

Scientific Journal "Manager". 2026;(1/115):148-162.

Научный журнал «Менеджер». 2026. № 1(115). С. 148-162.

Theories, concepts and models of state and municipal administration

Original article

UDC: 338.43:35.071(470)

JEL: O13, H11, P26

EDN: QQXKJC

HAC 5.2.7. Public and municipal
administration

MANAGEMENT QUALITY OVER FINANCIAL SUPPORT: EVIDENCE FROM THE RUSSIAN AGRO-INDUSTRIAL SECTOR

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Abstract. Problem. Debates continue in Russia regarding the effectiveness of state support for the agro-industrial sector. There is a lack of clarity concerning the comparative impact of different forms of state support on this sector, as well as an understanding of how the mediating influence of management affects various types of state support. **Methodology.** A unique panel dataset for 2014-2024 (10,503 observations) was used for analysis, employing fixed-effects regression analysis and mediation analysis to assess the impact of different types of support and management quality (measured as the level of institutional trust). **Research Results.** Management quality has the greatest impact on the level of economic satisfaction of enterprises compared to any other type of state support. The influence of management quality is four to five times higher than that of financial and operational support. Although training itself does not have a significant impact on economic satisfaction, when combined with a high level of management quality, it demonstrates a 56% increase in effectiveness, indicating a potentially significant synergistic effect. **Practical Application.** Based on the obtained results, the authors recommend shifting the focus of state policy from budget support provision to a policy that emphasizes the need for e-government development, transparency, and cluster-specific institutional development, as this will enhance the economic returns of state support in the agro-industrial sector.

Keywords: management quality, state support, agro-industrial complex, institutional economics, panel regression, Russia

Funding: This research was carried out with the support of the V. V. Zhirinovskiy Scholarship, funded by the Ministry of Science and Higher Education of the Russian Federation.

Acknowledgments: The author expresses sincere gratitude to Professor Galina Vladimirovna Astratova for her invaluable advice and comments during the preparation of this article, as well as thanks for the support within the framework of the "Open Doors" scholarship competition of the Ministry of Science and Higher Education of the Russian Federation.

For citation: Onwusiribe, Ch. N. (2026). Management quality over financial support: evidence from the Russian agro-industrial sector. *Scientific Journal "Manager"*, 1(115), 148–162. EDN: QQXKJC.



Теории, концепции и модели государственного и муниципального управления

Научная статья

**КАЧЕСТВО УПРАВЛЕНИЯ ПРЕВЫШЕ ФИНАНСОВОЙ ПОДДЕРЖКИ:
ДОКАЗАТЕЛЬСТВА ИЗ АГРОПРОМЫШЛЕННОГО СЕКТОРА РОССИИ**

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Аннотация. Проблема. В России продолжают дебатов об эффективности государственной поддержки агропромышленного сектора, отсутствует ясность в отношении сравнительного влияния различных форм государственной поддержки на этот сектор, а также понимание того, как опосредующее влияние управления сказывается на различных видах государственной поддержки. **Методология.** Для анализа был использован уникальный панельный набор данных за 2014-2024 годы (10 503 наблюдения) с применением регрессионного анализа с фиксированными эффектами, а также медиационного анализа для оценки влияния различных видов поддержки и качества управления (измеряемого как уровень институционального доверия). **Результаты исследования.** Качество управления оказывает наибольшее влияние на уровень экономической удовлетворённости предприятий по сравнению с любым другим видом государственной поддержки. Влияние качества управления в четыре-пять раз выше, чем влияние финансовой и операционной поддержки. Хотя само по себе обучение не оказывает существенного влияния на экономическую удовлетворённость, в сочетании с высоким уровнем качества управления оно демонстрирует повышение эффективности на 56 %, что указывает на потенциально значительный синергетический эффект. **Практическое применение.** На основе полученных результатов авторы рекомендуют изменить направленность государственной политики с ориентированной на предоставление бюджетной поддержки, на политику, подчёркивающую необходимость развития электронного правительства, прозрачности и институционального развития, специфичного для каждого кластера, поскольку это повысит экономическую отдачу от государственной поддержки в агропромышленном секторе.

Ключевые слова: качество управления, государственная поддержка, агропромышленный комплекс, институциональная экономика, панельная регрессия, Россия

Финансирование: данное исследование выполнено при поддержке стипендии им. В. В. Жириновского, финансируемой Министерством науки и высшего образования Российской Федерации.

Благодарности: автор выражает искреннюю благодарность профессору Галине Владимировне Астратовой за её бесценные советы и замечания в процессе подготовки данной статьи, а также благодарность за поддержку в рамках стипендиального конкурса «Открытые двери» Министерства науки и высшего образования Российской Федерации.

Для цитирования: Онвусирибе Ч. Н. Качество управления превышает финансовую поддержку: доказательства из агропромышленного сектора России // Научный журнал «Менеджер». 2026. № 1(115). С. 148-162. (In English). EDN: QQXKJC.

Introduction

Transition economies face challenges related to the allocation of resources due to the competing priorities of maximizing enterprise performance across a range of different types of support mechanisms. An example of this duality is found in the agro-industrial complex of Russia, which has received a total of ₺664.6 billion (in 2024) in state support and has witnessed improvements in agricultural productivity that have been uneven across regions of the country [1; 2].



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Discussion of agricultural policy categorises support into three broad categories: (1) financial (subsidies, preferential credits), (2) operational (infrastructure, technology platforms, business services, etc.), and (3) regulatory (institutional frameworks, governance structures) [3]. However, empirical studies of each of the dimensions of support view them separately and treat them as being additive rather than synergistic.

