FISCAL POLICY AND MACROSTABILITY IN KAZAKHSTAN: ASSESSING THE PROCYCLICALITY OF EXPENDITURES

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ABSTRACT

Resource-rich countries frequently exhibit fiscal behavior that reinforces economic fluctuations. This article evaluates the procyclicality of Kazakhstan's public finances and examines whether recent reforms to fiscal rules and transfer arrangements – particularly those related to the National Fund and intergovernmental transfers – have improved the stabilization of expenditures. Drawing on harmonized annual (2000–2024) and quarterly (2002Q1–2024Q4) official data, we estimate the elasticities of revenues and expenditures with respect to the output gap and assess how these relationships evolve around major institutional changes. We find that revenues and expenditures are both procyclical, but the main transmission mechanism operates through the revenue side: revenue elasticities are persistently larger than expenditure elasticities. Episodes of reform coincide with a statistically significant reduction in expenditure sensitivity of roughly 0.08–0.12 percentage points, whereas revenue sensitivity shows little change. Current expenditures display stronger procyclicality than capital expenditures, and subnational budgets exhibit higher cyclicality overall – though this effect is attenuated when transfers follow stable, formula-based rules rather than discretionary supplements.

Keywords: Kazakhstan, Finance, Budget, Resource-dependent economy, Revenues, expenses, Procyclicality, Transparency.

INTRODUCTION

In resource-dependent economies, procyclical fiscal policy remains a significant source of macroinstability: revenues are highly dependent on market conditions, while expenditures often amplify fluctuations rather than smooth them out. International studies show that the problem is exacerbated by limited access to borrowing and insufficiently rigid budget planning institutions that fail to separate short-term shocks from medium-term goals (Talvi & Végh, 2005). In response, many countries are moving toward "second-generation rules" – structural anchors and institutional frameworks (fiscal councils, predictable transfers) designed to reduce procyclicality, primarily on the expenditure side (Kaminsky et al., 2004; Davoodi et al., 2022). For Kazakhstan, this has practical significance given the role of the National Fund and transfers in the interbudgetary system, the dynamics of investment programs, and the need to prioritize items with the greatest macroeconomic impact during downturns (IMF, 2024; Fitch Ratings, 2024).

Against this backdrop, the research addresses a specific policy issue: even with formal fiscal rules in place, Kazakhstan's expenditure dynamics may remain closely linked to commodity cycles because oil-related revenues are channelled into spending via the National Fund and intergovernmental transfers. When the parameters of these transfers are revised in a discretionarily manner and on an ad hoc basis, the stabilizing role of the fiscal framework can weaken, amplifying volatility – especially for subnational budgets that have few borrowing instruments and depend largely on transfer receipts. This creates the need for a clear and comparable measurement of procyclicality across various time horizons and levels of government to evaluate whether institutional changes have actually strengthened macroeconomic stabilization and to pinpoint the channels through which these effects materialize.

Despite the extensive international literature on procyclicality and fiscal rules, four gaps remain for Kazakhstan:

– There are no comparable annual and quarterly estimates of revenue and expenditure elasticities to the output gap, accounting for oil and external shocks;

– There is little empirical evidence on the causal impact of fiscal framework reforms and the configuration of National Fund transfers on the cyclical sensitivity of expenditures (before/after, Treated vs. Control);

– The state-dependence of fiscal multipliers by expenditure type (current/capital) and COFOG functions has been virtually unexplored;

– There is insufficient evidence of the transmission of stabilization properties to the subnational level through the design of formulaic versus ad hoc transfers and regional heterogeneity of effects.

Accordingly, the study is guided by the following research questions:

– To what extent do Kazakhstan's aggregate government expenditures and revenues move in line with the output gap, and how do the estimated relationships change when relying on annual data as opposed to quarterly series?

– In what measure did key reforms of the fiscal framework and adjustments to the National Fund transfer rules casually reduce the cyclical sensitivity of expenditures, and how large is this effect?

– Do current and capital expenditures, as well as different COFOG functional categories, display distinct patterns of procyclicality, and which spending items are associated with the strongest state-dependent multipliers during downturns?

– Through which channels are stabilization properties conveyed to subnational budgets via formula-based and discretionary transfers, and what degree of regional heterogeneity characterizes these transmission effects?

The aim of the study is to identify the nature and extent of procyclicality in Kazakhstan's budget, assess the extent to which institutional changes (fiscal rules, parameters of transfers from the National Fund) reduce the sensitivity of expenditures to the cycle, and determine which types and functions of expenditures provide the greatest macroeconomic impact during recessions.

Research objectives:

– Estimate the elasticities of aggregate expenditure and revenue to the output gap using annual and quarterly samples with an expanded set of controls (inflation, REER, terms-of-trade, oil shocks).

– Identify the impact of fiscal framework and transfer reforms using event analysis and DiD (Post × gap; Treated × Post × gap), and test the robustness of the results to alternative cyclical indicators (HP/BK/CF, ToT).

– Compare the procyclicality of current and capital expenditures and test the hypothesis that current expenditures are more rigid than capital expenditures.

– Estimate state-dependent cumulative multipliers (Auerbach-Gorodnichenko local projections) for current and capital expenditures and for COFOG functions; identify areas with the greatest impact during recessions.

– Analyze the interbudgetary aspect: differences between the national and local levels, the role of formulaic and ad hoc transfers, and their impact on the elasticity and volatility of local expenditures.

– Conduct a regional DiD assessment of the impact of tightening transfer rules on expenditure procyclicality and volatility and document the spatial heterogeneity of these effects.

Based on original annual and quarterly series for 2000–2024 from official sources (BoN, Ministry of Finance, National Bank, National Fund) with verification using IMF/WB data, the study provides comparable estimates of expenditure and revenue elasticities and their rolling-window; causally tests the impact of fiscal framework and transfer parameter reforms (event-study and triple DiD interactions), separating the general trend from the "reform-induced" effect; for the first time for the Kazakhstan case, it consistently measures the state-dependence of multipliers by expenditure types and COFOG functions, identifying where macroeconomic returns are statistically higher during recessions; uncovers the channel of anchor transmission to the subnational level through transfer design (formulaic vs. unplanned) and its impact on volatility; and documents regional heterogeneity (heatmap/fan-chart), correlating the intensity of effects with institutional and structural characteristics.

The study thus integrates three strands of analysis – procyclicality, institutional anchors, and state-dependent multipliers – into a single empirical construct, enhancing its policy implications: the findings allow for the tuning of fiscal rule parameters and expenditure prioritization (infrastructure, education/healthcare)

for countercyclicality and accelerated recovery, while remaining consistent with practices in Chile and Norway.

LITERATURE REVIEW

Our theoretical framework draws on institutional and political-economy perspectives on fiscal procyclicality in emerging and resource-dependent economies. In these contexts, volatile commodity revenues, together with constrained access to borrowing and weak mechanisms of commitment or credibility, tend to induce governments to expand spending in booms and cut it in recessions, thereby amplifying cyclical fluctuations (Gavin & Perotti, 1997; Talvi & Végh, 2005; Kaminsky et al., 2004). Within this perspective, revenue windfalls can strengthen common-pool pressures and give rise to "voracity" dynamics, as competing claims on additional resources increase more than proportionally when revenues surge (Tornell & Lane, 1999).

Consequently, stabilization funds and rule-based fiscal frameworks are interpreted as commitment devices that convert highly volatile current revenues into smoother expenditure paths aligned with medium-term planning and, in conceptual terms, with permanent-income or tax-smoothing logic (Barro, 1979). At the same time, they help alleviate time-inconsistency problems central to the rules-versus-discretion debate (Kydland & Prescott, 1977). The fiscal-institutions literature argues that well-structured rules – specifying anchors, escape clauses, and monitoring arrangements – should reduce expenditure procyclicality primarily by constraining discretion and embedding more automatic adjustment mechanisms (Kopits & Symansky, 1998).

This lens is particularly pertinent for Kazakhstan, as it explicitly emphasizes the institutional channels that are investigated empirically – operations of the National Fund, the design of transfer mechanisms, and the balance between rules and discretion in intergovernmental fiscal relations – through which resource revenues are transformed into spending at both central and regional levels (Ossowski et al., 2001).

