Short Term Effectiveness of Chinese Stock Connect Program — a Study of the Pricing Dynamics of Cross-listed Stocks

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Abstract

This thesis examines the pricing dynamics of cross-listed stocks in the Chinese A-share and Hong Kong H-share markets. By identifying an announcement-implementation window, I offer a fresh perspective on the short-term price adjustment of cross-listed stocks around the launch of the first Stock Connect program. My findings reveal a significant increase of the A-H price ratio, but this price discrepancy appears to have been mitigated by the implementation of the Stock Connect program.Additionally, my observations suggest the existence of market inefficiencies, particularly among the groups of A-share stocks that are excluded from the Stock Connect program.

JEL classification: G14; G18

Keywords: Price efficiency; Cross-listed Stocks; Stock Connect Program

Introduction

Over the past decades, researchers have devoted efforts to understanding market frictions. Fama (1970) argues that financial markets are efficient and that stock prices reflect all available information, making it difficult or impossible to consistently achieve returns that outperform the overall market. Schreiber and Schwartz (1986) introduce a rigorous examination of price discovery, which refers to the process of finding an equilibrium price and is a crucial function of a stock exchange. Researchers have proposed different kinds of theoretical models to capture the important characteristics of an optimal capital market and to explain the inefficiencies in the real-world market. With the globalization of the economy and increasing competition between stock exchanges, the financial markets have become more efficient and balanced, benefiting from more mature policies and mechanisms. As a result, we have observed an increase in the number of dual listed companies, which has made different stock markets more interconnected and facilitated greater interactions between capital markets worldwide.

There is extensive literature that studies the interactions between developed markets. Eun and Sabherwalv (2003) studied the contribution of the U.S. stock exchanges to the price discovery of 62 Canadian stocks listed on the Toronto Stock Exchange (TSE) and a U.S. exchange. They found that prices on the TSE and U.S. exchange are cointegrated and mutually adjusting. For most of the stocks, U.S. prices adjust more to the TSE prices. Grammig et al. (2005) studied the contribution of the Frankfurt stock exchange and the NYSE for the price discovery of three German stocks. They discovered that the majority of price discovery during the overlapping trading period of domestic and U.S. markets is attributable to the German market. A simple idea that many researchers agree on is that the home market for a cross-listed company tends to

contribute more to the price discovery process. It is also worth-noting that developed markets often have well-established trading and regulatory standards, resulting in relatively good market efficiency.

Globalization of the economy created significant investing opportunities for emerging market. Since the 1980s, developing countries have started to liberalize their financial markets and enhanced the potential for globalization. Restrictions on cross-border investments have been lifted or made more lenient. Some literature states that liberalizations enhance market efficiency (Kim and Singal 2000; Cajueiro et al. 2009). However, the positive effect of market liberalization in emerging markets is less evident. For most of the time, opening-up policies may come along with macroeconomic and regulatory environment shifts, so it is hard to really distinguish the direct effect of liberalization. Also, the specific situation for each individual country could vary significantly. As a result, researchers who propose different metrics to account for market behavior and measure the effects of market liberalization may arrive at diverging conclusions.

My study focuses on the effect of a Chinese stock market liberalization policy: Stock Connect (SC) program. Chinese stock markets have three main exchanges: Shanghai Stock Exchange (SSE) as the largest exchange where most big state-owned companies are listed; Shenzhen Stock Exchange (SZSE) with more private companies in various industries; Hong Kong Stock Exchange (HKSE) with less regulations and more connections to global markets. The first two form the Chinese Mainland stock market (A-share market), which is excluded from HKSE and the broader global markets. The SC program connects the Chinese Mainland A-share market with the Hong Kong Stock Exchange, and investors in both markets can now invest in the other

market. This program provides a natural experiment to test for the effect of a market-opening policy. I use a regression model to look for the effect of the Stock Connect program on the Chinese Mainland companies listed in both stock markets simultaneously. The two listings of these cross-listed stocks can be considered as identical assets except for the difference of stock markets. Theoretically, when two stock markets are connected, the prices of identical assets should move closer to each other, because arbitrage opportunities can be exploited more efficiently thus gradually eliminating the price gap. Since the macroeconomic environment in China was rapidly changing, I only consider the short-term effectiveness of the SC program on the cross-listed companies. In order to accurately measure the impact of the SC program this study centers on the April 2014 announcement and November 2014 implementation of the program. To isolate the effect of the announcement and implementation, binary variables will be employed. In my study, I also consider the cross-listed stocks that are not included in the cross-border transaction scheme (in SZSE) and I find that the price patterns of those stocks are significantly different from those of companies listed in SSE.

