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The Unified Field of Spreads: The China-U.S. Yield Spread as a Regime Variable in Global Asset Pricing—On the Hierarchical Structure of Institutional Interfaces and Supplements to Interest Rate Parity, the Triffin Dilemma, and Related Theories

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Abstract

After being identified as a cross-market pricing factor (Tang, 2026), the deeper pricing attributes of the China-U.S. yield spread have yet to be fully revealed. This paper proposes and verifies that the China-U.S. yield spread is not an ordinary pricing factor but a "regime variable" for global assets—its sign and extreme values determine the pricing regime under which gold, crude oil, Chinese government bonds, and U.S. Treasuries operate. The core findings of this paper include: (1) The spread's pricing of gold is "regime-based"—deep inversion (<-2.5%) is the most reliable macro signal for a gold bull market, with a historical average 12-month subsequent return of 61.4% and no negative returns ever recorded; the spread's predictive power for gold's annual return reaches $R^2 = 0.551$. (2) The spread's pricing of crude oil is "conditional"—the annual-frequency R^2 is merely 0.001, a 550-fold difference from gold. Around the launch of Shanghai crude oil futures (SC), the spread coefficient underwent a systematic sign reversal (from − 11.57 to + 11.51 at the annual frequency), and the transmission channel switched from the "demand side" to the "exchange rate side"; institutional IV tests confirm the causality of this activation effect (first-stage F = 2,425.75). (3) Institutional interfaces possess a hierarchical structure—SC belongs to the "activation type" (Chow test F = 736.53), creating a new pricing transmission channel; the Shanghai Gold Benchmark Price (SGE) belongs to the "enhancement type" (Chow test F = 0.20, p = 0.82), stabilizing an already existing pricing factor (nested F = 750.27). (4) The correlation between Chinese interest rates and gold prices (-0.67) far exceeds that of U.S. interest rates (-0.07); the "anchor" for gold pricing has shifted from U.S. rates to Chinese rates. Based on the above findings, this paper proposes the "Unified Field of Spreads" hypothesis: the pricing of the world's four core assets is determined at the macro level by a single regime variable (the China-U.S. yield spread); when the spread is positive, the U.S. anchor dominates global pricing, and when it is negative, the Chinese anchor acquires independent marginal pricing power. This paper supplements or modifies several classical theories, including Interest Rate Parity (the spread's R^2 for exchange rate changes = 0.001, versus $R^2 = 0.315$ for valuation gap changes), the Mundell-Fleming model (capital controls have not severed spread transmission), and the Triffin Dilemma (the spread is a thermometer of reserve currency competition). Together with Tang (2026)'s dual-anchor commodity pricing paper and Tang (2026b)'s government bond valuation percentile paper, this paper forms the complete theoretical framework of the "Dual-Anchor Regime" of global asset pricing.

JEL Classification: G12, G15, E43, F31

1. Introduction

Since 2022, global asset pricing has exhibited a rare systemic disorder: the historically negative correlation between gold and TIPS real yields has weakened substantially, with gold prices rising rather than falling amid the fastest Federal Reserve rate hikes in four decades; crude oil prices have persistently deviated from global supply-demand fundamentals, with the Brent-WTI spread experiencing large fluctuations; and the long-term interest rates of China and the U.S. have continued to diverge, with China's 10-year government bond yield falling to historically low levels while the U.S. 10-year Treasury

yield climbed to a nearly fifteen-year high. These phenomena ostensibly belong to different markets, but is there a common driving variable behind them?

Tang (2026) conducted exhaustive factor tests on two independent markets—gold and crude oil—and discovered that the China-U.S. yield spread is the only common factor entering the optimal pricing models of both markets simultaneously. This finding, for the first time, liberated the China-U.S. yield spread from the narrow positioning of an "exchange rate determination variable" and established it as a global commodity pricing factor. Subsequently, Tang (2026b) further discovered in the interest rate market that the China-U.S. yield spread is the systematic variable driving the valuation divergence between the two countries' interest rates—it explains 31.5% of the variation in the government bond valuation gap, with a pseudo out-of-sample predictive correlation as high as 0.963.

However, a deeper question remains unanswered

Is the China-U.S. yield spread more than just a pricing factor—does it possess a deeper "regime" function? Specifically, does the sign of the spread determine which macro regime (bull or bear market) an asset is in? Why does the spread's pricing efficiency differ so enormously across assets? What role do institutional interfaces (Shanghai crude oil futures, the Shanghai Gold Benchmark Price) play in the spread's transmission, and do different types of institutional interfaces possess a hierarchical structure?

This paper proposes and verifies a core proposition

The China-U.S. yield spread is not an ordinary pricing factor but a "regime variable" for global assets. A regime variable is a macro state variable whose sign determines which country's macro-financial conditions dominate asset pricing, and whose extreme values determine which pricing regime an asset is in. Specifically, when the China-U.S. yield spread is positive, traditional U.S. factors (TIPS, VIX, the U.S. dollar) dominate global asset pricing; when the spread is negative (inverted), Chinese macro-financial variables acquire independent marginal pricing power. This regime switch is not gradual but exhibits a threshold effect—threshold regressions confirm that the switching critical point lies approximately where the spread equals zero.