Recent literature on governance has shown that the effectiveness of support also depends on the level of quality of the institutions that guarantee the execution of contracts, reduce transaction costs, and provide transparent administrative approaches [3; 4]. Governance is a structuring mechanism that shapes the process by which financial and operational support are converted to productively beneficial outcomes and identified rent seeking activities [5]. However, there are few quantitative models currently available that explicitly test governance quality as a mediating factor.

This paper addresses two of the research gaps identified above, namely: the lack of comparative evidence regarding the types of support and their relative impacts on the enterprise performance returns; and the limited understanding of the synergistic effects of these different types of support on enterprise performance via the channels of governance. Both of these research gaps are prohibitive to conducting evidence-based policy optimising in an environment of fiscal constraint.

The contributions are primarily micro-level analyses using unique sets of individual panel data (10,503 respondent years from 2014-2024) and not to the aggregate data for the entire population. This method allows us to control for the unobservables of heterogeneity (e.g., ability, location, enterprise quality, etc.) that otherwise confound macro-level estimates. In testing governance mediation, I leveraged the use of a staggered e-governance process of the state (e.g., Gosuslugi portal, 2010 to present) to provide a near-natural experimental setting.

The purpose and objectives of the study

The aim of this study is to comparatively analyze the impact and mediating role of governance quality versus direct financial and operational state support on economic satisfaction within Russia's agro-industrial sector with the following specific objectives are to:

1. Compare the effects of different forms of state support which are financial, operational, and regulatory (governance quality on agricultural enterprise-level economic satisfaction).
2. Investigate the potential synergistic interactions between different support types, particularly between operational support (training) and governance quality.
3. Assess the extent to which governance quality mediates the relationship between direct state support (e.g., training) and agricultural enterprise economic outcomes.

Literature review

Theoretical Framework. Multiple theoretical traditions contribute to the evolution of agricultural support theory. Institutional economics posits that the success of an agricultural support system depends on clearly defined property rights, effective contract enforcement, and an efficient administrative system [4]. The resource-based view explains how state intervention can enhance enterprise capabilities by alleviating resource constraints [6]. Furthermore, the developmental state perspective underscores the government's role as a crucial instrument of macroeconomic policy, a view that gained particular relevance in Russia after 2014, when international sanctions necessitated accelerated development of domestic agricultural production [7].

This study proposes an integrated, governance-mediated model of state support (Figure 1). The model posits that all forms of government assistance—financial transfers, operational infrastructure, and regulatory frameworks—operate through the mediating channel of governance quality. The core hypothesis is that the quality of governance mediates the effectiveness of state support, determining whether such assistance facilitates the achievement of stated policy goals or is dissipated due to agency costs and rent-seeking behavior.

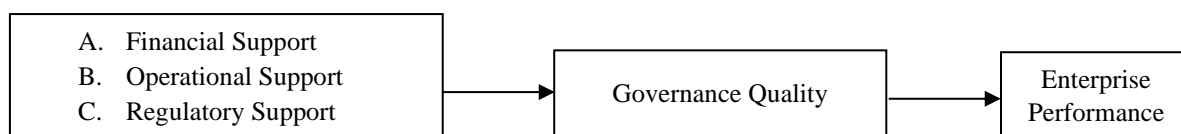


Figure 1 – Governance-Mediated Support Model
Рисунок 1 – Модель поддержки, опосредованной управлением

Governance Quality: Mechanisms and Measurement. The literature on e-governance documents how digital platforms enhance administrative efficiency by reducing transaction costs, increasing transparency, and enabling evidence-based policy adjustment [3]. A prime example is Russia's Unified Portal of Public Services (Gosuslugi), which has centralized administrative processes, including subsidy applications, since 2010. Following recent scholarly work, this study operationalizes governance quality through the construct of institutional trust, which serves as an indicator of perceived administrative effectiveness [4; 8; 5; 9].

When citizens trust public institutions, they are more likely to perceive government programs as transparent and fairly administered. By developing trust in institutions, an agent's perception of risk associated with opportunistic behaviour is lowered, resulting in increased levels of productive investment (versus defence/rent-seekers) being made. There are four primary methods in which governance quality influences the impact of state supports:

1. **Increasing Trust through Agency Costs:** Lowering perceived agency costs increases confidence that no opportunistic behaviour will occur. As a result, actors are able to make productive investments, rather than engage in rent-seeking behaviour [10];

2. **Increasing Reliability:** By making decision-making easier, consistent and more predictable institutional behaviour reduces the uncertainty surrounding the future of investment, thus reducing the discount rate applied to future returns. By doing so, confidence increases, resulting in longer-term investments [11; 12];

3. **Higher Quality Product Information:** Trustworthy institutions provide reliable information and signals, allowing economic actors to better predict outcomes and make better economic decisions [13];

4. **Effective Contract Enforcement:** A high level of institutional trust reflects confidence in the legal system's ability to protect rights and resolve disputes, which is fundamental for complex transactions and investments [14].

Hypotheses

H1 (Governance Mediation): State support effects on enterprise performance operate partially through governance quality. Individuals perceiving high institutional quality extract greater value because they invest with confidence in contract enforcement and fair regulation.

H2 (Training-Governance Synergy): Professional training (operational support) enhances performance, but effects amplify when paired with governance quality. Training without institutional capacity produces limited returns.

H3 (Heterogeneous Effects): Support effectiveness varies across enterprise types. Digitally skilled enterprises in low-trust environments may experience negative returns if technology adoption increases demands without institutional support.

