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To cite this article: Michelle Zemel & Tianrong Zhang (2018): The effect of the liberalization of the Chinese stock market on returns, Applied Economics Letters, DOI: [10.1080/13504851.2018.1528054](https://doi.org/10.1080/13504851.2018.1528054)

To link to this article: <https://doi.org/10.1080/13504851.2018.1528054>



Published online: 03 Oct 2018.




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The effect of the liberalization of the Chinese stock market on returns

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ABSTRACT

We examine the short-term effects of the liberalization of the Chinese stock market on returns. We find a positive and significant abnormal return associated with the announcement of the liberalization of the Shanghai Stock Exchange. Exploiting features of the reform, we are able to compare stocks directly and indirectly affected by the liberalization. We find that all stock prices reflect this announcement premium equally, suggesting that the premium does not reflect an increase in expected liquidity. We further find that observed liquidity, as measured by volume and price impact, did not increase following the liberalization. We conclude that the observed premium reflects a diversification benefit for Chinese investors.

KEYWORDS

Financial liberalization; stock market; liquidity; diversification; China

JEL CLASSIFICATION

G18; G15; G14

1. Introduction

On 17 November 2014, China launched the Shanghai–Hong Kong Stock Connect, a reform that partially liberalized the Shanghai Stock Exchange (henceforth ‘SSE’). This connection between the Shanghai and Hong Kong Exchanges effectively opened the Shanghai market to global investors and allowed Chinese investors access to a foreign market.

In this article, we ask whether the liberalization of the SSE lowered the cost of equity capital, as prior literature on stock market liberalizations in emerging countries would predict (e.g. Henry (2000), Bekaert and Harvey (2000)). We examine stock market returns around the announcement of the reform and document an abnormal return premium of 3.6% during the three-day window around the announcement date. This figure is consistent with the existing literature, notably Henry (2000) who documents an average abnormal return of 3.3% per month in the liberalizing countries price index before the initial liberalization.

We further investigate the underlying factors driving the observed abnormal announcement day return. Bekaert and Harvey (2000) argue that lower cost of capital is a result of diversification benefits for both domestic and foreign investors. Lower cost of capital may also be the result of increased liquidity

(Bekaert, Harvey, and Lundblad 2007). We exploit features of the implementation to identify stocks that were directly affected by the reform and those that were not, and find that both experienced announcement premiums. A premium on *all* Chinese stocks is inconsistent with an expectation of increased liquidity, but is consistent with the new ability of Chinese investors to better diversify stock market risk through access to new investment opportunities. In a final set of tests, we find further support for this conjecture by providing evidence that liquidity, measured both in terms of volume and price impact, did not increase after the liberalization.

Our article contributes to the literature on the effect of stock market liberalizations in emerging markets by demonstrating a lowered cost of capital in China’s stock markets due to the liberalization (e.g. Henry 2000, Bekaert and Harvey 2000). Additionally, we contribute to the literature on Chinese equity markets which examines liquidity and efficiency (e.g. Mookerjee and Yu 1999, Lai et al. 2012, Hilliard and Zhang 2015) by analysing the effect of the liberalization on liquidity. Finally, we build on the existing research on the Shanghai–Hong Kong Stock Connect. Prior research on the topic exclusively focused on whether the policy changed the process of price discovery and led to increased efficiency in the markets (Chan and Kwok 2016, Sohn and Jiang

2016). In contrast, we show that the Shanghai–Hong Kong Stock Connect added value to Chinese stock investors and further that this value is due to the diversification benefit.

II. Institutional details

The launch of the Shanghai–Hong Kong Stock Connect (henceforth ‘the Connect’) was widely seen as a step towards financial market liberalization in China. Through this new channel, global investors could access Shanghai A-shares via the Hong Kong Stock Exchange and mainland Chinese investors could access Hong Kong H-shares via the SSE (Securities and Futures Commission 2014). Prior to this reform, only selected foreign institutional investors were allowed to trade Shanghai A-shares under government-set Qualified Foreign Institutional Investor quotas, while A-shares were completely inaccessible for foreign retail investors. Investors in mainland China were also restricted access to the Hong Kong stock market. The stated purpose of the reform was to ‘[pave] the way for the opening up of the Mainland’s capital account and [to help] promote the internationalization of Renminbi (RMB) and development of the Hong Kong’s capital market’ (Hong Kong Exchanges and Clearing Limited 2014). The launch was first announced by the Chinese government on 10 April 2014.

