

## QURILISH ISHLAB CHIQRISH HAJMIGA INVESTITSIYALAR TA'SIRINI EKONOMETRIK BAHOLASH

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**Annotatsiya.** Mazkur maqolada qurilish ishlab chiqarish hajmiga investitsiyalar ta'sirining regression tahlili amalga oshirilgan. Avtoregressiya modeli tuzish orqali qisqa va uzoq muddatli istiqboldagi o'zgarishlar haqida xulosalar qilingan.

**Kalit so'zlar:** model, avtoregressiya, regressiya tenglamasi, Styudent t mezoni, Fisher, instrumental o'zgaruvchi.

Surxondaryo viloyati qurilish ishlab chiqarish hajmiga investitsiyalarning ta'sirini baholash maqsadida 2010-2023 yillarga mo'ljallangan ma'lumotlar [www.surxonstat.uz](http://www.surxonstat.uz) saytidan olindi (1-jadval).

1-jadval

### Surxondaryo viloyati qurilish ishlab chiqarish hamda investitsiyalar hajmi ko'rsatkichlari<sup>1</sup>

Yillar	<i>y</i>	<i>x</i>	Yillar	<i>y</i>	<i>x</i>
2010	335,9	655,3	2017	1 827,0	3 551,0
2011	470,6	802,9	2018	2 879,7	7 240,6
2012	605,3	980,3	2019	3 979,7	11 835,1
2013	849,5	1 371,0	2020	4 774,7	10 068,2

<sup>1</sup> Surxondaryo viloyati Statistika boshqarmasi [www.surxonstat.uz](http://www.surxonstat.uz) sayti





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2014	1 051,5	1 509,1	2021	5 868,4	12 037,8
2015	1 351,3	1 843,6	2022	6 521,9	11 569,4
2016	1 554,8	2 142,4	2023	7 353,3	17 956,0

Investitsiyalarning qurilish ishlab chiqarish hajmiga qisqa va uzoq muddatli ta'sirini baholashda avtoregressiya modellari qo'l keladi.  $AR(1) + x$  modeli umumiy ko'rinishi quyidagicha:

$$y_t = a + b_0 \cdot x_t + c_1 \cdot y_{t-1} + e_t \tag{1}$$

Ushbu modelni hisoblash uchun dastlab instrumental o'zgaruvchini baholovchi model tuzish talab etiladi:

$$\hat{y}_{t-1} = d_0 + d_1 \cdot x_{t-1} \tag{2}$$

(2) modelni baholash uchun natijaviy hamda omil belgilarning  $t - 1$  davr uchun laglarini aniqlashimiz zarur (2-jadval).

2-jadval

**Surxondaryo viloyati qurilish ishlab chiqarish va asosiy kapitalga o'zlashtirilgan investitsiyalar hajmi ko'rsatkichlarning  $t - 1$  davrdagi qiymatlari<sup>2</sup>**

Yillar	$y_t$	$x_t$	$y_{t-1}$	$x_{t-1}$
2010	335,9	655,3	-	-
2011	470,6	802,9	335,9	655,3
2012	605,3	980,3	470,6	802,9
2013	849,5	1 371,0	605,3	980,3
2014	1 051,5	1 509,1	849,5	1 371,0
2015	1 351,3	1 843,6	1 051,5	1 509,1
2016	1 554,8	2 142,4	1 351,3	1 843,6

<sup>2</sup> Surxondaryo viloyati Statistika boshqarmasi [www.surxonstat.uz](http://www.surxonstat.uz) sayti





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2019	3 979,7	11 835,1	2 879,7	7 240,6
2020	4 774,7	10 068,2	3 979,7	11 835,1
2021	5 868,4	12 037,8	4 774,7	10 068,2
2022	6 521,9	11 569,4	5 868,4	12 037,8
2023	7 353,3	17 956,0	6 521,9	11 569,4

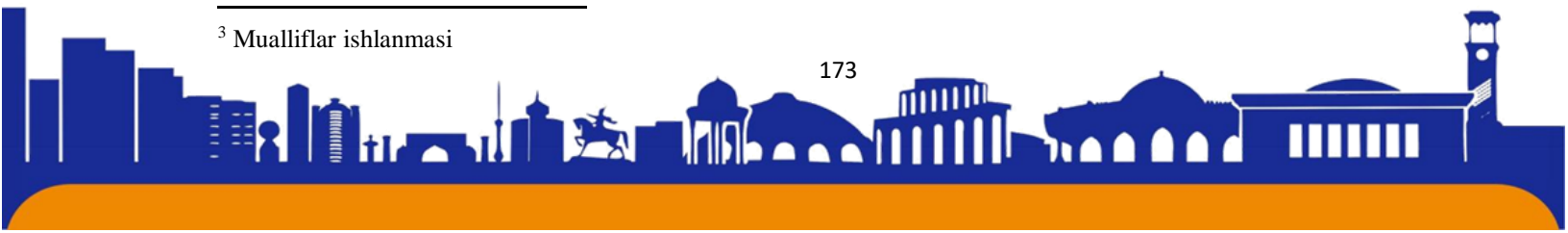
Gretl dasturida OLS usulidan foydalanib 2-jadvaldagi lag ko'rsatkichlarining regression bog'lanishini baholaymiz (3-jadval).