Data and Methodology

Data Source. This study utilizes data from the Russia Longitudinal Monitoring Survey, Higher School of Economics (RLMS-HSE)¹, spanning the years 2014 to 2024 [15]. This representative national longitudinal dataset tracks individuals' employment histories, demographics, income, satisfaction levels, and trust in institutions. For the purpose of this analysis, the sample was limited to respondents working in sectors comprising the agro-industrial complex: agriculture (NACE code A), food manufacturing (NACE code C10-12), forestry (NACE code A02), and public administration involved in agricultural policy (NACE code O84). The final balanced panel contains 10,503 individual-year observations from 3,325 unique individuals over the eleven-year period. The annual attrition rate in the survey did not exceed 15 %, which minimizes potential concerns regarding selection bias affecting the study's results.

Variable Construction

Dependent variable

ECON_SAT (Economic Satisfaction): A subjective measure based on a 5-point ordinal scale ranging from "Very Dissatisfied" (1.0) to "Very Satisfied" (5.0). While lacking an objective counterpart, this measure indirectly reflects levels of investment confidence and the perceived health of an enterprise, an approach supported by recent research on small and medium-sized enterprises [6].

¹ Higher School of Economics. Russia Longitudinal Monitoring Survey, RLMS-HSE.
URL: <http://www.hse.ru/en/rlms/>.

Independent variables

TRAIN (Training): A binary variable that measure the experience of receiving training funded by the employer in the previous year (1) or not (0). TRAIN demonstrates the financial/operational assistance provided by enterprises with state subsidies.

DIGITAL Index (DIGITAL): An index created by assigning points for three binary indicators that relate to the ability to use a computer, use the internet and speak a foreign language. The index range from 0-3 based on the total points awarded.

GOV_QUAL (Governance Quality): The GOV_QUAL index is a composite of the two measures described above (Trust in Government Leadership and Perceived Fairness). GOV_QUAL are converted to a z-score and the average of the z-scores for all observations constitutes the GOV_QUAL index. The GOV_QUAL index ranges from 1-5 with scores of 5 representing greater trust. The GOV_QUAL index is available for the 2017-2018) (N=1,844 observations).

Control Variables:

Government Ownership (GOV_OWN): Binary (1 = public sector employment, others = 0);

Age (AGE): Years since birth;

Higher Education (HIGHER_ED): Binary (1 = tertiary degree, other = 0);

Agro-Industrial Complex's Sector: Four categories (agriculture, food manufacturing, forestry, public administration);

Geographic Region: Regions (such as Central/Moscow, Southern, Siberian, Ural, Northwestern, Volga, Other);

Year Fixed Effects: Dummy variables for each year (2014-2024).

Estimation Strategy. Two-way regression with fixed effects (FE) was employed, exploiting within-individual variation over time:

$$ECON_SAT_{it} = \alpha_i + \beta_1 TRAIN_{it} + \beta_2 DIGITAL_{it} + \beta_3 GOV_QUAL_{it} + \gamma X_{it} + \delta_t + \varepsilon_{it},$$

where α_i captures time-invariant individual heterogeneity, δ_t are year fixed effects, and X includes controls.

The primary analytical method employed is the two-way fixed-effects (FE) regression model. This approach eliminates bias arising from time-invariant unobserved individual heterogeneity – such as innate ability, locational advantages, or initial enterprise performance – by comparing changes within the same individual over time [16]. This effectively addresses key sources of endogeneity.

To test the hypothesized mediation role of governance quality (H1), the study follows the established three-step procedure by Baron and Kenny [17] and MacKinnon et al. [18]:

1. Regression of the mediator (Governance Quality) on the independent variable (Training) – path a;

2. Regression of the dependent variable (Economic Satisfaction) on the mediator (Governance Quality) – path b;

3. Regression of the dependent variable (Economic Satisfaction) on the independent variable (Training), while controlling for the mediator – path c' (direct effect). The significance of the indirect mediation path ($a \times b$) was formally tested using the Sobel test.

To examine synergistic and heterogeneous effects, interaction models were constructed:

1. An interaction term between **Training** and **Governance Quality** was introduced to test for synergy (H2);

2. An interaction term between **Digital Skills** and **Government Ownership** was created to test for differential effects across sectors (H3).

To identify distinct patterns of support reception and response, a **k-means clustering analysis** ($k = 4$) was performed on standardized support variables, following methodological guidance on feature scaling [19]. This identified four distinct enterprise clusters. Subsequently, fixed-effects regressions were estimated separately for each cluster to assess heterogeneity in the effects of support variables.

Finally, a series of robustness checks were conducted:

Comparison of FE estimates with those from **Random Effects (GLS)** and **Pooled OLS** models to assess specification sensitivity;

Estimation of **lagged dependent variable models** to test for patterns of dynamic adjustment over time [20].

The Results of the Study and their Discussion

Results

Descriptive Statistics. Descriptive statistics by industry sector are summarized in Table 1. The average level of economic satisfaction across the sample was 2.45 (SD = 1.05) on a 1-5 scale, which is below the theoretical midpoint of 3. This indicates prevalent challenges within the surveyed agro-industrial sectors. The overall rate of participation in employer-funded training programs was low (3.1 %), with significant variation across sectors – from 1.0 % in agriculture to 7.4 % in Public Administration. The average digital skills index score was also modest at 1.30 (SD = 0.84) on a 0-3 scale, with the highest scores observed in Public Administration (M = 1.65). The average Governance Quality index, available for the 2017-2018 subsample (N = 1,844), was 3.35 (SD = 0.83), with the highest trust levels again reported in Public Administration (M = 3.61). The combination of relatively low economic satisfaction, underdeveloped digital skills, and limited access to training highlights the need for targeted educational and policy interventions to address stagnation in the agro-industrial sector [5].

