Use of Bank and Credit Cards

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Abstract

With the development of technology in recent years, the use of bank and credit cards has become widespread and the use of cash has decreased. The main purpose of this study is to investigate the factors affecting the changes in bank and credit card expenditures in Turkey in the last five years. In this project, various literature studies were used to understand the factors that cause the change in bank and credit card expenditures, and the data were obtained from the Central Bank's website. Both qualitative and quantitative research methods were used in the studies and the effects of factors such as tourism, technological convenience and Covid-19 on the use of bank and credit cards in Turkey were examined. As a result of this research, it has been observed that the expenditures as a result of tourism do not have a definite effect on the use of bank and credit cards, the use of debit and credit cards has increased thanks to technological convenience and easy access to products, and there has been an increase in the use of debit and credit cards during the Covid-19 pandemic process. In addition, among the various variables examined, it was noted that the use of bank and credit cards was mostly during online shopping and grocery shopping.At the same time, linear regression and correlation analysis were performed to understand the relationships.

KEY WORDS : Turkey, credit card, debit card, spending, research, Analysis, Change in the last 5 years, Credit and debit card use, Covid-19, Tourism.

1 intrdoction

Recently, the use of debit and credit cards has become quite common in Turkey. The number of bank and credit card usage is increasing and the places used are also changing due to this situation. Now instead of cash, cards are used in every areas. People are starting to not carry money on them, which shows that people are used to debit and credit cards. Debit and credit cards are now used in many areas. Especially in internet shopping, the most important thing is the use of debit and credit cards.Recently, internet expenditures constitute a large part of Turkey's bank and credit card expenditures. The contributing factors will be explored. For this analysis, the data set obtained by the central bank of the Republic of Turkey is used. The data consists of 73 observers and 15 variables. By using the monthly values of the last 5 years, it will be investigated how the difference has changed in terms of variables (clothing, health, food, internet) and which factors have an effect on this.

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2   Literature Review

The beginning of the use of debit and credit cards does not date back to ancient times. The idea of card payment was first introduced in a science fiction novel in 1887. This novel is Edward Bellamy's book "Looking Backward Or Life In The Year 2000". At the end of the 18th century, the United States introduced a card that allowed the purchase of goods and services without paying cash. In Turkey, the first credit card use was with Diners Club in 1968 and very few people had this card in those years. (Bayrakdaroğlu & Altuntaş, 2015; Kaya, 2009) Since then, the use of bank and credit cards has continued to increase until today. There are many reasons for the increase in the use of debit and credit cards. First of all, according to the study of Evans (2008), the use of debit and credit cards has increased visibly in the last thirty years. Credit cards have helped households (low-income families) buy things they couldn't get with cash, and Credit card loans have led households to have trouble-free consumption throughout their lives. At the same time, it has been observed that it affects the use of debit and credit cards in developed and developing countries.(Evans, 2004) Kaynak and Küçükemiroğlu(1995) examined credit card usage behavior in developed and developing countries (Turkey) and stated that the increase in bank and credit card usage is related to socio-economic and technological developments, and that the use of credit cards increases especially in developing countries.(Kaynak et al., 1995) Borzekowski and Kiser (2008) examined the payment preferences of consumers such as using debit cards, general purpose credit cards, petrol credit cards or cash and how it is determined. According to them, consumers who are less educated, low-income, middle-aged are found to have fewer credit cards and are more likely to use cash, and those who use debit and credit cards are younger and more educated.(Borzekowski & Kiser, 2008) However, the consumer Payment Choice Diary was made by the Federal Reserve. They have sought to understand the payment habits of the US population. Kim, Kumar and O'Brien (2016) highlight their findings in October every year since 2016. According to them, as in the findings in 2018, cash accounted for 35 percent of face-to-face payments, and debit cards have been the most preferred payment system in recent years. The results of the 2020 Diary said that many consumers prefer to use cash for daily payments, while others continue to emphasize that they use cash as a backup payment tool even when opting for debit and credit cards. One of the reasons for the increase in the use of credit cards is clearly indicated by the work of platinum in the army province. (Kim et al., 2020) In the survey conducted by Pilatin (2021) with 425 people on the factors affecting the use of credit cards in Turkey, it was understood that the most important factor in the use of credit cards in the province of Ordu is that credit cards provide the opportunity to shop in installments.(Pilatin, 2021) One of the other reasons, Ağan (2020), is related to the change of the payment system with covid-19. In the 2019-2020 period, the use of bank and credit cards has increased due to the effects of covid-19 in the world. Especially the 'contactless' feature that came to cards played an important role during the pandemic period. Fear of the virus transmitted by cash, people have moved away from paying cash and started using debit and credit cards. In addition, the use of debit and credit cards has been affected by cultural factors.(Büşra, 2020) Gul (2014),found significant relationships between the use of bank and credit cards and the increase in tourism demand. With the recent globalization, the tourism sector has