Trade through the Connect is restricted to a subset of Chinese stocks. All Hong Kong and overseas investors are allowed to trade a portion of SSE-listed stocks, including all the RMB-denominated constituent stocks of the SSE 180 Index and the SSE 380 Index, and all the SSE-listed A shares that are not included as constituent stocks of the relevant indices but which have corresponding H shares listed on the Hong Kong Stock Exchange. Meanwhile, mainland institutional and eligible retail investors gained access to the constituent stocks of the Hang Seng Composite LargeCap Index and Hang Seng Composite MidCap Index, and all H shares that are not included as constituent stocks of the relevant indices but which have corresponding shares listed on the SSE. Crucial to our analysis, we note

that although trading volume under the Stock Connect channel was bound by a set of aggregate and daily quotas when the Stock Connect first launched,¹ the aggregate quotas were never reached and daily quotas were only exceeded infrequently, indicating that trading volume largely reflects investors’ true interests.

III. Data and methodology

Our sample includes daily stock price and volume data for all member stocks of the SSE Composite Index and Shenzhen Stock Exchange Composite Index over the sample period 11 February 2014 to 11 March 2015, which includes both the announcement and the launch of the Connect. The list of member stocks was obtained as of the announcement date, 10 April 2014. Daily stock data were obtained from Bloomberg. The top and bottom 1% of observations by daily return and daily volume are removed from the sample to ensure robustness to outliers. Any stock-date observations that occur on a firm’s IPO date are removed so that return behaviour attributable to IPOs is not attributed to our variable of interest.

Announcement day returns

To test the effects of the stock market liberalization on returns, we employ an event study centered on the date of announcement of the Connect. We contrast the daily abnormal returns inside and outside of a small window centred on the event date, 10 April 2014 ($t = 0$). We further compare the stock price reaction of treated and control portfolios to the announcement of the reform in a difference-in-differences framework. We estimate the following model:

$$ar_{p,t} = \alpha + \beta_1 \text{Window}_t + \beta_2 \text{Treatment}_p + \beta_3 \text{Window}_t \times \text{Treatment}_p + \gamma \mathbf{X}_t + \epsilon_{p,t} \quad (1)$$

All variables are daily observations in the sample period $t = -30$ to $t = 30$. The dependent variable, $ar_{p,t}$, the daily abnormal return observed on portfolio p on day t is defined as follows:

¹Aggregate quotas were subsequently abolished in August 2016.

$$ar_{p,t} = r_{p,t} - \bar{r}_p$$

where $r_{p,t}$ represents the return observed on portfolio p on day t and \bar{r}_p , the expected return on the portfolio, is defined as the mean portfolio return observed over an estimation period of $t = -180$ to $t = -60$.²

In one specification, the treatment portfolio contains all member stocks of the SSE Composite Index and the control portfolio contains all member stocks of the Shenzhen Composite Index. Note that stocks traded on the Shenzhen Exchange are not eligible for trade through the Connect. In a second specification, the treatment portfolio contains all member stocks of the SSE Composite Index eligible for trade through the Connect and the control portfolio contains all remaining member stocks of the SSE Composite Index ineligible for trade. Comparing treatment and control portfolios will allow us to precisely identify whether the announcement day return premium is present at the level of affected stock, affected exchange, or economy-wide.

We include controls (X_t) for the daily return on the S&P 500 Index, the Morgan Stanley Europe, Australasia, and Far East Index, and the Morgan Stanley Emerging Markets Index to account for daily global macroeconomic factors.³ Returns on these global indices are obtained from Yahoo! Finance. We also include the daily RMB-USD exchange rate as a control for domestic macroeconomic conditions.⁴ Exchange rate data were obtained from the FRED database of the Federal Reserve Bank of St. Louis.

For all tests, coefficient estimates are obtained using OLS and estimated SEs are robust to heteroscedasticity and autocorrelation.