Policy Background

1. Early Opening-up Policies

The founding of the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE) in 1990 signaled the start of the Chinese stock market. The types of stocks in the two exchanges are the A-share and the B-share. While the A-share is a class of shares of mainland Chinese companies denominated in CNY, the B-share is issued by mainland China-based companies traded on the SSE in USD or traded on the SZSE in Hong Kong dollars. Prior to 2002, global

investors were limited to trading B-shares, which accounted for only a small portion of the total stocks available in the Chinese stock market. The A-share is the dominant component of the two exchanges where only domestic investors could trade initially, with more participations from global investors along the implementations of opening policies.

China, since joining WTO in 2001, has been devoted to developing an open economy with various new fiscal and economic policies to encourage cross-border investing. The Chinese government has made certain commitments to building a more open and liberal financial system. The Qualified Foreign Institutional Investor (QFII) scheme which started in 2002 is a key program that partially internationalized the Chinese stock markets. It allows licensed foreign entities to invest directly in the Chinese stock market and buy CNY-denominated A-shares. Qualified Domestic Institutional Investor(QDII) was introduced in 2006 to enable institutional investors in Mainland China to invest in financial markets abroad. Both programs allocate investment quotas exclusively to institutional investors and require applicants to meet certain qualifications and asset size. In 2011, the RMB Qualified Foreign Institutional Investor (RQFII) program was launched, enabling foreign investors to use offshore RMB and providing regulatory relaxations to facilitate investment. Generally, these programs provide international investors with limited access to Chinese stock markets, while markets are getting more prepared for the next level of opening policies.

2. Two Stock Connect Programs

The HKSE functions as an offshore stock exchange outside of Mainland China, listing companies with diverse backgrounds. These companies can be broadly classified into three groups. The first group includes companies based in Hong Kong. The second group consists of

state-owned companies that mainly conduct their business operations within Mainland China. The majority of the stocks in the second group are H-shares. The third group is comprised of other Mainland China-based private companies, including those such as Alibaba and JD that have cross-listed stocks in foreign countries.

On April 10, 2014, the Chinese authorities announced the launch of the Shanghai-Hong Kong Stock Connect Program. This program aims to connect the SSE and the HKSE by enabling investors in each market to trade shares on the other market, using their respective local brokers and clearing houses. The program was officially launched on November 17, 2014. Subsequently, in 2016, a similar program was introduced to connect the SZSE with the HKSE.

Before the Stock Connect program was introduced, most mainland Chinese investors did not have access to the Hong Kong stock market, except for a limited number of institutional investors that were granted special permissions. The pilot SC program gives investors in both stock markets mutual access to selected stocks in both markets. For global investors, the SC program offers them a chance to enter Chinese Mainland stock markets through HKSE with less restrictions. For the domestic investors in China, the SC program also gives them an opportunity to enter the HKSE through local stock exchange. Since the start of the connect program, the number of total eligible stocks for global investors in Chinese mainland market is 568, which account for 90% of all A-shares listed in SSE in terms of market capitalization. The stocks listed on the HKSE participating in this program include the component stocks of Hang Seng Composite Large-cap and Mid-cap indices and cover all the H-shares.

The SC programs make it much easier for both domestic investors and global investors to make cross-boundary investing using local brokers and clearing houses and significantly increase the

cross-boundary trading volume and foreign holdings of domestic stock markets. This study targets specifically the effect of SC programs on the pricing dynamics between the three stock exchanges. The optimal objects to study are the companies listed both in domestic A-share market(SSE and SZSE) and HKSE. The change of the relationship between the cross-listed stocks for a single company can shed light on the analysis of the relationship between stock exchanges.

