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Commodity Prices, the US Dollar and Commodity-Currency Returns: Directional Association, Regime Dependence and Explanatory Power

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ABSTRACT

Currencies of commodity-exporting economies are widely believed to move with the world prices of the goods those countries sell, yet the empirical record is mixed: some studies find that commodity prices predict exchange rates, others that exchange rates predict commodity prices, and the link appears to change with the US dollar, the forecast horizon and the market regime. This paper integrates these strands into one conceptual framework in which commodity price changes are linked to commodity-currency returns through a directional association, moderated by the US dollar and by regime differences, and judged by the explanatory power and stability of the relationship. Six hypotheses are tested with chi-square tests of independence, one-way ANOVA and nested multiple regressions implemented with live Excel formulas. A chi-square and Fisher exact analysis of 20 reviewed studies shows that regime dependence is strongly associated with reports of conditional or weak evidence ($\chi^2(1) = 9.38$, $p = .002$; Cramér's $V = 0.68$), whereas commodity type is not. A simulated monthly dataset for 1995–2024 covering four commodity currencies is used to demonstrate the empirical pipeline: the commodity coefficient is positive, the dollar coefficient is negative, lagged commodity changes add no explanatory power, and commodity sensitivity is larger after 2001. The monthly results are illustrative and must be re-estimated on observed data before any empirical claim is made.

Keywords: commodity currencies; exchange rates; commodity prices; US dollar; regime dependence; chi-square; ANOVA; regression

Introduction

Currencies of commodity-exporting economies such as Australia, Canada, Norway, Chile and South Africa are widely believed to move with the world prices of the goods those countries sell. If true, commodity prices should help explain, and perhaps forecast, currency returns, and exchange rates should in turn contain information about commodity markets. The empirical record, however, is mixed. Some studies find that commodity-specific prices predict exchange rates even at high frequency (Kohlscheen et al., 2016) or that a factor built from many commodity prices forecasts currency returns (Liu et al., 2020). Others find that exchange rates forecast commodity prices far better than the reverse (Chen et al., 2010), or that predictive power at monthly and quarterly horizons is slight even where a strong same-day link exists (Ferraro et al., 2015).

Two further complications make the picture harder to read. First, the US dollar sits on both sides of the relationship: commodities are priced in dollars, and the sign of the commodity-dollar link has changed as the United States became a net energy exporter (Rees, 2023; Hofmann et al., 2023). Second, the link is not constant. It shifts around the early 2000s with the financialization of commodity markets (Fratzscher et al., 2014), strengthens after the 2008 to 2009 crisis (Albulescu & Ajmi, 2021), and differs across market states and horizons (Beckmann et al., 2017; Wang et al., 2023).

This paper addresses these gaps by integrating the strands into one conceptual framework (Fig. 1) and testing it with accessible tools: chi-square tests of independence, one-way ANOVA and multiple regression, all implemented with live formulas in Excel. The research questions are: (RQ1) Is there a stable directional association between commodity price changes and commodity-currency returns? (RQ2) How do the US dollar and regime differences alter that association? (RQ3) How much explanatory power do these factors add, and is it stable?

Literature Review

Commodity prices as predictors of currencies

The case that commodity prices drive commodity-currency returns rests on terms-of-trade logic. Kohlscheen et al. (2016) built country-specific commodity indices for 11 exporters and found clear predictive power for exchange rates in and out of sample, not explained by global risk appetite or carry. Liu et al. (2020) extracted a common factor from 17 commodity prices that predicted both levels and excess returns of the Australian, Canadian,

New Zealand and South African currencies and produced economically meaningful portfolio gains. Haider et al. (2021) showed that the result depends on country type: commodity prices beat a random walk for roughly two thirds of export-dependent developed countries but much less often for emerging and import-dependent economies. The idea dates to Chen and Rogoff (2003), who studied three commodity exporters, Australia, Canada and New Zealand, and Cashin et al. (2004) found a long-run link between real exchange rates and real commodity export prices in about two fifths of the commodity-exporting countries they examined. Delle Chiaie et al. (2022) show that commodity prices share a common global factor, which motivates the use of broad commodity indices.