Liquidity pre- and post-launch

For further evidence on whether an increase in *expected* liquidity is reflected in abnormal announcement day returns, we examine changes

to *observed* liquidity before and after the launch of the Connect. We test for the effects of the liberalization on two components of liquidity: traded volume and price impact. We compare the difference in each component of liquidity for a treated and a control portfolio before and after the launch date of the event (17 November 2014, $t = 0$) in a difference-in-differences framework. We estimate the following model for each of the two components of liquidity:

$$\begin{aligned} L_{p,t} = & \alpha + \beta_1 Post_t + \beta_2 Treatment_p \\ & + \beta_3 Post_t \times Treatment_p + \gamma X_t + \eta_t \\ & + \epsilon_{p,t} + \sum_{j=1}^k \delta_j L_{p,t-j} \end{aligned} \quad (2)$$

The sample includes an observation for each day in the sample period $t = -100$ to $t = 100$. The dependent variable, $L_{p,t}$, denotes a measure of liquidity. The first measure examined is total trading volume, defined as the log of the sum of daily traded volume of all stocks in portfolio p on a day t . It should be noted that changes in volume at the time of the reform had two main components: a volume increase due to increased margin trading and a volume increase due to new capital flowing through the Connect. We obtain these two components by separating the predicted value and the residual value of the log of total portfolio volume using coefficient estimates from the following model estimated over the period $t = -100$ to $t = 100$:

$$\log V_{p,t} = \beta_1 \log M_{p,t} + \beta_2 \log S_{p,t} + \epsilon_{p,t}$$

$V_{p,t}$ denotes trading volume, $M_{p,t}$ denotes the market value (RMB) of portfolio shares bought on margin, and $S_{p,t}$ denotes the number of portfolio shares sold short. The above equation is estimated for each of the three trading volume measures.⁵

An increase in volume does not necessarily imply increased liquidity. We directly measure

²Note that an ADF test confirms that the dependent variable is stationary over the sample period.

³Note that an ADF test confirms that the three control portfolio return series are stationary over the sample period.

⁴The raw exchange rate series contains a unit root as confirmed by an ADF test. To ensure stationarity of the right-hand side variables, the exchange rate enters the specification as the daily residual from the Hodrick–Prescott filtered raw series estimated on a sample period of 241 days centred on the announcement date.

⁵The three volume series each contain a unit root as confirmed by ADF tests. To ensure stationarity of the left-hand side variable, the trading volume series enter the specification as the daily residual from the Hodrick–Prescott filtered raw series estimated on a sample period of 241 days centred on the launch date.

liquidity using the widely used price impact measure proposed in Amihud (2002). This measure requires only return data and is appropriate in the absence of more direct microstructure based measures of liquidity such as the bid-ask spread. The price impact measure is defined as follows:

$$Amihud_{i,t}^k = \sum_k \frac{|r_{i,t}|}{V_{i,t}}$$

where $r_{i,t}$ is the daily return on stock i on day t and $V_{i,t}$ is the dollar volume traded of stock i on day t . The ratio of returns to volume is averaged over a k -day period. We estimate the Amihud (2002) measure at a 1-day ($k = 1$) and 3-day ($k = 3$) frequency. The Amihud (2002) measure is calculated at the portfolio level by assuming equal weights when calculating portfolio return and total volume. Note that volume is measured in RMB (millions) and the resulting ratio is multiplied by a factor of 10^4 for convenience.

The main variables of interest in Equation 2 are an indicator for the post-launch period, an indicator for the treatment portfolio, and an interaction term between the two. Controls (X_t) include daily returns on the S&P 500 Index, the Morgan Stanley Europe, Australasia, and Far East Index, and the Morgan Stanley Emerging Markets Index to account for

daily global macroeconomic factors. Additional controls include the daily RMB-USD exchange rate⁶ and indicator variables for dates of interest rate cuts⁷ as controls for domestic macroeconomic conditions. Dates of interest rate cuts were obtained from the Xinhua News Agency website. Days of the week fixed effects (η_t) are also included. Treatment and control portfolios are defined as in the 'Announcement day returns' section. All specifications contain lagged values of the dependent variable to ensure that the residuals exhibit no autocorrelation.⁸ For all tests, coefficient estimates are obtained using OLS and estimated SEs are robust to heteroscedasticity and autocorrelation.⁹

IV. Empirical results

The results of the announcement day returns tests are presented in Table 1. In column (1), we see that for the SSE Composite Index, the announcement of the upcoming reform led to a statistically significant increase in abnormal daily returns. Abnormal returns in the announcement window of $t = -1$ to $t = 1$ are on average 1.2% higher than daily returns outside of the window, controlling for global macroeconomic factors and the RMB-USD exchange rate. This reflects a total announcement premium of 3.6% over 3 days.

Table 1. Announcement day abnormal returns.

