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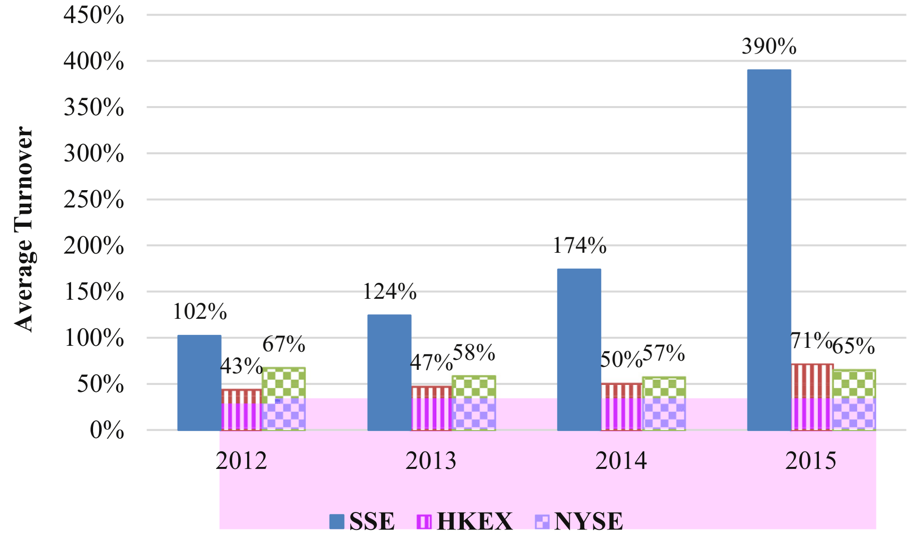

. 1. . This figure plots the average share turnover for stock listed in three stock exchanges, including Shanghai Stock Exchange (SSE), Stock Exchange of Hong Kong (HKSE), and New York Stock Exchange (NYSE) during 2012–2015.

In 2014, the Chinese government initiated the Shanghai-Hong Kong Stock Connect program, which allows investors in mainland China and Hong Kong to trade and settle on an eligible list of stocks listed on the other market through the exchange and clearing house in their home markets. The Shanghai-Hong Kong Stock Connect program provides an ideal setting to test the effect of demand shocks on stock prices and its interaction with speculative trading. First, the program introduces a large and unexpected demand shock for a subset of stocks (connected stocks) in mainland China, which has been under strict capital controls for decades. Second, famous as a “casino,” the Chinese stock market is well known for its speculative nature.[1] For example, share turnover, which is commonly associated with intensive speculative trading, is much higher in the Chinese stock market than in other developed markets such as Hong Kong and the U.S. stock markets, as depicted in Fig. 1.[2] There is also strong evidence that high-beta stocks are associated with substantially high turnover and earn significantly low expected returns.

We find that Shanghai connected stocks experience significant value appreciation (compared with unconnected stocks with similar firm characteristics) during the announcement of the program. More importantly, the value appreciation is larger for stocks with higher market beta. In addition, connected stocks experience significant increases in turnover and volatility, and such increases are also larger for high-beta stocks than for low-beta stocks. We further show that the multiplier effect of speculative beta is stronger in stocks with high beta-to-idiosyncratic variance ratios and is

[1] See, for example, Sarno and Taylor (1999), Allen et al. (2005), Hwang et al. (2006), Mei et al. (2009), Xiong and Yu (2011), and Andrade et al. (2013). Several features of the Chinese stock market are commonly viewed as responsible for abundant speculative trading. First, the market is relatively young and dominated by inexperienced individual investors who are more likely to hold diverse views on 6.359(4)4han)]3(et)] TJ 0 Tc /F2 1 Tf 6.3761o839059 T11.28e0 6.3761 260. 6.3761 0c44 Tm [(et)] TJ 0p.37611(o 6.3.376761 127.22468 135.8

500,000 *yuan* in their stock market accounts are qualified to trade eligible Hong Kong shares through the program.

Eligible shares under the Connect program consist of representative large- and mid-cap to arbitrage prevent the bubble component in stock prices from being arbitraged away quickly (Shleifer and Vishny, 1997). If the beta effect is indeed due to speculation rather than risk sharing, we should observe the beta effect reversing after the mispricing is corrected in the future. Our final hypothesis is stated as follows.

4. *If the multiplier effect of speculative beta is due to the interaction between demand shocks and speculation, it should be stronger when the ratio of beta to idiosyncratic variance is high. In addition, the*

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. Panel A reports the mean, standard deviation, minimum, 25th percentile, median, 75th percentile, and maximum of various firm characteristics of all Shanghai connected stocks that have a valid propensity-score-matched firm in the matched sample. Panel B presents the comparison of firm characteristics for Shanghai connected stocks and their propensity-score-matched unconnected stocks. We start with all Shanghai-listed stocks that are eligible in the Shanghai-Hong Kong Stock Connect program as the treatment firms and all unconnected A-share stocks as the control firms. All firms in our sample are required to have valid accounting data and return data in October 2014. We implement the propensity-score-matching procedure by first estimating a logit regression to model the probability of being a treatment firm using firm size (SIZE), book-to-market ratio (BM), return-on-assets (ROA), total volatility (TVOL), and Shanghai market beta ($BETA_{SH}$). We then match each treatment firm to the control firms using the nearest neighbor matching technique (without replacement and with the caliper set at 0.20). Our final sample includes 440 connected firms and their corresponding propensity-score-matched unconnected firms. All variables are winsorized at the 1% and 99% levels.

Panel A. Firm characteristics of connected stocks in the matched sample

Variable	N	MEAN	STD.	MIN	P25	P50	P75	MAX
SIZE	440	15.952	0.778	14.338	15.410	15.820	16.359	18.256
BM	440	0.616	0.388	0.077	0.347	0.523	0.786	2.163
ROA	440	0.047	0.038	−0.077	0.022	0.039	0.067	0.204
LEV	440	0.199	0.150	0.000	0.061	0.196	0.307	0.600
$BETA_{SH}$	440	1.228	0.258	0.563	1.071	1.213	1.394	1.828
TVOL	440	0.353	0.078	0.201	0.298	0.343	0.404	0.553
$IVOL_{SH}$	440	0.303	0.081	0.156	0.244	0.295	0.357	0.510
$BETA_{HK}$	440	0.487	0.188	0.019	0.372	0.477	0.599	1.050
TURNOVER	440	0.017	0.010	0.002	0.010	0.014	0.021	0.054
$AMIHUD\times10^8$	440	0.030	0.023	0.003	0.015	0.024	0.040	0.132
$RET_{\{-1,0\}}$	440	0.021	0.079	−0.116	−0.031	0.005	0.056	0.327

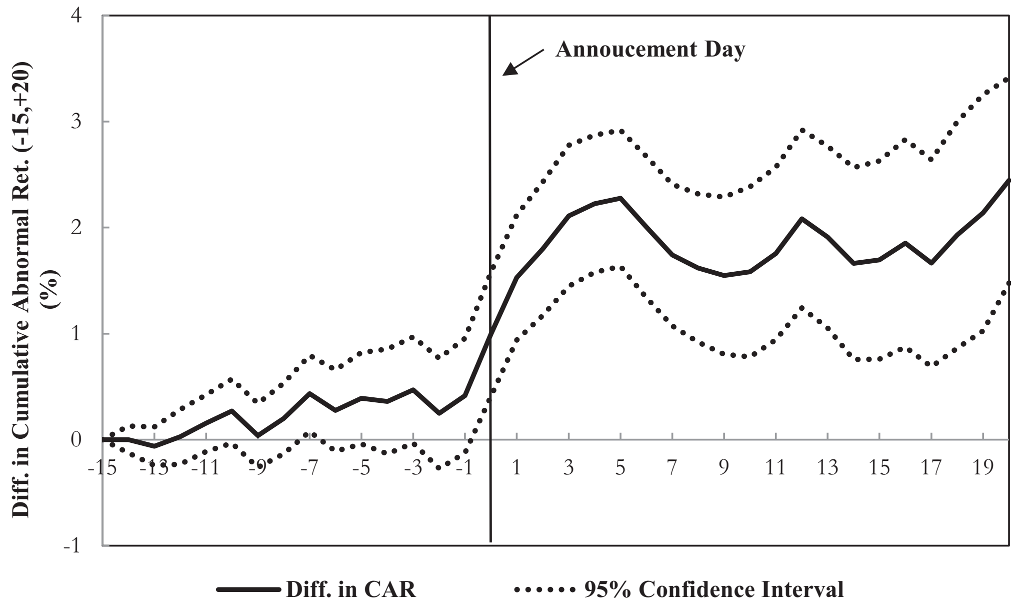
Panel B. Comparison of firm characteristics for connected and unconnected stocks in the matched sample

Variable	Connected	Unconnected		Difference		*t*-statistics	
SIZE	15.952	15.880		0.072		1.38	
BM	0.616	0.601		0.015		0.56	
ROA	0.047	0.047		0.000		0.13	
LEV	0.199	0.198		0.001		0.12	
$BETA_{SH}$	1.228	1.224		0.004		0.24	
TVOL	0.353	0.352		0.000		0.04	
$IVOL_{SH}$	0.303	. 0.303	3	0.000	0	−0.05	1
$BETA_{HK}$	0.487	0.465		0.022		0.78	
TURNOVER	0.017	0.015		0.002		0.86	
$AMIHUD\times10^8$	0.030	0.037		−0.006		−1.68	
RET							

3

- -

. Panel A reports the average market-adjusted CARs (CAR_{MktAdj}), CARs based on the market model (CAR_{MKT}), the Fama-French three-factor model (CAR_{FF3}), and the Carhart four-factor model ($CAR_{Carhart}$), and DGTW benchmark-adjusted CARs (CAR_{DGTW}) of connected stocks and their propensity-score-matched



. 2. . This figure plots the differences in CARs (in%) based on the market model (CAR_{MKT}) between connected and matched unconnected stocks in the (−15, 20) window around the announcement of Shanghai-Hong Kong Stock Connect program (the solid line). The 95% confidence intervals are plotted by dotted lines.

