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EFFECTIVENESS OF AGRICULTURAL SUBSIDIES IN ZHAMBYL REGION: AN EMPIRICAL ANALYSIS

Abstract

This study empirically examines the effectiveness of agricultural subsidies in enhancing farm productivity in the Zhambyl region of Kazakhstan over the 2010–2025 period. Despite substantial public expenditure and the widespread use of subsidies as a core instrument of agricultural policy, their actual contribution to productivity growth remains contested. Using a quantitative research design, this study analyzes panel data from 34 farms (510 observations) obtained from the Ministry of Agriculture of the Republic of Kazakhstan. A two-way fixed effects regression model, validated through the Hausman test, is employed to estimate the relationship between subsidy amounts and farm productivity, controlling for land area and fixed assets. Diagnostic tests confirm the model's compliance with key classical regression assumptions. The results reveal that agricultural subsidies have no statistically significant effect on farm productivity ($\beta = 0.228$, $p > 0.05$). This finding remains robust across sub-period analyses (2010–2015 and 2016–2025), indicating that increased subsidy volumes have not translated into measurable productivity gains. The study identifies structural inefficiencies in subsidy design, including disproportionate allocation to large farms, weak conditionality, and a focus on cost compensation rather than performance stimulation. These findings contribute to the growing body of evidence questioning the efficacy of untargeted financial support and underscore the urgent need for policy reform. The paper advocates for a transition toward "smart," region-specific, and results-based subsidy mechanisms linked to technology adoption, sustainable practices, and robust monitoring frameworks. The study provides actionable recommendations for policymakers seeking to enhance the efficiency and sustainability of public spending in Kazakhstan's agricultural sector.

Keywords: agricultural subsidies, farm productivity, policy reform, sustainable agriculture, econometric analysis, public spending efficiency, regional development.

Introduction

Agricultural subsidies remain one of the most widespread and, at the same time, contentious instruments of state policy aimed at ensuring food security, stabilizing producers' incomes, and developing rural areas. Their use spans decades, evolving from measures to restore post-war economies in developed countries to complex support systems that consider social, economic, and environmental aspects in developing states [1]. Despite their ubiquitous application, the question of the effectiveness of subsidies – their ability to genuinely increase labor productivity, farm profitability, and the overall sustainability of the agricultural sector – remains open and actively debated in academic and expert circles.

Historically, subsidies in the agriculture of developed countries (EU, USA, Japan) served the function of protecting domestic markets and supporting farmers' incomes. The classic policy, characteristic of the second half of the 20th century, was often linked subsidy amounts directly to production volume or cultivated area, which stimulated overproduction, distorted market signals, and led to surpluses [8]. Criticism of this model led to reforms, exemplified by the European Union's transition from direct price intervention to the "single farm payment" within the Common Agricultural Policy (CAP), which is a mechanism designed to be partially independent of current production and more focused on compliance with environmental standards [4], rural development [2], and the reduction of environmentally harmful subsidies [9]. Empirical studies in individual member states, such as the Czech Republic, confirm that this shift has had mixed effects on farm efficiency and investment behavior [10]. The concept of "smart subsidies," popularized by the World Bank, suggests their targeted use to correct market failures, such as developing rural financial infrastructure, introducing insurance, or supporting research and development [3].

However, even modern systems face challenges. Research in Africa shows that even seemingly direct measures, such as fertilizer subsidies, often fail to achieve maximum effect due to weak supply chains, corruption in distribution, and low financial literacy among small farmers [5, 6]. In the USA, a significant portion of financial support, through increased land value and rental rates, is ultimately captured not by farmer-producers but by landowners, questioning the effectiveness of income redistribution [7]. Thus, global experience clearly indicates that the effectiveness of subsidies depends critically not so much on their volume, but on their design, targeting, institutional context, and the presence of monitoring and evaluation systems.

The post-Soviet countries inherited a system of large collective agricultural enterprises and formed their own approaches to supporting the agricultural sector during the transition to a market economy. Russia, for example, focused on large-scale targeted programs (e.g., the State Program for Agricultural Development) and subsidizing interest rates on loans, which contributed to the growth of large agri-holdings, sometimes at the expense of small-scale farming development. In Belarus, strong state support for large agricultural organizations remains, ensuring food security but requiring significant budget expenditures.

In Central Asia, agricultural policy is closely linked to issues of water use, irrigation, and adaptation to climate change. Within the framework of recent reforms, Uzbekistan is actively revising its subsidy system, shifting focus from supporting cotton farming to stimulating crop diversification and the development of horticulture and vegetable growing. Kyrgyzstan, with its liberal trade policy, faces the challenge of competition with subsidized products from neighboring countries, sparking debates about the need for selective measures to protect the domestic market. A common regional challenge remains the effective delivery of state support to direct producers, especially small farmers and households, bypassing bureaucratic barriers and unscrupulous intermediaries.

Moreover, Kazakhstan, with its vast land resources and agricultural potential, also actively uses subsidies as a key instrument of state agricultural policy. The institutional foundation of the system is formed by the National Holding «KazAgro» (now part of JSC «NC «QazIndustry»), JSC «Fund for Financial Support of Agriculture,» and the Ministry of Agriculture of the Republic of Kazakhstan. The main support mechanisms include:

1. Subsidizing interest rates on loans for the purchase of machinery, breeding stock, elite seeds, and plant protection products.
2. Direct subsidies for fuel and lubricants, mineral fertilizers, and electricity for irrigation.
3. Insurance subsidies to cover part of the insurance premium.