Treatment control	SSE only			SSE SZ			Qualified SSE shares Remaining SSE shares		
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Length of announcement day window	(-1,+ 1)	(-2,+ 2)	(-3,+ 3)	(-1,+ 1)	(-2,+ 2)	(-3,+ 3)	(-1,+ 1)	(-2,+ 2)	(-3,+ 3)
Window	0.012*** (0.003)	0.008** (0.004)	0.006* (0.003)	0.008*** (0.003)	0.007** (0.003)	0.007** (0.003)	0.005** (0.002)	0.005** (0.002)	0.005** (0.002)
Treatment				0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	-0.000 (0.002)	-0.000 (0.002)	-0.000 (0.002)
Treatment x window				0.004 (0.004)	0.001 (0.005)	-0.002 (0.004)	0.003 (0.003)	0.001 (0.003)	0.001 (0.003)
Daily controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	60	60	60	120	120	120	120	120	120
R-squared	0.191	0.171	0.156	0.097	0.094	0.093	0.067	0.072	0.074
Placebo p -value	0.068	0.084	0.032						

Notes: This table presents coefficient estimates from a diff-in-diff model for effects of the announcement of the financial liberalization on daily abnormal returns for various treatment and control group portfolios. Robust SEs are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. The p -value of the estimated coefficient on the announcement day window is also estimated from a simulation of placebo regressions, where an event date is chosen at random. The likelihood of observing a coefficient estimate as large as the observed coefficient is calculated from the simulated sample of 500 placebo event dates and shown in the last row.

⁶To ensure stationarity, the exchange rate is measured as the daily residual from the Hodrick–Prescott filtered raw exchange rate series.

⁷Interest rate cuts in the sample period occurred on the following dates: 21 November, 4 February 2014, 2015 and 1 March 2015.

⁸The three volume regressions contain one lagged value of the dependent variable. The volume regressions also include one lagged value of the exchange rate series. The price impact regressions include one and eight lagged values of the dependent variable for the 1- and 3-day Amihud measures, respectively. Note that the 3-day Amihud measure exhibits substantially more autocorrelation because it is defined as a 3-day moving average.

⁹Similar results are obtained if instead of robust SEs, time-varying volatility is modelled explicitly using a GARCH(1,1) process.

Returns in the 5-day announcement window (column (2)) and 7-day announcement window (column (3)) are also statistically significant. Note that this observed announcement day premium could reflect increased expected liquidity, increased diversification benefits, or a perceived signal of increased economic benefits economy wide. The results of the difference-in-differences test help isolate the factors driving the observed premium.

Columns (4)–(9) of [Table 1](#) demonstrate that while daily returns increased in the announcement window, this increase did not differ between treated and control portfolios. In columns (4)–(6), the coefficient on the interaction term between the treated portfolio and the announcement window is not statistically significant, revealing that the announcement day premium was observed equally for shares trading on the SSE (treatment) and the Shenzhen Exchange (control). Similarly, columns (7)–(9) reveal that the announcement day premium was observed equally for both shares eligible (treatment) and shares ineligible (control) for trade through the Connect. If the announcement premium reflected increased liquidity, it should be observed only for the treated portfolios. The diversification benefit, on the other hand, accrues to all Chinese investors and as such a premium would be reflected in all domestic Chinese stocks. The results of the difference-in-differences estimation suggest that the premium reflects either increased diversity benefits to Chinese investors and/or a positive economy-wide signal.

To ensure that the results reflect an announcement day premium and are not driven by random variations in the level of daily returns, we perform a placebo regression exercise. To this end, an event date is chosen at random from the period $t = -200$ to $t = 200$ centred on the announcement date, $t = 0$. An announcement day window is then created around this randomly selected event date, and the models in columns (1)–(3) of [Table 1](#) are estimated. This exercise is repeated 500 times to create a simulated distribution of statistics. We compare our estimated coefficient to the sample distribution. Coefficient estimates as large as those estimated for the 3-, 5-, and 7-day announcement windows are

observed in only 6.8%, 8.4%, and 3.2% of the simulated cases, respectively. These simulated findings confirm our interpretation of the observed increase in abnormal daily returns as an announcement day premium. It should be noted that no similar premium was detected in an window around the date of the launch.

