

The Impact of the Shanghai-Hong Kong Stock Connect Program on the A-H Share Premium

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ABSTRACT

In this paper, we investigate the impact of the announcement and subsequent implementation of the Shanghai–Hong Kong Stock Connect Program in 2014 on the A-H share premium. Although most A-shares were valued more than H-shares before the implementation, their A-H premium increased rather than declined afterwards. We show that this puzzle is partially driven by the opposite trading actions of Hong Kong investors between the two event windows. Limited arbitrage possibility due to institutional differences between the two markets contributes to the persistent price disparity. We also find significant structural differences in market responses across the A-H stocks during the sample period. Our results have significant implications to dual-listed shares with institutional differences under partial market segmentation.

JEL Classifications: G14, G15, G18, G41

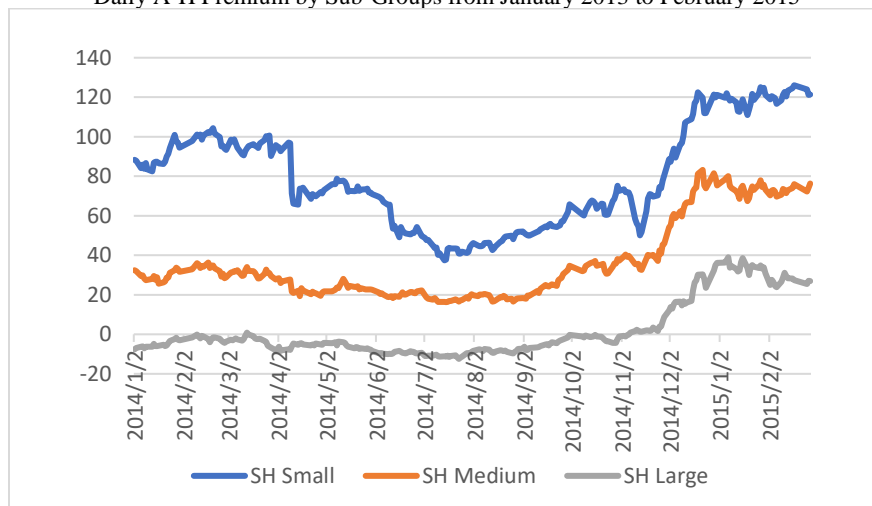
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I. INTRODUCTION

China's stock markets are not fully integrated into international stock markets because of restrictions on capital accounts¹ and foreign ownership². However, the country has been making steady progress toward capital market liberalization³. Among all the market liberalization programs introduced, perhaps the most significant step was taken in November 2014 when China launched the Shanghai–Hong Kong Stock Connect Program (The Program). For the first time, starting November 17, 2014, mainland investors can trade directly the preapproved hundreds of shares listed on the Stock Exchange of Hong Kong (SEHK). Conversely, investors (including foreign institutions and individuals) who have brokerage accounts in Hong Kong (H.K.) are also allowed for the first time to trade directly the preapproved hundreds of A-shares listed on the Shanghai Stock Exchange (SSE).

Historically, for the majority of companies that have both A- and H-shares cross-listed, the A-shares (in renminbi [RMB]) tend to trade at a frequently substantial A-H premium (defined as A-share price/H-share price – 1, converted to same currency) to the twin H-shares (in H.K. dollars [HKD]). Given the diminishing market segmentation limitations after The Program launch, the premium, should presumably decline. After controlling for pertinent factors, Fan and Wang (2017) find that the A-H premium did decline after The Program launch. However, other researchers have documented the opposing evidence. We also find that for the sample period after The Program launch in November 2014, the A-H discount started to disappear as the A-H premium widened and the wider premium persisted (see Figure 1). Such findings indicate that The Program fail to reduce valuation gaps between the A-H shares, thus weaken the expectation of improved market integration after The Program launch.

Figure 1
Daily A-H Premium by Sub-Groups from January 2013 to February 2015



Notes: The A-H Premium is calculated based on A-share price/H-share price (converted in the same currency) minus one. The scale on the vertical axis is in percentage. SH Small, SH Medium, and SH Large represent the small capitalization, medium-size capitalization, and large capitalization stocks dual-listed on Shanghai Stock Exchange and Hong Kong Stock Exchange, respectively.

More importantly, we explore the dynamics of the premium changes by investigating the underlying price changes of A- and H-shares, and attribute the unexpected policy outcome to four reasons: first, the institutional differences between the two markets, such as the existence of price limits, short-selling restriction, and prohibition of intraday trading in the A-share market, hinder arbitrage between the prices of A- and H-shares. Second, The Program requires each participating mainland investor to have the minimum RMB500,000 in the brokerage account, prohibiting vast majority of mainland retail investors from trading H-shares, especially buying those that have the largest discounts. Third, large A-shares which traded with discounts relative to the twin H-shares before The Program launch eliminated the discounts afterwards. Finally, perhaps a transitory effect, The Program launch coincides with the start of a government-induced bull market of A-shares in mainland, elevating the prices of A-shares further away from those of the H-shares.

II. LITERATURE REVIEW

Market segmentation leads to failure of arbitrage and the law of one price. Researchers have documented various factors accounting for the dual-class share price differences and the true explanation for the persistent A-H premium remains elusive (see Carpenter and Whitelaw, 2017).

Some researchers (Bailey, 1994; Chakravarty et al., 1998; Chan et al., 2008) find that smaller firms have larger A-B premia than larger firms. They attribute this result to information asymmetry. However, Fang (2014) shows that despite the segmentation, investors in mainland China and H.K. can, to a certain extent, invest in each other's market place. The enormous A-H share premia given ever-expanding information technology makes the information asymmetry hypothesis difficult to hold.

Fernald and Rogers (2002) find that the A-B premium is due to mainland investors' lack of investment alternatives to bank deposits, thus low opportunity cost for them to move deposits into potentially high-yielding stocks. Froot and Dabora (1999) find that the price premium of dual-listed stocks is highly correlated with the more active (i.e., high turnover) local market performance; that is, the location of trades matters. Chen et al. (2001) attribute B-share discounts to lower liquidity in the B-share market. The prohibition of short selling in mainland markets is found to lead to relatively overpriced domestic A-shares and high turnover rates (e.g., Mei, Scheinkman, and Xiong, 2009).

Wang and Jiang (2004) find that the average daily A-H premium is 312% (223% for Shanghai-listed stocks and 567% Shenzhen-listed ones).⁴ The A- and H-shares are each influenced by their own market risk and investor sentiment. In addition, because dividends for the H-shares are paid in RMB, the H-share discount is found to be positively related to RMB devaluation expectation. Chan and Kwok (2005) find that the A-H premium can be attributed to the fact that significantly more H-shares are floated than A-shares, when mainland investors already face limited investment alternatives. Li, et al. (2006) attribute the A-H share price premium to the respective local market indexes and the savings rate differences. Chung, et al. (2013) find that standard deviation of asset volatility explains the A-H premium.

Guo, et al. (2013) and Hou and Lee (2014) confirm the role of corporate governance affecting the premium of dual-listed shares. Guo, et al. (2013) also find a positive relationship between the A-H premium and the potential for controlling

shareholders to extract gains from external investors. Leuz, et al. (2009) find that foreign investors are less likely to invest in weak governance firms especially in countries lack of investor protection and disclosure rules because of high information and monitoring costs.

