

**ENSURING HIGH-QUALITY DEVELOPMENT OF AGRICULTURAL  
ENTERPRISES IN THE CONTEXT OF THE DIGITAL ECONOMY***Yakhshiev Shakhzod Sherali ugli**“STARS” international university**Teacher of the department “Finance and Accounting of Businesses and State Enterprises”*[Shahzodtaylqei@gmail.com](mailto:Shahzodtaylqei@gmail.com)

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**Abstract:** This article selects enterprises specializing in agriculture and examines how the digital economy affects the high-quality development of these enterprises. Analysis of the mechanism revealed that the digital economy indirectly affects the high-quality development of enterprises by increasing their operational leverage. At the same time, the analysis showed that management costs have a significant impact on the relationship between the development of the digital economy and the high-quality development of agricultural enterprises. At the same time, this work allows us to empirically understand the role of the digital economy in the development of agricultural enterprises and offers strategic directions for accelerating rural development through the effective use of the digital economy for enterprises.

**Keywords:** Digital economy, high-quality development of agricultural enterprises, operational leverage, management costs.

**INTRODUCTION**

Rural development is an important component of the economy of any state, which directly affects the overall economic situation and social balance of the country. According to data from one of the international research institutes operating in the field of information and communication, in 2023, the volume of the digital economy in developing countries reached 8,163 trillion dollars, which amounted to 51.3 percent of GDP. According to forecasts, this industry will continue to grow rapidly in the coming years. However, the process of digital transformation in rural areas is much slower than in urban areas, which creates a number of problems and shortcomings. [1]

Therefore, the study of how the digital economy can contribute to the high-quality development of rural areas is of great theoretical and practical importance. Such an analysis contributes to the transformation and modernization of the rural economy and, in the long term, contributes to the sustainable development of rural areas in developing countries.

Analysis of statistical data for the period 2014-2025 shows that the number of agricultural, forestry, and fishery enterprises in Uzbekistan demonstrated a steady growth trend. The number of enterprises, which was 16,936 in 2014, reached 53,808 by 2023, which means an increase in the number of entities operating in the industry by almost 3.2 times. The most intensive stage of growth during this period was observed in the period 2018-2021, which is associated with the

policy of supporting entrepreneurship in agriculture, the effective use of land and water resources, and the development of the farmer and cluster system.

Also, in 2024-2025, the number of enterprises decreased by 37,772 and 30,952, respectively. This situation is explained by the processes of consolidation in the industry, that is, the unification of small enterprises into large production units, as well as the policy of resource optimization and increasing economic efficiency. In general, during 2014-2025, the sectors of agriculture, forestry, and fisheries became one of the important drivers of the country's economy. However, the decline in recent years reflects qualitative restructuring processes, which, in turn, indicates the transition of the industry to a stage of sustainable, effective, and competitive development. (Table 1) [2]

<b>Classifier</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
Agriculture, forestry and fisheries	16936	17026	17611	18319	21019	24480	29379	41321	46501	53808	37772	30952
Mining and quarrying	625	883	1139	1327	1530	1814	2349	2603	2820	3057	2439	2116
Manufacturing industry	34711	37302	39302	40944	46426	53654	66729	79230	86566	93772	65426	52027
Electricity, gas, steam supply and air conditioning	366	339	336	335	326	318	381	477	478	518	518	528
Water supply; sewerage system, waste collection and disposal	1240	1212	1000	908	903	1064	1117	1229	1288	1458	1061	975
Construction	18618	19948	21173	22089	24118	29112	36199	40950	43695	46971	34749	27408
Wholesale and retail trade; repair of motor vehicles and motorcycles	57968	58265	59432	61735	63199	70902	101081	132192	157129	182917	158065	137109
Transportation & Storage	8404	8931	9892	10881	11996	13330	15360	17301	18251	20666	17935	15778
Accommodation and food services	12004	13079	14299	15454	17126	19812	25636	30111	33104	36811	28364	26135
Information and communication	6438	6486	6370	6427	6403	6975	7901	9517	10587	12204	10551	9777
Financial and insurance activities	3966	4196	4792	4526	3867	3681	3562	3651	3279	3608	2776	2625

