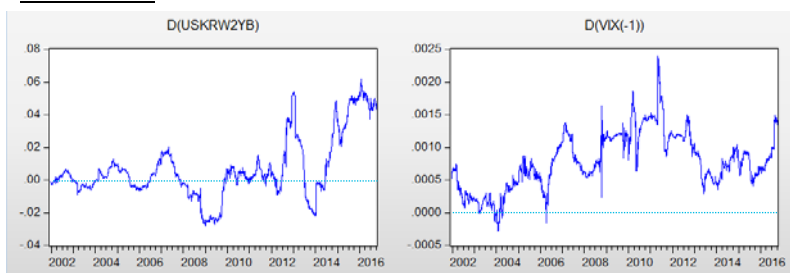
## Hall et al (2013) Information Criteria Structural Breaks for VIX

Country	China	China	China
Starting Date	8/24/2010	8/24/2010	6/22/2013
End Date	10/12/2016	6/21/2013	10/12/2016
$dln(CHN/EUR)$			
C	-0.0000	-0.0146	0.0225
$D(EURCHN\_2Y)$	1.9374***	1.7885***	1.1710***
$D(VIX)$	-0.0803***	-0.1439***	0.1225***
Adj. R2	0.09	0.2330	0.09
F-statistic	19.51363	0.61413	51.22539
Durbin-Watson	2.0529	2.077817	1.877421
Obs.	964	488	476

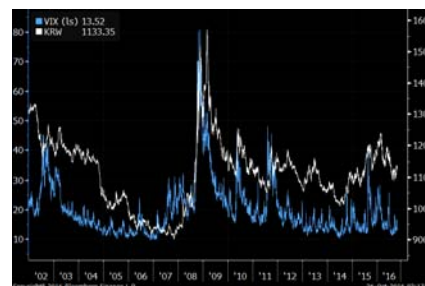
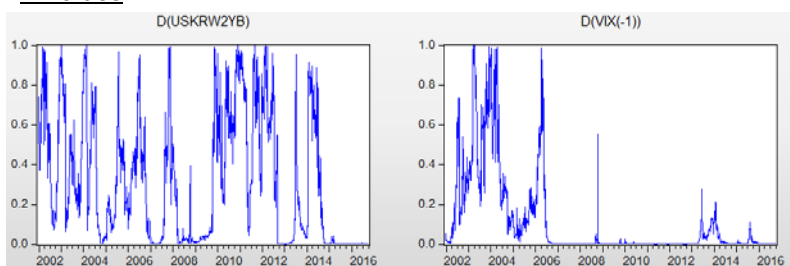
Note: \*, \*\*, \*\*\* indicate the 10%, 5%, 1% significant level.

# WON'S VULNERABLE CURRENCY EFFECTS

## Coefficients

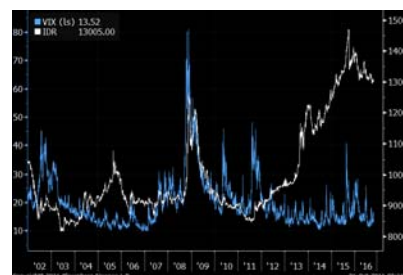
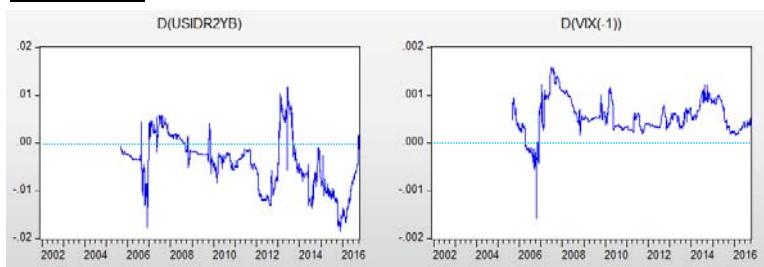