3-jadval

**Regression tahlil natijalari<sup>3</sup>**

Model 2: OLS, using observations 2011-2023 (T = 13)					
Dependent variable: yt1					
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
xt-1	0.464409	0.0256488	18.11	<0.0001	***
Mean dependent var	2466.947	S.D. dependent var		2138.834	
Sum squared resid	4731975	S.E. of regression		627.9580	
Uncentered R-squared	0.964690	Centered R-squared		0.913800	
F(1, 12)	327.8440	P-value(F)		4.44e-10	
Log-likelihood	-101.6781	Akaike criterion		205.3562	
Schwarz criterion	205.9211	Hannan-Quinn		205.2400	
rho	0.444907	Durbin-Watson		1.079236	

<sup>3</sup> Mualliflar ishlanmasi





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3-jadvaldan  $\hat{y}_{t-1}$  instrumental o‘zgaruvchini aniqlovchi regressiya tenglamasining umumiy ko‘rinishi

$$\hat{y}_{t-1} = 0,464409 \cdot x_{t-1} \quad (3)$$

kabi bo‘ladi.

Ushbu (3) model bo‘yicha Fisherning F mezonining hisoblangan qiymati  $F_{his} = 327,844$  ga teng. Bu esa  $df_1 = m = 1$  va  $df_2 = n - 1 - 1 = 12$  erkinlik darajasida hamda,  $\alpha = 0,05$  ahamiyatlilik darajasidagi Fisherning jadval qiymati  $F_{jad} = 4.75$  dan katta. Shuningdek (3) modelning parametrlari bo‘yicha Styudentning t mezon qiymatlari  $t_{d_1} = 18,11$  ga teng, bu esa  $\alpha = 0,05$  ahamiyatlilik darajasi hamda  $df = n - m = 13$  erkinlik darajasida Styudentning t mezon jadval qiymati  $t_{jad} = 2,16$  dan katta. Shu sababli model statistik ahamiyatga ega hisoblanadi.

$\hat{y}_{t-1}$  instrumental o‘zgaruvchining nazariy qiymatlarini aniqlaymiz. (4-jadval).

4-jadval

**Instrumental o‘zgaruvchining nazariy qiymatlari<sup>4</sup>**

Yillar	$y_t$	$x_t$	$y_{t-1}$	$x_{t-1}$	$\hat{y}_{t-1}$
2010	335,9	655,3	-	-	-
2011	470,6	802,9	335,9	655,3	304,3
2012	605,3	980,3	470,6	802,9	372,9
2013	849,5	1 371,0	605,3	980,3	455,3
2014	1 051,5	1 509,1	849,5	1 371,0	636,7
2015	1 351,3	1 843,6	1 051,5	1 509,1	700,9
2016	1 554,8	2 142,4	1 351,3	1 843,6	856,2
2017	1 827,0	3 551,0	1 554,8	2 142,4	995,0
2018	2 879,7	7 240,6	1 827,0	3 551,0	1 649,1

<sup>4</sup> Surxondaryo viloyati Statistika boshqarmasi [www.surxonstat.uz](http://www.surxonstat.uz) sayti





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2019	3 979,7	11 835,1	2 879,7	7 240,6	3 362,6
2020	4 774,7	10 068,2	3 979,7	11 835,1	5 496,3
2021	5 868,4	12 037,8	4 774,7	10 068,2	4 675,8
2022	6 521,9	11 569,4	5 868,4	12 037,8	5 590,4
2023	7 353,3	17 956,0	6 521,9	11 569,4	5 372,9

4-jadvaldagi  $y_t$ ,  $x_t$  hamda  $\hat{y}_{t-1}$  o‘zgaruvchilar ishtirokida (1) modelni baholash mumkin. Buning uchun yana Gretl imkoniyatlaridan foydalandik. (5-jadval).