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. This table reports the regression analysis for CARs (in%) of connected stocks and propensity-score-matched unconnected stocks:

$CAR_i = a_0 + a_1 CONNECT_i + \boldsymbol{bz_i} + \varepsilon_i$,

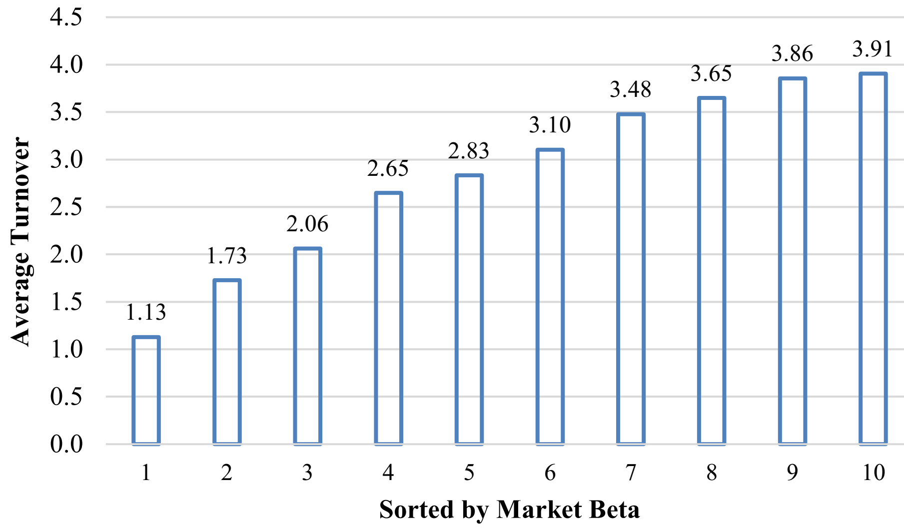
where CAR represents the market-adjusted CARs (CAR_{MktAdj}), the CARs based on the market model (CAR_{MKT}), the Fama-French three-factor model (CAR_{FF3}), and the Carhart four-factor model ($CAR_{Carhart}$), and the DGTW benchmark-adjusted CARs (CAR_{DGTW}) during the announcement window (−3,3), respectively. CONNECT is a dummy variable, which equals one if the firm is in the connect program and zero otherwise. Control variables include market capitalization (SIZE), book-to-market equity ratio (BM), return-on-assets (ROA), leverage (LEV), Shanghai market beta ($BETA_{SH}$), idiosyncratic volatility with respect to a Shanghai market model ($IVOL_{SH}$), Amihud illiquidity measure (AMIHUD), turnover (TURNOVER), and past one-month return ($RET_{\{-1,0\}}$). Corresponding *t*-statistics based on robust standard errors clustered at the industry level are reported in parentheses.

	$CAR_{MktAdj}(-3,3)$		$CAR_{MKT}(-3,3)$		$CAR_{FF3}(-3,3)$		$CAR_{Carhart}(-3,3)$		$CAR_{DGTW}(-3,3)$	
CONNECT	1.827	1.798	1.864	1.813	1.239	1.188	1.189	1.154	1.213	1.317
	(4.56)	(4.63)	(4.61)	(4.67)	(3.26)	(3.14)	(3.15)	(3.07)	(3.21)	(3.42)
$BETA_{SH}$		1.240		3.969		1.806		1.703		−0.115
		(1.39)		(4.44)		(2.13)		(2.02)		(−0.13)
SIZE		1.030		0.739		0.348		0.318		0.100
		(2.52)		(1.84)		(0.91)		(0.83)		(0.24)
BM		0.797		0.282		−1.424		−1.379		−0.893
		(1.50)		(0.53)		(−2.63)		(−2.57)		(−1.61)
ROA		3.802		3.329		6.828		6.002		3.291
		(0.79)		(0.69)		(1.45)		(1.27)		(0.68)
LEV		2.380		1.976		0.409		0.615		1.415
		(1.71)		(1.43)		(0.30)		(0.45)		(1.04)
$IVOL_{SH}$		−16.643		−19.566		−10.849		−12.250		−4.291
		(−4.72)		(−5.59)		(−3.14)		(−3.59)		(−1.18)
AMIHUD		−0.841		−10.687		−12.927		−10.334		12.159
		(−0.08)		(−1.00)		(−1.20)		(−0.97)		(1.08)
TURNOVER		−42.338		−55.335		−30.033		−28.947		−16.463
		(−1.38)		(−1.82)		(−1.05)		(−1.02)		(−0.52)
$RET_{\{-1,0\}}$		−0.589		−0.723		−2.312		−2.228		−1.466
		(−0.23)		(−0.29)		(−0.91)		(−0.88)		(−0.58)
Constant	0.381	−12.904	0.454	−9.714	−0.553	−3.576	−0.479	−2.612	−0.355	−0.574
	(1.34)	(−1.95)	(1.60)	(−1.50)	(−2.07)	(−0.57)	(−1.80)	(−0.42)	(−1.31)	(−0.08)
Adj. R^2	0.022	0.114	0.023	0.127	0.011	0.049	0.010	0.048	0.011	0.011
Observations	880	880	880	880	880	880	880	880	880	880

around the announcement of the connect program. The price appreciation is approximately 1.8% during the seven-day announcement window, which translates to more than US$41 billion in market value. The results support Hypothesis 1 that there exists a positive demand effect on the prices of connected stocks around the announcement of the connect program.

4.2.2. The speculative nature of market beta in China

Before we test the multiplier effect based on market beta, we provide evidence on the speculative nature of market beta in China based on all listed firms from 2006 to 2015. First, we show that high-beta stocks tend to have high turnover, which is widely believed to be a sign of speculative trading activities. We sort stocks



. 3. **-** **.** This figure plots the average annual turnover in the ten portfolios of Chinese A-share stocks ranked by market beta over 2006–2015. Stocks are first sorted into decile portfolios by their market beta estimated from daily returns every year. We then calculate average turnover for each portfolio in each year and take the average over the ten years. Market beta is estimated from the market model based on daily returns over each year. The sample includes all listed A-shares that have at least 100 trading days in each year.

. 4. **-** **-** **.** This figure plots the Carhart four-factor alphas (in%) of decile portfolios of Chinese A-share stocks ranked by market beta over 2006–2015. Stocks are first sorted into decile portfolios based on their market beta estimated from daily returns in the past one year. We then calculate the value-weighted portfolio returns over the next month and Carhart four-factor alphas for each portfolio.

into decile portfolios based on their market beta estimated from daily returns every year. We then calculate the average turnover for each portfolio in each year and take the average over the 10 years. In Fig. 3, we plot the average turnover rate for the 10 beta-sorted portfolios. It is striking that turnover increases monotonically with market beta as shown figure.

Second, we document that high-beta stocks have low expected returns, which provides the most direct evidence of speculative pricestrading based on asset If market beta measures only a firm's systematic risk, the expected return should increase with market beta. However, if market beta is associated with substantially speculative overpricing, as predicted by Hong and Sraer (2016), high-beta stocks should have low future stock returns. For every month starting from January 2006, sort all stocks into 10 portfolios based on their market beta estimated from past one-year daily returns. We then calculate the value-weighted portfolio returns over the next month. In Fig. 4, we show the average portfolio alphas with respect to the Carhart four-factor model. It is evident that high-beta portfolios earn low expected returns. The high-minus-low beta portfolio earns a monthly risk-adjusted return of -1.45%, which is significant at the 5% level. In unreported results, we find that risk-adjusted return spread of the high-minus-low beta portfolio during 2014–2015 is -3.45% per month, suggesting that the speculative beta effect around the program announcement is stronger than that during an average year.

In sum, we show that Chinese stocks with high market beta have substantially high turnover rates and experience significantly low future returns. The results support the prediction of speculative beta in Hong and Sraer (2016), which suggests that stocks with a high market beta are associated with high speculative trading when short-sale constraints are binding.

4.2.3. The speculative beta effect and revaluation in the cross section

In this section, we test Hypothesis 2, which states that connected stocks with a higher market beta experience a larger positive price appreciation upon the announcement of the con-

5 , , . This table reports the regression analysis for CARSs (in%) of connected stocks and propensity-score-matched unconnected stocks on the connect dummy and its interactions with Shanghai market beta:

$CAR_i = a_0 + a_1 CONNECT_i + a_2 CONNECT_i \times BETA_{SH,i} + a_3 BETA_{SH,i} + \boldsymbol{bz_i} + \varepsilon_i,$

where CAR represents the market-adjusted CARs (CAR_{MktAdj}), the CARs based on the market model (CAR_{MKT}), the Fama-French three-factor model (CAR_{FF3}), and the Carhart four-factor model ($CAR_{Carhart}$), and the DGTW benchmark-adjusted CARs (CAR_{DGTW}) during the announcement window (−3,3), respectively. CONNECT is a dummy variable that equals one if the firm is in the connect program and zero otherwise. $BETA_{SH}$ is beta with respect to the Shanghai market index. Control variables include market capitalization (SIZE), book-to-market equity ratio (BM), return-on-assets (ROA), leverage (LEV), idiosyncratic volatility with respect to a Shanghai market index model ($IVOL_{SH}$), Amihud illiquidity measure (AMIHUD), turnover (TURNOVER), and past one-month return ($RET_{\{-1,0\}}$). Corresponding *t*-statistics based on robust standard errors clustered at the industry level are reported in parentheses.

