Does the Shanghai-Hong Kong Stock Connect Program Enhance the Abnormal Rate of Return and Transaction Volatility of the Underlying Stocks: A Quasi-Natural Experimental Design

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Abstract

Shanghai-Hong Kong Stock Connect Program, which is a new starting point for the opening up of the mainland capital market, still has many uncertainties. Research on the benefits and market volatility of such policies can provide investors with time to invest in such policies, fluctuations in the underlying stocks of the Chinese stock market, and decision support for the formulation and revision of relevant policies. This paper studies whether there is significant abnormal rate of return in the selected stocks which are in the Shanghai Stock Connect Program within the specified period, the excess return gap between the stocks which are in the program and which are not in the program, and the impact of the Shanghai Stock Connect Program on the volatility of the relevant stocks. Based on the CAPM model and the Fama-French 3-factor model, this paper uses t test to study the significance of the abnormal rate of return. By establishing a difference-in-difference (DID) model, the regression of the abnormal rate of return is tested, and the sample volatility is analyzed according to the influence of the fund transaction. The study found that the stocks in the program have significant abnormal rate of returns during the window period. The Shanghai Stock Connect has brought about a huge change in transaction amount, and policy makers need to improve related and similar policies.

Keywords: Shanghai Stock Connect Program; Abnormal Rate of Return; DID Model; Event Study

1 INTRODUCTION

Shanghai-Hong Kong Stock Connect officially opened on November 17, 2014, which is the trading interconnection mechanism of the Shanghai-Hong Kong stock market, consists of two essential components, the Shanghai Stock Connect and the Hong Kong Stock Connect. Shanghai Stock Connect refers to Hong Kong investors who have entrusted local brokers to trade stocks through the Hong Kong Stock Exchange and report to the Shanghai Stock Exchange for trading in stocks listed on the Shanghai Stock Exchange. This will help promote the exchanges and two-way opening of the capital markets of two places, enhance the overall strength of China's capital market, and further promote Hong Kong's offshore Renminbi business, which will play an important supporting role in the internationalization of the Renminbi. The implementation of the new policy is always accompanied by various doubts and uncertainties. This paper studies whether there is significant abnormal rate of return in the selected stocks which are in the Shanghai Stock Connect within the specified period, the excess return gap between the stocks which are in the Shanghai Stock Connect and which are not in it, and the impact of the Shanghai Stock Connect on the volatility of the relevant stocks. These issues are the concern of investors, policy makers and others. Therefore, this paper is of great significance in the following areas.

Firstly, from theoretical policy to practical results, it is necessary for investors to analyze whether the excess returns of stocks in Shanghai Stock Connect in different periods are significant, whether stock liquidity is increasing, and provide constructive suggestions and important references for when the investment is more profitable during the

implementation of such policies;

Secondly, it provides a powerful reference for how the market activity of the relevant stock market in China changes before and after Shanghai Stock Connect, and how Shanghai Stock Connect affects the fluctuation of related stocks in the stock market of China;

Thirdly, it provides support for policy effects and feedback for the formulation of national policies such as Shanghai-Hong Kong Stock Connect, and provides realistic and specific reference for the formulation, implementation and revision of relevant policies (Shenzhen-Hong Kong Stock Connect, Shanghai-Singapore Stock Connect, and Shanghai-London Stock Connect, etc.).

The Shanghai and Shenzhen 300 constituent stocks were selected as research objects. They were divided into experimental group (treatment group) and control group according to whether they belong to the Shanghai Stock Connect. In order to prevent the impact of the listing of index options on the market, the data collection time range is from August 18, 2014 to February 10, 2015. According to the official opening time of Shanghai-Hong Kong Stock Connect (interval on November 17, 2014, 59 trading days before and after), after excluding the stocks that were transferred from the Shanghai and Shenzhen 300 and Shanghai-Hong Kong Stock Connect during the study period, the suspended stocks and the stocks that were newly added to the Shanghai and Shenzhen 300 and Shanghai-Hong Kong Stock Connect during the study period, there is a total of 278 stocks.