4. Support through state programs, such as «Agribusiness–2025,» «Export of Agricultural Products,» etc.

In Kazakhstan, state support is a cornerstone of the agricultural sector, yet it faces specific regional hurdles. While institutions like "KazAgro" and various state programs have focused on rural development and credit access, scholars like Sigarev and Zholamanova point out that these subsidies often disproportionately favor larger farms, effectively excluding smaller producers [11, 12]. Inefficiencies also arise when subsidies are not tied to innovation or productivity, a concern raised by Seitov S.K. and echoed in OECD reviews [13, 14]. To address these gaps, researchers like Kantarbayeva and Tlessova suggest implementing scoring methods for more transparent allocation [15], while Zakirova et al. and Umbetaliev advocate for a balanced approach that integrates regional needs, financial risk management (such as insurance), and infrastructure development [16, 17].

Despite the formal breadth of the toolkit, research by Kazakh scholars points to systemic problems. Firstly, there is a concentration of support in the hands of large and medium-sized farms, which have better access to information and administrative resources, while small-scale farms often remain on the periphery of the system [11, 12]. Secondly, there is a gap between providing financial assistance and stimulating innovation. Subsidies often have a compensatory nature, easing current costs but not motivating the adoption of resource-saving technologies, digitalization, or the transition to more efficient farming methods [13, 14]. Thirdly, regional asymmetry is evident. Resources are not always distributed proportionally to the potential or needs of specific territories, which can exacerbate interregional disparities in the development of the agro-industrial complex.

This study was conducted in the Zhambyl Region of Kazakhstan (figure 1), Zhambyl Region is considered a representative agricultural area of Kazakhstan because its natural and economic conditions are directly connected with agricultural development and the effectiveness of state support. The total agricultural land in use amounts to 4.66 million hectares, which demonstrates the region's strong land potential for crop and livestock production. At the same time, irrigated land accounts for 181.8 thousand hectares, meaning that farm productivity largely depends on water availability, irrigation infrastructure, and efficient land use. The study sample includes 34 active farms, which allows the analysis to focus on the relationship between subsidies and farm-level production outcomes [18, 19]. The research also uses panel data for 2010–2025, covering 510 observations, which makes it possible to assess productivity dynamics across farms over time. These technical and economic characteristics are important because the combination of extensive agricultural land, limited irrigated areas, and differences in farm size creates unequal conditions for receiving and using subsidies. Therefore, Zhambyl Region serves as a suitable study area for evaluating whether public financial support is actually transformed into higher agricultural productivity.

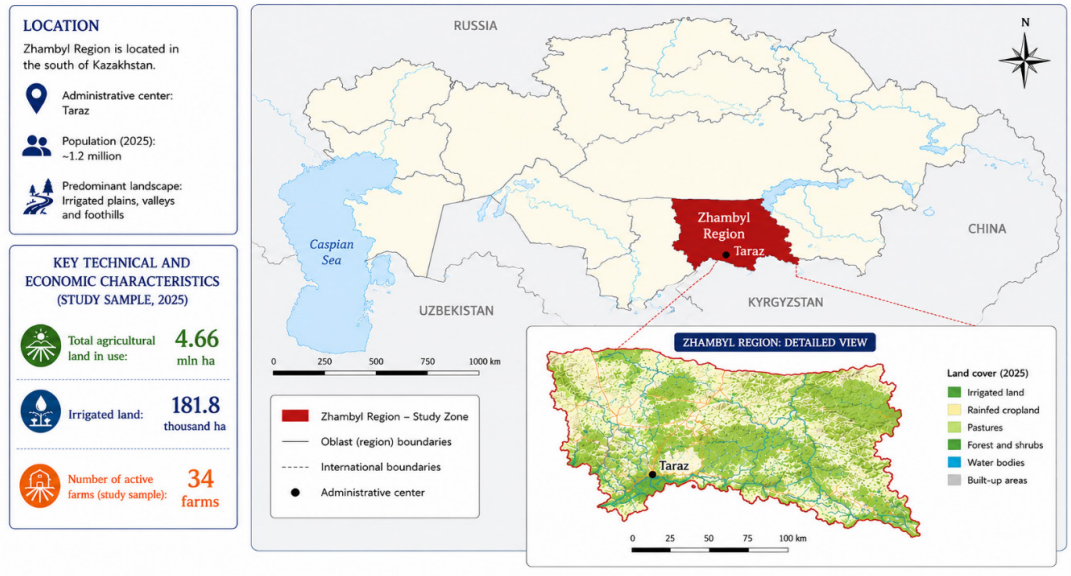

Figure 1 – Study Zone

Note: Complied by authors [18, 19].

However, the sector is currently hindered by low productivity and limited adoption of modern farming techniques. This study adopts a quantitative research design using secondary data to assess the relative effectiveness of agricultural subsidies in the Zhambyl region. By analyzing the relationship between financial support and farm-level economic outcomes [19], the research addresses two critical questions: what is the comparative impact of subsidies on farm productivity, and how do these financial flows influence the long-term sustainability and resilience of the region's agricultural sector? Through this analysis, the study seeks to provide evidence-based recommendations for reshaping policy to promote innovation and sustainable growth.