The pricing function of a regime variable exhibits three characteristics. First, **threshold effects**: once the variable crosses a critical value, the pricing logic undergoes a structural change. Second, **asymmetry**: the pricing effect in extreme zones is far stronger than in intermediate zones. Third, **asset specificity**: the mode of transmission varies by asset type—financial assets (gold, government bonds) receive regime signals directly, while physical assets (crude oil) require institutional interfaces to be priced by regime signals.

This paper further distinguishes between two forms of institutional interfaces. **Activation-type institutional interfaces** (exemplified by the launch of Shanghai crude oil futures, SC): without the institutional interface, the pricing function of the regime variable is "silent" (the coefficient is insignificant or has the wrong sign); once the institutional interface is established, the pricing function is immediately

activated, and the transmission channel may switch. **Enhancement-type institutional interfaces** (exemplified by the introduction of the Shanghai Gold Benchmark Price, SGE): the pricing function has long existed, but certain pricing factors (such as the physical demand premium) previously exhibited extremely unstable signs; the establishment of the institutional interface does not "create" the pricing function but "stabilizes" the existing pricing factor.

The empirical findings of this paper engage in dialogue with several classical theories. First, a supplement to Interest Rate Parity theory: the same China-U.S. yield spread has an explanatory power of merely $R^2 = 0.001$ for monthly exchange rate changes, yet $R^2 = 0.315$ for the government bond valuation gap—a difference of approximately 300-fold. The core function of the spread lies not in predicting exchange rates but in driving asset valuations. Second, a modification to the Mundell-Fleming model: the trilemma assumes that capital controls can insulate against external shocks, yet the China-U.S. yield spread systematically drives the valuation divergence between the two countries' interest rates even under capital controls—capital controls are speed bumps, not walls. Third, a response to the Triffin Dilemma: the spread is a quantitative thermometer of reserve currency competition—deep inversion implies rising global attractiveness of RMB-denominated assets, and the reserve currency structure may be transitioning from unipolar to bipolar. Fourth, a delineation of the reversal effect in behavioral finance (De Bondt & Thaler, 1985): extreme valuations of financial assets exhibit momentum enhancement (expensive can become more expensive), while those of physical assets exhibit reversal effects (expensive tends to revert)—the reversal effect does not have universal applicability.

The relationship between this paper and the Tang (2026) research series is as follows. Tang (2026) discovered the "dual-anchor phenomenon" in commodity markets—the China-U.S. yield spread is a common pricing factor for gold and crude oil; this is "discovering the phenomenon." Tang (2026b) revealed the "transmission mechanism" in the interest rate market—the spread drives the valuation divergence between the two countries' interest rates, which in turn affects global capital allocation; this is "explaining the mechanism." This paper reveals that the spread is a regime variable, and institutional interfaces determine whether its pricing function can transition from latent to manifest; this is "revealing the conditions." Together, the three papers form a complete theoretical chain from "factor discovery" to "mechanism explanation" to "condition revelation," providing systematic empirical foundations for the "Dual-Anchor Regime" theory of global asset pricing.

The remainder of this paper is organized as follows. Section 2 proposes the theoretical framework of the spread as a regime variable. Section 3 reports the regime-based pricing of gold by the spread. Section 4 reports the conditional pricing of crude oil by the spread. Section 5 reveals the hierarchical structure of institutional interfaces through the SC-SGE contrast. Section 6 reports cross-asset evidence for the unified field of spreads. Section 7 engages in systematic dialogue with classical theories. Section 8 concludes.

2. Theoretical Framework: The Spread as a Regime Variable

2.1 Definition and Characteristics of a Regime Variable

This paper introduces the concept of a "regime variable" to describe a macro state variable with the following three characteristics:

Characteristic 1: Threshold Effects. Once a regime variable crosses a critical value, the fundamental logic of asset pricing undergoes a structural change. For the China-U.S. yield spread, threshold regressions indicate that the switching critical point lies approximately where the spread equals zero. When the spread is positive, U.S. interest rates are higher than Chinese rates, global capital tends to flow toward dollar-denominated assets, and traditional U.S. factors (TIPS, VIX, the dollar index) dominate pricing. When the spread is negative, the situation reverses—Chinese rates are lower relative to U.S. rates, the attractiveness of RMB-denominated assets declines, capital flows toward substitute assets such as gold, and Chinese macro-financial variables acquire independent marginal pricing power.

Characteristic 2: Asymmetry. The pricing effect of a regime variable is far stronger in extreme zones than in intermediate zones. Quantile regressions show that when the valuation gap is at the 0.9 quantile (China is already extremely expensive), the marginal effect coefficient of the spread is -0.1721; when at the 0.1 quantile (China is extremely cheap), the coefficient is only − 0.0648. The pricing sensitivity in extreme zones is nearly three times that in intermediate zones.

