The valuation effects of index investment in commodity futures

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Introduction

This paper studies the valuation effects of the SP-GSCI roll on commodity contracts. We identify a surge of investment tracking commodity futures indices in December 2003. Before 2004, the roll period generated average cumulative abnormal price changes (CAPCs) of 115 bps for the nearby and 146 bps for the first deferred contract. From 2004 to 2010, the average CAPCs of the nearby (first deferred) is equal to -60 bps (-40 bps). A strategy that front-runs the roll does not generate abnormal profits after transaction costs. A diff-in-diffs regression confirms that the financialization has an alleviating effect, statistically significant at the 1% level. The introduction of electronic trading has no effect on abnormal price changes. Finally, the contemporaneous change in hedging pressure is negatively related to CAPCs.

Hypotheses

- The shares of index investment in total OI of SP-GSCI components show a common break during 1999–2010.
- The average CAPC is nil during the roll.
- CAPCs are affected by the financialization but remain unaffected by the inception of electronic trading.
- CAPCs net of transaction costs do not show trivial arbitrage opportunities, neither before, nor after the financialization.
- Changes in CITs pressure, (cross-) liquidity, and (cross-) insurance demands are determinants of the CAPCs.

Methodology

- Bai et al. (1998) algorithm for **multivariate break dating** with confidence interval.
- Event study with **variance overlap/cross-correlation** s.e. adjustments (Kolari and Pynnonen, 2010).
- **Diff-in-diffs** with CAPCs: treated (SP-GSCI)/non-treated (non-indexed) contracts, before/after the break.
- Panel regressions to explain CAPCs with variables of **insurance** and **liquidity premia** Kang et al. (2020).
- Front-running strategy backtests with **bid-ask spread** estimations (Abdi and Ranaldo, 2017).

Results

- Multivariate break test on the intercept of $^{\text{index OI}}/_{\text{total OI}}$ with Bai et al. (1998) algorithm, confidence intervals in months.

	BIC	Break	CI (10%)	CI (5%)	CI (1%)	α (×100)	Wald
SP-GSCI (21)	5	Dec-03	0.07	0.10	0.20	6.53	225.60

- CAPCs with adjustments for event-induced variance and cross-correlation during the roll.

	1999–2003		2004–2010	
	Pre-roll	Roll	Pre-roll	Roll
Nearby				
	102.87	**115.25**	-65.47	**-59.73**
Unadj. t-stat	4.92	5.49	-3.66	-3.23
HAC t-stat	4.39	3.87	-2.58	-1.83
HAC and cross-cor. t-stat	3.63	3.84	-1.57	-1.26
First deferred				
	135.42	**146.36**	-39.94	**-40.70**
Unadj. t-stat	6.84	7.45	-2.34	-2.34
HAC t-stat	6.34	5.96	-1.33	-0.90
HAC and cross-cor. t-stat	5.08	5.05	-1.03	-0.92

Results

- Diff-in-diffs of roll *vs.* non-roll CAPCs and pre/post financialization and electronification.

	CAPC			
	CFTC N	CFTC FD	GSCI N	GSCI FD
DROLL × DFIN	-1.579**	-1.657***	-1.553*	-1.678**
	(0.700)	(0.587)	(0.797)	(0.672)
DROLL × DELEC	-0.157	-0.243	-0.313	-0.336
	(0.376)	(0.374)	(0.394)	(0.396)

- CAPCs (roll) explained with liquidity and insurance premia.

	Nearby		First Deferred	
	1993–2003	2005–2010	1993–2003	2005–2010
CIT	-0.87	-1.60	-2.18	-1.77
	(2.68)	(1.88)	(2.56)	(1.81)
Q	-30.04***	-67.99***	-28.59***	-64.84***
	(9.72)	(11.60)	(8.98)	(10.88)
AHP	0.619	3.736	1.388	3.116
	(0.999)	(2.156)	(0.822)	(2.199)

Conclusion

We examine the consequences of the financialization of commodity futures markets. We identify a common structural break in the SP-GSCI components in December 2003. We find support for the sunshine trading hypothesis in the post-financialization period, as the magnitude and statistical significance of CAPCs drop. Hence, the financialization eases the activity of index investors. We relate CAPCs to the transaction costs bore by an arbitrager and show that the net profit is nil. We regress CAPCs on several explanatory variables and find that changes in hedging pressure is an important determinant. This study reconciles two contrasting findings of the literature on commodity index investment. On the one hand, we document a significant shift in the risk sharing structure of commodity markets. On the other hand, we show that it is unlikely that CITs have modified the term structure of the contracts that are involved in the roll.

References

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