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IMPLEMENTATION OF PAIRED CORRELATION AND REGRESSION ANALYSIS BETWEEN THE NUMBER OF BIRTHS AND THE NUMBER OF MARRIAGES IN THE REPUBLIC OF UZBEKISTAN BY REGION IN 2021

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Abstract
In this article, in order to analyze the demographic situation of the population of the Republic of Uzbekistan, the correspondence between the number of births in 2021 and the number of marriages concluded in 2021 is analyzed. As a result of the analysis, a regression equation of the relationship between the two indicators was created, and based on the analysis, scientifically based suggestions and comments were given.

Key words: birth, marriage, regression, correlation, correlational link, estimation of significance of regression model, Fisher's criterion, Student's criterion.

Demography is considered the science of population. Demographers try to study population dynamics by studying three main demographic processes: fertility, migration, and aging (including death). This process also contributes to population change, including how people live on Earth, form nations and societies, and develop culture.

Demography is also a statistical study of the human population. Demography studies the size, structure and movement of the population in space and time. He uses methods from history, economics, anthropology, sociology and other fields. Demography is useful to Governments and private enterprises as a tool for analyzing and forecasting social, cultural and economic trends related to the population.

Demographers collect data mainly through state registers, birth and death registers. However, these sources may be inaccurate depending on the accuracy of government reports. Demographers also collect indirect data by studying small groups of the population. These samples are then examined using statistical models to draw conclusions about the entire population.

While basic demographic studies, such as population censuses, were conducted in the Ancient World 6,000 years ago, the demographers we know today, such as John Graunt of Great Britain, appeared in the 16th century. Early statistical studies were mainly concerned with mortality (how many people died and at what age). By studying baptisms and funerals, Ground was able to estimate the number of men of military age and the number of women of childbearing age. His research was considered one of the first statistical surveys of the region's population. Demographic surveys are also often conducted by early life insurance agents to determine life insurance rates.

Although basic demographic studies, such as population censuses, were conducted in the ancient world 6,000 years ago, participates in pre-training in statistics or medical research. In combination of several disciplines, such as sociology, economics, epidemiology, geography, anthropology and history, demography combines the more technical quantitative approach underlying science with many other methods taken from the social or other sciences, offers tools to solve the problems of the population. Demographic research is conducted at universities, research institutes, as well as at statistical faculties and in several international agencies. This included demographic institutes belonging to the cicred network (International Committee for the Coordination of Demographic Research), many scientists engaged in demographic research are members of the International Demographic Scientific Association or the American Demographic Association in the United States of America, or the Canadian branches of the Canadian Federation of Demographers.

There are several areas of demography:

Biodemography;
Human longevity Biodemography;
Demographics of the world;
Demographic economy;
Gomperts-Makeham Death Act;
Linguistic demography;
Medieval demographics;
Political demography;
Population biology;
Population dynamics;
Population geography;
Population reconstruction;
Population statistics;
Religious demography;
Replacement migration;

Reproductive health;

In this article, to analyze the relationship between fertility and marriages, statistical data are provided on the official website of the State Statistics Committee of the Republic of Uzbekistan. (https://stat.uz/uz/rasmiy-statistika/demography-2) obtained by contacting.

The study of the interrelations between socio-economic processes is one of the most important tasks of the science of econometrics. In this analysis, the relationship between the number of births by region (Y) in the Republic of Uzbekistan in 2021 and the number of marriages concluded by region (X) in the Republic of Uzbekistan in 2021 is studied, a regression equation of their relationship is compiled.Below we will show you these completed works.

Y is the number of births in the Republic of Uzbekistan in 2021 by region.

X is the number of marriages concluded in the Republic of Uzbekistan in 2021 by region.

Regions	Number of births, people, 2021, (Y)	Number of marriages in units, 2021, (X)
Republic of Karakalpakstan	40 272	15 746
Andijan	84 664	26 740
Bukhara	43 173	16 923
Dzhizak	41 313	13 318
Kashkadarya	97 079	30 582
Navoi	26 576	9 210
Namangan	79 968	25 038
Samarkand	110 455	36 270
Surkhandarya	80 975	26 497
Syr Darya	23 244	8 065
Tashkent	72 659	25 692
Ferghana	99 146	32 804
Khorezm	42 653	15 543
Tashkent city	63 034	22 783

Table 1. Number of births by region in the Republic of Uzbekistan in 2021 (Y), number of marriages concluded by region in the Republic of Uzbekistan in 2021 (X)

Microsoft Excel was used to analyze these statistics.

r The correlation coefficient is a coefficient showing the degree of dependence between factors. r^2 the coefficient of determination is the main result of regression analysis. It is interpreted as the ratio of variance in an arbitrary variable that can be predicted from an arbitrary variable [1].

