



FACULTY OF  
BUSINESS &  
ECONOMICS

**FNCE30004 Asian Capital Markets (AY2017)**

**Research Project: China's Financial Integration with the World**

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## **1. Introduction**

The purpose of this report is to examine China financial integration with the global economy as its economy continues to grow at a remarkably fast pace. It is forecast to overtake the US as the world largest economy within the next 50 years.

The report will first discuss the relevant literature review regarding financial integration, followed by analyzing the 3 relevant measurements to financial integration (economic data, financial data, and risk premium data). Lastly, the findings are explained through qualitative explanations for each measurement.

## **2. Literature Review**

### **2.1. Financial Integration & Net Portfolio Investment**

Financial integration is the process through which financial markets become more closely integrated with other markets by broadening and deepening financial links or through market-driven and institutional processes. This implies an increase in capital flows and a tendency for prices and returns on traded financial assets in different countries to equalize (Brouwer, 2005).

The 2 channels of financial integration are:

- Portfolio investment in equity and debt securities
- Foreign direct investment in foreign ownership of domestic productive assets

Foreign investors get to engage in the international diversification of portfolio assets achieving a higher risk-adjusted return (Stuart & Markowitz, 1959) and the ability to access foreign credit. Developing countries on the other hand gain access to lower cost of capital (La Porta, et al., 1998; Bekaert & Harvey, 2003) and access to foreign exchange.

There would be an improvement in financial efficiency, increase in liquidity resulting in deeper and broader markets (Levine & Zervos, 1996) and competition from positive spillover effect (Feldman & Kumar, 1995). This will result in a developed financial system that improves the allocation of capital (Wurgler, 1999; Love, 2003; Rajan & Zingales, 1998).

## **2.2. Governance**

### **International Organization of Securities Commissions (IOSCO) Principles**

In the latest International Monetary Fund and World Bank joint assessment of China in 2012, it was found that out of the 29 IOSCO principles mentioned in the report, 18 were fully implemented, 8 were broadly implemented and 3 were partially implemented. The authorities noted that China "has enhanced the transparency of the market, broadened the range of available products and improved the financial soundness of intermediaries." These reforms have been carefully planned and implemented and are welcomed by market participants. Based on findings by Lipinsky and Ong (2014), investors should receive higher returns and lower volatility.

### **Regulatory Reforms**

In May 2016, both of China stock exchanges tightened regulations on share suspensions, requiring companies to disclose more details and shorten the length of suspensions. This prompted MSCI to include 222 A-shares into the index. MSCI (2016) stated that "The rights and interest of investors, and the liquidity of the market, should prevail over the rights and interest of listed companies".

In addition, many standard market practices were implemented over the years. For example, the standardized split-share structure in 2005, abolishment of stamp duties in 2008, margin trading and short selling in 2010, CSI 300 stock index futures in 2011 and IPO reforms in 2013.

### **Payments System Reforms**

The inadequacy of the infrastructure supporting cross-border RMB payments led to the development of the China Interbank Payment System (CIPS). CIPS is an important step to rectify deficiencies in RMB settlement and played a critical role in its growth as an international payment currency. Because payment messages are supported in both English and Chinese, and it operates under ISO20022 messaging standard and SWIFT bank identifier codes, cross-border payments made through CIPS achieve higher straight-through processing rates.

### 3. Methodology

#### 3.1. Measurements

This report will use 3 different measurements to measure the degree of financial integration:

- Quantity Studies by using actual international capital flow (economic data)
- Price/Volatility Studies by examining informational efficiency between markets (financial data)
- Premium studies by studying the correlation in risk premiums (risk premium data)

#### 3.2. Sample Selection

A total of 6 major economies are used as proxies to measure China integration with the world:

- Main Economies: United States (US) and China (CN)
- Developed Economies: Australia (AU) and United Kingdom (GB)
- Emerging Economies: Singapore (SG) and Hong Kong (HK)

The sample data are yearly period for economic data and monthly for financial data, from January 2002 to March 2017. The data are split into 2 time periods to measure if there is an improvement in financial integration:

- Pre-GFC (2002M1 – 2008M12)
- Post GFC (2009M12 – 2017M3)

#### 3.3. Variables

Economic Data:

- Net Portfolio Investment & GDP
- GDP Growth Rate
- Net Portfolio Investment Growth Rate

Financial Data:

- Govt Debt Yield Spread
- Govt Debt ST Yield Growth Rate
- Govt Bond LT Yield Growth Rate
- Equity Returns Growth Rate

Risk Premium Data:

