ACADIAN

RISK MISPRICING IN CHINA A-SHARES

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- **We observe the mispricing of risk in China A-shares, similar to other world markets.**
- **In China A, large-cap stocks constitute a greater portion of the low-vol universe than they do in the rest of emerging markets, and state ownership plays less of a role than investors might guess.**
- **Hypothetical China A minimum variance portfolios exhibit reduced risk and smaller drawdowns, suggesting promise for low-volatility investing in A-shares.**

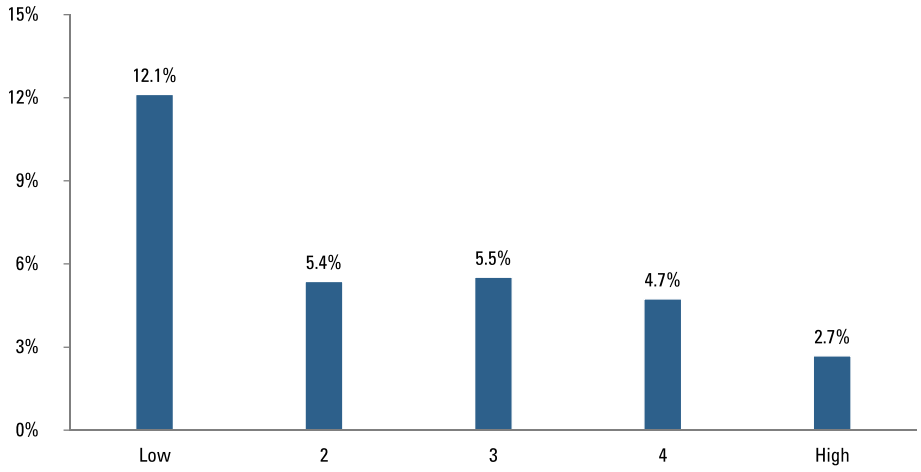
INTRODUCTION

Acadian is increasingly being asked about the potential benefits of a low-volatility investing approach to China A-shares, reflecting interest in accessing that market with a measure of drawdown protection. In this note, we demonstrate that the mispricing of risk is evident in China A-shares, much as it is in other markets around the world. We examine whether any distinctive characteristics of low-risk Chinese stocks differentiate low-volatility investing in A-shares from elsewhere in emerging markets (EM). We also provide a sense of the potential for risk reduction in China A.

RISK APPEARS MISPRICED IN A-SHARES

In broad strokes, the risk mispricing in China A shares looks similar to what we see in other equity markets around the world. Figure 1 shows that low-beta China A stocks have outperformed in absolute terms over the past 10 years. Figure 2 demonstrates the phenomenon on a risk adjusted basis: A-shares in the lowest beta quintile realize a large positive CAPM alpha, on average, while average alphas for stocks in all higher beta quintiles are negative. In other words, lower-beta stocks tend to earn higher returns and higher-beta stocks tend to earn lower returns than their risk profiles would suggest. This pattern is economically large in magnitude and monotonic.

FIGURE 1 – AVERAGE RETURNS BY BETA QUINTILE: CHINA A-SHARES MARKET, 2007-2017



Source: Acadian. At the end of each month, we form quintile portfolios on risk-model beta, where breakpoints and portfolio weights are set according to market-capitalization weights. The investable universe consists of stocks above USD 100MM in market-capitalization. Average returns are geometric. For illustration and educational purposes only. The investment universe quartile returns are not intended to represent investment returns generated by an actual portfolio. They do not represent trading or an actual account, but were achieved by means of using Acadian's China A Onshore universe of securities for the period specified above. Results do not reflect transaction costs or other implementation costs. Every investment program has the opportunity for loss as well as profit. Past results from our investment universe of securities are not a guarantee of future results.

