

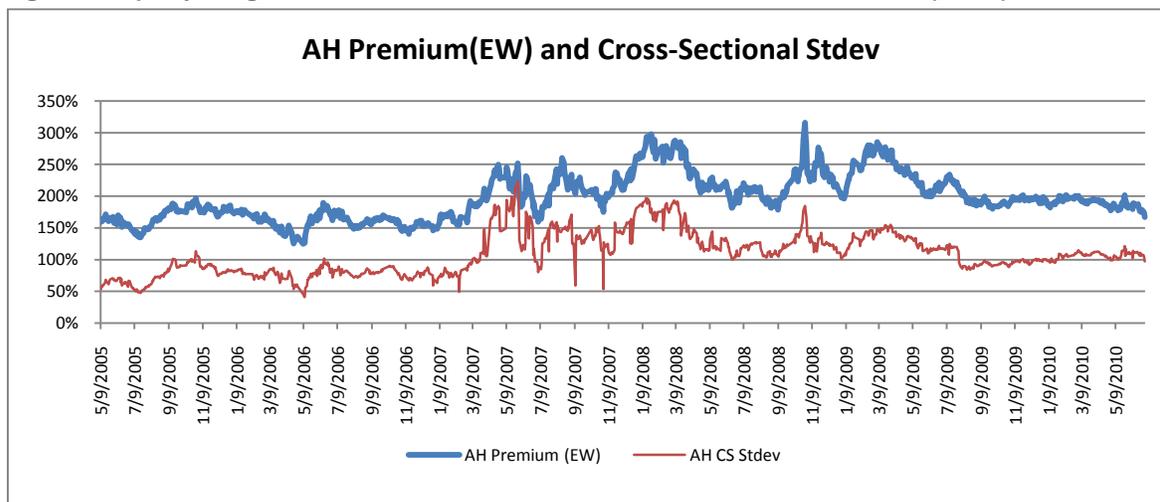
## Introduction

This year, the government of China approved the launch of index futures, margin trading, and short selling of stocks. The trial program for short selling rolled out with 90 stocks in the program as of March 31, 2010. In this paper, we explore the effect of the relaxation of short sale constraints on AH premium (the price differential between the domestic listed A-shares and the Hong Kong listed H-shares). We examine the AH premium movements of the group of dual-listed Chinese shares that are permitted to short, versus the group *not* permitted to short, both before and after the launch of the new short selling program. We also examine the impact and potential implications of these changes on the China equity market.

## Overview of AH Premium

Some firms incorporated in Mainland China are listed on both the Mainland exchange (A-shares) and Hong Kong Stock Exchange (H-shares). A-shares are denominated in Renminbi (RMB) and available only to domestic investors and Qualified Foreign Institutional Investors (QFII). H-shares are denominated in Hong Kong dollars (HKD) and available to overseas investors and Qualified Domestic Institutional Investors (QDII). While these two classes of shares are essentially the same and their shareholders have equal rights of ownership, capital restrictions have resulted in a significant premium in A-share prices relative to their H-share counterparts. Figure 1 below presents the equally weighted average AH premium<sup>1</sup> of all firms that issued both A-shares and H-shares from May 2005 to June 2010. Figure 1 also plots the cross-sectional standard deviation of AH premium over this period, ranging from 41% to over 200%. Although the AH premiums were fluctuating, the price disparity between A-shares and H-shares remained. In addition to the magnitude of the disparity, the AH premium also varied dramatically across firms. The average cross-sectional standard deviation of the premium was 109% over the sample period.

**Figure 1: Equally Weighted AH Premium and Cross-Sectional Standard Deviation (Stdev)**



**Note:** AH premium was calculated using daily closing prices from Bloomberg.

<sup>1</sup> AH premium is calculated as the price ratio of "A" share and "H" share expressed in percentage.

One explanation for this substantial price premium of A-shares over H-shares attributes the difference mainly to the capital flow restrictions and the non-fungibility of the two share classes. Market segmentation and limited investment opportunities for Mainland Chinese investors may create an imbalance between the supply and demand of stocks in China, raising the prices of A-shares. As Mainland China may be viewed as a closed market, Hong Kong listed shares may react more strongly to international economic developments than Mainland listed shares, contributing to the A-share premium. Another potential explanation for the premium is that investors cannot use arbitrage operations to eliminate the price difference, due to market imperfections and the inability to short most shares in the China “A” market.

