



BANK FOR INTERNATIONAL SETTLEMENTS

Regional pull vs global push factors: China and US influence on Asia-Pacific financial markets

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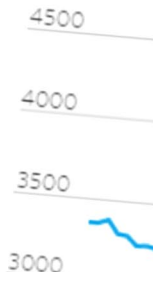


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Asian Shares Rise After China Cuts Rates

Shanghai up 3%, Tokyo up 1.3% after the third rate cut in six months

The Shanghai Composite Index



China's 'Black Monday' sends markets reeling across the globe - as it happened

World's financial markets today, as Chinese rout the US

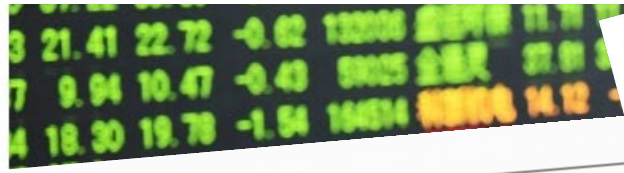
World

U.S., world stock markets slide as panic in China spreads

China rout sparks global stocks selloff

by Charles Riley @CRrileyCNN

January 4, 2016: 8:40 AM ET



U.S. stocks rally amid China easing

U.S. stocks advanced on Monday, for the second straight session, driven by a rally in bank stocks as well as a continuation of gains in technology.

closed 25.22 points, or 1.2%, to 2,000.00. The S&P 500 was the biggest winner, finishing up 0.36% to 1,875.00. The Industrial Average DJIA, +0.36% finished up 0.36% to 1,875.00.

Markets | Mon Jan 4, 2016 5:36pm EST

China selloff sparks gloomy 2016 start for stocks

NEW YORK | BY HERBERT LASH



BREAKINGVIEWS

Motivation

- US influences on global financial markets and real economy have been well documented
- China's rising impact is mainly studied from the real economy perspective
- However, there is little formal study on China's impact through financial linkages, although China's financial market influence appears to be rising

Overview

- We study financial market interactions between the US, China and Asian economies, using a Structural VAR framework.
- A range of markets are covered, including stock, bond and FX markets. Both cross-market and cross-country spillovers are examined.
- We also compare spillovers during crisis and tranquil times.
- We document China's influence in a time series perspective.

Key findings

- China's equity and FX markets have significant impacts on Asian markets
- China's bond market remains a negligible player
- China's impacts have become comparable to the US during non-crisis periods
- US markets have stronger spillovers during crisis periods

Agenda

- How does China influence Asian markets?
- Literature
- Methodology
- Results

China's global linkages

- China's financial linkages are much lower than trade linkages

International investment position

End-2013¹, as a percentage of GDP

Table 1

	PI Asset	PI Liability	PI Total	FDI Asset	FDI Liability	FDI Total
China	3	4	7	7	26	32
IFCs						
Hong Kong SAR	408	190	598	493	527	1,020
Singapore	295	59	354	169	284	453
Selected Asian Economies						
Indonesia	2	20	22	1	24	26
Korea	13	47	60	17	13	30
Malaysia	20	63	83	48	51	100
Philippines	4	29	32	4	11	15
Thailand	8	36	44	15	51	66
Advanced Economies						
United States	55	92	147	42	34	77
United Kingdom	161	159	321	74	63	137
Germany	85	97	182	54	38	92



How does China affect Asian markets

- US markets influence through the interest rate, risk taking, portfolio re-balancing, policy spillovers and sentiment spillovers
- For China, some channels may be weaker and there can be new channels.
 - Interest rate channel: may be limited
 - Portfolio re-balancing
 - Chinese economy's regional importance
 - Proxy trade
 - Sentiment

Literature: International financial market spillovers

- Extensive literature on co-movements of international financial markets (reviewed by Gagnon and Karolyi, 2006) and financial contagion (reviewed by Dornbusch, Claessens and Park, 2000, and Dungey et al, 2003)
- However, many studies only focus on a single market:
 - Equity market: Connolly and Wang (2003), Chow, Liu and Niu (2011)
 - Bond market: Felices, Grisse and Yang (2009)
 - FX market: Andersen and Bollerslev (1998)
- A few of studies have looked at several markets, eg. Ehrmann, Fratzscher and Rigobon (2005, 2011)

Literature: spillovers from major markets to Asia

- A number of studies establish renminbi impact on regional currencies (eg. Shu, He and Cheng, 2014)
- He, Zhang and Wang (2009) study spillovers from the US and China to financial markets (eg. stock, bond and FX) in Hong Kong during crisis and tranquil time
- Financial market spillovers from emerging market economies (IMF, 2016)

