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THE SHARE OF INFORMATION SERVICES IN THE SMALL BUSINESS SECTOR

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ABSTRACT

In this study, the impact of the share of information services on the development of small business sector was analyzed using an econometric method. In the analysis of this data, statistical data of the website of the statistical committee of our country and speedtest.net for the years 2012-2022 were obtained. In the process of statistical data analysis, econometric methods, correlation and regression analysis processes were implemented. By carrying out the process of correlation analysis, it was determined how the factors affecting the small business sector are connected. The regression equation of the study was created by conducting regression analysis. To determine the significance of the regression equation, the Fisher test was used, the Durbin-Watson test was used to check the autocorrelation of the model residuals, the t-student test was used to determine the reliability of the regression parameters, and the P-value was used to determine the significance of the t-student value. Also, a regression equation was created, its elasticity values were found, and forecasts were made for the next year.

Keywords : Small Business, Information Services, Correlation Analysis, Regression Analysis, Durbin-Watson Test, Fisher Test, T-Student Test.

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Original Article

INTRODUCTION

Today, the development of small business and private entrepreneurship remains one of the most important issues. Large-scale measures are being implemented in our country for the development of small business and entrepreneurship. This is also stated in the Resolution No. PQ-364 of August 30, 2022 "On measures to implement the tasks set in the open dialogue of the President of the Republic of Uzbekistan with entrepreneurs in 2022" on the development of small business and entrepreneurial activities. mentioned.

In this decision, more than 55,000 buildings designed for business activities were built in our country in the framework of the past 2021-2022, in order to eliminate the obstacles arising in the development of small and medium-sized businesses. Entrepreneurs with a turnover of more than 1 million dollars also increased by 5,000 to 26,000[1].

Also, preferential loans are allocated to people who want to start a small business and private entrepreneurship. Information services also have their own special place in running a small business. Information services can be very valuable for entrepreneurs and small business owners who want to start and grow their business. Information services that may be useful for this business include:

- use of business planning resources;
- conducting market research;
- financial management;
- activity in accordance with legal and regulatory legislation;
- development of knowledge and skills.

We know that in order to start a business, it is necessary to make a business plan. If there is no business plan, we cannot develop this business activity. Many information services offer resources and tools to help

1 Resolution PQ-364 dated August 30, 2022 "On measures to implement the tasks set in the open dialogue of the President of the Republic of Uzbekistan with entrepreneurs in 2022" https://lex.uz/uz/docs/-6178038

entrepreneurs develop business plans, including templates, guides, and online courses. Through these information services, we can create a business plan for our business activities.

In order to conduct our business activities in the market, the analysis of market activity helps us to understand market trends in information services, to study customer behavior and to make informed decisions for small businesses.

Information services can offer resources and tools to help small businesses manage their finances, including accounting software, budgeting tools, and financial planning resources.

It is possible to conduct activities in terms of legal and regulatory compliance in comprehensive information services. This legal and regulatory compliance can mainly be guidelines for licensing, obtaining permits and tax requirements.

Educational information services can offer training and education programs to help small business owners develop the skills and knowledge they need to succeed.

In our country, information services are a valuable resource for small business owners who want to start and develop their business. By providing access to these resources, data and information, these services help entrepreneurs make informed decisions and overcome the challenges of starting and running a small business. The share of information services in the small business sector may vary depending on the specific sector and region. However, information services are increasingly important to small businesses seeking to compete in a rapidly changing business environment.

In addition, the COVID-19 pandemic has shown the importance of information services for small businesses. Many small businesses were forced to develop their activities through new technologies in order to survive during the pandemic. It's safe to say that information services have played an important role in helping small businesses navigate the challenges of the pandemic, including accessing financial aid, transitioning to remote work, and adapting to changing customer needs. The share of information services in the small business sector is likely to continue to grow, as small businesses increasingly rely on technology and data to compete and succeed in the marketplace.

LITERATURE ANALYSIS

Researcher James Y. L Thong (1999) used several hypotheses to construct an integrated model of information systems implementation in the small business sector. The analysis process was based on theories from the literature on technological innovation and developed an integrated model of information systems adoption in small businesses. The model identified contextual variables such as decision-maker characteristics, information technology characteristics, organizational characteristics, and environmental characteristics as key factors in small business adoption.