### **Short Sale Constraints and AH Premium**

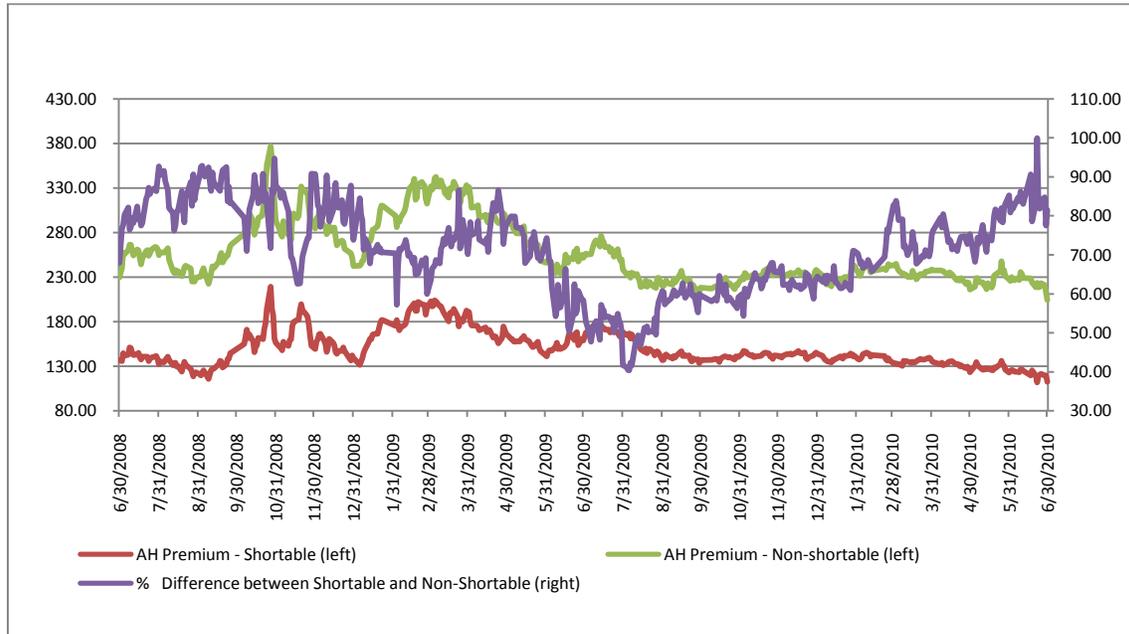
When a security trades at different prices across different markets with the same risk/return characteristics, theoretically the differences are arbitrated away. This has not happened with dual-listed AH shares. While H-shares can be shorted, no A-share stocks could be shorted prior to March 2010. Academic studies, such as Miller’s (1977)<sup>2</sup>, argue that short sale constraints commonly lead to overvaluation of stocks, since stock prices only reflect the views of optimistic, but not pessimistic investors. Based on this theory, H-share prices are likely to be priced more efficiently and closer to the companies’ fundamentals. Therefore, short selling on H-shares tends to have a downward impact on H-share prices, and increases the A-H share price differentials. Similarly, we would expect that the launch of the short selling program in the China A-share market would in all probability help correct the overvaluation of A-shares and narrow the price differential between A-shares and H-shares. To test this assumption, we compared the evolution of AH premium for the group of stocks eligible for short sales against the group ineligible for short sales.

As of June 30, 2010, 26 of the 61 dual-listed Chinese firms have A-shares that permit short sales. Figure 2 displays the equally weighted average AH premium of the group eligible for short sales and ineligible for short sales, along with the percentage difference between the two groups<sup>3</sup> from June 30, 2008 to June 30, 2010. The percentage difference fluctuated with a downward trend from July 2008 until August 2009, when it started to go up. The rise seems to be sharper after the launch of the short selling trial program on March 31, 2010, indicating the AH premium of the shortable group might have decreased relative to the non-shortable group since then.

<sup>2</sup> Miller, E. (1977). Risk, Uncertainty and Divergence of Opinion, *Journal of Finance* 32, 1151-1168.

<sup>3</sup> % Difference = 100 \* (equally weighted AH premium of the non-shortable group - equally weighted AH premium of the shortable group) / equally weighted AH premium of the shortable group.

**Figure 2: AH Premium Comparison of Shortable vs. Non-Shortable Stocks**



Note: AH premium was calculated using daily closing prices obtained from Bloomberg.