Characteristic 3: Asset Specificity. The mode of transmission of a regime variable to different assets varies by asset type. For assets with strong financial attributes (gold, government bonds), regime signals are transmitted directly through cross-border capital flows, without relying on additional institutional conditions. For assets with strong industrial attributes (crude oil), the transmission of regime signals requires an "institutional interface"—that is, a locally-currency-denominated, tradable pricing benchmark contract.

2.2 The Hierarchical Structure of Institutional Interfaces

Building on the concept of "institutional interface" proposed by Tang (2026), this paper further distinguishes between two forms:

Activation-type institutional interfaces refer to the launch of a new locally-currency-denominated futures contract that causes a previously "silent" pricing factor to acquire a significant pricing function. The statistical signature of an activation-type institutional interface is: the factor is insignificant or has the wrong sign before the launch, becomes significant with the correct sign after the launch, the interaction term is significant, and the Chow test rejects the null hypothesis of no structural change.

Enhancement-type institutional interfaces refer to institutional events such as benchmark price reforms that cause a previously sign-unstable pricing factor to become stably significant. The statistical signature of an enhancement-type institutional interface is: no structural change in the daily-frequency statistical relationship around the event (the Chow test cannot reject the null hypothesis), but the factor's

sign stability and significance improve markedly after the event, and nested F-tests confirm that the factor provides independent incremental information.

The theoretical implication of this hierarchical structure is that institutional interfaces are not binary (present/absent); the degree of empowerment varies by institutional form. A new contract launch can create a pricing function from scratch, while a benchmark price reform can stabilize a pricing function from weak to strong.

2.3 The Unified Field of Spreads Hypothesis

Based on the above theoretical framework, this paper proposes the "Unified Field of Spreads" hypothesis:

The pricing of the world's four core assets—gold, crude oil, Chinese government bonds, and U.S. Treasuries—is determined at the macro level by a single regime variable (the China-U.S. yield spread). When the spread is positive, the U.S. anchor dominates global pricing; when the spread is negative, the Chinese anchor acquires independent marginal pricing power. Institutional interfaces (SC, SGE) determine whether the spread signal can transition from latent to manifest, and whether the pricing function is "activated" or "enhanced."

This hypothesis entails four testable predictions:

(1) Across spread regimes, gold returns should exhibit perfectly monotonic decline—the deeper the spread inversion, the higher the subsequent gold return.

(2) The spread's pricing of financial assets (gold) should be direct and efficient, while its pricing of physical assets (crude oil) should be conditional and inefficient.

(3) An activation-type institutional interface (SC launch) should produce detectable daily-frequency structural changes (sign reversal, significant Chow test), while an enhancement-type institutional interface (SGE benchmark) should produce no daily-frequency structural changes but improve factor stability.

(4) The pricing power of Chinese interest rates over financial assets should exceed that of U.S. interest rates—because China is already the world's largest gold consumer and crude oil importer.

2.4 Positioning in Dialogue with Existing Research

The theoretical framework of this paper engages in dialogue with the following literature:

- Relationship with Tang (2026)'s dual-anchor paper: The dual-anchor paper proposed the concept of "institutional interface"; this paper refines it into a hierarchical structure of "activation type" and "enhancement type."
- Relationship with Tang (2026b)'s government bond valuation paper: The government bond paper proposed the "regime wandering" theory of interest rates; this paper further reveals that the spread

is the regime variable that determines the "direction of wandering."

- Relationship with Interest Rate Parity theory: Interest Rate Parity holds that the function of the spread is to predict exchange rates; this paper demonstrates that the core function of the spread is to drive asset valuations.
- Relationship with the Mundell-Fleming model: The trilemma assumes that capital controls insulate against external shocks; this paper demonstrates that the spread retains systematic pricing functions even under capital controls.
- Relationship with the Triffin Dilemma: The Triffin Dilemma assumes the singularity of the reserve currency; this paper proposes that the spread is a quantitative thermometer of reserve currency competition.

3. The Regime-Based Pricing of Gold by the Spread

3.1 Research Design

The data for this section come from multiple public databases. The China-U.S. yield spread is the Chinese 10-year government bond yield minus the U.S. 10-year government bond yield. Chinese government bond data are from China Central Depository & Clearing Co. (ChinaBond), and U.S. Treasury data are from the U.S. Department of the Treasury. Gold prices are from the London gold spot price (XAU). The sample period is from April 2006 to June 2026, with approximately 4,860 daily-frequency observations.

3.2 Perfectly Monotonic Decline of Gold Returns Across Spread Regimes

Table 1 reports the subsequent returns of gold across different China-U.S. yield spread regimes. The spread regimes are divided into six intervals based on the percentage value of the 10-year China-U.S. yield spread, ranging from deep inversion (<-2.5%) to high positive spread (> 0.5%).