5-jadval

**Regression tahlil natijalari<sup>5</sup>**

Model 2: OLS, using observations 2011-2023 (T = 13)					
Dependent variable: y					
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	346.814	187.231	1.852	0.0937	*
x	0.216391	0.0574790	3.765	0.0037	***
yt-1_fitted	0.546096	0.149724	3.647	0.0045	***
Mean dependent var	3006.744	S.D. dependent var	2422.853		
Sum squared resid	1933064	S.E. of regression	439.6662		
R-squared	0.972558	Adjusted R-squared	0.967070		
F(2, 10)	177.2045	P-value(F)	1.56e-08		
Log-likelihood	-95.85904	Akaike criterion	197.7181		
Schwarz criterion	199.4129	Hannan-Quinn	197.3697		
rho	0.399093	Durbin-Watson	1.173993		
Test for normality of residual -					
Null hypothesis: error is normally distributed					

<sup>5</sup> Mualliflar ishlanmasi



Test statistic: Chi-square(2) = 1.99324

with p-value = 0.369125

3-jadvalga ko'ra avtoregressiya tenglamamiz:

$$y_t = 346,814 + 0,216391x_t + 0,546096y_{t-1} \quad (4)$$

ko'rinishga ega bo'ladi. (4) modeldan ko'rinish turibdiki qisqa muddatli multiplikator  $b_0 = 0,216391$  ga, uzoq muddatli multiplikator  $b = \frac{b_0}{1-c} = \frac{0,216391}{1-0,546096} = 0,476733$  ga teng. Xulosa, shunday qilib  $x_t$  - asosiy kapitalga o'zlashtirilgan investitsiyalar hajmining 1 mlrd so'mga ortishi  $y_t$ - qurilish ishlab chiqarish hajmini o'rtacha 0,216391 mlrd so'mga oshiradi.  $x_t$  ning uzoq muddatda 1 mlrd so'mga oshishi esa,  $y_t$  ni 0,546096 mlrd so'mga oshiradi.

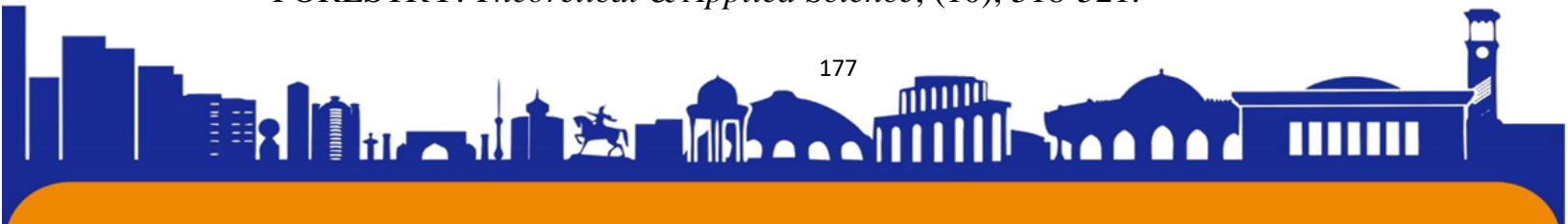
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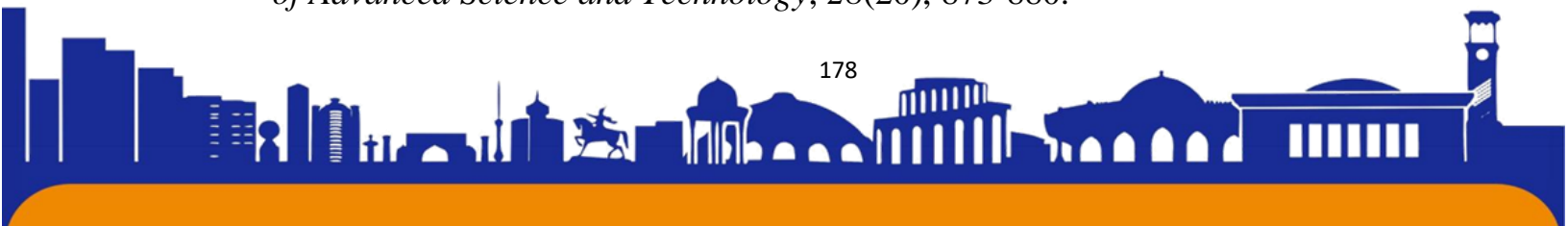
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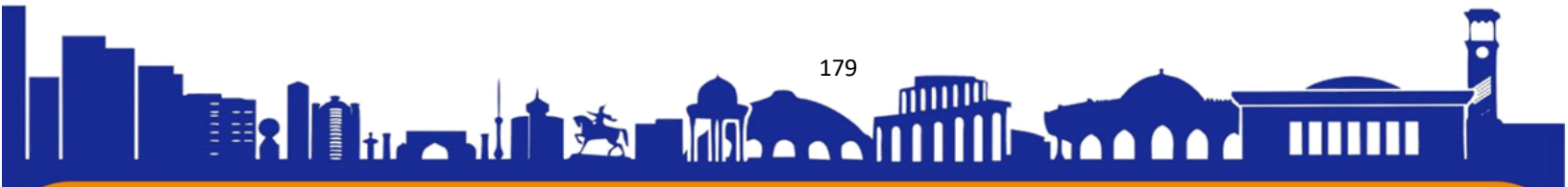
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