As in other markets, we believe that the phenomenon exists because higher-risk stocks tend to be overpriced due to irrational demand from naïve investors. We would expect that phenomenon to be particularly acute in a retail-driven market such as China A.[1]

DISTINCTIVE CHARACTERISTICS OF LOW VOLATILITY A-SHARES

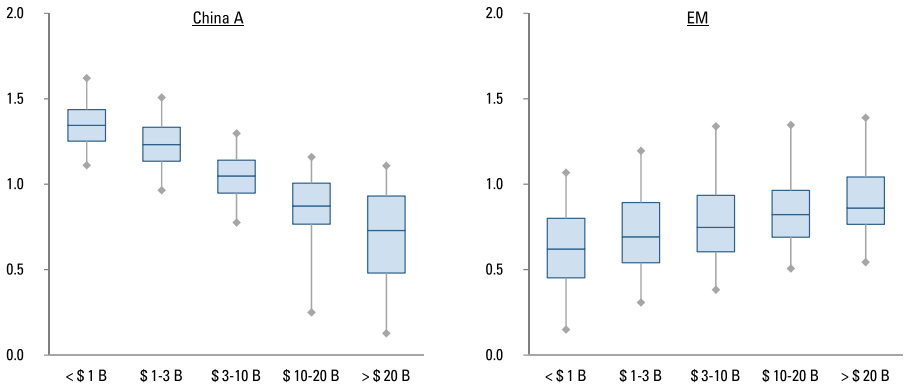
There are two striking differences between low-risk stocks in the A-shares market and elsewhere in EM. One is that they have distinctive market capitalization characteristics. In Figure 3, the left set of boxplots shows that among China A-shares, the largest stocks have the lowest betas to the A-shares index, while betas in the smallest two capitalization quintiles tend to be well above one. This isn't the case across other emerging markets, as shown in the right-hand set of boxplots. In EM ex-China A, betas are lowest among small-cap stocks. Figure 3 also shows that betas among China A large caps are highly dispersed, a further indication of their attractiveness for low-vol stock selection. As a result of the distinctive relationship between market capitalization and beta among China A-shares, China A low-volatility portfolios are likely to hold larger-capitalization stocks than investors are used to seeing in other EM contexts.

FIGURE 2 – REALIZED CAPM ALPHAS AND BETAS BY EX-ANTE BETA QUINTILE: CHINA A-SHARES, 2007-2017

	Low Beta	2	3	4	High Beta
Alpha	6.5%	-0.6%	-0.9%	-1.6%	-3.2%
Beta	0.71	0.87	1.05	1.17	1.25

Source: Acadian. See Figure 1 for description of universe and formation of beta quintiles. To calculate alphas and betas, we regress monthly returns of the quintile portfolios (in the following month) on contemporaneous equity market returns for the full sample period $R\_pt=\alpha\_p+\beta\_p\ R\_mt+\varepsilon\_pt$, where R_mt is the aggregate market return in China A and where R_pt is the return of the relevant portfolio (CAPM model). For illustration and educational purposes only. The investment universe quintile returns are not intended to represent investment returns generated by an actual portfolio. They do not represent trading or an actual account, but were achieved by means of using Acadian's China A Onshore universe of securities for the period specified above. Results do not reflect transaction costs or other implementation costs. Every investment program has the opportunity for loss as well as profit. Past results from our investment universe of securities are not a guarantee of future results.

FIGURE 3 – BETA DISTRIBUTIONS BY SIZE QUINTILE: CHINA A (LEFT) AND EM EX-CHINA A (RIGHT)



	< $1B	$1 - $3 B	$3 - $10 B	$10 - $20 B	> $20 B	*Total*
China A	1733	1129	376	51	36	3325
EM	4357	1074	622	174	142	*6369*

Source: Acadian. Betas of China A stocks to MSCI China A measured by a dedicated China A risk model. Betas of EM stocks to MSCI EM, excluding China A stocks, measured by a dedicated EM risk model. The investable universes include stocks that are at least USD 100MM in market-cap in a single cross-section as of December 2017. The horizontal axis shows bins by market-cap in USD Billions. The box-plots show the median, interquartile range and 5th and 95th percentiles. The corresponding number of stocks in each bucket are shown below both boxplots. For illustration and educational purposes only. The investment universe quartile returns are not intended to represent investment returns generated by an actual portfolio. They do not represent trading or an actual account, but were achieved by means of using Acadian's China A Onshore universe of securities for the period specified above. Results do not reflect transaction costs or other implementation costs. Every investment program has the opportunity for loss as well as profit. Past results from our investment. universe of securities are not a guarantee of future results.