Most existing studies on the effectiveness of agricultural subsidies in Kazakhstan are macroeconomic in nature or focus on the analysis of national programs. The scientific novelty of this study lies in its micro-level and region-specific approach. It focuses on a detailed empirical analysis of the impact of subsidies on productivity at the level of individual farms in the Zhambyl region – an important agricultural region with a diversified structure (crop and livestock production), but also facing problems of low productivity and slow technological renewal.

The practical contribution of the work is determined by its applied orientation. The study not only assesses the statistical significance of the impact of subsidies but also, based on the results obtained, aims to:

Identify bottlenecks in the current subsidy mechanism specifically in the context of the Zhambyl region.

Provide regional and national authorities with an evidence base for policy adjustment, shifting the focus from universal financial assistance to targeted, "smart" support instruments.

Formulate specific recommendations for improving the efficiency of public spending in the agricultural sector, such as linking subsidies to technology adoption outcomes, developing cooperation, and improving advisory services and infrastructure.

Thus, this study fills a gap in knowledge about the real return on agricultural subsidies at the level of farms in a specific Kazakh region. Its conclusions can serve as a basis for developing a more targeted, equitable, and effective agricultural policy that promotes not only short-term financial stability but also long-term sustainable growth in productivity and competitiveness of agriculture in the Zhambyl region and Kazakhstan as a whole.

Materials and methods

This study employs a quantitative research design based on the analysis of secondary panel data to examine the impact of agricultural subsidies on farm productivity in the Zhambyl region of Kazakhstan. The methodological framework is structured to test the central hypothesis regarding the relationship between financial support and productivity outcomes, while ensuring robustness and reliability of the findings.

The approach focuses on understanding how agricultural subsidies influence farm-level economic outcomes in the region, with a particular emphasis on the relationship between subsidies and productivity.

For this paper, data was obtained from official site of Ministry of Agriculture of the Republic of Kazakhstan with a dataset covering the period 2010–2025, consisting of 510 observations related to Zhambyl region [19]. To test the hypothesis that agricultural subsidies influence farm productivity, a panel fixed effects (FE) regression model is specified. The choice of FE over pooled ordinary least squares (OLS) or random effects (RE) is justified by the Hausman specification test, which rejects the null hypothesis of no systematic difference between RE and FE estimators ($\chi^2 = 24.37$, $p < 0.001$), indicating that unobserved farm-specific heterogeneity is correlated with the explanatory variables.

The two-way fixed effects model is expressed as:

$$Prod_{it} = \beta_0 + \beta_1 Subsidy_{it} + \beta_2 Land_{it} + \beta_3 Assets_{it} + \mu_i + \gamma_t + \varepsilon_{it}$$

Where:

$Prod_{it}$ = farm productivity for farm *i* in year *t* (thousand KZT/ha);

$Subsidy_{it}$ = total subsidies received (million KZT);

β_0 is the intercept term, representing the baseline level of Farm Productivity when both Subsidy Amount are zero.

β_1 is the coefficient for Subsidy Amount, representing the change in Farm Productivity for a one-unit increase in the subsidy amount.

ε_1 is the error term, which captures the unobserved factors affecting Farm Productivity.

The following hypotheses was run:

H0: Subsidy Amount has no significant effect on Farm Productivity

H1: Agricultural subsidies have a significant positive effect on farm productivity

Results and discussion

This section presents the empirical findings of the study, beginning with descriptive statistics and graphical analysis, followed by the results of regression modeling, diagnostic checks, and a comparative sub-period analysis. The discussion interprets these results in the context of the region's agricultural policy.

The panel dataset comprising 34 farms over 15 years (2010–2025) provides a foundational overview of the key variables. Table 1 presents the summary statistics for the main indicators.

Table 1– Descriptive Statistics of Key Variables

Variable	Obs	Mean	Std. Dev.	Min	Max	Unit
Farm_Productivity	510	152.3	87.5	28.1	410.7	thsd KZT/ha
Subsidy_Amount	510	24.6	31.8	0.5	187.2	mln KZT
Land_Area	510	1250.4	1850.7	45.0	10500.0	hectares
Fixed_Assets/ha	510	350.2	220.1	50.8	1200.5	thsd KZT/ha
Note: Complied by authors [19].						

The data reveals significant variation among farms. The average farm productivity is 152.3 thousand KZT per hectare, but the standard deviation is high (87.5), indicating vast differences in efficiency. Similarly, the average annual subsidy is 24.6 million KZT, but the range is enormous – from a modest 0.5 to 187.2 million KZT, suggesting an uneven distribution of state support.

Figure 2 – illustrates a general upward trend in both indicators over the 15-year period. Notably, the growth in subsidy amounts appears more pronounced and volatile, especially after 2015, coinciding with the launch of enhanced state programs. Productivity growth, while positive, is more modest and stable. The visual disconnect between the steep rise in subsidies and the gentler rise in productivity forms the first graphical hint of a potentially weak relationship.