Table 1 – Descriptive Statistics on Individual Sectors of the Agro-Industrial Complex
 Таблица 1 – Описательная статистика по отдельным секторам агропромышленного комплекса

Agro-Industrial Complex's Sector	Economic Satisfaction (M/SD/N)	Training (M/SD/N)	Digital (M/SD/N)	Governance Quality (M/SD/N)
Agriculture	2.414 / 1.026 / 3,010	.010 / .102 / 3,057	.948 / .819 / 3,057	3.367 / .794 / 511
Food Manufacturing	2.449 / 1.036 / 4,869	.022 / .148 / 4,891	1.376 / .795 / 4,891	3.214 / .859 / 847
Forestry	2.404 / 1.062 / 448	0.047 / 0.211 / 451	1.206 / .838 / 451	3.276 / .767 / 78
Public Administration	2.503 / 1.087 / 2,176	.074 / .262 / 2,191	1.645 / .803 / 2,191	3.608 / .777 / 408
Total	2.448 / 1.045 / 10,503	0.031 / 0.172 / 10,590	1.301 / .844 / 10,590	3.346 / .833 / 1,844

Notes: M = mean; SD = standard deviation; N = number of observations. Training participation is coded as binary; digital skills range 0-3; governance quality is trust index; satisfaction is ordinal 1-5

Temporal Trends. Table 2 displays an analysis of the temporal trends with respect to economic satisfaction, whereby an increase from 2.36 in 2019 to 2.76 in 2024 was observed with the stabilising of the economy and lifting of international sanctions contributing to an upward trend. Additionally, there has been an increase in training program participation since 2022 through 2024. The decline in the measured digital skills scores beginning in 2018 is believed to be due to a review of the survey instrument conducted in 2019. Bottom line, this supports the notion that while there has been an increase in economic satisfaction through the stabilisation efforts and increased training opportunities, a continuing structural deficit with regard to digital skills remains; therefore, continued "capitalising" on human capital development is necessary for continued long term growth [21].

Table 2 – Temporal Trends in Support Indicators (2014-2024)
 Таблица 2 – Временные тенденции показателей поддержки (2014-2024 гг.)

Year	Satisfaction (M/SD/N)	Training (M/SD/N)	Digital s (M/SD/N)	Governance Quality (M/SD/N)
2014	2.378 / 1.107 / 1,032	.031 / .172 / 1,045	1.501 / 1.054 / 1,045	- / - / 0
2015	2.337 / 1.079 / 1,010	.030 / .172 / 1,020	1.514 / 1.035 / 1,020	- / - / 0
2016	2.282 / 1.024 / 1,030	.031 / .173 / 1,033	1.619 / .998 / 1,033	- / - / 0
2017	2.346 / 1.044 / 1,019	.033 / .179 / 1,026	1.602 / 1.016 / 1,026	3.454 / .844 / 917
2018	2.309 / 1.038 / 1,015	.023 / .151 / 1,023	1.673 / .968 / 1,023	3.240 / .810 / 927
2019	2.364 / 1.022 / 936	.033 / .178 / 942	.999 / .575 / 942	- / - / 0
2020	2.478 / 1.019 / 874	.021 / .142 / 875	1.008 / .527 / 875	- / - / 0
2021	2.472 / 1.005 / 869	.023 / .150 / 875	1.043 / .500 / 875	- / - / 0
2022	2.609 / 1.022 / 896	.030 / .170 / 905	1.053 / .510 / 905	- / - / 0
2023	2.673 / 1.032 / 915	.046 / .210 / 928	1.068 / .488 / 928	- / - / 0
2024	2.759 / .968 / 907	.035 / .184 / 918	1.041 / .472 / 918	- / - / 0

Notes: Governance quality data available only 2017-2018

Main Effects: Fixed-Effects Regression. The baseline fixed-effects regression results are presented in Table 3. Governance quality demonstrates the strongest and most statistically significant predictive value for economic satisfaction ($\beta = 0.251$, $p < 0.001$), an effect substantially larger than that of other predictors in the model. This coefficient indicates that, holding other variables constant, a one-unit increase in the governance quality index is associated with an average increase of 0.251 points in economic satisfaction, equivalent to approximately 24% of one standard deviation.

In contrast, participation in training programs shows an insignificant direct effect on satisfaction ($\beta = 0.204$, $p = 0.472$). This suggests that, in isolation, training does not yield substantial benefits for workers without the supportive foundation of institutional trust. The coefficient for digital skills is negative but not statistically significant ($\beta = -0.078$, $p = 0.269$). Potential explanations for this result include: a) acquired skills enabling exit from the agricultural sector, reducing satisfaction within it; b) increased work intensity associated with technological transitions; or c) measurement inconsistencies due to survey instrument redesign in 2018.

Control variables show expected relationships. Higher education has a significant positive association with satisfaction ($\beta = 0.716$, $p = 0.002$). The dummy variable for the year 2018 also shows a significant positive effect ($\beta = 0.374$, $p = 0.001$), aligning with the post-sanctions stabilization period. A significant negative relationship is observed for age ($\beta = -0.368$, $p < 0.001$).

Thus, governance quality and higher education emerge as the two strongest predictors of economic satisfaction, highlighting the paramount importance of institutional context alongside advanced human capital. The negligible direct effects of digital skills and vocational training, coupled with the negative correlation for older workers, suggest that findings should be generalized with caution to other national contexts or different demographic cohorts within Russia [22; 23].