The study of fiscal policy procyclicality in developing and resource-dependent economies draws on a broad body of empirical evidence. Basic studies show that, with high revenue base volatility and limited access to borrowing during downturns, public spending and especially revenues move in unison with the cycle, thereby amplifying fluctuations in economic activity (Ilzetzki & Végh, 2008). At the micro – and meso-levels, this is due to the variability of the tax base, the discontinuity of investment, and the "squeezing" of the credit constraint during recessions, as well as the synchronization of the budget process with external fluctuations, including capital inflows and outflows. Cross-regional studies confirm that this effect is more pronounced in economies with high resource dependence and less developed public finance management institutions (Talvi & Végh, 2005; Kaminsky et al., 2004).

In response to the "institutional smoothing deficit," international practice has developed a set of fiscal rules designed to decouple current expenditures from short-term income volatility. A summary of developing country experience shows that the rigidity and operational specificity of rules (anchor clarity, sector coverage, adjustment mechanisms, and exceptions) are statistically associated with a reduction in procyclicality, primarily on the expenditure side (Bova et

al., 2014). Structural rules based on cyclically adjusted indicators serve as key benchmarks. In Chile, a structural budget balance regime (with expert assessment of trend GDP and the "normal" copper price) stabilized expenditure dynamics and reduced the budget's dependence on commodity volatility (Marcel, 2013; IMF, 2009). In Norway, the Government Pension Fund's fiscal anchor of "≈3% of real yield," anchored within a clear operational framework, ties the size of the guaranteed transfer to long-term rather than current conditions, which dampens procyclical spending impulses and supports the predictability of medium-term planning (Government of Norway, 2025; IMF, 2025). IMF reviews emphasize that the best results are achieved where the formal rule architecture is supported by independent fiscal institutions (fiscal councils) that ensure transparency of calculations, monitoring of deviations, and "reputational sanctions" for non-compliance (Davoodi et al., 2022).

A separate line of research focuses on the magnitude of fiscal multipliers and their dependence on the phase of the cycle. A methodological shift was provided by local projections with a state indicator, showing that expenditure multipliers are usually higher in recessions (state-dependent), with the difference being particularly noticeable for investment (Auerbach & Gorodnichenko, 2012). Meta-analyses and large-scale cross-country estimates confirm that capital expenditures produce higher and more persistent effects on output compared to current ones, and also respond more strongly to "idle capacity" and financial frictions during a downturn (Ilzetzki et al., 2013). These findings substantiate "second-generation" rules, which not only set anchors for aggregates but also protect priority items (infrastructure, education, healthcare) from procyclical cuts precisely when their multiplicative return is maximum.

The Kazakh context has been examined in detail by international financial institutions in recent years. The World Bank's Public Finance Review (2024) notes both the progress achieved in budget planning and the persistent challenges of formula-based calculation of transfers from the National Fund and the establishment of rules that ensure sufficient investment predictability, particularly at the subnational level (World Bank, 2024). The IMF's 2024–2025 consultations emphasize the need for consistent adherence to the fiscal anchor and increased transparency of transactions with the National Fund to strengthen the countercyclicality of expenditures and reduce the "flow-through" impact of the commodity cycle (IMF, 2024). Market analysts also point to the limitations of the current transfer rule and practice: according to Fitch, the scale and frequency of unscheduled transfers from the Fund could erode the stabilizing role of the anchor and increase the budget's dependence on commodity market prices (Fitch Ratings, 2024). National documents on budget policy (including provisions on guaranteed transfers and parameters of the fiscal rule) declare a focus on predictability and medium-term planning, but leave the issues of "rigidity" and automaticity of adjustments in case of deviations debatable (eGov.kz, 2023).

Comparison with the benchmark cases of Chile and Norway directly corresponds to the objectives of the article: in both examples, the separation of short-term volatility and the long-term ability of the budget to finance priorities is fundamentally important, secured through structural benchmarks and procedures for independent assessment of parameters (potential output, long-term commodity prices); international reviews of the IMF confirm that the combination of a "hard" rule with a fiscal

council and protection of investment/human capital is associated with a reduction in the procyclicality of expenditures and greater resilience to external shocks.

Thus, the combined findings of the literature define a number of hypotheses tested in the article. First, in resource-dependent economies, procyclicality is primarily manifested through the income channel, while expenditures react more weakly. Second, strengthening the institutional framework (structural anchors, independent verification of parameters, transparent transfer formulas) reduces the elasticity of expenditures to the cycle and transmits stabilization properties to the subnational level, while income sensitivity is generally preserved. Third, multiplier effects differ by the types and functions of expenditures and depend on the phase of the cycle: in recessions, multipliers for capital investment and areas related to infrastructure and human capital are higher, which justifies their protection and prioritization within the framework of "second-generation" rules. These premises form the empirical strategy of the study: assessment of the elasticities of expenditure and income to the cycle, identification of the impact of reforms of the fiscal framework and transfers, as well as analysis of state-dependent multipliers by types and functions of expenditures, taking into account Kazakhstan's institutional features.

Building on the theoretical framework, the empirical hypotheses are expressed in a testable format, enabling straightforward rejection or non-rejection of the null hypotheses concerning cyclical elasticities and the effects of reforms.

METHODS AND MATERIALS

We use our own database of annual time series for 2000–2024 and quarterly data for 2002Q1–2024Q4 (92 observations) from official sources (BoN, Ministry of Finance, National Bank, National Fund), with comparisons based on IMF and World Bank data. The analysis is conducted at the aggregate level of the government sector, by expenditure type (current and capital), by COFOG functions (infrastructure, education, healthcare, social support, defense), and at the interbudgetary level (republican and local budgets; a panel of regions for DiD).

We compile a consistent dataset at both annual (2000–2024) and quarterly (2002Q1–2024Q4) frequencies based on official Kazakhstani sources – the Ministry of Finance and the Treasury, the National Bank, National Fund publications, and national accounts – and cross-check levels and breaks in series against IMF and World Bank aggregates to ensure coherence. The key fiscal variables include total government revenues and expenditures, broken down into current and capital items and, where possible, by COFOG functions (infrastructure/transport and housing–utilities, education, health, social protection, defense/security).

For the intergovernmental dimension, we distinguish between spending by the republican and local budgets and construct transfer indicators that separate formula-based (regular/equalization) allocations from discretionary top-ups, as well as National Fund transfers differentiated by type (guaranteed versus targeted, where this can be identified). The macroeconomic block covers real GDP, CPI inflation, the real effective exchange rate (REER), terms of trade, and an oil-shock variable.

All nominal fiscal and monetary series are converted into real terms using the CPI (with the base year indicated in Table 1) and subsequently transformed in line with the requirements of each empirical specification: expressed in logarithmic levels for elasticity estimates, in log-differences for volatility analysis, and as ratios to GDP – either in shares or percentages – for the computation of multipliers.

The quarterly data are standardized so that the definition of government-sector aggregates is consistent, while seasonal patterns are controlled for by including quarterly dummy variables in the regressions and, where relevant, by relying on year-on-year growth rates. Before proceeding with estimation, the time-series characteristics of all variables were examined. Unit-root tests indicate that the series displays a combination of I_0 and I_1 properties, which supports the applied transformations and provides justification for using the ARDL framework.

In our analysis, the output gap is used as the indicator of the business cycle and is defined as the deviation of log real GDP from its trend, extracted using the HP filter ($\lambda = 6.25$ for annual observations and $\lambda = 1600$ for quarterly data). Robustness is checked by applying BK and CF filters, as well as by using external-cycle proxies such as the terms of trade. The oil-shock variable reflects an unanticipated change in oil-related conditions (in terms of price or revenue) relative to a forecast or autoregressive baseline (see Table 1) and is included to disentangle domestic fiscal cyclicality from commodity-induced effects. Table 1 provides detailed information on variable definitions, measurement units, transformations, and data sources, while Table 2 presents descriptive statistics for the key indicators.