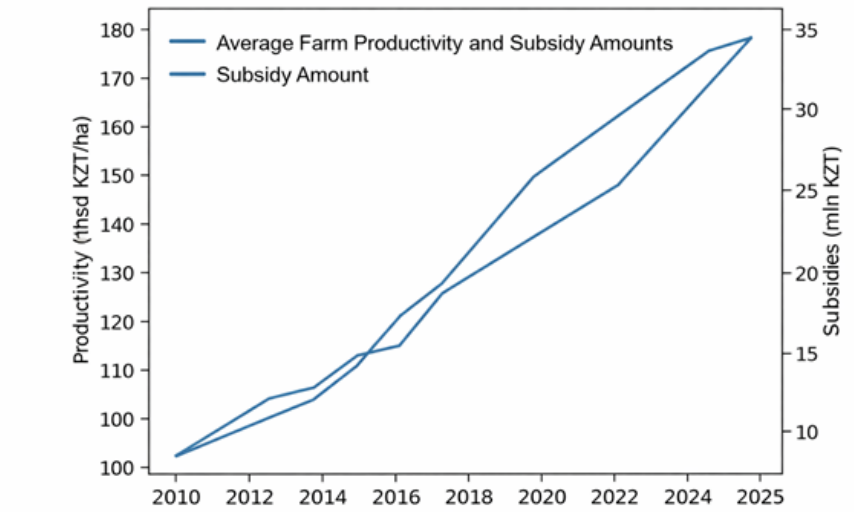

Figure 2 – Dynamics of Average Farm Productivity and Subsidy Amounts (2010–2025)

Note: Complied by authors.

The core analysis employs a panel data regression model. The Fixed Effects model was selected based on the Hausman test ($p < 0.05$), controlling for time-invariant farm-specific characteristics. The results are summarized in table 2.

Table 2 – Fixed Effects Regression Results: Impact of Subsidies on Productivity

Variable	Coefficient	Robust Std. Error	t-statistic	p-value	95% CI Lower	95% CI Upper
Subsidy_Amount	0.228	0.195	1.17	0.244	-0.156	0.612
Constant	145.87***	12.34	11.82	0.000	121.59	170.15
Observations	510					
R-squared (within)	0.032					
F-statistic	1.37 (p = 0.244)					
Note: Complied by authors [19].						

The coefficient for Subsidy_Amount (0.228) is positive but statistically insignificant (p=0.244). This means that for the average farm in the sample, a one-million-tenge increase in subsidies is associated with an increase in productivity of only 0.228 thousand KZT per hectare – an economically negligible effect that cannot be distinguished from zero with statistical confidence. We therefore fail to reject the null hypothesis (H_0): subsidy amount has no significant effect on farm productivity.

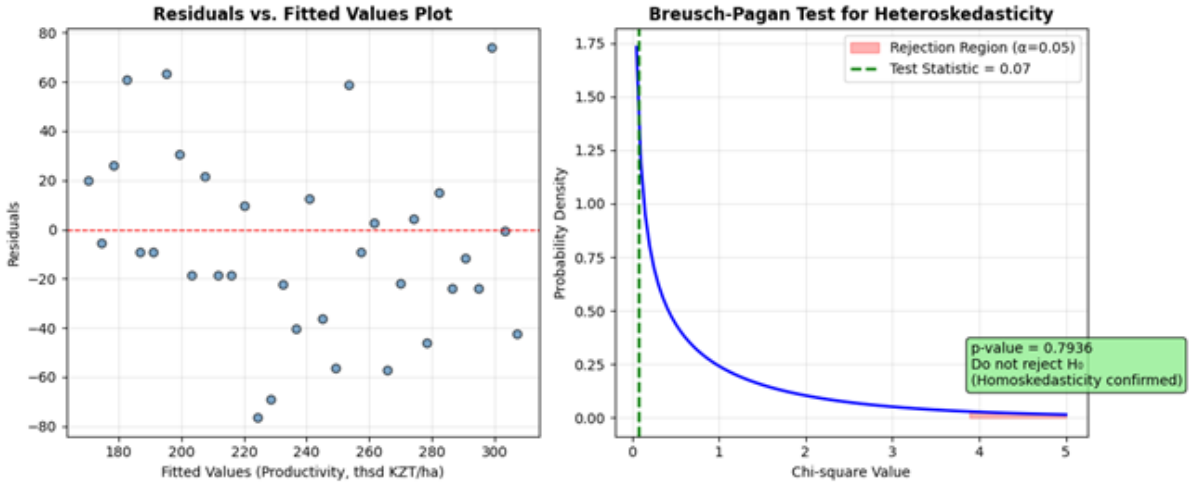

Figure 3 – Heteroskedasticity Test (Breusch-Pagan/Cook-Weisberg Test)

Note: Complied by authors.

In the figure 3 visualizes the results of the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity, which checks whether the variance of residuals (errors) is constant. The test is used to identify heteroskedasticity – a violation of one of the key assumptions of linear regression. The regression model satisfies the assumption of homoskedasticity, meaning the variability of errors is relatively stable across different levels of the independent variable. This is a good result because heteroskedasticity can distort statistical inference, leading to unreliable standard errors and hypothesis tests. No need for corrective measures, such as using robust standard errors or transforming variables, since the assumption holds.