had a great importance in the world. And this has led to an increase in tourism in Turkey. The increase in tourism demand is related to the purchasing power and it has been tried to determine the relationship between the spending that comes with the increase in purchasing power and the use of credit cards. Today, the developing card payment system has increased the spending in Turkish tourism. It has been shown that tourists can travel as they wish without the need to convert their money and carry cash. One of the reasons why tourists use credit cards is that they can shop in installments and at the same time, they spend less money with the same income level.(Gul, 2014)

3 Data

The data to be used in the analysis were taken from the Turkish central bank data. 73 observers were selected for these data for 5 years and 13 were selected as observers. As an observation, the monthly data of the last 5 years will be observed. The variables are Gas and Fuel expenditures, education expenditures, Electronic goods expenditures, Clothing & Accessories expenditures, Accommodation expenditures, Jewellers, grocery shopping expenditures, Furniture Decoration expenditures, Health expenditures, Food expenditures, Tax payments, online shopping. These variables were chosen considering psychological and geopolitical factors. In order to analyze the data, the data obtained from IPSOS The research was carried out by conducting an online survey with individuals over the age of 18 living in Turkey. The statistical error margin of the study is ± 3.5 in the 95 confidence interval. The data are weighted according to age, gender, education and region. The statistical summary of my data is given below.

Table 1: Summary Statistics

|	Mean	StandardDeviation	Minimum	Maximum
GasandFuelStations	9873313.3	8011191.2	2827188.000	32942708
EducationOfficeSupplies	3462998.8	2830273.3	1150225.000	14845972
ElectronicGoods	9793998.7	9566410.9	2667681.000	47187970
ClothingAccessories	10168722.5	8417561.6	1738862.000	37944444
Accommodation	2044670.8	2014973.1	73967.000	9473444
CasinoDrinksPlaces	173785.6	164765.9	117.951	686467
Jewelers	1957382.9	1569768.7	288948.000	7261969
Markets_ShoppingCenters	26462629.1	22309192.4	9361448.000	110425071
Furniture_Decoration	4358371.4	3463290.4	1463170.000	18069974
Health	5005908.5	4115902.0	1717184.000	20562451
Food	6491580.5	6411377.4	757588.000	29106893
Public_Taxpayments	6639696.5	2882109.9	2135586.000	18096011
OnlineShopping	35618984.8	36034473.2	7016847.000	176067673