Reverse and bidirectional causality

Chen et al. (2010) reported that exchange rates of commodity exporters forecast global commodity prices, with the opposite direction much weaker. Zhang et al. (2016), using multi-horizon causality measures, reached the converse conclusion that the pull from commodity prices to exchange rates dominates, sometimes by a factor of five to ten, and is strongest at short horizons. Ferraro et al. (2015) reconcile part of the disagreement: the link is strong and reliable within the same day but offers little dependable forecasting power at monthly or quarterly frequencies. Direction, horizon and the contemporaneous versus predictive distinction therefore matter for any test.

Oil, the US dollar and financialization

Oil and the dollar influence each other in both directions since the early 2000s, a pattern linked to oil trading increasingly like a financial asset (Fratzscher et al., 2014). Lizardo and Mollick (2010) found that oil adds explanatory power for the dollar, which falls against exporter currencies and rises against importer currencies when oil rises. More recently, the historical negative commodity-dollar relationship has reversed: with higher US oil output, a rise in oil prices now improves US terms of trade and tends to coincide with a stronger dollar (Rees, 2023; Hofmann et al., 2023). Wang and Cheung (2023) document that financialization tightened links among commodities and other assets, with a partial reversal afterwards. Bermpei et al. (2024) add that commodity price uncertainty weakens commodity currencies at first and lifts them in the medium run, while the dollar strengthens as a safe haven. Tang and Xiong (2012) and Basak and Pavlova (2016) attribute the rising co-movement among commodity prices to the financialization of commodity markets through index investment.

Time variation, regimes and structural change

Albulescu and Ajmi (2021) find that oil begins to drive the dollar from about 2005 and more strongly after the crisis, with influence running both ways for most of the sample. Beckmann et al. (2017) conclude that the direction and strength of the oil-exchange rate link shift with regime, currency and horizon, and call for models that let the relationship change with the state of the economy. Hatzenbuehler et al. (2016) show for corn and soybeans that sensitivity to exchange rates rises when stocks are low and policies shift, and Huchet-Bourdon (2011) shows that conclusions about agricultural price volatility depend on the volatility measure, frequency and period. Coudert et al. (2015) show that volatility affects the relationship between terms of trade and real exchange rates in commodity-exporting economies, which motivates including commodity volatility in the model.

Agricultural commodities and metals

Kristinek and Anderson (2002) synthesize evidence that a strong dollar depresses US farm prices and that commodity prices co-move over the long run through substitution. Nazlioglu and Soytas (2012) find long-run relationships among oil, the dollar and agricultural prices, with causality running from oil and the exchange rate to farm prices. Wang et al. (2023) show asymmetric effects of oil and the dollar on precious-metal returns that differ before and during COVID-19, and Kim and Kim (2016) show that local commodity prices adjust very unevenly to exchange rate shocks across commodities.

Research gap

Three gaps recur in the reviewed studies. (1) Most evidence concerns commodity exporters at a single horizon or in a single regime, leaving open how direction, horizon and regime interact. (2) The dollar is treated either as the numeraire or as an outcome, rarely as a moderator of the commodity-currency link whose own sign has changed. (3) Explanatory power is reported in-sample or out-of-sample, but its stability across regimes and countries is seldom tested directly. The framework below integrates these elements, and Table 1 codes the 20 studies on the dimensions it uses.