	$CAR_{MktAdj}(-3,3)$		$CAR_{MKT}(-3,3)$		$CAR_{FF3}(-3,3)$		$CAR_{Carhart}(-3,3)$		$CAR_{DGTW}(-3,3)$	
CONNECT	−3.902	−4.679	−3.946	−4.894	−3.350	−3.927	−3.458	−4.054	−3.729	−3.785
	(−4.15)	(−2.49)	(−3.53)	(−2.68)	(−2.51)	(−3.23)	(−2.68)	(−3.27)	(−3.51)	(−3.21)
$CONNECT \times BETA_{SH}$	4.676	5.282	4.734	5.471	3.740	4.172	3.788	4.248	4.033	4.162
	(5.69)	(3.56)	(4.97)	(3.71)	(3.41)	(4.01)	(3.61)	(4.10)	(4.80)	(4.54)
$BETA_{SH}$	−3.848	−1.575	−1.266	1.053	−1.354	−0.417	−1.611	−0.560	−2.995	−2.332
	(−2.20)	(−1.39)	(−0.70)	(0.92)	(−0.82)	(−0.37)	(−1.04)	(−0.52)	(−1.82)	(−1.77)
SIZE		1.054		0.765		0.367		0.337		0.119
		(1.20)		(0.97)		(0.56)		(0.53)		(0.13)
BM		0.681		0.162		−1.515		−1.472		−0.984
		(0.77)		(0.20)		(−1.93)		(−1.94)		(−1.20)
ROA		2.603		2.087		5.881		5.038		2.347
		(0.27)		(0.23)		(0.65)		(0.57)		(0.25)
LEV		2.313		1.906		0.356		0.561		1.362
		(1.08)		(0.96)		(0.17)		(0.28)		(0.59)
$IVOL_{SH}$		−17.134		−20.074		−11.236		−12.645		−4.678
		(−2.86)		(−3.35)		(−2.04)		(−2.40)		(−0.81)
AMIHUD		−1.140		−10.997		−13.164		−10.575		11.923
		(−0.07)		(−0.71)		(−0.91)		(−0.72)		(0.95)
TURNOVER		−43.544		−56.584		−30.986		−29.917		−17.413
		(−0.82)		(−1.11)		(−0.74)		(−0.71)		(−0.34)
$RET_{\{-1,0\}}$		−0.466		−0.596		−2.215		−2.129		−1.369
		(−0.18)		(−0.26)		(−1.59)		(−1.56)		(−0.44)
Constant	5.093	−9.531	2.004	−6.220	1.105	−0.912	1.493	0.101	3.311	2.084
	(3.12)	(−0.72)	(1.19)	(−0.52)	(0.65)	(−0.09)	(0.95)	(0.01)	(2.04)	(0.15)
Adj. R^2	0.032	0.125	0.033	0.138	0.016	0.057	0.015	0.056	0.018	0.018
Observations	880	880	880	880	880	880	880	880	880	880

nect program. The rationale behind the hypothesis follows from Hong et al. (2006), who suggest that the demand elasticity of price increases with the size of the speculative bubble, and from Hong and Sraer (2016), who argue that a stock's speculative overpricing increases with its market beta.

Using market beta as a proxy for speculative overpricing, we formally test the multiplier effect of beta. We calculate a stock's market beta with respect to the Shanghai Composite Index ($BETA_{SH}$) and extend model (1) by adding an interaction term between the CONNECT dummy and $BETA_{SH}$:

$$CAR_i = a_0 + a_1 \times CONNECT_i + a_2 \times CONNECT_i \times BETA_{SH,i} + a_3 \times BETA_{SH,i} + \boldsymbol{b} \times \boldsymbol{z_i} + e_i, \quad (2)$$

where CAR, CONNECT, and the control variables (represented by vector) are as previously defined. The key variable of interest is the coefficient on the interaction term (a_2), which is predicted to be positive.

We report the results in Table 5. The coefficient on $BETA_{SH}$ measures the effect of beta on CAR for unconnected stocks. The estimate is negative but statistically insignificant at the 5% level for all specifications after controlling for various stock characteristics. The coefficient on the interaction term $CONNECT \times BETA_{SH}$ measures the difference in the effect of beta on CAR between the connected and unconnected stocks, which captures the interaction effect between beta and the demand shock as only connected stocks experience the demand shock. Consistent with Hypothesis 2, we find a positive and significant coefficient on the interaction term, suggesting that the positive announcement effect on stock prices originated from the demand shock is more pronounced for connected stocks with high $BETA_{SH}$ than for those with low $BETA_{SH}$. The coefficients on the interaction term range from 3.740 to 5.471 across different regression specifications, indicating that a one-unit increase in the Shanghai market beta leads to an approximate 3.740–5.471% more increase in the CAR of connected stocks than that of matched unconnected stocks during the seven-day announcement window. The magnitude is economically large and statistically significant at the 1% level for all specifications. Overall, the evidence supports the prediction that the demand elasticity of price is higher for stocks with more speculative overpricing.

One potential concern about our results is whether the high announcement returns of high-beta stocks are driven by market-wide factors. For example, if the Shanghai stock market experiences significantly positive returns during the announcement of the program, the high-beta stocks naturally experience high announcement returns due to their high sensitivity to systematic factors. We argue that market-wide factors cannot explain our results for the following reasons. First, we investigate the CARs of connected stocks based on the market model and a number of commonly used factor models, which should already remove any effects from systematic factors. Second, we further control the effect of other common factors by matching connected stocks with unconnected stocks that have similar market beta and other firm characteristics, and by investigating the difference in CARs between the two groups of stocks.

from the initial announcement of Shanghai-Hong Kong connect program guideline (April 2014) to the commencement of the program (November 2014).[17] To make a comparison with previous literature, we attempt to estimate the economic significance of the speculative beta effect as a fraction of the price revaluation in a similar manner. For connected stocks, the average market beta is 1.228 and the coefficient on CONNECT×$BETA_{SH}$ in column 1 is 4.676, which suggests that the speculative beta effect explains 1.228×4.676 = 5.74% of price appreciation among connected stocks during the seven-day announcement window. It is worth noting that the speculative beta effect mainly manifests itself during the seven-day announcement window. It does not show up before November as evident in our placebo test in Table 13 and neither after the announcement window as evident in our test for the window (4, 6) in Panel D of Table 3. For connected stocks, the average price revaluation is 4.04% per month between April and November. Therefore, if we focus on the time period between April-November 2014 as in Chan and Kwok (2017), the speculative beta effect explains 5.74/(4.04×8) = 17.8% of the total price revaluation during the eight-month period.

4.3. Changes in turnover and volatility after the announcement program

Speculative bubbles generated by heterogeneous beliefs and short-sale constraints are often associated with high turnover and high stock volatility (Scheinkman and Xiong, 2003). In particular, Hong et al. (2006) predict that in addition to price appreciation, a positive demand shock leads to increases in turnover and return volatility. Moreover, the increases in turnover and return volatility should be larger for stocks with a higher degree of speculative overpricing.

4.3.1. Changes in turnover

We first perform the following regression analysis for the change in turnover of connected stocks and their PS-matched unconnected stocks:

$$\Delta TURNOVER_i = a_0 + a_1 \times CONNECT_i + a_2 \times CONNECT_i \times BETA_{SH,i} + a_3 \times BETA_{SH,i} + \boldsymbol{b} \times \boldsymbol{z_i} + e_i, \quad (3)$$

where ΔTURNOVER is defined as the percentage change in turnover during the (0,10) window after the program announcement (the average daily turnover during (0,10) window scaled by the average daily turnover in the most recent month and then minus one). All the other variables are as previously defined.

We present the results in Table 6. In column 1, we regress the change in turnover on the CONNECT dummy alone without any controls. The coefficient estimate is 0.114 with a t-statistic of 2.63, which implies that connected stocks experience an 11.4% increase in turnover compared to matched unconnected stocks on average. After controlling for various firm characteristics, the result in column 2 shows that the coefficient on the CONNECT dummy remains quantitatively similar (coef. = 0.103; t-stat = 2.47).

After establishing the result that connected stocks on average experience an increase in turnover relative to matched unconnected stocks, we next turn to examine the interaction between the CONNECT dummy and $BETA_{SH}$. The results are reported in columns 3 and 4 of Table 6. It is evident that the coefficient on the interaction term is significantly positive, suggesting that the positive effect of the demand shock on turnover is significantly higher for high $BETA_{SH}$ stocks than for low $BETA_{SH}$ stocks. The coefficient is 0.318 (t-stat = 3.49) without control variables, suggest-

[17] We replicate Chan and Kwok (2017) and confirm their findings. Table A6 in the Internet Appendix reports the results.