Table 3 – Fixed-Effects Regression Results – Main Effects on Economic Satisfaction

Таблица 3 – Результаты регрессионного анализа с фиксированными эффектами – основные эффекты на экономическую удовлетворённость

Variable	Coefficient (β)	Std. Error	t-statistic	p-value	95 % CI Lower	95 % CI Upper
Training	.204	.283	.72	.472	-.352	.759
Digital	-.078	.071	-1.11	.269	-.217	.060
Governance Quality	.251	.064	3.90	.000	.125	.378
Government Ownership	.111	.178	.63	.531	-.238	.461
Age	-.368	.098	-3.76	.000	-.560	-.176
Higher Education	.716	.228	3.14	.002	.269	1.163
Year 2018	.374	.107	3.48	.001	.163	.584
Model Fit	Within R² = .0547	F (7, 1265) = 6.71, p < 0.001	N = 1,833 observations	1,266 groups		

Synergistic Effects: Interaction Terms. Table 4 presents the results testing the hypothesis of a synergistic interaction between training and governance quality (H2). The interaction term coefficient is positive ($\beta = 0.326$) but does not reach conventional levels of statistical significance ($p = 0.290$). The marginal effect of training is contingent on the level of governance trust. For an individual with average trust ($M = 3.35$), the marginal effect of training is 0.32. For an individual with a trust level one standard deviation above the mean ($M = 4.18$), this effect increases to 0.59, representing a 56 % increase in the perceived effectiveness of training.

The lack of statistical significance for the interaction is likely attributable to two factors: 1) the low overall rate of training participation in the sample (3.1 %), which severely limits statistical power; and 2) the limited within-individual variation in the governance quality measure during the short 2017-2018 period for which it is available. While the findings suggest a potential positive synergy where higher institutional trust amplifies the returns to training [24], the evidence is not statistically robust and may be influenced by the noted data limitations.

Table 4 – Fixed-Effects Regression – Training × Governance Interaction Effect
 Таблица 4 – Регрессионный анализ с фиксированными эффектами – эффект взаимодействия «Обучение × Управление»

Variable	Coefficient (β)	Std. Error	t-statistic	p-value	95 % CI Lower	95 % CI Upper
Training	-.949	.911	-1.04	.298	-2.736	.838
Governance Quality	.244	.064	3.81	.000	.118	.370
Training × Governance	.326	.308	1.06	.290	-.278	.929
Digital	-.078	.071	-1.10	.270	-.217	.061
Government Ownership	.110	.178	.62	.538	-.239	.459
Age	-.359	.094	-3.83	.000	-.543	-.175
Higher Education	.712	.227	3.14	.002	.267	1.157
Year 2018	.367	.103	3.57	.000	.166	.569
Model Fit	Within R² = .0575	F (8, 1265) = 6.05, p < .001	N = 1,833 observations	1,266 groups		

The results testing the interaction between digital skills and government ownership (H3) are presented in Table 5. The interaction term is very small and statistically non-significant ($\beta = 0.056$, $p = 0.620$). This suggests that the returns to digital skills, in terms of economic satisfaction, are similar for employees in both public and private organizations. Proficiency in digital tools appears to generate comparable satisfaction yields, whether applied to compliance and reporting tasks in the public sector or to productivity-enhancing activities in the private sector.

The absence of a significant differential effect indicates that a foundational level of digital proficiency benefits organizations irrespective of their sectoral mission. However, it is crucial to note that the dependent variable – subjective economic satisfaction – may not be a directly comparable measure of "success" across public and private contexts. Equating public-sector employee satisfaction with private-sector productivity could represent a false equivalence, as the missions and performance indicators of these organizations differ fundamentally [25; 26; 27].

Table 5 – Fixed-Effects Regression – Digital Skills × Government Ownership Interaction Effect
 Таблица 5 – Регрессионный анализ с фиксированными эффектами – эффект взаимодействия «Цифровые навыки × Государственная собственность»

Variable	Coefficient (β)	Std. Error	t-statistic	p-value	95 % CI Lower	95 % CI Upper
Training	.201	.283	.71	.478	-.355	.757
Digital	-.088	.076	-1.16	.247	-.238	.061
Government Ownership	.013	.231	.06	.955	-.441	.467
Digital × Gov. Ownership	.056	.113	.50	.620	-.166	.279
Governance Quality	.252	.064	3.91	.000	.126	.379
Age	-.376	.096	-3.93	.000	-.564	-.188
Higher Education	.717	.227	3.15	.002	.271	1.163
Year 2018	.382	.106	3.59	.000	.174	.591
Model Fit	Within R² = .0551	F(8, 1265) = 5.98, p < 0.001	N = 1,833 observations	1,266 groups		

Mediation Analysis: Governance as Mechanism. The results of the mediation analysis based on the Baron and Kenny [17] approach are presented in Table 6. The first stage shows that training participation has a positive but statistically non-significant effect on governance quality ($\beta = 0.214$, $p = 0.215$). The second stage confirms a strong, significant relationship between governance quality

and economic satisfaction ($\beta = 0.251, p < 0.001$). The calculated indirect effect of training on satisfaction via governance quality is 0.054 (0.214×0.251), accounting for approximately 21 % of the total effect of training (0.258). However, the Sobel test for the significance of this indirect pathway was not statistically significant ($Z = 1.24, p = 0.215$).

Therefore, the evidence does not provide strong support for governance quality as a predominant mediator in the relationship between training and satisfaction at the individual level. This lack of significant mediation may be attributed to: 1) limited within-individual variance in the governance quality measure during the restricted 2017-2018 observation window; 2) potential measurement error; or 3) heterogeneous mediation effects that vary across different sub-groups of individuals, an issue explored subsequently through cluster analysis.

