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Determinants of Public Procurement Activity in Kazakhstan: Evidence from Regional Panel

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ABSTRACT

Public procurement is an important tool for providing public services and regional development, but its effectiveness varies significantly between regions, especially in Kazakhstan. The purpose of this study is to assess the impact of fiscal dependence and socio-economic conditions on the level of disruption of public procurement and intensity of procurement activities in Kazakhstan using a panel econometric approach with two-way fixed effects models, which allows taking into account unchangeable regional characteristics and general economic shocks. The empirical base of the study consists of a unique panel dataset on 458 districts and 17 cities of Kazakhstan covering 2016-2024 and includes 432,438 contracts worth 2.65 trillion tenge in total. The results show that, on average, 3.14% of contracts are declared invalid, corresponding to 0.87% of total purchase price.. The most stable factor disrupting purchases is inflation. An increase in the CPI by 1 point leads to an increase in failed contracts by 0.3-0.4 percentage points ($p<0.01$). Dependence on inter-budget transfers has a weak and unstable impact. Purchasing activity is significantly related to the labour market situation. Rising unemployment reduces both the number and value of contracts. Higher wages contribute to increasing their number. Inflation is a key constraint on public procurement effectiveness. In the future, research can be expanded by using more detailed regional socio-economic data and by disaggregating procurement by type of procedure and sector.

KEYWORDS: Regional Economy, Regional Development, Budget, Fiscal Strategy, Public Procurement, Government Spending, Finance, Financial Potential

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Детерминанты активности государственных закупок в Казахстане: анализ на основе региональных панельных данных

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АННОТАЦИЯ

Государственные закупки являются одним из важных инструментом обеспечения общественных услуг и регионального развития, однако их эффективность существенно различается между регионами, особенно в Казахстане. Целью данного исследования является оценка влияния фискальной зависимости и социально-экономических условий регионов на уровень срыва государственных закупок и интенсивность закупочной деятельности в Казахстане. В работе используется панельный эконометрический подход с применением моделей с двухсторонними фиксированными эффектами, позволяющих учитывать неизменяемые региональные особенности и общеэкономические временные шоки. Эмпирическая база исследования включает уникальный панельный массив данных по 458 районам 17 регионов и городов Казахстана за 2016-2024 гг., охватывающий 432 438 контрактов государственных закупок на общую сумму 2,65 трлн тенге. Результаты показали, что в среднем 3,14% контрактов были признаны несостоявшимися, что соответствует 0,87% совокупной стоимости закупок. Наиболее устойчивым фактором срыва закупок выступает инфляция: увеличение регионального ИПЦ на 1 пункт приводит к росту доли несостоявшихся контрактов на 0,3–0,4 п.п. ($p < 0,01$). Влияние зависимости от межбюджетных трансфертов носит слабый и нестабильный характер. Закупочная активность существенно связана с ситуацией на рынке труда: рост безработицы снижает как количество, так и стоимость контрактов, тогда как более высокий уровень заработной платы способствует увеличению их числа. В целом инфляция выступает ключевым ограничителем эффективности государственных закупок. В дальнейшем исследования могут быть расширены за счёт использования более детализированных районных социально-экономических данных, дезагрегации закупок по видам процедур и секторам.

КЛЮЧЕВЫЕ СЛОВА: региональная экономика, региональное развитие, бюджет, фискальная стратегия, государственные закупки, государственные расходы, финансы, финансовый потенциал

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INTRODUCTION

Public procurements are one of the largest channels of government spending worldwide, serving as a key instrument for delivering public services, stimulating local economies, and promoting inclusive growth. In many developing and transition economies, including Kazakhstan, procurement also remains a focal point of reform efforts aimed at improving transparency, efficiency, and competitiveness. However, the functioning of procurement systems remains unbalanced. Weak competition, administrative bottlenecks, and regional disparities in capacity often translate into procurement failures – delayed or cancelled tenders, unfulfilled contracts, and inefficient allocation of public resources.

Kazakhstan offers an exciting case for examining these issues. Since the mid-2010s, the country has undertaken a series of procurement reforms, including the introduction of e-procurement, new rules for transparency and competitive bidding, and gradual alignment with OECD standards (OECD, 2019; UNEP, 2021). While these reforms have improved access to procurement information and reduced corruption risks, substantial variation persists across regions. Some areas benefit from stronger administrative capacity, more industrial development, and higher private-sector participation, whereas others face limited competition and frequent contract failures. Understanding these geographic and economic patterns is essential not only for improving procurement outcomes but also for advancing the government's broader agenda of fiscal decentralization and regional equity.

For example, Casady et al. (2023) found that lack of competition is the main reason for these cancellations, highlighting how limited bidder participation can derail tenders. In transition economies, an overly rule-bound approach – a form of "bureaucratic safety" – often generates excessive levels of passive waste of public resources (Nemec et al., 2020), indicating that excessive proceduralism leads to inefficient use of public funds. This evidence underscores that weak competition, administrative inefficiencies, and uneven regional capacity are closely linked to tender cancellations, delays, and suboptimal resource use in public procurement.