Table 1

Definitions of variables, applied data transformations, and sources of information

Block	Variables	Definition	Main transformation(s)	Frequency
Fiscal aggregates	G, R	Total expenditures; total revenues	CPI-deflated to real; ln(·) in elasticity models; Δln(·) for growth/volatility; (·)/GDP for multipliers	Annual 2000–2024; Quarterly 2002Q1–2024Q4
Spending decomposition	G_cur, G_cap	Current vs. capital spending	Same as above; compared for differential procyclicality; scaled by GDP in multiplier estimates	Annual; Quarterly
COFOG functions	G_inf, G_edu, G_health, G_soc, G_def	Infrastructure; education; health; social support; defense/ security	CPI-deflated; ln(·) for elasticities; (·)/GDP for state-dependent multipliers	Annual
Intergovernmental	G_rep, G_loc	Republican vs. local expenditures	Real values; elasticities to output gap; local volatility from rolling variance of growth	Annual (+ quarterly growth for volatility windows)

Transfers & National Fund	T_reg, T_ad, NF	Formula-based transfers; ad hoc top-ups; National Fund transfers	Interaction terms with cycle (e.g., T×Gap); NF linked to reform periods	Annual; Quarterly (NF)
Business cycle & controls	Gap, π, REER, ToT, OilShock	Output gap; inflation; REER; terms-of-trade; oil shock	Gap via HP filter (λ=6.25 annual; 1600 quarterly), robustness BK/CF/ToT; controls enter regressions	Annual; Quarterly
Reforms / identification	Post, Treated	Post-reform; treated regime/ regions	Used in Post×Gap and Treated×Post×Gap (event study / triple DiD)	Annual; Region-year panel

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

Table 2

Scope of data, methods of compilation, and preprocessing procedures

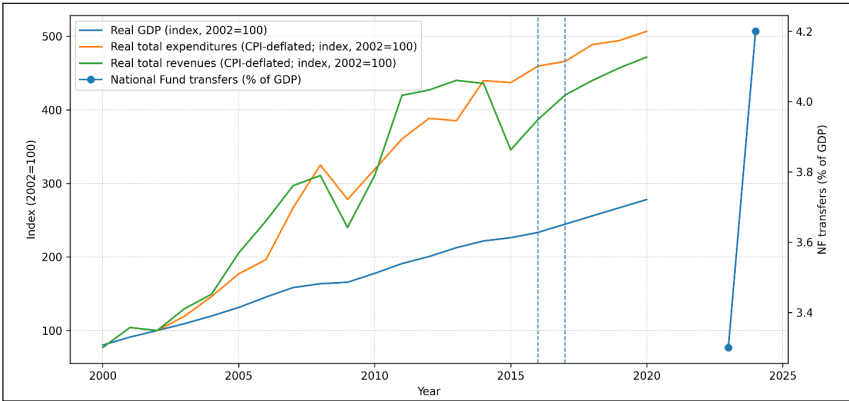| Dataset	Period	N	Key variables	Cycle measure	Main preprocessing	Main use
Annual aggregates	2000–2024	25	G, R, G_cur, G_cap; (COFOG where available); NF, T_reg, T_ad; π, REER, ToT, OilShock	Output gap (HP, λ=6.25; robust BK/CF, ToT)	CPI deflation; ln(·) in FE/ARDL; spending scaled by GDP for multipliers; HAC (NW) SEs	Baseline elasticities; reform effects (event / DiD); COFOG elasticities & annual multipliers
Quarterly aggregates	2002Q1–2024Q4	92	G, R, G_cur, G_cap; π, REER, ToT, OilShock	Output gap (HP, λ=1600; robust BK/CF, ToT)	CPI deflation; ln(·); quarter dummies; HAC (NW) SEs	Quarterly elasticities; rolling windows; state-dependent local projections (0–8Q)

Intergovernmental (rep/local)	2000–2024	25×2	G_rep, G_loc; T_reg×Gap, T_ad×Gap; controls	Annual output gap	CPI deflation; log growth for volatility; time dummies	Level comparison; transfer design and volatility
Regional panel	Region–year	400	G_loc; Post, Treated, Gap; controls; log σ²	Annual output gap	Treated × Post × Gap; optional trends; clustered SEs	DiD on procyclicality + volatility; heterogeneity

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

To illustrate the construction of the dataset and the application of the main transformations, Figures 1–3 display the key inputs and diagnostic checks. Figure 1 provides a brief overview of data coverage and shows the co-movement of the central aggregates – real GDP, real total expenditures, and real revenues – together with National Fund (NF) transfers as a share of GDP. The vertical markers indicate the major reform episodes included in the empirical analysis.

Figure 1

Data coverage and key aggregates: real GDP, real total expenditures, real total revenues, and National Fund transfers (% of GDP), Kazakhstan (2000–2024)
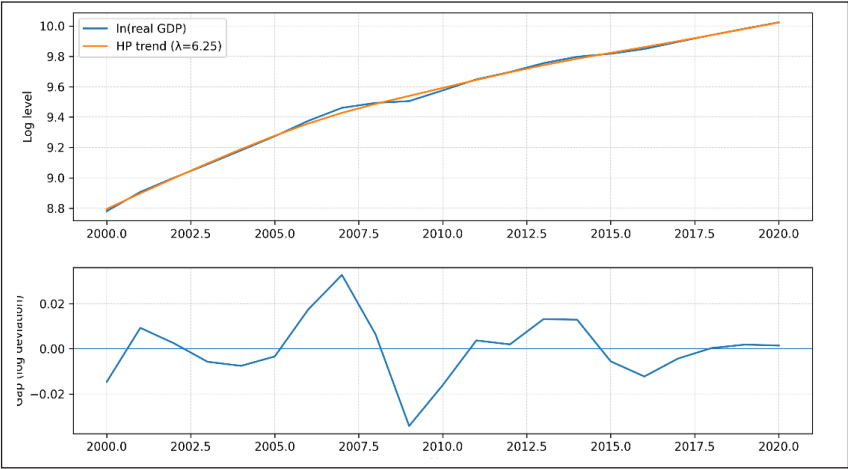

Source: Compiled on the basis of sources (World Bank, 2024; IMF, 2025; Fitch Ratings, 2024; eGov.kz, 2023)

The timeline of the main aggregates indicates that Kazakhstan's real GDP, real revenues, and real expenditures tend to move in parallel throughout the sample period, with National Fund (NF) transfers providing an additional and variable source of budget financing. This joint movement underscores the macro-fiscal setting in which swings in commodity-related revenues can feed into spending patterns, emphasizing the importance of the institutional structure governing NF operations and interbudgetary transfers for smoothing and stabilization.

Figure 2 shows how the cyclical indicator is derived by plotting log real GDP alongside its HP-filtered trend and presenting the resulting output gap, which is used as the primary business-cycle metric (with alternative filters applied for robustness checks).

Figure 2

Output gap construction: ln(real GDP), HP trend (λ = 6.25), and the resulting output gap (annual data)
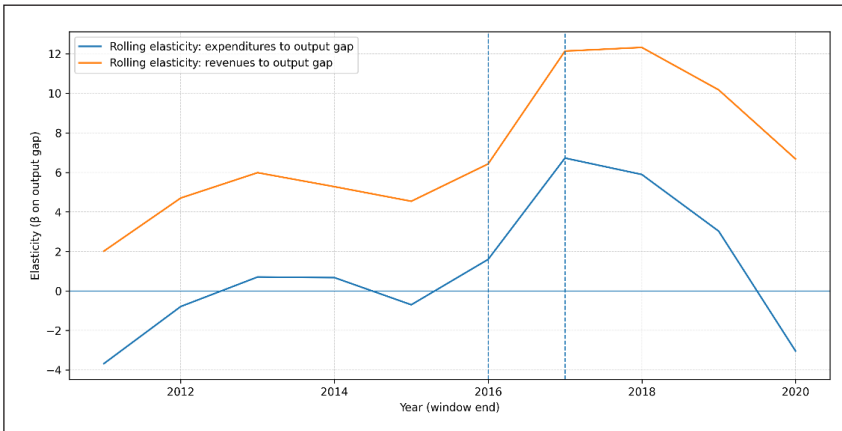

Source: Compiled on the basis of sources (IMF, 2025; World Bank, 2024; Bova et al., 2014; Talvi & Végh, 2005)

The HP-based decomposition of log real GDP shows how the baseline cyclical indicator is derived: the output gap reflects medium-term departures of economic activity from its trend rather than short-lived fluctuations. This establishes a clear connection between the data and the identification approach, helping ensure that the estimated fiscal elasticities and the effects of reforms are interpreted as reactions to the business cycle rather than to the underlying growth trajectory.

Finally, Figure 3 shows how fiscal cyclicality evolves over time by plotting rolling-window elasticities of expenditures and revenues with respect to the output gap. This representation links the empirical results to the underlying data, illustrating that revenue cyclicality remains persistently elevated, while expenditure sensitivity declines during periods characterized by tighter institutional constraints.