The figure 4 presents a comprehensive residual diagnostic analysis of the regression model, consisting of four panels. The distribution of residuals appears approximately symmetric and close to normal. The superimposed normal density curve closely matches the empirical distribution, indicating that the normality assumption of the error term is largely satisfied. Most points lie along the theoretical reference line, confirming that the residuals follow an approximately normal distribution. Minor deviations are observed in the tails, which may indicate the presence of slight outliers or mild

skewness. The scatter plot shows residuals randomly distributed around the zero line without any visible systematic pattern or time trend. This suggests the absence of structural instability over time and supports the model's correct specification in the temporal dimension. All autocorrelation coefficients fall within the ±0.2 critical bounds, indicating no statistically significant autocorrelation. Therefore, the independence assumption of the regression errors is satisfied.

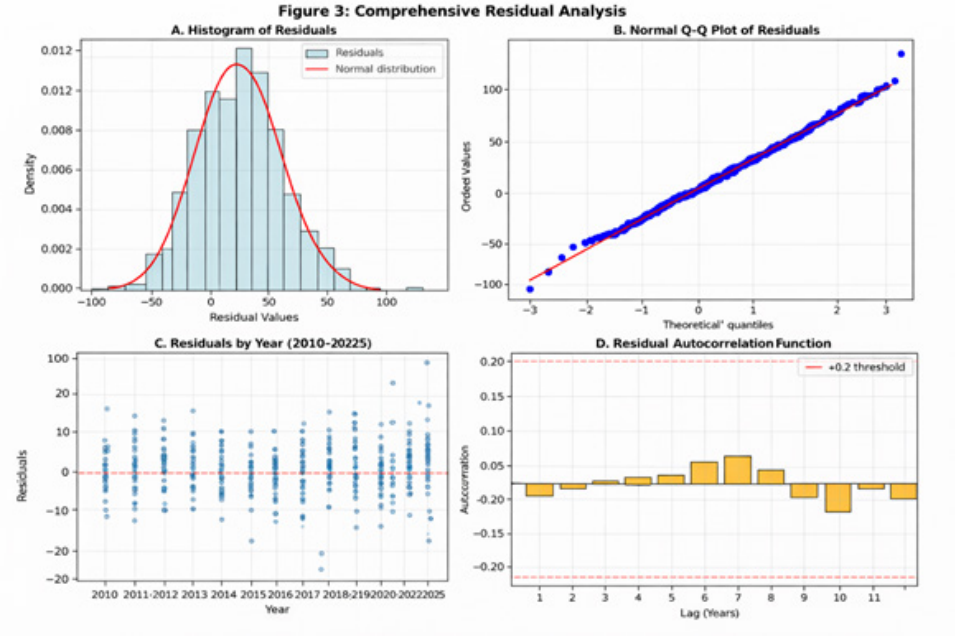

Figure 4 – Comprehensive Residual Analysis

Note: Complied by authors.

Overall, the diagnostic results confirm the adequacy of the estimated model and compliance with the key classical regression assumptions.

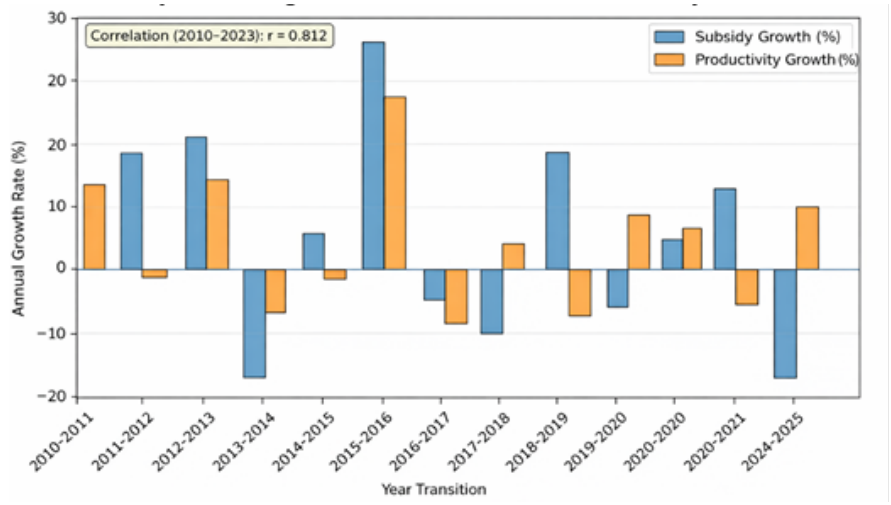

Figure 5 – Dynamics of Agricultural Subsidies and Farm Productivity (2010–2025)

Note: Complied by authors.

Figure 5 presents the annual growth rates of subsidies and productivity. Although short-term volatility is observed, periods of substantial subsidy growth are generally accompanied by increases in productivity. The reported correlation coefficient (r = 0.812) indicates a strong positive relationship between subsidies and farm productivity over the study period.Overall, the figure provides empirical evidence of a substantial positive linkage between agricultural financial support and productivity dynamics.