The empirical test is carried out according to the following ideas: The first step is to test the significance of the abnormal rate of return. Firstly, the abnormal rate of return of the two groups of total samples in the whole event window is tested. Then, the abnormal rate of return is tested in the three periods, which are before, during, and after the event. The second step is to establish a Difference-In-Differences (DID) model to further test the abnormal rate of return of the two groups of samples. The third step analyzes the volatility of the two groups of samples based on the impact of the fund transaction.

2 EMPIRICAL FRAMEWORK

The Actual Rate of Return R_{it} is calculated as

$$R_{it} = (P_{it} - P_{it-1})/P_{it-1} \tag{1}$$

where R_{it} represents the actual yield of the i-th stock in the t period, P_{it} represents the closing price of the i-th stock in the t period, and P_{it-1} represents the closing price of the i-th stock in the t-1 period.

Define NR_{it} as the normal rate of return of stock i in period t, then $NRit$ can be determined by the market rate of return model corrected by GARCH (1, 1), as follows:

$$\text{Mean Equation：} \quad R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{2}$$

$$\text{Variance Equation：} \quad h_{it} = d_{i0} + a_{it}\varepsilon_{it-1}^2 + b_{i1}h_{it-1} \tag{3}$$

Using the maximum likelihood method or the iterative method to estimate the parameters, maximize the likelihood function then the parameters α, β, d_0, a_1 and b_1 can be obtained.

In addition, based on the market model, the robustness test was performed using the F-F 3-Factor model.

$$R_{it} - R_f = \alpha_i + \beta_i(MKT_t) + s_i(SMB_t) + h_i(HML_t) + \varepsilon_{it} \tag{4}$$

where α_i is the intercept term，indicating the unconditional average return of stock i, R_i is the yield of stock i, R_f is the risk-free rate of return, R_i-R_f is the excess return of stock i, and $MKT_t=R_m$-R_f is the whole market The excess return of the portfolio, where R_m is the market return, SMB is the difference between the return of the small-cap market capitalization market portfolio and the large-cap market capitalization market portfolio, and HML is the difference in return between the high book-to-market ratio capitalization market portfolio and the low book-to-market ratio capitalization market portfolio. The method for determining SMB and HML is based on the market value published in the 2015 annual report. The sample companies are first divided into two groups, each group is weighted 50%, and

the corresponding stock data is sorted according to market value as B (large market value) and S (small market value) Group; then, based on the market value grouping, according to the book market value ratio grouping into H (high book-to-market ratio), M (medium book-to-market ratio), L (low book-to-market ratio), respectively accounting for 30%, 40% and 30%. The stocks grouped according to the above two methods are cross-grouped to obtain 6 stock combinations $\left(\frac{S}{H}, \frac{S}{M}, \frac{S}{L}, \frac{B}{H}, \frac{B}{M}, \frac{B}{L}\right)$. Then calculate the risk factor by calculating the daily average rate of return for each combination of stocks in the six portfolios according to the total market value weighting method.

$$SMB = \frac{1}{3}\left(\frac{S}{H} + \frac{S}{M} + \frac{S}{L}\right) - \frac{1}{3}\left(\frac{B}{H} + \frac{B}{M} + \frac{B}{L}\right) \tag{5}$$

$$HML = \frac{1}{2}\left(\frac{B}{H} + \frac{S}{H}\right) - \frac{1}{3}\left(\frac{B}{L} + \frac{S}{L}\right) \tag{6}$$

Define $AR_{it}=R_{it}-NR_{it}$ as the abnormal rate of return, which is expressed by average abnormal return (AAR) and cumulative average abnormal return (CAR). Calculate the AAR for all sample companies on a certain day in the event window:

$$AAR_t = \frac{1}{N}\sum_{I=1}^{N} A R_{it} \tag{7}$$

Calculate the cumulative abnormal rate of return of stock i in the event window CAR_i:

$$CAR_i = \sum_{t_1}^{t_2} A R_{it} \tag{8}$$

The significance test of AAR and CAR was performed by t test. Assuming that the event has no effect on the stock price, AAR_i and CAR_i are subject to a normal distribution with a mean of 0. Perform statistical tests on whether AAR_i and CAR_i are statistically significant. The null hypothesis H0 indicates that the event has no effect on the stock price. Perform a significant test on AAR, setting H0: $AAR_i = 0$; H1: $AAR_i \neq 0$. Construct t statistic, $t_{(AAR_i)} = \frac{AAR_i}{s/\sqrt{N-1}}$ where $s^2 = \frac{\sum_{i=1}^{N} (AAR_{it}-\overline{AAR_t})^2}{N-1}$. Perform a significant test on CAR, setting H_0: $CAR_i=0$; H_1: $CAR_i\neq0$. Construct t statistic, $t_{(CAR_i)} = \frac{CAR_i}{s/\sqrt{N-1}}$, where $s^2 = \frac{\sum_{i=1}^{N} (CAR_{it}-\overline{CAR_t})^2}{N-1}$.

The basic form of DID（Difference-in-difference）model is

$$y_{it} = \beta_0 + \beta_1 \cdot \chi_{Treated_{it}} + \beta_2 \cdot \chi_{Post_{it}} + \beta_3 \cdot \chi_{Treated_{it}} \cdot \chi_{Post_{it}} + \varepsilon_{it} \tag{9}$$

where $\chi_{Treated_{it}}$ represents group dummy variables, $\chi_{Post_{it}}$ represents the time dummy variable, ε_{it} represents the residual. The lower corner *i* represents the sample individual, the lower corner *t* represents time. *i=0* and *i=1* respectively represent "control group individual" and "treatment group individual", and *t=0* and *t=1* respectively indicate "before experiment" and "after experiment"

when individual *i*∈ treatment group:

$$\Delta Y_{treatment} = Y_{treatment,t1} - Y_{treatment,t0} = (\beta_0 + \beta_1 + \beta_2 + \beta_3) - (\beta_0 + \beta_2) \tag{10}$$

when individual *i*∈ control group:

$$\Delta Y_{control} = Y_{control,t1} - Y_{control,t0} = (\beta_0 + \beta_1) - \beta_0 \tag{11}$$

$$\text{treatment effect } D = \Delta Y_{treatment} - \Delta Y_{control} = \beta_3 \tag{12}$$

β_3 is the estimated measure of the treatment effect.

According to the influence of the capital transaction, the transaction amount of the processing group and the control group is compared in the window period, taking into account the impact of the real situation of the Chinese stock market, and making a trend graph of the ratio between the processing group transaction amount and the control group transaction amount in the window period.

3 EMPIRICAL RESULTS

Table 1 is the significance test result of AAR based on the CAPM model. The AAR of the Shanghai Stock Connect Group and the non-Shanghai Stock Connect Group both rejected the null hypothesis, but the difference is that the AAR of Shanghai Stock Connect Group is positive, of non-Shanghai Stock Connect Group is negative. This result indicates that the stocks of the Shanghai Stock Connect have a significant excess return compared to the control group during the window period. The excess return of the non-Shanghai Stock Connect group during the window period was negative, which may be due to the short-term transfer of funds due to the Shanghai Stock Connect.

TABLE 1 SIGNIFICANCE TEST RESULTS OF AAR BASED ON CAPM

Sample	Shanghai Stock Connect Group	non-Shanghai Stock Connect Group
Event Window	2014.8.18-2015.2.10	2014.8.18-2015.2.10
Significance test results of AAR based on CAPM		
Mean	0.7061	-0.5385
Stand Deviation	0.0102	0.0171
T-Statistic	6.9048	3.1542
Test Result	Reject	Reject

Table 2 shows the results of the significance test of AAR based on the F-F 3-factor model. The AAR test results of the Shanghai Stock Connect Group and the non-Shanghai Stock Connect Group are different, the former rejects the null hypothesis, but the latter accepts the null hypothesis. This result also shows that the stocks of the Shanghai Stock Connect have a significant excess return compared to the control group during the window period.

