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DID THE TENGE STOP FOLLOWING OIL? BRENT PRICES AND THE TENGE-DOLLAR RATE BEFORE AND AFTER FEBRUARY 2022

Abstract: Kazakhstan exports oil, and its currency is expected to move with the oil price. This study asks whether that link still held after February 2022, when Russia's full-scale invasion of Ukraine began and Russia, Kazakhstan's neighbour and trading partner, came under wide sanctions. It uses the official tenge-dollar rate of the National Bank of Kazakhstan for every day since the tenge was floated in August 2015, the daily Brent price from the U.S. Energy Information Administration and the Bank of Russia's official dollar rate, and compares 338 weeks before 24 February 2022 with 243 weeks after it. Before February 2022 a 10% rise in oil came with a 1.25% stronger tenge over two weeks (95% interval 0.62 to 1.87%), and oil alone explained 15.7% of weekly moves in the rate. After February 2022 the estimate is 0.22% in the opposite direction (interval from 0.51% stronger to 0.96% weaker), oil explains 0.7% of weekly moves, and the change is significant for this date, which was fixed by the research question but not pre-registered ($p = 0.003$). The monthly correlation fell from −0.64 to −0.16. The rouble did not take oil's place: a 1% fall of the rouble moved the tenge by 0.59% over two weeks before February 2022 and by 0.19% after it, and by about zero when the first weeks of the war are left out. A search over all possible break dates finds stronger evidence of a change in 2017 and 2020 than in 2022, so the oil link has changed before. Since February 2022 the link is close to zero on average and unstable: in rolling two-year windows it briefly had the old sign in 2022–2024 and the opposite sign in 2023–2025, but an effect of the pre-2022 size is ruled out for the period as a whole.

Keywords: tenge; exchange rate; oil price; Brent; Kazakhstan; Russian rouble; commodity currency

Introduction

Kazakhstan is an oil exporter, so the tenge is expected to behave like other commodity currencies: when oil becomes more expensive, more dollars flow into the country and the tenge should strengthen; when oil becomes cheaper, it should weaken. Since August 2015 the National Bank of Kazakhstan (NBK) has run an inflation-targeting regime with a floating exchange rate, keeping the right to intervene in the foreign exchange market only in exceptional cases [1, 2]. Under a floating rate, an oil link should be visible in the data from week to week.

Research on commodity exporters supports this picture in general. World prices of commodity exports have a strong and stable effect on the real exchange rates of commodity-exporting countries, in particular Australia and New Zealand [3]. For the Canadian dollar, the link with oil is clear at the daily frequency but weak at monthly and quarterly frequencies [4]. For Kazakhstan, monthly data for 2007–2017 show that the oil price Granger-causes the exchange rate [5], while a model of the tenge on quarterly data for 2005–2021 points to the role of direct and indirect state intervention in the currency market [6]. A study of the years after the

float argued that the tenge had partly lost its connection with the factors that used to explain it, and linked this to the foreign investment activity of the National Fund and the pension fund [7]. An earlier study of the Kazakhstan Stock Exchange found that a regularity that was clear in 2015–2020 was absent in 2021–2026 [8], which is one reason to ask whether other well-known links on Kazakhstan's markets have also changed.

February 2022 is a natural point to test, because after Russia's full-scale invasion of Ukraine on 24 February 2022 Russia, Kazakhstan's large neighbour and trading partner, came under wide sanctions. If the tenge still follows oil, the oil link after February 2022 should look like the link before it. This study asks two questions: how strongly did Brent prices move the tenge-dollar rate before February 2022, and did that link change after it? Because Russia is so close to Kazakhstan's economy, the same comparison is made for the rouble.