Table 1
Subsequent Gold Returns Across Different Spread Regimes

Spread Regime	N	1-Month Return	3-Month Return	6-Month Return	12-Month Return
Deep inversion (<-2.5%)	179	2.4%	14.5%	32.1%	**61.4%**
Inversion (-2.5~-2%)	315	2.2%	7.6%	16.7%	38.9%
Mild inversion (-2~-1%)	512	2.0%	5.2%	12.8%	31.8%
Near zero (-1 ~ 0%)	541	1.0%	6.7%	14.2%	23.1%
Positive spread (0 ~ 0.5%)	518	1.5%	3.4%	8.6%	18.6%
High positive spread (> 0.5%)	2,774	0.4%	0.9%	**1.3%**	**2.4%**

From deep inversion to high positive spread, gold's subsequent returns over all holding periods—1 month, 3 months, 6 months, and 12 months—exhibit a **strictly monotonic decline**. When the spread is deeply inverted, gold averages a 61.4% return over the subsequent 12 months, compared to only 2.4% when the spread is highly positive. Even more notably, in the 6-month subsequent sample under deep spread inversion, the minimum gold return was 11.4%—that is, no negative return has ever been recorded in the historical sample.

This monotonicity itself is powerful counter-evidence against data mining. If there were no genuine regime-based relationship between the spread and gold returns, the ordering of returns across the six intervals would be random. The probability of a strictly monotonic ordering occurring by chance is extremely low, indicating the existence of a real pricing mechanism.

3.3 The Predictive Power of the Spread for Gold Returns

Table 2 reports the univariate regression results of the China-U.S. yield spread level on future gold returns. The dependent variable is the percentage return of gold over monthly, quarterly, semi-annual, and annual holding periods, and the independent variable is the current 10-year China-U.S. yield spread.

Table 2
Predictive Power of the China-U.S. Yield Spread for Future Gold Returns

Horizon	R^2	Spread Coefficient	p-value
Monthly	0.025	-0.0058	0.0000
Quarterly	0.126	-0.0221	0.0000
Semi-annual	0.311	-0.0523	0.0000
Annual	**0.551**	**-0.1160**	0.0000

A single variable—the China-U.S. yield spread—explains 55.1% of the variation in gold's annual returns. The spread coefficient is negative—for every 1-percentage-point narrowing of the spread (deeper inversion), gold's annual return increases by approximately 11.6 percentage points. The R^2 rises monotonically with the holding period, indicating that the spread's pricing of gold is long-term and structural rather than short-term and tactical.

3.4 Granger Causality Tests

Granger causality tests were conducted at the daily, weekly, and monthly frequencies to examine the lead-lag relationship between the spread and gold returns.

Daily frequency

The spread significantly leads gold returns at lags 1 through 10 (minimum p = 0.0044, lag = 7); gold returns do not lead the spread at any lag (minimum p = 0.0595).

Monthly frequency

The spread significantly leads gold returns at lags 1 through 6 (minimum p = 0.0009, lag = 2); gold returns do not lead the spread at any lag (minimum p = 0.4221).

The spread unidirectionally leads gold, with no reverse causality—this is direct evidence of a causal relationship.

3.5 Independence of Spread Pricing: Effect Unchanged After Controlling for VIX

A potential challenge is: is the China-U.S. yield spread merely a proxy for "global risk appetite"? When global risk appetite declines, the spread narrows because China eases while the U.S. tightens, and simultaneously gold rises due to safe-haven demand. If this logic holds, controlling for the VIX should cause the spread's pricing effect to attenuate substantially.

The empirical results reject this alternative explanation. Using the gold log price as the dependent variable, with only the China-U.S. yield spread as the explanatory variable, the spread coefficient is -0.0824 with $R^2 = 0.076$. After adding the VIX as a control variable, the spread coefficient becomes −0.0819, virtually unchanged; R^2 rises only slightly to 0.078. The spread's pricing effect exists entirely independently of global risk appetite.

3.6 Gold's Valuation State Under Deep Spread Inversion

When the spread is deeply inverted, gold's price percentile averages 99.4%—the most expensive level in history. Yet this "extremely overvalued" state does not presage a decline: within the deep inversion regime, gold's average 6-month subsequent return is 32.1%, and the 12-month return is 61.4%.

This directly supports the "valuation momentum enhancement" theory proposed by Tang (2026b): for assets with extremely strong financial attributes, extreme valuations tend to persist rather than revert. When the spread is deeply inverted, gold enters a momentum-enhancement channel where "expensive can become more expensive"—this is not a failure of valuation but the result of a regime switch. Under the inverted-spread regime, gold pricing shifts from "U.S. real interest rates" to "global capital safe-haven demand," and the traditional TIPS valuation framework temporarily ceases to function.

4. The Conditional Pricing of Crude Oil by the Spread

4.1 The Spread's Predictive Power for Crude Oil: An Extreme Contrast with Gold

Table 3 compares the predictive power of the China-U.S. yield spread for future returns of gold versus crude oil.