Other studies on public procurement performance have emphasized the roles of transparency, competition, and administrative capacity in determining efficiency and failure (Casady et al., 2023; Xu and Wang, 2024). The development economics literature highlights how disparities in local governance and infrastructure translate into uneven outcomes in public investment (OECD, 2019). Empirical research in Kazakhstan remains scarce, however, particularly at the regional level. Existing reports by OECD (2019) and UNEP (2021) highlight progress in e-procurement but point to persistent variation in capacity and compliance across subnational governments.

This paper examines regional and local variation in public procurement performance across Kazakhstani regions over the period 2016-2024. Using a unique region-level panel dataset covering the number and value of procurement contracts, as well as the share of failed contracts, our study analyzes how procurement activity varies across regions and time. These outcomes reflect the scale and scope of public spending and capture inefficiencies and administrative capacity constraints. By linking these indicators to regional measures of economic development – such as gross regional product (GRP) per capita, transfer dependency, consumer price index (CPI), urbanization rate, unemployment rate, and SME activity, and other unobservable regional characteristics and year trends – the paper explores how local economic conditions influence procurement outcomes.

Therefore, our contributions are threefold. First, a unique dataset is compiled on public procurements at the third administrative fiscal level (district). Second, the first comprehensive review of Kazakhstan's procurement system from a regional perspective is provided. Third, by systematically linking procurement outcomes to key economic indicators over the years and across multiple regions in a panel dataset, this study provides one of the first quantitative assessments of the relationship between regional economic development and procurement performance in Kazakhstan.

The findings aim to inform ongoing policy discussions on procurement reform, fiscal decentralization, and regional development. Identifying regions where procurement failures are concentrated can help policymakers target capacity-building and monitoring resources more effectively. Moreover, understanding the economic determinants of procurement outcomes contributes to broader debates on how to align public expenditure management with equitable and efficient development.

LITERATURE REVIEW

This study is related to several strands of literature. Public procurement is widely understood as a key interface between government capacity and economic development. Large cross-country studies show that public procurement accounts for 12-20% of GDP and plays a central role in transforming fiscal resources into public goods, services, and infrastructure (Bosio et al., 2022). Procurement outcomes, such as contract amounts, competition levels, single-bidding, or contract failures, are shaped not only by formal regulations but also by the underlying institutional and administrative capacity of procuring entities (Khorana et al., 2024; Kundu et al., 2025).

From a theoretical perspective, procurement performance depends on three broad determinants: economic capacity, administrative and institutional capability, and macroeconomic conditions. The previous studies are based on principal-agent and incomplete-contracts theory, fiscal federalism, transaction-cost economics, and the Tanzi framework in public finance. These theories predict that procurement outcomes vary with regional economic capacity (GRP per capita), market integration (trade per capita), administrative transaction costs (regional fixed effects), and macroeconomic stability (CPI). Within this framework, our primary variable of interest – regional transfer dependence – corresponds to classical fiscal federalism predictions: reliance on intergovernmental transfers may relax budget discipline, reduce incentives for oversight, or encourage overcommitment to procurement projects.

A growing empirical literature examines how regional economic development shapes procurement behavior. Multiple studies show that jurisdictions with higher GDP or GDP per capita tend to spend more through public procurement (Bosio et al., 2022; Fazekas and Czibik, 2021). Kutlina-Dimitrova and Lakatos (2016) identified that GDP per capita increases the probability of cross-border procurement awards in EU Member States, suggesting that wealthier and more open economies participate more actively and competitively in procurement markets.

At the subnational level, economic capacity remains a strong predictor of procurement performance. Fazekas and Czibik (2021) find that regional GDP per capita is strongly correlated with procurement quality indicators – transparency, competition, and corruption risk – across European regions. Casady et al. (2023) demonstrated that local tax revenue per capita significantly determines Danish municipalities' procurement capacity and contract completion rates, highlighting the role of fiscal capacity in enabling contractual commitments.

Inflation has long been recognized as a key macroeconomic factor affecting public spending. While moderate inflation may temporarily increase nominal government revenues (Mauro et al., 2015), sustained inflation erodes real budgets and raises procurement costs – a classical "Tanzi effect" (Tanzi, 1977). Recent studies confirm that high inflation reduces the number of bids and increases contract prices due to risk premiums and price uncertainty (Klimavičiūtė et al., 2024; Kubiczek et al., 2023). These dynamics suggest that inflationary environments may increase procurement failure rates or distort procurement values.