Jia, et al. (2017) find that mainland Chinese investors favor domestic analysts and investors in H.K. favor foreign analysts. “Analyst recommendations may exacerbate, rather than attenuate, the market segmentation between the two share classes” (p. 2972). With regard to the impact of The Program, Huang and Lin (2016) find positive price effects on both A- and H-shares, and the H-shares have stronger positive price impact. Their sample period is from August 2014 to February 2015, focusing on The Program launch event. By examining the market indexes, Wang, et al (2016) find that The Program launch results in positive though different effects on the volatility and returns of Shanghai, Shenzhen, and Hong Kong stock markets. Chan and Kwok (2016) find more price parity (and cointegration) between April 2014 and July 2014 and rising A-H Share premium is accompanied by substantial price co-movements after the Program implementation.

Fan and Wang (2017) conduct a regression test of The Program implementation impact on the A-H premium index. They examine the A-H premium changes. Their main evidence is opposite to that of most other researchers and ours. The sample size may partially explain such differences.

Bai and Chow (2017) also find asymmetric price reactions of A-share versus H-shares to The Program launch window. Burdekin and Siklos (2018) find that the cash flows between Shanghai and H.K. affect the A-H share premium using the daily data from November 2014 to January 2017. More specifically, the A-H Share premium is negatively correlated with Northbound trade than with Southbound trade during the more volatile sample period. Hui and Chan (2018) examine the impact of the implementation and the stock market crisis of 2015 on the A-H premium. They find similar results to ours for a small part of our sample for the implementation event.

Our paper differs from the recent studies in several important ways. We compare the underlying return performance of the A- and H-shares around the times of The Program announcement and implementation and find significant reversals of share performance between the two events. We examine how the A-H premium responded during the two event windows using both the portfolio approach and the regression tests. Moreover, we find that the A-H premium based on different market capitalizations have different underlying price dynamics, the change of which is simultaneously driven by the relative performance of the underlying A- and H-shares.

In addition, given the institutional constraints (e.g., short-selling restriction, daily price limits, intraday trading restriction, etc.) and The Program limitations for A-shares (e.g., mainland individual investors are mostly precluded from participating in The Program), we find that investors of the H-shares in H.K. tend to be much more active than their mainland counterparts of the twin A-shares. Using very different methodologies, for the sample period, we find similar results to those in Jiang and Sohn (2016) that H-shares contribute significantly more than A-shares to the price discovery of A-H shares before and after The Program implementation.

The investigation of the A-H premium puzzle contributes to our understanding of cross-listing dynamics and capital market efficiency especially under partial market segmentation. Our results reflect the contrast in trading behavior between informed traders and naive counterparties, reveal the unintended consequences of government

policies (Brunnermeier et al., 2017), and indicate potential ways to mitigate disintegration between dual-listed share markets. These findings have significant policy implications with regard to The Program and the institutional differences between the two markets.

III. DATA AND METHODOLOGY

Our sample includes the four-year daily series of A- and H-share prices, the A-H premium of all 68 actively traded stocks that are dual-listed in H.K. and in Shanghai from January 1, 2013 to December 31, 2016. The total market capitalization of all dual-listed stocks was RMB19.33 trillion (USD3.05 trillion) as of September 30, 2015, about 43% and 83% of the total A-share market capitalization and H.K. stock market capitalization, respectively. The data are from Wind and Bloomberg.⁵ For each stock, our sample includes the daily series of the transaction date, the H-share price in HKD and in RMB, the A-share price in RMB, and the A-H premium. The sample also includes market capitalization, number of float A- and H-shares, number of A- and H-shares outstanding, total number of shares outstanding, and daily trading volume of both A- and H-shares. Other control variables include state ownership, ownership fraction of the largest shareholders, debt ratio, fraction of nonexecutive independent directors on the board, and total annual RMB salary of independent directors. Daily exchange rates between RMB and HKD are also included in the sample.

In Table 1 Panel A, we provide the summary statistics of key variables. During the sample period, the average A-H premium for the dual-listed shares in Shanghai and H.K. is 66.6%. The average Hang Seng Index (HSI) return is -0.006% versus the average daily return of the SSE index of 0.038% . The minimum daily return for the H-shares is -27.88% , and the maximum 80.43% .⁶ The total market capitalization of the sample A-shares is about 5.19 times as large as that of the twin H-shares. A-shares have greater total number of shares outstanding than H-shares, but H-shares have greater number of float shares than A-shares. The average debt–asset ratio is 29%. On average, around 68% of board members are independent directors. The average total annual salary for all nonexecutive board members is around 1 million RMB. Government owns on average 56% of these cross-listed companies, and 60.5% of sample firms have a higher percentage of A-shares versus H-shares owned by the largest shareholders.

Table 1
Summary Statistics
(January 1, 2013 – December 31, 2016)
Panel A: Key Variables in Regression Analysis

<i>N</i> =59,828	Mean	Median	Minimum	Maximum	Stdev
<i>AHP</i>	0.666	0.424	-0.406	8.436	0.822
<i>R_{HSI}</i>	-0.006	0.010	-5.814	4.276	1.075
<i>R_{SSE}</i>	0.038	0.073	-8.491	5.763	1.634
<i>R_A</i>	0.067	0	-11.679†	10.232	2.814
<i>R_H</i>	0.016	-0.038	-27.881	80.428	2.581
<i>Relative vol.</i>	1.096	1.077	0.543	2.031	0.276
<i>Size</i>	11.008	10.892	7.218	14.752	1.512
<i>Relcap</i>	5.193	4.230	0.034	30.022	3.508
<i>Relshr</i>	3.455	2.776	0.034	83.290	3.669

<i>Relfl</i>	0.448	0.311	0.015	4.127	0.575
<i>LEV</i>	0.291	0.269	0	0.846	0.168
<i>TOP_A</i>	0.598	0.664	0	0.987	0.281
<i>TOP_H</i>	0.513	0.527	0	1.129	0.266
<i>IBD</i>	0.681	0.714	0.363	1.000	0.134
<i>SAL</i>	10.467	6.800	0	131.495	13.498
<i>State</i>	0.562	0.741	0	0.997	0.419
<i>D_{TOPA>TOPH}</i>	0.605	1.000	0	1.000	0.488

Panel B: AHP by Market Capitalization and Time

Year	N	Mean	Median	Stdev	N	Mean	Median	Stdev
<i>Small-cap Group</i>					<i>Mid-cap Group</i>			
2013	5,932	1.474	0.974	1.416	6,133	0.351	0.237	0.500
2014	6,005	0.966	0.702	1.048	6,415	0.297	0.254	0.359
2015	5,742	1.509	1.351	0.987	6,207	0.975	0.831	0.695
2016	5,886	1.432	1.118	1.134	6,290	0.866	0.752	0.608
Before	11,154	1.225	0.812	1.299	11,715	0.309	0.236	0.432
After	12,411	1.448	1.239	1.049	13,330	0.898	0.722	0.649
Total	23,565	1.343	1.035	1.179	25,045	0.621	0.499	0.631
<i>Large-cap Group</i>					<i>Full Sample</i>			
2013	5,799	0.054	-0.020	0.240	14,789	0.491	0.237	0.775
2014	6,272	-0.009	-0.071	0.198	15,157	0.327	0.195	0.535
2015	6,254	0.520	0.347	0.634	14,770	0.965	0.775	0.863
2016	6,247	0.447	0.323	0.495	15,112	0.885	0.652	0.892
Before	11,273	0.011	-0.056	0.209	28,005	0.397	0.201	0.678
After	13,299	0.466	0.320	0.562	31,823	0.902	0.697	0.854
Total	24,572	0.256	0.150	0.493	59,828	0.666	0.425	0.822

Notes: In Panel A, † “-11.679%” is the return of Huadian Power International (600027) on June 19, 2015. It is the only data point that we find as a probable data error from the stock exchange. In Panel B, we report AHP across different years and subsample groups. “Before” and “After” indicate the period before and after the Shanghai–Hong Kong Stock Connect Program launch on November 17, 2014, respectively.