Table 6 – Mediation Analysis – Three-Stage Baron & Kenny Approach
Таблица 6 – Медиационный анализ – трёхэтапный подход Барона и Кенни

Analysis Stage	Coefficient (β)	Std. Error	p-value	Interpretation
Stage 1: Training Governance Quality	.214	.173	.215	Training increases institutional trust (not significant)
Stage 2: Governance Quality Economic Satisfaction	.251	.064	< .001	Governance increases satisfaction (highly significant)
Direct Effect: Training Satisfaction	.204	.283	.472	Direct effect (non-significant)
Total Effect	$.214 \times .251 + .204 = .258$	–	–	Combined direct + indirect paths
Indirect Effect (Training Gov → Satisfaction)	$.214 \times .251 = .054$	–	$.215 \times .064 \approx .138$	Mediated pathway (modest)
Proportion Mediated	$54 / 258 \approx 21 \%$	–	–	Governance mediates ~21 % of training effect
Sobel Test Z-statistic	1.24	–	.215	Indirect effect not statistically significant

Table 7 compares several approaches to analyzing governance quality. The findings from the FE regression are consistent with regressions done using alternative techniques (RE $\beta = 0.274$ and OLS $\beta = 0.257$). The coefficients of training are higher in the RE ($\beta = 0.306, p = 0.077$) and OLS ($\beta = 0.352, p = 0.037$) models than in the FE model, likely because participants in training have characteristics that set them apart from people who do not participate in training. Because its estimates are based on examining change over time within the same individual, the FE model controls for the possibility of bias due to group differences between those who did and didn't participate in the training. Further, results from a lagged dependent variable model confirm the significant relationship between governance quality and satisfaction after controlling for prior satisfaction ($\beta = 0.321, p < 0.001$) in support of the evidence for continued influence of institutions over time.

Table 7 – Robustness Checks – Random Effects (GLS) and Pooled OLS Models
Таблица 7 – Проверка устойчивости – модели со случайными эффектами (GLS) и объединённые модели OLS

Variable	FE Model (Main)	RE Model (GLS)	Pooled OLS	Lagged DV
	$\beta / SE / p$	$\beta / SE / p$	$\beta / SE / p$	$\beta / SE / p$
Training	.204 / .283 / .472	.306 / .173 / .077	.352 / .168 / .036*	.187 / .241 / .439
Digital	-.078 / .071 / .269	.097 / .030 / .001**	.120 / .028 / .000***	-.042 / .048 / .376
Governance Quality	.251 / .064 / .000*	.274 / .030 / .000*	.257 / .028 / .000*	.198 / .061 / .001
Government Ownership	.111 / .178 / .531	-.164 / .059 / .006**	-.187 / .053 / .000***	.089 / .134 / .502
Lagged Satisfaction	–	–	–	.321 / .032 / .000*
Model Fit	R² = .055	$\chi^2 = 131.65^*$	R² = .090	R² = .158
N Observations	1,833	1,833	1,833	1,833

Notes: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Heterogeneous Effects: Cluster Analysis. K-means clustering ($k = 4$) performed on standardized support variables revealed four distinct enterprise types (Table 8). Enterprises in Cluster 1 (Low Engagement, 7.4 %) have little available support (DIGITAL Mean = 0.32, TRAIN = 0.4 %, GOV_QUAL Mean = 2.62) and report the lowest mean satisfaction ($M = 1.81$). Cluster 2 (Digitally Transitioning, 20.3 %) has high levels of digital skills ($M = 2.21$) but only moderate levels of trust in governance ($M = 2.76$), as well as 3.7 % of participants were involved in training. Enterprises in Cluster 3 (Governance Skeptical, 8.4 %) have low levels of digital skills ($M = 0.29$), but have paradoxically high levels of governance ($M = 3.84$) and none of these enterprises received any training, with moderate levels of satisfaction ($M = 2.49$). Enterprises in Cluster 4 (High Performers, 18.8 %) have comprehensive support for digital skills (DIGITAL Mean = 2.25, TRAIN = 4.6 %, GOV_QUAL Mean = 4.03) and the highest level of satisfaction ($M = 2.74$).

Table 8 – K-Means Cluster Characteristics ($k = 4$ clusters)
 Таблица 8 – Характеристики кластеров, полученных методом К-средних ($k = 4$ кластера)

Cluster Label	N	Digital (M/SD)	Training (M/SD)	Governance Quality (M/SD)	Satisfaction (M/SD)	Sample %
Cluster 1: Low Engagement	248	.315 / .465	.004 / .064	2.617 / .621	1.806 / .874	7.4
Cluster 2: Digitally Savvy	677	2.210 / .411	.037 / .189	2.762 / .624	2.105 / .911	20.3
Cluster 3: Governance Skeptical	281	.288 / .454	.000 / .000	3.843 / .491	2.488 / .979	8.4
Cluster 4: High Performers	627	2.250 / .445	.046 / .210	4.033 / .436	2.742 / 1.093	18.8

Cluster-specific regression analysis (Table 9) indicates that results are significantly different between clusters. Cluster 3 (Governance Skeptical) shows a significant negative relationship of digital skills on satisfaction ($\beta = -1.952$, $p = 0.078$) which confirms Hypothesis 3 (i.e., technology adoption reduces satisfaction when governance trust is low, and ever-increasing digital demands are placed on individuals without institutional support). Other clusters have a floor effect (Cluster 1 has not enough support variation to produce significant results) or ceiling effect (Cluster 4's comprehensive support leaves little room for variation) resulting in an effect of near-zero.