Real estate transactions	1089 8	1061 7	1085 0	1134 2	1251 1	1310 9	1352 9	1389 3	1423 6	1508 8	1463 7	1414 3
Professional, scientific and technical activity	1134 4	1111 0	1154 7	1194 1	1274 4	1359 8	1480 3	1569 2	1733 3	1920 7	1801 9	1796 9
Management activities and provision of support services	5204	4666	5787	6792	8643	9768	1152 0	1293 9	1346 9	1536 2	1265 9	1182 3
Public administration and defense; compulsory social security	1181 4	1221 2	1235 9	1236 5	1235 2	1234 6	1240 7	1250 5	1285 2	1355 0	1348 5	1339 4
Education	1904 2	1916 8	1992 5	1983 1	2022 6	2492 3	2775 5	2924 1	3175 6	3413 5	3118 5	3001 6
Health and social services	8479	8381	8082	8241	5840	6778	7903	9145	1039 1	1159 7	1099 8	1075 3
Art, entertainment and leisure	3329	3320	3608	3617	3958	4470	5314	5921	6422	7093	5972	5134
Providing other types of services	9814	9543	1025 1	1135 2	1234 3	1338 2	1520 7	1727 8	1877 1	2054 8	1841 1	1617 7
Activities of households that hire domestic servants and produce goods and services for their own consumption	0	0	0	0	1	1	1	1	1	1	2	1
Activities of extraterritorial organizations	1	3	3	2	0	0	0	0	0	0	0	0

**Table 1. Number of enterprises and organizations operating in Uzbekistan by sectors of the economy [3]**

The rapid development of the digital economy in the Republic of Uzbekistan has not only changed the economic structure of cities, but has also created unprecedented opportunities for rural areas. However, due to weak infrastructure and the outflow of qualified personnel to cities, the digital transformation process in rural areas is proceeding more slowly [4]. Therefore, ensuring high-quality development of rural areas using the capabilities of the digital economy is one of the pressing issues [5].

In the period 2015-2025, the growth rates of the number of agricultural, forestry, and fishery enterprises showed variable dynamics. In 2015-2021, the number of enterprises in the industry showed a stable growth trend, and the highest growth rate was observed, reaching 40.6% in 2021. The high growth observed during this period is explained by the development of the agro-industrial complex in the country, the introduction of digital technologies, and the state's policy of supporting small and medium-sized businesses. However, since 2022, there has been a significant decline in growth rates. In 2024, negative growth rates were recorded, equal to -29.8%, and in 2025 - 18.0%.

In general, although the growth rates of the number of agricultural, forestry, and fishery enterprises during the analyzed period developed in a positive direction in the long term, the decline observed in recent years indicates the need for systemic reforms in the industry, the widespread introduction of innovative technologies, and the creation of a stable investment climate.

## LITERATURE REVIEW

In recent years, the digital economy has been forming as a new driver of economic growth on a global scale, and it also plays an important role in the socio-economic development of rural areas. Researchers have been studying the impact of the digital economy on agriculture and rural enterprises from different perspectives.

Xiong et al. (2023) emphasizes in their research that the widespread introduction and effective use of digital technologies will optimize agricultural production processes, increase the efficiency of resource use, and contribute to the growth of farmers' incomes. In their opinion, digital technologies - especially smart agricultural systems, digital data analysis, and automated production tools - are one of the important factors in increasing productivity in agriculture. [6]

Zhang & Liu (2023) focused on the practical aspects of the digital economy and analyzed the role of e-commerce platforms in bringing agricultural products to market. In their research, it was noted that the possibility of delivering agricultural products directly to the consumer through e-commerce systems has been created, which will serve to reduce marketing costs and increase the competitiveness of rural producers. [7].