We model the panel data using generalized method of moment (GMM) estimators as follows:

$$AHP_{i,t} = \alpha_i + \beta_i AHP_{i,t-1} + \gamma'_i X_{i,t} + \delta'_i D_t + \varepsilon_{i,t}, \quad (1)$$

where $AHP_{i,t}$ is the daily A-H premium of firm i at time t . $AHP_{i,t-1}$ is the lagged one-day premium. Other independent variables $X_{i,t}$ include SSE index return, HSI return, logarithm of combined market capitalization of A- and H-shares, relative volatility of both shares, exchange rate (RMB/HKD), relative market capitalization of both shares, ratio of floating A-shares over floating H-shares, relative turnover (A-share turnover ratio divided by H-share turnover ratio), and the leverage ratio. In addition, we include three corporate governance variables as control variables: TOP is the percentage of total shares outstanding held by the largest institutional shareholders, IBD is the fraction of independent directors on the board, SAL is the log of the total annual RMB salary of the nonexecutive board directors, and $State$ is the percentage of total shares held by the government.

We use two dummy variables D_t to indicate the two events: the dummy for the announcement equals 1 if the period is from April 10, 2014 to November 16, 2014, and

0 otherwise; the dummy for the launch event equals 1 if the sample period is on and after November 17, 2014, and 0 otherwise.

To explore the significance of the A-H premium change, we calculate the daily weighted A-H premium for the full sample, the smallest, and the largest one-third of the sample based on market capitalization, respectively. We then calculate the relative daily change in the A-H premium for the three groups by subtracting the mean of each group for the three prior periods: one week, one month, and one quarter before the announcement day and the launch day for each day during the two event windows, respectively. For each day during each event window, measured against each of the prior periodic mean, a portfolio's relative change of the A-H premium ($\Delta AHP_{p,t}$) is

$$\Delta AHP_{p,t} = \sum_{i=1}^n W_i AHP_{i,t} - \sum_{i=1}^n W_i (\sum_{t=t_0-1}^{t_0-T} AHP_{i,t} / T), \quad (2)$$

where n is the number of stocks in each portfolio group, W_i is the weight of stock i , t_0 is The Program announcement day or launch day. $T = 5, 21,$ and 68 trading days for the one-week, one-month, and one-quarter test before day 0 in each event window, respectively. The standard error for the portfolio each day in the event window is derived based on each stock's excess A-H premium defined as $AHP_i - \sum_{t=1}^T AHP_{i,t} / T$ in the portfolio group; the t -values and p -values are then reported.

To explain why the A-H premium changed in the way it did, we calculate the daily weighted returns of the A- and H-shares separately for the full sample, the small-stock, the medium-stock, and the large-stock group based on market capitalization, relative shares outstanding ratio, and turnover ratio, respectively. We then calculate the market-adjusted abnormal returns for each of the groups. Finally, we calculate the cumulative abnormal returns (CARs) of the H- and A-shares for each event window.

To have a more robust test of the stock return impact on A-H premium changes, we run a cross-sectional regression of the cumulative A-H premium changes on the CARs of both the A-shares and H-shares while controlling similar explanatory variables as before:

$$C_ \Delta AHP_i = \alpha + \beta CAR_{i,A} + \delta CAR_{i,H} + \gamma' X_i + \theta D_{i, TOP} + \varepsilon, \quad (3)$$

where $C_ \Delta AHP_i$ is the six-day (0, 5) cumulative A-H premium changes of stock i for each event window, and $CAR_{i,A}$ and $CAR_{i,H}$ are the corresponding CARs of the A-shares and H-shares, respectively. The dummy variable $D_{i, TOP}$ equals 1 when TOP for the A-shares is greater than TOP for the H-shares, and 0 otherwise. Other independent variables X_i include the same variables as those in model (1).

IV. HOW DID THE A-H PREMIUM CHANGE?

The timeline of the key events in 2014 and 2015 regarding The Program is provided in the Appendix. Figure 1 shows the unadjusted A-H premium changes based on market capitalization for the sample period.

A. How did the A-H premium change after the program announcement?

Given that the H.K. stock market is far more developed than the mainland market, our basic premise with regard to valuation of A- and H- shares is that H-share prices are much

closer to the asset fundamental values than A-shares, especially before The Program announcement. Since The Program does not alter the valuation of firms, the impact of The Program is on how the dual-class share prices move relative to each other. As such, before the announcement, the observation is that relative to the H-shares, the twin A-shares of small and mid-size stocks in general tended to be significantly overvalued and the twin A-shares of large stocks were slightly undervalued.⁷

Brunnermeier, et al. (2017) show that policy-induced noises tend to attract “speculation of short-term investors by diverting away from asset fundamentals” (p. 34). Because the announcement of The Program was a surprise and positive development in reducing market segmentation and that limitations to arbitrage are to be relaxed, for the event announcement window in April 2014, The Program is expected to reduce the price disparity. In addition, because small stocks tend to have much higher A-H premium than large stocks, it is also expected that the absolute value changes in the A-H premium for small stocks decrease more than large stocks do.

In Table 1 Panel B, we partition the sample by total market capitalization and time for different sample groups. The Shanghai small-cap firms have the highest A-H premium across all years, and the A-H premium monotonically decreases as firm size increases. For example, before the launch of The Program, the A-H premia for the Shanghai small, medium, and large firms were 122.5%, 30.9%, and 1.1%, respectively. After the launch, the corresponding A-H premium increased to 144.8%, 89.8%, and 46.6% for the three groups.

In Table 2, we show regression results based on model (1) using panel data. The impact of the announcement event on A-H premium changes is negative and significant at the 1% level. The surprising announcement decreased the A-H premium as expected. Among the control variables, the A-H premium is positively and significantly affected by the SSE index, and negatively and significantly affected by the HSI. We find that the A-H premium is negatively and significantly related to the market capitalization. In addition, relative volatility, relative market cap, and relative turnover have a positive and significant impact on the A-H premium. As expected, the leverage ratio has a positive and significant impact on the A-H premium (t -value = 2.22) at the 5% level.