During the research, he conducted a survey of 166 small business entities and analyzed the data. Data analysis shows that

- certain characteristics of the CEO: level of innovation and IT knowledge;
- innovative features: relative advantage, compatibility and complexity of IT;
- organizational characteristics: business size and level of IT knowledge of employees[2]

It was found that small enterprises with these characteristics are more likely.

In the adoption of information systems, the CEO and innovative features were considered important factors in the decision to adopt, which were found to have no effect on the level of adoption of information systems. The level of adoption of information technology was mainly determined by organizational characteristics. Finally, it was found that the environmental characteristics of competition do not directly affect the adoption of information systems by small businesses.

The author of this article, MirzayevDilshod (2021), paid special attention to the expansion of the field of service to small businesses and entrepreneurs in our country. In his article, he highlighted a number of services such as service to

[2]James Y. L. Thong – "An Integrated Model of Information Systems Adoption in Small Businesses", Journal of Management Information Systems. Volume 15,1999.

small businesses and business entities, as well as the expansion of the production sector in business entities, such as technical repair, material technical support, storage, processing and sale of products.

The author touched a little on small business activities and said that "every businessman who wants to start a business cannot carry out his business without sufficient and accurate information. Information is necessary for business activity, consists of a set of messages, and is a form of communication between producers, sellers and buyers of information.[3]

Also, external information was considered to be relations with product manufacturers and consumers, state authorities, banking organizations, competitors, etc. These are messages from the external environment that are related to the sale and purchase of goods.

The main activities of these small businesses and private enterprises are closely related to banks. Because it was explained that the purchase of raw materials, created goods, payment of wages to employees and economic relations with various other enterprises, firms and organizations in terms of income tax, utility, transport services are carried out through banks. Also, the article touched on bank operations, and it was also pointed out that these operations consist of active and passive operations, and that passive operations direct funds to certain directions.

The author of the next article, Boyzokova D.F (2022), considered the impact of services and the service industry on macroeconomic stability. It was explained how important it is to provide services in ensuring the employment of the population, increasing their income and ensuring their well-being.

In the article, for the rapid development of the service sector, it is necessary to expand the type of services provided in rural areas and improve their quality, and based on this, the role of the service sector in the stable and rapid development of the economy of our country, ensuring the employment of the population, increasing their income and improving their well-being. increasing its importance is becoming one of the current issues [4]- it was mentioned.

In the development of regional programs for the development of the service sector and measures for their implementation, special importance is attached to the following:

further improvement of the structure of the service sector, rapid development and filling of the market with modern types of services that create demand among the population;

based on the approved standards for planning the construction of urban and rural settlement areas, to further increase the quality of various social and communal services to the residents of the regions and to expand the possibilities of their use;

in the first place, development of service enterprises in rural settlements, wide involvement of enthusiastic young people from among family business entities and graduates of specialized vocational colleges and higher educational institutions in the service sector were also mentioned.

In conclusion, the growth of the share of small business and private entrepreneurship in the economy of our country ensures that the domestic market is filled with high-quality and competitive products. It was noted that as a result of this, the expansion of the service sector and the increase in the composition of exports in line with the requirements of the world market will be the basis for the creation of new jobs.

The authors of the next article, such as Shadiyeva G and Rustamova Z (2022), conducted research on the development and efficiency of family entrepreneurship in the service sector. In the article, the authors paid special attention to the development of family entrepreneurship in the service sector and expressed their opinions on the development and improvement of the efficiency of this family entrepreneurship. They also touched on the subject statistics.

When conducting this research, they focused on the number of family businesses in our republic in 2021. When comparing the number of family businesses from 2017 to 2021, the authors found that the number of family businesses in 2017 was 11,036, and in 2021 it was 49,919, which is a 4-fold increase compared to 2017.