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, , . This table reports the regression analysis for the change in volatility of connected stocks and propensity-score-matched unconnected stocks:

$\Delta VOLATILITY_i = a_0 + a_1 CONNECT_i + \boldsymbol{bz_i} + \varepsilon_i$,

$\Delta VOLATILITY_i = a_0 + a_1 CONNECT_i + a_2 CONNECT_i \times BETA_{SH,i} + a_3 BETA_{SH,i} + \boldsymbol{bz_i} + \varepsilon_i$,

where standardized change in volatility (ΔVOLATILITY) is defined as the average daily volatility of firm i in the event window (0,10) after the program announcement divided by average daily volatility in the most recent month and then minus one. Daily volatility is calculated as the standard deviation of intraday 5-min returns. CONNECT is a dummy variable that equals one if the firm is in the connect program and zero otherwise. $BETA_{SH}$ is beta with respect to the Shanghai market index. Control variables include market capitalization (SIZE), book-to-market equity ratio (BM), return-on-assets (ROA), leverage (LEV), idiosyncratic volatility with respect to a Shanghai market index model ($IVOL_{SH}$), Amihud illiquidity measure (AMIHUD), turnover (TURNOVER), and past one-month return ($RET_{\{-1,0\}}$). Corresponding t-statistics based on robust standard errors clustered at the industry level are reported in parentheses.

	ΔVOLATILITY			
CONNECT	0.054	0.047	−0.069	−0.105
	(2.33)	(2.10)	(−1.50)	(−1.42)
CONNECT×$BETA_{SH}$			0.100	0.124
			(3.06)	(2.14)
$BETA_{SH}$		0.167	0.042	0.101
		(3.42)	(0.57)	(2.01)
SIZE		0.069		0.069
		(2.89)		(1.24)
BM		0.046		0.043
		(1.32)		(1.17)
ROA		−0.281		−0.309
		(−1.04)		(−0.52)
LEV		0.002		0.000
		(0.02)		(0.00)
$IVOL_{SH}$		−0.695		−0.707
		(−3.36)		(−1.68)
AMIHUD		0.333		0.326
		(0.48)		(0.29)
TURNOVER		0.522		0.494
		(0.28)		(0.20)
$RET_{\{-1,0\}}$		−0.524		−0.521
		(−3.40)		(−5.08)
Constant		−1.055		−0.976
		(−2.71)		(−1.24)
Adj. R^2	0.005	0.057	0.009	0.058
Observations	880	880	880	880

volatility than their unconnected counterparts. The next two columns present the results with the interaction term. The coefficient on the interaction term is 0.100 (t-stat = 3.06) without control variables, meaning that connected stocks with a one-unit increase in $BETA_{SH}$ experience a 10.0% higher increase in volatility than their matched unconnected stocks. The coefficient becomes 0.124 (t-stat = 2.14) after controlling for various firm characteristics.

Combining the results on turnover and volatility, we provide supporting evidence for Hypothesis 3. After the announcement of the Shanghai-Hong Kong Stock Connect program, connected stocks experience significant increases in turnover and volatility compared to their PS-matched unconnected stocks. More importantly, high $BETA_{SH}$ stocks experience significantly larger increases in turnover and volatility than low $BETA_{SH}$ stocks. The results confirm the theoretical prediction of Hong et al. (2006) that turnover and volatility increase more in response to a demand shock for stocks with a higher degree of speculative overpricing.

4.4. Connection, speculative beta, and the beta-to-idiosyncratic variance ratio

Market beta can be positively related to speculative overpricing due to heterogeneous beliefs about the aggregate market and short-sale constraints, as suggested by Hong and Sraer (2016). However, it is also commonly viewed as a measure of systematic

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, , - - . This table reports the regression analysis of the CAR (in%) during the program announcement on the connect dummy and its interactions with Shanghai market beta in high and low beta-to-idiosyncratic variance ratio subsamples, respectively:

$CAR_i = a_0 + a_1 CONNECT_i + a_2 CONNECT_i \times BETA_{SH,i} + a_3 BETA_{SH,i} + \boldsymbol{bz_i} + \varepsilon_i$,

where CAR represents the CARs based on the market model (CAR_{MKT}) during the announcement window (−3,3). CONNECT is a dummy variable that equals one if the firm is in the connect program and zero otherwise. $BETA_{SH}$

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. This table reports the regression analysis of the CARs (in%) during the program announcement on the connect dummy and its interactions with Shanghai market beta over the extended event window:

$CAR_{i,\ (-3,\ t)} = a_0 + a_1 CONNECT_i + a_2 CONNECT_i \times BETA_{SH,i} + a_3 BETA_{SH,i} + \boldsymbol{bz_i} + \varepsilon_i$,

where $CAR_{i,\ (-3,\ t)}$ represents the market-adjusted CARs (CAR_{MktAdj}), the CARs based on the market model (CAR_{MKT}), the Fama-French three-factor model (CAR_{FF3}), and the Carhart four-factor model ($CAR_{Carhart}$), and the DGTW benchmark-adjusted CARs (CAR_{DGTW}) during the event window ($-3,t$) (t=3, 10, 20, 40, 60). CONNECT is a dummy variable that equals one if the firm is in the connect program and zero otherwise. $BETA_{SH}$ is beta with respect to the Shanghai market index. Control variables include market capitalization (SIZE), book-to-market equity ratio (BM), return-on-assets (ROA), leverage (LEV), idiosyncratic volatility with respect to a Shanghai market index model ($IVOL_{SH}$), Amihud illiquidity measure (AMIHUD), turnover (TURNOVER), and past one-month return ($RET_{(-1,0)}$). To save space, we only report the coefficients on the interaction term (a_2) in the above regression equation. Corresponding t-statistics based on robust standard errors clustered at the industry level are reported in parentheses.

Window	CAR_{MktAdj}	CAR_{MKT}	CAR_{FF3}	$CAR_{Carhart}$	CAR_{DGTW}
(−3, 3)	5.282	5.471	4.172	4.248	4.162
	(3.56)	(3.71)	(4.01)	(4.10)	(4.54)
(−3, 10)	5.268	5.671	4.597	4.662	4.577
	(5.71)	(5.66)	(6.96)	(6.78)	(8.24)
(−3, 20)	3.823	4.446	0.215	1.315	2.382
	(1.32)	(1.69)	(0.06)	(0.36)	(0.77)
(−3, 40)	5.601	6.571	−3.652	−1.257	4.331
	(1.67)	(2.15)	(−0.48)	(−0.19)	(1.28)
(−3, 60)	−1.569	0.301	−4.406	−3.584	−2.551
	(−0.32)	(0.06)	(−0.59)	(−0.46)	(−0.52)

4.5. The beta effect over time

We further investigate the multiplier effect of beta on stock returns over the extended event window. If the beta effect is closely related to speculative overpricing, it will reverse over time as mispricing is gradually corrected (Hypothesis 4). By contrast, a risk-based explanation does not offer such a prediction. Table 9 reports the coefficients on the interaction term between the CONNECT dummy and $BETA_{SH}$ in regression model (2) for the event windows of (−3,3), (-3,10), (−3,20), (−3,40), and (−3,60). The results suggest that the beta effect starts to weaken 20 trading days after the program announcement and becomes insignificant for all CARs 60 trading days after the announcement. The reversal of the beta effect provides further support for the speculation-based explanation and poses a challenge for a pure risk-based explanation. While risk sharing explains a significant proportion of the stock price revaluation during market integration as suggested by previous literature, our evidence suggests that the demand effect and its interaction with speculative trading can also lead to significant price appreciation around the announcement of a market liberalization event. We will further discuss the risk-sharing explanation in details in Section 5.3.

5.

5.1. Does market beta proxy for the size of demand shocks?

Given the fixed supply curve over a relevant time horizon, stock price reaction is determined by both the slope of the demand curve and the size of the demand shock. Hong et al. (2006) argue that speculative overpricing amplifies stock price reaction upon a demand shock by steepening the slope of the demand curve. Following Hong and Sraer (2016), we use a stock's market beta as a proxy for the degree of speculative trading when investors disagree over the market or over a common factor of firms' cash flows. In other words, market beta affects the stock announcement return through its multiplier effect on the slope of the demand curve.

An alternative explanation posits that market beta may be positively correlated with the size of demand shocks. First, investors may demand more of high-beta stocks due to portfolio constraints. Theories in Black (1972) and for Frazzini and Pedersen (2014) suggest that when investors face portfolio constraints so that they cannot gain optimal exposure to certain risk factors, they overweigh stocks with high sensitivity (or beta) with respect to these factors (commonly

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: **?** This table reports the regression results of the change in analysts' earnings forecast per share (EPS) and future firm accounting performance on the connect dummy and its interaction with Shanghai market beta. In Panel A, the dependent variable is the change in forecasted EPS divided by the stock price at the end of October 2014 (in%) for years 2014, 2015, and 2016, respectively. The change in forecasted EPS (ΔForecastEPS) is defined as the difference between the median forecasted EPS in the six months after the announcement of the connect program and the median forecasted EPS in the six months before the announcement of the connect program. In Panel B, the dependent variables are the changes in earnings divided by total assets (ΔROA, in%), operating profits divided by total assets (ΔOPOA, in%), and sales divided by total assets (ΔSOA, in%) from fiscal 2014 to fiscal 2015. Corresponding *t*-statistics based on robust standard errors clustered at the industry level are reported in parentheses.