4 Methods and Data Analysis

4.1 Methods

4.1.1 Linear Regression Analysis
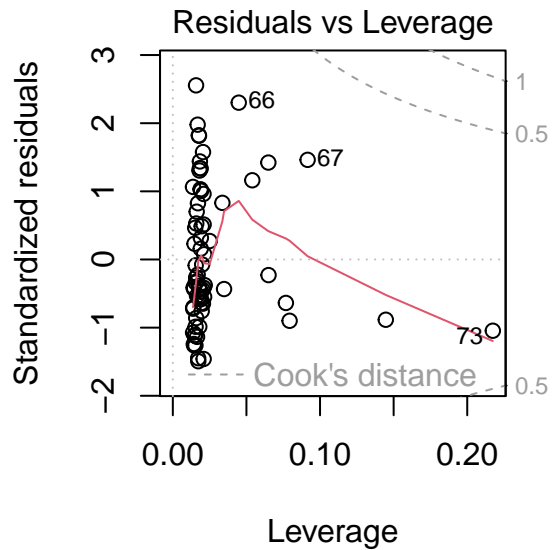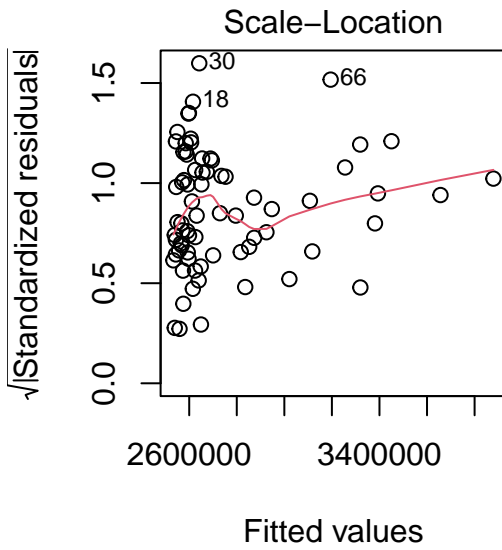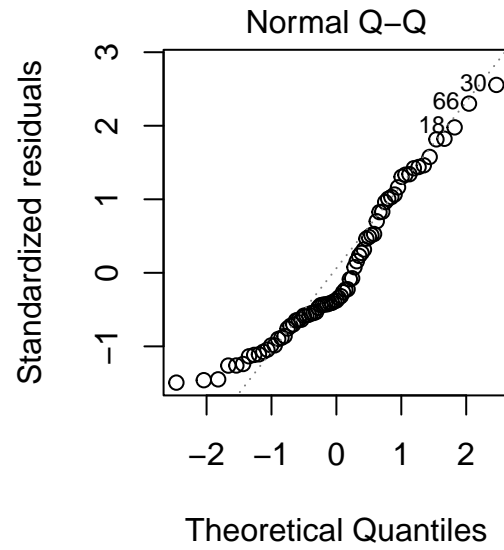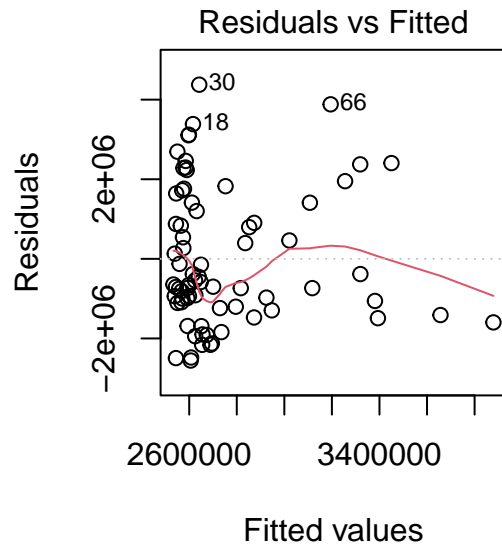
$y_i = \beta_0 + \beta_{1xi} * (bty_a vg)$

The equation of linear regression analysis is given above. In this section, linear regression analysis will be performed. In the equation, a relationship has been established between the number of tourists (yi) which is the dependent variable and the amount of expenditure (xi) which is the independent variable.

$score = 3.88 + 0.07 * (bty_a vg)$

Plot 1 : Regnession Analysi
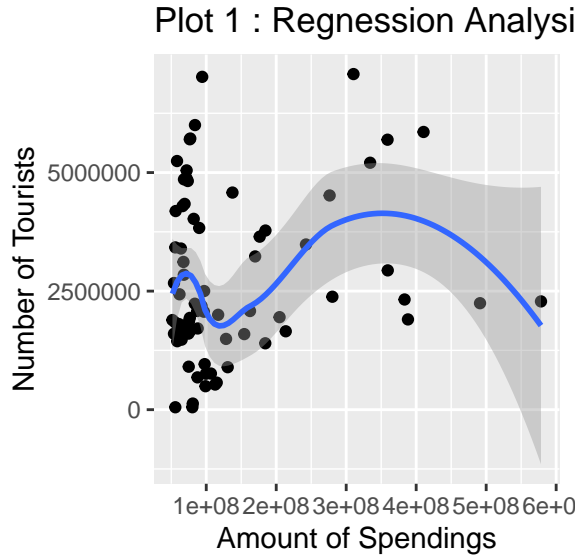
Looking at the summaries of our data, this equation emerges. This given linear regression analysis model tries to explain the relationship between the number of tourists visiting Turkey and the total amount of spending by bank and credit card. In the equation, a relationship has been established between the number of tourists (yi), which is the dependent variable, and the amount of spending with credit and debit cards (xi), which is the independent variable.