Table 2
Regressions of the A-H Premium (AHP)
on Dummy Variables of Event Dates and Other Control Variables

GMM Coefficient			GMM Coefficient		
Variables	Estimate	T-values	Variables	Estimate	T-values
Intercept	0.029***	2.63	<i>Relcap</i>	0.008***	10.17
<i>AHP(t-1)</i>	0.940***	208.90	<i>Relfl</i>	-0.006	-0.75
<i>Dummy for Announcement</i>	-0.002***	-2.61	<i>Relto</i>	0.001***	3.19
<i>Dummy for Launch</i>	0.003***	3.64	<i>TOP</i>	-0.003***	-2.97
<i>SSE Index Return</i>	1.368***	77.51	<i>LEV</i>	0.003**	2.22
<i>HSI Return</i>	-1.702***	-63.28	<i>IBD</i>	-0.003*	-1.77
<i>Ln(Market Cap)</i>	-0.001***	-3.69	<i>SAL</i>	0.000	0.01
<i>Relative Vol.</i>	0.002**	2.25	<i>State</i>	0.002**	2.20
<i>Exchange Rate</i>	-0.025**	-2.01			
Adjusted R ²	0.989		N	59,828	

Notes: *AHP(t)* is the A-H premium at time t . *AHP(t-1)* is the lagged one-term premium. *Dummy for Announcement* equals 1 if the period is from April 10, 2014 to November 16, 2014, and 0 otherwise; *Dummy for Launch* equals 1 if the sample period is on and after November 17, 2014, and 0 otherwise. *SSE Index Return*

is the daily Shanghai Stock Market index return in percentage. *HSI Return* is the daily Hong Kong Hang Seng index return in percentage. *Relative vol.* is relative stock return volatility between A-shares and H-shares. $\ln(\text{market Cap})$ is the logarithm of market capitalization in millions of RMB. *Relcap* is A-share market capitalization divided by its twin H-share market capitalization. *Relfl* is the total number of float shares of A-shares divided by H-shares. *Relto* is the relative turnover ratio between A-shares and H-shares. *TOP* is the percentage of total shares outstanding held by the largest shareholders. *LEV* is the leverage ratio. *IBD* is the percentage of independent directors on the board. *SAL* is the total RMB (in 100,000) salary of nonexecutive board members. *State* is the percentage of government ownership. ***, **, and * indicate the significance at the 1%, 5%, and the 10% levels, respectively.

With regard to the corporate governance variables, we find that *TOP* (ownership fraction by the largest shareholders) has a negative and significant impact on the A-H premium at the 1% level, indicating better governance reduces price differences. These results are consistent with the correlation results. Also, *SAL* (total annual salary of the nonexecutive board members) is not significant at any conventional level. We also find that *State* (government ownership) has a positive and significant impact on the A-H premium at the 5% level.

In Table 3, using the portfolio approach, we show the structural impact of The Program announcement on A-H premium changes in April 2014. For the full sample, the change in the A-H premium during the event window is negative and significant at the 1% level (except for one case on day 4 in Panel C at the 5% level) when measured against the prior one-week, one-month, and one-quarter mean A-H premium. For small stocks, the results are similar to those for the full sample, the changes in the A-H premium are negative and significant at the 1% level in all except for three cases (day 3 to 5 in Panel B which are significant at the 5% level). For example, the A-H premium change over the prior one-week average on day 0 (the announcement day, April 10, 2014) is -23.64% with a t -value of -3.69 (p -value = 0.0002). The change in the A-H premium for the large-cap group is not significantly different from zero when measured against the prior one-month or one-quarter mean A-H premium. However, the one-week change in the A-H premium for the large-cap group is positive and significant at the 1% level except for day 0 which is at the 5% level. In Table 1, the average A-H premium of large stocks in 2013 is only 5.40%. In 2014, we observe a negative A-H premium (-0.90%) for large stocks. As a matter of fact, for large stocks, the prior one-week mean A-H premium is -6.85% relative to the prior one-month mean of -3.68% and the one-quarter mean of -4.08% (not reported in tables). Therefore, it is not surprising that the announcement effect on the A-H premium of large stocks is positive and significant when measured against the prior one-week average — the A-H premium (or discount) becomes less negative after the announcement, consistent with the policy intention.

Table 3
Changes in the A-H Premium ($\Delta\text{AHP}\%$) during the Announcement Window

Diff.	Full Sample			Small-Cap Group			Large-Cap Group		
	$\Delta\text{AHP}\%$	t -value	p -value	$\Delta\text{AHP}\%$	t -value	p -value	$\Delta\text{AHP}\%$	t -value	p -value
Panel A: $\Delta\text{AHP}\%$ relative to the Daily Average in the Prior Month									
D5-1M	-9.02	-3.32	0.0007***	-18.94	-2.55	0.006***	-0.59	-0.61	0.7289
D4-1M	-8.60	-3.20	0.0011***	-19.47	-2.67	0.0045***	0.13	0.14	0.4428
D3-1M	-8.80	-3.46	0.0005***	-19.41	-2.86	0.0027***	0.04	0.04	0.4835
D2-1M	-11.70	-3.54	0.0004***	-26.74	-3.01	0.0017***	-0.56	-0.45	0.6725
D1-1M	-11.75	-3.60	0.0003***	-26.38	-3.04	0.0016***	0.05	0.04	0.4839

D0-1M	-11.73	-4.46	0.0000***	-25.35	-3.78	0.0001***	-1.44	-1.25	0.8917
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Panel B: Δ AHP% relative to the Daily Average in the Prior Quarter

D5-3M	-7.57	-2.70	0.0044***	-15.50	-1.98	0.0256**	-0.19	-0.20	0.5802
D4-3M	-7.15	-2.55	0.0065***	-16.0	-2.06	0.0215**	0.54	0.58	0.2824
D3-3M	-7.35	-2.77	0.0036***	-15.97	-2.18	0.0159**	0.44	0.50	0.3092
D2-3M	-10.24	-3.03	0.0017***	-23.30	-2.50	0.0072***	-0.16	-0.13	0.5524
D1-3M	-10.30	-3.09	0.0014***	-22.94	-2.52	0.0068***	0.46	0.36	0.3616
D0-3M	-10.28	-3.73	0.0002***	-21.91	-2.98	0.0019***	-1.04	-0.93	0.8232

Panel C: Δ AHP% relative to the Weekly Average in the Prior Week

D5-1W	-6.55	-2.50	0.0074***	-17.23	-2.43	0.0085***	2.58	3.68	0.000
D4-1W	-6.13	-2.37	0.0104**	-17.75	-2.56	0.0061***	3.30	5.08	0.0000
D3-1W	-6.33	-2.58	0.0060***	-17.70	-2.73	0.0038***	3.21	4.49	0.0000
D2-1W	-9.22	-2.86	0.0028***	-25.02	-2.91	0.0023***	2.61	2.68	0.0044***
D1-1W	-9.28	-2.89	0.0026***	-24.67	-2.92	0.0023***	3.22	3.03	0.0016***
D0-1W	-9.26	-3.62	0.0003***	-23.64	-3.69	0.0002***	1.73	2.06	0.0212

Notes: D0 to D5 are the six days in the event window: April 10 to April 11, and April 14 to April 17, 2014. 1M, 3M, and 1W refer to the month, quarter, and week before the event window, respectively. Δ AHP% is the change in the A-H premium relative to an average of a prior period. The Full Sample contains 68 stocks dual-listed in Shanghai and Hong Kong; Small-Cap Group is the portfolio consisting of the smallest one-third (23 stocks) of the Full Sample based on market capitalization; Large-Cap Group is the portfolio consisting of the largest one-third (23 stocks). ***, **, and * indicate the significance at the 1%, 5%, and the 10% levels, respectively.