TABLE 2 SIGNIFICANCE TEST RESULTS OF AAR BASED ON F-F 3-FACTOR MODEL

Sample	Shanghai Stock Connect Group	non-Shanghai Stock Connect Group
Event Window	2014.8.18-2015.2.10	2014.8.18-2015.2.10
Significance test results of AAR based on F-F 3-Factor model		
Mean	0.8307	0.4224
Stand Deviation	0.0093	0.0099
T-Statistic	3.9220	1.2832
Test Result	Reject	Accept

Table 3 is the significance test result of CAR based on the CAPM model. The CAR of the Shanghai Stock Connect Group and the non-Shanghai Stock Connect Group both rejected the null hypothesis, but the difference is that the CAR of Shanghai Stock Connect Group is positive, of non-Shanghai Stock Connect Group is negative. This result indicates that the stocks of the Shanghai Stock Connect have a significant excess return compared to the control group during the window period. The excess return of the non-Shanghai Stock Connect group during the window period was negative, which may be due to the short-term transfer of funds due to the Shanghai Stock Connect.

TABLE 3 SIGNIFICANCE TEST RESULTS OF CAR BASED ON CAPM

Sample	Shanghai Stock Connect Group	non-Shanghai Stock Connect Group
Event Window	2014.8.18-2015.2.10	2014.8.18-2015.2.10

Significance test results of CAR based on CAPM		
Mean	0.8501	-0.4544
Stand Deviation	0.0813	0.1208
T-Statistic	10.4624	-3.7627
Test Result	Reject	Reject

Table 4 shows the results of the significance test based on the F-F three-factor model CAR. The CAR of the Shanghai Stock Connect Group and the non-Shanghai Stock Connect Group rejected the null hypothesis. Although the results show that CAR is positive, the T value of the group T test is 5.3743, which is significant at the 1% level. This result indicates that the stocks of Shanghai Stock Connect have significant excess returns compared with the control group during the window period.

TABLE 4 SIGNIFICANCE TEST RESULTS OF CAR BASED ON F-F 3-FACTOR MODEL

Sample	Shanghai Stock Connect Group	non-Shanghai Stock Connect Group
Event Window	2014.8.18-2015.2.10	2014.8.18-2015.2.10
Significance test results of CAR based on F-F 3-Factor model		
Mean	0.8817	0.4085
Stand Deviation	0.0720	0.0537
T-Statistic	12.2501	7.6061
Test Result	Reject	Reject
Differential T Test	5.3743***	

Next, the statistical results of the Shanghai Stock Connect Group are subdivided and tested according to the time period. This paper divides the time window into three stages: [-59, -3], [-2, 2], and [3, 59].

Table 5 gives the results of the significance test of the AAR based on the CAPM model. AAR accepted the null hypothesis at the [-59, -3] stage, that is, before the official opening of the Hong Kong Stock Connect, the relevant stocks do not have obvious excess return. The [-2, 2] and [2, 59] stages all rejected the null hypothesis, indicating that the relevant stocks have significant excess returns at the time of the opening of the Shanghai Stock Connect.

TABLE 5 PERIOD-SEGMENTED SIGNIFICANCE TEST RESULTS OF AAR BASED ON CAPM

Sample	Group Shanghai Stock Connect		
Event Window	2014.8.18-2014.11.12	2014.11.13-2014.11.19	2014.11.20-2015.2.10
Significance Test of AAR based on CAPM			
Average	-0.0345	0.6778	1.4335
Standard Deviation	0.0055	0.0097	0.0170
T	-0.6216	6.9611	8.4340
Test Result	Do not reject	Reject	Reject

Table 6 gives the period-segmented significance test results of the AAR time period based on the F-F three-factor model. It can be seen that AAR rejects the null hypothesis in the [-59, -3] stage, but the excess return is obviously negative. That is to say, before the official opening of the Shanghai Stock Connect, there is no obvious excess return on the relevant underlying stocks. ARR rejects the null hypothesis in [3,59], indicating that after the opening of Shanghai Stock Connect, the relevant underlying stocks have significant excess returns.