Table 1 - Coding of the 20 reviewed studies

Study	Commodity type	Evidence	Regime-dependent
Chen, Rogoff & Rossi (2010)	Broad/mixed	Conditional/weak	Yes
Kohlscheen et al. (2016)	Broad/mixed	Strong/consistent	No
Bermpei et al. (2024)	Broad/mixed	Conditional/weak	Yes
Wang & Cheung (2023)	Broad/mixed	Conditional/weak	Yes

Study	Commodity type	Evidence	Regime-dependent
Liu, Tan & Wang (2020)	Broad/mixed	Strong/consistent	No
Haider et al. (2021)	Broad/mixed	Conditional/weak	No
Zhang, Dufour & Galbraith (2016)	Broad/mixed	Strong/consistent	No
Fratzscher et al. (2014)	Oil/energy	Strong/consistent	Yes
Rees (2023)	Broad/mixed	Conditional/weak	Yes
Beckmann, Czudaj & Arora (2017)	Oil/energy	Conditional/weak	Yes
Hofmann, Igan & Rees (2023)	Oil/energy	Conditional/weak	Yes
Albulescu & Ajmi (2021)	Oil/energy	Conditional/weak	Yes
Lizardo & Mollick (2010)	Oil/energy	Strong/consistent	No
Ferraro, Rogoff & Rossi (2015)	Oil/energy	Conditional/weak	Yes
Kristinek & Anderson (2002)	Agricultural & metals	Strong/consistent	No
Hatzenbuehler et al. (2016)	Agricultural & metals	Conditional/weak	Yes
Huchet-Bourdon (2011)	Agricultural & metals	Conditional/weak	Yes
Nazlioglu & Soytas (2012)	Agricultural & metals	Strong/consistent	No
Wang, Chen & Ren (2023)	Agricultural & metals	Conditional/weak	Yes
Kim & Kim (2016)	Broad/mixed	Conditional/weak	No

Source: coded by the authors from the findings and novelty-gap columns of the review table compiled for this study. The coding involves judgment and is documented in the accompanying Excel workbook.

Conceptual Framework and Hypotheses

Fig. 1 presents the framework. Commodity prices (changes, volatility and commodity type) feed a directional association with commodity-currency returns, which has three features: the sign of the link, a lead-lag structure, and short versus long horizons. Commodity-currency returns are described by currency returns, return volatility and country-level differences. Two moderating blocks act on those returns: the US dollar (movements, strength and volatility) and regime differences (pre and post 2001, crisis and non-crisis, high and low regimes). Regime differences also determine the final block, explanatory power, which is assessed through predictive value, stability and forecast ability.

Table 2 lists the six hypotheses together with their variables and the tests used.

Table 2 - Hypotheses, variables and tests

No.	Hypothesis	Variables	Test
H1	Commodity price changes are positively associated with commodity-currency returns.	Comm_Chg; FX_Avg; direction	Regression; chi-square
H2	The association differs by horizon: contemporaneous effects exceed lagged effects.	Comm_Chg; Comm_Chg_Lag1	Regression (M3)
H3	US dollar movements are negatively associated with commodity-currency returns and raise explanatory power.	USD_Chg; R-squared	Regression (M2, M3)
H4	Sensitivity differs across regimes (pre/post 2001, crisis, volatility).	Regime flags; interactions	ANOVA; chi-square; regression (M4)
H5	Sensitivity and evidence strength differ across countries and commodity types.	Country returns; commodity type	ANOVA; chi-square; country regressions

No.	Hypothesis	Variables	Test
H6	Explanatory power and coefficients are not stable across regimes.	Pre/post coefficients; R-squared	Split-sample regression

