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Legal Factors Affecting The Efficiency Of State Management Of The Digital Economy

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Abstract: In the context of the transition to a digital economy, the issues of public administration efficiency become relevant, due to the need to ensure the implementation of state policy aimed at the efficient use of budgetary, labor, material and technical and information resources, a fair redistribution of income and guaranteeing basic social rights, maintaining public order.

Keywords: economy management, social rights, public administration, correlation-regression, criminal justice.

Introduction

In turn, the digitalization of public administration will lead to an increase in labor productivity, an improvement in the quality of service and a decrease in the cost of services, an increase in the efficiency of the use of investments and efficiency in making managerial decisions [7].

The purpose of the study was to identify legal factors that affect the quality of digital economy management, to develop correlation-regression models for predicting effective management in a virtual environment.

For the purposes of analyzing the legal factors affecting the quality of public administration in the context of the transition to a digital economy in the Republic of Uzbekistan, we will conduct an econometric analysis, where we will take Government Effectiveness as an effective factor, the characteristic factors are presented in Table 1.

Table 1. Description of variables (Compiled by the author)

Designation	Factor	Variable
y	Government performance	Government Effectiveness
x1	Quality of regulation/quality of legislation	Regulatory quality
x2	Open government (order and security)	Open Government
x3	Compliance with laws	Regulatory Enforcement
x4	criminal justice	Criminal justice
x5	civil justice	Civil justice
x6	Absence of Corruption	Absence of Corruption

The correlation matrix (Table 2) contains the pair correlation coefficients for all features used in the model. Coefficients tested for statistical significance. The analysis revealed dependencies: a strong degree of direct linear relationship between government performance and the absence of corruption (r=0.78) and an almost linear (very strong direct) relationship

between government performance and criminal justice (r=0.82). There is a moderate inverse relationship between government efficiency and openness (r = -0.60).

Table 2 Correlation matrix (Compiled by the author)

	Y	X6	X5	X4	X3	X2	X1
Y	1.000	0.777	0.487	0.820	-0.361	-0.601	0.678
X6	0.777	1.000	0.550	0.653	-0.463	-0.463	0.807
X5	0.487	0.550	1.000	0.137	-0.522	-0.327	0.575
X4	0.820	0.653	0.137	1.000	-0.443	-0.812	0.530
X3	-0.361	-0.463	-0.522	-0.443	1.000	0.509	-0.366
X2	-0.601	-0.463	-0.327	-0.812	0.509	1.000	-0.619
X1	0.678	0.807	0.575	0.533	-0.366	-0.619	1.000

Based on the data described in Table 1, we will build a multiple regression linear model (Table 3).

Table 3 Multiple regression metrics (Compiled by the author)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X6	-2.493609	0.873994	-2.853120	0.0462
X5	7.157531	1.235005	5.795548	0.0044
X4	6.696427	0.912419	7.339202	0.0018
X3	1.633953	0.957185	1.707040	0.1630
X2	4.605576	1.022159	4.505735	0.0108
X1	0.270724	0.088190	3.069789	0.0373
C	-8.050115	1.077094	-7.473919	0.0017
R-squared	0.979962	Mean dependent var		-0.636950
Adjusted R-squared	0.949905	S.D. dependent var		0.150226
S.E. of regression	0.033623	Akaike info criterion		-3.686062
Sum squared resid	0.004522	Schwarz criterion		-3.432856
Log likelihood	27.27334	Hannan-Quinn criter.		-3.845673
F-statistic	32.60365	Durbin-Watson stat		3.033145
Prob(F-statistic)	0.002345			

Coefficient determination R^2=0.98 shows that the post is a functional connection factor. Criterion Fisher F_(observation.) = 32.60, 〖 F〗 _(criterion.) = 8.94. According to the Fisher criterion, this model is adequate. The probability of accepting the null hypothesis H_0 for all models and the whole is 0.002, which proves the necessity of accepting the alternative hypothesis and the significant model of the whole.

Tabular value of the Student's criterion, corresponding to the confidence probability γ = 0,95 and the number of degrees of freedom $v = n - m - 1 = 11 - 6 - 1 = 4$; $t_{крит} = t_{0,05;4} = 2,78$. Comparing the calculated t-statistics of the coefficients of the equation with the table value, we conclude that all the coefficients for the variables of the regression equation (except x3), as well as the free term, are statistically significant. It should be added that the probability of accepting the null hypothesis for the coefficients for most variables takes a value below 0.05, which confirms the high quality of the constructed model.