Model

- Structural VAR model
 - 3 country block: US, China, Asia
 - 8 endogenous variables:
 - US: long term bond yield, stock
 - China and Asia blocks: long term bond yield, stock, exchange rate

● (1)
$$A y_t = \Pi(L) y_t + e_t ,$$

● Where:

$$y_t = \begin{pmatrix} US_bond_t \\ US_stock_t \\ China_bond_t \\ China_stock_t \\ RMB_t \\ Asian_bond_t \\ Asian_stock_t \\ Asian_currency_t \end{pmatrix} .$$

Sign restrictions for SVAR identification

- Reduced form VAR is given as:

- (2)
$$\mathbf{y}_t = \mathbf{B}(\mathbf{L})\mathbf{y}_t + \boldsymbol{\varepsilon}_t,$$

- Identification methods :

- Traditional methods: recursive, long-run effects (Blanchard and Quah, 1989) and short-run restrictions (Gali, 1992)
- More recent methods: Sign restrictions (Canova and De Nicolo, 2002; Uhlig, 2005; Hau and Rey, 2004, etc.)

- “Sign restrictions” is a non-parametric approach

- Pairwise interaction can be allowed among all variables
- Reverse causation can be investigated: eg. China influences US market

Key theoretical hypotheses (1)

- Assumptions made for sign restrictions are based on theoretical grounds and established empirical evidence:

“Cross-country, within-market” spillovers:

- US impacts on other blocks
 - US bond yields have positive impact on Asian bond yields
 - global liquidity cycle: eg. Miranda-Agrippino and Rey, 2014; He and McCauley, 2013
 - policy spillovers: eg. Hofmann and Takats, 2015
 - US stocks have positive impact on Chinese and Asian stock prices
 - Pavlova and Rigobon, 2007

Key theoretical hypotheses (2)

- China's impact on other blocks
 - Chinese stocks have positive impact on US and Asian stocks
 - business cycle synchronisation: He and Liao, 2012
 - Pavlova and Rigobon, 2007

 - RMB/USD rate has positive impact on Asian currencies
 - RMB's regional impact: Shu, He and Cheng, 2015

"Cross-market, cross-country" spillovers

- US stock on Asian currency: positive foreign stock price shock will lead to domestic currency appreciation (Hau and Rey, 2004)

Sign restrictions: summary

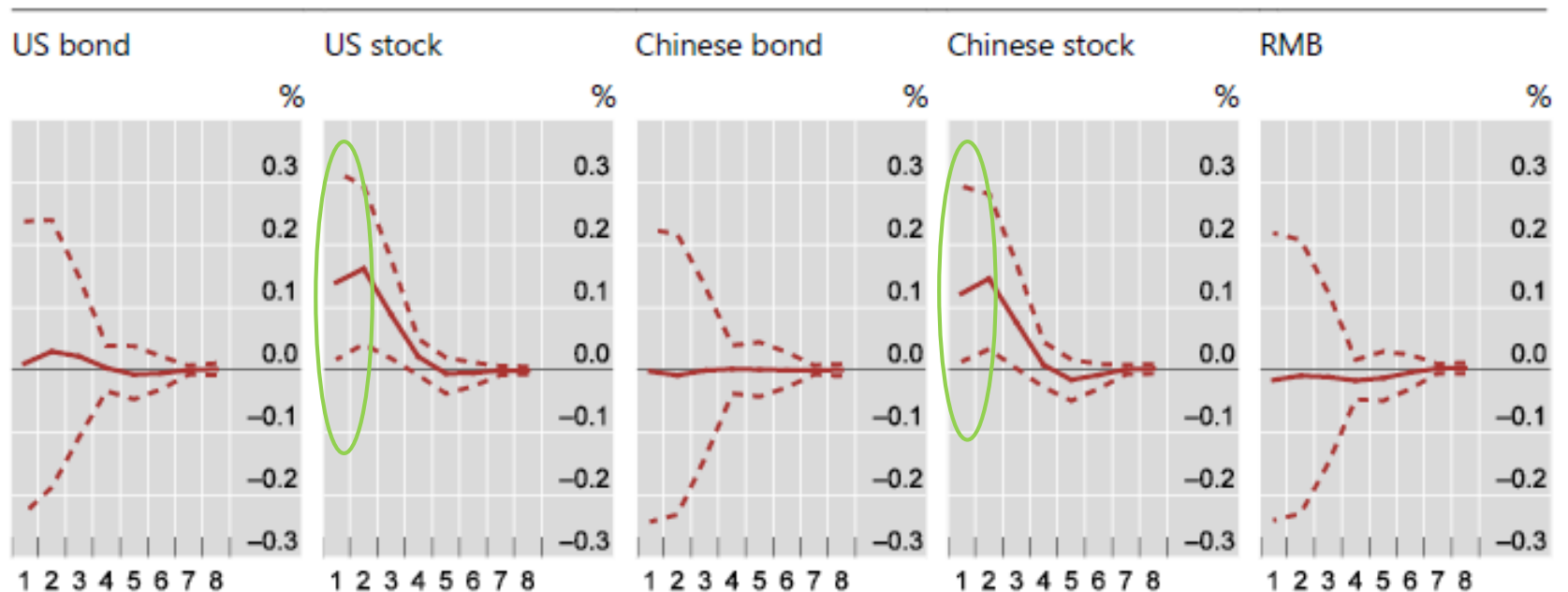
	US bond	US stock	China bond	China stock	RMB/USD	Asian bond	Asian stock	Asian currency /USD
US bond shock	+					+		
US stock shock		+		+			+	-
China bond shock			+					
China stock shock		+		+			+	
RMB/USD shock					+			+
Asian bond shock						+		
Asian stock shock							+	
Asian currency/USD shock								+