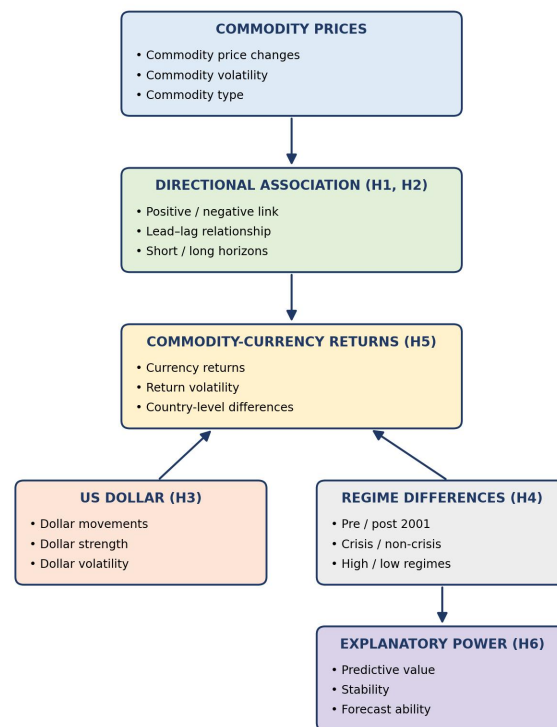


Fig. 1 - Conceptual framework (H1 to H6 mark where each hypothesis applies)

Data and Methodology

Data

Two data sources are used. The first is the coded literature sample of 20 studies from the review table compiled for this study (Table 1). The second is a monthly dataset covering January 1995 to December 2024 (360 months) with four commodity currencies (Australian dollar, Canadian dollar, Norwegian krone, South African rand) measured as percentage returns against the US dollar, a commodity price change series, a US dollar change series and regime flags. In this study the monthly series are simulated with a fixed random seed (42) so that every formula in the Excel workbook can be demonstrated; they are not observed data. For a real study, commodity price changes can be taken from the IMF Primary Commodity Prices database, the dollar from a broad trade-weighted index, and exchange rates from FRED or central banks, all as monthly log differences multiplied by 100.

Variables

Table 3 defines each variable and links it to a block of the conceptual framework.

Table 3 - Variable definitions and framework blocks

Variable	Definition	Framework block
Comm_Chg	Monthly commodity price change (%)	Commodity prices
Comm_Vol	Standard deviation of Comm_Chg over the past six months	Commodity prices
Comm_Chg_Lag1	Comm_Chg lagged one month	Directional association
USD_Chg	Monthly change in the US dollar (%)	US dollar

Variable	Definition	Framework block
Post2001, Crisis	Dummies for January 2001 onward, for September 2008–June 2009 and for February–April 2020	Regime differences
Vol regime	High if Comm_Vol is at or above its sample median	Regime differences
FX_Avg	Mean of the four currency returns (positive = appreciation)	Commodity-currency returns
Direction	Concordant if Comm_Chg and FX_Avg share the same sign in a month	Directional association

Chi-square test of independence

The chi-square test examines whether two categorical variables are independent. With observed counts O and expected counts $E = (\text{row total} \times \text{column total}) / N$, the statistic is given in Eq. (1) with $(r - 1)(c - 1)$ degrees of freedom, and the effect size is Cramér's V , given in Eq. (2).

$$\chi^2 = \sum (O - E)^2 / E \quad (1)$$

$$V = \sqrt{\chi^2 / (N \cdot \min(r - 1, c - 1))} \quad (2)$$

The test is applied (i) to the literature coding, crossing regime dependence and commodity type with evidence strength, and (ii) to the monthly data, crossing directional concordance with the regime and with the volatility regime. Because the literature sample has only 20 studies, some expected counts fall below five and the p-values are approximate; Fisher's exact test (with the Freeman–Halton extension for tables larger than 2×2) is therefore also reported in Section 5.1.

One-way ANOVA

One-way ANOVA compares group means through the F ratio in Eq. (3), where MSB is the between-group and MSW the within-group mean square.

$$F = MSB / MSW \quad (3)$$

ANOVA 1 compares mean monthly returns across the four currencies (country-level differences). ANOVA 2 compares the mean absolute average currency return, a volatility proxy, across three regimes: pre-2001, post-2001 non-crisis and crisis. Eta-squared (η^2) reports the share of variance explained by the grouping. The currencies are cross-correlated and returns are fat-tailed, so the p-values are indicative.