Materials and Methods

Data. Three official daily series are used. The tenge-dollar rate is the NBK's official (market) rate of the US dollar for every calendar day from 1 August 2015 to 21 October 2026, 4,100 days, downloaded from the NBK website as the bank's own spreadsheet export [9]. As a check, the NBK's daily rate files for the same days were downloaded one by one: they carry a rate for 4,068 days and agree with the export to the last digit on every one of them; for 20 December 2022 and for 28 July to 28 August 2023 except 22 August, the daily files are empty, and the export fills those 32 days. The oil price is the Europe Brent spot price (US dollars per barrel) of the U.S. Energy Information Administration [10], 2,846 trading days from August 2015 to 16 October 2026. The rouble is the Bank of Russia's official rate of the US dollar [11], 2,773 dates. For one check, the Federal Reserve's nominal broad dollar index is used [12]. All data are public and contain no personal information.

Timing. The NBK rate dated a given day is set after the previous business day's trading; in the data the float shows as a jump from 188.38 tenge (rate dated 20 August 2015) to 255.26 (rate dated 21 August 2015). A week therefore ends on a Friday: the tenge is the NBK rate dated the following Saturday, the rouble is the Bank of Russia rate dated the same Saturday, and Brent and the dollar index are the last values on or before that Friday. A month uses the rates dated the first day of the next month and the last Brent price of the month.

Measures. Every change is 100 times the log difference, so it reads as a percentage. A tenge change is the change in tenge per dollar, so a positive number means the tenge weakened. An oil coefficient below zero therefore means that when oil rises, the tenge strengthens.

Periods. Period A covers the weeks ending 4 September 2015 to 18 February 2022 (338 weeks) and the months September 2015 to January 2022 (77 months). Period B covers the weeks ending 25 February 2022 to 16 October 2026 (243 weeks), starting with the week of 24 February 2022, and the months February 2022 to September 2026 (56 months); the month of February 2022 is counted in B although the war began on the 24th.

Model. In each period the weekly tenge change Δs_t is regressed on the oil change of the same week and of the previous week: $\Delta s_t = a + \beta_0 \cdot \Delta b_t + \beta_1 \cdot \Delta b_{t-1} + e_t$. The sum $\beta_0 + \beta_1$ is the two-week effect, and R^2 is the share of weekly moves explained. Standard errors are Newey-West [13] with four lags for weekly data, three for monthly regressions and ten for daily data. Whether the effect changed is tested in one model on all weeks, with a dummy for period B and its products with both oil terms. The rouble is treated in the same way, alone and together with oil. At the monthly frequency the study reports the correlation of oil and tenge changes.

How the analysis developed. On 7 October 2026 the author's mentor proposed three topics, one of which was whether the oil-tenge link changed after 2022. The author chose it on 10 October 2026, and the same day the mentor told him that a first look at the data suggested a weaker monthly link after 2022. The February 2022 break therefore comes from the topic, but it was not pre-registered: the mentor had seen the data before the specifications above were chosen, and nothing was written down in advance. The following were added after the first results: the counts of months by the direction of oil and the tenge, and their correction for the tenge's drift; all rows of Table 2 except the main estimate; the shorter periods in Table 3 and the rolling window; the rolling-window significance counts; the search over all break dates without March to May 2020; the dollar-index control; the rouble result without the first weeks of the war; period B ending in 2025; and the monthly checks without March to May 2020.

Results

The data. Figure 1 shows the two series. The tenge moved from 252.47 per dollar on 22 August 2015 to 428.32 on 19 February 2022 and 452.12 on 17 October 2026, with its weakest point at 549.15 on 2 October 2025. Brent was 43.84 dollars on 21 August 2015, 96.18 on 18 February 2022 and 119.33 on 16 October 2026, with a low of 9.12 on 21 April 2020. The tenge was about as volatile in both periods (weekly standard deviation 1.52% and 1.49%), and so was oil (5.91% and 6.12%). The rouble became twice as volatile (1.81% and 3.62%).