Data

- Asian economies: cover 11 major economies in Asia-Pacific
- Use two-day rolling average returns to address the issue of different trading time due to the time zone difference (Forbes and Rigobon, 2002; IMF, 2016)
- Daily data from Q1 2002 to Q3 2013
- 5 days effects of variance decomposition: “short-term” means contemporaneous effect and “long-term” means the 5th day’s effect.

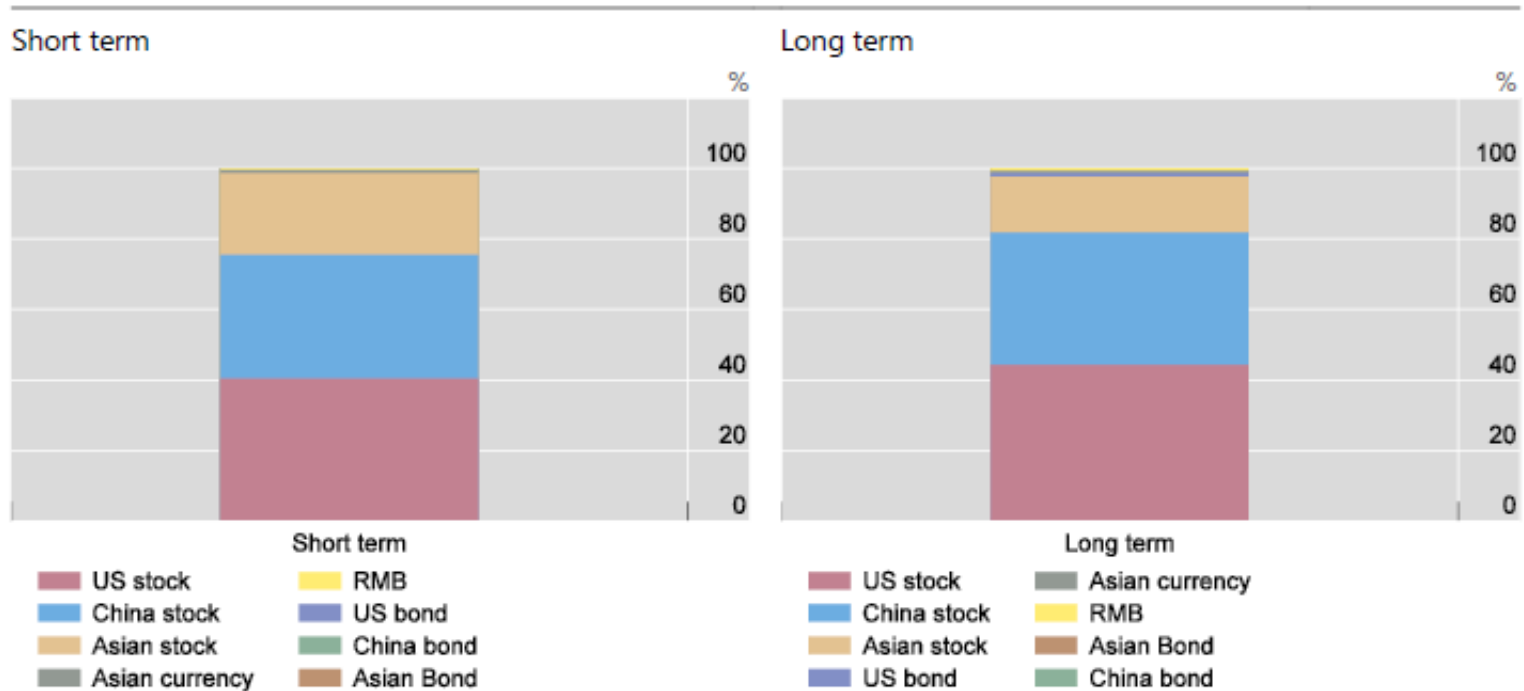
Asian stock market: impulse response

- Asia stocks' responses are similar to US and China stock shocks upon impact



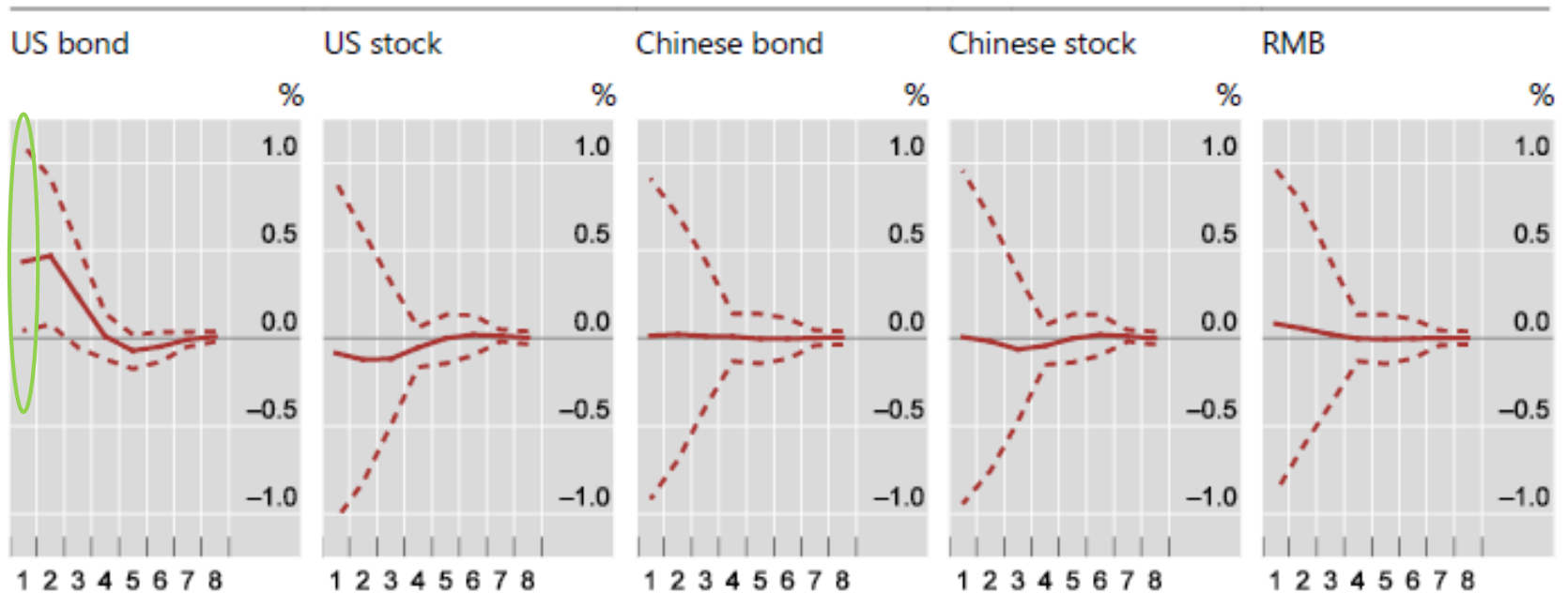
Asian stock market: variance decomposition

- US stock market has the biggest impact on Asian stocks, closely followed by China stock movements