Compared to earlier opening-up policies, SC has a larger impact on cross-border equity investing. However, we need notice in advance that the SC program is not a stand-alone policy shift. It is a cross-border transaction scheme that incorporates various policies, and the specific policies within this scheme will be continuously updated. For instance, the SC program still puts some aggregate quotas and daily quotas to control the cross-border trading activities to some extent. The initial aggregate quota of 550 billion RMB of Shanghai-Hong Kong SC program was canceled in 2016. In 2018, the daily quotas for cross-border trading activities in both directions for two programs quadrupled.

Literature Review

There are several branches of literature that study the interactions between HKSE and the Chinese Mainland stock market. Li (2007) argued that the magnitude of the volatility links between the mainland and Hong Kong was small, indicating a weak integration of the Chinese stock exchanges with external markets. He stated that overseas investors can reduce total portfolio risk by adding mainland Chinese stocks to their investment portfolio. Mohammadi and Tan (2015) found evidence of return spillovers from the U.S. to Mainland and HKSE

respectively, but no spillover between Hong Kong and either of the two China Mainland stock markets (SSE & SZSE). Huo (2017) indicated that the SSE played a leading role in the Stock Connect program, with high turnover of A shares generating mean and volatility spillover effects. The study also suggested that the program significantly improved market efficiency. Prior to the introduction of the Stock Connect program, many studies reported weak evidence of return and volatility spill-over effects between the Chinese mainland stock markets and the Hong Kong stock market. However, following the implementation of the Stock Connect program, such effects became more significant, as demonstrated by recent empirical research. The literature also has sought to figure out the price discovery process of prices in A-shares and H-shares. HKSE has advantages in market information because its openness and earlier listing in H shares then in A shares. Researchers found that the H shares play a dominant role in the price discovery process(Su and Chong, 2007; Sohn and Jiang, 2016).

There is some literature that directly looks at the impact of the SC programs. Wang (2020) proposed that the price difference between the A-shares and their corresponding H-shares didn't decrease because the need of A-shares was higher. Shan et al., (2022) concluded that the SC program didn't make the connected stocks more correlated with World Index, though stocks that are held by foreign investors through QFII became more correlated with World Index after the QFII program started. Yuan et al. (2018) observed that the Shanghai stock connect didn't significantly improve the cointegration between A-shares and H-shares in the long run. Li and Chen (2020) used t-copula–DCC–GARCH model to calculate the dynamic conditional correlations to measure the price comovement between stock exchanges. The stock connect

programs didn't substantively enhance the daily price co-movements among the A-shares market and the Hong Kong stock market.

Methodology & Hypothesis

Earlier studies on the market liberalization of emerging markets have highlighted the importance of understanding the rapid-changing macroeconomic environment and investor sentiment. The process of liberalization is complex and could fundamentally change market dynamics.In order to avoid the complexity of the market, I choose to study the pricing dynamics around the official starting date of the SC program that connects SSE and HKSE. This program provided the first opportunity for large-scale cross-border transactions with relatively easy requirements, so it significantly affected the investor base and increased investing opportunities for investors in both markets. The Chinese authorities first announced the SC program on April 10 2014 and the program officially started from November 17 2014, creating a window between the announcement date and the official starting date. Although investors didn't have access to the other market, they could react to the information related to the SC program within the window. The April announcement of the SC program noted that the program would start sometime in October and the official staring date was later postponed to November. Consequently, investors had an expectation for an incoming SC program and enough time to react to the information. To measure the effect of this policy on stock markets, I identify three time periods around the start of the SC program: 4 months prior to the announcement date, the announcement-implementation window, and 4 months after the official start.

I chose 10 cross-listed stocks from SSE and 8 cross-listed stocks from SZSE to carry out my analysis. Since the first SC program only connected SSE to HKSE, the cross-listed stocks from SZSE were not included. In the period before the announcement, these two groups of stocks don't have any difference in terms of cross-border investing. However, after the announcement, investors are not expecting a SC program for stocks in SZSE in the short run, which is different from stocks in SSE. It is worth comparing the difference in the effect of SC program on the two groups of stocks. The difference between cross-listed stocks in SZSE and SSE is expected to be more significant after the implementation of the SC program.

