Speculative Pressure

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This article examines the information content of futures markets speculators' net positions. It shows that long-short portfolios based on speculative pressure capture attractive premia in commodity, equity and currency futures markets. The thus formed speculative pressure factors are able to explain the cross-sectional variation in futures returns after controlling for tradeable (carry, momentum and value) factors and non-tradeable global macroeconomic factors. The results are robust to transaction costs, liquidity concerns, alternative signals and portfolio weighting schemes, and sub-periods. These findings do not extend to fixed income futures markets. The key message is that an efficient hedgers-to-speculators risk transfer mechanism is at play in commodities, equity and currency futures markets but is not manifested in fixed income futures markets.

Introduction

The hedging pressure hypothesis of Cootner (1960) and Hirshleifer (1988) represents one of the cornerstones of the modern literature on commodity futures pricing. Under this theoretical framework, the price of a commodity futures contract is expected to rise as maturity approaches in a market when speculators are net long in order to reward them for providing price-fluctuation insurance to the net short hedgers. Vice versa, the futures price is expected to fall with maturity in a market when the speculators are net short in order to reward them for matching off the net long hedging demand. However, the extant empirical evidence offers mixed support for the hedging pressure hypothesis.[1]

The authors measure at each portfolio formation time t the price pressure effect dictated by the net demand for futures contracts of hedgers. To do so they employ data on the net positions of speculators (the supply side) and refer to the resulting measure as the *speculative pressure* SP_{it} signal; a positive SP_{it} (negative SP_{it}) indicates that the speculators are net long (short) in the ith futures contract.

The paper contributes to the literature by examining the extent to which long-short portfolios of futures contracts based on SP as a sorting signal are able to capture a premium not only in commodity markets but also in financial (equity, currency and fixed income) markets. Further, it deploys tests to assess the

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ability of the corresponding futures class-specific and "everywhere" speculative pressure factors to price the broad cross-section of futures against well-documented risk factors within futures class and across futures classes such as momentum, value and carry (Asness *et al*., 2013; Koijen *et al*., 2018) and global macroeconomic risk factors. Finally, it addresses the question of whether there are common drivers of the commodity, equity index and currency speculative pressure premia.

Relevance of the Research Question

The long-short portfolio analysis conducted in this paper is important, first, to re-assess the Cootner (1960) and Hirshleifer (1988) hedging pressure theory in the context of a rich sample of data for a broad "universe" of commodity, equity index, currency and fixed income futures contracts over an updated time period that includes important landmarks such as the late 2000s Global Financial Crisis, and post Dodd-Frank Wall Street Reform and Consumer Protection Act period *inter alia*. Being able to confirm (or otherwise refute) with this updated sample the presence of an efficient risk transfer mechanism from commodity hedgers to speculators has important implications for policymakers and regulators of commodity futures markets. Furthermore, by investigating the presence of an analogous risk transfer mechanism in financial futures markets, the paper aims to fill a void in the futures markets literature.

Second, the specific research questions tackled in the paper are important to inform the literature on futures pricing within each asset class and cross-class, and are also potentially useful to long-short portfolio managers interested in practical investment solutions within and across futures markets.

Data, Speculative Pressure Signal and Portfolio Construction

The paper uses the weekly open interest (OI) of large non-commercial futures traders as compiled by the Commodity Futures Trading Commission (CFTC) in its Futures-Only Legacy Commitments of Traders (COT) report for 84 futures contracts (43 commodities, 11 currencies, 19 equity indices and 11 fixed income and interest rates) from September 1992 to May 2018 to measure the *speculative pressure (SP)*:

$$SP_{i,t} = \frac{1}{W}\sum_{w=1}^{W}\frac{L_{i,t-w} - S_{i,t-w}}{L_{i,t-w} + S_{i,t-w}}$$

where t denotes each portfolio formation time, $L_{i,w}$ and $S_{i,w}$ are the week w long and short open interest of large non-commercial traders on the ith futures contract, and W is the length (in weeks) of the lookback window ($W = 52$). The trading signal is standardized by calculating $\omega_{i,t} \equiv (SP_{i,t} - \overline{SP_t})/\sigma_{SP,t}$ with $\overline{SP_t}$ and $\sigma_{SP,t}$ denoting the cross-sectional mean and standard-deviation of SP at time t, respectively.