Figure 3

Rolling-window elasticities of expenditures and revenues with respect to the output gap (annual data; rolling window)

Source: Compiled on the basis of sources (World Bank, 2024; IMF, 2025; Talvi & Végh, 2005; Bova et al., 2014)

Rolling-window estimates demonstrate that fiscal cyclicality varies over time: the elasticity of revenues to the output gap consistently exceeds that of expenditures, aligning with the paper's conclusion that the revenue channel is dominant. At the same time, expenditure elasticity exhibits clear changes around the key reform period, reinforcing the interpretation that stronger institutional constraints correspond to lower expenditure procyclicality, even when revenue cyclicality stays high.

Monetary series are normalized to real values using the CPI and transformed using logarithms; when calculating multipliers, expenditures are scaled relative to GDP. The output gap is extracted using an HP filter ($\lambda = 1600$ for quarterly data; $\lambda = 6.25$ for annual data) with robustness checks to alternative BK/CF filters and to an indicative metric of external conditions (terms-of-trade). The models include the "oil shock", inflation, and REER.

Basic elasticity estimates are obtained using fixed-effects and ARDL(1.1) models; the variability of sensitivity over time is analyzed using a rolling window approach. The effect of institutional shifts (fiscal framework, transfer formulas) is identified using an event study with lead and lagged intervals and triple-DiD (Treated×Post×Gap). The regional panel additionally measures the impact on volatility using the logarithm of the variance of the moving expenditure growth rates.

The choice of an ARDL(1.1) specification is grounded in the time-series characteristics of the data. Unit-root tests (ADF, PP, KPSS) indicate that the variables comprise a mix of I_0 and I_1 processes, with none exhibiting integration of order two. Under these circumstances, the ARDL approach yields consistent estimates and performs well in relatively small samples, enabling the joint identification of short – and long-run elasticities. It also reduces the likelihood of spurious relationships, as differencing and the inclusion of appropriate lags help account for non-stationarity in the series.

For state-dependent multipliers, local Auerbach–Gorodnichenko projections are used, with phase distinctions: recession is the lower tercile of the output gap, and recovery is the upper tercile. Cumulative effects are calculated over horizons of up to one year for annual data and up to eight quarters for quarterly data.

Standard errors are estimated using the HAC/Newey–West method (for annual and quarterly series), and regional clustering is used in panel models. Robustness is tested for substituting cycle indicators, excluding crisis years, varying window lengths, control compositions, and trend/seasonality specifications.

Reform dates and criteria for classifying regimes as "processed" are established based on regulations and rules/transfer parameters. Reproducibility is ensured by a single versioned pipeline (R/Python/Stata) with a documented transformation log and scripts for replicating tables and figures.

FINDINGS AND DISCUSSIONS

As Table 3 shows, the elasticities of total government expenditure to the output gap are positive and statistically significant, confirming hypothesis H1 on procyclicality. At an annual frequency, the estimates are 0.28–0.35, and at a quarterly frequency, 0.15–0.22. Revenues react more strongly – 0.60–0.75 (Table 4), which is consistent with classical results on the high volatility of the tax base and borrowing constraints during recessions for resource-dependent economies. Figure 1 shows the trajectory of the moving elasticities: the "rigidity" of expenditures is lower than that of revenues, especially in quarterly data.

Table 3

Elasticities of budget expenditures and revenues with respect to the output gap

Dependent Variable	Year, FE	Year, ARDL(1,1)	Quarter, FE	Quarter, ARDL(1,1)
A. Total Expenditures				
Output gap	0.35*** (0.07)	0.28*** (0.06)	0.22*** (0.05)	0.15** (0.06)
Output gap	25	25	92	92
N Observations	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R² / Adj. R²	0.52	0.55	0.48	0.51
B. Budget Revenues				
Output gap	0.75*** (0.09)	0.63*** (0.08)	0.70*** (0.08)	0.60*** (0.07)
Output gap	25	25	92	92
N Observations	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R² / Adj. R²	0.61	0.63	0.57	0.60

Note: *** – significance level 1% ($p < 0.01$); ** –5% ($p < 0.05$); * –10% ($p < 0.10$). All p-values are two-sided

Source: Compiled from sources (World Bank, 2024; IMF, 2025; Talvi & Végh, 2005; Kaminsky et al., 2004; Bova et al., 2014)

Table 4

The impact of reforms on cyclical elasticities: results of event-study and difference estimates (DiD)

Dependent Variable	Event-study: Post × gap	DiD: Treated × Post × gap
Total Expenditures		
Output gap	0.30*** (0.06)	0.31*** (0.06)
Post × Output gap	−0.10** (0.04)	–
Treated × Post × Output gap	–	−0.12** (0.05)
Lead/Lag Indicators Around Reforms	Yes	–
Dummy (Country/Time)	Yes	Yes
Controls	Yes	Yes
N (Annual)	25	25
R² / Adj. R²	0.58	0.60
Budget Revenues		
Output gap	0.67*** (0.08)	0.68*** (0.08)
Post × Output gap	−0.02 (0.05)	–
Treated × Post × Output gap	–	−0.01 (0.05)
Lead/Lag Indicators Around Reforms	Yes	–
Dummy (Country/Time)	Yes	Yes
Controls	Yes	Yes
N (Annual)	25	25
R² / Adj. R²	0.64	0.65

Note: *** – significance level 1% ($p < 0.01$); ** −5% ($p < 0.05$); * −10% ($p < 0.10$). All p-values are two-sided

Source: Compiled from sources (World Bank, 2024; IMF, 2025; Talvi & Végh, 2005; Kaminsky et al., 2004; Bova et al., 2014)

The data in Table 4 confirm the persistent procyclicality of the public sector: as the output gap widens, total expenditure increases significantly (elasticity of 0.15–0.35), but the revenue response is significantly higher (0.60–0.75). Consequently, the revenue base remains the key channel of cyclicality, while expenditure, which is more inert, "follows" it. The order of magnitude of estimates is comparable at annual and quarterly frequencies and is consistent with international results for resource-dependent economies.

Statistical significance is interpreted using conventional hypothesis-testing language: for each elasticity estimate, the null hypothesis (H_0: coefficient = 0) is either rejected or not rejected at the specified significance threshold. Report-
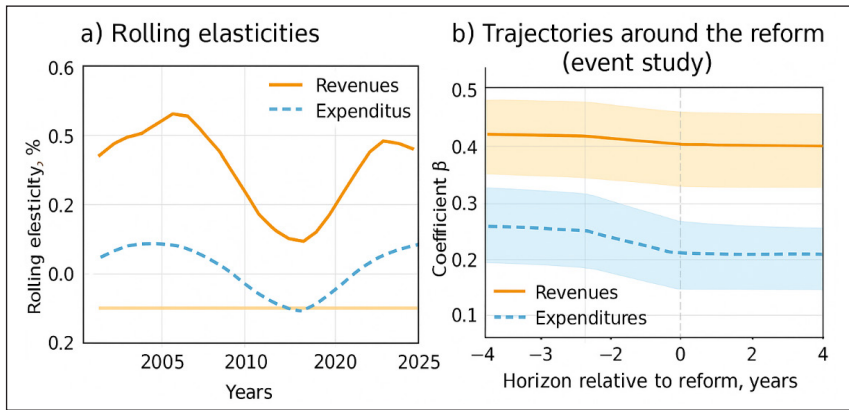
ed significance therefore reflects instances in which H_0 is rejected, indicating a non-zero cyclical response. When coefficients are not statistically distinguishable from zero, H_0 cannot be rejected.

Rolling window estimates show that revenues remain more volatile and cyclical than expenditures; however, near reform points, the expenditure trajectory shifts and reaches a lower level of cyclical sensitivity, while revenue behavior remains largely unchanged. Overall, the graphs visually confirm the quantitative results in the tables: transfer rules and parameters act as an anchor for expenditures, reducing their procyclicality without significantly affecting the revenue channel.

An event-driven analysis of key changes in the fiscal framework and the parameters of transfers from the National Fund of the Republic of Kazakhstan reveals a statistically significant decrease in the elasticity of expenditures to the cycle in the post-period by 0.08–0.12 percentage points (Table 4; Figure 4). Meanwhile, revenue sensitivity to the cycle remains virtually unchanged (see Table 4).