Panel A. Regression results of expected cash flow

	(1) ΔForecastEPS2014	(2) ΔForecastEPS2015	(3) ΔForecastEPS2016	(4) ΔForecastEPS2014	(5) ΔForecastEPS2015	(6) ΔForecastEPS_016
CONNECT	0.113	0.167	0.098	0.440	0.056	−0.007
	(0.96)	(1.24)	(0.55)	(0.76)	(0.09)	(−0.01)
CONNECT×BETA_{SH}				−0.266	0.091	0.085
				(−0.56)	(0.18)	(0.14)
BETA_{SH}	−0.129	−0.030	0.000	0.015	−0.077	−0.045
	(−0.53)	(−0.10)	(0.00)	(0.05)	(−0.20)	(−0.09)
SIZE	0.296	0.177	0.232	0.294	0.177	0.232
	(2.56)	(1.15)	(1.25)	(2.55)	(1.16)	(1.26)
BM	−0.098	−0.085	−0.178	−0.090	−0.088	−0.180
	(−0.59)	(−0.33)	(−0.54)	(−0.54)	(−0.34)	(−0.55)
ROA	0.857	−2.054	−2.661	0.947	−2.085	−2.689
	(0.59)	(−1.30)	(−1.32)	(0.65)	(−1.30)	(−1.33)
LEV	−0.686	−0.807	−0.990	−0.686	−0.807	−0.990
	(−1.58)	(−1.41)	(−1.28)	(−1.58)	(−1.41)	(−1.28)
IVOL_{SH}	−1.496	−0.641	−2.442	−1.483	−0.649	−2.451
	(−1.64)	(−0.55)	(−1.55)	(−1.62)	(−0.56)	(−1.55)
AMIHUD	11.629	7.386	11.937	11.664	7.369	11.915
	(2.75)	(1.72)	(2.23)	(2.75)	(1.71)	(2.22)
TURNOVER	20.918	15.136	36.783	20.892	15.120	36.788
	(2.85)	(1.54)	(2.83)	(2.84)	(1.53)	(2.83)
$\text{RET}_{\{-1,0\}}$	1.246	2.965	3.450	1.235	2.969	3.453
	(1.46)	(3.07)	(2.90)	(1.44)	(3.07)	(2.90)
Constant	−5.091	−3.300	−3.973	−5.243	−3.246	−3.922
	(−2.53)	(−1.30)	(−1.30)	(−2.50)	(−1.25)	(−1.26)
Adj. R^2	0.018	0.018	0.021	0.017	0.017	0.019
Observations	494	597	576	494	597	576

Panel B. Regression results of realized cash flow

	(1) ΔROA	(2) ΔOPOA	(3) ΔSOA	(4) ΔROA	(5) ΔOPOA	(6) ΔSOA
CONNECT	−0.030	0.050	0.163	1.384	1.607	3.372
	(−0.11)	(0.18)	(0.13)	(0.97)	(1.05)	(0.47)
CONNECT×BETA_{SH}				−1.154	−1.271	−2.619
				(−1.03)	(−1.05)	(−0.45)
BETA_{SH}	0.354	0.588	2.897	0.956	1.252	4.265
	(0.57)	(0.87)	(0.89)	(1.19)	(1.40)	(0.99)
SIZE	0.005	0.034	0.050	0.003	0.032	0.044
	(0.02)	(0.14)	(0.03)	(0.01)	(0.13)	(0.03)
BM	−0.065	0.122	−3.022	−0.036	0.154	−2.956
	(−0.18)	(0.33)	(−1.88)	(−0.10)	(0.41)	(−1.83)
ROA	−9.711	−10.358	−37.934	−9.487	−10.111	−37.426
	(−2.45)	(−2.48)	(−3.35)	(−2.41)	(−2.44)	(−3.34)
LEV	−0.627	−0.449	−8.773	−0.616	−0.437	−8.747
	(−0.61)	(−0.42)	(−1.70)	(−0.60)	(−0.41)	(−1.70)
IVOL_{SH}	−0.851	−0.439	−0.168	−0.735	−0.311	0.095
	(−0.37)	(−0.18)	(−0.02)	(−0.33)	(−0.13)	(0.01)
AMIHUD	0.268	1.793	−8.522	0.471	2.016	−8.061
	(0.03)	(0.17)	(−0.16)	(0.05)	(0.20)	(−0.15)
TURNOVER	2.506	8.062	−12.774	3.119	8.738	−11.381
	(0.12)	(0.37)	(−0.10)	(0.15)	(0.40)	(−0.09)
$\text{RET}_{\{-1,0\}}$	1.319	0.937	5.642	1.249	0.859	5.482
	(0.78)	(0.54)	(0.72)	(0.74)	(0.50)	(0.70)
CONSTANT	−0.710	−2.004	−5.981	−1.490	−2.864	−7.753
	(−0.17)	(−0.45)	(−0.24)	(−0.37)	(−0.66)	(−0.30)
Adj. R^2	0.006	0.011	0.007	0.006	0.011	0.006
Observations	742	742	742	742	742	742

5.3. Revaluation and risk sharing

The risk-sharing effect provides an alternative explanation for the revaluation around the announcement of the connect program. When Hong Kong investors are allowed to trade and hold the stocks in the Shanghai market, they participate in the risk sharing on these stocks, which will lead to changes in expected stock returns. Chari and Henry (2004) show that in scenarios ranging from complete liberalization to partial liberalization with strong segmentation, the change in the expected return of a stock upon market integration should be proportional to the change in the covariance of this stock's return with the return of a representative investor's portfolio before and after the integration. If the change in covariance increases with $BETA_{SH}$, the price appreciation we document around the announcement of the connect program may reflect the change in the expected return through the risk-sharing channel rather than the demand effect.

Following Chari and Henry (2004), we construct two measures of the difference in covariance (DIFCOV) and test the risk-sharing hypothesis by introducing an interaction term between CONNECT and DIFCOV in the regression of CARs:

$$CAR_i = a_0 + a_1 \times CONNECT_i + a_2 \times CONNECT_i \times BETA_{SH,i} + a_3 \times BETA_{SH,i} + a_4 \times CONNECT_i \times DIFCOV_i + a_5 \times DIFCOV_i + \boldsymbol{b} \times \boldsymbol{z_i} + e_i. \quad (5)$$

We consider two versions of DIFCOV. The first measure of the difference in covariance ($DIFCOV_{HK}$) is defined as the return covariance of an individual stock with the Shanghai market minus the return covariance of the stock with the Hong Kong market. We use the returns of the Shanghai Composite Index and Hang Seng Index as proxies for the returns the Shanghai and Hong Kong of markets, respectively. The second measure the difference in covari of ance ($DIFCOV_{MSCI}$) is the difference between a stock's return covariance with the Shanghai market and its return covariance with the MSCI Global Market Index. $DIFCOV_{HK}$ is appropriate for Hong Kong investors who mainly invest in the Hong Kong stock market, whereas $DIFCOV_{MSCI}$ is most suitable for Hong Kong investors who invest globally. The risk-sharing hypothesis predicts that the regression coefficient on CONNECT × DIFCOV (a_4) is positive.

We report the regression results in Table 12. Column (1) reports the results for $DIFCOV_{HK}$. It is evident that after controlling for CONNECT × $DIFCOV_{HK}$, the coefficient on CONNECT × $BETA_{SH}$ remains significantly positive. We also find that the coefficient on CONNECT × $DIFCOV_{HK}$ is insignificant. Column (2) reports the results for $DIVCOV_{MSCI}$. Similarly, the coefficient on CONNECT × $BETA_{SH}$ remains positive and significant after controlling for CONNECT × $DIFCOV_{MSCI}$. The coefficient on CONNECT × $DIFCOV_{MSCI}$ is also positive, suggesting that risk-sharing also contributes to CARs.

While speculative bubbles generated by heterogeneous beliefs and short-sale constraints are shown to be often associated with high turnover and high price volatility, the risk-sharing effect does not have a directional prediction the change in turnover on or volatility of connected stocks in Nevertheless, to rule general. out the possibility that the beta effect the change in turnover on or volatility is due to the change in covariance, we also include an interaction term between CONNECT and one of the two DIFCOVs in the regression the change in turnover of volatility. In the Internet Appendix (Table A3), we find that the coefficients on CONNECT × $BETA_{SH}$ remain significantly positive in all specifications, and both the economic magnitude and statistical significance of the coefficients are little affected after controlling for risk sharing. In addition, the coefficients the term between interaction CONNECT and DIFCOV are statistically insignificant for both changes in turnover and volatility. results confirm Our that changes thus in covariance cannot explain the speculative beta effect on stock turnover and return volatility.

Overall, the results in Table 12 suggest the speculative beta that effect on stock prices is very robust even after we control for the risk-sharing effect. While risk sharing explains a significant proportion of the stock revaluation integration, an during market additional substantial part the stock of in response market appreciation to the program announcement is driven by the demand effect and its interaction with speculation Shanghai stock prices. On From a pure risk-sharing perspective, it is also difficult to explain our previous results that the beta effect is stronger when the beta-to-idiosyncratic variance ratio is higher and reverses in three months.

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: . This table reports the regression results of the CAR (in%) during the program announcement on the connect dummy and its interactions with Shanghai market beta, $DIVCOV_{HK}$, and $DIVCOV_{MSCI}$:
$CAR_i = a_0 + a_1 CONNECT_i + a_2 CONNECT_i \times BETA_{SH,i} + a_3 BETA_{SH,i} + a_4 CONNECT_i \times DIFCOV_i + a_5 DIFCOV_i + \boldsymbol{bz_i} + \varepsilon_i$,
where CAR represents the CARs based on the market model (CAR_{MKT}) during the announcement window (−3,3). CONNECT is a dummy variable that equals one if the firm is in the connect program and zero otherwise. $BETA_{SH}$ is stock beta with respect to the Shanghai market index. $DIFCOV_{HK}$ is constructed as the difference between a stock's return covariance with the Shanghai market and its return covariance with the Hong Kong market. $DIFCOV_{MSCI}$ is between a stock's return covariance with the Shanghai market and its return covariance with the MSCI Global index. Control variables include market capitalization (SIZE), book-to-market equity ratio (BM), return-on-assets (ROA), leverage (LEV), idiosyncratic volatility with respect to the Shanghai market index model ($IVOL_{SH}$), Amihud illiquidity measure (AMIHUD), turnover (TURNOVER), and past one-month return ($RET_{\{-1,0\}}$). Corresponding *t*-statistics based on robust standard errors clustered at the industry level are reported in parentheses.