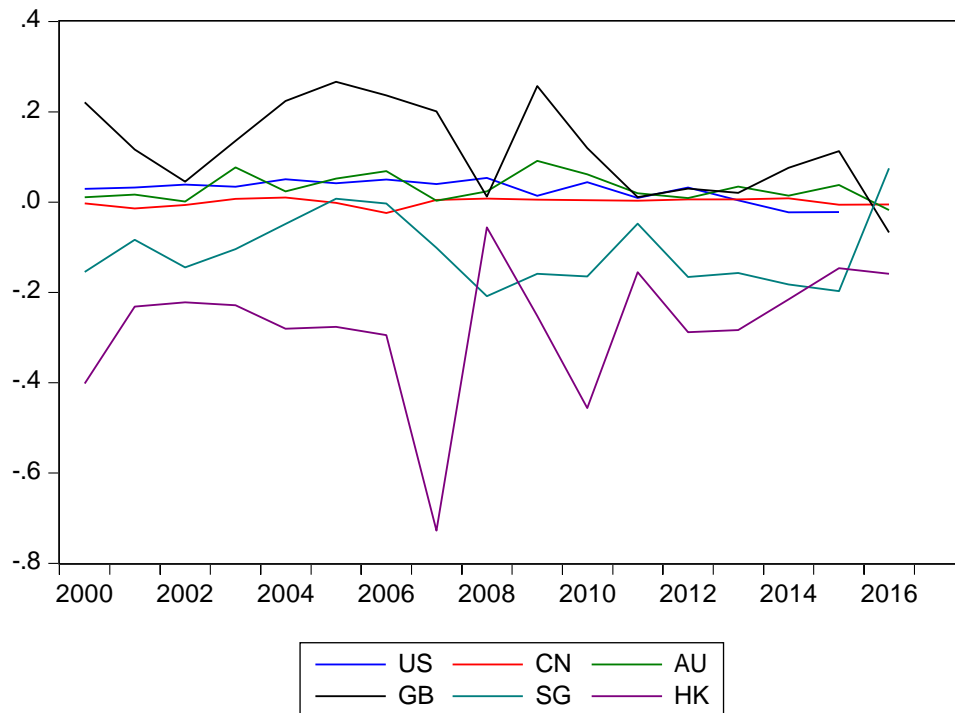
- Equity Risk Premium

Equity Proxies:

Market Index	US	CN	AU	GB	SG	HK
	S&P 500	CSI 100	ASX 200	FTSE 100	STI 30	HSI 60

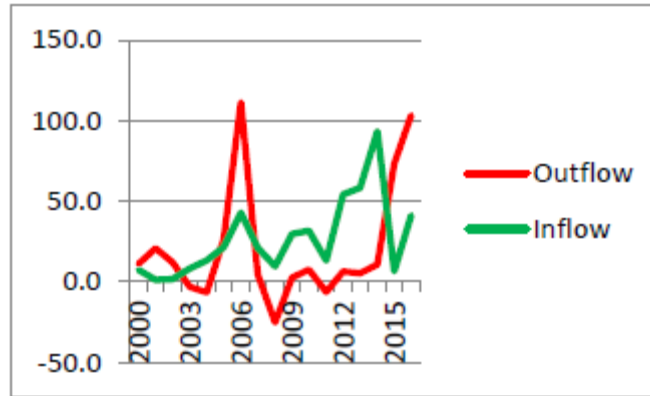
#### 4. Economic Data

##### 4.1. Net Portfolio Investment & GDP



**Fig 4.1.1 Net Portfolio Investment/GDP Ratio**

The graph above displays the net portfolio investment to GDP ratio. CN experienced a relatively stable net portion investment to GDP throughout the sample period, implying a steady flow of funds relative to GDP and hence stronger financial integration.



**Fig 4.1.2 CN Portfolio Investment Inflow & Outflow**

CN had almost identical inflow and outflow throughout the sample period, implying that both directions of capital movement are relatively equally opened. In addition, the magnitude of increased post-GFC.

Year	US	CN	AU	GB	SG	HK
2007	0.016646	0.28871	0.090948	-0.06379	0.071026	0.036389
2008	-0.02038	0.112569	-0.04744	-0.17305	0.001053	-0.02417
2009	0.037847	0.184688	0.268246	0.024245	0.243428	0.068224

**Fig 4.1.3 GDP Growth (2007–2009)**

CN that did not experience a recession during the GFC. This further strengthens the possibility that CN financial integration with the global economy was weak pre-GFC and grew stronger post-GFC.

## 4.2. GDP Growth Rate

Covariance Analysis: Ordinary  
Date: 09/20/17 Time: 08:56  
Sample: 2000 2008  
Included observations: 9

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.172997 0.464715 0.6562	1.000000 ----- -----				
AU	0.609140 2.032166 0.0817	0.321942 0.899677 0.3982	1.000000 ----- -----			
UK	0.844110 4.165288 0.0042	0.134056 0.357908 0.7310	0.851123 4.289533 0.0036	1.000000 ----- -----		
SG	0.578657 1.877190 0.1026	0.686044 2.494778 0.0413	0.659452 2.320921 0.0533	0.605811 2.014592 0.0838	1.000000 ----- -----	
HK	0.550306 1.743756 0.1247	0.772671 3.220344 0.0146	0.289680 0.800755 0.4496	0.338411 0.951491 0.3730	0.837350 4.052589 0.0049	1.000000 ----- -----

**Fig 4.2.1 GDP Growth Rate Correlation (2002–2008)**

Covariance Analysis: Ordinary  
Date: 09/20/17 Time: 09:05  
Sample: 2009 2016  
Included observations: 8

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.207864 0.520531 0.6213	1.000000 ----- -----				
AU	-0.097695 -0.240453 0.8180	0.695453 2.370681 0.0555	1.000000 ----- -----			
UK	0.627090 1.971958 0.0961	0.652886 2.111326 0.0792	0.285535 0.729799 0.4930	1.000000 ----- -----		
SG	0.070747 0.173730 0.8678	0.680551 2.275149 0.0632	0.925674 5.993388 0.0010	0.227984 0.573550 0.5871	1.000000 ----- -----	
HK	0.437729 1.192529 0.2781	0.833864 3.700457 0.0101	0.483770 1.353972 0.2245	0.609595 1.883653 0.1086	0.451364 1.239004 0.2616	1.000000 ----- -----

**Fig 4.2.2 GDP Growth Rate Correlation (2009–2017)**

The correlation of the GDP growth rate of all economies with CN is positive and statistically significant post-GFC.