[3]MirzayevDilshod - "Service to small business and entrepreneurship", "SCIENCE AND EDUCATION" SCIENTIFIC JOURNAL. MAY 2021/ VOLUME 2. ISSUE 5

[4]Boyzokova D.F - "THE ROLE OF THE SERVICE FIELD IN ENSURING MACROECONOMIC STABILITY", "Economics and Sotsium" #10 (101) -1 2022.

When analyzing the number of family enterprises in the region of our country in 2021, it was found that the largest number of family enterprises is in Samarkand region. These family enterprises were 9,041 in Samarkand region, followed by Fergana, Surkhandarya and Khorezm regions. They also determined that the number of family enterprises in these regions is 5,778 in Fergana, 5,400 in Surkhandarya, and 4,682 in Khorezm.[5]

As a conclusion, according to the results of the research conducted by the author, it is possible to build New Uzbekistan by supporting family entrepreneurship. In assessing the effectiveness of family business in the development of each region of our republic, it was recommended to further develop family business in the service sector in the following types of activities:

- trade and catering (retail trade, national cuisine and restaurants) services;
- national crafts, repair services and household goods;
- computer and modern information technology services (types of services such as internet cafe, small printing house, mobile connection and "paynet");
- transport services;
- photo and beauty salons (wedding dress and wedding equipment rental, etc.).[6]

METHODOLOGY

It was determined how the share of information services affects the development of the small business sector of our country. These statistical secondary data were used from the statistical data of the website of the official statistics committee of our country and the statistical data of speedtest.net sites. correlation and regression analysis processes of econometric analysis were used.

To carry out the research, 3 variables affecting the small business sector were selected. The selected variables are:

1. Volume of services in the field of small business, bln. in soum - Y;
2. The number of personal computers per 100 households, units - X1;
3. Wired Internet speed, Mbit/s - X2.

ANALYSIS AND RESULTS

Statistical information on the volume of services in small business activities of our country, the number of personal computers per 100 households, and the speed of wired Internet from 2015 to 2022 is presented in Table 1 below.

Table 1: Statistical Information on the Volume of Services in Small Business Activities, the Number of Personal Computers Per 100 Households and the Speed of Wired Internet[7]

Years	Volume of services in the field of small business	Number of personal computers (per 100 households)	Wired internet speed
2015	47269,6	47	3,31
2016	61346,2	49	4,32
2017	69212,7	50	5,81
2018	84433,4	52	10,11
2019	103106,6	55	13,50
2020	114052,7	56	29,92
2021	144812,7	63	44,36
2022	173157,7	66	45,03

[5]ShadiyevaGulnora, Rustamova Zarina - "WAYS OF DEVELOPMENT AND INCREASE EFFICIENCY OF FAMILY BUSINESS IN THE FIELD OF SERVICE", "SCIENCE AND INNOVATION", INTERNATIONAL SCIENTIFIC JOURNAL. VOLUME 1. 2022.
[6]Recommendations of the authors of the article
[7]Information from the official statistics committee of the Republic of Uzbekistan and speedtest.net

First of all, it was determined that the number of personal computers per 100 households and the speed of wired internet are correlated with the volume of services in the small business sector. In the correlation matrix in Table 2, we can see the correlation coefficient of the number of personal computers per 100 households and the speed of the wired Internet to the volume of services in the small business sector.

Table 2: Correlation Coefficients of the Number of Personal Computers per 100 Households and the Speed of Wired Internet on the Volume of Services in the Field of Small Business

	Volume of services in the field of small business(Y)	Personal computer number(X1)	wired internet speed(X2)
volume of services in the field of small business(Y)	1,0000		
personal computer number(X1)	0,9954	1,0000	
wired internet speed(X2)	0,9596	0,9669	1,0000

From this Table 2, it can be seen that the correlation coefficient of the number of computers per 100 households and wired internet speed to the volume of services in the small business sector is 0.9954 and 0.9596, respectively. lib, properly proportional and strongly correlated. From this, it can be said that the number of personal computers and the speed of the wired Internet have a positive effect on the volume of services in the small business sector, while having a strong impact on the volume of this service sector. Also, the correlation coefficient between the number of PCs per 100 households and the wired internet speed is 0.9669, showing a direct proportional and strong correlation between them..