	(1)	(2)
CONNECT	−4.565	−4.814
	(−2.85)	(−2.73)
CONNECT×$BETA_{SH}$	5.148	5.389
	(3.77)	(3.66)
$BETA_{SH}$	0.989	0.980
	(0.89)	(0.85)
CONNECT×$DIFCOV_{HK}$	−2.440	
	(−0.67)	
$DIFCOV_{HK}$	7.701	
	(1.57)	
CONNECT×$DIFCOV_{MSCI}$		4.153
		(3.52)
$DIFCOV_{MSCI}$		1.299
		(0.61)
SIZE	0.437	0.658
	(0.74)	(0.92)
BM	−0.024	0.144
	(−0.03)	(0.19)
ROA	3.342	2.550
	(0.44)	(0.30)
LEV	1.805	1.898
	(1.05)	(0.99)
$IVOL_{SH}$	−16.569	−18.850
	(−3.06)	(−3.21)
AMIHUD	−14.289	−11.776
	(−0.99)	(−0.80)
TURNOVER	−69.553	−60.328
	(−1.54)	(−1.23)
$RET_{\{-1,0\}}$	−0.956	−0.683
	(−0.51)	(−0.31)
Constant	−1.551	−4.726
	(−0.17)	(−0.43)
Adj. R^2	0.148	0.139
Observations	880	880

5.4. Placebo tests

In all of our previous tests, we match connected stocks with unconnected stocks based on their major firm characteristics. However, differences in returns around the program announcement and changes in turnover and return volatility after the program announcement may be driven by differences in unobserved stock characteristics between these two groups of stocks. In this case, such differences may be persistent and do not depend on the specific event time *per se*.

To rule out the explanation that unobserved differences between connected and unconnected stocks drive the pattern of returns, turnover, and volatility observed, we implement placebo tests. Specifically, we consider two pseudo announcement dates, October 10, 2014 and September 10, 2014, which are one and two months before the announcement date, respectively, and repeat the analyses in Tables 4–7 for these dates. If certain unobserved factors other than the connect program drive the relations we document, we expect to observe similar relations on those pseudo dates.

We report the results of our placebo tests in Table 13. We find that the effects of CONNECT and the interaction between CONNECT and $BETA_{SH}$ completely disappear on these randomly chosen dates for return (Panel A), turnover (Panel B), and volatility (Panel C). On either pseudo date, none of the coefficients on CONNECT are significant, which suggests that the connected and matched unconnected stocks have indistinguishable returns and changes in turnover and in volatility during any time outside the event window. Moreover, none of the coefficients on the interaction between CONNECT and $BETA_{SH}$ are significant for CARs, changes in turnover, or changes in volatility. The results confirm that the speculative beta effect only manifests itself during the announcement of the connect program, which introduces the anticipation of a large demand shock to the connected stocks. The placebo tests assure us that the relation we document is not driven by persistent heterogeneities between the connected and unconnected stocks.

5.5. Alternative beta estimation

While the Shanghai-Hong Kong Connect Program is finally approved and announced on November 10, 2014, the idea was presented by Chinese Premier Li Keqiang at the Boao Forum in Hainan Province, China on April 10, 2014. Although the details on the final approval and implementation of the pilot program was not available at that time, there could potentially be speculation in the market between April and November 2014, and thus introduce some bias in the estimation of beta. In addition, the estimation of beta in the market model may also involve bias due to illiquidity of small stocks (Dimson, 1979).

To alleviate the potential biases in beta estimation, we reestimate beta by making the following two modifications. First, we exclude the seven months from April to October 2014, which is potentially subject to the speculation in the market. Second, we follow Hong and Sraer (2016) by regressing a stock's excess return on the contemporaneous excess market return as well as five lags of the excess market return to account for the potential illiquidity of small stocks. The measure of beta is then defined as the sum of the six coefficients.

We then repeat our main analysis on the speculative beta effect on announcement CARs, turnover, and volatility by using the reestimated beta. We find that the results are very similar to what we report before. As a result, we present all the results based on the alternative beta estimation in the Table 14 as an important robustness test. Panel A of Table 14 presents the results of the speculative beta effect on announcement CARs. In all specifications, the coefficients on CONNECT×$BETA_{SH}$ are all significantly positive at the 1% level with a magnitude ranging from 3.055 to 4.624, which is very close to those reported in Table 5. Panel B reports the results of the speculative beta effect on changes in turnover and volatility after the program announcement. The coefficients on CONNECT×$BETA_{SH}$ are significantly positive at the 5% level after controlling for various stock characteristics, and the results are again very close to what we find in Table 6 (changes in turnover) and Table 7 (changes in volatility). The evidence validates that our results are robust to potential bias in beta estimation, such as early market speculation or illiquidity of small stocks.

5.6. Alternative measures of changes in turnover and volatility

There may also exist potential bias on measuring changes in turnover and volatility due to market speculation between April

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. This table reports the placebo tests for the CAR, change in turnover, and change in volatility. We choose two pseudo trading dates, October 10 and September 10, 2014, which are one and two months before the program announcement date. Panels A, B, and C report the results for the CARs based on the market model ($CAR_{MKT}(-3,3)$, in%), change of turnover (ΔTURNOVER), and change of volatility (ΔVOLATILITY), respectively. Control variables include market capitalization (SIZE), book-to-market equity ratio (BM), return-on-assets (ROA), leverage (LEV), beta with respect to the Shanghai market index model ($BETA_{SH}$), idiosyncratic volatility with respect to a Shanghai market model ($IVOL_{SH}$), Amihud illiquidity measure (AMIHUD), turnover (TURNOVER), and past one-month return ($RET_{\{-1,0\}}$). Corresponding *t*-statistics based on robust standard errors clustered at the industry level are reported in parentheses.

Panel A. Cumulative abnormal returns (Dependent variable = CAR_{MKT} (−3,3))

	10/10/2014		09/10/2014	
CONNECT	−0.301	−3.660	0.559	0.800
	(−0.78)	(−3.05)	(0.74)	(0.45)
CONNECT×$BETA_{SH}$		0.672		−0.198
		(1.05)		(−0.16)
$BETA_{SH}$	−2.279	−3.691	−2.231	−2.122
	(−2.81)	(−7.55)	(−3.15)	(−1.91)
SIZE	−0.243	−0.251	−1.625	−1.624
	(−0.65)	(−0.84)	(−5.09)	(−2.99)
BM	−0.071	−0.113	0.329	0.335
	(−0.12)	(−0.13)	(0.69)	(0.77)
ROA	−20.661	−21.185	−10.109	−10.043
	(−3.53)	(−2.94)	(−2.28)	(−1.47)
LEV	−2.243	−2.336	1.519	1.528
	(−1.53)	(−1.22)	(1.36)	(2.56)
$IVOL_{SH}$	−10.065	−10.025	−14.703	−14.709
	(−3.36)	(−3.58)	(−5.90)	(−27.23)
AMIHUD	−1.507	−1.989	3.157	3.243
	(−0.13)	(−0.34)	(0.34)	(0.23)
TURNOVER	−58.654	−58.712	−36.720	−36.573
	(−2.28)	(−5.98)	(−1.45)	(−0.95)
$RET_{\{-1,0\}}$	0.581	0.654	3.196	3.207
	(0.26)	(0.42)	(1.28)	(1.95)
Constant	12.641	14.619	32.497	32.333
	(1.94)	(2.62)	(5.84)	(2.98)
Adj. R^2	0.083	0.085	0.212	0.211
Observations.	894	894	894	894

Panel B. Changes in turnover (Dependent variable = ΔTURNOVER)

	10/10/2014		09/10/2014	
CONNECT	0.507	1.571	0.147	0.322
	(1.18)	(0.89)	(1.03)	(2.95)
CONNECT×$BETA_{SH}$		−0.847		−0.144
		(−0.69)		(−0.65)
$BETA_{SH}$	0.053	0.501	0.017	0.097
	(0.14)	(0.97)	(0.11)	(1.85)
SIZE	−0.113	−0.110	−0.184	−0.183
	(−0.80)	(−0.67)	(−2.82)	(−4.02)
BM	0.759	0.772	0.561	0.565
	(0.80)	(0.66)	(1.62)	(2.70)
ROA	2.868	3.034	1.129	1.177
	(1.15)	(1.39)	(0.91)	(4.66)
LEV	2.007	2.036	−0.712	−0.706
	(1.16)	(2.78)	(−1.46)	(−1.75)
$IVOL_{SH}$	−0.538	−0.551	0.655	0.651
	(−0.19)	(−0.17)	(0.63)	(1.34)
AMIHUD	5.229	5.382	1.034	1.096
	(0.33)	(0.36)	(0.43)	(1.13)
TURNOVER	−4.682	−4.663	−17.295	−17.189
	(−0.35)	(−0.27)	(−2.05)	(−2.19)
$RET_{\{-1,0\}}$	−1.738	−1.761	−0.004	0.004
	(−1.46)	(−3.24)	(0.00)	(0.00)
Constant	1.077	0.450	2.980	2.861
	(0.36)	(0.20)	(1.99)	(4.71)
Adj. R^2	−0.004	−0.005	0.015	0.014
Observations	894	894	894	894

Table 13
(Continued)

Panel C. Changes in volatility (Dependent variable = ΔVOLATILITY)