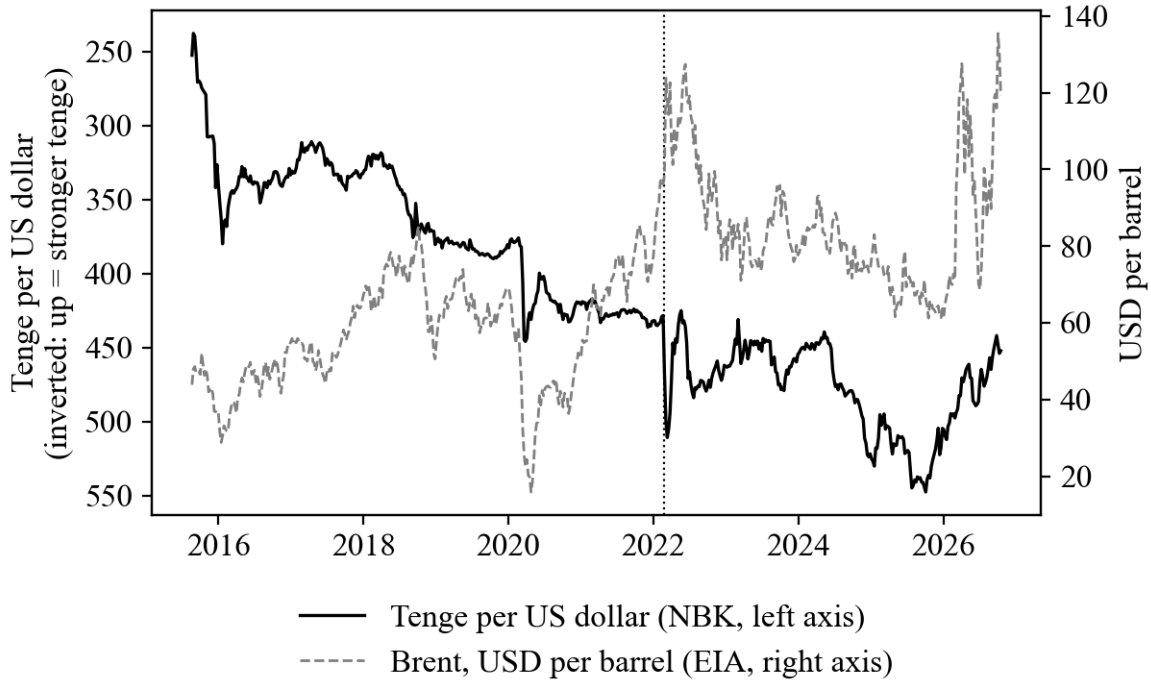


Figure 1. Tenge per US dollar (NBK, inverted axis) and Brent price (EIA), weekly, August 2015 – October 2026. The dotted line marks 24 February 2022

The oil link before and after February 2022. Table 1 gives the main result. Before February 2022, oil moved the tenge in the expected direction in the same week ($\beta_0 = -0.084$, $p < 0.001$) and again in the following week ($\beta_1 = -0.041$, $p = 0.044$). Over two weeks, a 10% rise in oil came with a 1.25% stronger tenge (95% interval 0.62 to 1.87%), and oil alone explained 15.7% of weekly moves in the rate. After February 2022 neither coefficient differs from zero; the two-week effect is +0.022 ($p = 0.55$), that is, a 0.22% weaker tenge for a 10% rise in oil,

and oil explains 0.7% of weekly moves. Even the most negative value in the interval after 2022, −0.051, is far from the estimate before it, −0.125, so an effect of the old size is ruled out. The change between the periods, +0.147, is significant for this break date, fixed by the question though not pre-registered ($p = 0.003$; joint test of both oil terms $\chi^2 = 9.03$, $p = 0.011$).

Table 1. Weekly regressions of the tenge-dollar change on oil and on the rouble, Newey-West standard errors (4 lags)

	Period A, Sep 2015 – Feb 2022	Period B, Feb 2022 – Oct 2026	Change, B minus A
Oil, same week (β_0)	−0.084 ($p < 0.001$)	+0.002 ($p = 0.93$)	
Oil, previous week (β_1)	−0.041 ($p = 0.044$)	+0.020 ($p = 0.19$)	
Oil, two weeks ($\beta_0 + \beta_1$)	−0.125 ($p < 0.001$)	+0.022 ($p = 0.55$)	+0.147 ($p = 0.003$)
95% interval of the two-week oil effect	−0.187 to −0.062	−0.051 to +0.096	
R^2, oil only	0.157	0.007	
Rouble, two weeks	+0.589 ($p < 0.001$)	+0.190 ($p = 0.003$)	−0.399 ($p = 0.001$)
R^2, rouble only	0.306	0.159	
Oil, two weeks, with the rouble in the model	−0.057 ($p = 0.001$)	−0.013 ($p = 0.63$)	
R^2, oil and rouble	0.334	0.167	
Weeks	338	243	