The next analysis consists of a regression analysis process, in which the best regression model is selected. This regression analysis process was performed through linear model and log-linear model. The results of the linear regression model can be seen in Table 3 below.

Table 3: Linear Regression Model Results

					Number of obs =	8
Source |	SS	df	MS		F(2, 5) =	272,37
Model |	1,2913e+10	2	6,4564e+09		Prob > F =	0,0000
Residual |	118523012	5	23704602,5		R-squared =	0,9909
Total |	1,3031e+10	7	1,8616e+09		Adj R-squared =	0,9873
					Root MSE =	4868,7
Y |	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
X1 |	6624,981	1068,099	6,20	0,002	3879,346	9370,616
X2 |	-106,0662	408,6674	-0,26	0,806	-1156,579	944,4467
_cons |	-260970,7	50825,11	-5,13	0,004	-391620,8	-130320,6

From the results of linear regression in Table 3, it can be seen that the value of R-square in the regression is equal to 0.9909, which means that this model can cover 99% of the volume of services in the small business sector. The Fisher value of the regression model was 272.37, which was significant at Pvalue (0.0000) and indicated the significance of the regression model. The value of the average squared deviation is equal to 4868.7. The significance of the t-student value of the parameters of the linear regression model was determined by the Pvalue. In this case, the P value of X1 and constanta

in the regression equation was equal to 0.002 and 0.004, respectively, which indicated that the t-student values of these parameters were significant. Based on this, since the t-student value of X1 and constanta parameters was significant, the values of X1 and constanta were reliable. Only the value of the parameter X2 is unreliable because the t-student value for this parameter is not significant because the P value of the parameter is greater than 0.05. Also, the normal distribution of the residuals of this linear regression model can be seen from the histogram in Figure 1.

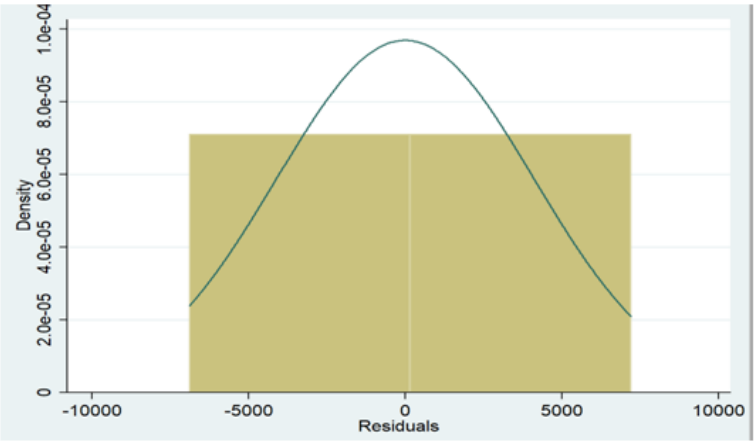

Figure 1: A Histogram Shows Whether The Residuals Of A Linear Model Are Not Normally Distributed Or Not

The histogram in Figure 1 shows that the residuals are normally distributed. Although this linear model has large residuals, the residuals are almost normally distributed. The next model is the Log-linear model, and the results of this regression model are shown in Table 4 below. According to the results of this Log-linear model, the Fisher value in the Log-linear regression equation for 8 observations was 41.33, which indicated the significance of the regression equation. The R-square value is equal to 0.9430, which means that this model can cover 94.3% of the volume of services in the small business sector. The P value of X1 and constanta in this Log-linear regression equation were 0.002 and 0.045, respectively, which indicated that the t-student values of these parameters were significant. Based on this, since the t-student value of X1 and constanta parameters was significant, the values of X1 and constanta were reliable. In the model, only the value of the X2 parameter is unreliable, because the P value of this parameter is greater than 0.05, which means that the t-student value is not significant.