Beyond economic variables, procurement outcomes are heavily influenced by regional administrative capacity. An extensive literature uses detailed contract-level datasets to measure procurement quality, corruption risk, or competition at the regional level. Fazekas and Czibik (2021) construct a multi-dimensional index of procurement quality for European regions, showing large regional disparities and strong associations with socioeconomic development. Related work identifies how political discretion, favoritism, and border effects (Garcıa-Santana and Santamarıa, 2021; Titl et al., 2021; Szucs, 2024) shape procurement prices, competition, and allocation efficiency. Procurement quality, in turn, has significant implications for regional economic growth, firm performance, and resource allocation (Decarolis and Giorgiantonio, 2022; Lisciandra et al., 2022).

However, this emerging literature is still concentrated in Western countries' settings and primarily focuses on governance indicators such as corruption risk, single bidding, or price inefficiencies. Very few studies analyze procurement volumes per capita or procurement failure rates as core outcomes, and almost none examine these at the subnational level over extended panel horizons. Thus, the determinants of procurement intensity and procurement failure remain underexplored, particularly in developing and transition economies like Kazakhstan.

Research on Kazakhstan's procurement system

is comparatively limited and primarily descriptive or legal in nature. Research by OECD (2019) and UNEP (2021) reports progress in digitization and transparency through the e-procurement development, highlighting the importance of regional institutional constraints, but does not provide empirical analysis of regional procurement outcomes.

Empirical studies using Kazakhstan's e-procurement data also remain scarce. Kalyuzhnova et al. (2022) examine local content policies in the extractive sector and show how procurement spending is geographically distributed within a single industry. Ten (2024) provides a comparative analysis, while Tursyn (2025) provides a comprehensive descriptive analysis of procurement trends. However, none of these studies constructs a regional panel, models procurement determinants, or analyzes procurement volumes and failure rates per capita.

This paper addresses these gaps by assembling a unique regional panel dataset on procurement volumes, values, and failure rates, and estimating fixed-effects models that relate procurement outcomes to fiscal dependence, economic capacity, market structure, and inflation. The study contributes to the comparative literature on determinants of public procurement and offers a quantitative assessment of procurement performance at the subnational level in Kazakhstan.

This study addresses the following research question: *How do fiscal dependence and regional economic conditions influence procurement failure and procurement activity across Kazakhstan's regions?*

Building on the theoretical frameworks and empirical evidence from the literature, the following hypotheses are formulated regarding the determinants of procurement failure and procurement activity across Kazakhstan's regions.

H1: *Higher transfer dependence is associated with higher procurement failure rates and lower procurement activity per capita.*

This hypothesis is rooted in fiscal federalism and soft-budget-constraint theory. Regions that rely more heavily on intergovernmental transfers may experience weaker incentives for stringent budget oversight, greater political pressure to initiate projects, or lower administrative capacity to manage procurement processes. These dynamics are expected to increase procurement failures and reduce efficient procurement activity.

H2: *Higher regional inflation (CPI) is associated with higher procurement failure rates and may also increase nominal procurement values.*

The incomplete-contracts framework and the Tanzi effect predict that inflation increases input price volatility, erodes the real value of budgets, and heightens uncertainty in contract execution. These factors increase the likelihood of cancellations, renegotiations, and delays, resulting in higher procurement failure rates.

H3: *Higher regional economic development is associated with greater procurement activity per capita.*

Richer regions typically have greater demand for public services, greater fiscal resources, and more developed markets, which should translate into larger procurement volumes. Prior studies show positive associations between GDP per capita and procurement spending or procurement competitiveness.

DATA AND METHODOLOGY

The electronic public procurement portal (goszakup.gov.kz) serves as the central national platform for administering all public procurement procedures in Kazakhstan. Its functioning is regulated by the Law of the Republic of Kazakhstan "On Public Procurement" and the corresponding Public Procurement Rules, which define the institutional framework and procedural standards. The portal provides comprehensive administrative records covering procurement planning, tender announcements, supplier participation, contract awards, and contract execution.

The primary procurement data were obtained through the official API access token issued by the E-Finance Center JSC, following the standard authorization procedure described on the portal. All downloaded records were stored in a MySQL database. Then, SQL queries are used to isolate contracts for district administrations by selecting customers whose full Russian titles contain the keywords "akim's office" and "district", while excluding entities containing "rural district". This approach targets the third-level budget units directly below region administrations and ensures consistent identification of district-level contracting authorities.

Overall, 458 districts generated 432,438 contracts between 2016 and 2024, totaling 2,649.28 billion Kazakhstani tenge. Over this period, procure-

ment activity showed a generally increasing trend, particularly after 2021. The number of contracts peaked in 2024 at 53,963, suggesting a significant expansion in public contracting activity in recent years.

There is substantial regional variation in both the number and value of public procurement contracts. Kostanay region recorded the highest number of contracts (53,258), while Mangistau region had the lowest (5,400). In terms of total contract value, Astana city led with 1,374.85 billion tenge, whereas Mangistau region again ranked lowest at 25.91 billion tenge. Recent administrative reforms have also split larger territories, such as the former Almaty and East Kazakhstan regions, into new units, including Abay, Zhetisu, and Ulytau, thereby redistributing procurement activity among these emerging jurisdictions.