Regression models

Four nested ordinary least squares models (M1 to M4, Eqs. 4 to 7) explain FX_Avg, estimated with Excel's LINEST function over June 1995 to December 2024 ($n = 355$):

$$FX_t = \alpha + \beta_1 \text{Comm}_t + \varepsilon_t \quad (4)$$

$$FX_t = \alpha + \beta_1 \text{Comm}_t + \beta_2 \text{USD}_t + \varepsilon_t \quad (5)$$

$$FX_t = \alpha + \beta_1 \text{Comm}_t + \beta_2 \text{USD}_t + \beta_3 \text{CommVol}_t + \beta_4 \text{Comm}_{t-1} + \varepsilon_t \quad (6)$$

$$FX_t = \alpha + \beta_1 \text{Comm}_t + \beta_2 \text{USD}_t + \beta_3 \text{CommVol}_t + \beta_4 \text{Comm}_{t-1} + \beta_5 (\text{Post2001}_t \times \text{Comm}_t) + \beta_6 (\text{Crisis}_t \times \text{Comm}_t) + \varepsilon_t \quad (7)$$

M2 is also estimated for each currency separately (country differences) and separately for the pre-2001 and post-2001 samples. Equality of coefficients across the two samples is judged with the approximate z-statistic in Eq. (8):

$$z = (b_{\text{post}} - b_{\text{pre}}) / \sqrt{(\text{se}_{\text{pre}})^2 + (\text{se}_{\text{post}})^2} \quad (8)$$

Explanatory power is compared through R-squared and adjusted R-squared across models and subsamples. Standard errors are classical OLS errors; heteroskedasticity-robust or HAC errors should be used in publication-quality work.

Implementation in Excel

All tests are built with live formulas in the accompanying Excel workbook: COUNTIFS, CHIDIST and CHITEST for chi-square; DEVSQ, AVERAGEIF, SUMPRODUCT, FDIST and FINV for ANOVA; INDEX(LINEST()) and TDIST for regression. The same results can be reproduced with the Data Analysis ToolPak (Anova: Single Factor; Regression). The workbook formulas were cross-checked against independent Python calculations and agree to the precision reported.

Results

Chi-square tests on the literature (coded from the reviewed studies)

Table 4 crosses regime dependence with evidence strength. Of the seven studies reporting strong, consistent evidence, only one reports regime dependence, while 11 of the 13 studies reporting conditional or weak evidence do. The association is statistically significant ($\chi^2(1) = 9.38$, $p = .002$) and large (Cramér's $V = 0.68$). The smallest expected count is 2.8, so the p-value is approximate, but the direction of the evidence is clear: where the link is found to depend on regime, researchers rarely describe it as strong and stable. This supports H4. Fisher's exact test on the same table gives a two-sided $p = .004$ (odds ratio = 0.03), so the conclusion does not depend on the chi-square approximation.

Table 4 - Regime dependence by evidence strength (20 studies)

Regime-dependent	Strong/consistent	Conditional/weak
Yes	1	11
No	6	2

Expected counts: 4.2, 7.8 (Yes); 2.8, 5.2 (No).

Crossing commodity type with evidence strength gives $\chi^2(2) = 0.07$, $p = .964$, Cramér's $V = 0.06$. There is no evidence that studies of broad commodity indices, oil, or agricultural goods and metals differ in the strength of the link they report (strong evidence in 3 of 9, 2 of 6 and 2 of 5 studies respectively). Strength of reported evidence therefore appears to depend on regime and design more than on which commodity is studied, which provides no support for H5 at the level of the literature. The Freeman–Halton exact test gives $p = 1.00$, again indicating no difference by commodity type.

Directional association (demonstration data)

Commodity change and average currency return share the same sign in 69.2% of months. Table 5 shows that concordance varies by regime: 55.6% pre-2001, 72.0% post-2001 non-crisis and 84.6% in crisis months. The chi-square test rejects independence ($\chi^2(2) = 8.74$, $p = .013$, Cramér's $V = 0.16$). By contrast, concordance is almost identical in high-volatility (69.7%) and low-volatility (70.1%) months ($\chi^2(1) = 0.007$, $p = .936$). Direction therefore depends on the period and crisis status, not on the volatility regime, in this dataset.