I use the following linear regression model to examine the effect of the announcement and implementation of the SC program:

$$ln(P_{at}/P_{ht}) = \alpha + \beta_1 A_t + \beta_2 I_t + \beta_3 lnEx_t + \beta_4 lnVol_{at} + \beta_5 lnVol_{ht} + \epsilon_t$$

The variables in the model are defined as following:

P_{at}, P_{ht}: the close price of day t for the cross-listed stocks in A-share and H-share respectively. Chinese Mainland stock market closes at 3 pm, but the HKSE closes at 4pm. These time difference could potentially undermine the result, however, I assume the extra 1-hour in HKSE is not significant since China Mainland is the home market. To facilitate a uniform comparison of prices, I converted all A-share prices, which are originally denominated in CNY, to HKD. Since the percentage changes in stock prices over time are

more likely to be normally distributed than the actual price levels themselves, I take the natural log of the P_{at}/P_{ht}.

A_t: 0 if t is before the announcement date (April 10 2014), 1 if t is after the announcement date

I_t: 0 if t is before the starting date (November 17 2014), 1 if t is after the starting date

Ex_t: the exchange rate of HKD in terms of CNY on day t

Vol_{at}, Vol_{ht}: The trading volume of the stock in A-share and H-share respectively on day t

The main coefficients are I_t and A_t that directly measure the effect of announcement and implementation of the SC program. I hypothesize that the implementation of the SC program will have a larger and more positive impact on price difference compared with announcement effect, leading to the A-H shares price premium. I expect that the implementation of the Stock Connect program would have a less pronounced effect on the price ratio between A-shares and H-shares for cross-listed stocks in the SSE, compared to those listed in the SZSE. The main reason behind it is that there is not a SC program that connects the SZSE to HKSE, but the stocks in SZSE are well-connected to stocks in SSE and investors held an expectation that there were going to be another SC program connecting SZSE and HKSE in following years.

Inclusion of exchange rate between HKD and CNY is significant. Previous literature documented a strong effect of exchange rate on the stock market. Mroua and Trabelsi

(2020) successfully identified causality relationships between exchange rates and stock market indices for the BRICS countries. Intuitively, the exchange rate could potentially increase the transaction costs incurred by investors when entering a market denominated in a different currency. The volume of stocks in A-share and H-share can give me a measure of how trading activities in one market affect the pricing dynamics between two markets. The interpretation of these coefficients is meaningful only for these selected stocks and within the time period I set. Generalizing the conclusion requires test for broader time horizon and more stocks.

Data

I collect data for 18 stocks selected as representatives of cross-listed stocks from Bloomberg. In Table 1.a and Table 1.b, I provide the names of the 18 companies, their stock market codes, and their sectors. In Table 2.a and Table 2.b, I include the averages of $ln(P_{at}/P_{ht})$ for three time periods. The whole time period is from December 10 2013 to March 17 2015. The A-share codes starting with number "6" represent stocks from SSE, while A-share codes starting with number "0" represent stocks from SZSE. Almost every stock from SSE has a negative price ratio in the first two periods, while nearly every stock from SZSE has a positive price ratio for the entire time period.

Table 1.a

Cross-listed stocks from SSE

Name	A-share Code	H-share Code	Sector
Huaneng Power International, Inc.	600011	902	Utilities
China Petroleum & Chemical Corporation	600028	386	Energy
Shanghai Fosun Pharmaceutical (Group) Co., Ltd.	600196	2196	Healthcare
Anhui Conch Cement Company Limited	600585	914	Basic Materials
Haitong Securities Co., Ltd.	600837	6837	Financial Services
Ping An Insurance (Group) Company of China, Ltd.	601318	2318	Financial Services
Industrial and Commercial Bank of China Limited	601398	1398	Financial Services
CRRC Corporation Limited	601766	1766	Industrials
China Construction Bank Corporation	601939	939	Financial Services
Bank of China Limited	601988	3988	Financial Services