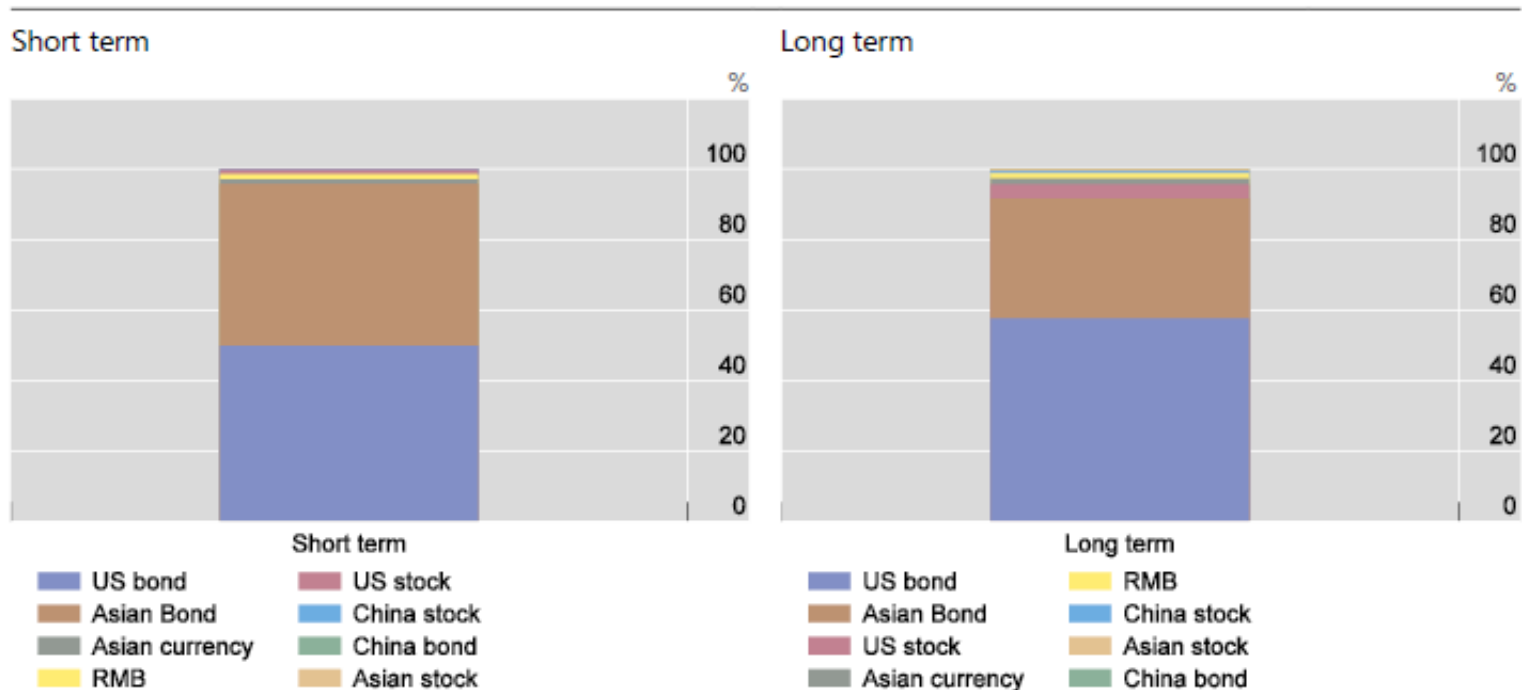
Asian bond market: impulse response

- Asian bonds respond strongly to US bond movements



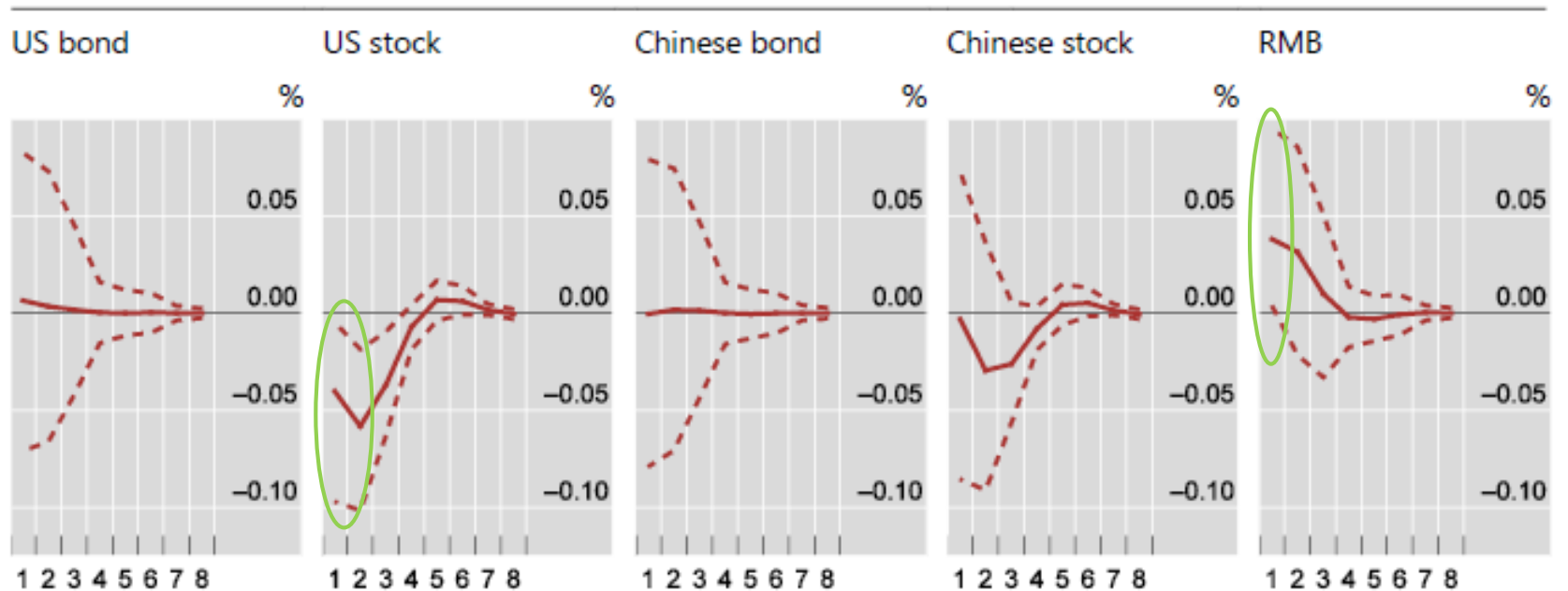
Asian bond market: variance decomposition