TABLE 6 PERIOD-SEGMENTED SIGNIFICANCE TEST RESULTS OF AAR BASED ON F-F 3-FACTOR MODEL

Sample	Group Shanghai Stock Connect		
Event Window	2014.8.18-2014.11.12	2014.11.13-2014.11.19	2014.11.20-2015.2.10

Significance Test of AAR based on F-F 3-Factor Model		
Average	-0.4701	0.0023	1.3338
Standard Deviation	0.0060	0.0113	0.0137
T	-7.8792	0.2045	9.7309
Test Result	Reject	Do not reject	Reject

Based on the results of Tables 5 and 6, it can be seen that there is no significant excess return before the opening of Shanghai Stock Connect, and there is a significant excess return after the opening. This illustrates that before the opening of the Shanghai Stock Connect, the market funds did not blindly speculate on the relevant individual stocks. However, after the Shanghai Stock Connect opened, the overseas funds could select the relevant underlying stocks of Shanghai Stock Connect and intervene in the funds, thus showing excess returns.

Tables 7 and 8 show the results of the period-segmented significance test results of CAR based on the CAPM and the F-F three-factor model, respectively. It can be seen that the results are respectively consistent with Tables 5 and 6.

TABLE 7 PERIOD-SEGMENTED SIGNIFICANCE TEST RESULTS OF CAR BASED ON CAPM

Sample	Group Shanghai Stock Connect		
Event Window	2014.8.18-2014.11.12	2014.11.13-2014.11.19	2014.11.20-2015.2.10
Significance Test of CAR based on CAPM			
Average	-0.0250	0.8431	1.7097
Standard Deviation	0.1176	0.4522	0.1150
T	-0.2128	1.8645	14.8619
Test Result	Do not reject	Reject	Reject

TABLE 8 PERIOD-SEGMENTED SIGNIFICANCE TEST RESULTS OF CAR BASED ON F-F 3-FACTOR MODEL

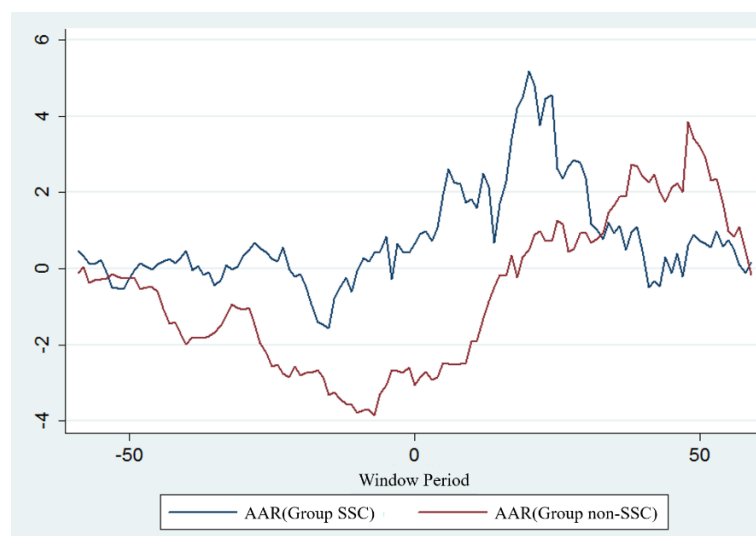| Sample	Group Shanghai Stock Connect		
Event Window	2014.8.18-2014.11.12	2014.11.13-2014.11.19	2014.11.20-2015.2.10
Significance Test of CAR based on F-F 3-Factor model			
Average	-0.3948	0.0805	1.2246
Standard Deviation	0.0837	0.2544	0.0703
T	-4.7154	0.3164	17.4127
Test Result	Reject	Do not reject	Reject