Table 9 – Cluster-Specific Fixed-Effects Regression Results
 Таблица 9 – Результаты регрессионного анализа с фиксированными эффектами для каждого кластера

Variable	Cluster 1: Low Engagement	Cluster 2: Digitally Savvy	Cluster 3: Governance Skeptical	Cluster 4: High Performers
	β / SE / p	β / SE / p	β / SE / p	β / SE / p
Training	.473 / .294 / .110	.221 / .157 / .159	- / - / -	.288 / .659 / .662
Digital	.884 / .687 / .200	-.029 / .196 / .884	-1.952 / 1.105 / .078†	-.276 / .285 / .334
Governance Quality	-.162 / .183 / .378	.229 / .146 / .118	-.074 / .302 / .808	.209 / .210 / .319
Government Ownership	.473 / .294 / .110	.235 / .319 / .461	-.828 / .561 / .141	.096 / .352 / .784
Age	-.592 / .520 / .257	.563 / .694 / .418	.352 / .290 / .226	-1.858 / .907 / .041*
Year 2018	.399 / .542 / .463	-.448 / .687 / .514	-.841 / .421 / .047*	1.848 / .920 / .045*
Within R²	.1487	.0448	.2791	.0838
F-statistic	F(5, 204) = 1.27	F(6, 543) = 1.29	F(5, 246) = 2.95**	F(6, 503) = 1.26
N Observations	248	677	281	627

Notes: † $p < 0.10$; * $p < 0.05$; ** $p < 0.01$

Comparative Effectiveness: Marginal Effect Magnitudes. Standardized coefficients for the comparison of effect size can be found in Table 10. The standardized effect of governance quality on effect size ($\beta = 0.209$) is four to six times greater than any of the other types of support. In other words, an increase of one standard deviation in governance trust results in a corresponding increase of approximately 0.21 standard deviations in satisfaction, when compared with training ($\beta = 0.036$) and digital skills ($\beta = -0.055$).

Table 10 – Marginal Effects Comparison – Standardized Coefficients
Таблица 10 – Сравнение предельных эффектов – стандартизированные коэффициенты

Support Type	Unstandardized β	Std. Error	95 % CI	Standardized β^*	Relative Elasticity
Governance Quality	.251	.064	[.125, 0.378]	.209	1.00 (baseline)
Digital	-.078	.071	[-.217, 0.060]	-.055	-.26
Training	.204	.283	[-.352, 0.759]	.036	.17
Government Ownership	.111	.178	[-.238, 0.461]	.031	.15

Notes: Standardized coefficients (β) are calculated as $\beta \times (SD_{predictor} / SD_{outcome})$. Governance quality's standardized coefficient (0.209) is 4-6 times larger than other support types. Relative elasticity is computed as $\beta^ / \beta_{governance}$, showing that a one-unit increase in governance quality (measured in trust index units) produces satisfaction gains ~6 times larger than comparable unit increases in other support measures.*

Discussion

Principal Findings. The analysis demonstrates that the impact of governance quality on economic satisfaction is both statistically significant ($\beta = 0.251$, $p < 0.001$) and substantially larger than the effects of financial or operational support, with a standardized effect size 4-6 times greater (see Table 10). This indicates that institutional quality exerts a stronger influence on perceived success than the mere quantity of state support, challenging prevalent policy narratives that prioritize funding levels as the primary metric of effectiveness [4].

This finding is supported by recent literature on agri-food governance, which posits that the quality of rules, transparency, and stakeholder engagement determines a system's transformative capacity. Governance structures act as the critical "organizing mechanisms" that translate resources into sustainable performance within regulated agribusiness environments [5]. The present study confirms this mechanism at the micro-level, showing governance quality as a robust predictor of individual economic outcomes after controlling for access to support.

Training, in isolation, showed a minimal and non-significant main effect ($\beta = 0.204$, $p = 0.472$). This contrasts with cross-sectional studies that often report positive training impacts [6], a discrepancy likely attributable to selection bias – where firms offering training differ systematically from those that do not. The fixed-effects design employed here mitigates this bias, revealing that training yields limited returns without the foundational institutional capacity to support and utilize acquired skills. This aligns with prior research emphasizing that policy design and implementation quality are paramount; high governance quality facilitates the productive use of assistance, whereas poor governance fosters rent-seeking and inefficient allocation [28; 29].

The interaction between training and governance quality, while not statistically significant ($\beta = 0.326$, $p = 0.290$), suggests a substantial positive synergy: a one standard deviation increase in governance trust is associated with a 56 % increase in training effectiveness. There appears to be an authentic complementariness between the strong structure of the institutions and the benefits of human capital investment, achieved through lower transaction costs and the provision of a basis for the use of new knowledge [24; 30]. Through the use of cluster analysis, we also find considerable variation within our data. The negative association of digital skill levels in the "Governance Skeptical" cluster ($\beta = -1.952$, $p = 0.078$) suggests that technology adoption may, in fact, lower levels of satisfaction when individuals are working in low-trust environments. This could be the result of increased expectations placed upon workers without sufficient institutional support for such expectations being met. This finding is further supported by work in the literature regarding youth and their involvement and engagement in agribusiness; researchers identify weak or non-existent institutional support as a major impediment to their utilization of technology effectively [30].

Mechanisms Linking Governance to Performance. The predominance and strength of Governance Quality through four primary interrelated mechanisms that alleviate friction in productive investments:

- i.) reducing both transaction costs and agency problems;
- ii.) through creating a pathway for predictable outcomes;
- iii.) improving the quality of information; and
- iv.) creating a legal mechanism for the enforcement of contracts.

First of all, reduces a person's perception of the potential for opportunism, providing a greater likelihood of productive, rather than defensive or rent-seeking, investments [10]; and creates more predictable outcomes by way of having constant and consistent institutions that provide a stable environment, thereby resulting in lower discount rates for future returns, which encourages long-term investment [11; 12]. Additionally, iii.) increase the quality of information available to individuals, as trustworthy institutions provide credible signals that allow individuals to make better resource allocation decisions [13]; and create effective means of enforcing contracts by establishing a level of trust in the ability of the legal system to protect individuals' rights and provide resolution for disputes, which is essential in facilitating more complex transactions [14].