B. How did the A-H premium change around the launch window?

In Table 2, in contrast to the negative announcement impact discussed above, the impact of The Program launch on A-H premium changes is positive and significant at the 1% level. We find that the launch of The Program did indeed increase not decrease the A-H premium for the sample. Overall, across different model specifications, even after we control for well-documented variables that could affect the premium, the dummy variable for the launch day remains positive and significant, which is also consistent with the visual observation in Figure 1.

In Table 4, we show the impact of The Program launch on the A-H premium changes in November 2014. For the full sample, the changes in the A-H premium during the event window are positive and significant at the 1% level relative to the mean A-H premium during all three periods preceding the launch date, except for day 0 in Panel A, when the A-H premium change is 1.18% with a t -value of 1.51 (significant at the 10% level). The A-H premium changes for the small stocks are positive and significant at the 1% level in Panels B and C, except for day 0 in Panel B where the A-H premium change is not significant at any conventional level. The A-H premium changes relative to the mean during the preceding month are positive and significant at either the 1% or the 5% level except for the day 0 (not significant at any conventional level) and day 1 (marginally significant at the 5% level). For the large stocks, the premium changes are positive and significant at the 1% level in Panels A and B. In contrast, the changes from the prior week mean are not significant at any conventional level except for one case on day 4 when the result is positive (1.60%) and significant at the 1% level. The findings here confirm the earlier results for The Program launch in Table 2.

Table 4
Changes in the A-H Premium ($\Delta\text{AHP}\%$) During the Launch Window

Diff.	Full Sample			Small-Cap Group			Large-Cap Group		
	$\Delta\text{AHP}\%$	t -value	p -value	$\Delta\text{AHP}\%$	t -value	p -value	$\Delta\text{AHP}\%$	t -value	p -value
Panel A: $\Delta\text{AHP}\%$ relative to the Daily Average in the Prior Month									
D5-1M	4.22	5.39	0.0000***	5.44	2.86	0.0027***	2.86	3.58	0.0003***
D4-1M	4.59	6.38	0.0000***	4.29	2.31	0.0115**	3.84	5.34	0.0000***
D3-1M	4.29	5.71	0.0000***	4.98	2.53	0.0066***	2.52	4.26	0.0000***
D2-1M	4.29	5.37	0.0000***	5.35	2.45	0.0082***	2.08	3.52	0.0004***
D1-1M	3.67	4.75	0.0000***	3.29	1.58	0.0590*	2.37	2.95	0.0020***
D0-1M	1.18	1.51	0.0677*	-1.90	-0.95	0.8281	2.45	3.12	0.0013***
Panel B: $\Delta\text{AHP}\%$ relative to the Daily Average in the Prior Quarter									
D5-3M	8.93	8.82	0.0000***	9.96	5.07	0.0000***	4.96	3.45	0.0004***
D4-3M	9.30	9.52	0.0000***	8.81	4.33	0.0000***	5.95	4.53	0.0000***
D3-3M	9.00	8.84	0.0000***	9.50	4.45	0.0000***	4.62	3.78	0.0001***
D2-3M	8.99	8.56	0.0000***	9.87	4.25	0.0000***	4.19	3.67	0.0002***
D1-3M	8.38	7.86	0.0000***	7.81	3.36	0.0006***	4.47	3.35	0.0006***
D0-3M	5.89	6.18	0.0000***	2.62	1.19	0.1189	4.56	3.63	0.0002***
Panel C: $\Delta\text{AHP}\%$ relative to the Weekly Average in the Prior Week									
D5-1W	6.97	4.98	0.0000***	14.53	4.59	0.0000***	0.62	0.84	0.2010
D4-1W	7.34	5.82	0.0000***	13.38	4.50	0.0000***	1.60	2.52	0.0067***
D3-1W	7.04	5.19	0.0000***	14.07	4.60	0.0000***	0.28	0.63	0.2640
D2-1W	7.03	5.12	0.0000***	14.44	4.83	0.0000***	-0.16	-0.32	0.6245
D1-1W	6.42	5.15	0.0000***	12.38	4.62	0.0000***	-0.13	0.20	0.4199
D0-1W	3.93	5.38	0.0000***	7.19	4.44	0.0000***	0.21	0.38	0.3536

Notes: D0 to D5 are the six days in the event window: November 17 to November 21, and November 24, 2014. 1M, 3M, and 1W refer to the month, quarter, and week before the event window, respectively. $\Delta\text{AHP}\%$ is the change in the A-H premium relative to an average of a prior period. The Full Sample contains 68 stocks dual-listed in Shanghai and Hong Kong; Small-Cap Group is the portfolio consisting of the smallest one-third (23 stocks) of the Full Sample based on market capitalization; Large-Cap Group is the portfolio consisting of the largest one-third (23 stocks). ***, **, and * indicate the significance at the 1%, 5%, and the 10% levels, respectively.

V. WHAT DRIVE THE A-H PREMIUM CHANGE?

A firm's A-H premium could decrease (rise) due to: (1) the A-share price falls (rises) more than the twin H-share does, or (2) the H-share price rises (falls) more than the twin A-share does, or (3) the A-share price falls (rises) while the twin H-share rises (falls).

A. What drive the A-H premium changes after the announcement?

The Program does not change the institutional differences between A- and H-shares. The Shanghai Stock Exchange imposes a daily price limit of $\pm 10\%$ for each stock from the previous close (except for special occasions). Short-selling is very limited, expensive, and difficult to implement. In addition, intraday trading is prohibited (a stock bought cannot be sold the same day). In contrast, the Stock Exchange of Hong Kong (SEHK) allows intraday trading and short-selling, with no daily price limits. The dividend taxes

on the mainland depend on the length of the holding period, but dividends in H.K. are not taxed.

Given such constraints with regard to short-selling, daily price limits, and intraday trading on the A-share market, thus limiting the arbitrage opportunities between the two markets, the shrinking of the price disparity between A and H shares upon The Program announcement should be reflected more acutely in changes of H-share prices than in changes of twin A-share prices. In other words, despite H-share discounts for small and mid-size stocks are more reasonable than the twin A-share premium to begin with, it is expected that policy-induced investors upon The Program announcement bid up the H-share prices more promptly than mainland investors sell off the twin A-shares. For large stocks, since the H-shares were priced slightly higher than A-shares before the announcement, we expect the H-shares to be sold in anticipation of buying back the relatively undervalued A-shares when The Program launches later.

A notable rule of The Program requires that mainland individual investors maintain the minimum brokerage account balance of RMB500,000 (about USD80,000) to qualify for participating in The Program.⁸ No such restriction exists for investors in H.K. The 2014 China Securities Depository and Clearing Corporation Statistical Yearbook shows that more than 93% of all A-share individual brokerage accounts were valued below half million RMB as of the end of 2014. That is, the vast majority of A-share investors on the mainland cannot participate in The Program to invest in H-shares. It is well documented that the mainland stock market is dominated by small investors who are more risk prone than their counterparts in the H.K. market, and that small A-share investors tend to invest heavily in small-cap stocks. This minimum account balance restriction for mainland investors, to a large extent, prevents trading behavior exhibited in the A-share market from affecting the H-share market.