Out of all these contracts, 3.14% are considered failed, which is 0.87% of the contract value. Failed contracts are defined as failed if the contract was initiated but was later assigned one of the following statuses: "terminated by mutual agreement", "waiting for the contract to be terminated", "terminated unilaterally", or "not locked".

The remaining region-level data on regional GDP, trade, CPI, transfer dependency, unemployment rate, urbanization rate, SME activity, and average wage were extracted from the Bureau of National Statistics website. Ideally, district-level indicators would be used to capture the impact of these factors on public procurement indicators; however, there is no consistent, publicly available data at that level. Once it becomes available, there will be an opportunity for even more detailed analysis in future studies.

This study applies a panel-data framework to examine the determinants of procurement failure and procurement activity across Kazakhstan's regions from 2017 to 2023. The empirical strategy is designed to control for regional heterogeneity in economic structure, administrative capacity, and other unobserved factors that may jointly influence procurement outcomes. To account for these factors, a series of two-way fixed-effects regression models is estimated, which control for both region-specific and year-specific unobserved characteristics.

Two-way fixed-effects models are widely used in empirical research at both the country and subnational levels, such as the regional level. By introducing fixed effects for both regions and years, the estimator effectively compares each region to itself across different periods, ensuring that identification is based on within-region variation rather than potentially biased cross-sectional differences. This methodology is especially relevant for Kazakhstan, where regions differ markedly in fiscal capacity, public-sector professionalism, procurement experience, and exposure to national development programs. Many of these features are deeply rooted and evolve slowly, and at the same time, data for such features is hard to acquire.

The empirical analysis proceeds in two steps. First, procurement effectiveness is assessed by examining the determinants of the share of failed contracts, measured as the total count of failed contracts relative to the total contract count for a given region-year observation. For this purpose, the following two-way fixed effects specification is estimated by equation (1):

$$Y_{rt} = \beta_1 Dependence_{rt} + \beta_2 ln\,(GRP_{rt}) + \\ + \beta_3 CPI_{rt} + \beta_4 X_{rt} + \mu_r + \theta_t + \varepsilon_{rt} \quad (1)$$

where:

Y_{rt} – the share of failed procurement contracts in region *r* in year *t* as our main outcome;

$Dependence_{rt}$ – the key explanatory variable of interest, measured as intergovernmental transfers to region *r* in year *t* divided by its total revenue;

$\ln(GRP_{rt})$ – the gross regional product, expressed in logarithmic form;

CPI_{rt} – annual regional inflation;

X_{rt} – vector of additional time-varying regional control variables (Log SME per capita, Unemployment rate, Urbanization rate, Log average wage);

μ_r – region fixed effects, controlling for time-invariant regional characteristics such as geography, institutional quality, and cultural factors;

θ_t – account for macroeconomic shocks and national policy changes common to all regions;

ε_{rt} – the error term.

To test whether the influence of transfer dependence is non-linear, the paper re-estimates the model in equation (1) by including a squared transfer dependence term, as specified in equation (2): [AK1][AT2]

$$Y_{rt} = \beta_1 Dependence_{rt} + \beta_2 Dependence_{rt}^2 +$$

$$+ \beta_3 ln\,(GRP_{rt}) + \beta_4 CPI_{rt} + \beta_5 X_{rt} + \\ + \mu_r + \theta_t + \varepsilon_{rt} \quad (2)$$

where:

Y_{rt} – the share of failed procurement contracts in region *r* in year *t* as our main outcome;

$Dependence_{rt}$ – the key explanatory variable of interest, measured as intergovernmental transfers to region *r* in year *t* divided by its total revenue;

$Dependence_{rt}^2$ – is the squared dependence term for region r in year t, included to allow for a non-linear relationship;

$\ln(GRP_{rt})$ – the gross regional product, expressed in logarithmic form;

CPI_{rt} – annual regional inflation;

X_{rt} – vector of additional time-varying regional control variables (Log SME per capita, Unemployment rate, Urbanization rate, Log average wage).

To examine whether inflation affects procurement differently in more transfer-dependent regions, an interaction between dependence and CPI is estimated in equation (3): [AK3][AT4]

$$Y_{rt} = \beta_1 Dependence_{rt} + \beta_2 Dependence_{rt} * \\ * CPI_{rt} + \beta_3 ln\,(GRP_{rt}) + \beta_4 CPI_{rt} + \\ + \beta_5 X_{rt} + \mu_r + \theta_t + \varepsilon_{rt} \quad (3)$$

where:

Y_{rt} – the share of failed procurement contracts in region *r* in year *t* as our main outcome;

$Dependence_{rt}$ – the key explanatory variable of interest, measured as intergovernmental transfers to region *r* in year *t* divided by its total revenue;

$Dependence_{rt} * CPI_{rt}$ – is an interaction term testing whether the association between inflation and procurement failures depends on transfer dependence;

$\ln(GRP_{rt})$ – the gross regional product, expressed in logarithmic form;

CPI_{rt} – annual regional inflation;

X_{rt} – vector of additional time-varying regional control variables (Log SME per capita, Unemployment rate, Urbanization rate, Log average wage).