Table 1.b

Cross-listed stocks from SZSE

Name	A-share Code	H-share Code	Sector
Angang Steel Company Limited	000898	347	Basic Materials
Shandong Xinhua Pharmaceutical Company Limited	000756	719	Healthcare
Zoomlion Heavy Industry Science and Technology Co., Ltd.	000157	1157	Industrials
Weichai Power Co., Ltd.	000338	2338	Industrials
BYD Company Limited	002594	1211	Consumer Cyclical
ZTE Corporation	000063	763	Technology
China International Marine Containers (Group) Co., Ltd.	000039	2039	Industrials
Hisense Home Appliances Group Co., Ltd.	000921	921	Consumer Cyclical

Table 2.a

Descriptive data for cross-listed stocks from SSE

Code	Average of $ln(P_{at}/P_{ht})$ from 12/10/2013 to 4/10/2014	Average of $ln(P_{at}/P_{ht})$ from 4/10/2014 to 11/17/2014	Average of $ln(P_{at}/P_{ht})$ from 11/17/2014 to 3/17/2015
600011	-0.1265	-0.1567	-0.0147
600028	-0.054	-0.0914	0.1887
600196	0.0058	-0.1074	0.011
600585	-0.3747	-0.2542	-0.0712
600837	0.1202	0.0052	0.3481
601318	-0.2697	-0.1662	0.0364
601398	-0.96	-0.1228	0.0094
601766	-0.0516	-0.0803	0.2066
601939	-0.0742	-0.1031	0.1282
601988	-0.0302	-0.0624	0.138

Table 2.b

Descriptive data for cross-listed stocks from SZSE

Code	Average of $ln(P_{at}/P_{ht})$ from 12/10/2013 to 4/10/2014	Average of $ln(P_{at}/P_{ht})$ from 4/10/2014 to 11/17/2014	Average of $ln(P_{at}/P_{ht})$ from 11/17/2014 to 3/17/2015
000898	-0.2929	-0.2131	0.1279
000756	0.9852	0.707	0.981
000157	0.0537	0.1982	0.4106
000338	-0.2786	-0.2162	0.0384
002594	0.2772	0.2309	0.4536
000063	0.0675	0.0534	0.2746
000039	0.0982	0.1006	0.4401
000921	0.1643	0.2167	0.5587

Result

1. SSE-HKSE Pairs

The results for 10 SSE-HKSE pairs are in Table 3. 8 out of 10 β_1 are negative, and all coefficients are significant at 1% level. The result demonstrates that the announcement of the SC program cause the price ratios between A-shares and H-shares for most of cross-listed stocks in the SSE to become more negative. Comparing the averages of $ln(P_{at}/P_{ht})$ before and after the announcement of the SC program, 6 out of 10 A-H cross-listed pairs exhibited wider price disparities between A-shares and H-shares. One plausible explanation is that the institutional investors in China can use the existing QDII to invest in HKSE to take advantage of the information, while foreign investors can't fully react to the information. For foreign investors, their reactions were limited by the strict regulations of existing cross-border transaction schemes. Although the selected stock pairs represent different sectors and have large volume, they just account for 10%-20% of total stocks in SSE that have a listing in HKSE. Therefore, it is possible that these results can't really capture the pricing dynamics of the whole group of SSE-HKSE cross-listed pairs.

The coefficient β_2 demonstrates the effect of the official start of SC program. All the results are significant and positive, indicating a very strong increase of price ratios of A-shares to H-shares . For 8 out of 10 stock pairs, the A-H price relationship ends up with a premium for A-share. When comparing the average of A-H price ratio for the first period and third period, half of the results demonstrate an increasing price difference. As a

result, the price differences between A-shares and H-shares do not indicate a unanimous significant increase throughout the whole sample period.