The coefficient 0 represents the estimated number of tourists when the amount of expenditure is 0, while 1 represents the change in the number of tourists for each unit increase in the amount of spending. It has been stated that 1 is expressed as (btyavg).

Residuals vs Fitted

30
18
66

Residuals

2e+06
−2e+06

2600000   3400000

Fitted values

Normal Q–Q

30
66
18

Standardized residuals

3
2
1
0
−1

−2 −1 0 1 2

Theoretical Quantiles

Scale–Location

30
18
66

$\sqrt{|\text{Standardized residuals}|}$

1.5
1.0
0.5
0.0

2600000   3400000

Fitted values

Residuals vs Leverage

66
67
73

Standardized residuals

3
2
1
0
−1
−2

1
0.5
0.5

Cook's distance

0.00   0.10   0.20

Leverage

The graph of linear regression analysis is given below. The number of tourists visiting Turkey in the last 5 years and the total amount of spending with debit and credit cards show that there is a trend that moves together. When the result plots are examined, it is observed that the linear regression analysis is Normal Q-Q.

4.1.2 Correlation analysis

Correlation analysis is a statistical method used to evaluate the relationship between two or more variables. Results are expressed by a measure called the correlation coefficient. The correlation coefficient can take a value between -1 and 1 and indicates the direction (negative or positive) and strength of the relationship. Correlation analysis was performed below to understand whether the variables are related to each other. As a result of the correlation analysis, a correlation matrix with a predominant blue color was obtained and it was observed that there was a strong and positive relationship between the observed variables. In this observed situation, it was observed that there was a linear relationship between the variables.
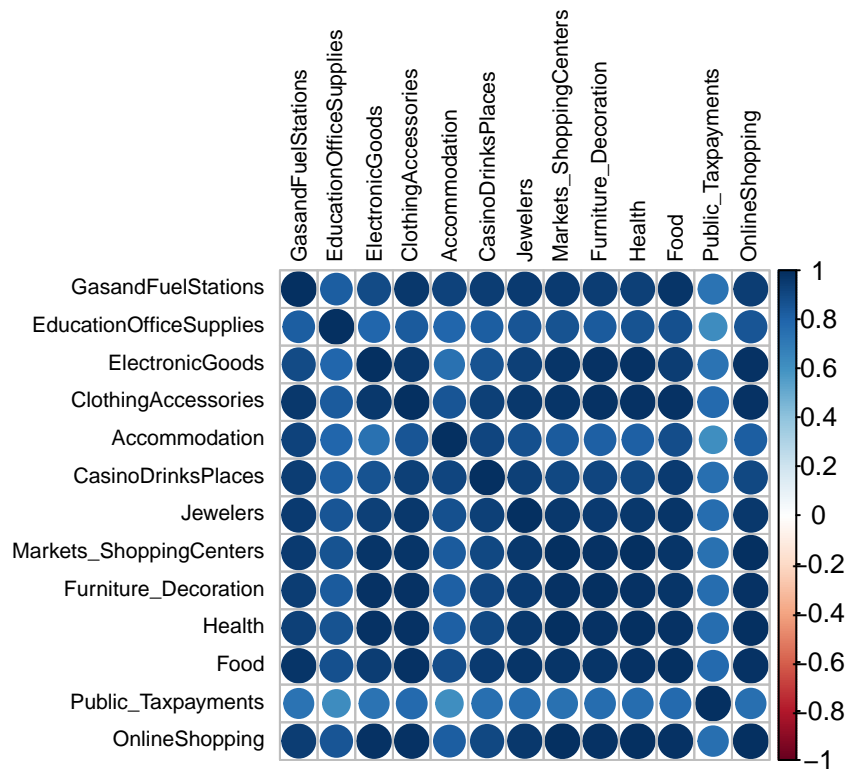
4.2 Data Analysis

In figure 1 , the total amount of expenditures made using debit and credit cards in the last 5 years is given. It was observed 903.9 million in 2018, 944.5 million in 2019, 1.040 million in 2020, 1.723 million in 2021 and 3.412 million in 2022. Figure.1 shows the number of visitors to Turkey in the last 5 years, along with other data from the Turkish central bank. According to the information given in Figure 2, increases were seen in August of 2018, August of 2019, September of 2020, August of 2021 and August of 2022. By looking at these data, it will be examined whether tourists coming to Turkey have a positive effect on the use of credit and debit cards.