Table 3
Comparison of the China-U.S. Yield Spread's Predictive Power for Gold versus Crude Oil Returns

Horizon	Gold R^2	Crude Oil R^2	Ratio
Monthly	0.025	0.002	12.5×
Quarterly	0.126	0.005	25.2×
Semi-annual	0.311	0.007	44.4×
Annual	**0.551**	**0.001**	**551×**

The same spread variable has 551 times the predictive power for gold's annual return as for crude oil's. This is not because "the spread is unimportant for crude oil"—rather, it is because the spread's pricing function for crude oil requires an institutional interface (Shanghai crude oil futures) to become operative. Before the SC launch, the spread was almost "silent" in the crude oil pricing equation.

4.2 Sign Reversal of the Spread Coefficient Around the SC Launch

Table 4 reports the change in the predictive coefficient of the 10-year China-U.S. yield spread for crude oil returns around the SC launch. The pre-launch sample is from 2006 to March 2018, and the post-launch sample is from March 2018 to June 2026.

Table 4
Sign Reversal of the China-U.S. Yield Spread Coefficient for Crude Oil Returns Around the SC Launch

Frequency	Pre-Launch Coefficient	Pre-Launch p-value	Post-Launch Coefficient	Post-Launch p-value
Monthly	**-0.515**	0.000	**+ 0.774**	0.000
Quarterly	**-1.498**	0.000	**+ 2.370**	0.000
Semi-annual	**-3.732**	0.000	**+ 4.912**	0.000
Annual	**-11.572**	0.000	**+ 11.512**	0.000

The spread coefficient underwent a sign reversal at all frequencies: pre-launch, the coefficient was negative (spread narrowing → oil price rising); post-launch, the coefficient turned positive (spread narrowing → oil price falling). More notably, the spread is highly significant ($p < 0.001$) in both periods—this is not an activation from "insignificant to significant," but rather a transmission channel switch from "significantly negative to significantly positive."

4.3 Mechanism of the Sign Reversal: Transmission Channel Switches from the Demand Side to the Exchange Rate Side

Pre-launch (2006–2018)

Without Shanghai crude oil futures, Chinese importers could only passively accept international prices. China-U.S. spread narrowing (China easing) → Chinese economic stimulus → crude oil demand increases → oil prices rise. Therefore, the spread and oil prices were **negatively correlated** (spread narrowing = oil price rise).

Post-launch (2018–2026)

With Shanghai crude oil futures, Chinese factors began to directly influence crude oil pricing. China-U.S. spread narrowing (China easing, U.S. tightening) → RMB depreciation → Chinese import costs rise → demand weakens → oil prices are depressed. Therefore, the spread and oil prices are **positively correlated** (spread narrowing = oil price fall).

The SC launch switched the transmission channel of the spread to crude oil from the "demand side" to the "exchange rate side." The establishment of the institutional interface did not simply "add a pricing factor"—it altered the entire transmission mechanism.

4.4 Rolling Window Confirmation

Rolling 5-year window analysis of the spread coefficient further confirms the robustness of the sign reversal. Among the 40 pre-launch windows, only 37.5% had a positive spread coefficient; among the 31 post-launch windows, 77.4% had a positive spread coefficient. The sign reversal is not an isolated occurrence in a few windows but a systematic structural change.

4.5 Asymmetric Granger Causality

In sharp contrast to gold, Granger causality tests reveal that the spread does not lead crude oil returns at either the daily or monthly frequency. At the monthly frequency, the minimum p-value for the spread leading crude oil is 0.058 (lag = 4), failing to reject the null hypothesis that "the spread does not lead crude oil." Conversely, crude oil returns lead the spread at the daily frequency (p = 0.011, lag = 1).

This asymmetric causal structure precisely corroborates the core mechanism of the dual-anchor paper: gold directly receives the spread signal (the spread unidirectionally leads gold), while crude oil requires an institutional interface for indirect transmission (the spread does not lead crude oil). Crude oil returns leading the spread reflects the reverse macro feedback in which rising oil prices influence Fed policy expectations through inflation expectations, which in turn affect the spread—this is a reverse macro feedback, not the pricing function of the spread.

5. The Hierarchical Structure of Institutional Interfaces: The SC-SGE Contrast

5.1 SC Launch: An Activation-Type Institutional Interface

Using the launch of Shanghai crude oil futures (March 26, 2018) as a natural experiment, a series of structural change tests were conducted.

The Chow test splits the sample into pre- and post-launch periods and tests whether the regression model structure underwent a systematic change. Using a univariate regression of the WTI log price on the China-U.S. yield spread as the baseline, the Chow test yields an F-statistic of 736.53 (p = 0.0000), strongly rejecting the null hypothesis of no structural change in the model around the SC launch.

The interaction term test adds a Post dummy variable (Post = 1 after the SC launch) and its interaction with the spread to the regression. The interaction term coefficient is -12.14 with a t-statistic of -18.24 (p < 0.001), confirming that the marginal effect of the spread changed significantly after the launch.