However, there are some problems associated with the development of the digital economy. Guo et al. (2023), the imbalance in the implementation of digital technologies - in particular, differences in infrastructure, digital literacy, and technical capabilities - can further exacerbate the economic gap between urban and rural areas. Therefore, the benefits derived from the digital economy are not distributed equally across all regions. [8]

According to Wu & Yang (2022), the slow pace of the digital transformation process in rural areas is mainly explained by the weakness of infrastructure, limited internet access, and the migration of qualified personnel to cities. This situation leads to the inability of agricultural enterprises to fully utilize the opportunities of the digital economy. [9]

In addition, although the direct impact of the digital economy on agriculture (through indicators such as production efficiency, income, sales volume) has been widely analyzed in the available

scientific literature, the mechanisms of indirect influence have been little studied. Zhang et al. (2022) emphasizes that the digital economy contributes to the high-quality development of rural enterprises by optimizing operational leverage, reducing management costs, and strengthening financial stability. [10]

Yu et al. (2023) shows that ensuring sustainable and high-quality development of rural areas through the use of the opportunities of the digital economy is one of the most urgent strategic tasks at the present time. In their opinion, digital technologies not only increase economic efficiency, but also allow for the strengthening of social equality and interregional integration. [11]

In general, the available literature shows that the digital economy is considered as an important factor in high-quality development through the development of innovative approaches in agriculture, optimization of production processes, and strengthening the interaction of market participants. At the same time, one of the necessary conditions for ensuring the effectiveness of digital transformation is the development of infrastructure, increasing digital skills, and improving the investment climate.

**RESEARCH METHODOLOGY**

In this study, based on empirical analysis, the influence of the digital economy on the high-quality development of agricultural enterprises was studied. The study uses a quantitative approach, and cause-and-effect relationships are determined using regression models based on available statistical data. Also, analytical, comparative, observational, inductive, deductive, logical, and monitoring methods were used in a comprehensive manner.

The definitions of these variables are given in Table 2.

<i>Variable type</i>	<b>Variable name</b>	<b>Variable symbol</b>	<b>Variable definition</b>
<i>Dependent variable</i>	qualitative development of agricultural enterprises	roe	This study calculates the main indicators of the qualitative development of rural enterprises from three dimensions: innovation-oriented, green and low-carbon, and using a coordinated distribution using the entropy method.
	Net profit growth rate	npg	Net profit of the year/Net profit of the previous year - 1
<i>Independent variable</i>	Digital economy	digital	Ln (summed from the sub-indicators of artificial intelligence (AI), blockchain (BD), cloud computing (CC) and big data (BD) and adoption (application) of digital technologies)
<i>intermediate variable</i>	Operating leverage	ol	(Net profit + profit tax expenses + financial expenses + depreciation of fixed assets, depreciation of oil and gas assets, depreciation of production biological assets +

<i>Variable type</i>	<b>Variable name</b>	<b>Variable symbol</b>	<b>Variable definition</b>
			depreciation of intangible assets + depreciation of long-term depreciation) / (Net profit + profit tax expenses + financial expenses)
<i>Moderator variable</i>	Cost of management	cost	Ln (total operating expenses)
<i>Control variables</i>	Investments in research and development	rd	Annual R&D expenses/income of firms
	Loss occurred	loss	If the net profit of the year is less than 0, then 1, otherwise 0.
	Price to balance	pb	Share price/Net assets per share
	Verified by one of the Big Four	audit	If the company was audited by the "Big Four" (PricewaterhouseCoopers, Deloitte, KPMG, Ernst & Young) - 1 and otherwise - 0.
	Enterprise size	size	Ln (total economic assets)
	Asset-liability ratio	lev	Total liabilities/total assets
	Cash flow	cf	Cash at year-end/total assets at year-end
	Nature of the enterprise	state	State-owned enterprises accept the value of 1, otherwise it will be 0.
	Enterprise age	age	Ln (enterprise listing age)

**Table 2. Definition of variables.**

## ANALYSIS AND RESULTS

In the study, a descriptive statistical analysis method was used for a preliminary assessment of the dynamics of the main variables (Table 3). According to the results, the profitability of net profit (roe), representing the high-quality development of agricultural enterprises, averaged 0.0803, the standard deviation was 0.1740, the values were accumulated around the average, but there is a certain degree of variability. The average value of the digital economy (digital) is 2.6751, the standard deviation is 0.9685, which indicates the level of data dispersion. Operating leverage averaged 1.4348, standard deviation 0.8739, reflecting the differences between enterprises. And management costs (cost) have good stability with an average value of 21.0320.