Note: the dependent variable is the weekly change in tenge per dollar, in per cent (positive = weaker tenge); oil is the weekly change in the Brent price and rouble the weekly change in roubles per dollar, both in per cent. Calculated from NBK [9], EIA [10] and Bank of Russia [11] data.

Monthly data. Before February 2022 the correlation between monthly oil and tenge changes was −0.64 (95% interval −0.76 to −0.49, 77 months); after it, −0.16 (interval −0.40 to +0.11, $p = 0.25$, 56 months). The fall is significant (test of equal correlations, $p < 0.001$). The monthly figure before 2022 owes much to the pandemic months: without March to May 2020 it is −0.44 (interval −0.61 to −0.23), and the fall from −0.44 to −0.16 is then not significant ($p = 0.086$). The rank (Spearman) correlation is −0.49 before 2022 and −0.09 after it, a significant fall ($p = 0.013$).

Rises and falls of oil. Counting months gives an impression of asymmetry. Before February 2022 oil fell in 30 months, and in 25 of them (83%) the tenge weakened; oil rose in 47 months, and the tenge strengthened in only 27 of them (57%). Fisher's exact test of whether the tenge moved in the expected direction equally often in the two kinds of months gives $p = 0.025$. But the tenge weakened in 45 of the 77 months whatever oil did, by 0.78% a month on average, and this drift alone makes "weaker when oil fell" common and "stronger when oil rose" rare. Measured against that average, the tenge did worse than usual in 16 of the 30 months when oil fell and better than usual in 34 of the 47 months when oil rose ($p = 0.14$). In a monthly regression with an intercept, the effect of a 1% oil rise is −0.103 and of a 1% oil fall −0.127, and the test that they are equal gives $p = 0.47$; in the weekly model the two-week effects are −0.069 for rises and −0.171 for falls ($p = 0.065$ for equality). Once this drift is allowed for, the difference between rises and falls is not statistically significant, although both point estimates are larger for falls: the raw counts overstate the asymmetry, but the data cannot rule one out.

The rouble. The rouble explained more of the tenge's weekly moves than oil in both periods (R^2 0.306 against 0.157 before, 0.159 against 0.007 after; Table 1). But its effect also fell: before February 2022 a 1% fall of the rouble against the dollar came with a 0.59% weaker tenge over two weeks (0.44% in the same week), and after it with 0.19% (0.15% in the same week); the fall is significant (p = 0.001). Even this smaller link comes from the first weeks of the war: without the weeks of 24 February to 30 April 2022, the two-week rouble effect after February 2022 is +0.025 (p = 0.65) and the rouble explains 0.7% of weekly moves. Part of the old oil effect ran through the rouble: before 2022 weekly oil and rouble changes were correlated (−0.38), and with the rouble in the model the two-week oil effect shrinks from −0.125 to −0.057, though it stays significant (p = 0.001). After 2022 the correlation between oil and the rouble turned positive (+0.23).

Robustness. The result does not depend on the exact break date, on single episodes or on the dollar's general strength (Table 2). The checks are: moving the break to 1 January 2022; leaving out the first weeks of the war, the first year of the float, or the pandemic oil crash of March to May 2020; using five weeks of oil changes; controlling for the broad dollar index; and ending period B in December 2025, before the very large oil swings of 2026 (weekly standard deviation of oil 10.01% in 2026 against 4.93% from February 2022 to 2025; the causes of these swings are outside the scope of this study). In every version the two-week effect is between −0.10 and −0.13 before the break and between −0.02 and +0.07 after it, and it is never significant after. Daily data show a smaller link in both periods: the two-day effect is −0.071 before February 2022 (R^2 0.082) and −0.028 after it (p = 0.023, R^2 0.007), so a small daily link is still measurable after 2022, but it explains less than 1% of daily moves.