### 4.3. Net Portfolio Investment Growth Rate

Covariance Analysis: Ordinary  
Date: 09/20/17 Time: 09:19  
Sample: 2000 2008  
Included observations: 9

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.320666 0.895703 0.4002	1.000000 ----- -----				
AU	-0.132798 -0.354489 0.7334	-0.287721 -0.794849 0.4528	1.000000 ----- -----			
UK	-0.790332 -3.412916 0.0112	-0.187918 -0.506203 0.6283	0.041316 0.109404 0.9160	1.000000 ----- -----		
SG	0.247188 0.674945 0.5214	0.099858 0.265526 0.7983	-0.122742 -0.327220 0.7531	-0.304717 -0.846459 0.4253	1.000000 ----- -----	
HK	0.242270 0.660669 0.5300	0.230087 0.625537 0.5515	-0.440625 -1.298646 0.2352	-0.428328 -1.254115 0.2501	0.837350 4.052589 0.0049	1.000000 ----- -----

**Fig 4.3.1 Net Portfolio Investment Growth Rate Correlation (2002–2008)**

Covariance Analysis: Ordinary  
Date: 09/20/17 Time: 09:39  
Sample: 2009 2015  
Included observations: 7

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	-0.020366 -0.045548 0.9654	1.000000 ----- -----				
AU	0.030487 0.068203 0.9483	-0.317886 -0.749701 0.4872	1.000000 ----- -----			
UK	-0.532167 -1.405512 0.2189	0.400392 0.977039 0.3734	-0.037718 -0.084399 0.9360	1.000000 ----- -----		
SG	0.551036 1.476552 0.1998	0.311098 0.731958 0.4970	-0.254994 -0.589678 0.5810	-0.252774 -0.584192 0.5845	1.000000 ----- -----	
HK	0.052187 0.116853 0.9115	-0.163181 -0.369840 0.7266	-0.063533 -0.142352 0.8924	-0.014711 -0.032899 0.9750	0.528586 1.392368 0.2226	1.000000 ----- -----

**Fig 4.3.2 Net Portfolio Investment Growth Rate Correlation (2009–2017)**

The correlation of the net portfolio investment growth rate of all economies with CN is statistically insignificant in both periods.

#### **4.4. Findings**

The results from the analysis of economic data are conclusive that financial integration did take place. The report will now investigate the reasons for this:

##### **RMB/Qualified Foreign (RQFII/QFII) & Domestic Institutional Investor (RQDII/QDII)**

The QFII and RQFII regime was launched to allow foreign financial institutions to apply for a license to invest in China securities like A-share and warrants while the QDII and RQDII were for domestic financial institutions to invest overseas.

Throughout the regime's lifetime, the amount of license, quota and repatriation limits were raised periodically showing signs of loosening capital control.

##### **China Interbank Bond Market (CIBM) Direct**

Launched in 2010, it allowed foreign central banks and RMB clearing banks to invest in CIBM. The rules were relaxed twice allowing for international financial institutions, sovereign bond funds and overseas institutional investors to participate.

This scheme allowed a wider range of offshore investors to access the China bond market and for more dynamic levels of investments as there were no specific approval and quota limits. There is no lock-up period to repatriate investment principle and daily repatriation is possible which provided a smoother cash flow in and out of China for global investors.

##### **Global Financial Crisis (GFC)**

The International Monetary Fund (2014) found that "advanced" economies accounted for only 31% of global GDP while emerging and developing economies accounted for 69% of global GDP from 2007 to 2014, with China taking the lead. Market forces and rising global uncertainty allowed China to emerge as a regional economic power and the size and dynamism of its economic activity and trading relationships have played the dominant role in linking specifically the Asian economies.

##### **Financial Innovation**

Due to the bond market reforms, new instruments such as green bonds (Ng, 2016), municipal bonds and panda bonds have seen explosive growth recently. As the market becomes more established and mature, the range of issuers and investors has surged considerably allowing them to choose from a wide range of assets to fulfil their financial goals.

## 5. Financial Data

### 5.1. Govt Yield Spread

Covariance Analysis: Ordinary  
Date: 09/17/17 Time: 19:39  
Sample: 1 84  
Included observations: 84

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.036407 0.329897 0.7423	1.000000 ----- -----				
AU	0.452739 4.597947 0.0000	0.076683 0.696448 0.4881	1.000000 ----- -----			
UK	0.524629 5.580347 0.0000	0.135773 1.240972 0.2182	0.651222 7.770669 0.0000	1.000000 ----- -----		
SG	0.220683 2.048886 0.0437	0.039533 0.358269 0.7211	0.204330 1.890161 0.0623	0.020417 0.184922 0.8537	1.000000 ----- -----	
HK	0.268098 2.519986 0.0137	0.125185 1.142589 0.2565	0.268612 2.525186 0.0135	0.075637 0.686891 0.4941	0.362543 3.522624 0.0007	1.000000 ----- -----

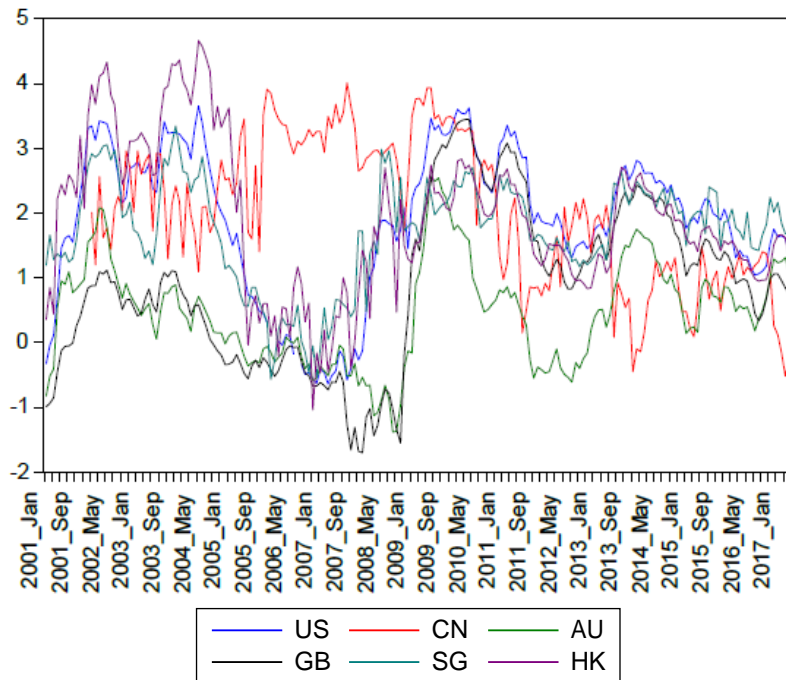
**Fig 5.1.1 Yield Spread Correlation (2002–2008)**