The tabular value of the Student's criterion associated with the confidence probability □ = 0.95 and realized degrees of freedom v = n - m - 1 = 11-6-1=4; t_crit=t_(0.05;4)= 2.78. Comparative calculated t-statistics of the coefficients of the equation with a tabular value concluded that all coefficients when using regression coefficients (except x3), as well as the intercept, are significant. It has been

added that it is supposed to implement the possibility of a null hypothesis for the coefficients with a maximum use of values below 0.05, which is the maximum quality of the constructed model. The approximation error is an acceptable value (less than 15%):

$$\overline{A} = \frac{1}{n} \cdot \sum_{i=1}^{n} \left| \frac{y-\hat{y}}{y} \right| \cdot 100\,\% = 3{,}0469\% \quad (1)$$

Check the residuals for autocorrelation. To do this, we write out the value of the Durbin-Watson statistics from Table 3: DW = 3.033. Using special tables, we determine the significant points dl and du for the 5% significance level. For m = 6 and n = 11: dl=0.203; du=0.405. Since du≤DW ≤4-du, then, therefore, there are reasons to believe that there is no autocorrelation.

Let's check for autocorrelation using the Breusch-Godfrey test. It is based on the following idea: if there is a correlation between neighboring observations, then it is natural to expect that in the equation:

$$e_t = \rho \times e_{t-1}, \quad t = 1, \dots, n \quad (2)$$

где e_t - regression residuals obtained by the ordinary least squares method), the coefficient ρ will be significantly different from zero.

The results of the Breusch-Godfrey test are presented in Table 4.

Table 4 Breusch-Godfrey Serial Correlation LM Test (Compiled by the author)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X6	-0.993381	0.629539	-1.577950	0.2127
X5	-0.044373	0.740887	-0.059891	0.9560
X4	0.779943	0.611879	1.274668	0.2922
X3	-0.433389	0.593900	-0.729734	0.5184
X2	0.771160	0.670141	1.150744	0.3332
X1	0.077845	0.059532	1.307605	0.2822
C	0.078433	0.646599	0.121302	0.9111
RESID(-1)	-1.211338	0.425109	-2.849475	0.0651
R-squared	0.730204	Mean dependent var		1.13E-15
Adjusted R-squared	0.100680	S.D. dependent var		0.021265
S.E. of regression	0.020166	Akaike info criterion		-4.814333
Sum squared resid	0.001220	Schwarz criterion		-4.524954
Log likelihood	34.47883	Hannan-Quinn criter.		-4.996745
F-statistic	1.159930	Durbin-Watson stat		2.858313
Prob(F-statistic)	0.496129			

The results of the Breusch-Godfrey test indicate that the probability of accepting the null hypothesis of the absence of autocorrelation is Prob=0.496 and, therefore, there is no autocorrelation in the model.

Let us establish the presence (absence) of heteroscedasticity of random deviations of the model using the Glaser test for this (see Table 5).

Table 5 Heteroskedasticity Test: Glejser (Compiled by the author)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.358867	0.419153	-0.856171	0.4402
X6	0.079959	0.340116	0.235092	0.8257
X5	0.360893	0.480604	0.750914	0.4945
X4	0.086766	0.355069	0.244363	0.8190
X3	0.288366	0.372490	0.774158	0.4820
X2	-0.012889	0.397775	-0.032402	0.9757

X1	-0.005292	0.034319	-0.154208	0.8849
R-squared	0.385554	Mean dependent var		0.017601
Adjusted R-squared	-0.536114	S.D. dependent var		0.010557
S.E. of regression	0.013085	Akaike info criterion		-5.573634
Sum squared resid	0.000685	Schwarz criterion		-5.320428
Log likelihood	37.65499	Hannan-Quinn criter.		-5.733245
F-statistic	0.418322	Durbin-Watson stat		2.669576
Prob(F-statistic)	0.837038			

The Glaser test showed that, in accordance with the data obtained for the model as a whole, the probability of accepting the null hypothesis is above 5%, which indicates the absence of heteroscedasticity.

Let us check the constructed model for heteroscedaticity of residuals using the Breusch-Pagan test (see Table 6).