Table 4: Results of the Log-Linear Regression Model

					Number of obs =	8
Source |	SS	df	MS		F(2, 5) = 41,33	
Model |	1,2832429	2	0,641621452		Prob > F =	0,0008
Residual |	0,077626792	5	0,015525358		R-squared =	0,9430
Total |	1,3608697	7	0,194409957		Adj R-squared =	0,9201
					Root MSE =	0,1246
ly|	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
X1 |	0,072568	0,0273348	2,65	0,045	0,0023016	0,1428343
X2 |	-0,003656	0,0104586	-0,35	0,741	-0,0305408	0,0232286
_cons |	7,524569	1,300717	5,78	0,002	4,18097	10,86817

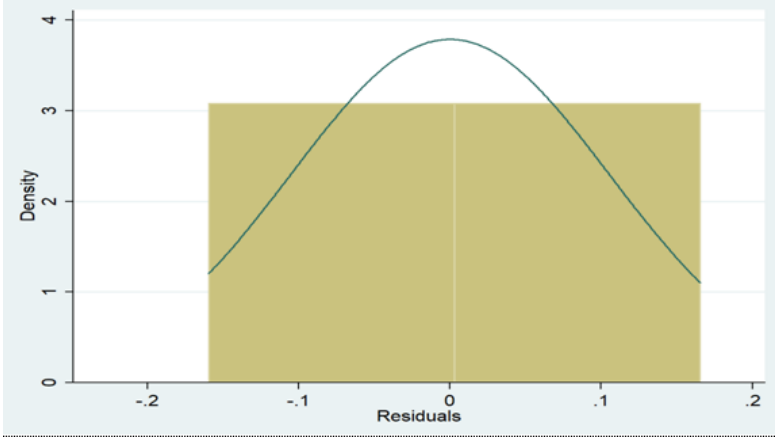

Figure 2: A Histogram shows whether the Residuals of the Log-Linear Model are not Normally Distributed or not

From the location of the residuals in the histogram given in Figure 2, it can be seen that these residuals are normally distributed. Because the residuals of the Log-linear model are almost close to zero.

Among these two Linear and Log-linear models, the Log-linear model can be taken as the best model. However, the R-squared value in this model may be small, but because the constanta and X2 parameter values are positive, the residuals are almost normally distributed toward zero, and the mean square deviation of the model is also small, so it is Log-linear. model was taken as the most optimal model for research. The normal distribution of the residuals of this Log-linear model can be seen in Figure 2 above. The next analysis is the Durbin-Watson test, which tests the residuals for autocorrelation, that is, whether there is repetition in the residuals. You can see the results of this test in the diagram in Figure 3 below.

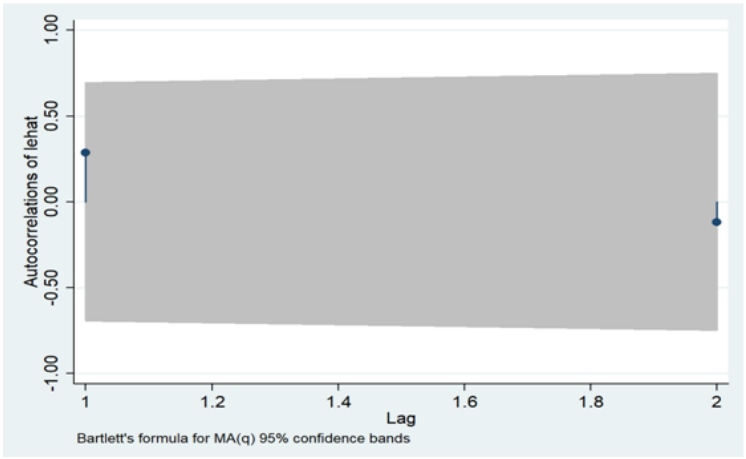

Figure 3: Autocorrelation Test Plot of Residuals

It can be seen in the diagram in Figure 3 that there is no recurrence in the model residuals. Also, it will be possible to determine whether there is repetition in these residues through the Durbin-Watson d-statistic table. This Durbin-Watson d-statistic value for 3 variables and 8 years of follow-up was 1.003394. Now checking this value for d1=0.367 and d2=2.287, it is found that this value lies between d1 and d2. Based on this, uncertainty was detected in the determination of autocorrelation in the residuals, in such a case, it is necessary to conduct other investigations.