Covariance Analysis: Ordinary  
Date: 09/17/17 Time: 19:40  
Sample: 1 100  
Included observations: 100

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	-0.114661 -1.142619 0.2560	1.000000 ----- -----				
AU	0.766793 11.82572 0.0000	0.008271 0.081883 0.9349	1.000000 ----- -----			
UK	0.830787 14.77632 0.0000	-0.113903 -1.134968 0.2592	0.712145 10.04209 0.0000	1.000000 ----- -----		
SG	0.465050 5.200316 0.0000	-0.127933 -1.276968 0.2046	0.326734 3.422329 0.0009	0.465908 5.212566 0.0000	1.000000 ----- -----	
HK	0.741519 10.94100 0.0000	-0.105450 -1.049759 0.2964	0.632056 8.074399 0.0000	0.598625 7.398084 0.0000	0.399284 4.311291 0.0000	1.000000 ----- -----

**Fig 5.1.2 Yield Spread Correlation (2009–2017)**

The correlation of yield spread of all economies with CN is statistically insignificant in both periods.



**Fig 5.1.3 Yield Spread**

Throughout the sample period, CN exhibited contradictory movement in yield spread in contrast with other countries.

## 5.2. Govt Short-Term Yield

Covariance Analysis: Ordinary  
Date: 09/17/17 Time: 20:13  
Sample: 1 84  
Included observations: 84

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.034661 0.314060 0.7543	1.000000 ----- -----				
AU	0.256322 2.401324 0.0186	0.189243 1.745201 0.0847	1.000000 ----- -----			
UK	0.576285 6.385424 0.0000	0.216198 2.005184 0.0482	0.624824 7.246755 0.0000	1.000000 ----- -----		
SG	0.103217 0.939684 0.3501	-0.083382 -0.757698 0.4508	0.080328 0.729759 0.4676	-0.077315 -0.702218 0.4845	1.000000 ----- -----	
HK	0.128507 1.173413 0.2440	0.099498 0.905489 0.3679	0.185491 1.709354 0.0912	0.006519 0.059033 0.9531	0.251422 2.352287 0.0211	1.000000 ----- -----

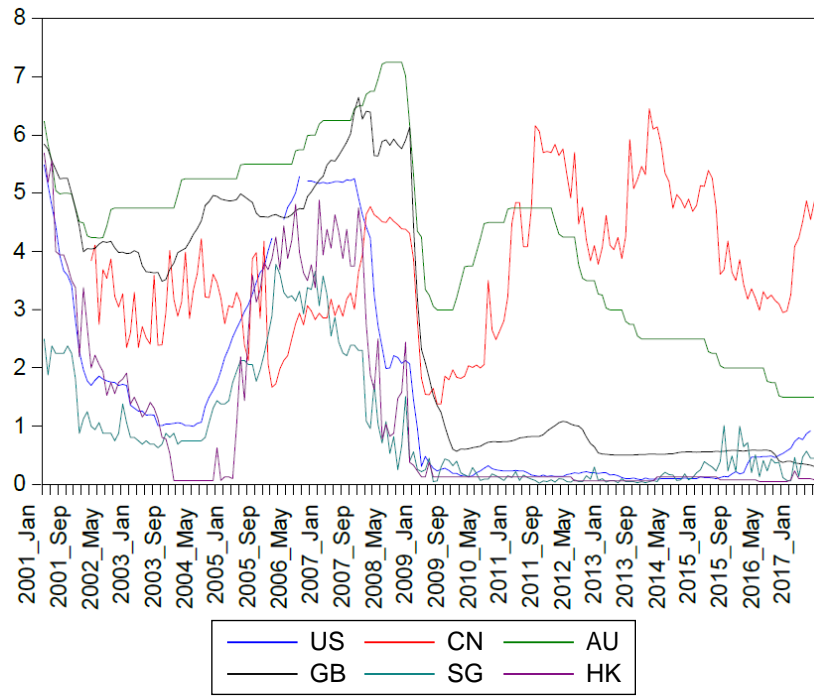
**Fig 5.2.1 ST Yield Correlation (2002–2008)**

Covariance Analysis: Ordinary  
Date: 09/17/17 Time: 20:14  
Sample: 1 100  
Included observations: 100

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.020037 0.198397 0.8431	1.000000 ----- -----				
AU	-0.143642 -1.436888 0.1539	0.149597 1.497790 0.1374	1.000000 ----- -----			
UK	0.156627 1.569904 0.1197	0.059688 0.591936 0.5553	0.342781 3.612203 0.0005	1.000000 ----- -----		
SG	0.011158 0.110465 0.9123	0.019124 0.189350 0.8502	0.013822 0.136841 0.8914	0.009954 0.098541 0.9217	1.000000 ----- -----	
HK	0.025136 0.248917 0.8039	0.045776 0.453635 0.6511	0.053155 0.526956 0.5994	0.031595 0.312932 0.7550	0.307850 3.203125 0.0018	1.000000 ----- -----

**Fig 5.2.2 ST Yield Correlation (2009–2017)**

The correlation of ST yield of all economies with CN is statistically insignificant post-GFC.