Table 5 - Directional concordance by regime (months)

Direction	Pre-2001	Post-2001 non-crisis	Crisis
Concordant	40	198	11
Discordant	32	77	2

Crisis cell expected counts are small (smallest expected = 4.0); interpret with care since only 13 crisis months exist.

ANOVA (demonstration data)

ANOVA 1 finds that mean monthly returns differ across the four currencies ($F(3, 1436) = 5.86$, $p < .001$), with means of 0.24% (AUD), 0.03% (CAD), -0.17% (NOK) and -0.56% (ZAR). The effect is small ($\eta^2 = 0.012$), because monthly return variance is large relative to the differences in means. ANOVA 2 shows that absolute currency returns differ by regime ($F(2, 357) = 6.56$, $p = .002$, $\eta^2 = 0.035$). Mean absolute returns are 1.39% pre-2001, 1.49% post-2001 non-crisis and 2.66% in crisis months, so return volatility roughly doubles in crises.

Table 6 - One-way ANOVA summary

Analysis	F	df	p-value	η^2	Decision
1. Returns by country	5.86	3, 1436	< .001	0.012	Reject H_0
2. Returns by regime	6.56	2, 357	.002	0.035	Reject H_0

Regression: direction, dollar, lead-lag and regimes (demonstration data)

Table 7 reports the four models. In M1 the commodity price change is positively and significantly associated with currency returns ($b = 0.263$, $p < .001$) and explains 38.3% of variance, consistent with H1. Adding the dollar (M2) raises R-squared to 0.692; the dollar coefficient is negative (-0.583 , $p < .001$), as H3 predicts, and the commodity coefficient is 0.173. Lead-lag and volatility terms in M3 add nothing: neither the lagged commodity change ($b = 0.003$, $p = .789$) nor commodity volatility ($p = .382$) is significant and adjusted R-squared slips from 0.690 to 0.689, so the link is contemporaneous rather than predictive at the monthly horizon, in line with H2 and with Ferraro et al. (2015). In M4 the post-2001 interaction is positive and significant (0.091, $p = .006$), indicating that commodity sensitivity roughly doubled after 2001, while the crisis interaction is not significant at 5% ($p = .121$). Adjusted R-squared rises only modestly to 0.698.

Table 7 - OLS regressions of average currency return (FX_Avg)

Variable	M1	M2	M3	M4
Comm_Chg	0.263*** (0.018)	0.173*** (0.013)	0.171*** (0.014)	0.092** (0.029)
USD_Chg	—	−0.583*** (0.031)	−0.585*** (0.031)	−0.569*** (0.031)
Comm_Vol	—	—	−0.034 (0.039)	−0.053 (0.039)
Comm_Chg (t−1)	—	—	0.003 (0.013)	0.006 (0.013)
Post-2001 × Comm	—	—	—	0.091** (0.033)
Crisis × Comm	—	—	—	0.062 (0.040)
Intercept	−0.119 (0.080)	−0.101 (0.057)	0.036 (0.167)	0.110 (0.166)
R-squared	0.383	0.692	0.693	0.703
Adj. R-squared	0.381	0.690	0.689	0.698
F-statistic	219.1	395.6	197.4	137.1
Observations	355	355	355	355

Coefficients with standard errors in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$. Classical OLS standard errors. Simulated data.

Country-level differences (demonstration data)

Estimating M2 separately by currency gives commodity coefficients of 0.261 (AUD), 0.191 (CAD), 0.123 (NOK) and 0.117 (ZAR), all significant at the 0.1% level, and R-squared values from 0.46 (AUD) down to 0.24 (ZAR). Sensitivity and explanatory power thus differ by country (Table 8, Fig. 2), consistent with H5 at the currency level, although the literature-based test in Section 5.1 found no difference by commodity type.