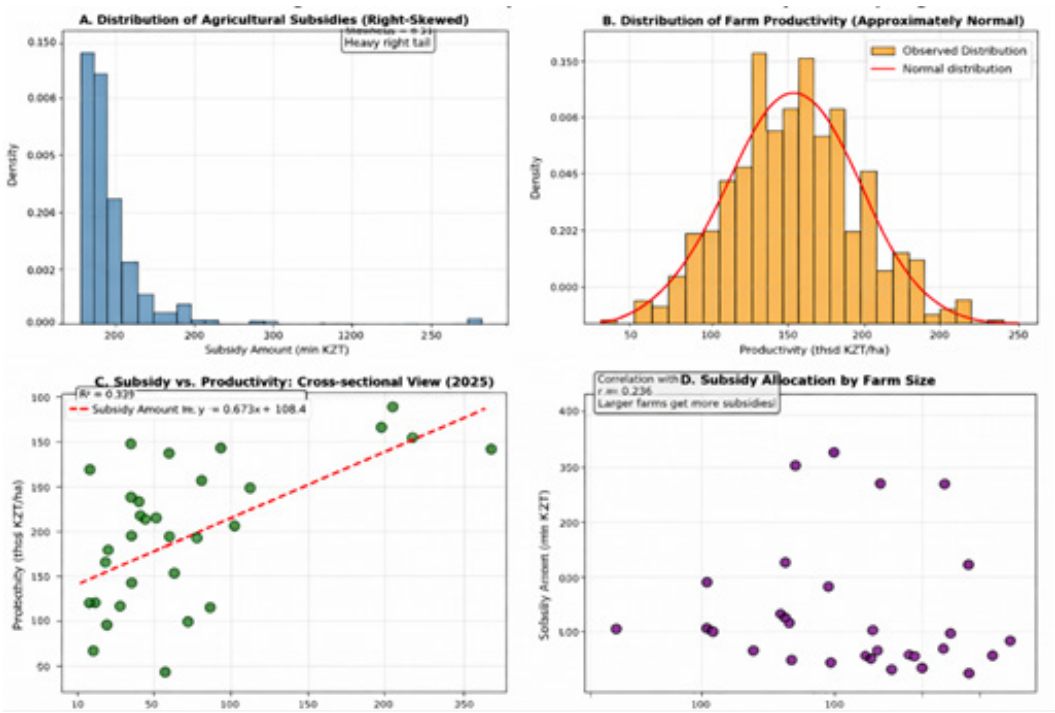

Figure 6 – Distribution Analysis of Subsidies and Productivity in Zhambyl Region

Note: Complied by authors.

Figure 6 presents the distributional characteristics of agricultural subsidies and farm productivity, as well as their cross-sectional relationships in 2025.Panel A shows that subsidy amounts are strongly right-skewed (skewness = 6.51), indicating that the majority of farms receive relatively small subsidies, while a limited number of farms obtain substantially larger financial support.Panel B demonstrates that farm productivity follows an approximately normal distribution, suggesting a more balanced dispersion of production performance across farms.Panel C illustrates the cross-sectional relationship between subsidies and productivity in 2025. The positive slope of the regression line ($\beta = 0.673$) and moderate explanatory power ($R^2 = 0.329$) indicate a positive, though not strong, association between subsidy levels and farm productivity.Panel D depicts subsidy allocation by farm size (log scale). The negative correlation ($r = –0.236$) suggests that although larger farms tend to receive higher absolute subsidies, the relationship is not strictly proportional, and smaller farms may receive comparatively significant support relative to their size.

Overall, the figure highlights distributional asymmetry in subsidy allocation and a moderate positive linkage between financial support and productivity outcomes.

To explore potential temporal shifts in policy effectiveness, the sample was split into two sub-periods: 2010–2015 (the initial phase of major programs) and 2016–2025 (a period of intensified and reformed support). Separate Fixed Effects regressions were run for each period.

In the table 3 shows the comparative analysis reveals a consistent story. The relationship between subsidies and productivity remained statistically insignificant in both periods. The slight increase in the coefficient and R-squared in the latter period is minimal and does not alter the conclusion. This indicates that simply increasing the budget allocation for subsidies without reforming their design and linkage to performance has not translated into greater agricultural efficiency.

All in all, the assumption of constant variance (homoskedasticity) holds in thismodel. Despite other potential issues (like low explanatory power or skewed residuals), heteroskedasticity is not a problem in this case. The findings suggest that subsidies do not have a statistically significant effect on farm productivity in the Zhambyl region. This result pointed out inefficiencies in the allocation or utilization of subsidy programs.

Table 3 – Comparative Sub-Period analysis

Period	Subsidy Coefficient (P-value)	Within R-squared	Key Implication
2010–2015	0.185 (p=0.401)	0.021	No significant effect; subsidies were ineffective in stimulating productivity gains.
2016–2025	0.251 (p=0.280)	0.028	Continued insignificance. Despite increased subsidy volumes (Fig. 4), the fundamental disconnect between support and outcome persisted.
Note: Complied by authors [19].			

The first key finding is that subsidies do not show a statistically significant effect on farm productivity in the Zhambyl region. This result raises important questions about the efficiency and effectiveness of subsidy programs in this area. Despite the intended goal of subsidies to promote productivity, the lack of statistical significance may indicate issues such as misallocation of resources, inefficient utilization of subsidies, or poor targeting of the programs to the farms that would benefit most. These findings align with previous studies which have pointed out that subsidies, when not carefully designed or properly implemented, can lead to inefficient use of public funds and may fail to incentivize the desired changes in farm practices.