As discussed earlier, the results of the significant decline of A-H premium for small stocks could be due to different A-H price dynamics. The uncertainty is resolved by the evidence in Table 5 where we report the adjusted CARs of A-shares (Panel A) and H-shares (Panel B) during the announcement window. For the full sample of A-shares, the CAR (0, 0) of 0.76%, which is the mean abnormal return of the group on April 10, 2014, is positive and significant at the 1% level (t -value = 8.67). The result is driven by large stocks whose mean abnormal returns from day 0 to 3 are positive and significant at the 1% level, whereas small stocks fell albeit insignificantly until day 1 (t -value = -1.81) at the 10% level and day 2 (t -value = -2.28) at the 5% level. The CARs of large stocks for window (0, 2) or longer become negative and are no longer significant at any conventional level. The insignificant results are due to opposite market reactions to the small and mid-size stocks versus the large stocks.

Table 5
Adjusted Cumulative Abnormal Return (CAR)
of A-Shares and H-Shares during the Announcement Window

Date	Full Sample			Small-Cap Group			Large-Cap Stocks		
	CAR	%>0	t-value	CAR	%>0	t-value	CAR	%>0	t-value
Panel A: A-Shares									
(0, 0)	0.758	47.69	8.67***	-0.33	42.10	-0.28	2.16	72.00	11.01***
(0, 1)	0.041	43.08	3.70***	-1.21	26.32	-1.81*	1.75	73.08	6.50***
(0, 2)	-0.338	41.54	-1.22	-1.72	16.67	-2.28**	1.29	76.92	3.66***
(0, 3)	-0.382	41.54	-0.89	-1.12	44.44	-0.93	0.71	53.85	1.63

(0, 4)	-0.398	35.38	-0.73	-0.89	16.67	-0.74	0.78	61.54	1.89*
(0, 5)	-0.461	38.46	-0.33	-0.84	29.41	-0.63	0.55	53.85	1.24

Panel B: H-Shares

(0, 0)	5.00	66.15	20.30***	12.00	84.21	27.62***	-0.89	32.00	-4.13***
(0, 1)	4.26	63.08	12.38***	12.10	89.47	20.60***	-2.28	26.92	-6.33***
(0, 2)	3.77	52.31	8.58***	12.30	72.22	15.88***	-2.13	23.08	-4.88***
(0, 3)	2.16	49.23	4.11***	9.11	77.78	10.27***	-2.95	11.54	-5.35***
(0, 4)	1.94	49.23	3.02***	9.47	77.78	9.39***	-3.18	15.38	-5.20***
(0, 5)	1.76	44.61	2.49***	9.20	70.59	7.93***	-3.34	11.54	-4.79***

Note: ***, **, and * indicate the significance at the 1%, 5%, and the 10% levels, respectively. %>0 indicates the proportion of the CARs in a group that are positive.

In contrast, in Panel B of Table 5, for the full sample, the CARs of the H-shares show a much stronger reaction to the announcement than those of the A-shares. Except for the large-cap group, the CARs are all positive and significant at the 1% level. For the full sample, the CAR(0,0) is 5% (t -value = 20.30), 12% (t -value = 27.62) for small stocks, and -0.89% (t -value = -4.13) for the large stocks. About 84% of the small stocks, as opposed to 32% of large stocks, earned positive returns on day 0. As the substantial premium of the small and mid-size firms is expected to be reduced, investors bought the H-shares of these firms aggressively upon The Program announcement. They also sold the H-shares of large stocks which had negative A-H premium to push the valuation closer to parity.

The findings here for small stocks prove that the significant decline in the small stocks' A-H premium shown in Table 3 is driven mostly by the significant rise of small H-share prices and, to certain extent, helped by the (sometimes significant) decrease in the twin A-share prices. For large stocks, the combination of positive CARs for the A-shares and negative CARs for the twin H-shares led to diminishing price disparity, consistent with the weekly results shown in Table 3.

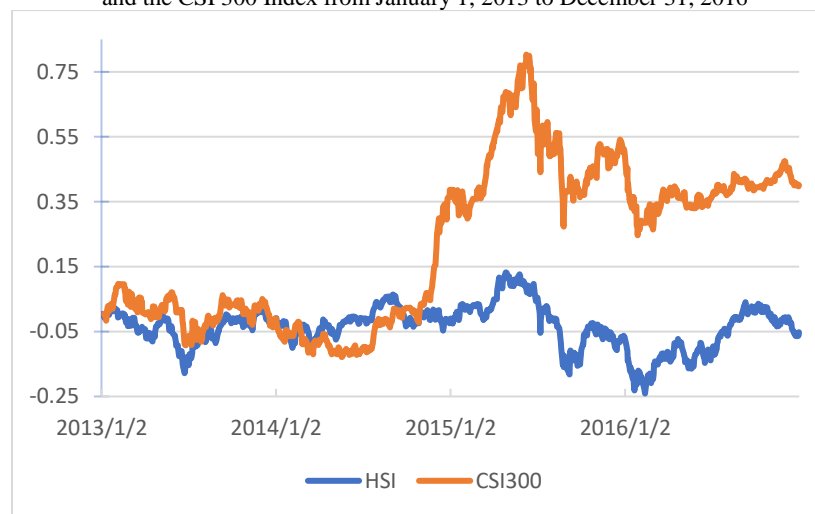
B. What drive the A-H premium changes around the launch window?

The two event windows are about seven months apart. The impact of The Program launch in November can be very different from that of the announcement in April in that the event effect by the time of the launch may have already been fully priced in by markets. In other words, the impact of the official launch of The Program may be materially affected by the market performance leading up to the launch, perhaps to an extent similar to the price pressure-caused price reversal pattern documented by Trueman, et al (2003).⁹ As The Program launches, informed investors in the H.K. market may unwind to cash out from their earlier trades as the small H-shares may now have been priced well above their fundamentals (regardless if still having discounts relative to the overvalued twin A-shares); and for large stocks, the informed investors could buy back the H-shares they sold after the announcement, or more rationally, buy more of the twin A-shares as the government-induced bull market takes off, as capital flows, to a large degree, are no longer constrained as before.

The Program launch happened to coincide with the early stage of a government-induced bull market of A-shares (see Figure 2), the prices of which rise sharply after The Program launch, thus the A-H premium could be expected to unwind not only to the level

around the announcement event, but potentially to even higher levels for small to midsize stocks, and for large stocks from discount to premium. The argument of Brunnermeier, et al. (2017) is also consistent with the unfolding of the A-share performance. Such observation is also consistent with the theory of Adam, et al. (2016, 2017) who show that optimizing investors' subjective expectations of potential capital gains tend to drive the actual capital gains and lead to large inefficient price fluctuations, that is, rational individual investors optimizing with subjective beliefs could lead to booms and busts.

Figure 2
Cumulative Daily Returns of the Hang Seng Index (HSI)
and the CSI 300 Index from January 1, 2013 to December 31, 2016



Note: The Hang Seng Index (HSI) is the free-float market capitalization-weighted leading stock market index in Hong Kong. The CSI 300 is a free-float market capitalization-weighted stock market index tracking the performance of top 300 stocks traded in the Shanghai and Shenzhen stock exchanges. The substantial rise of the A-H premium around the end of 2014 and the start of 2015 exhibited in Figure 1 is caused by the powerful rally of the A-shares relative to the lackluster performance of the H-shares shown here.