- US bond market has a dominant impact on Asian bond markets
- China bond market has negligible influence



Asian currency: impulse response

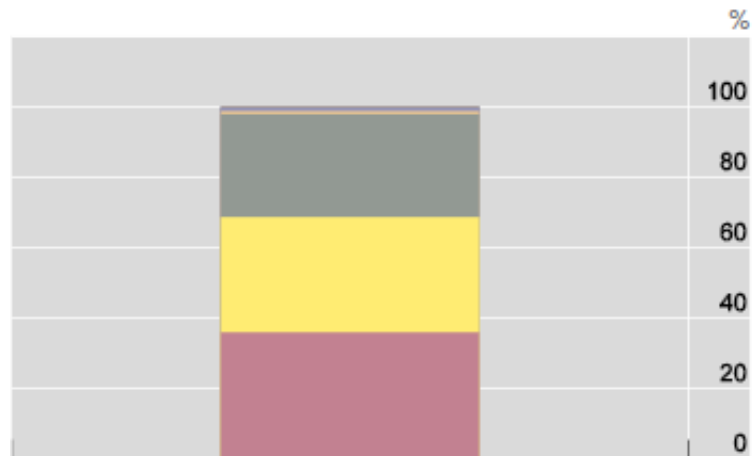
- Asian currencies respond to shocks to US bonds and RMB



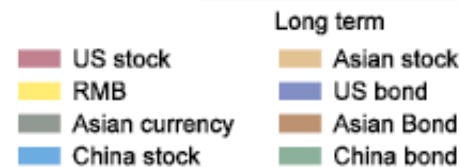
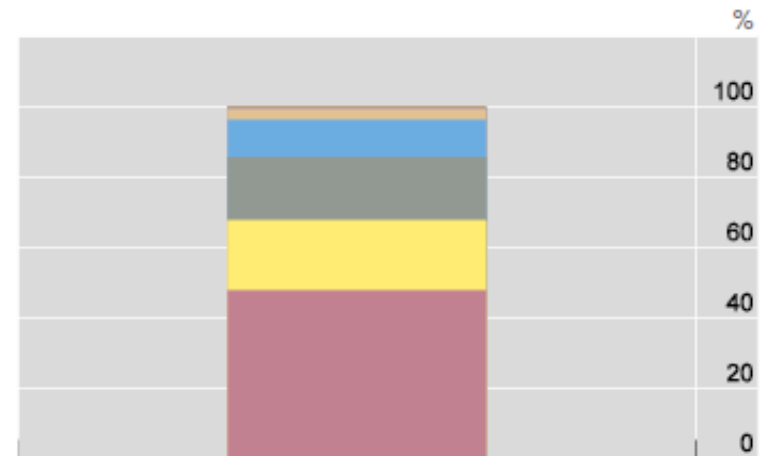
Asian currency: variance decomposition

- RMB and US stocks affect Asian currency movements, particularly in the short run.
- In the long run, other factors such as China stock movements also have impact on Asian currencies.