FIG.1 TREND OF AAR IN THE WINDOW PERIOD

It can be seen from Figure 1 that before the opening of the Shanghai Stock Connect, there is no obvious excess return for the underlying stocks of Group Shanghai Stock Connect. In contrast, the excess returns of the Group non-Shanghai Stock Connect are negative and all the way down. The difference between the two groups is significantly widened. After the official opening of the Shanghai Stock Connect, the excess returns of the two groups gradually converge, indicating the market's early digestion of the news. It is worth noting that the market's early digestion of the news did not appear to be a "good" for the Group Shanghai Stock Connect, and the performance was a "bad" for the Group non-Shanghai Stock Connect. That is to say, the market has reasonable expectations for Shanghai Stock Connect, and has given the Group non-Shanghai Stock Connect a "bad" that is not up to expectations.
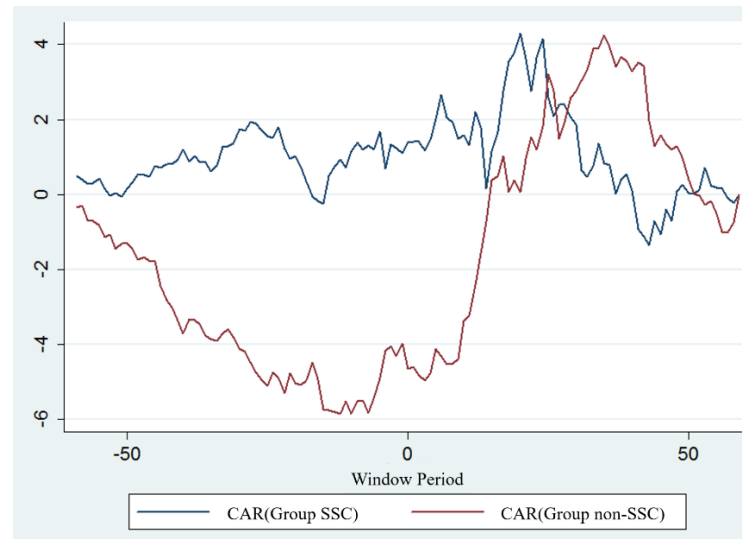

FIG.2 TREND OF CAR IN THE WINDOW PERIOD

Figure 2 also explains that before the opening of Shanghai Stock Connect, there is no obvious excess return for the underlying stocks of Shanghai Stock Connect, and the excess returns of the Group non-Shanghai Stock Connect are negative and all the way down. The difference between the two groups is significantly increased. After the official opening, the excess returns of two groups gradually converge. In summary, combined with Figure 1, the market digested the news ahead of time, reasonably expected the Shanghai Stock Connect, giving the Group non-Shanghai Stock Connect a below-expected "bad" rather than the "good" for the Group Shanghai Stock Connect.

In order to further explore the difference between the above-mentioned excess return gap before and after the policy time point in the above figures, the DID analysis model is established in this paper. Post is a dummy variable for policy time, taking 0 before the opening of Shanghai Stock Connect, otherwise taking 1. T is the type of grouping. The Group Underlying Stocks of Shanghai Stock Connect takes 1, and the Group Underlying Stocks of non-Shanghai Stock Connect takes 0. The results are as follows:

TABLE 9 REGRESSION RESULTS BASED ON DID MODEL

	(1)	(2)	(3)
	ret	CAR	AAR
R_m	0.935***	4.807	3.855***
	(90.13)	(1.12)	(7.40)
post	0.00159***	4.000***	2.449***
	(2.88)	(17.52)	(88.54)
t	0.00107**	4.544***	1.867***
	(2.17)	(22.16)	(75.17)
post_t	-0.00213***	-3.726***	-0.881***
	(-3.03)	(-12.79)	(-24.97)

_cons	-0.000160	-3.677***	-1.885***
	(-0.41)	(-22.84)	(-96.65)
adj. R-sq	0.277	0.030	0.481

*Significant at 10% level；** Significant at 5% level；*** Significant at 1% level

Regression (1) is the regression result of individual stocks returns, and Rm is the market return. It can be seen that the regression coefficient of the type variable t is 0.00107, and is significant at 5% level, indicating that the underlying stocks of Shanghai Stock Connect have a higher absolute yield in the window period. The regression coefficient of the interaction term between post and t is -0.00213 and is significant at 1% level. Therefore, the situation that underlying stocks of Shanghai Stock Connect with higher absolute returns disappeared after the official opening of Shanghai Stock Connect.

