ISSN (E): 2181-4570 ResearchBib Impact Factor: 6,4 / 2023 SJIF 2024 = 5.073/Volume-2, Issue-7

QURILISH ISHLAB CHIQARISH 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 saytidan olindi (1-jadval).

1-jadval

Surxondaryo viloyati qurilish ishlab chiqarish hamda investitsiyalar hajmi ko'rsatkichlari[1]

Yillar	*y*	*x*	*Yillar*	*y*	*x*
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

[1] Surxondaryo viloyati Statistika boshqarmasi 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:

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

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

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

(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[2]

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

[2] Surxondaryo viloyati Statistika boshqarmasi 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[3]

Model 2: OLS, using observations 2011-2023 (T = 13)

Dependent variable: yt1

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
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

[3] Mualliflar ishlanmasi

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

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

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 mezoni qiymatlari $t_{d_1} = 18{,}11$ ga teng, bu esa $\alpha = 0{,}05$ ahamiyatlilik darajasi hamda $df = n - m = 13$ erkinlik darajasida Styudentning t mezoni 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[4]

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

[4] Surxondaryo viloyati Statistika boshqarmasi 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[5]

Model 2: OLS, using observations 2011-2023 (T = 13)

Dependent variable: y

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
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

[5] Mualliflar ishlanmasi

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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'rinib turibdiki qisqa muddatli multiplikator $b_0 = 0{,}216391$ ga, uzoq muddatli multiplikator $b = \frac{b_o}{1-c} = \frac{0{,}216391}{1-0{,}546096} = 0{,}476733$ 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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