The main drivers behind the increase of price ratio are the large demand of A-shares and the low demand of H-shares through the SC program. During the initial stages of the SC program's implementation, the trading volume from HKSE to SSE link is significantly larger than the opposite direction (SSE to HKSE). An explanation for the difference between the demand of A-shares and H-shares is that there are limited options for good alternatives in China for A-shares, but investors in Hong Kong have access to stocks in other global markets. The isolation from global markets of A-shares is evidenced by low correlations to other developed markets and the higher trading volume compared with H-shares. The low demand of H-shares for Chinese investors was not expected prior to the SC programs. The plausible explanation behind the low demand could be that the individual investors, who constitute the majority of investors in Chinese stock markets, were unaware of the benefit of diversifying their portfolios.

For coefficient β_3, the results indicate an ambiguous effect on price ratio of cross-listed stocks. Among 10 stock pairs, 601766 has the highest coefficient. One possible explanation for this could be that 601766 is a rolling stock manufacturer with significant overseas sales, which means that a weaker CNY is anticipated to have a favorable impact on their business and revenue. The remaining 9 companies have comparatively lower overseas sales.

β_4 and β_5 measure how the trading volume in each stock exchange affects the A-H price ratio. The results of β_4 are all positive and significant at 5% level, leading to a positive effect on A-H price ratio. One of the main reasons behind this result is that the A-shares market, with the dominant presence of individual investors, are more volatile and immature. Also considering that half of the results of β_5 are insignificant at 5% level, I can conclude that when there is an increase in the trading volume of A-shares in SSE, the A-H price ratio increases more significantly compared to when there is an increase in trading volume of H-shares. As a result, it can be inferred that trading activities of cross-listed A-shares in SSE have a greater impact on the A-H price ratio compared to activities of H-shares

Table 3

Coefficient	600011	600028	600196	600585	600837	601318	601398	601766	601939	601988
β_1	-0.017	-0.027	-0.100	0.178	-0.156	0.107	-0.043	-0.109	-0.063	-0.063
β_2	0.119	0.215	0.108	0.184	0.307	0.147	0.076	0.180	0.130	0.066
β_3	-0.947	-1.315	(-1.026)	-4.580	2.829	(-0.521)	0.831	5.608	1.352	1.640
β_4	0.027	0.037	0.027	0.018	0.014	0.037	0.026	0.066	0.044	0.039
β_5	-0.024	(-0.007)	-0.016	-0.026	(-0.0004)	(-0.0073)	(-0.0006)	-0.027	(-0.0011)	-0.020
R^2	0.692	0.846	0.564	0.872	0.815	0.905	0.771	0.512	0.835	0.789

The coefficients in the parenthesis is not significant at 5% level

2. SZSE-HKSE Pairs

The result for SZSE-HKSE pairs is in Table 4. 4 out of 8 coefficients of β_1 are positive, indicating an ambiguous effect of the announcement of the SC program. Considering the changes of averages of $ln(P_{at}/P_{ht})$ from the first period to the second period, 3 out of 8 price ratios of A-shares over H-shares widen. One explanation behind the results is that the Chinese institutional investors only sold SSE A-shares and bought corresponding H-shares to react to the announcement of the SC program, thus leading to a smaller negative impact on the SZSE-HKSE pairs.

For the results of β_2, the coefficients are positive and significant at the 1 % level. The implementation of the SC program has had a significant positive impact, resulting in an increase in the price ratio of cross-listed stocks on both the SZSE and the HKSE. As a consequence, all 8 stock pairs have ended up with an A-H price premium. The SC program's impact on SZSE is realized through connection between SZSE and SSE. Because investors have similar expectations for policies and macroeconomic conditions affecting SZSE and SSE, the pricing dynamics of these two exchanges are highly correlated. Given the absence of an SC program linking SZSE to HKSE, the implementation of the SC program have a significant impact on the price ratio of cross-listed stocks.

The distinctive idiosyncratic characteristics of the cross-listed stocks in SZSE, as opposed to those in SSE, can also explain the significant impact of the SC program. The SZSE and SSE have some key differences in the types of companies listed there. Firstly, the companies listed in SZSE represent a more diverse range of sectors, with many of them being private companies. In terms of market capitalization, the companies listed in SZSE are generally smaller compared to

those in SSE. Furthermore, the sectors in which companies are listed differ between the two exchanges. Many of the companies listed on SZSE are in popular sectors, while those listed on SSE are mainly in traditional sectors. The estimates of β_3 indicate a ambiguous effect of exchange rate on the price ratio of cross-listed stocks. The estimates of β_4 and β_5 show similar patterns as the coefficients of cross-listed stocks in SSE.