Table 6 Heteroskedasticity Test: Breusch-Pagan-Godfrey (Compiled by the author)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.011938	0.019612	-0.608711	0.5756
X6	0.002094	0.015914	0.131584	0.9017
X5	0.011013	0.022488	0.489745	0.6500
X4	0.005044	0.016614	0.303610	0.7766
X3	0.007638	0.017429	0.438253	0.6838
X2	0.002241	0.018612	0.120388	0.9100
X1	0.000113	0.001606	0.070465	0.9472
R-squared	0.330401	Mean dependent var		0.000411
Adjusted R-squared	-0.673998	S.D. dependent var		0.000473
S.E. of regression	0.000612	Akaike info criterion		-11.69778
Sum squared resid	1.50E-06	Schwarz criterion		-11.44458
Log likelihood	71.33782	Hannan-Quinn criter.		-11.85740
F-statistic	0.328954	Durbin-Watson stat		2.703683
Prob(F-statistic)	0.891478			

The Breusch-Pagan test showed that the probability of accepting the null hypothesis for the whole model is above 5% and, therefore, we can accept an alternative hypothesis about the absence of heteroscedasticity of the model residuals.

Thus, the study showed that, despite the presence of autocorrelation between variables, the model is homoscedastic. The coefficient of determination and the Fisher criterion also confirm the high quality of the model, however, the approximation error of the second model is slightly higher than the first one (see (2) and (3)), the Akaike information criterion also confirms the need to choose the first model:

$$\mathrm{AIC}_1 = -4{,}84,\ \mathrm{AIC}_2 = -3{,}69 \quad (5)$$

However, based on the fact that in the first constructed model, only three out of eight coefficients for variables are statistically significant, and in the second model, five out of six are statistically significant, we conclude that it is necessary to build a forecast based on the second model.

In accordance with the results of the Breusch-Pagan test, the probability of accepting the null hypothesis for the whole model is above 5% and, therefore, we can accept the alternative hypothesis that there is no heteroscedasticity of the model residuals.

Thus, the study showed that, despite the

presence of autocorrelation between variables, the model is homoscedastic. The coefficient of determination and the Fisher criterion also confirm the high quality of the model.

Как следует из данных, полученных с помощью программы EViews методом наименьших квадратов, полученная многофакторная модель будет иметь вид:

$$Y = -8{,}05 + 0{,}27 \cdot x_1 + 4{,}61 \cdot x_2 + 1{,}63 \cdot x_3 + 6{,}70 \cdot x_4 + 7{,}16 \cdot x_5 - 2{,}49 \cdot x_6 \quad (3)$$

– (t) (-7,47) (3,07) (4,51) (1,71) (7,34) (5,80) (-2,85)

– Equation (6) expresses the dependence of the government performance indicator (Y) on the quality of regulation / quality of legislation indicator (x1), the indicator of government openness (order and safety) (x2), the indicator of law enforcement (x3), criminal justice (x4), civil justice (x5), absence of corruption indicator (x6). The coefficients of the equation show the quantitative impact of each factor on the performance indicator, while others remain unchanged. In our case, the government performance indicator is:

– grows by 0.27 units. with an increase in the quality of regulation / quality of legislation by 1 unit. with all other indicators unchanged;

tends to increase by 4.61 units. with an increase in the government openness index by 1 unit. subject to the invariance of other indicators;

grows by 1.63 units. with an increase in the index of compliance with laws by 1 unit. with the remaining indicators unchanged;

increases by 6.70 units. with an increase in the criminal justice index by 1 unit. subject to the invariance of other indicators;

increases by 7.16 units. with an increase in the indicator of civil justice by 1 unit. subject to the invariance of other indicators;

and, finally, decreases by 2.49 units. with an increase in the indicator of the absence of corruption.

Thus, the indicators of civil and criminal justice give the greatest increase to the productive attribute.

The study showed that model (3) can be used to make a forecast based on it, having previously predicted explanatory variables based on trends (Table 4).

Table 4 Characteristics of temporal models of explanatory variables (Built by the author using the Excel spreadsheet editor)

Variable	model type	Relationship equation	R^2
x1	Linear	$x_1 = 0{,}0836 \cdot t - 1{,}8581$	0,77
x2	Polynomial	$x_2 = 0{,}0012 \cdot t^2 - 0{,}0214 \cdot t + 0{,}4087$	0,69
x3	Linear	$x_3 = -0{,}0025 \cdot t + 0{,}4647$	0,47
x4	Polynomial	$x_4 = -0{,}0022 \cdot t^2 + 0{,}0357 \cdot t + 0{,}3015$	0,91
x5	Polynomial	$x_5 = -0{,}001 \cdot t^2 - 0{,}0097 \cdot t + 0{,}5119$	0,67
x6	Linear	$x_6 = 0{,}113 \cdot t + 0{,}2742$	0,85