Table 2. Two-week oil effect under alternative choices

Version	Before: effect (p)	Before: R^2	After: effect (p)	After: R^2
Main estimate (Table 1)	−0.125 (< 0.001)	0.157	+0.022 (0.55)	0.007
Break on 1 January 2022	−0.126 (< 0.001)	0.159	+0.022 (0.55)	0.007
Weeks of 24 Feb – 30 Apr 2022 left out	−0.125 (< 0.001)	0.157	−0.020 (0.43)	0.026
First year of the float left out	−0.102 (0.006)	0.197	+0.022 (0.55)	0.007
March – May 2020 left out	−0.128 (< 0.001)	0.107	+0.022 (0.55)	0.007
Five weeks of oil changes	−0.110 (0.002)	0.184	+0.008 (0.88)	0.021
Broad dollar index in the model	−0.096 (< 0.001)	0.243	+0.017 (0.64)	0.029
Period B to December 2025	−0.125 (< 0.001)	0.157	+0.068 (0.29)	0.021
Period B from January 2023	−0.125 (< 0.001)	0.157	−0.005 (0.86)	0.020

Note: "before" and "after" refer to the break used in each row. Newey-West standard errors (4 lags). Calculated from NBK [9], EIA [10] and Federal Reserve [12] data.

When did the link change? Table 3 and Figure 2 show that the oil link was not the same in every year before 2022. It was strong in 2015–2017, when the two-week effect was the largest of all (−0.205), weak in 2018–2019, when the effect was −0.052 (p = 0.057) and oil explained

only 2% of weekly moves, and strong again from 2020 to February 2022, when oil explained 37% of weekly moves. After February 2022 the average effect is close to zero in both 2022–2023 and 2024–2026, but it is not stable. Of the 235 rolling 104-week windows that end before 24 February 2022, 162 show a significant negative effect ($p < 0.05$), ranging from −0.22 to −0.03. Of the 140 windows that start in or after that week, 4 (starting in April and May 2022) show a significant negative effect, the old direction, and 35 (starting between April 2023 and January 2024, so covering 2023–2025) a significant positive one, when the tenge tended to weaken as oil rose; the effects range from −0.09 to +0.13.

Table 3. Two-week oil effect in shorter periods

Period	Effect (p)	R^2	Weeks	Monthly correlation
Sep 2015 – Dec 2017	−0.205 (< 0.001)	0.152	122	−0.62
Jan 2018 – Dec 2019	−0.052 (0.057)	0.020	104	−0.24
Jan 2020 – Feb 2022	−0.113 (0.015)	0.367	112	−0.90
Feb 2022 – Dec 2023	+0.063 (0.51)	0.016	97	+0.01
Jan 2024 – Oct 2026	+0.005 (0.87)	0.009	146	−0.31

Note: Newey-West standard errors (4 lags). Calculated from NBK [9] and EIA [10] data.

If the break date is not fixed in advance but searched for over every week from May 2017 to February 2025, the test must be judged against the critical values of Andrews [14, 15]; for two coefficients and 15% trimming, the 5% critical value simulated here is 11.72. The largest statistic is at the week of 3 April 2020 (18.06), and without March to May 2020 at the week of 14 July 2017 (25.29); February 2022 gives 9.03 and 10.61, below the critical value. So the data do not single out February 2022 as the moment the link changed, and the significance of the change reported in Table 1 holds only because that date was fixed by the question. What the data do show is that a strong link existed in most of the years before February 2022, and that since then it has been close to zero on average and unstable in sign. The last twelve months are the only hint of a return: from October 2025 to September 2026 the monthly correlation is −0.54, but with 12 months its interval runs from −0.85 to +0.05 ($p = 0.071$).