Interestingly, Figure 2 also reveals that the shortable group had historically lower AH premium compared to the non-shortable group. This could be explained by the different characteristics of the two groups. The “Rules for Implementation of Pilot Margin Trading and Securities Lending” issued by the Shanghai and Shenzhen Stock Exchanges stipulate that stocks permitted to sell short must meet certain criteria. Among the criteria, the stocks must have completed the share unification reform, and never been categorized as “special treatment securities with at least 4,000 shareholders, a minimum of 200 million floating shares or RMB 800 million of floating market capitalization”. There are turnover and volatility requirements as well. Overall, these rules imply that stocks eligible for short selling must be relatively liquid, large cap stocks with low volatility. It seems reasonable to assume that these stocks may be priced more efficiently than the ineligible stocks. As a result, A-shares of these stocks may be less overvalued, and have prices closer to their H-share counterparts.

Using the Barra China Model (CHE2), we analyzed the risk characteristics of the shortable group and the non-shortable group for a period of three months before and after the launch of the short sale trial program. Table 1 indicates that the two groups have very different risk characteristics. The average size of the shortable group was substantially larger than the non-shortable group, with size exposure close to 0.9 and -0.9 respectively. Although less dramatic, the volatility exposure of the two groups also differed, with the shortable group exhibiting lower volatility.

**Table 1: Risk Characteristics of Equally Weighted Portfolios Calculated Using Barra CHE2 Model**

Risk Index Exposures	Shortable		Non-Shortable	
	3M Before	3M After	3M Before	3M After
Size	0.91	0.92	-0.90	-0.84
Volatility	-0.24	-0.38	0.18	0.06
Trading Activity	-0.09	-0.20	0.72	0.58
Momentum	-0.36	-0.43	-0.30	-0.24
Financial Leverage	0.31	0.31	0.05	0.10
Value	0.87	0.86	0.41	0.39
Growth	0.16	0.13	-0.61	-0.63

## AH Premium and Short Interest

To continue exploring the impact of short selling on AH premium, we used short interest as a proxy for shorting demand and looked at the relationship between shorting demand and AH premium. The trial program for short selling was running for just over three months and only retail investors were participating. While the shorting demand in the A-share market was relatively low, the trend shows a gradual increase in activities. Table 2 below shows the correlation of the aggregated short interest in the China A-share market with the AH premium of the shortable and non-shortable groups, and the percentage difference in AH premium of the two groups. There is a significant negative relationship between the AH premium of the shortable group and short interest with p-value below 0.0001. This implies that as short interest rises, the AH premium of these stocks tend to decrease. Meanwhile, the percentage difference of AH premium between the two groups has a significant positive relationship with short interest at the 99% confidence level, suggesting that the AH premium gap between the two groups tends to widen as shorting demand increases. These test results support the theory that relaxing short sale constraints may potentially have helped narrow the AH premium. However, given the short observation horizon, it is hard to draw a definite conclusion, and the AH premium may continue as long as capital restrictions and share class non-fungibility remain in place.

**Table 2: Correlation Between AH Premium and Short Interest**

	Correlation with A-Share Aggregated Short Interest	P-value
AH Premium – Shortable Group	-0.665	<0.0001
AH Premium – Non-Shortable Group	-0.2068	0.1193
Percentage difference in AH Premium between Two Groups	0.4006	0.0018

## Conclusion

While AH premium could be related to various factors, one possible explanation is that the short sale constraints on A-shares created a technical barrier for arbitragers and kept A-shares overvalued. The launch of the trial short selling program in the China A-share market allowed us to test this hypothesis. We studied the potential impact of short selling on AH premium by comparing the AH premium change of the group of dual-listed Chinese firms eligible for short sales with the group ineligible for short sales. We found that the two groups of stocks traded on a different AH premium range and exhibited drastically different risk characteristics. Further analysis of the correlation of AH premium of the two groups with shorting demand in the China A-share market suggests that the relaxation of short sale constraints could potentially be playing a role in lowering AH premium. Considering the short history of the trial program and the short selling market, which has been dominated by individual investors until now, it may be worth revisiting this topic as more data become available.

The relaxing of short sale constraints may potentially also allow China domestic investors to explore investment processes incorporating short selling, long/short, and 130/30 type strategies, as well as arbitraging away price inefficiencies in the China market.

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Rules for Implementation of Pilot Margin Trading and Securities Lending in. Shanghai Stock Exchange (SSE)

Rules for Implementation of Pilot Margin Trading and Securities Lending in. Shenzhen Stock Exchange (SZE)

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