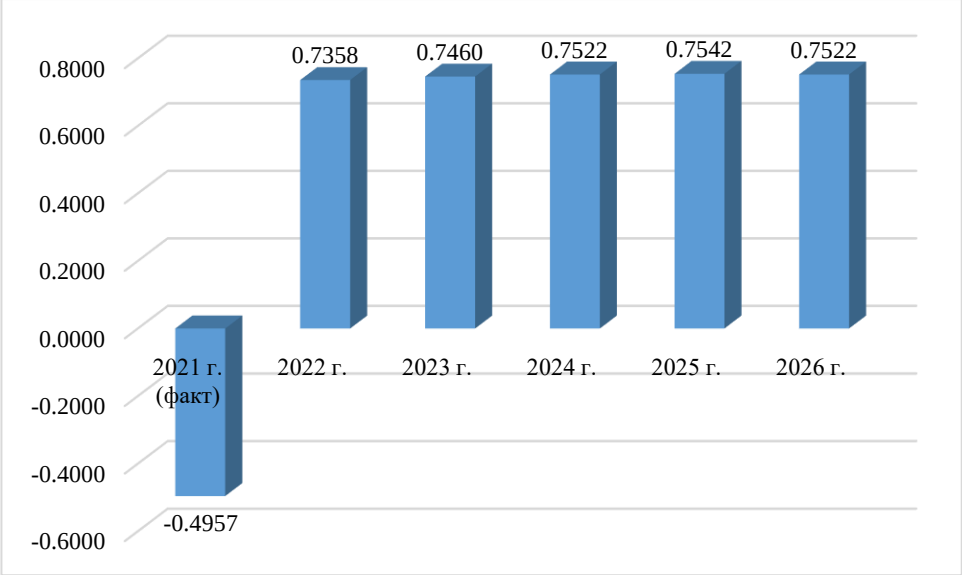
On the basis of trend dependencies, we will construct predictive values of exogenous variables (Table 5).

Table 5 Forecast values of exogenous model variables up to 2026. (Developed by the author on the basis of the constructed multi-factor economic and mathematical model)

Years	Regulatory quality / quality of legislation (regulatory quality)	Open government (order and security)	Compliance with laws (Regulatory Enforcement)	criminal justice / criminal justice	civil justice / civil justice	Absence of Corruption
2021 y. (fact)	-0,92345	0,31	0,43	0,43	0,53	0,41

2022 y.	-0,8549	0,5865	0,4347	0,4131	0,5395	0,4098
2023 y.	-0,7713	0,5951	0,4322	0,3938	0,5548	0,4211
2024 y.	-0,6877	0,6061	0,4297	0,3701	0,5721	0,4324
2025 y.	-0,6041	0,6195	0,4272	0,342	0,5914	0,4437
2026 y.	-0,5205	0,6353	0,4247	0,3095	0,6127	0,4550

The obtained predictive indicators of the factors of the constructed model will make it possible to predict the effective factor - the index of the efficiency of the government of the Republic of Uzbekistan (Fig. 1).



Rice. 1. Forecast values of the performance index of the government of Uzbekistan in 2022-2026

Thus, in accordance with the constructed model, starting from 2022, the performance index of the government of the Republic of Uzbekistan will increase significantly, while taking on a positive value, and by 2026 will exceed 0.75.

Based on the study, the main goal of the state policy of Uzbekistan for the future in the field of improving the efficiency of the government should be the development of a state program to improve the quality of criminal and civil justice, providing a system of measures to increase the level of government openness and compliance with laws. The implementation of strategic goals in the field of improving the efficiency of government measures will lead to an increase in the democratization of society, an increase in the availability and quality of information resources, a decrease in the level of corruption, and, ultimately, will achieve the most important goals of sustainable development of Uzbekistan [8].

The implementation of projects for the digitalization of public administration is aimed at improving the effectiveness of public administration, including the quality of public services provided, and its efficiency, that is, at reducing the costs of the state, business and citizens associated with the implementation of certain public functions. Thus, it can be assumed that a high level of digitalization of public administration provides a higher level of quality of public administration in general or its individual parameters.

The introduction and use of digital technologies in public administration requires the training of highly qualified professional personnel for the modern IT market, innovative development of enterprises and accelerated technological renewal.

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