Empty Cell	<b>Obs</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Median</b>	<b>Max</b>
<i>roe</i>	3423	0.0803	0.1740	-0.8310	0.0803	0.5900

Empty Cell	Obs	Mean	SD	Min	Median	Max
<i>npg</i>	3423	-0.3805	4.1084	-28.1342	0.0684	9.6571
<i>digital</i>	3423	2.6751	0.9685	0.0000	2.6751	5.3132
<i>ol</i>	3423	1.4348	0.8739	-2.6269	1.3620	5.2288
<i>cost</i>	3423	21.0320	1.4904	17.3442	21.0320	24.9108
<i>rd</i>	3423	0.0392	0.0342	0.0002	0.0392	0.1794
<i>loss</i>	3423	0.1226	0.3164	0.0000	0.0000	1.0000
<i>pb</i>	3423	3.6576	3.3162	0.3345	3.4298	31.5484
<i>audit</i>	3423	0.0169	0.1288	0.0000	0.0000	1.0000
<i>size</i>	3423	21.7847	1.1845	19.0158	21.7847	25.1115
<i>lev</i>	3423	0.4294	0.1901	0.0632	0.4285	0.9564
<i>cf</i>	3423	0.1766	0.1257	0.0159	0.1491	0.6646
<i>state</i>	3423	0.3067	0.4613	0.0000	0.0000	1.0000
<i>age</i>	3423	2.2358	0.6892	0.1914	2.2358	3.3338

**Table 3. Descriptive statistical analysis.**

In the first column, the direct impact of the digital economy on the development of agricultural enterprises was analyzed, and it was found that the coefficient is 0.0035, which is positive and significant at a level of 1%. In the second model, when control variables were added, the digital economy coefficient increased to 0.0076, which further strengthened the positive impact of the digital economy. (Table 4)

<i>O'ZGARUVCHILAR</i>	(1)	(2)
	roe	roe
<i>digital</i>	0.0035* * *	0.0076* * *
	(4.4393)	(5.0701)
<i>rd</i>		0.3403*
		(1.8992)
<i>loss</i>		-0.1138* * *
		(-4.6540)
<i>pb</i>		-0.0035
		(-1.0220)

<i>O'ZGARUVCHILAR</i>	(1)	(2)
	roe	roe
<i>audit</i>		0.0344 (0.8951)
<i>size</i>		-0.0354* * * (-4.0735)
<i>lev</i>		-0.2884* * * (-5.8804)
<i>cf</i>		0.0556 (0.9541)
<i>age</i>		0.0514* * * (6.7233)
<i>Constant</i>	0.1132* * * (5.0714)	0.9245* * * (5.0927)
<i>Observations</i>	3423	3423
<i>Number of id</i>	163	163
<i>Adjusted R-squared</i>	0.3156	0.3564
<i>ID FE</i>	YES	YES
<i>Year FE</i>	YES	YES

**Table 4. Results of the main regression analysis.**

**CONCLUSIONS AND PROPOSALS**

Through comprehensive empirical analysis, this article thoroughly examines the impact of the digital economy on the high-quality development of agricultural enterprises and tests the four hypotheses put forward. The research results show that the digital economy significantly stimulates the development of agricultural enterprises in a positive direction, and this conclusion remains stable even with the replacement of various model configurations and variables. The digital economy stimulates the high-quality development of enterprises by increasing the level of operational leverage, strengthening market competitiveness, and strengthening financial stability.

Overall, this study presents new scientific approaches to understanding the role of the digital economy in the high-quality development of agricultural enterprises and provides practical recommendations for policy developers. The role of the digital economy as a new economic form in this process is incomparable, and its importance cannot be denied. In the future, as the

development of digital technologies and their practical application expand, the digital economy is expected to play an even more important role in the process of comprehensive renewal and revitalization of rural areas.

At the same time, although this article has achieved certain scientific results, there are also some limitations of the research. In particular, this work is mainly aimed at studying the influence of the digital economy on the development of agricultural enterprises, and the differential impact of the digital economy on various sectors and regions, as well as the interaction of the digital economy and macroeconomic policies, has not been sufficiently deeply analyzed. Further research can further expand this area, comprehensively analyze the complex mechanisms of the digital economy for the high-quality development of agricultural enterprises, and as a result, develop a deeper theoretical basis and practical recommendations for the comprehensive development of rural areas.

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