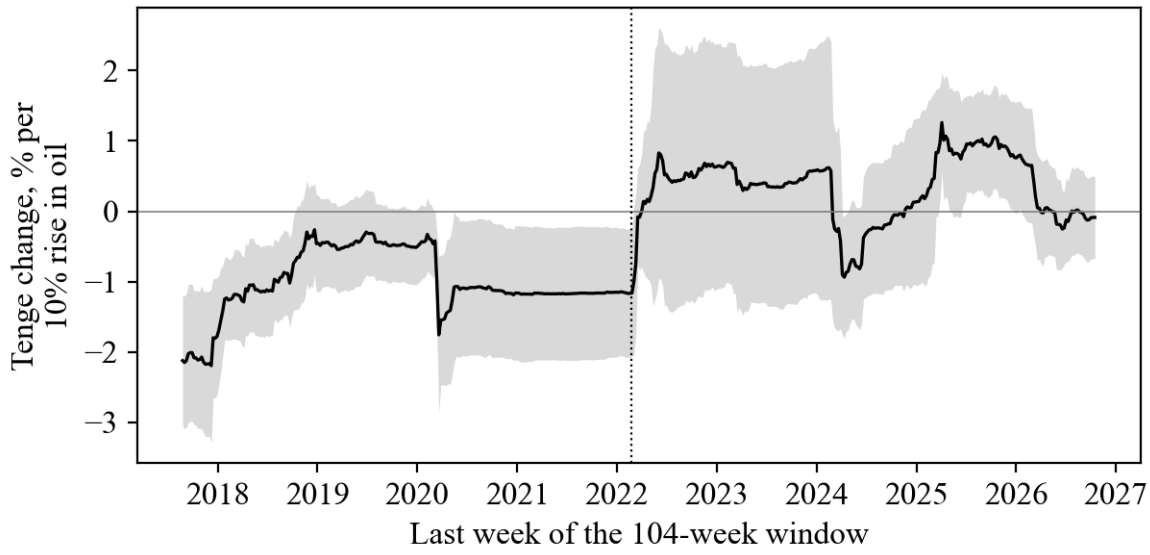


Figure 2. Two-week effect of a 10% rise in Brent on the tenge-dollar rate, in per cent, estimated in rolling 104-week windows, with 95% intervals (grey). Negative values mean that the tenge strengthens when oil rises. The dotted line marks 24 February 2022; windows ending between February 2022 and February 2024 contain weeks from both periods.

Discussion

The main finding is that before February 2022 the tenge followed oil, and after it the link is close to zero on average and unstable: a 10% rise in oil used to bring a 1.25% stronger tenge within two weeks, and an effect of that size is now ruled out for the period as a whole. This agrees with the picture of the tenge as a commodity currency before 2022 [3, 5]. Unlike the Canadian dollar, whose oil link is clearest at the daily frequency [4], the tenge's link before 2022 was stronger at weekly and monthly frequency than daily (R^2 0.082 daily, 0.157 weekly; monthly correlation −0.64); after 2022 only a small daily link remains. The weak spell of 2018–2019 fits the view that the tenge partly lost its connection with its usual drivers in the years after the float [7]; the difference is that the link returned in 2020–2021, while since February 2022 it has not returned in a stable form.

After his mentor told him on 10 October 2026 that a first look suggested a weaker link after 2022, and before the full calculations, the author wrote down his own explanation (15 October 2026, translated from Russian):

"I think that after 2022 the tenge exchange rate came to be influenced more strongly by events in Russia and by the demand for dollars inside Kazakhstan. Their influence may sometimes have outweighed the rise in oil prices, so expensive oil no longer helped the tenge to strengthen as much."

The data can test only part of this guess, and only through one channel, the rouble rate. If events in Russia had pushed oil aside through the rouble, the rouble link should have become stronger. It became weaker: a 1% fall of the rouble moved the tenge by 0.59% before February 2022 and by 0.19% after it, and by about zero once the first weeks of the war are left out. Other effects of events in Russia, and the demand for dollars inside Kazakhstan, are not measured in these data, so that part of the guess is neither confirmed nor rejected.