Similarly, regressions (2) and (3) are the regression results of CAR and AAR, respectively. The regression coefficients of t and post_t are consistent with regression (1), indicating that the underlying stocks of Shanghai Stock Connect have higher excess returns in the window period, but this situation was greatly weakened after the official opening of Shanghai Stock Connect.

On the whole, the relevant underlying stocks have leading excess returns before the official opening of Shanghai Stock Connect. Shanghai Stock Connect does not have a material impact on the company's operating results, only increasing the investment convenience of overseas funds and improving the market price discovery function; therefore, after the official opening of the Shanghai Stock Connect, the excess returns of the relevant underlying stocks will gradually converge with the Group non-Shanghai Stock Connect.

Finally, in order to research on the impact of related individual stock market fluctuations before and after the opening of Shanghai Stock Connect, this paper mainly refers to the impact of the capital transaction, and find that the opening of the Shanghai Stock Connect is conducive to the promotion of the relevant target market activity.
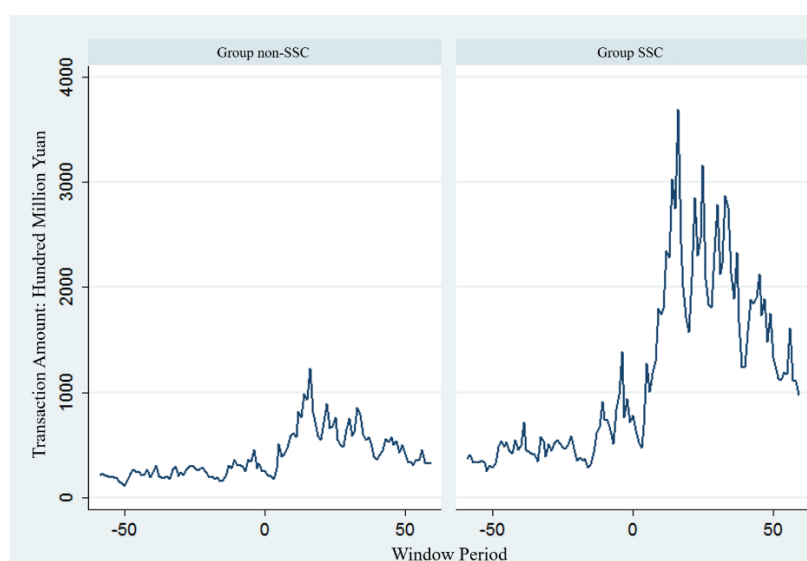

FIG.3 TREND OF THE TRANSACTION AMOUNT IN THE WINDOW PERIOD

It can be seen from Figure 3 that before the opening of the Shanghai Stock Connect, in the interval of [-50, -15], the transaction amounts of the two groups are not much different, and the fluctuation is small. Overall, the transaction amount of the Group Shanghai Stock Connect is slightly higher than that of the Group non-Shanghai Stock Connect, which is caused by the difference in the characteristics of the two groups of enterprises. However, in the interval of [-20, 50], the transaction amount of the Group Shanghai Stock Connect exceed the Group non-Shanghai Stock Connect, and it has soared after the official opening of the Shanghai Stock Connect. Although the transaction amount of Group non-Shanghai Stock Connect also has a rapid increase, this is due to the bull market pattern of China's stock market from 2014 to 2015, and its increase is far less than that of Shanghai Stock Connect.
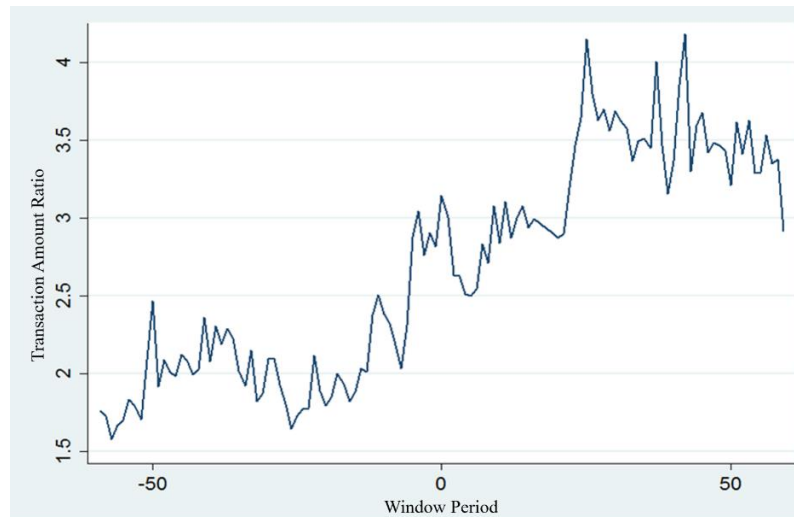
FIG.4 TREND OF THE RATIO OF THE TRANSACTION AMOUNT IN THE WINDOW PERIOD

