A tale of two premiums revisited

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Summary

- Revisit the study of Kang, Rouwenhorst, and Tang (2020) (KRT) in the light of:
  - Optimal risk adjustment
  - Effects of the financialization
  - Commodity risk factors *vs.* characteristics debate

Context: KRT and financialization

- Financialization effects detected during the roll of commodity index funds:
  - Long only, passive funds must roll their positions from the expiring futures to the next
  - Roll date and position sizes are public, *i.e.*, there is no information revealed during the roll
  - Sunshine trading applies (Bessembinder, Carrion, Tuttle, and Venkataram, 2016, Dubois and Maréchal, 2021), abnormal returns do not survive transaction costs

- Two characteristics relate trader's positions to the cross-section of commodity futures returns (KRT):
  - "Average" hedging pressure (AHP), *i.e.*, hedging pressure computed with a 52 weeks rolling backward window, proxy for insurance demand
  - Net trading (Q) *i.e.*, the change in commercial net position over a week, proxy for liquidity demand

Context: risk factors for commodity futures?

- Are commodity futures exposed to systematic risk factors?
  - No, according to Black (1976)
  - Empirical studies:
    - no exposure to traditional systematic risk factors (Dusak, 1973, Bodie and Rosansky, 1980, Daskalaki, Kostakis, and Skiadopoulos, 2014)
    - mean reverting process; Schwartz (1997). Thus, they do not have a systematic market risk exposure
    - however there are (ad-hoc) factors derived from contract characteristics that captures fundamentals, liquidity, or insurance premia in the cross-section: Basis, Momentum, Basis-Momentum, Hedging Pressure (insurance), Net Trading (liquidity), crowding, β on average commodity portfolio and OI growth rate.
  - Factors or characteristics?
    - No consensus

Objectives

- Replicate KRT:
  - optimal risk adjustment
  - extend the period and check the robustness
- Control for the effects of the financialization:
  - roll weeks - limit the study to weeks that have a three-day overlap with the roll or more
  - measure of CIT pressure
  - pre- and post-financialization
- Overcome FMB limitations with a panel approach

Main results

- Optimal risk adjustment: four factors identified B-M-BM-CR
- Impact of the days of the roll on returns, turnover, and factors: only turnover is significantly affected
- KRT results are robust to risk adjustment, financialization period, roll days, and measure of CIT pressure with FMB regressions
- Results in panel are different:
  - Characteristics favoured
  - Reduction of the insurance price in the post-financialization period (liquidity price unch.)

Data

- Daily prices of 26 commodity futures contracts, nearby ($F^1_{c,t}$) and first deferred ($F^2_{c,t}$), downloaded from Datastream (1994–2021), that are indexed by SP-GSCI and BCOM (almost perfect roll overlap)
- Weekly (Tuesday) CFTC data: COT (from 1994) and DCOT (from 2006) for positions of long and short traders of all categories, and total open interest (1994–2021)
- CIT pressure: Masters (2008) procedure

Factors (1)

- Arithmetic weekly returns from Tuesday to Tuesday rolled onto the deferred contract one week before maturity: $R_{c,t} = \frac{F_{c,t}}{F_{c,t-1}} - 1$
- Net trading: $Q_{c,t} = \frac{\left(CL_{c,t} - CS_{c,t}\right) - \left(CL_{c,t-1} - CS_{c,t-1}\right)}{OI_{c,t-1}}$
- Average hedging pressure: $AHP_{c,t} = \frac{\frac{1}{52}\sum_{j=0}^{51}\left(CS_{c,t-j} - CL_{c,t-j}\right)}{OI_{c,t}}$
- Basis: $B_{c,t} = \frac{\ln F^2_{c,t} - \ln F^1_{c,t}}{T_2 - T_1}$
- Momentum: $M_{c,t} = \prod_{j=0}^{51}\left(1 + R^1_{c,t-j}\right)$

Factors (2)

- Basis-Momentum: $BM_{c,t} = \prod_{j=0}^{51}\left(1+R^1_{c,t-j}\right) - \prod_{j=0}^{51}\left(1+R^2_{c,t-j}\right)$
- Average factor beta: $\beta_{c,t} = \frac{Cov\left(R^1_{c,t|t-52}, AVG_{t|t-52}\right)}{Var\left(AVG_{t|t-52}\right)}$
- Crowding: $CR_{c,t} = \frac{NCL_{c,t}-NCS_{c,t}}{OI_{c,t}} - \frac{1}{52}\sum_{j=0}^{51}\frac{NCL_{c,t-j}-NCS_{c,t-j}}{OI_{c,t-j}}$
- Open interest growth rate $\Delta OI_{c,t} = \prod_{j=0}^{51}\left(\frac{OI^{USD}_{c,t-j}}{OI^{USD}_{c,t-j-1}}\right)^{1/52} - 1$