Figure 1: Number of visitors
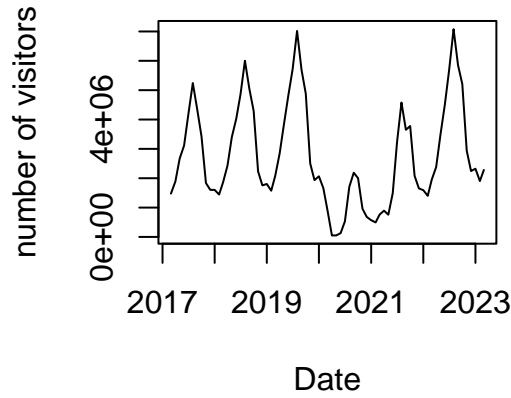
figure 2 :Number of sales
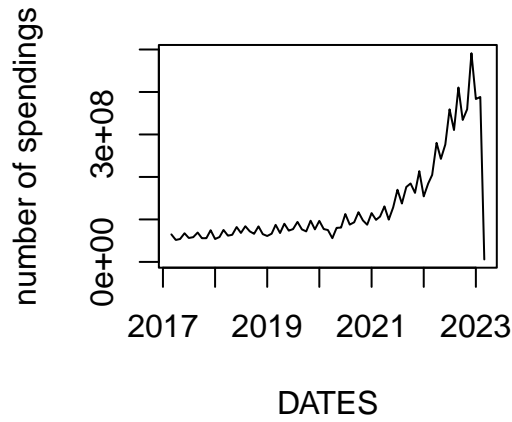
Looking at Figure 3, 1600 people were asked a question about the use of credit cards in the IPSOS survey, and 61% stated that they have a credit card that belongs to them. 30% do not have a credit card and 9% have an additional card that does not belong to them. When asked in Figure 4, which payment method do you use while shopping, 49% stated that they preferred the cash payment method, while 37% stated that they used a credit card, while the rest (14%) stated that they used both credit card and cash payment methods equally. stated. In figure 5, 55% of the reasons for using a credit card said that they generally had insufficient income for cash payments, 36% of them chose to use a credit card because it was a habit, and 32% of them said that they chose to use a credit card to defer payments to the next month. It has been shown that credit card use is affected by economic problems and people who do not have cash prefer credit and debit cards.
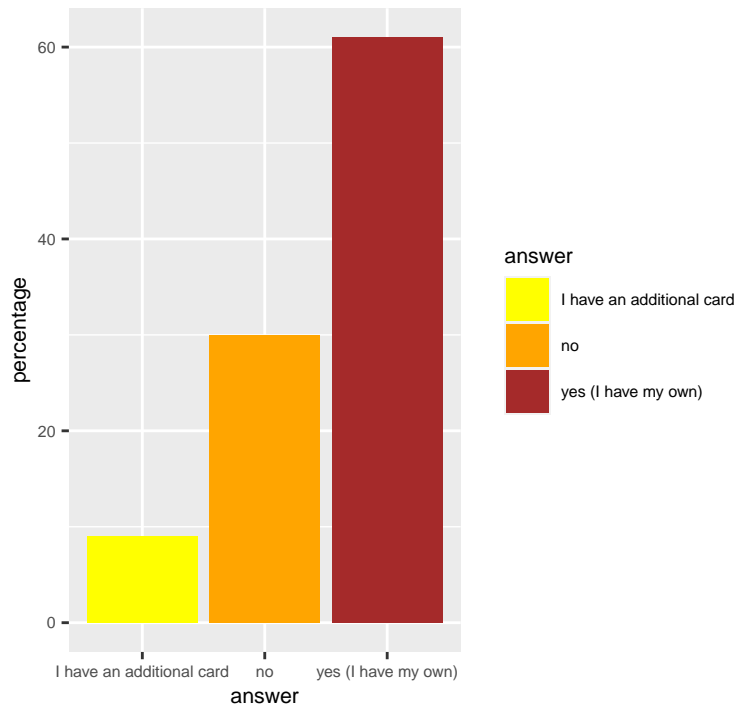
figure 3: Use of Credit Cards

