International volatility risk and Chinese stock return predictability

Jian Chen a, Fuwei Jiang b,*, Yangshu Liu c,*, Jun Tu d

a Department of Finance, School of Economics, Xiamen University, China
b School of Finance, Central University of Finance and Economics, China
c Department of Finance, School of Management, Xiamen University, China
d Lee Kong Chian Business School, Singapore Management University, Singapore

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ABSTRACT

This paper investigates the predictive ability of international volatility risks for the daily Chinese stock market returns. We employ the innovations in implied volatility indexes of seven major international markets as our international volatility risk proxies. We find that international volatility risks are negatively associated with contemporaneous Chinese daily overnight stock returns, while positively forecast next-day Chinese daytime stock returns. The US volatility risk (ΔVIX) is particularly powerful in forecasting Chinese stock returns, and plays a dominant role relative to the other six international volatility measures. ΔVIX’s forecasting power remains strong after controlling for Chinese domestic volatility and is robust in- and out-of-sample. Economically, high ΔVIX forecasts high Chinese domestic market volatility, low trading activity, and low market liquidity, indicating that both ICAPM and liquidity risk help to explain international volatility risks’ predictive power for Chinese stock returns.

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1. Introduction

Recent research suggests that information now is evaluated and reflected in a timely manner between markets due to globalization. Specifically, Chinese stock market is showing an increasing level of
integration with the international financial markets due to its ongoing trade and financial liberalization
over the past three decades. For example, Glick and Hutchison (2013) find that Chinese stock market
is strongly linked to its East Asian neighbors. Goh et al. (2013) present evidence that US economic
variables are leading indicators of Chinese stock market, particularly after China joined the World
Trade Organization (WTO). Jordan et al. (2014) show that stock returns of countries that China net
imports from can significantly forecast the aggregate Chinese stock market return. In this paper, we
investigate whether international volatility risks are useful in explaining the time variation of Chinese
stock market returns.

Understanding the risk–return relationship is critical to many fundamental issues in asset pricing,
investment, and corporate finance. Merton (1980) theoretically shows that volatility risk is related to
expected stock return. An et al. (2014), Guo and Qiu (2014), Bali et al. (2015), among others, provide
empirical evidence on the predictive power of volatility risk for US stock returns. Given China's strengthen-
ed link to international financial markets, it is hence possible that the Chinese stock market is exposed
to the international volatility risks. Empirically, we find that international volatility risks, particularly
the US volatility, can strongly forecast the future Chinese stock market returns beyond Chinese domestic
volatility.

This paper also contributes to the asset pricing literature on Chinese stock market, which recently
has attracted considerable attention from both practitioners and academics. China now has the second
largest stock market in the world, valued at more than eight trillion US dollars (with the Shanghai
and Shenzhen exchanges combined), and has more than two thousand public firms listed. Moreover,
the Chinese stock market is still young, underdeveloped, speculative, highly volatile, and with many
abrupt market fluctuations. Therefore, it is of great interest to understand whether international vol-
atility risk is priced in the emerging Chinese stock market with high volatility, speculation, and poor
governance. If international volatility risk contains information for forecasting future Chinese stock
returns beyond that contained in the Chinese domestic risk factors, investors should incorporate these
international risk measures into their information set to enhance the accuracy of their returns fore-
cast. The enhancement of the return forecasts can be economically large, and will therefore affect the
benchmark used for measuring investment performance.

Following Ang et al. (2006), Bali and Engle (2010), Chang et al. (2013) and An et al. (2014), we employ
the innovations in daily implied volatility indices of seven major international markets as our proxies
for international volatility risks. Specifically, we calculate the daily changes of implied volatility for
the US, UK, France, Germany, Euro zone, Japan, and Hongkong markets, and denote them as ΔVIX, ΔVFTSE,
ΔVCAC, ΔDAX, ΔSTOXX, ΔVXJ, and ΔVSHI, respectively. Bali and Peng (2006), Guo and Whitelaw
(2006) and Guo and Qiu (2014) advocate for using implied volatility instead of realized or GARCH related
volatility measures to study the relation between the stock market risk and the expected stock return.1

Since the opening and closing GMT timings for the American and European markets are lagged to
the Chinese stock market by six to fifteen hours (see Table 1), the volatility innovations observed in
these markets are overlapped with the Chinese close-to-open overnight stock returns. To avoid this
look-ahead bias, we decompose the Chinese close-to-close daily stock returns into close-to-open over-
night returns and open-to-close daytime returns. We then focus on forecasting the future Chinese open-
to-close daytime stock returns, for which there is no look-forward bias. Becker et al. (1990) investigate
the correlation between the US market return and subsequent daytime returns of East Asian coun-
tries. However, little research shows evidence of the relationship between international volatility risks
and Chinese daytime returns. To the best of our knowledge, out study is the first paper providing such
an empirical result.

Interestingly, we document significant daily return reversals in Chinese stock market: large neg-
ative overnight returns from close-to-open and large positive daytime returns from open-to-close. This
finding hence indicates on average a lower opening price for the next trading day relative to the closing
price at the end of current trading period in Chinese market, which is in sharp contrast to the posi-

1 We use the daily realized volatility as a proxy for the Chinese domestic volatility risk, calculated as the sum of squared
five-minute intraday returns, since there is no option market in China. We obtain similar findings using alternative interna-
tional volatility risk measures such as the variance risk premium (VRP).
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