Methodology

- Optimal risk adjustment with factor selections based on the Bayesian procedure of Barillas and Shanken (2018)
- Individual regressions on overlapping roll dummies of:
  - returns on futures contract
  - turnover
  - factors
- FMB predictive regressions of returns on insurance and liquidity variables and setting adjusting for the financialization (days of the roll, sub-periods, index traders' pressure
- Factors *vs.* characteristics with the "Generalized Portfolio Sort" approach of Hoechle, Schmid, and Zimmermann (2020)

Optimal risk adjustment

$$ML_z = |X'X|^{N-2}|S_z|^{-\frac{T-K}{2}} \times H_z$$

# factors	Selected factors		Absolute test				
		Avg. $\lvert\alpha\rvert$ %	*W*	*GRS*	P-value GRS	*BF*	Prob.
1	*B*	0.10	63.96	2.01	0.00	0.05	0.04
2	*B-CR*	0.10	50.05	1.63	0.02	0.13	0.12
3	*B-BM-CR*	0.09	43.79	1.47	0.05	0.36	0.26
4	**B-M-BM-CR**	**0.09**	**40.67**	**1.41**	**0.07**	**0.56**	**0.36**
5	*B-M-BM-ΔOI-CR*	0.09	39.98	1.44	0.07	0.50	0.33
6	*β-B-M-BM-ΔOI-CR*	0.09	39.97	1.50	0.05	0.38	0.27

Revisiting the results

$$R^1_{c,t} = \beta_{0,t} + \beta_{1,t} AHP_{c,t-1} + \beta_{2,t} Q_{c,t-1} + \beta_{3,t} CIT_{c,t-1} + {}^{\mathbf{T}}\mathbf{b_t}\mathbf{RISK}_{c,t-1} + \epsilon_{c,t}$$

	KRT	Opt. risk	3+	CIT	Pre	Post	1994–2020
$AHP_{c,t-1}$	0.43	0.34	0.55	0.38	0.25	0.43	0.41
	(2.67)	(1.93)	(1.98)	(2.04)	(0.92)	(1.84)	(2.33)
$Q_{c,t-1}$	4.66	3.80	2.32	3.70	2.63	4.82	3.20
	(5.97)	(4.91)	(1.88)	(4.63)	(3.10)	(3.91)	(2.49)
$CIT_{c,t-1}$				-0.25			
				(-0.29)			
Avg. Adj. R^2 (%)	11.95	13.73	12.81	13.88	13.65	13.78	14.44

Risk factors or characteristics?

$$R^1_{c,t} = \mu_c + {}^{\mathbf{T}}\left({}^{\mathbf{T}}\mathbf{z}_{c,t} \odot {}^{\mathbf{T}}\mathbf{x}_t\right)\mathbf{\Theta} + \epsilon_{c,t}$$

	1994–2017		Pre		Post	
	(1)	(2)	(3)	(4)	(5)	(6)
$AHP_{c,t-1}$	0.33	0.33	0.48	0.50	0.25	-0.37
	(2.28)	(2.24)	(2.26)	(2.36)	(1.34)	(-0.76)
$Q_{c,t-1}$	2.78	2.80	2.52	2.69	3.19	4.79
	(5.73)	(5.75)	(4.83)	(4.98)	(3.26)	(3.31)
$CIT_{c,t-1}$	-0.26	-0.18	2.93	1.55	-0.69	-0.86
	(-0.19)	(-0.14)	(0.71)	(0.41)	(-0.48)	(-0.50)
B_t		0.56		2.69		-2.31
		(0.30)		(1.35)		(-0.69)
M_t		2.30		0.39		-1.52
		(1.28)		(0.18)		(-0.51)
BM_t		-1.95		-0.51		-3.97
		(-0.96)		(-0.28)		(-1.23)
CR_t		-1.37		-0.79		0.65
		(-0.80)		(-0.29)		(0.21)
Constant	0.01	0.01	-0.02	-0.03	0.02	-0.55
	(0.18)	(0.19)	(-0.37)	(-0.38)	(0.31)	(-2.01)
FE						✓
Haussman	1.28	15.70	2.87	13.93	6.00	25.16**
Adj. R^2 (%)	0.15	0.17	0.21	0.36	0.11	0.33

Conclusion

- Optimal risk adjustment: four factors identified B-M-BM-CR
- Impact of the days of the roll on returns, turnover, and factors: only turnover is significantly affected
- Kang et al. (2020) results are robust to risk adjustment, financialization period, roll days, and measure of CIT pressure
- When using the panel approach, the post-financialization period seem to benefit hedgers, leaving them the liquidity premium and decreasing their insurance premium
- Extension of the paper towards a more characteristics *vs.* risk factors approach

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