The institutional instrumental variable (IV) test uses the "SC launch" as an instrumental variable in a two-stage least squares estimation. The first-stage regression uses Post and baseline factors as explanatory variables, with the interaction between the spread and Post as the dependent variable. The first-stage F-statistic reaches 2,425.75, far exceeding the weak-IV critical threshold of 10, ruling out weak instrument concerns. In the second-stage regression, the coefficient of spread_post is 44.94 (t = 6.49, p < 0.001), further confirming that the activation is causal rather than spurious.

5.2 SGE Benchmark: An Enhancement-Type Institutional Interface

Using the introduction of the Shanghai Gold Benchmark Price (April 19, 2016) as a second natural experiment, the same testing framework was applied.

The Chow test, based on a univariate regression of daily gold returns on the China-U.S. yield spread, yields an F-statistic of 0.20 (p = 0.82), completely failing to reject the null hypothesis of no structural change in the model around the SGE introduction. In the interaction term test, all variables' interaction terms are insignificant.

Judging from the daily-frequency statistical relationship, the introduction of the SGE benchmark price appears to have "changed nothing."

But deeper analysis reveals the true value of the SGE. Tang (2026) found that the SGE premium factor previously exhibited "extremely unstable signs, with a positive-sign rate of only 20%." After the SGE introduction, the SGE premium coefficient is -0.0031 (p = 0.0000), with highly stable sign. A nested F-test shows that adding the SGE premium raises the gold valuation model's R^2 from 0.7505 to 0.8059 (F = 750.27, p = 0.0000). The SGE benchmark price did not "create" gold's pricing function—gold's pricing function had existed since at least 2006—but rather "stabilized" the physical-demand pricing channel.

1. **5.3 Contrast Between the Two Types of Institutional Interfaces**

Dimension	**SC Launch (Crude Oil)**	**SGE Benchmark (Gold)**
Nature of institutional event	New futures contract launch	Spot benchmark price introduction
Pre-event spread status	Coefficient sign wrong (+ 3.97)	Already existed, but SGE premium unstable
Post-event change	**Sign reversal** (- → +)	**No daily-frequency structural change**
Chow test	F = 736.53, p = 0.0000	F = 0.20, p = 0.82
Interaction term test	t = -18.24, p < 0.001	All insignificant
IV-2SLS	First-stage F = 2,425.75	—
Factor stability change	Transmission channel switch	Nested F = 750.27
Institutional interface type	**Activation type**	**Enhancement type**
Theoretical implication	Creates new transmission channel	Stabilizes existing pricing factor

1. **5.4 Theoretical Implication: The Hierarchical Structure of Institutional Interfaces**

The SC-SGE contrast reveals a hierarchical structure of institutional interfaces. Activation-type institutional interfaces (SC) produce detectable daily-frequency structural changes—sign reversal, significant Chow test, significant interaction term. Enhancement-type institutional interfaces (SGE) produce no daily-frequency structural changes but function by improving the sign stability and significance of pricing factors.

This distinction has universal significance. For future research, any newly launched locally-currency-denominated futures contract or benchmark price reform can be classified as an "activation-type" or "enhancement-type" institutional interface based on whether it produces daily-frequency structural changes. This classification framework provides a standardized analytical tool for testing the impact of institutional events on pricing power.

6. Cross-Asset Evidence for the Unified Field of Spreads

6.1 Correlation Matrix of Chinese and U.S. Interest Rates with the Four Core Assets

Table 5 reports the correlations between Chinese and U.S. interest rates at various maturities and gold and crude oil prices.

Table 5
Correlations Between Chinese and U.S. Interest Rates and Gold/Crude Oil Prices

Interest Rate	Gold Log Price	Crude Oil Log Price
China 10Y	**-0.670**	+ 0.312
China 2Y	-0.401	+ 0.410
China 30Y	-0.694	+ 0.235
U.S. 10Y	**-0.069**	+ 0.357
U.S. 2Y	+ 0.093	+ 0.106
U.S. 30Y	-0.070	+ 0.452

The correlations between Chinese interest rates at all maturities and gold prices (ranging from − 0.40 to -0.69) are systematically higher than those of U.S. interest rates (ranging from − 0.07 to + 0.09). U.S. short-end rates are even positively correlated with gold prices—this cannot be explained under the traditional cost-of-carry framework, but can be understood within the "dual-anchor pricing" framework: during the initial phase of a U.S. rate-hiking cycle, global capital flows toward dollar-denominated assets, and gold prices do not fall but rise, until the dollar strengthening effect suppresses gold prices in the later stages of rate hikes. Chinese interest rates, as the "second anchor," provide a more stable and unidirectional pricing signal than U.S. rates.

6.2 Comparison of Predictive Power Across Maturities

The predictive power of the spread for gold is systematically higher than for crude oil across all maturities. Table 6 reports the predictive power of China-U.S. yield spreads at various maturities for gold's annual return.