[1] For general background on the low volatility mispricing and its causes, see: Acadian Asset Management. "Managed Volatility Strategies Overview." (March 2018); Acadian Asset Management. "20 Years of Low-Volatility Equities: A Brief Performance Survey." (June 2017); Baker, Malcolm, Brendan Bradley, and Jeffrey Wurgler. "Benchmarks as Limits to Arbitrage: Understanding the Low Volatility Anomaly." Financial Analysts Journal 67, no. 1 (2011): 40-54; Baker, Malcolm, Brendan Bradley, and Ryan Taliaferro. "The Low-Risk Anomaly: A Decomposition into Micro and Macro Effects." Financial Analyst Journal 70, no. 2 (2014)

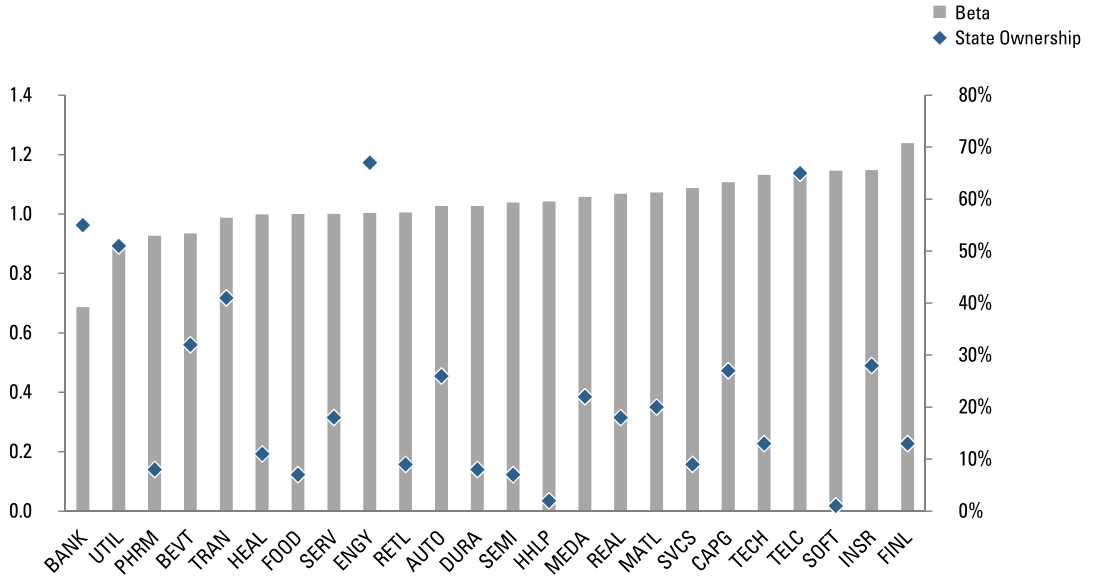
A second differentiating characteristics of China A low-volatility stocks is state ownership. While state ownership is a significant theme in EM as a whole, it's particularly prominent in China A, a point that we discussed in-depth in "State-Owned Enterprises – Buyer Beware?"[2] Nearly half of China A companies have state-ownership exceeding 20%, and Chinese state-owned enterprises (SOEs) account for almost all of the substantial recent growth in SOE weighting within the Fortune Global 500.

Nevertheless, we are optimistic about the prospect of building low-risk A-shares portfolios that don't have unusual degrees of state ownership. The reason for this is that we find no relationship between state ownership and beta among China A-shares. We demonstrate this in Figure 4, which shows variation in both beta and state ownership across industry groups. While the two lowest beta industries, banks and utilities, are indeed characterized by high degrees of state ownership, there are many low-beta sectors where state ownership is quite low, such as healthcare, food, and services.

Further, if we subdivide stocks in the low and high beta quintiles from Figure 2 by state ownership, we find that differences in alphas and betas between SOEs and non-SOEs are not statistically significant.

In sum, despite the relative prominence of SOEs in China compared to the rest of EM, we don't believe that state ownership should drive low-volatility outcomes in the A-shares market. We do believe that state ownership has potential to help forecast returns, however, and we incorporate it into our stock-selection model.

FIGURE 4 – BETA AND STATE OWNERSHIP BY INDUSTRY GROUP



Source: Acadian. For illustrative purposes only. Cap-weighted industry group portfolios sorted by beta to the China A market from lowest (left) to highest (right) using a proprietary risk model in a recent cross section (August 2018). The percentage of outstanding shares that were state-owned were aggregated with market-cap weights for each industry group (right axis).