Table 4

Coefficient	**000898**	**000756**	**000157**	**000338**	**002594**	**000063**	**000039**	**000921**
β_1	0.048	-0.2924	0.1322	0.0857	-0.1019	-0.0398	(0.0231)	0.0979
β_2	0.3123	0.2271	0.1364	0.2543	0.1347	0.2105	0.3196	0.2926
β_3	-0.9997	3.5417	(-1.2036)	-2.5242	5.3527	1.8347	(-0.5108)	-1.7613
β_4	0.039	(-0.0026)	0.0618	0.0163	0.0506	(0.0019)	(0.0133)	0.0733
β_5	(-0.0039)	-0.0391	(0.0132)	(-0.0013)	(0.0053)	(-0.0003)	0.016	0.0068
R^2	0.8852	0.7504	0.725	0.812	0.688	0.687	0.833	0.812

The coefficients in the parenthesis is not significant at 5% level

Discussion

The key finding of my study on the effectiveness of the SC program is that the it leads to an increase of price ratios of A-H shares. As a result, most of the A-shares of cross-listed stocks had a A-H premium over the corresponding H-shares. For cross-listed stocks in SSE, the impact of the SC program is directly related to the cross-border transactions and the large trading volume from the Hong Kong investors. For cross-listed stocks in SZSE, the effect of the implementation of the SC program is larger, leading to a bigger increase of A-H price ratios and a higher A-H premium for all of the 8 selected stock pairs. The spillover effect of SSE, instead of the direct

effect of the SC program, is likely to influence the cross-listed stocks in SZSE. By comparing the results of the price ratios after the implementation of the SC program with the price ratios of the first two periods, the price disparities between A-shares and H-shares didn't improve. The increasing price ratios of A-shares over H-shares indicated that the Chinese stock market was still fundamentally different from the Hong Kong stock markets.

However, the positive effect of the implementation of the SC program is supported by the difference in the pricing dynamics of cross-listed stocks in SZSE and SSE. It is evident that the effect of the implementation of the SC program is larger for cross-listed stocks in SZSE. The higher levels of A-H premiums for cross-listed stocks in SZSE are likely to be caused by the lack of a cross-border transaction mechanism in effect for SZSE. The launch of the SC program undoubtedly lead to a more diverse investor base and opportunity for arbitrages between SSE and HKSE, improving the stock market efficiency to some extent. In conclusion, the SC program helped controlling the A-H premium from increasing significantly, but positive effect of the program was very limited.

I consider the ambiguous effect of the announcement of the SC program as limited evidence of market inefficiency in SSE and SZSE. A straightforward argument is that if there is an easy access for investors in both markets to conduct cross-border transactions, then the information can be utilized in a short period of time. On the contrary, the price disparities for cross-listed stocks in SSE don't appear to be decreasing. I also need to take the macroeconomic environment into consideration which could potential have explanatory power towards the decrease of A-H price ratios. For the Chinese Mainland markets, the launch of the SC program was postponed once, creating market instability. Since the SC program is the first impactful cross-border

transaction scheme, investors are not sure whether the program can be launched successfully. In Hong Kong, there were a series of protests causing instability for the Hong Kong markets.

Both results for SZSE and SSE show that the trading actives of A shares have a large impact on the price difference of cross-listed stocks. These findings are in accordance with the study of previous literature on the role of A share market in the price discovery process.

To improve the validity of this study on the effectiveness of the SC program, it is worth considering the fundamental characteristics of SZSE and SSE. It is rewarding to compare the pricing dynamics of cross-listed stocks in SSE and those in SZSE, as the first SC program only connects SSE with HKSE. However, the inclusion of SSE in the first SC program is a strategic decision and is potentially determined by its market maturity of SSE compared with SZSE. The problem of reverse causality has the potential to undermine the empirical results.

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