China Versus the US Who Leads the Financial Markets?

Gil Cohen

Carmel Academic College Business School, Haifa, Israel

Julia Pavlodsky

Ort Braude College, Carmiel, Israel

In the following research we tried to establish which financial market—the US or the Chinese one—is the world leading market. These two world's largest economies compete between each other on both the product and the financial markets. In order to examine the financial leadership in the stocks and bonds markets, we gathered daily data from 2012 to April 2015. Using Garch model, we found that there is a dual impact of both stock markets over each other on the same day of trading. That means that both countries' major stock index (the S&P500 and the Hang Sang) have an equally strong impact on their counterparts. The bond markets dependencies result shows that the Chinese bond market is influencing the US bond market but not vice versa. Could that mean that China is the most dominant player in the world market? No cross country causalities were found between the stocks and the bonds markets.

Keywords: stocks markets, China, US, bonds yields, financial leadership, bond markets

Introduction

China is the world's second-largest economy next to the US. They are huge trading partners, and the two economies are incredibly intertwined. In recent years, China's economy is maturing which is resulting in a slower growth rate that threatens the world's economies. That slowing growth has ignited high turbulences on the Chinese financial markets influencing the financial markets in the rest of the world. The Chinese authorities are trying to contain those turbulences in assets prices with regulations with limited success. The trading relationship between the US and China has been stable for a long time, with China exporting to the US more than its importing. However, the financial market correlations and casualties are still not clear since not enough researchers have addressed that issue especially in recent years. The financial leadership question is essential in order to better understand the dependencies between the two financial markets and to enhance financial policies taken by policy makers of both countries. Former studies have examined the co-movement of different financial markets. Forbes and Rigobon (2002) have shown that high level of dependence is visible between most markets, and those changes in correlations are related to volatility changes. Ahlgren and Antell (2010) found that markets are linked closer in times of crisis which significantly harm the effort to reduce risk using global diversification. Kenett, Raddant, Zatlavi, Lux, and Ben-Jacob (2012) show that while the developed western markets (US, U.K., and Germany), are highly correlated, the inter-dependencies between these markets and the eastern

Gil Cohen, Ph.D., the head of the Finance and Banking Track, Carmel Academic College Business School, Haifa, Israel.

Julia Pavlodsky, Ph.D., lecturer, Ort Braude College, Carmiel, Israel.

Correspondence concerning this article should be addressed to Gil Cohen, Carmel Academic College Business School, Shaar Palmer 4, Haifa, Israel.

markets (India and China) are very volatile and with noticeable maxima at times of global world events.

Huang, Yang, and Hu (2000) have explored the causality and cointegration relationships among the stock markets of the United States, Japan, and the South China. They found that stock price changes in the US have more impact on China's financial markets than those of Japan do. Moreover, price changes in the US can be used to predict those of Hong Kong and Taiwan markets on next day. Dooley and Hutchison (2009) have found that emerging markets responded very strongly to the deteriorating situation in the US financial system and real economy in 2008.

In the following research we attempt to examine those correlations for both the stock markets and bond markets. Moreover, we also check dependencies between the stock and the bond markets of those two countries.

Methodologies and Results

In order to avoid the latest Chinese turbulences starting with the dramatic crash of the Chinese stocks markets beginning in June 2015, we collected data from the beginning of 2012 to April 2015. Our data include daily changes of 10 year government bonds yields for both countries (China bond yield hereafter referred to as China-BY, US bond yields hereafter referred to as US-BY) and the following stocks indices: Hang-Sang index (referred to as HS hereafter), Shanghai stock exchange index (referred to as SSE hereafter), S&P500 and the NASDAQ. Our aim is to study cross causalities between the stocks and the bonds markets of the two countries in order to extend the knowledge on the question that China dethroned US as the world financial leader. Since the Chinese market and the US market trade at different time zones¹, one may argue that at a specific trading date, causality if exists, can only be in one direction—China affects the US. However, we must remember that the US future markets are open simultaneously along with the Chinese markets meaning that information can be conveyed from one market to another through the future markets. We start by using Granger tests to establish the direction of causalities with one day lag (Table 1).

