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**Iqtisodiy tizimlarda to'plamlarni korrelyatsion-regression taxlil qilish****Nasriddinova Muborak Tulanbayevna**

Namangan davlat texnika universiteti

tel: +998774494101, e-mail: mbrknasriddinova@gmail.com**Haydarova Sevinch Alimardon qizi**

Namangan davlat texnika universiteti Magistri

tel: +998775772250, e-mail: ismoilovelmurod011@gmail.com

Annotatsiya Bajarilgan ishda murakkab iqtisodiy masalalarni statistik tahlil qilishga harakat qilingan. Ko'p omilli bog'lanishlar yordamida korrelyatsion- regression tahlil qilingan. Eng kichik kvadratlar usuli yordamida baholangan. To'plamli korrelyatsiya koeffitsiyenti G.Tintner usuli yordamida hisoblangan.

Kalit so'zlar Korrelyatsiya, regressiya, G.Tintner usuli, statistika, bashorat funksiyasi, kvadratik xatolik, funksional bog'lanish, statistik bog'lanish.

Ayrim iqtisodiy tarmoqlarni ishlab chiqarish faoliyatini o'rganishda, har xil omillar sarflanishlari va ular o'rtasidagi bog'lanishni ifodalovchi funksiya va ishlab chiqarilayotgan mahsulot hajmi bilan tasvirlanadi.

Tasodifiy alomatli omillar o'zaro korrelyatsion bog'langan bo'lib, ya'ni $y = f(x_1, x_2, \dots, x_n)$ kuzatishlar natijasida n hajmli statistik ma'lumotlar quyidagi ko'rinishida berilgan bo'lsin:

x_1	x_2	...	x_{m-1}	x_m	y
$x_1^{(1)}$	$x_2^{(1)}$	...	$x_{m-1}^{(1)}$	$x_m^{(1)}$	$y^{(1)}$
$x_1^{(2)}$	$x_2^{(2)}$	...	$x_{m-1}^{(2)}$	$x_m^{(2)}$	$y^{(2)}$
...	...	...	...	...	...
$x_1^{(n)}$	$x_2^{(n)}$	...	$x_{m-1}^{(n)}$	$x_m^{(n)}$	$y^{(n)}$

Bular orasidagi chiziqli ko'p omilli korrelyatsion bog'lanish tenglamasidir:

$$y = a_0 + a_1x_1 + a_2x_2 + \dots + a_mx_m \quad (1)$$

Bu yerda $a_0, a_1, a_2, \dots, a_m$ lar o'zgarmas koeffitsientlar bo'lib, $x_1, x_2, \dots, x_m$ omillar orasidagi o'zaro munosabatlarga bog'liqdir [1-2].

Eng kichik kvadratlar usuli yordamida $a_0, a_1, a_2, \dots, a_m$ larni topamiz

$$S(a_0, a_1, a_2, \dots, a_m) = \sum_{i=1}^n \left(a_0 + \sum_{j=1}^m a_j x_j^i - y_i \right)^2 \rightarrow \min \quad (2)$$

$S(a_0, a_1, a_2, \dots, a_m)$ funksiyani $a_0, a_1, a_2, \dots, a_m$ noma'lum parametrlar bo'yicha xususiy xosilalarini olib,





$$\begin{cases} \frac{\partial S}{\partial a_0} = 0 \\ \dots\dots\dots (j = \overline{1, m}) \\ \frac{\partial S}{\partial a_j} = 0 \end{cases} \quad (3)$$

Quyidagi tenglamalar sistemasini xosil qilamiz:

$$\begin{cases} na_0 + a_1 \sum x_1 + a_2 \sum x_2 + \dots + a_m \sum x_m = \sum y \\ a_0 \sum x_1 + a_1 \sum x_1^2 + a_2 \sum x_1 x_2 + \dots + a_m \sum x_1 x_m = \sum x_1 y \\ \dots\dots\dots \\ a_0 \sum x_m + a_1 \sum x_1 x_m + a_2 \sum x_1 x_m + \dots + a_m \sum x_m^2 = \sum x_m y \end{cases} \quad (4)$$

(1) tenglama regressiya tenglamasi deyiladi. $(a_j, j = \overline{1, m})$

koeffitsiyentlar regressiya koeffitsiyentlari deyiladi.

Endi biz korrelyatsion-regression tahlilga tegishli barcha parametrlarni hisoblash formulalarini keltiramiz:

$$\begin{cases} \bar{x}_j = \frac{1}{n} \sum_{i=1}^n x_j^{(i)}, & \bar{y}_j = \frac{1}{n} \sum_{i=1}^n y_i \\ \bar{x}_k \bar{x}_j = \frac{1}{n} \sum_{i=1}^n x_k^{(i)} x_j^{(i)}, & (k = \overline{1, m}; j = \overline{1, m}) \\ \bar{x}_j^2 = \frac{1}{n} \sum_{i=1}^n [x_j^{(i)}]^2, & \bar{y}^2 = \frac{1}{n} \sum_{i=1}^n y_i^2 \end{cases} \quad (5)$$

Bog'lanish zichligi to'plamli korrelyatsiya koeffitsiyenti yordamida baholanadi:

$$R_{yx_j} = \sqrt{1 - \frac{\sum (y_i - \hat{y}_2)^2}{\sum (y_i - \bar{y}_2)^2}} \quad (|R| \leq 1) \quad (6)$$

Bu yerda $\hat{y}$ -regressiya tenglamasi (1) yordamida aniqlangan natijaviy ko'rsatkichning o'rtacha arifmetik qiymati [3-6].

Demak o'rtacha kvadratik xatolik

$$S = \sqrt{\frac{\sum (y_i - \hat{y}_i)^2}{n - k - 1}} \quad (7)$$

bunda n - kuzatuvlar soni; k - omillar soni.

Umumiy variatsiya (V):

$$V = \sum_{i=1}^n (y_i - \bar{y})^2 \quad (8)$$

Tasodifiy variatsiya (V_2):

$$V = \sum_{i=1}^n (y_i - \hat{y})^2 \quad (9)$$

Tendensiya variatsiyasi:

$$V_1 = V - V_2 \quad (10)$$





Chiziqli funksiya uchun dispersiyalar:

$$\begin{cases} S^2 = \frac{V}{n-1} \\ S_1^2 = V_1 \\ S_2^2 = \frac{V_2}{n-2} \end{cases} \quad (11)$$

To'plamli korrelyatsiya koeffitsiyenti **G.Tintner** taklifiga asosan quyidagi formula bo'yicha hisoblanadi:

$$R_{yx_j} = \sqrt{\frac{a_1 S_1 + a_2 S_2 + \dots + a_m S_m}{S_y}} \quad (j = \overline{1, m}) \quad (12)$$

Bu yerda $S_j = \overline{y^* x_j} - \overline{y}^* \overline{x_j}$ formula bo'yicha hisoblanadigan kovariatsiya koeffitsiyenti; S_y - natijaviy ko'rsatkich dispersiyasi; $a_j (j = \overline{1, m})$ - regressiya koeffitsiyenti.

Yuqoridagi formulalardan shuni aniqlash mumkinki agar omillar soni ko'p bo'lsa ham regressiya tenglamasi chiziqli funksiya iborat bo'lsa bunday statistik funksiyalar o'zaro funksional bog'lanishi mumkin ekan.

Foydalanilgan adabiyotlar

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