## P-Values

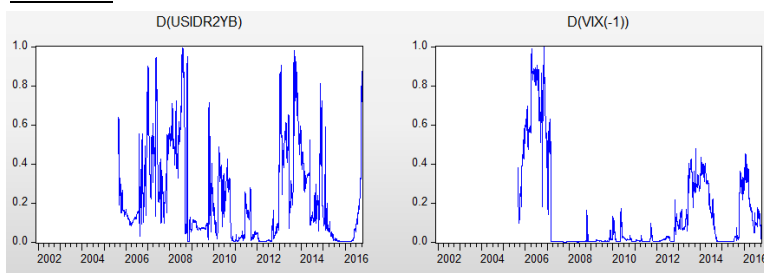


# RUPIAH'S VULNERABLE CURRENCY EFFECTS

## Coefficients



## P-Values



# ASIAN CURRENCY VULNERABLE CURRENCY

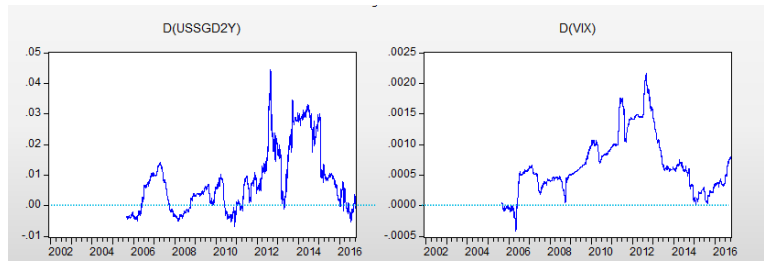
Hall et al (2013) Information Criteria Structural Breaks for VIX  
-No Significant Structural Breaks

Country	Korea	China (CNY)	Indonesia
Starting Date	1/4/2001	6/9/2005	1/4/2005
End Date	10/12/2016	10/12/2016	10/12/2016
dln(LCY)			
C	-0.00896	-0.0129	0.0151
D(US(-1)-LCY2Y)	-0.2153	0.214***	-0.2299***
D(VIX(-1))	0.097***	0.004***	0.0512***
Adj. R2	0	0.014825	0.036888
F-statistic	0.160824	16.55234	57.303
Durbin-Watson	-7.146823	1.989843	2.271413
Obs.	3513	2068	2941

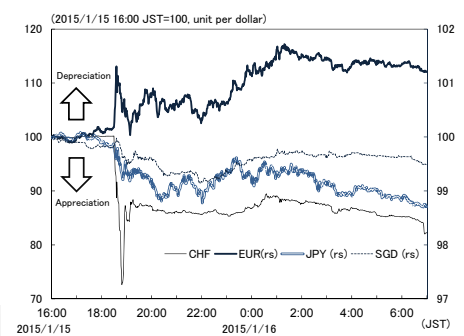
Note: \*, \*\*, \*\*\* indicate the 10%, 5%, 1% significant level.

# SGD'S CURRENCY STATUS **IN TRANSITION?**

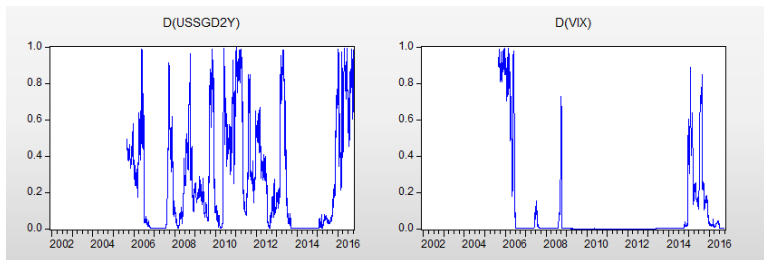
## Coefficients



## Swiss Shock – Jan 15, 2015



## P-Values



# SGD'S **VULNERABLE CURRENCY STATUS: STRUCTURAL BREAKS**

## Hall et al (2013) Information Criteria Structural Breaks for VIX

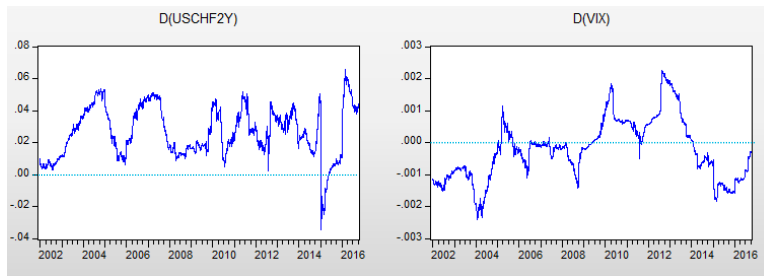
Structural Break Dates: 5/27/2010, 11/1/2012