The results of the trading volume tests are presented in [Table 2](#). Compared to the 100 days prior to the launch, the trading volume of treated stocks did not increase substantially in the 100 days after the launch as evidenced by nonsignificant coefficient on the interaction term of treatment and the post-launch indicator in columns (1) and (4). Further, neither volume driven by increased margin trading and short sales nor residual volume attributed to new capital flowing through the Connect increased significantly. This is shown in columns (2), (3), (5), and (6), where volume is separated into a component predicted by margin trading and short sales and a residual component which we attribute to new capital flowing through the Connect. Both the margin-predicted and residual components of volume show nonsignificant interaction terms.

In a final set of tests, we ask whether the financial liberalization altered fundamentally the liquidity of treated stocks beyond trading volume. [Table 3](#) presents the results of models comparing the price impact of stocks before and after the reform and between treatment and control portfolios. Comparing the Amihud (2002) price impact measure in the 100 days before the launch and the 100 days after the launch, we note that price impact did not decrease following the launch for any of the treated portfolios. This evidence suggests that the effective liquidity of treated stocks did not change following the launch and provides more evidence in favour of the announcement day premium reflecting diversification benefits or general positive sentiments about the Chinese economy.¹⁰

V. Conclusion

We find a positive and significant abnormal return of 3.6% associated with the announcement of the

¹⁰Note that the coefficient estimates on the treatment variable for both the 1- and 3-day Amihud measures in [Table 3](#) indicate that treated SSE stocks are in general more liquid, i.e. have lower price impact measures, than untreated SSE stocks (see columns (3) and (4)).

Table 2. Trading volume pre and post-launch.

Treatment control	SSE SZ		Qualified SSE shares Remaining SSE shares			
Dependent variable	(1)	(2)	(3)	(4)	(5) (6)	
	Total volume	Predicted volume	Residual volume	Total volume	Predicted volume	Residual volume
Post	-0.000 (0.013)	-0.000 (0.012)	-0.000 (0.010)	0.002 (0.016)	0.003 (0.015)	-0.003 (0.020)
Treatment	0.000 (0.013)	-0.000 (0.011)	0.000 (0.010)	-0.000 (0.014)	-0.000 (0.021)	0.000 (0.024)
Post x treatment	0.005 (0.020)	-0.002 (0.016)	0.008 (0.015)	0.005 (0.022)	0.003 (0.024)	0.002 (0.031)
Daily controls	Yes	Yes	Yes	Yes	Yes	Yes
Day of the week fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Lags of dependent variable	1	1	1	1	1	1
Observations	390	389	389	390	390	390
R-squared	0.455	0.400	0.144	0.399	0.110	0.243

Notes: This table presents coefficient estimates from a diff-in-diff model for effects of the financial liberalization on daily traded volume for various treatment and control groups. Predicted and residual volume are obtained from a regression of volume on margin and short sales activity. Robust SEs are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 3. Price impact pre-re and post-launch.

Treatment control	SSE SZ		Qualified SSE shares Remaining SSE shares	
Dependent variable	Amihud (2002) Liquidity measure			
Measurement frequency	(1)	(2)	(3)	(4)
	1 day	3 day	1 day	3 day
Post	-0.000 (0.000)	-0.000 (0.001)	-0.001 (0.001)	-0.002 (0.001)
treatment	-0.000 (0.000)	-0.000 (0.001)	-0.003*** (0.001)	-0.004*** (0.001)
Post x treatment	-0.001 (0.001)	-0.001 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Daily controls	Yes	Yes	Yes	Yes
Day of the week fixed effects	Yes	Yes	Yes	Yes
Lags of dependent variable	1	8	1	8
Observations	390	390	390	390
R-squared	0.145	0.803	0.256	0.857

Notes: This table presents coefficient estimates from a diff-in-diff model assessing the effects of the financial liberalization on price impact for different treatment and control portfolios. Price impact is measured as in Amihud (2002) at a 1- and 3-day frequency. Robust SEs are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Shanghai–Hong Kong Stock Connect, indicating lower cost of capital as a result of stock market liberalization. However, when we compare stocks directly affected by the reform and those that were not, we find that prices in both groups reflect this premium equally. This finding is inconsistent with an increase in expected liquidity. Our finding that neither volume nor price impact increased after the launch provides further evidence that the abnormal announcement day return does not reflect a premium for expected liquidity. We conclude that the observed premium associated with the announcement of the Shanghai–Hong Kong Stock Connect reflects a diversification benefit or an economy-wide positive signal which accrues equally to all Chinese investors who now have access to a new market.

Disclosure statement

No potential conflict of interest was reported by the authors.

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