Investable Commodity Premia in China

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This paper discusses how investable Chinese commodity risk premia might be, amid the recent acceleration of the market opening process in China. The findings suggest that strategies based on conventional contract rolling and portfolio weighting schemes are not investable due to limited capacity induced by policy-induced liquidity dynamics. It is further shown that the capacity can be substantially increased by dynamic rolling and strategic portfolio weights, and that style integration can notably enhance the investor's opportunity set. The investable premia documented survive execution delay, stop-loss, seasonality, sub-periods, illiquidity and transaction cost tests, and provide portfolio diversification benefits. Finally, the analysis reveals that investable commodity premia in China exhibit a strong ability to predict global real economic growth.

Introduction

The investment management industry has embraced the rising opportunities in China as a result of the government's recent effort to internationalize its financial markets. As of 2020, many of the world's largest hedge funds – BlackRock, Bridgewater Associates, Invesco, Man Group, UBS and Winton Capital inter alia – have established subsidiaries in China.

Meanwhile, as one of the most popular investment styles in recent decades, a growing number of studies have confirmed the profitability of momentum and trend-following strategies in Chinese commodity futures markets (Li *et al*., 2017; Ham *et al*., 2019). Fan and Zhang (2020) conduct a study that confirms the existence of carry and momentum premia in these markets after controlling for an exhaustive list of long-short factors that have been documented in the U.S. market. However, the extant literature has largely neglected the effects of retail-dominance, barriers-to-entry, time-varying margins and strict position limits.

This paper investigates how investable various risk premia are in Chinese commodity futures markets. These premia include the momentum, carry and recently proposed basis-momentum factors that have been documented in the U.S. futures markets. Using a wide range of portfolio construction methods, the authors assess how investable these factors are in Chinese futures markets from three angles: capacity, enhancement, and implementation. The specific research questions addressed by this study in the context of the above styles in commodity futures markets are as follows: (1) Are those risk premia

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investable? (2) How can investment in those premia be effectively increased? (3) Do such premia have predictive implications for the global economy?

Why the Paper's Research Questions are Important

The literature on commodity factor investing has gained popularity because of its implications to the investment management industry. While the literature to date focused on developed futures markets in the U.S., U.K., and Japan, the emerging commodity market in China offers a natural laboratory to conduct experiments on existing factors. Despite its importance to global commodity trading and increased attention from investors, the Chinese commodity futures market is still poorly understood due to the unique institutional settings. Largely deviating from the real-world setting, naïve assumptions imposed by existing studies cast doubt on the validity and practicality of previously documented results. To fill the gap, this paper explores investing in risk premia by examining the investment capacity, implementation challenges and the implications for the global economy. The findings are of imminent interest to global institutional investors. This study also contributes to the growing debate on the replicability of risk factors (Harvey *et al*., 2016; Hou *et al*., 2018).

Data Description

Data for 44 commodities covering grains, oilseeds, industrials, metals and energy sectors, traded on the Dalian (DCE), Shanghai (SHFE) and Zhengzhou (ZCE) exchanges, respectively, are obtained from Datastream International. The cross-section of the raw dataset spans 4,500 individual contracts and maturities from 1993 to 2018. Thinly traded products are dynamically excluded. As macroeconomic variables, the authors employ inflation and industrial production data from China, the U.S. and world, the Keqiang, Kilian and Baltic Dry indices, and the Chinese versions of the Economic Policy Uncertainty (EPU) Index, the Geopolitical Risk (GPR) Index, the term spread and the TED spread. As financial variables, the authors consider broad stock, bond and currency indices for China, U.S., and Europe.

Methodology

The authors investigate how investable factors such as carry are (Koijen *et al*., 2018), as well as momentum (Miffre and Rallis, 2007) and basis-momentum (Boons and Prado, 2019), in Chinese commodity futures markets. To measure the threshold capacity (Vangelisti, 2006), the authors compute the position ceilings set by regulators for each commodity covered in the sample. Accordingly, they estimate the maximum investment capacity of carry, momentum and basis-momentum factors using the conventional rolling method and equal portfolio weights. The conventional roll holds the m^{th} (where m = 1, 2, 3, 4) nearest contracts until the last trading day of the month prior to expiration of the front contract.

In an effort to improve capacity, two alternative roll-over methods are employed: the Gradual roll expands the rollover process evenly over the last five trading days (de Groot *et al*., 2014), and the Dynamic roll changes positions whenever the open interest of the holding contract is surpassed by another contract for three consecutive days (Asness *et al*., 2013). In addition to equal weights, four strategic portfolio weighting techniques are exploited including rank (Koijen *et al*., 2018), strength (Fan *et al*., 2020), volatility (Moskowitz *et al*., 2012) and trade weights. Each long-short portfolio consists of the entire cross-section

and is rebalanced monthly. For risk adjustments, the authors employ commodity market factors (Bakshi, *et al.*, 2019), common risk factors (Fan *et al.*, 2020), as well as a geopolitical risk measure (Caldara and Iacoviello, 2019; GPR) and Chinese economic policy uncertainty measure constructed à la Baker, Bloom and Davies (2016; EPU).

Key Results

Momentum, carry and basis-momentum premia are robust under conventional contract rolling and equal portfolio weights, but are not investable due to limited capacity (approx. one million Chinese Renminbi (RMB) or U.S. $142,000). However, dynamic rolling and strategic portfolio weights significantly boost the capacity of the above strategies to billions of RMB, without compromising the statistical or economic significance of the risk premia.

Second, the observed investable risk premia can be enhanced through a simple style integration framework (Fernandez-Perez *et al.*, 2019), while maintaining a high level of investment capacity. These integrated strategies report an average annualized Sharpe ratio of 0.81 and a median capacity of 932 million RMB. However, only the combination of momentum and basis-momentum under rank, strength and trade weights can deliver "alpha" when the standalone risk premia are used as benchmarks.

Third, the investable risk premia are robust to several implementation concerns, such as execution delay, stop-loss and liquidity considerations. A 10% stop-loss improves the risk-return profile for the carry strategy but not for momentum and basis-momentum. Moreover, a correlation analysis reveals that investable premia in Chinese commodity futures can provide diversification benefits for both Chinese and international risk exposures on traditional assets.

Fourth, the paper finds no evidence of a significant relationship between investable commodity premia in China and macroeconomic, liquidity, volatility and economic policy/geopolitical risks. However, investable carry premia persistently predict real global economic activity for up to one year ahead. This highlights the important role that Chinese commodity markets play in the global economy. Lastly, the robustness of investable premia is reassured in seasonality and sub-period tests and the premia remain when subjected to transaction costs.

Conclusion

This article examines investing in commodity risk premia in China. Conventional momentum, carry and basis-momentum premia are not investable given the minuscule capacity on the front end of the commodity futures curve. To harvest the premia, dynamic contract rolling and strategic portfolio weights play an indispensable role. Such investable premia survive a variety of implementation tests and can convey important information about the future growth of the global economy. Moreover, the paper shows that style integration can be a very useful tool to enhance the investable risk premia. Overall, the paper highlights the importance of taking into consideration how investable and replicable factor risk premia are across asset classes and regions.

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Keywords

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