**Fig 5.2.3 ST Yield**

Throughout the sample period, CN exhibited contradictory movement in ST yield in contrast with other countries.

### 5.3. Govt Long-Term Yield

Covariance Analysis: Ordinary  
Date: 09/17/17 Time: 20:36  
Sample: 1 96  
Included observations: 96

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.134524 1.316226 0.1913	1.000000 ----- -----				
AU	0.805970 13.20057 0.0000	0.239531 2.391970 0.0187	1.000000 ----- -----			
UK	0.839789 14.99699 0.0000	0.174541 1.718620 0.0890	0.851644 15.75398 0.0000	1.000000 ----- -----		
SG	0.512743 5.790312 0.0000	0.201061 1.989998 0.0495	0.472527 5.198276 0.0000	0.511590 5.772664 0.0000	1.000000 ----- -----	
HK	0.787808 12.40108 0.0000	0.224287 2.231389 0.0280	0.722753 10.13931 0.0000	0.727693 10.28608 0.0000	0.500591 5.606443 0.0000	1.000000 ----- -----

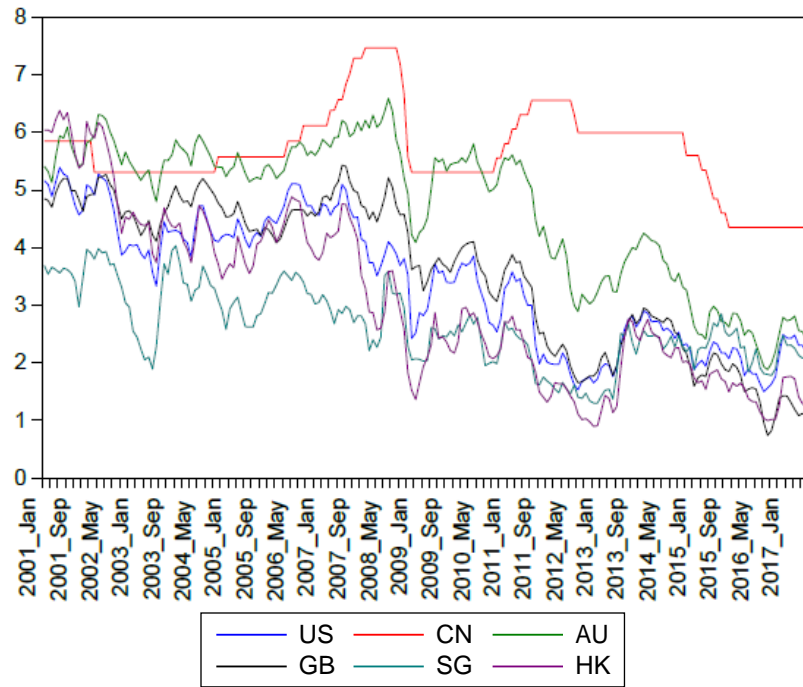
**Fig 5.3.1 LT Yield Correlation (2002–2008)**

Covariance Analysis: Ordinary  
Date: 09/17/17 Time: 20:37  
Sample: 1 101  
Included observations: 101

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.088484 0.883867 0.3789	1.000000 ----- -----				
AU	0.849911 16.04877 0.0000	0.057763 0.575695 0.5661	1.000000 ----- -----			
UK	0.822824 14.40622 0.0000	0.061339 0.611467 0.5423	0.733208 10.72836 0.0000	1.000000 ----- -----		
SG	0.551993 6.586640 0.0000	-0.038023 -0.378597 0.7058	0.438866 4.859667 0.0000	0.531404 6.241640 0.0000	1.000000 ----- -----	
HK	0.751404 11.33054 0.0000	0.113252 1.134143 0.2595	0.637672 8.236644 0.0000	0.555764 6.651640 0.0000	0.452915 5.054601 0.0000	1.000000 ----- -----

**Fig 5.3.2 LT Yield Correlation (2009–2017)**

The correlation of LT yield of all economies with CN is statistically insignificant post-GFC.



**Fig 5.3.3 LT Yield**

Throughout the sample period, CN exhibited contradictory movement in LT yield in contrast with other countries.



## 5.4. Equity Returns Growth Rate

Covariance Analysis: Ordinary  
Date: 09/17/17 Time: 21:09  
Sample: 1 96  
Included observations: 96

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.282234 2.852324 0.0053	1.000000 ----- -----				
AU	0.791535 12.55756 0.0000	0.316196 3.231429 0.0017	1.000000 ----- -----			
UK	0.753145 11.09973 0.0000	0.308536 3.144799 0.0022	0.760345 11.34965 0.0000	1.000000 ----- -----		
SG	0.733054 10.44917 0.0000	0.308393 3.143183 0.0022	0.772749 11.80390 0.0000	0.719786 10.05274 0.0000	1.000000 ----- -----	
HK	0.744271 10.80435 0.0000	0.469024 5.148816 0.0000	0.675786 8.888902 0.0000	0.639494 8.064729 0.0000	0.732218 10.42348 0.0000	1.000000 ----- -----