Short term

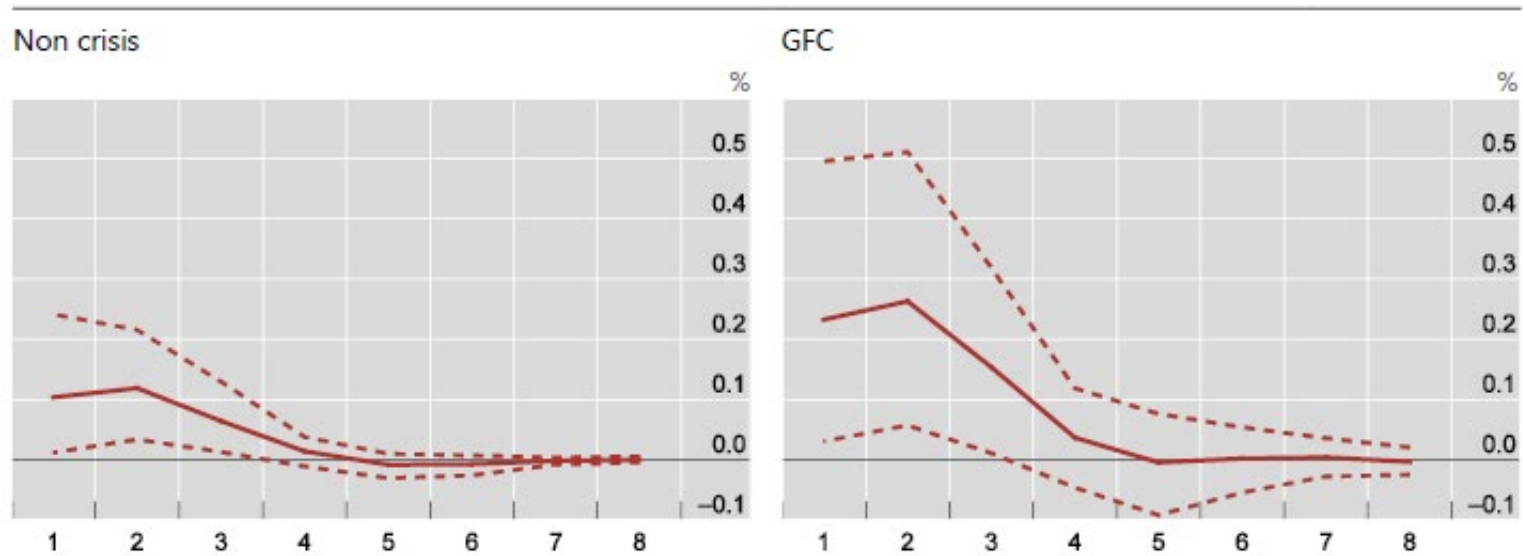


Long term



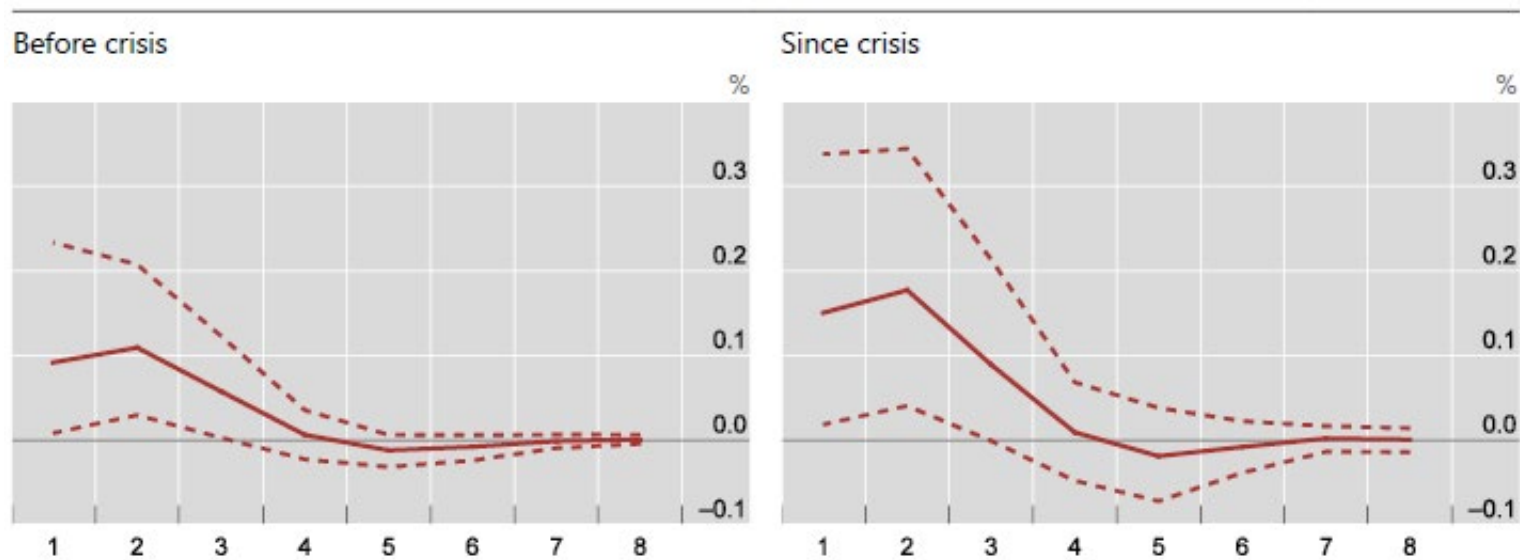
US stocks on Asian stock market: crisis vs non-crisis