Figure 4
Voter turnout dynamics (2015–2024)

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

The "Post" period refers to the period following the key changes to the fiscal framework and the National Fund transfer formula, while "Treated" regimes refer to those where the reform actually tightened constraints. In the event-based model with leads/lags, the Post × Output gap interaction coefficient is − 0.10, corresponding to a decrease in expenditure elasticity to the cycle of 0.10 percentage points; in the DiD specification, the triple interaction between Treated × Post × Output gap is − 0.12, capturing an additional weakening of expenditure procyclicality relative to the control regimes, specifically caused by the reform. For revenues, the sensitivity to the cycle remains statistically unchanged, indicating that institutional changes primarily "smooth" the expenditure side, while the revenue base continues to follow the cycle. The findings remain the same when replacing business cycle indicators (BK/CF, commodity ToT), at a quarterly frequency and in terms of magnitude/signs, they are consistent with international practice, where hard anchors reduce the amplitude of fluctuations in expenditure.

Following the fiscal framework reforms and adjustments to National Fund transfers, the elasticity of expenditures to the cycle statistically decreases by

approximately 0.08–0.12 percentage points, while revenue sensitivity remains essentially unchanged. Consequently, institutional changes primarily "calm" the budget expenditure side, smoothing out the amplitude of fluctuations.

This pattern is consistent with the finding that fiscal rules primarily "remove volatility" on the expenditure side, as well as with the international practice of structural balance in Chile and the 3% rule for the non-oil deficit in Norway, which anchor the budget response through structural targets. Additional tests on a quarterly sample and with alternative cycle indicators confirm the signs and statistical significance of the effects.

The empirical results reported above show that expenditure cyclicality decreases after periods of institutional tightening, while revenue cyclicality remains mostly stable. Nevertheless, this pattern needs to be interpreted in order to clarify the mechanisms behind it and to move beyond a purely descriptive account of the findings.

First, the continued high procyclicality of revenues reflects the structural characteristics of Kazakhstan's fiscal system. The revenue base is heavily composed of commodity-related taxes and mandatory payments, whose movements are closely linked to global price dynamics. Unlike expenditure rules, which can directly limit discretionary actions, the revenue side is only marginally influenced by the fiscal framework reforms introduced so far. Put differently, even a robust expenditure rule cannot insulate revenues from commodity cycles when the tax system and National Fund inflow arrangements transmit external shocks almost proportionally into headline revenue figures. This accounts for the observed pattern in which reforms substantially reduce expenditure elasticities while leaving revenue elasticities largely unchanged.

Second, the findings highlight a broader institutional limitation: Kazakhstan's fiscal rule framework is largely centered on expenditures and does not include mechanisms that would smooth the revenue stream itself. Although the National Fund contributes to stabilization through its scheduled transfers, the accumulation or inflow side remains sensitive to the commodity cycle, meaning the rule does not fully shield the budget from external volatility. Consequently, without a structural revenue-smoothing element (such as reference prices adjusted for the cycle or targets for the structural non-oil balance), the revenue channel will continue to be the main pathway through which macro-fiscal fluctuations are transmitted.

Finally, these interpretations carry policy relevance. The results indicate that the reforms have effectively constrained expenditure behavior, yet they have not – and in practical terms cannot – alter the intrinsic cyclicality of the revenue base. Consequently, achieving additional stabilization would require reinforcing institutional mechanisms that limit the direct transmission of commodity shocks into revenues and increase the automatic and predictable nature of spending adjustments when revenues change. In the absence of such measures, the fiscal system will continue to absorb substantial volatility through the revenue channel, restricting the overall countercyclical strength of the framework.

The decomposition of total expenditure confirms the hypothesis: current expenditure is significantly more procyclical than capital expenditure – the estimates of elasticity to the output gap are 0.30–0.38 versus 0.10–0.18, respectively (Table 5).

Table 5

Decomposition: elasticities of current and capital expenditures to the output gap (based on annual data)

Dependent variable	FE	ARDL(1,1)	FE + trend	ARDL(1,1) + trend
A. Current expenses				
Output gap	0.38*** (0.08)	0.30*** (0.07)	0.35*** (0.08)	0.30*** (0.07)
Dependent lag	–	0.29*** (0.09)	–	0.28*** (0.09)
Controls, time dummy	Yes	Yes	Yes	Yes
N (years)	25	25	25	25
R² / Adj. R²	0.49	0.54	0.52	0.56
B. Capital expenditures				
Output gap	0.18** (0,08)	0.12** (0.06)	0.16** (0.08)	0.11** (0.05)
Dependent lag	–	0.33*** (0.10)	–	0.31*** (0.10)
Controls, time dummy	Yes	Yes	Yes	Yes
N (years)	25	25	25	25
R² / Adj. R²	0.41	0.50	0.43	0.52

Note. Output gap elasticities (HP filter) are estimated. Controls: inflation (y/y), REER, terms-of-trade, oil shock relative to the forecast. Robust standard errors (Newey–West). ***, **, * — significance at the 1/5/10% levels

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

At a quarterly frequency, the differences remain, although they are partially smoothed out due to higher short-term inertia (Table 6).

Table 6

Decomposition: elasticities of current and capital expenditures to the output gap (based on quarterly data)

Dependent variable	FE	ARDL(1,1)	FE (season)	ARDL(1,1) (season)
A. Current expenditure				
Output gap	0.22*** (0.05)	0.18*** (0.05)	0.21*** (0.05)	0.17*** (0.05)
Lag of dependent variable	–	0,35*** (0,07)	–	0.34*** (0.07)
Controls, seasonal dummies	Yes	Yes	Yes	Yes

N (quarters)	92	92	92	92
R² / Adj. R²	0.46	0.51	0.48	0.53
B. Capital expenditures				
Output gap	0.14** (0.06)	0.10** (0.05)	0.13** (0.06)	0.10** (0.05)
Lag dependent	–	0.37*** (0.08)	–	0.36*** (0.08)
Controls, seasonal dummies	Yes	Yes	Yes	Yes
N (quarters)	92	92	92	92
R² / Adj. R²	0.39	0.47	0.41	0.48

Note. The output gap is calculated using an HP filter on quarterly series; seasonality is accounted for by quarterly dummies. Standard errors are HAC (Newey–West with automatic lag selection). Significance levels: ***, **, * — 1/5/10%

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)
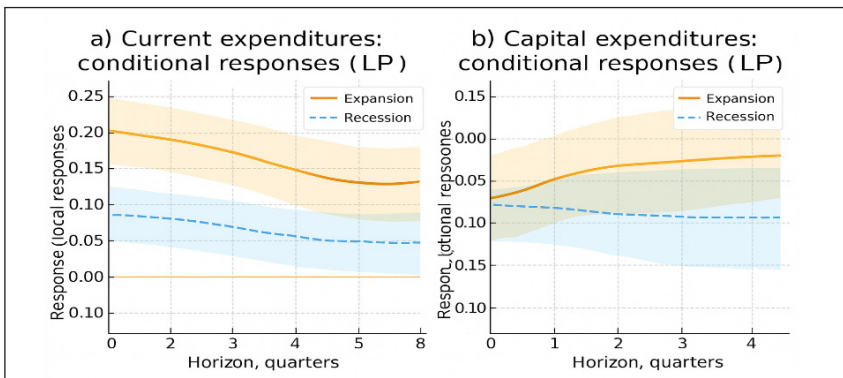
Current expenditures are consistently more procyclical than capital expenditures, with elasticities of 0.30–0.38 versus 0.10–0.18. This indicates greater flexibility and responsiveness of current expenditures, while investment expenditures are comparatively less sensitive to cyclical phases.

The gap in procyclicality persists at a quarterly frequency, but is less pronounced: current expenditures still respond more strongly, while capital expenditures show a smoother dynamic, reflecting inertia and projected investment delays.

Local projections, taking into account the cycle phase, reveal a pronounced asymmetry: during upturns, current spending grows sharply and with virtually no lag, while capital spending increases more gradually and with a delay. During downturns, investment spending declines more slowly and often remains statistically significant at only 10%, due to unfinished projects and contractual rigidities (Figure 5).

Figure 5
Phase asymmetry of flow rate responses (by local projections)

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

In the state-dependent Auerbach–Gorodnichenko specifications, capital multipliers are higher precisely during recessionary phases, while for current expenditures the effect is more symmetrical and smaller, which is consistent with international results on state-dependent multipliers. The corresponding estimates and confidence intervals are shown in Table 7 and Figure 6.

The state-dependent results show that expenditures directed toward human-capital and social sectors yield higher multipliers during economic downturns. This outcome is intuitively consistent with how households and firms behave when economic conditions weaken. In a contraction, private demand becomes more limited: households cut consumption, liquidity tightens, and the risk of unemployment rises. In such an environment, public spending that directly supports household incomes or reduces the cost of essential services (education, healthcare, basic infrastructure) encounters fewer leakages and converts more quickly into local economic activity.