Country	Singapore	Singapore	Singapore	Singapore
Starting Date	1/4/2001	1/3/2001	5/28/2010	11/1/2012
End Date	10/12/2016	5/27/2010	11/1/2012	10/12/2016
dln(SGD)				
C	-0.00764	-0.0141	-0.0133	0.00626
D(USSGD2Y)	0.4322***	0.2172*	0.7609	0.8545***
D(VIX)	0.0752***	0.0581***	0.1501***	0.0466***
Adj. R2	0.13853	0.124995	0.382944	0.038765
F-statistic	217.8474	89.35343	174.1467	3867.166
Durbin-Watson stat	2.037427	2.011535	1.927249	2.047536
Obs.	2698	1238	559	902

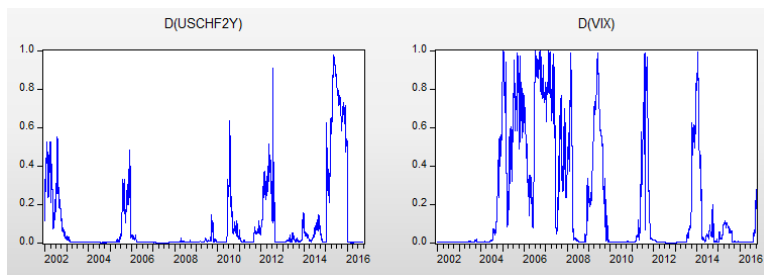
Note: \*, \*\*, \*\*\* indicate the 10%, 5%, 1% significant level.

# CHF'S SAFE HAVEN EFFECTS

## Coefficients



## P-Values



# CHF'S SAFE HAVEN STATUS HAS BEEN CHANGING OVERTIME

## Hall et al (2013) Information Criteria Structural Breaks for VIX

Structural Break Dates: 11/4/2008, 4/19/2013

Country	Switzerland	Switzerland	Switzerland	Switzerland
Starting Date	1/3/2001	1/3/2001	11/5/2008	4/20/2013
End Date	10/12/2016	11/4/2008	4/19/2013	10/12/2016
dln(CHF)				
C	-0.0163	-0.0117	-0.026	-0.0116
D(USCHF2Y)	2.3861***	2.1173***	2.6933***	2.3556***
D(VIX)	-0.00436	-0.0532***	0.073***	-0.0927***
Adj. R2	0.038221	0.086347	0.057587	0.040075
F-statistic	76.36685	90.26221	33.32481	2818.972
Durbin-Watson	2.094789	2.137643	1.932715	2.151249
Obs.	3794	1890	1059	846



# RESULTS

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- Yen is safe haven currency as well as safe assets
- The offshore traded renminbi (CNH) has the vulnerable status to the U.S. dollar and the yen, while the CNH shifted to the vulnerable status relative to the euro and the Swiss franc in May 2014 from the safe haven status, associated with a change to net capital outflows from inflows
- Swiss Franc is a safe haven currency as well as safe assets. Still, its safe have status is weaker than the yen's
- Won, Yuan, Rupiah, Singapore dollar are vulnerable currencies. Still, due to restricted capital flows, exchange rate regime, and intervention might have distorted the results

# POLICY IMPLICATION

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- Yen's safe haven status may have damped the business sentiment and export-driven recovery, but it may have masked vulnerability of government financing with massive monetary easing
- Yen's safe haven status could have helped other Asian countries' exports due to vulnerability of currency unless they don't have large government debts
- Evaluating currency status may work as the early warning system as it seems to be associated to capital flows in the yuan's case
- Korean won and Singaporean dollar may emerge from the vulnerable currency status in near future. So, Japan's lessons may provide a hint for growth and exchange rate stability.

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