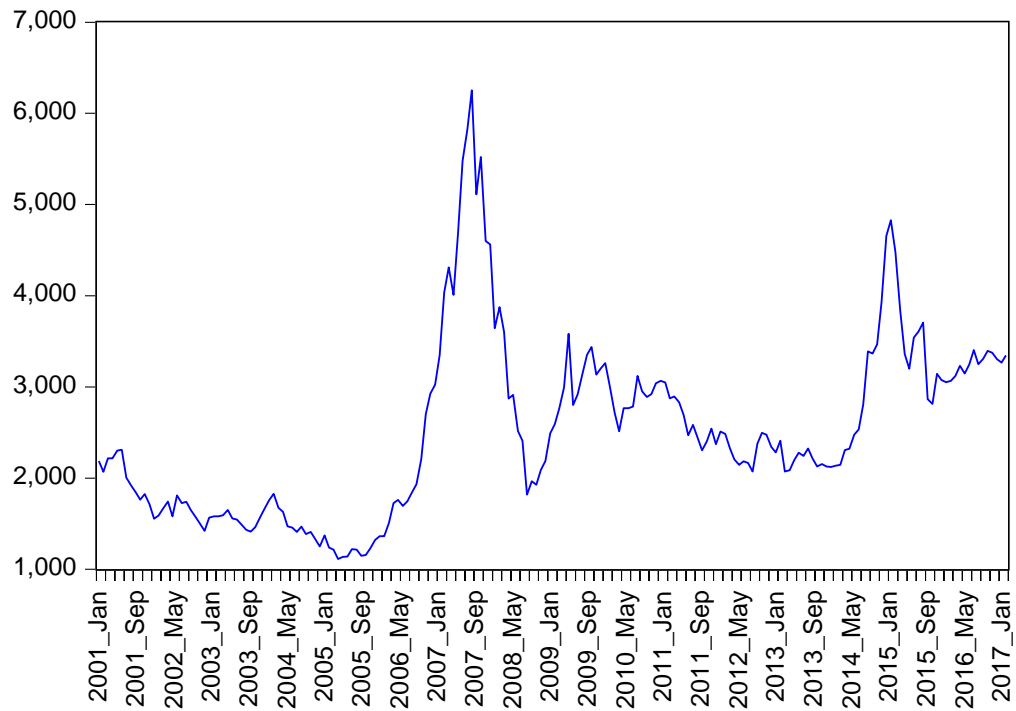
**Fig 5.4.1 Equity Returns Growth Correlation (2001–2008)**

Covariance Analysis: Ordinary  
Date: 09/17/17 Time: 21:10  
Sample: 1 101  
Included observations: 101

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.361858 3.862166 0.0002	1.000000 ----- -----				
AU	0.737652 10.87048 0.0000	0.357099 3.803888 0.0002	1.000000 ----- -----			
UK	0.518927 6.040187 0.0000	0.191239 1.938581 0.0554	0.399373 4.334386 0.0000	1.000000 ----- -----		
SG	0.706165 9.923410 0.0000	0.472128 5.328934 0.0000	0.612830 7.716353 0.0000	0.520094 6.058797 0.0000	1.000000 ----- -----	
HK	0.667628 8.922589 0.0000	0.575702 7.005551 0.0000	0.646972 8.442202 0.0000	0.494463 5.660208 0.0000	0.814971 13.99279 0.0000	1.000000 ----- -----

**Fig 5.4.2 Equity Returns Growth Correlation (2009–2017)**

The correlation of equity returns growth rate of all economies with CN is positive and statistically significant post-GFC.



**Fig 5.4.3 China Equity Prices**

CN equity price displayed erratic movement and is very volatile.

## **5.5. Findings**

The results from the analysis of financial data are conclusive that financial integration did take only to a small degree the debt market while to a large extent for the equity market. The report will now investigate the reasons for this:

### **Debt Market**

#### **Interest Rate Liberalization**

China has taken steps to liberalize its short-term yield. These rates used to be significantly lower than the GDP growth rate, resulting in an increase in yield during post-GFC.

The stagnant pattern in the long-term yield meant that rates were still strictly controlled to ensure stability and growth in the long run. This resulted in the government yield curve being flat, reflecting the lack of proper pricing of the term premium for long-dated bonds (ASIFMA, 2013). Since yields across the curve are similar, market liquidity tends to be concentrated in the one- to three-year part of the curve.

As a result, China's yield curve has inverted twice in 2013 and 2017 respectively. This reflects the pessimistic views of investors about China's long-term growth and inflation outlook due to the renewed regulatory pressure on banks to unwind their leveraged bond portfolios.

#### **Global Slowdown**

The downward trend in the co-movement of long-term yield reflected increasing integration in the global economy. Rachel & Smith (2015) attributed the trend to slow global growth caused by secular trends driving desired saving like demographic change, rising inequality and glut of precautionary saving, and secular trend indirect investments like falling relative price of capital goods, lower public investment, and the rise in the spread between the risk-free rate and return on capital. China however did not carry those factors and thus behaved contradictory.

#### **Internationalism of RMB**

The inclusion of RMB into the SDR basket in 2016 promoted greater use of the RMB as a reserve currency thus driving demand for government debt, as well as higher overall interest in corporate credit (ASIFMA, 2013).

The greater use of the RMB in the denomination and settlement of cross-border trade and financial transactions, expanding trade settlement in Hong Kong, and rising issuance of Renminbi-denominated bonds both in Hong Kong and the Mainland promoted RMB global financial integration.

## **Equity Market**

### **Speculative & Policy-Oriented Market**

The speculative culture of Asian markets combined with the Chinese market being a typical “policy-oriented market” (Guo, et al., 2013; Chan & Chang, 2014) has resulted in a very volatile debt and equity market.