	October 10, 2014		September 10, 2014	
CONNECT	−0.025	−0.002	0.020	−0.029
	(−1.15)	[illegible]	(0.92)	(−0.76)
CONNECT×$BETA_{SH}$		[illegible]		0.040
		[illegible]		(0.79)
[illegible]	[illegible]	[illegible]	[illegible]	−0.027
	[illegible]	[illegible]	[illegible]	(−1.21)
SIZE	[illegible]	[illegible]	−0.116	−0.116
	(−3.90)	[illegible]	(−5.34)	(−4.54)
BM	−0.072	[illegible]	0.007	0.006
	(−2.40)	[illegible]	(0.23)	(0.45)
ROA	−0.577	[illegible]	−0.428	−0.441
	(−1.79)	[illegible]	(−1.52)	(−1.77)
LEV	−0.161	−0.160	−0.139	−0.140
	[illegible]	(−3.03)	(−1.67)	(−2.33)
[illegible]	[illegible]	−0.451	−0.276	−0.274
	[illegible]	(−8.53)	(−1.62)	(−1.63)
[illegible]	[illegible]	[illegible]	0.323	0.306
	(−2.84)	[illegible]	(0.46)	(0.40)
TURNOVER	−3.941	[illegible]	−3.137	−3.167
	(−3.11)	[illegible]	(−1.94)	(−1.67)
$RET_{\{-1,0\}}$	−0.476	[illegible]	−0.537	−0.539
	(−4.99)	[illegible]	(−3.84)	(−4.39)
Constant	1.805	[illegible]	2.148	2.181
	(5.34)	[illegible]	(5.69)	(4.66)
Adj. R^2	0.063	[illegible]	0.103	0.102
Observations	[illegible]	[illegible]	893	893

[illegible] and October 2014. To alleviate this concern, we redefine changes in turnover and volatility by skipping the seven months before the program announcement on November 2014 and use the average daily turnover or volatility in March 2014 to scale the abnormal values. Specifically, we define the standardized change in turnover (ΔTURNOVER) as the average daily turnover of firm i in the window (0,10) after the program announcement divided by average daily turnover in March 2014 and then minus one. Similarly, we define the standardized change in volatility (ΔVOLATILITY) as the average daily volatility of firm i in the event window (0,10) after the program announcement divided by average daily volatility in March 2014 and then minus one.

We repeat our main analysis on changes in turnover and volatility by using the alternative definitions. The results are qualitatively similar to what we report before and thus we present the results based on the alternative definition of changes in turnover and volatility in Table 15 as a robustness check. Panel A of Table 15 presents the connection and speculative beta effect on the change in turnover. The coefficients on CONNECT and CONNECT×$BETA_{SH}$ are significantly positive at the 1% level. The economic magnitudes are slightly larger than those reported in Table 6. Panel B of Table 15 presents the connection and speculative beta effect on the change in volatility. The coefficients on CONNECT and CONNECT×$BETA_{SH}$ are significantly positive at the 5% level and the magnitudes are close to those reported in Table 7.

5.7. Alternative PS-matched sample using only SZ stocks as the control group

Given that the program was presented on April 10, 2014 but the implementation details, including the list of stocks, were officially announced on November 10, 2014, unconnected stocks may experience price appreciation during the seven-month period between the two dates due to market speculation and receive a negative surprise on November 10, 2014. Then our results based on the return difference between connected and matched unconnected stocks may overestimate the positive demand effect on the stock prices of connected stocks. Because the original proposal is only about Shanghai-Hong[illegible] Kong Connect is not proposed until two years later in August 2016, market speculation [illegible] severe for unconnected SZ stocks. Usi[illegible] Shenzhen stocks as the control group can help alleviate the concern as Shenzhen stocks are less anticipated by the market to be included

Table 14

. This table reports the speculative beta effect for announcement CARs (Panel A) and changes in turnover and volatility (Panel B) of connected stocks and propensity-score-matched unconnected stocks using alternative beta estimation:

$CAR_i = a_0 + a_1 CONNECT_i + a_2 CONNECT_i \times BETA_{SH,i} + a_3 BETA_{SH,i} + bz_i + \varepsilon_i,$

$\Delta TURNOVER_i \ (or \ \Delta VOLATILITY_i) = a_0 + a_1 CONNECT_i + a_2 CONNECT_i \times BETA_{SH,i} + a_3 BETA_{SH,i} + bz_i + \varepsilon_i,$

where CAR represents the cumulative market-adjusted abnormal returns (CAR_{MktAdj}), the CARs based on the market model (CAR_{MKT}), the Fama-French three-factor model (CAR_{FF3}), and the Carhart four-factor model ($CAR_{Carhart}$), or the cumulative DGTW benchmark-adjusted abnormal returns (CAR_{DGTW}) during the announcement window (−3,3). ΔTURNOVER is standardized change in turnover defined as the average daily turnover of firm *i* in the window (0,10) after the program announcement divided by average daily turnover in the most recent month and then minus one. ΔVOLATILITY is standardized change in volatility defined as the average daily volatility of firm *i* in the event window (0,10) after the program announcement divided by average daily volatility in the most recent month and then minus one. CONNECT is a dummy variable that equals one if the firm is in the connect program and zero otherwise. $BETA_{SH}$ is beta with respect to the Shanghai market index, which is estimated by regressing a stock's excess return on the contemporaneous excess market return and five lags of the excess market return using the past 12 months of daily returns before April 2014 (from April 2013 to March 2014) and summing up the six coefficients. Corresponding *t*-statistics based on robust standard errors clustered at the industry level are reported in parentheses.

(0.22) (1.01) 1.44) (5.32)

Panel A. Announcement CARs

	$CAR_{MktAdj}(-3,3)$		$CAR_{MKT}(-3,3)$		$CAR_{FF3}(-3,3)$			$CAR_{Carhart}(-3,3)$		$CAR_{DGTW}(-3,3)$	
CONNECT	−2.977	−3.822	−3.079	−4.171	−2.751	−3.442	−2.722	−3.430	−3.049	−3.167	
	(−3.34)	(−2.32)	(−3.36)	(−2.61)	(−2.40)	(−2.70)		(−2.59)	(−2.84)	(−3.00)	(−2.56)
CONNECT×$BETA_{SH}$	3.794	4.380	3.868	4.624	3.112	3.593		3.055	3.559	3.349	3.514
	(5.69)	(3.77)	(5.59)	(4.03)	(3.74)	(3.71)		(4.08)	(3.97)	(5.32)	(4.40)
$BETA_{SH}$	−2.281	−0.651	−1.334	0.542	−1.256	−0.065		−1.536	−0.231	−1.860	−1.418
	(−2.14)	(−0.91)	(−1.49)	(1.12)	(−1.27)	(−0.10)		(−1.74)	(−0.42)	(−1.44)	(−1.61)
SIZE		1.041		0.833		0.421			0.381		0.066
		(1.19)		(1.01)		(0.63)			(0.59)		(0.07)
BM		0.705		0.245		−1.479			−1.435		−0.992
		(0.80)		(0.30)		(−1.97)			(−1.95)		(−1.21)
ROA		2.662		2.042		6.464			5.553		2.274
		(0.26)		(0.22)		(0.69)			(0.61)		(0.23)
LEV		2.295		1.847 3.593				0.066			

stocks and their propensity-score-matched unconnected stocks separately. We report the regression analysis in Table A9 of the Internet Appendix. Panel A reports the results for the connected stocks and Panel B for the propensity-score-matched unconnected stocks. The first major finding is that the coefficient on $BETA_{SH}$ is significantly positive for connected stocks, suggesting that the announcement CAR of connected stocks increases with their Shanghai market beta. More importantly, the coefficient on $BETA_{SH}$ is insignificant for propensity-score-matched unconnected stocks in all specifications. This result assures us that the beta effect that we document based on the difference in the market reaction between connected and matched unconnected stocks is only driven by the treatment sample but not the control sample.

Second, the program was presented on April 10, 2014, while the details including the list of stocks were announced on November 10. There might be early market reaction on unconnected stocks during the seven-month period between the two dates, leading to a negative surprise to unconnected stocks when the detailed list of connected stocks is finally announced in November 2014. To test this potential explanation, we include the cumulative return between April and October 2014 ($RET_{\{Apr, Oct\}}$) in the regression analysis. We find that the coefficient on $RET_{\{Apr, Oct\}}$ is indeed significantly negative for unconnected stocks, suggesting that the announcement CAR of unconnected stocks decreases with $RET_{\{Apr, Oct\}}$, which is consistent with the hypothesis that the more positively the market reacts on unconnected stocks between April and October, the more negative abnormal returns these unconnected stocks experience when the program is finally announced. Interestingly, we find that the coefficient on $RET_{\{Apr, Oct\}}$ is also significantly negative for connected stocks. This result suggests that there are also early market reactions on connected stocks. And the more positively the market reacts on the connected stocks between April and October, the less positive abnormal returns these connected stocks experience during the program announcement in November. Overall, our results suggest that there are early market reactions on both connected stocks and unconnected stocks with similar characteristics. Higher returns between April and October will lead to more negative returns for unconnected stocks and less positive returns for connected stocks. By taking the difference in announcement CARs of connected and unconnected stocks, our estimation of the connect effect captures not only the announcement effect but also the early market expectation of the program, which in fact helps us measure the overall effect of the connect program.

6. - - : -

Since its official launch on November 17, 2014, the Shanghai-Hong Kong Stock Connect program has been operating smoothly. To further promote the development of capital markets in both mainland China and Hong Kong, the CSRC and the HKSFC agreed, in principle, upon the establishment of mutual stock market access between Shenzhen and Hong Kong (the Shenzhen-Hong Kong Stock Connect) on August 16, 2016.