In all specifications, standard errors are clustered at the regional level to allow for serial correlation within regions over time. Then, procurement activity is evaluated by estimating the determinants of two additional outcomes: (1) the log average sum of contracts per capita and (2) the log number of contracts per capita.

RESULTS

In this descriptive analysis, the dynamics of the number of contracts, average contract sums, and failure rates across regions and years between 2016 and 2024 (the latest complete annual data available) are presented. By 2024, it had almost reached 5,000 contracts, which is almost twice the average across all regions and around 4 times higher than Astana and Shymkent. While Astana saw a significant increase in the number of contracts, almost tenfold, between 2016 and 2018, most likely due to Expo 2017, it has since decreased to around 1,000 contracts per year and has remained relatively stable. Shymkent city has seen a steady increase in the number of contracts since 2016, and by 2024, it had overtaken Astana. Across the other 16 regions, Akmola, Kostanay, and Karaganda consistently rank among the top performers, each exceeding 5,000 contracts by 2024. Since 2016, Atyrau, Zhetisu, and Mangistau have consistently had the fewest contracts (~1,000 or fewer). These differences may indicate varying levels of regional procurement readiness. In terms of annual total contracts, as shown in Table 1, Almaty demonstrates the highest growth.

Table 1. Annual total contracts by region 2016-2024

Region	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
Astana city	250	1833	2694	1036	1347	955	1139	1215	1112	11581
Almaty city	807	1244	1564	3404	3371	1538	1659	4611	4940	23138
Shymkent city	466	542	705	535	653	731	1036	1173	1374	7215
Akmola	4030	5813	6072	5724	5675	5409	4574	5184	5706	14866
Kostanay	4673	6574	6452	6366	5532	5205	4608	5202	5349	48187
Karaganda	2747	4896	5012	4536	5376	5015	4935	5434	5264	28781
Aktobe	2081	2755	2775	2815	3357	3349	3222	4048	4379	23835
North Kazakhstan	2407	3499	3493	3478	3610	3521	3027	3340	3645	9303

Almaty	1311	2164	2532	2511	2739	2746	3192	3431	3209	22692
Zhambyl	2191	2853	2913	2951	3240	2913	2710	3098	3127	43215
East Kazakhstan	1830	2420	2724	2493	2803	2584	2415	2606	2817	49961
West Kazakhstan	2062	2584	2817	2573	2470	2732	2166	2516	2649	13786
Turkestan	1774	2833	3835	3854	3008	2571	2462	2398	2345	4957
Pavlodar	1683	3108	2962	2366	2263	2223	2180	2207	2234	30020
Abay	1463	1830	1784	1595	1532	1626	1845	1486	1705	21226
Kyzylorda	1157	1432	1641	1650	1608	1760	1410	1639	1489	25080
Atyrau	841	1223	1162	1126	1008	1003	883	953	1104	22569
Zhetisu	386	598	694	583	617	670	853	718	637	25996
Mangistau	491	658	595	476	463	539	543	588	604	5756
TOTAL	32650	48859	52426	50072	50672	47090	44859	51847	53689	432164

Note: compiled by the authors

Astana dominates, reaching over 40 billion KZT in peak years (2021 and 2023), well ahead of Almaty and Shymkent. While Astana's average values fluctuated, they remained consistently higher even after a decrease in 2018, post Expo 2017. Almaty city maintained a mid-range average contract value (generally around 10 billion KZT) without dramatic shifts until 2022, but by 2024, the average had tripled. Shymkent, on the other hand, displayed modest, relatively stable average values, peaking in 2022 and dropping sharply by 2024. This divergence indicates that although Almaty leads in the number of contracts, Astana processes fewer but significantly larger-value contracts, likely reflecting its capital status and concentration of central government procurements.

When the remaining 16 regions are compared, there is significant volatility, especially since 2020. Karaganda had a dramatic increase in the average sum, from 12,5 million in 2016 to 485,6 million in 2024, a 38-fold increase. Aktobe saw a similar trend with a 23-fold increase in 9 years and overtook Karaganda as the leader in 2024. Regions with the lowest average sum in 2024 are Turkestan, Kostanay, Akmola, and Pavlodar, each with a sum of less than 100 million on average. Turkestan experienced a spike in 2019, when average contracts reached 391,7 million, most likely due to a new region status in 2018, but it gradually decreased to 80,2 million by 2024.

Regarding the contract failure rate shown in Table 3, Shymkent has exhibited a higher failure rate for most of the year, with significant volatility since 2016.