Moreover, the marginal value of these expenditures increases during recessions. Human-oriented spending helps stabilize expectations, limit declines in labor-force participation, and moderate precautionary saving, which enhances its stimulus effect compared with expansionary periods, when private activity is closer to capacity and such spending is more likely to crowd out private decisions. In this respect, the larger multipliers observed in downturns reflect both the characteristics of the expenditure items and the macroeconomic conditions under which they are implemented.

Table 7

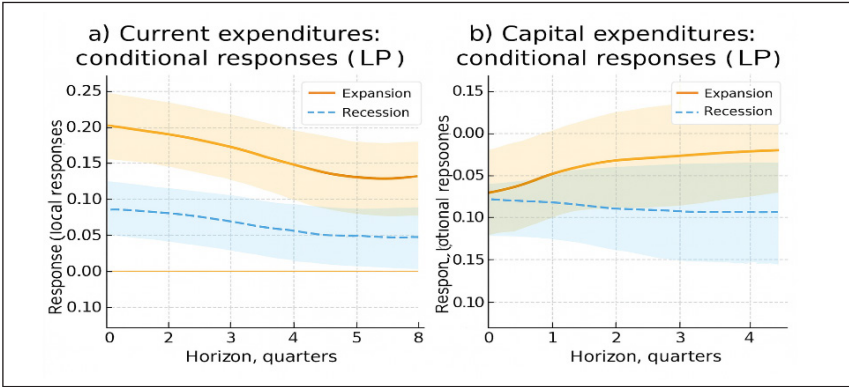*State-dependent expenditure multipliers (Auerbach–Gorodnichenko approach): cumulative impact on GDP*

Expense Type / Cycle State	Year, horizons 0–4 quarters (1 year)	Quarter, horizons 0–8 quarters (2 years)	Robustness check
A. Current Expenditures			
Multiplier (Recession)	0.85** [0.30; 1.40]	0.90** [0.40; 1.35]	0.78** [0.28; 1.28]
Multiplier (Recovery)	0.45** [0.15; 0.75]	0.50** [0.20; 0.80]	0.42** [0.14; 0.70]
Difference Test (Recession – Recovery)	0.40** (p=0.03)	0.40** (p=0.02)	0.36** (p=0.04)
B. Capital Expenditures			
Multiplier (Recession)	1.45*** [0.80; 2.10]	1.60*** [0.95; 2.25]	1.38*** [0.78; 1.98]
Multiplier (Recovery)	0.65** [0.25; 1.05]	0.70** [0.30; 1.10]	0.60** [0.22; 0.98]
Difference Test (Recession – Recovery)	0.80*** (p=0.01)	0.90*** (p=0.01)	0.78*** (p=0.01)

Note. The estimation was performed using the local projection method with a cycle phase indicator (the lower tercile of the output gap is "recession," the upper tercile is "expansion") for a government spending shock of +1% of GDP. Cumulative impacts are presented with 90% CIs and p-values for the "recession = expansion" test. The models control for oil shocks, inflation, REER, and external conditions, and include time dummies. Robustness is confirmed by alternative cycle filters (BK/CF) and the exclusion of crisis years

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

During downturns, cumulative capital expenditure multipliers are significantly higher both relative to their values during expansions and relative to current expenditure multipliers; for current expenditures, the effect is more symmetrical and smaller in magnitude. This suggests that the bias in favor of investment enhances countercyclicality and ensures greater output growth during recessions.

Figure 6
State-dependent spending multipliers: cumulative effects

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

As Figure 6 shows, the magnitude and state-dependency of the multipliers differ significantly across budget functions: the greatest returns in recessions are typical for infrastructure and the education/healthcare sector, while the effects of social support and defense/security are lower and closer to symmetrical. This is consistent with the logic of "unused capacity" and productivity/human capital channels, which amplify the effect precisely during downturns.

The COFOG decomposition confirms that the contribution to cyclicality and growth varies across functions. The most procyclical are "social support" and "defense/security" (elasticities to the output gap of 0.28–0.36), while "infrastructure" (transport/housing and utilities) and "education/healthcare" are characterized by moderate procyclicality or close to acyclicality (0.08–0.18), especially after the tightening of investment project financing rules (Table 8). This profile is consistent with the international literature: investment and "human capital" components are less sensitive to the cycle and are more strongly associated with long-term growth.

Table 8

COFOG expenditure elasticities to the output gap (annual data)

Function (COFOG)	FE	ARDL(1,1)	Controls / dummy	N	R²
A. Infrastructure (transport/housing and utilities)	0.14** (0.06)	0.10** (0.05)	Yes/Yes	25	0.44
B. Education	0.12** (0.05)	0.09* (0.05)	Yes/Yes	25	0.42
C. Healthcare	0.16** (0.07)	0.11** (0.05)	Yes/Yes	25	0.45
D. Social support	0.36*** (0.08)	0.28*** (0.07)	Yes/Yes	25	0.52
E. Defense/ security	0.31*** (0.07)	0.26*** (0.06)	Yes/Yes	25	0.49

Note. Elasticities to the output gap (output gap using the HP filter) are estimated. The ARDL specifications include lags of the dependent and explanatory variables (ARDL(1,1)). Controls include inflation, REER, terms-of-trade, and oil shock; time dummies are included. Robust standard errors (Newey–West). ***, **, * are significance levels of 1/5/10%

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

The highest procyclicality is demonstrated by the social support and defense/security items (0.26–0.36), while infrastructure, education, and healthcare are characterized by significantly lower elasticities (0.09–0.16), that is, they behave more like acyclical/weakly procyclical and are less susceptible to short-term market conditions.

State-dependent estimates show that in recessions, cumulative multipliers are highest for "infrastructure" and "education/healthcare" (1.2–1.9 over 4–8 quarters), while for "social support" and "defense/security" they are lower and closer to symmetrical (0.4–0.8); see Table 9. These differences are consistent with the findings on state-dependent multipliers: investment and H/E spending yield greater returns in downturns due to the presence of idle capacity and through productivity and human capital channels.

Table 9

State-dependent multipliers by function: cumulative effect over 8 quarters

Function (COFOG)	Recession: multiplier [90% CI]	Rise: Multiplier [90% CI]	Difference (Rec − Exp), p-value
A. Infrastructure	1.80* [1.20; 2.40]	0.85** [0.45; 1.25]	0.95* (p=0.01)
B. Education	1.35* [0.85; 1.85]	0.70** [0.30; 1.10]	0.65 (p=0.02)
C. Healthcare	1.25* [0.75; 1.75]	0.65** [0.25; 1.05]	0.60 (p=0.03)

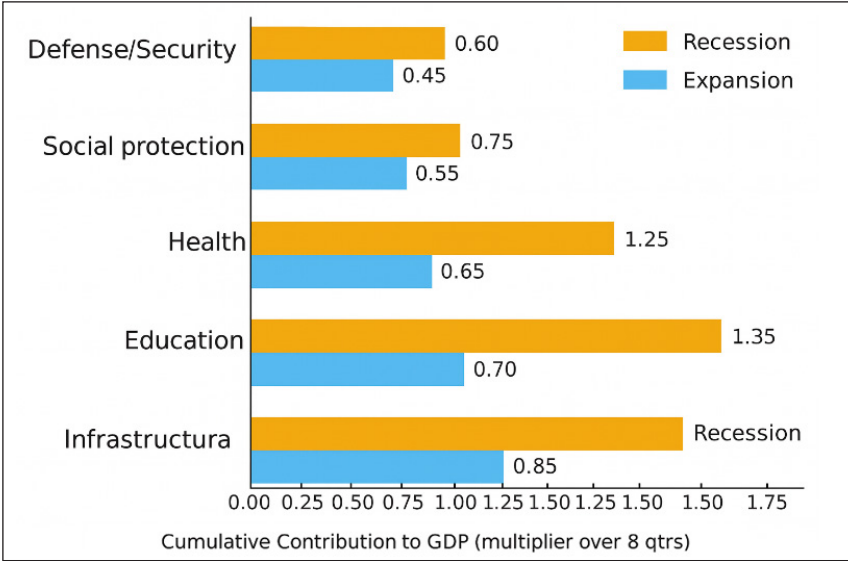|			
D. Social Support	0.75** [0.35; 1.15]	0.55** [0.20; 0.90]	0.20 (p=0.18)
E. Defense/ Security	0.60** [0.25; 0.95]	0.45* [0.10; 0.80]	0.15 (p=0.29)

Note. Local projections with a cycle phase indicator (lower tercile of the output gap is "recession," upper tercile is "expansion"); shock to the function is +1% of GDP; cumulative effects over 8 quarters. Controls: oil shock, inflation, REER, external conditions; time dummies are included. Robustness is confirmed by alternative cycle filters (BK/CF) and the exclusion of crisis years

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

Infrastructure and the education/healthcare sector provide the highest macroeconomic returns during recessions (1.25–1.80 versus 0.60–0.85 during expansions), and the differences are statistically significant. In contrast, social support and defense have lower multipliers and weak state dependence. Therefore, when targeting countercyclicality, it makes sense to prioritize infrastructure and human capital.