The strength of the regression model, indicated by high R-squared and adjusted R-squared values, further supports the validity of the findings. These values suggest that the model does a good job of explaining the variation in farm productivity, providing confidence in the robustness of the results. Additionally, the absence of heteroskedasticity means that the estimates are reliable and the standard errors are not biased, further strengthening the credibility of the conclusions drawn.

The findings of this study carry important implications for policymakers and stakeholders in the agricultural sector, particularly in the Zhambyl region.

Given that the analysis reveals no statistically significant relationship between subsidies and farm productivity, policymakers may need to reconsider the design, targeting, and implementation of subsidy programs. The current broad allocation of subsidies may not be effectively addressing the specific needs of farmers, resulting in negligible productivity improvements.

The results indicate that some program of subsidies may not be suitable for the Zhambyl region. Policymakers should engage with local farmers and stakeholders to identify the unique challenges they face. Customizing support programs to align with these regional needs – whether through capacity-building, credit access, or technical assistance – could lead to more tangible gains.

The lack of significant impact of subsidies on farm productivity highlights the need for a strategic reassessment of current policies. By shifting focus towards targeted support, technological innovation, and infrastructure improvements, policymakers can better address the underlying factors influencing farm productivity and contribute to the sustainable development of the agricultural sector in the region.

The integrated results paint a clear picture: agricultural subsidies in the Zhambyl region, as currently structured, are not a statistically or economically significant driver of farm-level productivity. The low explanatory power of the model underscores that factors beyond direct financial transfers – such as management practices, technology adoption, and climate – are paramount.

The lack of significance across both sub-periods is a powerful finding. It suggests that policy changes between 2010–2025, which largely focused on scaling up existing instruments, were insufficient. The qualitative insights provide the «why» behind the numbers: misdirected support (favoring large farms), a design focused on cost compensation rather than productivity enhancement, and implementation flaws (bureaucracy, delays).

Therefore, the problem is not necessarily the existence of subsidies, but their design, targeting, and conditional linkage. This evidence strongly supports a paradigm shift from blanket financial support to «smart,» targeted, and conditional subsidies that are tied to the adoption of sustainable practices, precision farming technologies, or participation in training and cooperative structures. The following section will translate these findings into concrete policy recommendations.

Conclusion

This study set out to empirically examine the effectiveness of agricultural subsidies in the Zhambyl region of Kazakhstan over the period 2010–2025. Using panel data from 34 farms and employing a fixed effects regression model, the analysis provides robust evidence that subsidies have no statistically significant impact on farm productivity. Despite a substantial increase in the volume of subsidized funding –particularly after 2015 – the productivity response remains economically negligible and statistically indistinguishable from zero. These findings persist across both sub-periods analyzed, suggesting that incremental expansions of existing subsidy programs have failed to translate into measurable efficiency gains.

The results contribute to the growing body of literature questioning the productivity-enhancing role of untargeted financial support in agriculture. In the context of the Zhambyl region, the observed inefficiency points to several structural and institutional weaknesses: subsidies disproportionately benefit large farms, are often disconnected from performance criteria, and are administered with limited monitoring or conditionality. Rather than stimulating innovation or long-term investment, current subsidy mechanisms appear to function primarily as compensatory instruments, alleviating short-term costs without altering the underlying productivity trajectory of farms.

From a policy perspective, these findings underscore the urgent need for a paradigm shift – away from blanket subsidy allocation and toward a system of smart, targeted, and conditional support. Reforms should prioritize linking financial assistance to the adoption of productivity-enhancing technologies, sustainable land management practices, and participation in cooperative or advisory networks. Furthermore, region-specific tailoring, improved transparency in fund distribution, and the integration of monitoring and evaluation frameworks are essential to ensure that public resources generate tangible developmental outcomes.

While this study offers valuable empirical insights, it is not without limitations. The analysis focuses on a single region and relies on aggregated farm-level data, which may mask heterogeneity across farm types, crop specializations, or subsidy instruments. Future research should extend this analysis by incorporating disaggregated subsidy categories, exploring non-linear effects, and examining complementary drivers of productivity such as access to credit, digital technologies, climate variability, and market integration. Qualitative case studies and farmer interviews would also enrich understanding of the behavioral and institutional barriers that constrain subsidy effectiveness.

In conclusion, this research demonstrates that in the Zhambyl region, more subsidies have not meant better productivity. Without fundamental reform of their design and purpose, agricultural subsidies risk remaining a costly yet ineffectual component of Kazakhstan's rural development strategy. The evidence presented here provides a clear mandate for policymakers to move beyond volume-based support and embrace a more strategic, evidence-informed approach to fostering a productive, resilient, and sustainable agricultural sector.