De Long et al. (1990a) argue that “noise trader risk” can not only pressure prices away from fundamentals but also deter rational arbitrageurs from taking advantage of them. De Long et al. (1990b) postulate that rational speculators can initiate “positive-feedback trading” that is further driven by noise traders to increase volatility. Shleifer and Summers (1990) state that the key to investment success is not just predicting future fundamentals, but also predicting the movement of other active investors. ... Not only do arbitrageurs spend time and money to predict noise trader moves, they also make active attempts to take advantage of these moves. When noise traders are optimistic about particular securities, it pays arbitrageurs to create more of them. (p. 26)

The vast majority of mainland investors, barred by minimum account balance requirements, could not buy the relatively undervalued H.K. shares. Barber and Odean (2008) show that individual investors are attention driven and tend to buy stocks that are in the news. It seemed that investors started to aggressively buy small and mid-size A-shares when The Program was officially launched with much fanfare in November. Informed investors could have helped the trend. Thus, the A-H premium for small and

mid-size stocks could be expected to rise due to selling of the H-shares and buying of the twin A-shares.

Given the above discussion, we expect the informed investors to sell H-shares to uninformed buyers around the launch window and buy A-shares (along with anyone else) given that the burgeoning bull market in mainland is unfolding. Thus, for the launch of The Program, the price changes of the small and mid-size H-shares are expected to be negative and significant, and price changes in the twin A-shares are positive and significant during the launch window.

For large stocks before The Program announcement, the small premium of the H shares is relatively more efficient, the twin A shares are slightly undervalued then. The Program announcement makes both selling of large H-shares and purchasing of the twin A-shares rational, driving valuations of two types of shares towards parity. Upon The Program launch, we would expect that informed investors buy back H-shares of large stocks to return to the previous efficient price level around the announcement time, or they buy A-shares as the twin A-shares are expected to rise further in conjunction with the emerging mainland bull market. Thus, the price changes of the large H-shares and A-shares are expected to be both positive and significant, but the price changes of A-shares are expected to be more than those for the twin H-shares.

In Table 6, we present the adjusted CARs of A-shares (Panel A) and H-shares (Panel B) during The Program launch window. For the full sample of A-shares, the CARs are negative and significant at the 1% or 5% level, except for CAR (0, 5) which is insignificant at any conventional level. Large stocks exhibit negative and significant price changes at the 1% level for the first 4 days. The CARs of the small-cap group are not significant at any conventional level. For the full sample of H-shares, the CARs are negative and significant at the 1% or 5% level. The CARs for the small-cap group are all negative and significant at the 1% level.

Table 6
Adjusted Cumulative Abnormal Return (CAR)

of A-Shares and H-Shares during the Launch Window									
Date	Full Sample			Small Stocks			Large Stock		
	CAR	%>0	t-value	CAR	%>0	t-value	CAR	%>0	t-value
Panel A: A-Shares									
(0, 0)	-0.64	40.62	-4.41***	0.41	77.78	1.28	-1.44	16.67	-6.54***
(0, 1)	-0.64	35.94	-4.09***	0.48	52.94	1.44	-1.84	20.00	-7.48***
(0, 2)	-0.67	35.94	-2.97***	0.47	58.82	1.54	-2.35	16.00	-6.93***
(0, 3)	-0.80	35.93	-2.53***	-0.14	52.94	1.15	-1.92	20.00	-5.19***
(0, 4)	-0.97	34.37	-2.18**	-0.95	41.12	0.51	-1.11	28.00	-3.12***
(0, 5)	-0.54	40.62	-1.12	-1.14	47.06	0.38	0.36	40.00	1.08
Panel B: H-Shares									
(0, 0)	-3.35	12.50	-10.45***	-6.40	11.11	-5.87***	-1.04	12.50	-4.37***
(0, 1)	-4.80	14.06	-9.87***	-11.00	5.88	-6.71***	-1.42	24.00	-3.98***
(0, 2)	-4.99	18.75	-7.33***	-13.20	11.76	-6.56***	-1.21	24.00	-2.63***
(0, 3)	-5.30	17.18	-6.84***	-14.35	5.88	-6.15***	-0.89	20.00	-2.07**
(0, 4)	-4.78	21.87	-5.32***	-13.30	11.76	-5.04***	-0.10	32.00	-0.94
(0, 5)	-3.71	39.06	-2.12**	-13.34	11.76	-4.91***	2.41	64.00	3.35***

Note: ***, **, and* indicate the significance at the 1%, 5%, and the 10% levels, respectively. %>0 indicates the proportion of the CARs in a group that are positive.

Comparing Table 6 with Table 4, we note that the significant increase in the A-H premium for the small stocks during the launch window is due to significant underperformance of the twin H-shares, mostly consistent with the expectations. The small stocks' A-shares mostly outperformed those of the large stocks, whereas the small stocks' H-shares significantly underperformed those of the large stocks, also consistent with the expectations.

However, for large stocks, the price changes are unexpected. The increase of large stocks' A-H premium shown in Table 4 is likely due to the differences between gross returns and excess returns. A stronger performance of the A-share index (CSI 300) than that of the large A-shares in our sample distorts the results. However, with the burgeoning bull market in mainland, subsequent to the 5-day launch event window, A-share prices increase substantially while H-shares went sideways, leading to significant rise of A-H premium for large stocks. The CAR (0, 5) of large A-shares during the launch window already turns positive, though insignificant at any conventional level. The proportion of positive CARs is 40%, much higher than the levels in previous days.

Finally, in Table 7, we present the results from the cross-sectional regressions of cumulative A-H premium changes (ΔAHP) for the full sample for the two event windows, respectively. For both event windows, the negative relation between the five-day cumulative A-H premium changes and the corresponding CARs of the H-shares is significant at the 1% level. A positive and significant relation between the five-day cumulative A-H premium changes and the CARs of the A-shares is found for the launch window, not the announcement window. The evidence is largely consistent with prior findings, indicating rising cumulative A-H premium changes due to negative H-share price changes and sometimes positive A-share price changes. The control variable relative volatility has a positive impact on ΔAHP and significant at the 1% level in the announcement window only. The relative shares variable has a negative impact on ΔAHP and significant in the launch window only. The relative market capitalization has a positive and significant impact on ΔAHP in both event windows at either the 5% or the 1% level. For the launch window, *TOP* (percentage ownership by largest shareholders) and *LEV* (debt ratio) are positively and negatively related to ΔAHP at the 5% level for the combined group, respectively. State (government ownership) also has a negative and significant impact on ΔAHP at the 5% level for both groups in the launch window only.