On 17 October 2026 his mentor sent the author a summary of the results, which already said that the oil link had almost disappeared, that the rouble link had weakened too, and that the

tenge had weakened in more of the months when oil fell than it strengthened in the months when oil rose. After reading it, the author compared the results with his guess (20 October 2026, translated from Russian):

"I assumed that after 2022 the tenge became less dependent on oil, and this was confirmed: the link almost disappeared. But my guess that Russia's influence became stronger and outweighed oil was not confirmed: the link with the rouble weakened too. I was also surprised that earlier the tenge weakened more often when oil fell than it strengthened when oil rose. So other causes have become more important, but from these data it is not yet possible to say which ones."

The full analysis supports his first point, which his mentor's first look had already suggested, and his second, and qualifies the third. The pattern that surprised him is real in the raw counts, but much of it comes from the tenge's steady weakening in 2015–2022: once that drift is allowed for, the difference between rises and falls of oil is no longer statistically significant, although the point estimates still lean towards a stronger reaction to falls.

Which other causes became more important cannot be answered from these data, and what follows is a list of candidates, not findings. The NBK keeps the right to intervene in the currency market and publishes its operations monthly [1], and the foreign investment activity of state institutions such as the National Fund has been named as a factor in the tenge rate [7], so the way the state supplies dollars to the market is one candidate; it was not tested here. Changes in trade and capital flows after the sanctions on Russia are another, and the change in the rouble itself is a third: before 2022 the rouble fell when oil fell, which strengthened the oil link for the tenge, while after 2022 the rouble tended to weaken when oil rose (correlation +0.23). Each of these needs its own data to test.

Limitations. The study measures co-movement, not cause: it shows that oil and the tenge stopped moving together, not why. The specifications were chosen by the mentor after a first look at the data, and many checks were added after the first results, so they describe the data rather than test predictions made in advance. A search over all dates does not identify February 2022 as the main break. The rouble test is weaker after 2022 than before: since June 2024, with exchange trading in dollars suspended under sanctions, the Bank of Russia has set its official dollar rate from bank reports and over-the-counter data [16]. The NBK rate is set from one exchange session a day and Brent is a spot price set in another time zone, so the timing of a week can be off by up to a day; the two-week model and the daily check reduce, but do not remove, this problem. The period after February 2022 includes several shocks of its own, among them the oil price swings of 2026, and with 56 months it is still short.

Conclusion

From the float of August 2015 to February 2022, the tenge followed oil: a 10% rise in Brent came with a 1.25% stronger tenge over two weeks, oil explained about 16% of weekly moves, and the monthly correlation was −0.64. After February 2022 the link is close to zero on average and unstable in sign, and an effect of the old size is ruled out. The author expected that events in Russia and the demand for dollars had outweighed oil; through the rouble channel this is not supported, because the rouble link also weakened, to about zero after the first weeks of the war. The apparent stronger reaction of the tenge to falling oil is no longer significant once the tenge's general weakening is taken into account. The oil link had already weakened once, in 2018–2019, and returned, so whether the stronger but not significant monthly co-movement of the last twelve months marks a new return can be judged only with more data.

Data availability. All data are public: NBK official exchange rates [9], EIA Brent prices [10], Bank of Russia official exchange rates [11] and the Federal Reserve broad dollar index [12]. The downloaded files, the analysis code and its full output are available on request from the author's mentor.

Author contributions and use of AI tools. The author chose the topic of this study from three directions proposed by his mentor; after his mentor shared a first impression of the data, he wrote down his own explanation (15 October 2026); and after reading the mentor's summary of the results, he compared it with that explanation (20 October 2026). Both texts are quoted in the Discussion. The author's mentor downloaded the data, wrote and ran the analysis code, and drafted the English text of this article, using the generative AI assistant Claude (Anthropic) to help write the code, search the literature and draft and translate the text. No number in this article was produced by an AI model: every figure calculated here comes from code run on the official data and can be reproduced from it; other figures are quoted from the cited sources.

Conflict of interest. The author declares no conflict of interest. The mentoring was provided as a paid educational service arranged by the author's family; no other funding was received.

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МАЗМҰНЫ – СОДЕРЖАНИЕ – CONTENT

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