Also, how close the Log-linear model is to the true model graph can be seen from the graph in Figure 4.

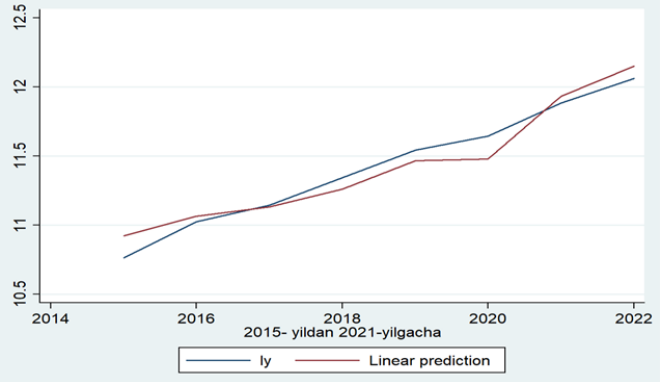

Figure 4: A Graph of the Closeness of the Estimated (Ly) Model to the True Model (Y).

It can be seen in Figure 4 how close the calculated (ly) model is to the true (y) model. The graphs in Figure 4 are almost identical.

During the research, a number of tests were conducted on the Log-linear model. The equation for this Log-linear model is formulated as follows:

$$LN(Y) = 7{,}524 + 0{,}072 *X1 – 0{,}0036 * X2$$

If other factors are not affected, the volume of services in the field of small business will change by 7.52%. A change in the number of personal computers per 100 households (X1) by 1%, other factors not being affected, leads to an increase in the volume of services in the small business sector by 0.072%. If a 1% change in wired internet speed (X2) leads to a 0.0036% decrease in the volume of services in the small business sector. Table 5 below shows the coefficients of elasticity of the Log-linear model.

Table 5: Elasticity coefficients of the log-linear regression model

Average marginal effects			Number of obs = 8			
Model VCE: OLS						
Expression: Linear prediction, predict()						
ey/ex w.r.t.: X1 X2						
			Delta-method			
	ey/ex	Std. Err.	z	P>|z|	[95% Conf.	Interval]
X1	0,3467573	0,1306113	2,65	0,008	0,0907638	0,6027509
X2	-0,0060876	0,0174193	-0,35	0,727	-0,0402289	0,0280537

In the elasticity coefficients of the Log-linear model given in Table 5, the elasticity value of X2 is unreliable, because the P value is greater than 0.05, that is, the P value of X2 is equal to 0.727, and only the elasticity coefficient of X1 is reliable.

The elasticity coefficients of X1 and X2 can be expressed as follows:

If a 1% increase in the number of personal computers per 100 households increases the volume of services in the small business sector by 0.346%.

If a 1% increase in wired internet speed leads to a 0.006% decrease in the volume of services in the small business sector.

Using this log-linear regression equation, we can make the following forecast for 2023:

If the number of personal computers per 100 households is equal to 67 units and the wired Internet speed increases to 46 Mbit/s, the volume of services in the field of small business is 277130.3 billion soums. This forecast was calculated without taking into account other factors.

CONCLUSIONS AND SUGGESTIONS

Our research on the development of services in the field of small business in our country is aimed at the development of services in this small business, considering the impact of personal computers and wired Internet per 100 households on the volume of services in small business. In the process of research, it is the implementation of the forecasting process based on the results obtained in the regression analysis process. The Log-linear model was selected as the model of the research process, and other analysis processes were carried out on the basis of this model. This Log-linear model has an R-squared value of 0.9430, which means that this model can cover 94.3% of the service sector in the small business sector, and the remaining 5.7% is due to other factors.

The elasticity coefficients of this Log-linear model are determined, and these coefficients indicate that a 1% increase in the number of personal computers per 100 households in the small business sector increases by 0.346%, but a 1% increase in wired Internet speed increases by 0.006 It was determined during the research process that it will decrease by %.

It is also possible to make a forecast for the volume of services in the field of small business for 2023. If the number of personal computers per 100 households is 67 units, and the wired Internet speed is 46 Mbit/s, the volume of services in the field of small business is 277,130.3 billion soums.

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