- US stock market has noticeably stronger impact during crisis



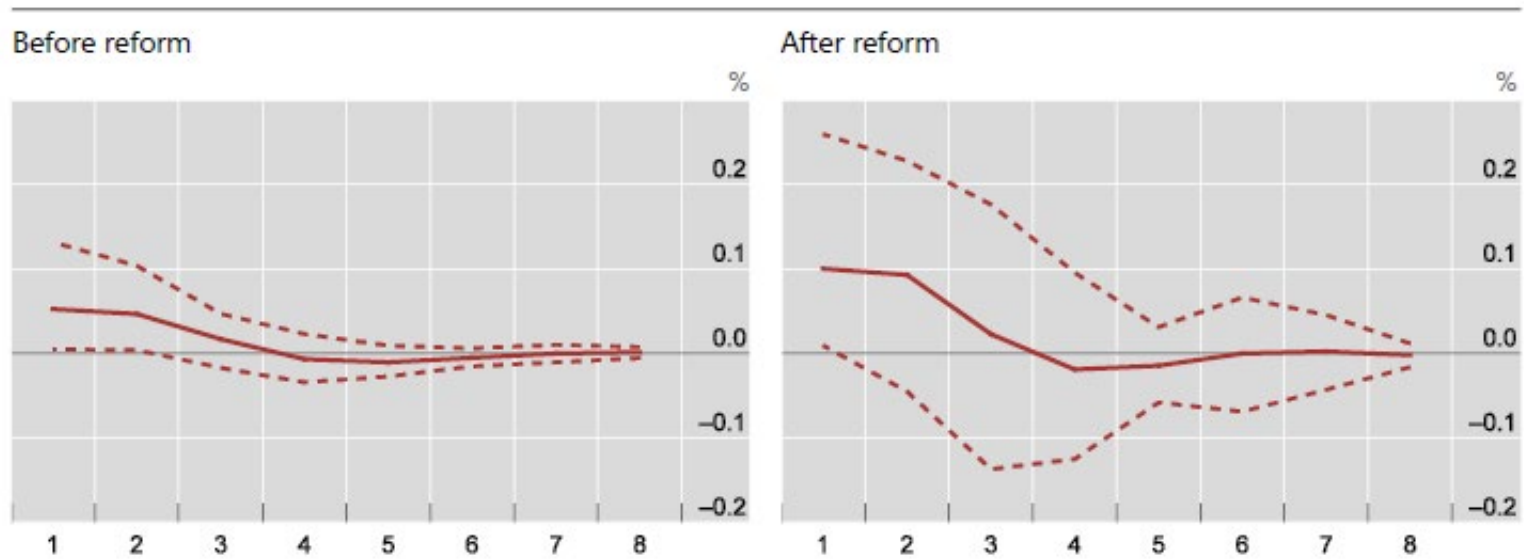
China impact on Asian stocks: before and since crisis

- Chinese stock market's impact has grown since the GFC



China impact on Asian currencies: before and since crisis

- RMB impact on regional currencies has grown



Robustness checks

- Re-estimate the system, eliminating the sign to be tested (Hau and Rey, 2004)
 - Eg. to test the robustness of Chinese stocks on Asian stocks ($\beta_{4,7} > 0$)
 - Estimate the system with the signs in Table 2; but
 - Without the sign $\beta_{4,7} > 0$

Summary findings

- China's stock and currency influences on Asia have been growing over time
- China's bond market remains isolated from both the US and Asia
- The US has stronger spillovers to Asian markets during crisis periods, but US and China's stock impacts have become more comparable during non-crisis periods.

Interpretation/Implications

- Traditional discussion along the lines of (domestic) 'pull' vs 'push' factors
- The analysis suggests:
 - US remains an important push factor
 - (domestic) pull factors also play a role
 - China becomes a key regional pull factor
- Interaction of international push and regional push factors
 - Moving in the opposite direction: they partly offset each other
 - In recent past, they moved in the same direction, reinforcing the trend

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