[2] Acadian Asset Management, April 2018

RISK REDUCTION POTENTIAL

To provide a sense of the risk-reduction potential in China A-shares, we examine the historical behavior of a hypothetical "plain vanilla" minimum variance strategy. It targets MSCI China A[3] as the benchmark, sources stocks from an investable universe (market capitalization greater than USD 100MM), and maximizes risk reduction based on Acadian's proprietary, dedicated China A risk forecasting model. This portfolio is fully invested, long-only, and rebalanced monthly. We cap stock-level active overweights at 3%, a typical plain-vanilla construction approach.

Figure 5 presents the hypothetical performance of such a portfolio from January 2007 – July 2018. This demonstrates material positive active returns, along with substantial benchmark-relative reductions in beta and total volatility (approximately 15% and 11%, respectively). For investors familiar with other EM contexts, that risk reduction may seem modest. Keep in mind, however, that in the China A context, we're forgoing country diversification, which has a material beta-reduction benefit in portfolios that span EM.

The year-by-year performance breakout in Figure 6 also demonstrates the potential drawdown protection afforded by a low-volatility approach. For example, during the China A sell-off from June 2015 to February 2016, when the benchmark returned -44%, the hypothetical minimum variance portfolio experienced a materially smaller loss of -35.4% (i.e., an active return of +8.6%). A trade-off of this downside protection is expected underperformance during some strong rallies, as can be seen in 2009 and 2014.

FIGURE 5 – HISTORICAL PERFORMANCE OF A HYPOTHETICAL MINIMUM VARIANCE STRATEGY

	Annualized Performance Statistics (%)
Panel A	
Arithmetic Active return	3.62
Realized Beta	0.84
% Benchmark risk	88.74
Geometric Portfolio return	12.44
Arithmetic Portfolio return	15.57
Total risk	27.58
Return/Risk	0.56
Annual turnover (% of value)	81.80
Average # positions	179

Source: Acadian. The information provided is for educational and illustrative purposes only based on proprietary models. This is not intended to represent investment returns generated by an actual portfolio. They do not represent actual trading or an actual account, but were achieved by means of using the Acadian universe of securities. Results do not reflect transaction costs or other implementation costs. Every investment program has an opportunity for loss as well as profit.

Table shows hypothetical historical returns and risk based on monthly portfolio returns, annualized. See 'Risk Reduction Potential' section for description of key portfolio construction elements employed.

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FIGURE 6 – HYPOTHETICAL COMPOUNDED ANNUAL RETURNS

	Total Returns		Active Returns
	Minimum Variance	Benchmark	Minimum Variance
2007	180.7	167.4	13.4
2008	-53.5	-60.4	6.9
2009	88.5	95.0	-6.5
2010	5.6	-4.6	10.2
2011	-15.0	-22.8	7.9
2012	7.5	9.4	-1.9
2013	7.1	0.6	6.5
2014	35.6	46.5	-10.9
2015	20.2	9.1	11.1
2016	-9.6	-18.0	8.3
2017	20.7	23.1	-2.4
2018 Jan -Jun	-12.7	-14.5	1.8

Benchmark: MSCI China A.

Source: Acadian. The information provided is for educational and illustrative purposes only based on proprietary models.This is not intended to represent investment returns generated by an actual portfolio. They do not represent actual trading or an actual account, but were achieved by means of using the Acadian universe of securities. Results do not reflect transaction costs or other implementation costs. Every investment program has an opportunity for loss as well as profit. Reference to the benchmark is for comparative purposes only. Index Source: MSCI Copyright MSCI 2019. All Rights Reserved. Unpublished. PROPRIETARY TO MSCI.

Table shows hypothetical historical returns and risk based on monthly portfolio returns, annualized. See 'Risk Reduction Potential' section for description of key portfolio construction elements employed.

CONCLUSION

Growing interest in applying low-volatility investing to China A-shares reflects both the increasing prominence of the market and its continued volatility. Evidence that risk mispricing manifests in China A-shares is supported by the behavior of a hypothetical minimum variance portfolio. Investors should expect that characteristics of low-volatility China A portfolios will differ from those in other markets. For one thing, the level of risk reduction is likely to be lower than that seen in broader low volatility portfolios that benefit from country diversification. Nevertheless, hypothetical China A minimum variance portfolios exhibit reduced risk and smaller drawdowns, suggesting promise for low-volatility investing in China A-shares.

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