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r, correlation	Number of births, people, 2021, Y	Number of marriages in units, 2021, X
Number of births, people, 2021, Y	1	-
Number of marriages in units, 2021, X	0,990733699	1

Table 2. Correlation density between the number of births and the number of marriages, information processed by the author.$r_{xy} = 0{,}990733699$ since it is equal to and, we conclude that the connection between and is correct and tight.$r_{xy} = 0{,}990733699$ from the fact that the coefficient of determination $r_{xy}^2 = 0{,}981553$ it turns out that ... The value of the coefficient of determination represents a change in accordance with the degree of change [2].

The next stage of the analysis is to determine the regression equation using Microsoft Excel $y = a + bx$ we search by visibility, evaluate the quality and significance of the model by the Fisher criterion, as well as by the Student criterion.

Table 3. The result of the regression analysis of the number of births (Y) compared to the number of marriages (X) is the information processed by the author.

	A	B	C	D	E	F	G
1	OUTPUT OF RESULTS						
2	Regression statistics						
3	Multiple R	0,990734					
4	R-square	0,981553					
5	Normalized R-square	0,980016					
6	Standard error	4028,328					
7	Observations	14					
8	Analysis of variance						
9		***df***	***SS***	***MS***	***F***	***Significance F***	
10	Regression	1	1,04	1,04	638,5215	8,96	
11	Remains	12	1,95	16227430			
12	Total	13	1,06				
13		***Coefficients***	***Standard error***	***t-statistics***	***P-Value***	***Lower 95%***	***Upper 95%***
14	Y-intersection	-5540,44	2979,368	-1,8596	-0,087622	-12031,9	951,0461
15	Variable X 1	3,219993	0,127429	25,26898	8,96	2,942349	3,497636

Values in cells B14 and B15 based on the table 3 $y = a + bx$ coefficients of the regression equation:$a = -5540{,}44$, $b = 3{,}219993$. From this, the following regression equation is obtained.$y = -5540{,}44 + 3{,}219993 \cdot x$ (1)

The value in cell E10 in Table 3 is the calculated value of the Fisher criterion (F_{his}), The value in cell F10 is the value of checking the Fischer criterion table (F_{jad}) presents. If $F_{his} > F_{jad}$ if the compiled type of regression equation is selected correctly and is considered statistically significant,$F_{his} < F_{jad}$ if the compiled type of regression equation is chosen incorrectly and is considered statistically insignificant.$F_{his} = 638{,}5215$, $F_{jad} = 8{,}96$. $F_{his} > F_{jad}$ from the fact that (1) the regression equation is chosen correctly and statistically significant.

The numbers in cells D14 and D15 of Table 3 represent the values of the student's criterion t of regression coefficients a and B, respectively. On the other hand, the numbers in cells E14 and E15 represent an indicator of checking the values of the student's criterion t of regression coefficients A and B, respectively. If $t_a > t_{aj}$, $t_b > t_{bj}$ if the parameters of the compiled regression equation are called statistically significant, $t_a < t_j$, $t_b < t_j$ if the parameters of the compiled regression equation are not statistically significant, they say [3].

$t_a = -1{,}8596$, $t_b = 25{,}26898$, $t_{aj} = -0{,}087622$, $t_{bj} = 8{,}96$. $t_a > t_{aj}$, $t_b > t_{bj}$ from the fact that (1) the parameters of the regression equation are statistically significant, we conclude.

Therefore, taking the regression equation (1) as an estimated model, we can predict the number of births in the Republic of Uzbekistan by region for the following years. In this article, conclusions were drawn about forecasting by constructing a regression equation by analyzing statistical data, evaluating the compiled equation using evaluation criteria, and adopting the regression equation as an evaluation model.

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