Table 8 - Country-level regressions (M2 specification)

Currency	Comm_Chg	USD_Chg	R-squared
AUD	0.261*** (0.026)	−0.571*** (0.059)	0.463
CAD	0.191*** (0.027)	−0.626*** (0.063)	0.392
NOK	0.123*** (0.027)	−0.703*** (0.062)	0.376
ZAR	0.117*** (0.026)	−0.433*** (0.060)	0.235

Coefficients with standard errors in parentheses. *** $p < .001$. Simulated data.

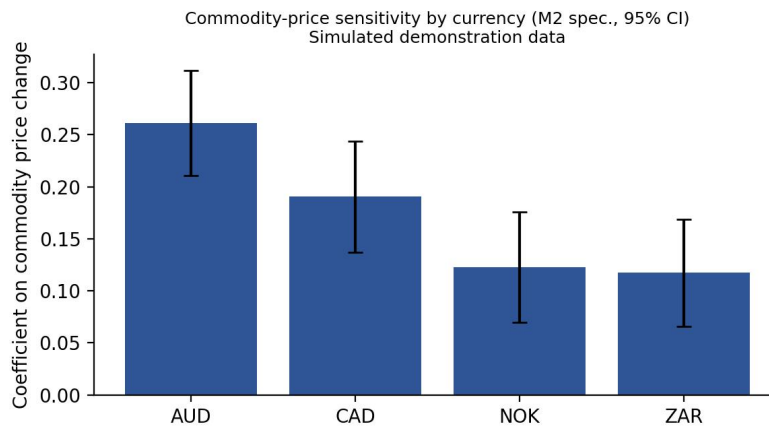


Fig. 2 - Commodity-price sensitivity by currency (simulated data)

Stability of explanatory power (demonstration data)

Splitting the sample at 2001 (Table 9), the commodity coefficient rises from 0.098 to 0.193 ($z = 2.68$, $p = .007$), a statistically significant instability, while the dollar coefficient is essentially unchanged (-0.592 versus -0.565 ; $z = 0.31$, $p = .759$). R-squared increases from 0.512 to 0.729. Explanatory power is therefore regime-dependent for the commodity channel but stable for the dollar channel, a partial confirmation of H6.

Table 9 - Pre-2001 versus post-2001 coefficients (M2 specification)

Variable	Pre-2001	Post-2001	Difference	z	p-value
Comm_Chg	0.098	0.193	0.095	2.68	0.007
USD_Chg	-0.592	-0.565	0.027	0.31	0.759
R-squared	0.512	0.729			
Observations	67	288			

Summary of hypotheses

Table 10 summarises the outcome of each hypothesis test.

Table 10 - Summary of hypothesis tests

No.	Result	Basis
H1	Supported: positive commodity coefficient	Regression M1 to M4 (simulated)
H2	Supported: contemporaneous effect only; lag insignificant	Regression M3 (simulated)
H3	Supported: negative dollar coefficient; R-squared rises from 0.38 to 0.69	Regression M2 (simulated)
H4	Supported by literature coding; partly by data (post-2001 and crisis months differ, volatility regime does not)	Chi-square 1, 3, 4; ANOVA 2; M4
H5	Mixed: currencies differ; commodity type does not differ in the literature	ANOVA 1; Table 8; chi-square 2
H6	Partly supported: commodity coefficient unstable, dollar coefficient stable	Table 9 (simulated)

Discussion

The literature-based evidence is the empirically grounded part of this study. It indicates that disagreement among studies is not random: the studies that find the commodity-currency link to be strong tend to be those that do not test for regime dependence, and the studies that allow for regimes, horizons or country types tend to find the link conditional. That pattern is what the framework predicts, since regime differences feed both the commodity-currency link and its explanatory power. It also suggests that reported strength of evidence depends less on whether oil, broad indices or agricultural goods are studied than on how heterogeneity is modelled.