Since the stock market policies have an endogenous dynamic inconsistency, some policies caused fluctuations while others gave the stock market more stability. A study by Wang, et al. (2017) found that since 2010 trading of stock index futures has caused higher fluctuation, long-term constant volatility has increased dramatically, and the strong asymmetric effect has made the market highly sensitive to negative shocks.

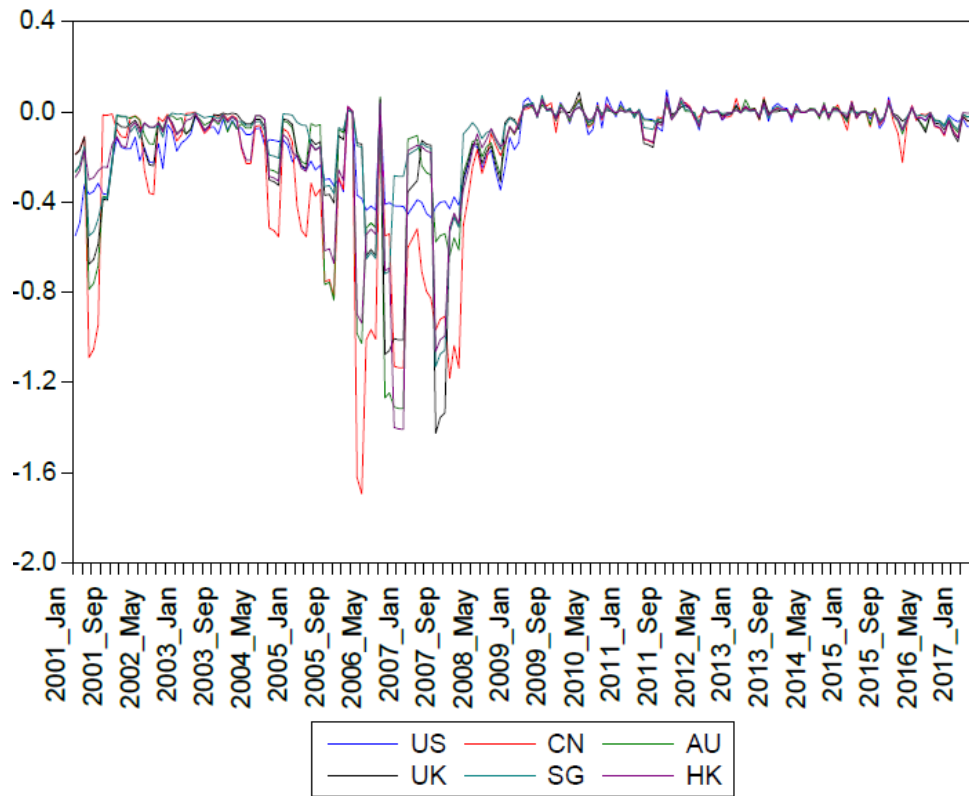
### **Integration with the Hong Kong Market**

The Shanghai (SSE) & Shenzhen (SZSE) - Hong Kong (HKSE) Stock Connect launched to allow for cross-boundary investment channels that connect the SSE and SZSE with the HKSE thus increasing liquidity. This resulted in the A-H valuation convergence, the end game for B-shares, and the ability for foreign investors to short A-shares (ASIFMA, 2013). Bond Connect was launched shortly after to serve the same purpose for the debt market.

In 2015, the Mutual Recognition of Funds (MRF) was launched providing a new channel for HK and Mainland investors to access each other’s market via investing in the funds managed by fund companies. Currently, a total of 6 Northbound funds worth RMB 10.22 billion and 48 Southbound funds worth RMB 152 million have been approved.

## 6. Risk Premium Data

### 6.1. Equity Risk Premium (ERP)



**Fig 6.1.1 Equity Risk Premium**

To determine the international equity risk premium, the Credit Suisse First Boston Model (1997) will be used. This model was chosen to avoid using the foreign exchange rate as the RMB is known to be devalued and not freely floated.

Credit Suisse First Boston Model:

$$E[r_{i,t}] = rf_t + \beta_{i,us} \{E[r_{us,t} - rf_{us,t}] \times A_i\} K_i$$

The correlation of coefficient  $A_i$  will be calculated for every 3 months, while the adjustment factor  $K_i$  is assumed as 0.5 for developing economies (CN, SG, HK), 0.8 for developed economies (AU, GB) and 1 for the US. The equity risk premium for the US is the S&P500 Index returns minus the 3-months Treasury Bills rate.

## 6.2. Equity Risk Premium Growth Rate

Covariance Analysis: Ordinary  
Date: 09/19/17 Time: 00:46  
Sample: 1 96  
Included observations: 96

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.568663 6.702639 0.0000	1.000000 ----- -----				
AU	0.561743 6.583136 0.0000	0.802919 13.05946 0.0000	1.000000 ----- -----			
UK	0.450378 4.890674 0.0000	0.440529 4.757608 0.0000	0.649122 8.273440 0.0000	1.000000 ----- -----		
SG	0.498547 5.575956 0.0000	0.364403 3.793877 0.0003	0.536533 6.164242 0.0000	0.913402 21.75547 0.0000	1.000000 ----- -----	
HK	0.483972 5.362094 0.0000	0.696487 9.410496 0.0000	0.825898 14.20203 0.0000	0.712442 9.843355 0.0000	0.525341 5.985919 0.0000	1.000000 ----- -----

**Fig 6.2.1 ERP Correlation (2001-2008)**

Covariance Analysis: Ordinary  
Date: 09/19/17 Time: 00:48  
Sample: 1 98  
Included observations: 98