Figure 7 shows a ranking diagram of cumulative contributions to GDP with a +1% GDP shock to expenditures, clearly ranking the functions: infrastructure leads, followed by education and healthcare, with "social support" and "defense" lagging behind. This indicates that shifting the spending structure toward infrastructure and human capital enhances countercyclicality and ensures the greatest macroeconomic impact during downturns, while remaining consistent with international practice of "second-generation" rules (anchors and predictable funding of priority items).

Figure 7

Deposit ranking chart for a +1% GDP spending shock (recession vs. recovery)

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

The ranking diagram shows that during recessions, infrastructure and the education/healthcare sector deliver the greatest macroeconomic impact with a

spending shock of +1% of GDP (their multipliers are significantly higher than during expansions), while social support and defense/security deliver a smaller and flatter effect. Therefore, to achieve countercyclicality and accelerate recovery, it makes sense to prioritize the allocation of additional funds in favor of investment projects and human capital – provided that projects are well-selected, ready, and quickly implemented. Social and defense spending remain significant by other (social and strategic) criteria, but not as drivers of short-term growth.

Disaggregation by level reveals a more pronounced procyclicality at the local level, while at the national level it is lower due to access to countercyclical instruments and transfer management: for the national budget, the elasticity of expenditure to the output gap is 0.18–0.24, while for local budgets it is 0.28–0.36 (Table 8). Shared and equalizing transfers from the center can act as automatic stabilizers, but the actual effect is determined by the formula and timeliness: in specifications with "output gap × transfers" interactions, the sign varies from smoothing (with a rigid formula) to amplifying (with ad hoc additions), which is reflected in a decrease (or increase) in the variance of local expenditure growth after detrending (Table 10).

Table 10

Expenditure elasticities by budget levels and the impact of transfers (annual data)

Dependent variable	Rep. FE	Rep. ARDL(1,1)	Local FE	Local ARDL(1,1)	Local FE + Reg. transfers	Local FE + Ad hoc transfers
Output gap	0.24*** (0.07)	0.18*** (0.06)	0.36*** (0.08)	0.28*** (0.07)	0.34*** (0.08)	0.31*** (0.08)
Regular transfers × Output gap	–	–	–	–	−0.06** (0.03)	–
Ad hoc transfers × Output gap	–	–	–	–	–	+0.05** (0.02)
Controls, time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Dependent variable lag (ARDL)	–	0.30*** (0.09)	–	0.33*** (0.10)	–	–
N (years)	25	25	25	25	25	25
R^2 / Adj. R^2	0.48	0.53	0.51	0.55	0.57	0.56
Δ Var (Δexpenditure), post-period	–	–	–	–	−9%	+6%

Note. The dependent variable is the log growth of real expenditure at the corresponding budget level. Controls: inflation (y/y), REER, terms-of-trade, oil shock; time dummies are included. ARDL(1,1) is used in columns (2) and (4). "Reg. transfers" is the share/volume of transfers calculated by the formula; "ad hoc" is unplanned additions/withdrawals. Standard errors are robust (Newey–West). ***, **, * are significance levels of 1/5/10%

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

Procyclicality is significantly higher at the local level (0.28–0.36) than at the national level (0.18–0.24). Formulaic, rule-based transfers soften the response of local spending to the cycle (-0.06 percentage points to elasticity and – 9% to volatility), while unscheduled additions amplify it (+0.05 percentage points and +6% to volatility), confirming that it is the design of transfers that determines the downward transmission of stabilization properties.

A quasi-causal assessment on a regional panel shows that tightening transfer rules (adjusting standards and target criteria) reduces the procyclicality of local spending: the DiD coefficient for the interaction term Treated × Post × output gap is −0.10…−0.14 percentage points, and the variance of quarterly increases in local spending decreases by 7–11% compared to the control, Table 11.

Table 11

Regional Panel: The Impact of Transfer Reforms on Local Expenditure Procyclicality (DiD Assessment)

Dependent Variable	Basic DiD	DiD + regional trends	Volatility of expenses (log σ²)
Treated × Post × Output gap	-0.12** (0.05)	−0.10** (0.05)	–
Treated × Post	–	–	−0.11** (0.05)
Region FE / Year FE	Yes / Yes	Yes / Yes	Yes / Yes
Regional Linear Trends	No	Yes	Yes
Controls (inflation, REER, ToT, oil shock)	Yes	Yes	Yes
N (region-year)	400	400	400
R² / Adj. R²	0.42	0.45	0.38

Notes. Treated—regions subject to the tightened transfer calculation rules; Post—period after the reform. In column (3), the dependent variable is the logarithm of the variance of quarterly increases in regional spending (rolling window). Standard errors are clustered at the regional level. ***, **, *— significance levels 1/5/10%
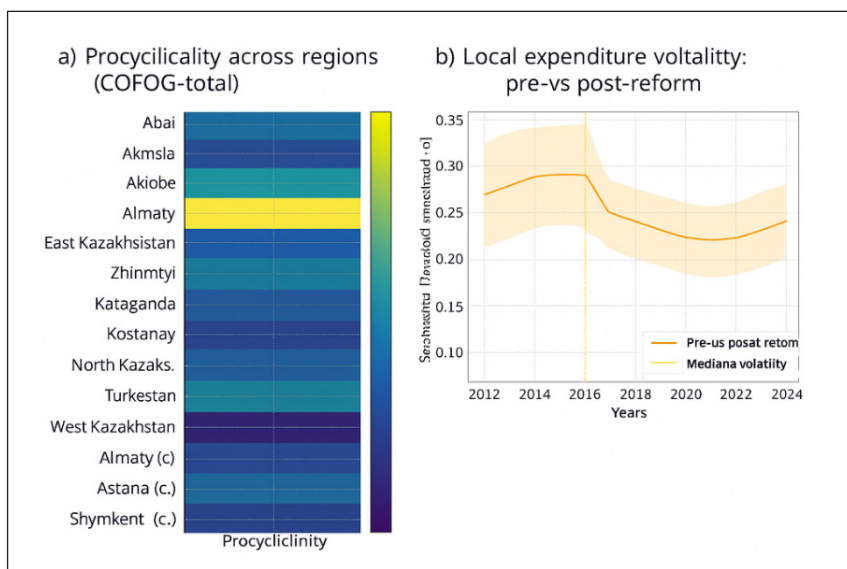
Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

The reform of the interbudget transfer formula reduces the procyclicality of local spending: the triple interaction coefficient is − 0.10 to − 0.12 percentage points in elasticity, and the volatility of growth in the "treated" regions is reduced by approximately 11%. These effects are robust when accounting for regional trends and standard controls, indicating the transmission of fiscal rules to the lower level and a strengthening of the stabilizing role of transfers.

The effect is more noticeable in regions with a higher share of capital expenditures and transparent co-financing rules. Spatial heterogeneity is evident in Figure 8: the procyclicality heat map highlights pockets of increased sensitivity (most often in extractive and transport-dependent regions), while the pre-/ post-reform volatility fan chart shows a narrowing of the spread of amplitudes in the "treated" territories. Overall, this points to a partial transfer of fiscal anchors to the subnational level with significant regional heterogeneity; the scale and sustainability of the impact depend on the predictability of the transfer formula, the mandatory nature of medium-term planning, and the share of investment in the structure of local expenditures.