Table 1

One Day Lagged Granger Causalities

Explaining/Explained	China-BY	HS	SSE	US-BY	Nasdaq	S&P500
China-BY		2.3958 (0.1221)	3.713 (0.054)	0.041 (0.084)	0.185 (0.667)	0.028 (0.867)
HS	0.3734 (0.5413)		1.369 (0.242)	0.579 (0.447)	0.034 (0.853)	0.0006 (0.980)
SSE	0.224 (0.636)	1.027 (0.311)		0.003 (0.954)	0.003 (0.988)	0.0075 (0.876)
US-BY	0.110 (0.739)	1.899 (0.189)	0.024 (0.8769)		0.455 (0.406)	0.561 (0.827)
Nasdaq	0.69 (0.406)	98.756** (0.000)	8.608** (0.000)	0.558 (0.689)		0.068 (0.794)
S&P500	0.664 (0.415)	107.11** (0.000)	7.196** (0.024)	0.338 (0.5613)	0.171 (0.679)	

Note. ** = significance of p value ≤ 0.01 , * = significance of p value ≤ 0.05 .

Table 1 shows that the US stock indices explain the next day Chinese stock indices but not vice versa. The US indices have a stronger impact on the HS index than on the SSE. No significant lagged causalities have been found between the stock markets and the bonds markets. Since, as explained earlier, trading time

¹ The Chinese market close about 10 hours before the US financial market starts trading.

differences exist, and data may spill over the markets through future markets, we constructed a Garch model that addresses intraday causalities along with day lagged causalities. The model also captures the changing volatility of the error-terms of the explained variable time series. For example, the following Garch model measures the impact of China-BY on US-BY (Equation 1).

$$\text{US-BY}_t = C_1 * \text{CHINA-BY}_{t \text{ or } t-1} + \mu + \varepsilon_t \quad (1)$$

$$\varepsilon_t \sim N(0, h_t)$$

$$h_t = w + \alpha * \varepsilon_{t-1}^2 + \beta * h_{t-1}$$

where, h_t = is the variance of the error term of the explained variable which changes over time. t or $t-1$ means that the explaining variable is dated at the same day of the explained variable or a day before.

The models results are presented in Table 2.

Table 2

Garch Models Results for Lagged and Non-Lagged Stocks Indices Impact

	Explained variable	Explaining variable	W	α	β	AIC	LogL
1	Nasdaq	HS**	0.075 (0.036)	0.067 (0.0057)	0.835 (0.000)	2.533	-959.02
2	SP&500	HS**	0.072 (0.0105)	0.102 (0.002)	0.773 (0.000)	2.227	-842.39
3	SP&500	SSE*	0.076 (0.005)	0.116 (0.0006)	0.757 (0.000)	2.257	-853.97
4	Nasdaq	SSE*	0.077 (0.034)	0.068 (0.0058)	0.834 (0.000)	2.573	-973.95
5	SSE	Nasdaq*	0.042 (0.015)	0.052 (0.000)	0.918 (0.000)	3.145	-1191.67
6	HS	Nasdaq*	0.0505 (0.1701)	0.0281 (0.0381)	0.9194 (0.000)	2.7965	-1059.07
7	HS	S&P500**	0.055 (0.09)	0.035 (0.024)	0.902 (0.000)	2.704	-1022.51
8	SSE	S&P500**	0.059 (0.1)	0.0347 (0.03)	0.898 (0.000)	2.7157	-1026.97
9	HS	SP&500 (-1)**	0.5539 (0.949)	0.03475 (0.024)	0.9015 (0.0000)	2.7039	-1022.51
10	SSE	SP&500 (-1)**	0.0428 (0.0137)	0.0521 (0.0000)	0.9173 (0.0000)	3.1378	-1187.36
11	SSE	Nasdaq (-1)**	0.0425 (0.015)	0.053 (0.000)	0.917 (0.000)	3.136	-1186.57
12	HS	Nasdaq (-1)**	0.059 (0.09)	0.035 (0.0304)	0.898 (0.000)	2.716	-1026.97

Notes. ** = significance of p value ≤ 0.01 , * = significance of p value ≤ 0.05 .

AIC = the Akaike information criterion which measures the relative quality of the model.

LogL = Likelihood function used when describing a function of a parameter given an outcome.