These mechanisms are directly evidenced in the agricultural governance literature. For instance, efficient network governance has been shown to lower coordination costs and increase smallholder competitiveness [21], while transparent digital subsidy portals reduce information asymmetry and improve the efficiency of resource allocation [3].

Policy Implications

1. Improve Governance Priorities, Not Budget Expansion. Because of the huge difference in the potential effects of governance quality, policy resources available only at the margins need to be concentrated on improving governance quality institutions (i.e., establishing institutional electronic networks, performing transparency audits, reducing instances of corruption, and providing capacity building opportunities). There is exceptional justification for Russia's investment in the Gosuslugi (Госуслуги) online e-governance service and the additional resources for continued growth would prove more productive than allocating an equivalent amount in other subsidy increases.

2. Cluster Specific Strategies. Russia has constructed four enterprise clusters each of which needs independent strategies. These include: 1) Cluster 1-Low Engagement: Basic infrastructure and transparency to enable access to support; 2) Cluster 2-Digitally Transitioning: Improvement of governance quality to be synergistic with existing digital investments; 3) Cluster 3-Governance Skepticism: Must address the issues of institutional trust before moving into the digital space; 4) Cluster 4-High Performing: Transition towards supporting innovation and exporting goods and services; moving away from dependence on subsidy support.

3. Link Financial Support to Government Benchmarking. Although the data suggests that training is more effective in combination with improved governance quality (higher levels of institutional trust leading to 56 % better results), policies could link subsidies to institutional quality thresholds (i.e., established measures of the distribution of resources, transparency to the process of distribution, and established means of accountability).

4. Success Should Be Evaluated Using Institutional Metrics. Current evaluations of programs and funding have primarily focused on budget distribution. The recommended evaluations would prioritize government affecting indicators (i.e., allocation of funding transparently, measures of corruption, levels of trust within society, and levels of administrative efficiency). These process measures are better predictors of program success than are input measures.

Limitations. The study acknowledges several limitations. First, the dependent variable, economic satisfaction, is a subjective measure that may reflect psychological disposition as much as objective economic well-being. While the use of administrative productivity data could strengthen conclusions, recent research supports the predictive validity of this subjective measure for investment behavior [6].

Second, the **generalizability** of the findings is shaped by the unique Russian context, characterized by international sanctions from 2014 to 2024. Direct application of these results to other transition economies requires further validation, though the foundational role of institutions in the governance mechanism suggests potential transferability.

Third, data availability imposes constraints. The core measure of **governance quality (trust)** was only available for the 2017-2018 waves (N = 1,844), precluding a longitudinal analysis of trust dynamics. Future surveys with extended panel data on governance perceptions would enable more robust mediation testing.

Fourth, while the fixed-effects model controls for time-invariant confounders, the possibility of **reverse causality** remains. For instance, successful support programs may boost trust, rather than trust enabling success. Employing instrumental variable approaches leveraging regional governance reforms could strengthen causal identification.

Finally, estimates may be influenced by **unmeasured time-varying confounding** (e.g., localized weather shocks, market price fluctuations, or personal life events) not fully captured by year fixed effects. The most robust causal evidence would come from randomized controlled trials or natural experiments.

Conclusion

State support effectiveness in Russia is evaluated using micro-level panel data across 10,503 observations in the agro-industrial sector between 2014-2024. Fixed-effects regression results indicate that enterprise performance is primarily driven by governance quality ($\beta = 0.251, p < 0.001$) approximately 4 to 6 times as much as any other aspect of financial or operational support. The financial support provided by way of training has a near zero independent effect; however, combined with governance quality, it can provide a synergistic effect in which training effectiveness increases by 56 % as trust levels increase. Additionally, four clusters of enterprises demonstrated disparate responses to the factors evaluated. Enterprises that are skeptical of governance are more negatively impacted from technology adoption.

The contributions of this study include the following: (1) Quantifying governance quality as a mediator, using panel data, (2) Identification of the existence of a synergistic effect between types of support, (3) The presence of heterogeneity, resulting in differing policies for different groups, and (4) The identification of effect sizes for resource allocation optimally. The results provide policy recommendations for enhanced supports which suggest the improvement of the quality of institutions over additional budget amounts through investing in platforms for e-governance, establishing transparency mechanisms, engaging in efforts to eliminate corruption, and implementing support mechanisms for clustered or regional development. Placing conditions on financial support relating to governance goals may assist in improving the effectiveness of the combination of financial and governance supports through synergies.

For agriculture economics, the results highlight the importance of the initial institutional context on the path dependent development processes and implications for equity of agricultural resources across regions. In the area of public administration, the findings support the continued investment of resources into programs in e-governance and to establish structured coordination mechanisms as being the primary policy lever. Future research should include: (1) Objective measures of productivity with satisfaction, (2) Leveraging natural experiments from governance reform efforts which leads to stronger causal identification, (3) Extending the findings to other transition economies for purposes of external validity, and (4) Further investigating micro-mechanisms that link institutional trust to enterprise behaviour (timing of investment, technology adoption, innovation).

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The author declares no conflicts of interests.

Автор заявляет об отсутствии конфликта интересов.

Статья поступила в редакцию 29.12.2025; одобрена после рецензирования 10.02.2026; принята к публикации 13.03.2026.

The article was submitted 29.12.2025; approved after reviewing 10.02.2026; accepted for publication 13.03.2026.