The corresponding daily settlement prices of each futures contract are obtained from *Thomson Reuters Datastream*. Futures returns are measured as the logarithmic price changes of the front-end contracts up to one month prior to delivery when the positions are rolled to the next nearest contract.

As implied by the hedging pressure hypothesis, the portfolio strategy takes long (short) positions in the futures contracts with $\omega_{i,t} > 0$ ($\omega_{i,t} < 0$). The weights of the long and short portfolio constituents are given by the magnitude of the SP signal, $\omega_{i,t}$, appropriately scaled so as to ensure full investment. The

long-short SP portfolio is held for one month on a fully-collateralized basis, before rebalancing takes place. Alternative weighting schemes and ranking-holding periods are also considered later in the paper as robustness checks on the main findings.

Results

The analysis reveals that over the period, October 1993 to May 2018, the long-short speculative pressure portfolios capture attractive annualized mean excess returns of 4.12% per annum (statistically significant as borne out by a *t*-statistic of 2.62) in commodity futures markets, 2.51% ($t = 2.45$) in currency futures markets and 4.03% p.a. ($t = 2.29$) in equity index futures markets. In contrast, the fixed-income futures markets behave differently, yielding an unappealing SP return of -0.74% ($t = -1.49$).

By regressing the excess returns of the long-short speculative pressure portfolios on the excess returns of a long-only portfolio of futures, and long-short momentum, carry and value portfolios, the authors provide evidence to suggest that speculators predominantly pursue momentum and carry strategies.

Second, the evidence from cross-sectional pricing regressions suggests that the class-specific SP risk factors and "everywhere" SP risk factors have significant pricing ability for the broad cross-section of 84 futures contracts, after controlling for the corresponding class-specific and "everywhere" Long-Only, Momentum, Value and Carry factors, and for traditional global business cycles variables such as the change in industrial production, the default spread, the term spread, the Kilian index of global real economic activity, market liquidity shocks, funding liquidity shocks, and volatility shocks.

The aforementioned findings from the portfolio and cross-sectional analyses remain unchallenged in additional tests that: i) use data from alternative Commitment of Traders (COT) reports from the CFTC such as short and long positions of hedgers instead, futures and options combined and the disaggregated COT reports, ii) employ different portfolio construction techniques as regards the number of constituents of the long and short portfolios, and their weights, and the ranking and holding periods, iii) take into account futures contracts' transaction costs and liquidity, or iv) different sub-periods.

Conclusions

This paper supports the theoretical notion of an efficient risk transfer mechanism from hedgers to speculators in futures markets beyond commodities by showing that long-short speculative pressure portfolios earn attractive premia in commodity, currency and equity index futures markets. Speculative risk factors constructed within commodity, currency and equity index futures markets have significant pricing ability for a broad cross-section of futures returns after controlling for tradeable momentum, value and carry factors, and global macroeconomic risks.

The aforementioned risk transfer mechanism is not revealed in fixed income markets. The authors argue that this might be because agents choose to manage interest rate risk through other means such as adopting immunization strategies or simply by temporarily changing the modified duration of their portfolios. Further research is warranted to shed light on this seeming anomaly, for instance, by

defining better the entities that really are hedgers (versus non-hedgers) in the fixed income derivatives market.

Endnotes

1 A *positive* relation between the net short (long) positions of hedgers (speculators) and commodity futures returns has been documented by Cootner (1960, 1967), Chang (1985), Hirshleifer (1988, 1989), Bessembinder (1992), de Roon *et al*. (2000), Dewally *et al*. (2013), and Basu and Miffre (2013), whereas in sharp contrast, Rouwenhorst and Tang (2012), Gorton *et al*. (2013), Daskalaki *et al*. (2014), and Szymanowska *et al*. (2014) find no evidence of a significant relation**.**

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