Table 2 demonstrates that there is a dual influence of the two stock markets upon each other. Both the S&P500 and NASDAQ indexes have a significant influence on the HS and SSE indexes with emphasis on the S&P500 as the major leader. The Chinese stocks indices are also influencing the US stocks indices with greater impact of the HS than the SSE. Overall, the magnitude of the influence of the US stock market on the Chinese one is greater than vice versa. The table also shows that the US stocks indices have “same day” impact on the Chinese stock indices probably through future markets². Moreover, lines 9-12 show a lagged significant

² Lines 5-8.

influence of the US stocks indices over the Chinese ones. These results emphasize that the closing of the US major indices at a specific day has a strong significant influence on the closing of the next trading day in China. We now move to explore the impact of both countries bond markets upon each other and upon their counterpart's stocks indices (Table 3).

Table 3

Garch Model Results for Lagged and Non-Lagged Bonds Yields Impacts

	Explained variable	Explaining variable	W	α	β	AIC	LogL
1	US-BY	China-BY*	0.0478 (0.0265)	0.0367 (0.000)	0.955 (0.000)	4.454	-1689.80
2	China-BY	US-BY	0.0000008 (0.0002)	0.182 (0.000)	0.803 (0.000)	-5.877	2241.13
3	China-BY	US-BY(-1)	0.0000007(0.0002)	0.18 (0.0000)	0.8034 (0.0000)	-5.879	2239.012
4	Nasdaq	China-BY	0.078 (0.035)	0.067 (0.0057)	0.835 (0.000)	2.578	-975.85
5	S&P500	China-BY	0.076 (0.006)	0.114 (0.000)	0.759 (0.000)	2.2622	-855.782
6	China-BY	Nasdaq	0.0000008(0.0001)	0.184 (0.0000)	0.799 (0.000)	-5.879	2239.037
7	China-BY	SP&500	0.000008 (0.0001)	0.183 (0.000)	0.799 (0.000)	-5.879	2238.94
9	China-BY	Nasdaq (-1)	0.0000008 (0.0001)	0.184 (0.000)	0.800 (0.000)	-5.879	2239.04
10	China-BY	S&P500 (-1)	0.000008 (0.0001)	0.183 (0.000)	0.800 (0.000)	-5.848	2238.94

Notes. ** = significance of p value ≤ 0.01 , * = significance of p value ≤ 0.05 .

AIC = the Akaike information criterion which measures the relative quality of the model.

LogL = Likelihood function used when describing a function of a parameter given an outcome.

Table 3 shows that the Chinese bond yields have a significant influence on its US bond yields but not vice versa. Moreover, checking for day lagged causality has been proven to be ineffective too, meaning that the Chinese market is the leading market as far as bonds are concerned. This is the first time to our knowledge that anyone documented dominance of the Chinese financial market over the US one. No cross effect was found between the bonds and the stocks markets of the two countries.

Summary and Conclusions

In the following research we tried to establish which financial market—the US or the Chinese one—is the world leading market. The product trade “winner” is known to be China for a long time over the US. However, the leader on the financial markets has been examined here. In order to avoid the latest financial market turmoil that began with the crash of the Chinese stock market on June 15, 2015, we gathered daily data from 2012 to April 2015. Using Granger causality we have found one day lagged influence—the US stock market influences the Chinese stock market but not vice versa. However, using Garch model we found that there is a dual impact of both stock markets over each other at the same day of trading. In that respect, the S&P500 and the HS have been found to have a stronger impact on the counterpart's stock indices than the NASDAQ or SSE. The influence of the bond market was found to be only in one direction: the Chinese bond market is influencing the US bond market and not vice versa. Could that mean that China is the most dominant player in the world market? No cross country causalities were found between the stocks and the bonds markets.

References

- Ahlgren, N., & Antell, J. (2010). Stock market linkages and financial contagion: A cobreaking analysis. *The Quarterly Review of Economics and Finance*, 50(2), 157-166.
- Haung, B. N., Yang, C. W., & Hu, J. (2000). Causality and cointegration of stock markets among the United States, Japan and the south China growth triangle. *International Review of Financial Analysis*, 9(3), 281-297.
- Dooley, M., & Hutchison, M. (2009). Transmission of the US subprime crisis to emerging markets: Evidence on the decoupling-recoupling hypothesis. *Journal of International Money and Finance*, 28(8), 1331-1349.
- Forbes, K., & Rigobon, R. (2002). No contagion, only interdependence: Measuring stock market comovements. *Journal of Finance*, 57(5), 2223-2261.
- Kenett, D. Y., Raddant, M., Zatlavi, L., Lux, T., & Ben-Jacob, E. (2012). Correlations and dependencies in the global financial village. *International Journal of Modern Physics*, 16, 13-28.