The Shenzhen-Hong Kong Stock Connect program was officially approved and announced on November 25, 2016. The announcement confirmed that trading would commence on December 5, 2016. After the launch of Shenzhen-Hong Kong Stock Connect program, mutual stock market access between mainland China and Hong Kong is expanded through the Northbound Shenzhen Trading Link and the Southbound Hong Kong Trading Link under the Shenzhen-Hong Kong Stock Connect program, which is similar to the Shanghai-Hong Kong Stock Connect program.

Eligible shares under the Northbound Shenzhen Trading Link consist of any constituent stocks of the SZSE Component Index and the SZSE Small/Mid Cap Innovation Index with a market capitalization of 6 billion *yuan* or above and all SZSE-listed stocks with both A- and H-shares. Eligible shares under the Southbound Hong Kong Trading Link consist of all constituent stocks of the Hang Seng Composite LargeCap Index and the Hang Seng Composite MidCap Index, any constituent stocks of the Hang Seng Composite SmallCap Index with a market capitalization of 5 billion HKD or above, and all SEHK-listed stocks with both A- and H-shares. On December 5, 2016, the first day of trading, there are 881 eligible stocks under the Northbound Shenzhen Trading Link and 417 eligible stocks under the Southbound Hong Kong Trading Link.

6.1. Announcement returns, connection, and the beta effect

The event of the Shenzhen-Hong Kong Stock Connect program serves as an opportunity for us to perform out-of-sample tests for our previous findings. We match the 881 SZSE-listed connected stocks with all the other A-share stocks that are not affected by the Shenzhen-Hong Kong Stock Connect program following the procedure described in Section 4.[18] We report the regression analysis of abnormal announcement returns in Table A7 of the Internet Appendix. The dependent variable is CAR based on the market model during the window (−3,3) around the announcement date of November 25, 2016. The coefficient on the CONNECT dummy is significantly positive with a magnitude of 0.471 after controlling for various firm characteristics. The result suggests that SZSE-listed connected stocks on average experience a 0.471% higher CAR than the PS-matched non-event stocks during the announcement of the Shenzhen-Hong Kong stock connect program. The magnitude is smaller than that during the announcement of the Shanghai-Hong Kong Stock Connect program, which is potentially due to the expectation of the event before the announcement and less uncertainty of the Shenzhen-Hong Kong Stock Connect program.

Moreover, the coefficient on the interaction term CONNECT × $BETA_{SZ}$ is significantly positive with a magnitude of 1.645 after controlling for various firm characteristics. The result indicates that a one-unit increase in Shenzhen market beta leads to a 1.645% more increase in the CAR of SZSE-listed connected stocks than that of the non-event stocks during the seven-day announcement window.

Taken together, our results based on the Shenzhen-Hong Kong Stock Connect program provide out-of-sample evidence supporting our main hypotheses. We show that connected stocks experience significant higher price appreciation than stocks that are not affected by the program, especially for those stocks with a high Shenzhen market beta.

6.2. Hong Kong investors' holdings of Shenzhen connected stocks and firm characteristics

Different from the Shanghai-Hong Kong Stock Connect program, Hong Kong investors' holdings of connected stocks through the Shenzhen-Hong Kong Stock Connect program at the stock level are immediately disclosed by the Shenzhen Stock Exchange after the commencement of the program. This disclosure enables us to perform a timely analysis of the relation between the Hong Kong investors' demand of connected stocks and firm characteristics such as market beta, which complements our previous studies of the Shanghai-Hong Kong Stock Connect program.

We collect Hong Kong investors' holdings of all Shenzhen connected stocks at each of the four quarter ends right after the announcement of the program (December 2016, March 2017, June

[18] A-share stocks that are not affected by the Shenzhen-Hong Kong Stock Connect include the stocks that have never been included in either the Shanghai-Hong Kong Stock Connect or the Shenzhen-Hong Kong Stock Connect program and stocks that have already been included in the Shanghai-Hong Kong Stock Connect program.

2017, and September 2017). We regress Hong Kong investors' holdings of a stock on its market beta and a number of other firm characteristics. The results are reported in Table A8 of the Internet Appendix. Consistent with previous findings, there is no positive relation between Hong Kong investors' holdings and a stock's market beta. Instead, the coefficient on market beta is significantly negative, which suggests that Hong Kong investors demand less of high-beta stocks. The results confirm that the beta effect is not due to the size of the demand shock but rather due to the slope of the demand curve.

7.

In this paper, we show that the demand effect and its interaction with speculative trading play an important role in determining asset prices during the announcement of a large market liberalization event, the Shanghai-Hong Kong Stock Connect program. Anticipating Hong Kong investors' demand, Chinese investors react positively to the announcement of the connect program. Connected stocks in the Shanghai Stock Exchange experience significant value appreciation compared with unconnected stocks with similar firm characteristics, especially for stocks with high market beta.

Due to heterogeneous beliefs about the aggregate market and short-sale constraints, stocks with high market beta are more prone to speculative trading as suggested by Hong and Sraer (2016). We show that high-beta stocks in China are associated with significantly high turnover and low expected returns, supporting the speculative nature of market beta. Moreover, the beta effect for announcement returns is stronger for stocks with high beta-to-idiosyncratic variance ratios as predicted by Hong and Sraer (2016) and is reversed within 60 trading days after the announcement. These additional results further distinguish a speculation-based explanation from a risk-based explanation. The interaction between the demand shock and the speculative beta in our results is consistent with the theoretical prediction in Hong et al. (2006) that the demand curve is steeper for stocks with a higher degree of speculative trading. We also use the Shenzhen-Hong Kong Stock Connect program more recently announced on November 25, 2016 as an out-of-sample check and find that our results and conclusions continue to hold.

Speculative trading is usually associated with high turnover and high return volatility. We further show that connected stocks experience substantial increases in turnover and return volatility after the announcement. Moreover, the increases in both turnover and volatility are larger for stocks with a higher Shanghai market beta. All of our evidence suggests that the beta effect is closely related to the speculative trading activities of Chinese investors.

Stock revaluation during market liberalization is often understood from the risk-sharing perspective. We point out that the demand effect and its interaction with stock market speculation can also have substantial effects on asset prices. We provide extensive evidence that our results are robust to alternative explanations, including the size of demand shocks, the information on future cash flows, the risk-sharing perspective, and the endogenous effect of persistent firm characteristics. One potential interesting direction for future work is to test the theoretical prediction of the multiplier effect of speculative trading on the price sensitivity to demand/supply shocks in other settings, such as constitutional changes in the stock index and institutional block trades in speculative markets.

Variable	Definition
SIZE	Natural logarithm of the market capitalization (in thousand yuan).
BM	Book-to-market equity ratio, defined as the book value of equity divided by the market value of equity.
ROA	Return-on-assets, defined as net income divided by total assets.
LEV	Leverage, defined as the sum of short-term debt and long-term debt divided by total assets.
$BETA_{SH}$	Shanghai market beta, which is estimated from a market model using the return of Shanghai composite index as the market return. The model is estimated based on daily return over the past 12 months.
TVOL	Total volatility, defined as the (annualized) standard deviation of daily stock returns in the past 12 months.
$IVOL_{SH}$	Idiosyncratic volatility, defined as the (annualized) standard deviation of the daily residual returns from a Shanghai market index model in the past 12 months.
$BETA_{HK}$	Hong Kong market beta, which is estimated from a market model using the return of Hang Seng index as the market return. The model is estimated based on daily return over the past 12 months before program announcement.
TURNOVER	Average daily turnover over the past 12 months. Turnover is defined as trading volume (in shares) divided by total free-float shares outstanding.
AMIHUD	Amihud illiquidity measure, defined as the average ratio of daily absolute stock return to daily trading value (in yuan) $\times 10^8$ over the past 12 months.
$RET_{\{-1,0\}}$	Stock return in month $t-1$.
CAR_{MktAdj}	Cumulative market-adjusted abnormal return.
CAR_{MKT}	Cumulative abnormal return based on the market model. A 250-day pre-event window is used to estimate the coefficient on the market return and at least 30 days of available return data is required. A 30-day gap between the pre-event estimation period and the event window is used in order to avoid any microstructure effects and mechanical results.
CAR_{FF3}	Cumulative abnormal return based on the Fama-French three-factor model.
$CAR_{Carhart}$	Cumulative abnormal return based on the Carhart four-factor model.
CAR_{DGTW}	Cumulative benchmark-adjusted abnormal return following Daniel et al. (1997).
ΔTURNOVER	Change in turnover, defines as average daily turnover in the specified window after the program announcement divided by average daily turnover in the most recent month and then minus one.
ΔVOLATILITY	Change in return volatility, defined as average daily volatility in the specified window after the program announcement divided by average daily volatility in the most recent month and then minus one.

(continued on next page)

Variable	Definition
$DIFCOV_{HK}$	Difference between a stock's return covariance with the Shanghai market and its return covariance with the Hong Kong market. Covariances are estimated based on daily return over the past 12 months before program announcement.
$DIFCOV_{MSCI}$	Difference between a stock's covariance with the Shanghai market and its covariance with the MSCI Global index. Covariances are estimated based on daily return over the past 12 months before program announcement.
ΔForecastEPS2014	Change in analysts' earnings forecast per share (EPS) divided by the stock price at the end of October 2014 (in%) for year 2014, defined as the difference between the median forecasted EPS in six months after the announcement of the connect program and the median forecasted EPS in six months before the announcement of the connect program. Δ