The simulated analysis shows how the framework would be tested. It illustrates the three-step logic: establish direction (M1 and the concordance test), add the dollar (M2) and examine whether lagged commodity changes add predictive value (M3), then allow regime interactions and split samples to test stability (M4 and Table 9). Because the simulation was built with a positive commodity effect, a negative dollar effect, a stronger post-2001 link and higher crisis volatility, finding those features confirms that the Excel pipeline can recover them. It is not evidence about actual markets. Real data may well show weaker or differently signed effects, in particular the post-2010s reversal of the commodity-dollar relationship described by Rees (2023), which the model can test by allowing the dollar coefficient to differ across regimes.

Practical implications, conditional on real-data confirmation, are that analysts should use a dollar control and regime-specific coefficients when linking commodity prices to commodity currencies, and should not expect lagged commodity prices to add predictive value at monthly frequency, consistent with Ferraro et al. (2015).

Implications

Theoretical implications: The disagreement between studies looks systematic, not random, so the commodity-currency link is better modelled as depending on the regime. The US dollar should be treated as a moderating variable, not a neutral baseline. Separating same-period association from predictive power helps explain why some studies find strong links and others find weak forecasting power.

Practical implications: Currency analysts should include a dollar control and regime-specific coefficients. Exporters, importers and corporate treasurers can use the same-period link to judge currency exposure, though it may strengthen in crises. Risk managers should expect higher currency volatility in crisis periods.

Policy implications: Central banks and governments of commodity exporters should calibrate their buffers to the current regime, not to a long-run average. Import-dependent and emerging economies should be cautious about using commodity prices alone to predict currency moves (Haider et al., 2021). Models that assume a fixed negative commodity-dollar relationship may mislead (Rees, 2023).

Implications for future research: Next steps are testing on real monthly data with robust standard errors, regime-switching models and out-of-sample comparison against a random walk. A second coder would strengthen the literature coding.

Limitations

The monthly dataset is simulated; its results are illustrative only and must be replaced by real data.

The literature coding involves 20 studies and the coder's judgment; small expected counts make chi-square p-values approximate and a Fisher exact test is advisable. A second coder and inter-rater agreement (Cohen's kappa) would strengthen the coding.

The crisis regime contains only 13 monthly observations, so crisis estimates are imprecise.

OLS with classical standard errors ignores heteroskedasticity and autocorrelation; the four currencies are cross-correlated, which affects the ANOVA assumptions. Robust errors, panel methods, GARCH volatility and out-of-sample forecast comparison against a random walk (as in Kohlscheen et al., 2016) are natural extensions.

The framework treats commodity prices as exogenous drivers, whereas some studies find bidirectional causality (Chen et al., 2010; Fratzscher et al., 2014); Granger-causality or VAR tests would address this.

Conclusion

This paper proposed a framework linking commodity price changes, volatility and type to commodity-currency returns through a directional association with lead-lag and horizon features, moderated by the US dollar and by regime differences, and judged by explanatory power and its stability. A chi-square analysis of 20 reviewed studies shows that regime dependence is strongly associated with conditional or weak evidence of the link, while commodity type is not. An Excel workbook with chi-square, ANOVA and regression tests implements the empirical design and is ready to run on real monthly data. The next step is to replace the demonstration series with observed data, report robust inference, and test whether the sign of the commodity-dollar link has changed across regimes.

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Declarations

Ethics and consent. Participation was voluntary and consent was implied by completing the anonymous online questionnaire. No institutional ethics approval or exemption is documented for this study.

Conflict of interest. The authors reported no conflict of interest.

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Author contributions. Kolli Guna Chandra: conceptualization, literature review, data curation, formal analysis, writing – original draft. Golli Mohan: methodology, supervision, validation, writing – review and editing. Both authors read and approved the final manuscript.

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