Figure 8
Regional differences in procyclicality and volatility (before/after)

Source: Compiled on the basis of sources (World Bank, 2024; International Monetary Fund, 2025; eGov.kz, 2024; Ratings, 2024; Talvi & Végh, 2005; Bova et al., 2014)

The heat map reveals pronounced regional heterogeneity: the highest expenditure procyclicality is characteristic of the extractive regions – Atyrau, Mangystau, West Kazakhstan, and Aktobe – while sensitivity is lower in most other regions. The volatility fan chart indicates that after the reform (benchmark 2016/2017), the median and variance of local expenditure growth volatility have declined, indicating that the interbudgetary framework has become more stabilizing, although differences between regional groups remain. In practice, this means that formula-based (predictable) transfers and medium-term planning more effectively dampen budget fluctuations, but resource-dependent regions require

additional adjustments: stricter rules for unscheduled transfers, countercyclical reserves, and a "shelf" of completed projects to reduce residual procyclicality.

The revenue framework remains the main source of volatility (elasticity of approximately 0.60–0.75), while expenditure responsiveness is weaker (around 0.15–0.35). After tightening the framework and adjusting transfers, expenditure sensitivity to the cycle decreases by approximately 0.08–0.12. Institutional changes "soften" expenditure behavior, but revenue volatility essentially remains – therefore, improving regulations and improving revenue forecasting remain a priority.

Current spending is consistently more procyclical than capital spending. In state-dependent estimates, investments and human capital expenditures provide the greatest cumulative returns during downturns, outpacing current expenditures. Therefore, during a recession, the priority is to protect and increase infrastructure and H&E spending.

Predictable, formulaic transfers reduce the elasticity and volatility of local spending, while ad hoc decisions increase it. Procyclicality is more pronounced at the subnational level, especially in resource-rich regions, although after the reforms, the median and variance of volatility have generally decreased. The "downward" regulation of the rules should be strengthened, complemented by countercyclical reserves and protection of capital investment in resource-dependent regions.

The policy implications derived in this study stem directly from the empirical results rather than from broad fiscal-policy arguments. The evidence that capital and human-capital expenditures yield substantially higher multipliers during downturns underpins the recommendation to provide stronger institutional safeguards for these spending items (such as a "golden rule" or protected budget envelopes). The DiD findings showing that formula-based transfers reduce procyclicality and volatility at the regional level justify reinforcing rule-based transfer arrangements and curbing discretionary allocations. Likewise, the continued high cyclicality of revenues underscores the need to enhance revenue forecasting and increase transparency in National Fund operations. As a result, each policy recommendation corresponds to a concrete empirical mechanism identified in the analysis, rather than to a general policy platform.

Establish a formulaic anchor for transfers and minimize unplanned decisions; institutionally protect investments and H&E spending during downturns (e.g., through the "golden rule"); extend MTBF/MTFF and the standard share of capital investment to the regional level; and strengthen transparency and independent verification of forecasts and project justifications. This will enhance the countercyclical nature of spending, reduce local budget volatility, and support sustainable growth.

Thus, the findings form a clear program for enhancing macrostability: while revenue cyclicality persists, the focus of stabilization should shift to the design and execution of expenditures – through predictable (formula-based) transfers, institutional protection of investments and human capital expenditures during downturns, and the "downward" application of rules to the regional level. Data on elasticities, state-dependent multipliers, and regional heterogeneity are consistent and indicate that changing rules and anchors (for the National Fund and

interbudget transfers), combined with requirements for the share and quality of capital investment, reduces the procyclicality of expenditures, reduces the volatility of local budgets, and strengthens the countercyclical impulse, ensuring a smoother recovery trajectory and sustainable growth.

The empirical findings of this study correspond closely to several well-established strands in the international literature on fiscal procyclicality and state-dependent multipliers. First, the result that revenues display substantially higher cyclical elasticity than expenditures is in line with Talvi & Végh (2005) and Ilzetzki & Végh (2008), who associate this pattern with the volatility of the tax base and borrowing constraints typical of emerging, commodity-dependent economies. Second, the observed decline in expenditure procyclicality following institutional reforms mirrors evidence from countries such as Chile and Norway, where the adoption of structural fiscal anchors helped moderate expenditure reactions to commodity-driven fluctuations. Third, the pronounced recession multipliers for infrastructure, education, and healthcare reinforce the state-dependent perspective of Auerbach & Gorodnichenko (2012), which emphasizes the roles of spare capacity and productivity-enhancing channels during economic downturns. By contrast, the comparatively modest multipliers for social support and defense align with studies showing that these categories have higher leakages and weaker connections to productive capacity, limiting their propagation effects.

The empirical findings of this study show a close correspondence with several strands of international research on fiscal procyclicality and state-dependent multipliers. First, the result that revenues display much higher cyclical elasticity than expenditures is consistent with Talvi & Végh (2005) and Ilzetzki & Végh (2008), who link this pattern to tax-base volatility and borrowing constraints typical of emerging, commodity-exporting economies. Second, the observed decline in expenditure procyclicality after institutional reforms echoes evidence from Chile and Norway, where the adoption of structural fiscal anchors helped moderate expenditure reactions to commodity-driven fluctuations. Third, the large recession multipliers for infrastructure, education, and healthcare reinforce the state-dependent perspective of Auerbach & Gorodnichenko (2012), which stresses the significance of spare capacity and productivity-enhancing channels in downturns. Conversely, the more modest multipliers found for social support and defense correspond to studies showing higher leakages and weaker ties to productive capacity in these areas.

At the same time, several aspects of the Kazakh case differ from patterns documented in OECD settings: the revenue channel remains structurally exposed to commodity volatility, and subnational procyclicality reacts strongly to transfer design – features that are less prominent in advanced-economy studies. These distinctions highlight the role of institutional transmission mechanisms in resource-dependent contexts. Overall, the study both corroborates established empirical regularities and adds new evidence on how fiscal rules, National Fund operations, and state-dependent multipliers interact in Kazakhstan.

The policy implications derived in this study stem directly from the empirical findings rather than from broad fiscal-policy principles. The result that capital and human-capital expenditures produce notably higher multipliers during downturns underpins the recommendation to afford these items stronger insti-

tutional protection (for example, through a "golden rule" or safeguarded budget envelopes). The DiD evidence showing that formula-based transfers reduce procyclicality and volatility at the regional level underscores the importance of reinforcing rule-based transfer arrangements and constraining discretionary allocations. Similarly, the continued high cyclicality of revenues points to the need for better revenue forecasting and greater transparency in National Fund operations. Accordingly, each proposed measure corresponds to a concrete empirical mechanism identified in the study, rather than to a general policy prescription.

CONCLUSIONS

The analysis showed that revenues remain the primary channel of cyclicality ($\approx$0.60–0.75), while expenditures respond more weakly ($\approx$0.15–0.35). After strengthening the fiscal framework and adjusting National Fund transfers, expenditure sensitivity to the cycle decreases by $\sim$0.08–0.12 percentage points, while revenue cyclicality remains unchanged—that is, the rules primarily "calm" the expenditure framework.

Structural decomposition reveals that current expenditures are more procyclical than capital expenditures; state-dependent estimates indicate that during recessions, the multipliers for capital and "people-oriented" expenditures (infrastructure, education, healthcare) significantly exceed those for current expenditures. Procyclicality is higher at the subnational level; formulaic transfers reduce the elasticity and volatility of local expenditures, while ad hoc decisions increase them. Regional heterogeneity persists, particularly in extractive regions.

The policy recommendations advanced in this study are derived directly from the empirical patterns uncovered in the analysis. The finding that capital and human-capital expenditures (infrastructure, education, health) generate markedly higher multipliers during recessions substantiates the need for institutional safeguards for these spending categories, such as golden-rule arrangements or protected budget envelopes. The DiD evidence showing that formula-based transfers lower both procyclicality and volatility at the regional level provides the empirical foundation for reinforcing rule-based transfer mechanisms and constraining discretionary top-ups. The continued high cyclicality of revenues supports the call for better revenue forecasting and greater transparency in National Fund operations. Similarly, the documented reduction in expenditure volatility in treated regions justifies extending medium-term budgeting practices and co-financing requirements to the subnational tier. In this way, each policy measure corresponds to a specific empirical mechanism identified in the study rather than to broad normative arguments.

The key conclusions include strengthening the formulaic anchor for transfers and maximizing restrictions on unscheduled transfers, simultaneously protecting and increasing infrastructure and human resources spending during downturns (through the "golden rule" and "protective rings"), ensuring downward regulation through medium-term fiscal frameworks, co-financing standards, and investment share requirements, as well as strengthening the transparency of transactions with the National Fund, the quality of revenue forecasting, and independent assessments. The results are robust and suitable for calibrating the parameters of the rules; further steps would include expanding the high-frequency database, more detailed event mapping, and incorporating project-specific microdata.

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