In order to more intuitively see the impact of Shanghai Stock Connect on the fluctuation of related individual stocks, Figure 4 is shown as a trend chart of the ratio of the trading amount of the Group Shanghai Stock Connect to the trading amount of the Group non-Shanghai Stock Connect in the window period. Before the opening of the Shanghai Stock Connect, the ratio basically remained in the range of 1.5-2.5, but after the official opening of the Shanghai Stock Connect, the ratio has risen significantly, up to 4 times. The landing of Shanghai Stock Connect has indeed brought greater transactions and fluctuations to related individual stocks.

4   CONCLUSION

This paper divides the Shanghai and Shenzhen 300 constituent stocks into experimental group and control group according to whether it is a concept stock of Shanghai Stock Connect, and screens out the stocks within the specified time limit and meeting the conditions (not transferred, not newly added to CSI 300 or Shanghai Stock Connect, haven't been suspended). The abnormal rate of return is expressed by the average abnormal rate of return AAR and the cumulative average rate of abnormal rate CAR. Based on the t-test of CAPM and F-F three-factor model on the significance of abnormal returns rate of the two groups, the underlying stocks of Shanghai Stock Connect was found to have a significant excess return, compared with that of the control group during the window period. Due to the short-term transfer of funds caused by the Shanghai Stock Connect, the excess returns of the Group non-Shanghai Stock Connect during the window period were negative. On this basis, this paper regresses the abnormal return rate according to three time intervals, before-event, in-event and the post-event interval. The results show that there is no significant excess return for the relevant underlying stocks before the opening of Shanghai Stock Connect. After the opening, there is a significant excess return, but gradually converge with the excess returns of the Group non-Shanghai Stock Connect. Then, using the double difference model to study the difference between the excess return gap before and after the policy time point, it is concluded that the underlying stocks of Shanghai Stock Connect have higher excess returns during the window period, but this situation was greatly weakened after the official opening of Shanghai Stock Connect. Excess returns of two group are still converging. In addition, this paper analyzes the impact of Shanghai Stock Connect on the volatility of related individual stocks, and concludes that the implementation of Shanghai Stock Connect does bring greater transaction amount and volatility to related individual stocks. Therefore, the research in this paper draws the following rules and practical significance:

First, the underlying stocks of Shanghai Stock Connect have significant excess returns during the window period, and subsequently the returns converge with the non-Shanghai Stock Connect. Therefore, investors are advised to make rational short-term investments in relevant underlying individual stocks only during the window period. This kind of investment could effectively avoid risks. As the increase in the turnover of Shanghai Stock Connect, it is not recommended to blindly follow the trend and continue to invest after the window period.

Second, Shanghai Stock Connect will bring huge changes in transaction amount, which is beneficial to the

improvement of the relevant target market activity. The rational use of Shanghai Stock Connect and related policies will help the volatility of relevant stocks in China's stock market, making market volatility more predictable and reasonable.

Third, Shanghai Stock Connect is increasing the convenience of overseas investment and improving the market price discovery function. At the same time, it also makes the excess returns of the relevant underlying stocks converge with the Group non-Shanghai Stock Connect, which means that policy makers need to further improve related and similar policies, and strengthen the supervision of the stock market to enhance the market competitiveness at future policy implementation point, attracting international investors and promoting the RMB to become an international investment currency.

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