Table 3. Annual contract failure rate for 2016-2024

Region	2016	2017	2018	2019	2020	2021	2022	2023	2024	Overall
Astana city	1,6	2,1	3,0	3,4	3,7	3,5	2,2	3,3	2,2	2,8
Almaty city	2,4	4,1	3,1	4,5	2,5	5,5	3,9	2,1	3,4	3,5
Shymkent city	6,2	7,0	3,6	4,1	8,0	9,3	3,1	6,3	12,2	6,6
Aktobe	3,7	3,4	2,3	1,9	3,0	4,7	4,1	3,9	5,0	2,8
North Kazakhstan	2,0	1,9	1,8	2,0	2,9	3,7	2,6	4,5	4,9	3,0
Akmola	2,7	2,6	2,1	2,0	2,4	2,5	3,1	4,9	4,8	3,6
Zhambyl	3,3	3,0	3,2	2,9	2,5	4,0	3,1	4,6	4,6	3,8
Karaganda	3,4	3,5	3,2	2,0	4,2	3,4	3,2	4,1	4,4	4,0
Abay	1,4	3,9	1,9	2,0	3,5	2,2	2,0	4,4	4,3	2,6
East Kazakhstan	3,0	1,8	2,0	1,7	2,1	2,2	2,3	2,9	4,2	3,5
Mangistau	3,7	2,4	1,2	0,4	1,3	3,0	3,9	6,6	4,0	3,4
Zhetisu	4,4	3,3	3,3	2,9	2,3	3,4	2,2	4,9	3,6	3,5
Pavlodar	2,2	2,7	2,2	1,7	1,8	2,4	2,8	2,9	3,6	2,7
Almaty region	4,6	5,1	3,8	3,7	3,2	2,9	3,4	3,8	3,6	2,4
West Kazakhstan	1,9	1,8	1,9	2,3	1,9	3,0	2,9	4,7	3,4	2,9
Kostanay	3,0	2,8	1,8	1,6	2,8	2,4	2,8	3,7	3,4	2,5
Turkestan	4,5	4,5	1,8	1,7	5,2	3,3	3,3	4,4	3,4	2,9

Atyrau	3,6	3,6	5,1	4,4	5,0	5,6	3,5	2,8	2,5	3,6
Kyzylorda	3,1	3,0	0,9	1,6	1,9	3,1	2,9	2,8	2,0	2,5
MEAN (all regions)	3,2	3,3	2,5	2,5	3,2	3,7	3,0	4,1	4,2	3,3

Note: compiled by the authors

The failure rates were increasing from 2018 to 2021 to almost 9%, then sharply decreased the following year in 2022 to close to 2.5%, only to increase to an even higher level in 2024 to 12.2%, which is the highest failure rate across all regions and republican-level cities, 4 times the country average. Since gaining republican-level status in 2018 and adopting an independent procurement process, it might have contributed to volatility in their rate of success/failure over the years. Volatility was much lower in Almaty and Astana, with overall failure rates between 2% and 4% (except in 2021 in Almaty, which rose to 5,5%). Across the other 16 regions, most of the regions fluctuated around 2% and 5% failure rate, and the majority around 3-4% in 2024. Two regions with the lowest failure rates are Atyrau at 2,5% and Kyzylorda at 2%, the only two below 3%. Both of these regions maintained a relatively low failure rate throughout the years, never exceeding 4%. Mangistau region experience the most volatile failure rates, with a sharp decrease from 2016 to 2019 (from 3,7% to 0,4%), followed by a steady increase to 6,6% through 2023, the highest among all regions across all years. In 2024, it fell to 4% again, back to the country's average.

To sum up, a descriptive review shows significant disparity across republican-level cities and regions for all three procurement indicators, with varying volatility and trend. This warrants further investigation of the determinants of public procurement indicators using econometric techniques that control for variation across regions and years to understand what and how to mitigate the risks that affect the efficient procurement process at the subnational level.

Table 4 reports the main regression results using the share of failed contracts as the dependent variable.

Table 4. Fixed effect regression results for the share of failed contracts

Dependent variable	Share of Failed Contracts			
	1	**2**	**3**	**4**
Transfer dependence	**0.055***	0.044	0.056	-0.268
	(0.029)	(0.035)	(0.043)	(0.325)
Log GRP per capita	-0.001	-0.014	-0.014	-0.010
	(0.011)	(0.011)	(0.011)	(0.011)
CPI	**0.004*****	**0.003*****	**0.003*****	0.002
	(0.001)	(0.001)	(0.001)	(0.002)
Log SME per capita	-	0.003	0.004	**0.008***
	-	(0.002)	(0.002)	(0.004)
Unemployment rate	-	0.011	0.011	0.011
	-	(0.010)	(0.011)	(0.013)
Urbanization rate	-	**0.002****	**0.002****	0.001
	-	(0.001)	(0.001)	(0.001)
Log average wage	-	-0.003	-0.002	-0.021
	-	(0.018)	(0.019)	(0.026)
Dependence squared	-	-	-0.016	-
	-	-	(0.036)	-
Dependence * CPI	-	-	-	0.003
	-	-	-	(0.003)
Number of observations	98	93	93	93
R-squared	0.625	0.707	0.707	0.725
R-squared adjusted	0.515	0.592	0.586	0.610
R-squared within	0.152	0.308	0.309	0.350
R-squared within adjusted	0.118	0.235	0.224	0.270