Correlation t-Statistic Probability	US	CN	AU	UK	SG	HK
US	1.000000 ----- -----					
CN	0.738640 10.73603 0.0000	1.000000 ----- -----				
AU	0.888466 18.96785 0.0000	0.824922 14.29918 0.0000	1.000000 ----- -----			
UK	0.738347 10.72666 0.0000	0.776863 12.08837 0.0000	0.817143 13.88940 0.0000	1.000000 ----- -----		
SG	0.809446 13.50644 0.0000	0.765847 11.66947 0.0000	0.804780 13.28428 0.0000	0.849547 15.77937 0.0000	1.000000 ----- -----	
HK	0.827287 14.42865 0.0000	0.823373 14.21563 0.0000	0.876696 17.85661 0.0000	0.899705 20.19548 0.0000	0.897631 19.95465 0.0000	1.000000 ----- -----

**Fig 6.2.2 ERP Correlation (2009-2017)**

The correlation of equity risk premium growth rate of all economies with CN are positive and statistically significant in both periods.

### **6.3. Findings**

The results from the analysis of risk premium data are conclusive that financial integration did take place. The report will now investigate the reasons for this:

#### **Risk Aversion & Consumption Preference**

The risk aversion of an individual increase with age. Bakshi and Chen (1994) examined ERP in the US and noted an increase in premiums as investor's age. Understanding how the higher risk aversion should translate into higher ERP requires more study of the utility functions, specifying how investor utility relates to wealth (and variance in that wealth).

ERP changes accordingly with investors' preferences. An increase in investor preferences for current over future consumption would lead to an increase in risk premiums. ERP increases as savings decreases in an economy. Based on the data, ERP decrease post-GFC as financial integration smoothed consumption level by saving.

#### **Irrational Behavior**

Investors tend to behave irrationally, thus the ERP are determined by quirks in human behaviour globally. This behaviour tends to be more apparent as the number of market participants increases.

#### **Information Risk**

One reason why investors demand larger risk premiums in some emerging markets than in others is due to the wide variations of transparency and information disclosure requirements. Markets like Russia, where firms provide little (and often flawed) information about operations and corporate governance, should have higher risk premiums than markets like India, where information on firms is not only more reliable but also much more easily accessible to investors. Lau et al. (2011) concluded that countries with more information disclosure, measured using a variety of proxies, have less volatile risk premiums and that the importance of information is heightened during crises.

#### **Liquidity Risk**

Investors demand higher ERP if they must accept large discounts on estimated value or pay high transactions costs to liquidate equity positions. Through studies, Gibson and Mougeot (2002), and Harvey et al. (2003) found evidence that the differences in ERP across emerging markets can be explained by differences in liquidity across the markets.

## **7. Conclusion**

### **7.1. Governance**

The internationalism of RMB was the start of a magnitude of reforms to push China markets into the global platform. According to the Society for Worldwide Interbank Financial Telecommunication (SWIFT), the path of RMB internationalization can be divided into three phases, first as usage for trade finance, then for investment, and in the longer term, as a reserve currency. The harmonization of rules and regulations with IOSCO Principles, regulatory reforms to match standard market practices in other developed economies, and the improvement in payment systems through CIPS, bilateral swaps agreements and offshore clearing banks with foreign countries further prove that China is on a path for financial integration.

### **7.2. Economic Data**

China has a stable net portfolio investment to GDP ratio, but also an equal inflow and outflow of portfolio investment which increased post-GFC, therefore showing financial integration took place. In addition, China did not experience a recession at all when all other economies did. This goes to show China was “immune” to the GFC because of its powerhouse as the world’s 2nd largest economy, contributing the most to global GDP post-GFC.

The crisis caused disruptions in traditional financial linkages and may have increased investors’ awareness or “attentiveness” to China as a source and destination of investment, explaining the reason for other countries increased GDP growth correlation with China, while a decrease in correlation with the US. This coupled with loosened capital control through schemes like QFII, RQFII, QDII and CIBM Direct, and financial innovation like green and panda bonds gave way for smooth capital flow to grow China economy.



### **7.3. Financial Data**

Data analysis of the debt market has proved that financial integration only took place to a small degree. This is possibly due to the bond market in China being relatively undeveloped and dominated by government issuers. Most outstanding bonds were issued by the Ministry of Finance or policy banks. This resulted in very limited bond trading.

Interest rate liberalization of short-term yield resulted in a contradictory movement post-GFC as investors flooded the market through CIBM Direct, causing an increase in liquidity and the speculative nature of short-term yields. This allowed for a quick recovery in short-term yield after the crisis. Long-term yields are however still controlled strictly thus resulting in an inverted yield curve twice.

Equity markets showed promising results of financial integration. One example is the SZSE and SSE stock connect with HKSE. This paved way for a brand-new channel for investors to utilize and enter the equity markets and proved to be extremely successful with the abolishment of aggregate quota in 2016.

Global institutions like MSCI and International Monetary Fund have supported China's integration by adding A-shares into the MSCI index and the RMB into the SDR basket respectively, further strengthening the confidence and bolstering the integration process of China's market.

### **7.4. Risk Premium Data**

It was conclusive by examining the equity risk premium that there was financial integration. The convergence of risk premium is primarily due to the even risk spread among markets due to strong market efficiency powered by strong linkages.

This was a result of firstly, stable economic growth, inflation and interest rates brought on by sound macroeconomic policies and stable government. Secondly, with the harmonization of rules and regulations by China as mentioned in the earlier section, information disclosure and corporate government have strengthened astoundingly. This reduces the risk of asymmetric information faced by investors. Lastly, with the removal of stamp duties and the increase in market participants, liquidity in the secondary market increased thus removing such risk. The increase in market participants also standardized the risk aversion, consumption level and irrational behaviour to that of international level.

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