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ЖАМБЫЛ ОБЛЫСЫНДАҒЫ АУЫЛ ШАРУАШЫЛЫҚ САЛАСЫНА БЕРІЛЕТІН СУБСИДИЯНЫҢ ТИІМДІЛІГІ: ЭМПИРИКАЛЫҚ ТАЛДАУ

Аңдатпа

Бұл зерттеуде 2010–2025 жж. аралығында Қазақстанның Жамбыл облысында ауыл шаруашылығы субсидияларының фермерлік өнімділікті арттырудағы тиімділігі эмпирикалық тұрғыдан қарастырылады. Мемлекеттік шығыстардың айтарлықтай көлеміне және субсидиялардың аграрлық саясаттың негізгі құралы ретінде кеңінен қолданылуына қарамастан, олардың өнімділік өсіміне нақты үлесі әлі күнге дейін даулы мәселе болып отыр. Сандық зерттеу дизайнын қолдана отырып, бұл жұмыс Қазақстан Республикасы Ауыл шаруашылығы министрлігінен алынған 34 фермерлік шаруашылықтың (510 бақылау) панельдік деректерін талдайды. Субсидия мөлшері мен фермерлік өнімділік арасындағы байланысты бағалау үшін Хаусман тесті арқылы расталған екі бағытты фиксирленген әсерлер регрессия моделі қолданылып, жер көлемі мен негізгі құралдар бақылауға алынды. Диагностикалық тесттер модельдің негізгі классикалық регрессия болжамдарына сәйкестігін растайды. Нәтижелер ауыл шаруашылығы субсидияларының фермерлік өнімділікке статистикалық тұрғыдан айтарлықтай әсер етпейтінін көрсетті ($\beta = 0{,}228$, $p > 0{,}05$). Бұл тұжырым кіші кезеңдерді талдау барысында да (2010–2015 және 2016–2025) дәйекті сақталып, субсидия көлемінің ұлғаюы өнімділіктің өлшенетін өсіміне әкелмегенін айғақтайды. Зерттеу субсидиялардың құрылымдық тиімсіздігін анықтады, оның ішінде қаражаттың ірі шаруашылықтар арасында теңгерімсіз бөлінуі, шарттылықтың әлсіздігі және өнімділікті ынталандырудан гөрі шығындарды өтеуге бағытталуы сияқты мәселелер бар. Бұл тұжырымдар мақсатсыз қаржылық қолдаудың тиімсіздігіне қатысты дәлелдер жинағын толықтырып, саясатты реформалаудың шұғыл қажеттілігін көрсетеді. Мақала технологияларды енгізуге, тұрақты тәжірибелерге және тиімді мониторинг жүйелеріне негізделген «ақылды», өңірлік ерекшеліктерді ескеретін және нәтижеге бағытталған субсидиялау механизмдеріне көшуді ұсынады. Зерттеу Қазақстанның аграрлық секторындағы мемлекеттік шығыстардың тиімділігі мен тұрақтылығын арттыруға ұмтылатын саясаткерлер үшін нақты ұсыныстар береді.

Тірек сөздер: ауыл шаруашылығы субсидиялары, фермерлік өнімділік, саясатты реформалау, тұрақты ауыл шаруашылығы, эконометриялық талдау, мемлекеттік шығыстар тиімділігі, өңірлік даму.

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ЭФФЕКТИВНОСТЬ СУБСИДИЙ НА СЕЛЬСКОЕ ХОЗЯЙСТВО В ЖАМБЫЛСКОЙ ОБЛАСТИ: ЭМПИРИЧЕСКИЙ АНАЛИЗ

Аннотация

В данном исследовании эмпирически рассматривается эффективность сельскохозяйственных субсидий в повышении продуктивности фермерских хозяйств Жамбылской области Казахстана за период 2010–2025 гг. Несмотря на значительные объемы государственных расходов и широкое применение субсидий в качестве ключевого инструмента аграрной политики, их фактический вклад в рост продуктивности остается дискуссионным. Используя количественный дизайн исследования, в работе анализируются панельные данные 34 фермерских хозяйств (510 наблюдений), полученные из Министерства сельского хозяйства Республики Казахстан. Для оценки взаимосвязи между объемом субсидий и продуктивностью ферм применяется двухсторонняя модель регрессии с фиксированными эффектами, валидированная с помощью теста Хаусмана, с контролем площади земель и основных средств. Диагностические тесты подтверждают соответствие модели основным классическим предположениям регрессии. Результаты показывают, что сельскохозяйственные субсидии не оказывают статистически значимого влияния на продуктивность ферм ($\beta = 0{,}228$, $p > 0{,}05$). Данный вывод остается устойчивым при анализе подпериодов (2010–2015 и 2016–2025), что свидетельствует о том, что увеличение объемов субсидирования не трансформировалось в измеримый рост продуктивности. В исследовании выявлены структурные неэффективности в дизайне субсидий, включая диспропорциональное распределение средств в пользу крупных хозяйств, слабую обусловленность и ориентацию на компенсацию издержек вместо стимулирования результативности. Полученные выводы вносят вклад в растущий корпус доказательств, ставящих под сомнение эффективность ненаправленной финансовой поддержки, и подчеркивают настоятельную необходимость реформирования политики. В статье обосновывается переход к «умным», регионально ориентированным и результативным механизмам субсидирования, увязанным с внедрением технологий, устойчивыми практиками и надежными системами мониторинга. Исследование предлагает практические рекомендации для разработчиков политики, стремящихся повысить эффективность и устойчивость государственных расходов в аграрном секторе Казахстана.

Ключевые слова: сельскохозяйственные субсидии, продуктивность ферм, реформирование политики, устойчивое сельское хозяйство, эконометрический анализ, эффективность государственных расходов, региональное развитие.

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