Table 6
Predictive Power (R^2) of China-U.S. Yield Spreads at Various Maturities for Gold's Annual Return

Spread Maturity	Gold R^2	Crude Oil R^2
1Y spread	0.435	0.005
2Y spread	0.458	0.008
3Y spread	0.476	0.003
5Y spread	0.509	0.000
10Y spread	0.551	0.001
30Y spread	0.501	0.004

Across all six maturities, the spread's R^2 for gold's annual return ranges from 0.43 to 0.55, while for crude oil it is merely 0.001 to 0.008. The spread's pricing power for gold is several hundred times that for crude oil, and this difference is highly consistent across all maturities.

6.3 The China-U.S. Difference in Domestic Spread Effects

Chinese and U.S. domestic spreads (yield curve slopes) predict the same asset (gold) in completely opposite directions. When China's 30Y-10Y spread steepens, gold's annual return declines (negative coefficient); when the U.S. 30Y-10Y spread steepens, gold's annual return rises (positive coefficient). The same curve shape, in the two countries, has opposite effects on the same asset—because the two countries are at different points in their monetary policy cycles. This difference indicates that domestic spread signals must be interpreted in conjunction with the country's position within the global dual-anchor system and cannot be applied universally across markets.

7. Systematic Dialogue with Classical Theories

7.1 Supplement to Interest Rate Parity Theory

Interest Rate Parity (IRP) is one of the most fundamental theories in international finance, with the core assumption that the interest rate differential between two countries equals the expected exchange rate change. Under this framework, the sole function of the spread is to predict exchange rates.

The empirical evidence of this paper provides a major supplement to this theory. The same China-U.S. yield spread variable has an explanatory power of merely $R^2 = 0.001$ for monthly changes in the RMB exchange rate—the direction is consistent with IRP expectations (spread narrowing → RMB depreciation) but the economic significance is negligible. Yet the same variable has an explanatory power as high as $R^2 = 0.315$ for the government bond valuation gap, and $R^2 = 0.551$ for gold's annual return.

The spread's explanatory power for exchange rate changes is virtually zero, yet its explanatory power for asset valuations reaches tens of percentage points—a difference of several hundred times. Interest Rate Parity theory captures only a tiny slice of the spread's pricing function—the more important role of the spread lies in driving the relative valuation of the two countries' interest rates and the pricing regime of global assets.

This paper does not deny the logic of Interest Rate Parity—the spread is indeed related to exchange rates. But the empirical evidence demonstrates that the functional boundary of the spread extends far beyond the exchange rate determination domain. It is a more fundamental macro state variable that, by altering the global capital allocation landscape, simultaneously affects exchange rates, government bond valuations, and commodity pricing.

7.2 Modification to the Mundell-Fleming Model

The Mundell-Fleming model and its derivative "trilemma" posit that a country can only choose two of the following three: fixed exchange rates, free capital mobility, and independent monetary policy. China has chosen an intermediate solution of "limited exchange rate flexibility + limited capital mobility + independent monetary policy." This theory implicitly assumes that capital controls can insulate against external shocks and protect domestic interest rates from the influence of international spread movements.

The empirical evidence of this paper demonstrates that, despite the existence of capital controls in China, the China-U.S. yield spread remains a systematic variable driving the valuation divergence between the two countries' interest rates. A pseudo out-of-sample prediction test shows that a simple model trained on 2002–2020 data can predict the valuation gap over 2021–2026 with a correlation as high as 0.963. The spread's pricing transmission has not only not disappeared under capital controls but is remarkably stable.

Capital controls may have slowed the speed of transmission, but they have not severed the transmission channel. The spread continues to influence the asset prices of both countries through multiple channels —trade credit, central bank reserve management, cross-border wealth management connect schemes, and more. Capital controls are speed bumps, not walls.

7.3 Response to the Triffin Dilemma

The Triffin Dilemma points out that the U.S. dollar, as the global reserve currency, must provide dollar liquidity to the world through trade deficits, which ultimately undermines dollar credibility. This theory implicitly assumes that the dollar is the sole global reserve currency and that the reserve currency structure is singular.

This paper proposes that the China-U.S. yield spread can serve as a quantitative thermometer of reserve currency competition. When the China-U.S. spread is positive (U.S. rates higher than Chinese rates), dollar-denominated assets are relatively more attractive, global capital tends to hold dollar assets, and

the reserve currency structure tilts toward dollar unipolarity. When the spread is negative (deeply inverted), the relative attractiveness of RMB-denominated assets rises, global central banks and investors begin to increase their allocation to RMB assets, and the reserve currency structure shifts toward bipolarity.

When the spread is deeply inverted, gold's average 12-month subsequent return is 61.4%, and no negative return has ever been recorded in the historical sample. Gold, as a "neutral reserve asset," benefits when reserve currency competition intensifies—it is neither the dollar nor the renminbi, but the safe-haven choice of global capital in the dual-anchor game.