Table 7
Cross-Sectional Regressions of Cumulative Six-Day
A-H Premium Changes (ΔAHP) on Key Variables
during the Announcement Window and the Launch Window

Variables	Announcement	Launch	Variables	Announcement	Launch
	ΔAHP	ΔAHP		ΔAHP	ΔAHP
Constant	-0.035 (-0.26)	0.017 (0.63)	<i>TOP</i>	0.029 (0.46)	0.022* (1.84)
$CAR_A(0, 5)$	0.376 (1.23)	1.592*** (18.24)	<i>LEV</i>	0.070 (1.02)	-0.022* (-1.86)
$CAR_H(0, 5)$	-2.669*** (-16.79)	-1.762*** (-24.67)	<i>IBD</i>	0.050 (0.61)	-0.008 (-0.52)
$\ln(\text{Size})$	-0.017	-0.001	<i>SAL</i>	0.001	0.000

	(-1.54)	(-0.61)		(0.61)	(-0.52)
<i>Rel Vol.</i>	0.170***	0.004	<i>Relcap</i>	0.016**	0.005**
	(2.57)	(0.31)		(2.11)	(2.19)
<i>Relto</i>	-0.005	-0.000	<i>State</i>	-0.028	-0.015**
	(-0.81)	(-0.15)		(-0.85)	(-2.24)
<i>Relfl</i>	0.009	-0.007**	<i>D_{TOPA>TOPH}</i>		-0.051
	(-0.83)	(-2.04)		(-0.44)	(-1.33)
<i>N</i>	65	65	<i>Adj. R²</i>	0.938	0.976

Note: ΔAHP is the cumulative daily AHP changes from day 0 to 5 for each event window. *TOP* is the percentage of total shares outstanding held by the largest shareholders. *LEV* is the leverage ratio. *IBD* is the fraction of independent directors on the board. *SAL* is the log of the total annual RMB salary of nonexecutive board directors. *TOP_A* and *TOP_H* are the *TOP* for the A-shares and H-shares, respectively. *State* is the government ownership. The *t*-values are reported in parentheses. ***, **, and * indicate the significance at the 1%, 5%, and the 10% levels, respectively.

In sum, the critical factor implied in the test results contributing to the persistent price disparity between the A- and H-shares is the limited ability to arbitrage between the two markets. Such hinderance is a direct consequence of the different market structures, such as price limits, short-sale and intraday trading restrictions, and The Program constraints themselves.

VI. CONCLUSION

In this paper, we add evidence to the market integration and the cross-listing literature by investigating investor behavior exhibited in the dual-listed space in the Chinese A- and H-share markets. Controlling for various factors documented in literature, we find that the launch of The Program in late 2014 did indeed increase the A-H premium, an unintended outcome for policymakers. We find significant contrast in market reactions to The Program announcement (in April) and launch (in November). For the first event, the significant decline in the A-H premium for small stocks is driven by the positive and significant H-share reaction to the surprising announcement. Furthermore, the very positive H-share reaction of the small stocks seems to be much more conspicuous than the negative A-share reaction, perhaps due to the short-selling constraints in conjunction with daily price limits in the A-share markets. The opposite pattern is found for large stocks and the outcome is attributed to their negative premium prior to the announcement becoming less negative afterwards, that is, approaching valuation parity, consistent with the expectations and The Program intention.

For the launch event, the performance largely reversed. The A-H premium increased significantly for small stocks, driven largely by sharply declining H-share prices. Overall, we show that investors in H.K. of smaller H-shares tend to be far more agile than those in the twin A-shares, at least in the dual-listed space around the event windows. Our observation is that after The Program was introduced in April 2014, the high A-H premium/small H-shares were bought aggressively, consequently reducing their A-H premium, but these H-shares were sold eagerly around the time when The Program was officially launched with much fanfare.

The ensuing bull market in mainland, on the other hand, exacerbates the situation where already overpriced small A-share prices are driven even higher than fundamentals after The Program launch which contributed further to the rise of the A-H premium. The evidence of the substantial rise of A-shares is consistent with the arguments by Adam, et

al. (2016, 2017) and the postulation by Shleifer and Summers (1990). From the valuation convergence perspective, The Program was not successful around the sample period.

Our results have important policy implications. The Program constraints in A-share markets could be gradually phased out. If the majority of small mainland investors had been allowed to trade H-shares from the start, perhaps they would have bought undervalued H-shares, instead of chasing the overvalued A-shares. The institutional differences between the two markets, severely limiting the arbitrage opportunities, could be mitigated and The Program constraints lessened to make arbitrage channels more practical. Capital market integration is more than opening opportunities for investors in different markets, it is about eventually building a common and robust market infrastructure. Such implications are pertinent to China's ambition to build a world-class capital market and to connect its domestic markets with developed markets. Such implications are also pertinent to other emerging markets in general.

APPENDIX

Timeline of Events

The following is a timeline of key events in 2014 and 2015 regarding The Program:

- 4/10/2014: The Program was first announced by China's Premier at the Bo'ao Forum for Asia. The Program was expected to start in October 2014 but was delayed by the Street Occupation Movement in H.K. around that time.
- 11/10/2014: China's President Xi met H.K. Governor Liang at the Asia-Pacific Economic Cooperation meeting to agree to start The Program on November 17, 2014.
- 11/17/2014: The Program officially started. The daily cap of RMB20,000 to exchange per H.K. residents was removed. The Hang Seng Index (HSI) fell by 1.21%. The daily program cap of RMB13 billion to invest in Shanghai stocks (northbound) was reached at 1:55 p.m., but the southbound volume was only 17% of the daily cap by the market close.
- 11/18-11/20/2014: the HSI fell by 1.13%, 0.66%, and 0.10%, respectively.
- 4/8/2015: the daily program cap of RMB10.5 billion to invest in H.K. stocks (southbound) was reached for the first time at 2:09 p.m.

The most important event days are The Program announcement day on April 10, 2014 and The Program launch on November 17, 2014.

ENDNOTES

1. Presently, no more than \$50,000 can be purchased by each Chinese citizen per year.
2. The Qualified Foreign Institutional Investors (QFII) program is for foreign investors to invest in RMB-denominated securities, its quota is less than 2% of A-shares' total market capitalization as of September 28, 2015. B-shares market capitalization is only a fraction of that of the QFII program. Only until June 20, 2017, did MSCI decide to include 222 large-capitalization A-shares in its Emerging Markets Index beginning in June 2018.
3. On June 17, 2019, the establishment of the Shanghai-London Stock Connect Program was announced by the China Securities Regulatory Commission (CSRC) and the Financial Conduct Authority of the United Kingdom (FCA).
4. Wang and Jiang's (2004) formula and numbers are expressed in discounts that are converted into premium here. Sometimes in the news and literature, the A-H premium is expressed as the ratio of A-share price/H-share price (in same currency).

Our formula is the same ratio minus one, which follows the standard practice on the mainland and in most of the literature.

5. Wind is the premier provider of Chinese financial information. We cross-check all the data in this paper between the two databases and do not find any notable differences.
6. The maximum return is due to a five billion dollars asset swap deal announced by Sinopec Oilfield Service Corp. (1033.HK). Stocks with significant corporate events around or before the event windows are removed in later tests.
7. It is widely documented that the A-share stock market is dominated by individual investors who prefer small and “new-economy” stocks to large and “old-economy” ones.
8. Moreover, in The Program rule book released April 29, 2014, mainland investors are required to pass a test on knowledge of the H.K. stock market and of exchange rate risk. However, mainland institutional investors are not subject to these rules and restrictions.
9. Price reversal patterns documented by Trueman, et al (2003) involve only one event. Further, the event outcome of earnings announcement studied in Trueman, et al (2003) is uncertain, so the comparison with our study needs to be interpreted with caution.

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