AIC	-655.0	-637.4	-635.4	-641.1
Note: Statistical significance at * 0.1, ** 0.05, *** 0.01 levels. Standard errors clustered by region are in parentheses. Data are for 2017-2023. All specifications include region and year fixed effects. Transfer dependence is calculated as transfer amounts divided by the region's total revenue. SME includes the number of registered small and medium enterprises and individual entrepreneurs.				

Note: compiled by the authors

All specifications include region and year fixed effects, which account for time-invariant unobserved regional characteristics (e.g., geography, local cultural factors) as well as time-variant macroeconomic and policy shocks common across regions. Standard errors are clustered at the regional level. Across all models, overall fit is strong, with adjusted R-squared values exceeding 0.62.

The results for transfer dependence, measured as the share of intergovernmental transfers in total regional revenue, are mixed. In the base specification (Model 1), which conditions only on economic factors (log GRP per capita and CPI) and fixed effects, transfer dependence is positively associated with the share of failed contracts, with statistical significance at the 10% level. This finding is broadly consistent with fiscal federalism and soft-budget-constraint theories, which propose that regions that rely more heavily on central transfers may face weaker marginal budget discipline, lower incentives to oversee procurement decisions, or more political pressure to initiate projects despite limited administrative capacity. However, this association is not robust: after including additional observed regional characteristics such as log number of SME per capita, unemployment, urbanization rates, and average wages (Models 2-4), the coefficient on Transfer dependence becomes statistically insignificant.

In contrast, inflation, measured by the regional CPI, demonstrates a much stronger and more consistent relationship with procurement failure. In Models 1-3, CPI has a positive coefficient that is statistically significant at the 1% level. A one-unit increase in the CPI index is associated with a 0.3-0.4 percentage-point increase in the failure rate. This aligns with theories of incomplete contracts and the classical "Tanzi effect": inflation erodes the real value of budgets, raises the volatility of input prices, and increases the likelihood of implementation delays, renegotiations, or cancellations. High-inflation environments, thus, create uncertainty for both procuring agencies and suppliers, making contract execution more difficult and increasing the probability of failure.

Urbanization is another significant predictor in some specifications. In Models 2 and 3, the urbanization coefficient is positive and statistically significant at the 5% level. This is intuitive: more urbanized regions tend to handle larger and more complex procurement projects, which may face greater implementation or coordination challenges that can contribute to failures.

Other predictors, including log GRP per capita, unemployment, log number of SME per capita, and average wages, are not statistically significant across all specifications. Furthermore, neither the quadratic term in transfer dependence nor the interaction between transfer dependence and CPI has a significant effect.

Table 5 reports the results of regression analyses with procurement activity, log average sum of contracts per capita, and log contracts per capita as dependent variables.

Table 5. Fixed effect regression results for procurement activity

Dependent variable	Log Average Sum of Contracts Per Capita			Log Contracts Per Capita		
	1	**2**	**3**	**4**	**5**	**6**
Transfer dependence	-0.469	-0.502	**-3.830***	0.602	0.943	0.995
	(1.526)	(0.958)	(1.907)	(0.833)	(0.697)	(1.034)
Log GRP per capita	0.290	-0.416	-0.380	0.251	0.024	0.023
	(0.647)	(0.652)	(0.662)	(0.318)	(0.146)	(0.151)
CPI	0.056	0.111	0.123	0.008	0.034	0.033
	(0.149)	(0.106)	(0.115)	(0.049)	(0.034)	(0.036)
Log SME per capita	-	0.133	0.085	-	**0.154***	0.155
	-	(0.295)	(0.310)	-	(0.087)	(0.095)

Unemployment rate	-	**-1.917****	**-1.759****	-	**-0.777***	**-0.780***
	-	(0.710)	(0.750)	-	(0.403)	(0.434)
Urbanization rate	-	0.066	0.056	-	-0.007	-0.007
	-	(0.043)	(0.039)	-	(0.021)	(0.022)
Log average wage	-	2.480	2.150	-	**1.470****	**1.475****
	-	(1.615)	(1.604)	-	(0.644)	(0.638)
Dependence squared	-		**4.410***	-	-	-0.070
	-		(2.381)	-	-	(1.516)
Number of observations	117	113	113	117	113	113
R-squared	0.946	0.966	0.967	0.946	0.959	0.959
R-squared adjusted	0.931	0.953	0.954	0.931	0.945	0.944
R-squared within	0.009	0.219	0.244	0.027	0.226	0.226
R-squared within adjusted	-0.024	0.153	0.171	-0.005	0.160	0.150
AIC	174.0	131.1	129.3	-24.7	-43.7	-41.7
BIC	245.8	212.9	213.9	47.1	38.1	42.8
Note: Statistical significance at * 0.1, ** 0.05, *** 0.01 levels. Standard errors clustered by region are in parentheses. Data are for 2017-2023. All specifications include region and year fixed effects. Transfer dependence is calculated as transfer amounts divided by the total revenue of the region. SME includes the number of registered small and medium enterprises and individual entrepreneurs.						