The current China-U.S. yield spread is deeply inverted (approximately − 2.73%), gold is at its most expensive level in history (price percentile 99.4%), and global central bank gold purchases are at record highs. This combination is precisely characteristic of "dual-anchor competition"—the Chinese anchor (low rates + easing) drives capital toward gold, while the pricing weight of the U.S. anchor (high rates + tightening) is being eroded.

7.4 Delineation of the Reversal Effect in Behavioral Finance

De Bondt and Thaler (1985) discovered that stock markets exhibit a long-term reversal effect—past loser portfolios subsequently outperform. This finding laid the foundation for the "overreaction" theory and implies that extreme valuations will be corrected.

The Fama-MacBeth cross-asset regressions in this paper place a boundary condition on the universality of the reversal effect. For financial assets (U.S. Treasuries), the valuation percentile coefficient is + 0.229 ($p = 0.000$), implying that high valuation → high future return—that is, a momentum effect: expensive can become more expensive. For physical assets (crude oil), the valuation percentile coefficient is -0.121 ($p = 0.006$), implying that high valuation → low future return—that is, a reversal effect: expensive tends to revert.

The reversal effect holds for assets with stronger commodity characteristics, but for assets with extremely strong financial attributes and strong trend characteristics (such as U.S. Treasuries and gold), the momentum effect dominates the reversal effect. The reversal effect is not universally applicable; its boundary is determined by the financial attribute of the asset.

8. Conclusion

This paper proposes and verifies the core proposition that the China-U.S. yield spread serves as a "regime variable" for global assets. The principal findings are as follows:

First, the spread's pricing of gold is "regime-based." Deep spread inversion (<-2.5%) is the most reliable macro signal for a gold bull market—in the historical sample, the average 12-month subsequent return is 61.4%, and no negative return has ever been recorded. The spread's predictive power for gold's annual return reaches $R^2 = 0.551$, and Granger causality tests confirm unidirectional leadership. This

relationship exists entirely independently after controlling for the VIX; the spread is not a proxy for risk appetite.

Second, the spread's pricing of crude oil is "conditional." The spread's predictive power for crude oil's annual return is merely $R^2 = 0.001$, a 551-fold difference from gold. Around the SC launch, the spread coefficient underwent a systematic sign reversal (from − 11.57 to + 11.51 at the annual frequency), and the transmission channel switched from the "demand side" to the "exchange rate side." Institutional IV tests confirm the causality of this activation effect (first-stage F = 2,425.75).

Third, institutional interfaces possess a hierarchical structure. SC belongs to the "activation type" (Chow test F = 736.53), creating a new pricing transmission channel. SGE belongs to the "enhancement type" (Chow test F = 0.20, p = 0.82), stabilizing an already existing pricing factor (nested F = 750.27). The distinction between activation-type and enhancement-type interfaces provides an operational classification framework for testing other institutional interfaces in the future.

Fourth, the spread's pricing function transcends the predictive scope of classical theories. The spread's explanatory power for monthly exchange rate changes ($R^2 = 0.001$) is far lower than its explanatory power for asset valuations ($R^2 = 0.315–0.551$); Interest Rate Parity captures only a minute fraction of the spread's function. Capital controls have not severed spread transmission; the Mundell-Fleming model requires modification. The spread is a quantitative thermometer of reserve currency competition, providing a new analytical tool for the Triffin Dilemma. The reversal effect is not universally applicable; extreme valuations of financial assets exhibit momentum enhancement.

Fifth, the "Unified Field of Spreads" hypothesis takes shape. The pricing of the world's four core assets—gold, crude oil, Chinese government bonds, and U.S. Treasuries—is determined at the macro level by a single regime variable (the China-U.S. yield spread). When the spread is positive, the U.S. anchor dominates global pricing; when it is negative, the Chinese anchor acquires independent marginal pricing power. Institutional interfaces determine whether the spread signal can transition from latent to manifest.

Together with Tang (2026)'s dual-anchor commodity pricing paper and Tang (2026b)'s government bond valuation percentile paper, this paper forms the complete theoretical framework of the "Dual-Anchor Regime" of global asset pricing. Tang (2026) discovered the "dual-anchor phenomenon"—the China-U.S. yield spread is a cross-market pricing factor. Tang (2026b) revealed the "transmission mechanism"—the spread drives the valuation divergence between the two countries' interest rates, which in turn affects global capital allocation. This paper reveals the "regime conditions"—the spread is a regime variable, and institutional interfaces determine the mode of activation of its pricing function. From "factor discovery" to "mechanism explanation" to "condition revelation," the three papers complete the theoretical construction of the dual-anchor regime of global asset pricing, from phenomenon to essence.

Declarations

Data Availability Statement

All data used in this study are sourced from publicly available databases, including China Central Depository & Clearing Co. (ChinaBond), the U.S. Department of the Treasury, the Federal Reserve Bank of St. Louis (FRED), the Shanghai Gold Exchange, the Shanghai International Energy Exchange, and the World Gold Council. The analysis code is written in Python.

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