Note: compiled by the authors

These models also include region and year-specific fixed effects, with standard errors clustered at the regional level. Transfer dependence shows a statistically significant non-linear relationship with the log average sum of contracts per capita in Model 3. The negative linear term and positive squared term imply that the marginal effect of transfer dependence on procurement spending is initially negative but becomes positive at higher levels of dependence (above 44%). This finding is consistent with the expectation that regions with lower or moderate reliance on central transfers tend to reduce procurement spending. In contrast, regions that are highly dependent on central funding may continue to increase procurement activity due to greater support from the central government.

Most regions in Kazakhstan exceeded the 44% average transfer dependence threshold during 2017-2023. Only two industrial regions and two republican-level cities fall below it: Astana city (37.3%), Mangystau region (31.5%), Almaty city (17.8%), and Atyrau region (13.1%). However, there is no robust evidence that transfer dependence is systematically associated with either procurement spending or the number of contracts across the complete set of models.

The unemployment rate shows a consistent and statistically significant negative relationship with procurement activity. A one-percentage-point increase in unemployment is associated with a 1.8-1.9% decrease in the average sum of contracts per capita (significant at the 5% level) and a 0.8% decrease in the number of contracts per capita (significant at the 10% level).

Average wages are positively and significantly associated with the number of contracts per capita in Models 5 and 6. Regions with a 1% higher average wage level tend to have approximately 1.5% more procurement contracts, holding other factors constant. This relationship does not extend to the value of procurement contracts. There is also a modest positive relationship between log SME per capita and log number of contracts per capita (Model 5), which is intuitive, though not consistently significant across specifications. Log GRP per capita, CPI, and urbanization do not show statistically significant effects in any of the procurement-activity models, even when fixed effects and other controls are included.

Overall, the results in Tables 1 and 2 indicate that inflation is a strong predictor of procurement failures, whereas transfer dependence has limited explanatory power for either procurement failures or procurement activity. By contrast, regional labor market conditions, such as unemployment and income levels, appear to play a more central role in shaping procurement activity across Kazakhstan's regions.

CONCLUSION

This study investigates the determinants of public procurement failure and activity across Kazakhstan, using a unique panel dataset of regional procurement and economic indicators from 2017 to 2023. By combining descriptive statistics with fixed-effects regression models, the study examines how transfer dependence, economic development, inflation, labor-market conditions, and regional administrative capacity influence procurement outcomes across regions.

The findings show that inflation is positively and strongly associated with procurement failure, emerging as a key constraint on procurement outcomes at the regional level. Higher inflation significantly increases the likelihood of contract failure, underscoring the macro-fiscal vulnerability of procurement systems in inflationary environments. Unemployment consistently reduces procurement activity by lowering both the number and the value of contracts per capita, pointing to the importance of regional labor-market conditions. Transfer dependence, by contrast, shows some significant, but limited influence on procurement failure rates and quantities. Notably, the results do not indicate that wealthier regions systematically perform better in procurement once unobserved regional and time factors are accounted for.

Despite its contributions, the paper faces several limitations. First, the analysis relies on administrative procurement data, which may not fully capture informal practices, strategic behavior, or off-budget procurement channels. Second, the empirical approach is observational and cannot establish causal relationships. Further research could explore administrative records in greater detail, including disaggregation by contract type, sectoral patterns, and failure mechanisms, or could exploit institutional reforms or quasi-experimental variation to strengthen causal inference.

Overall, this study provides one of the first quantitative assessments of Kazakhstan's procurement landscape at the regional level and highlights the role of macroeconomic conditions and fiscal decentralization in shaping public procurement outcomes. The findings provide evidence for a consistent and robust influence of inflation on procurement failure. At the same time, the sign of fiscal decentralization and soft-budget constraints driven by transfer dependence is weak. In terms of policy implications, this suggests that ensuring price stability may be a key macroeconomic condition for improving procurement performance across Kazakhstan's regions, complemented by targeted, but likely limited in effectiveness, policies aimed at strengthening intergovernmental fiscal structures and regional economic conditions.

AUTHOR CONTRIBUTIONS

Conceptualization and theory: BY; research design: BY, AT and OZ; data collection: AT and OZ; analysis and interpretation: BY and OZ; writing draft preparation: BY, AT and OZ; supervision: BY; correction of article: BY, AT and OZ; proofread and final approval of article: BY, AT and OZ. All authors have read and agreed to the published version of the manuscript.

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