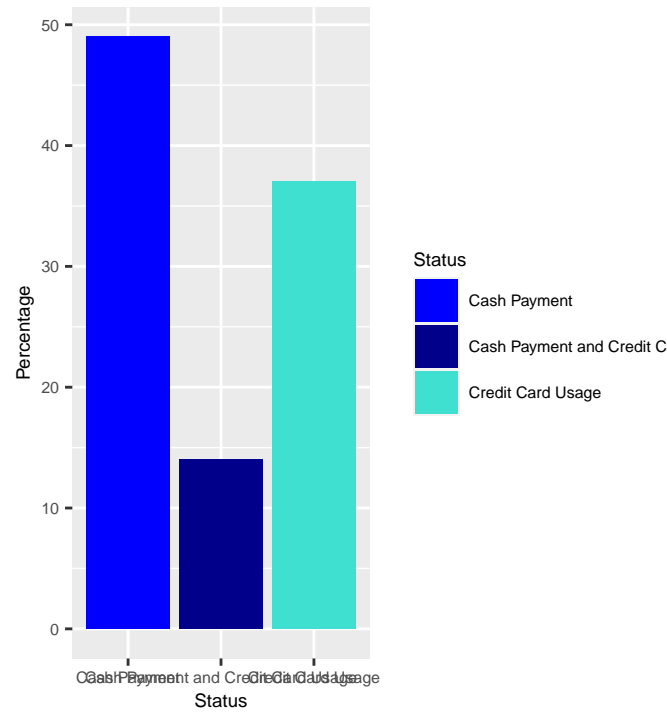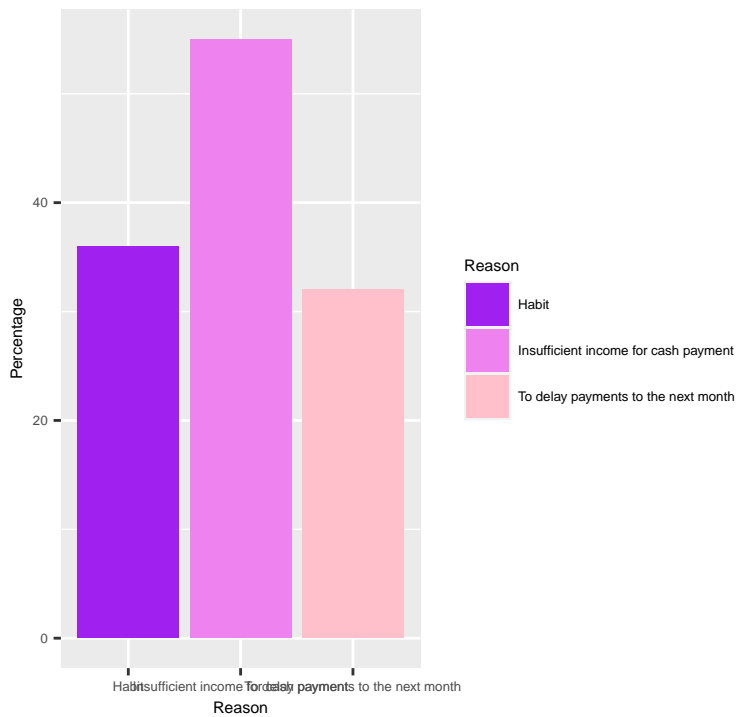## Figure 4: Shopping Payment Preferences

Figure 5: Reasons for Credit Card Usage

Looking at plot 2, while accommodation and gas purchases are the least during the covid-19 period seen in our country on February 19, 2020, online shopping and health expenditures are higher. There has been a radical decrease in all variables in April 2020. As of March 21, 2020, citizens over the age of 65 are prohibited from going out on the streets as part of the COVID-19 pandemic measures in Turkey. Later, as of April 3, the ban was extended to apply to those under the age of 20. This decrease is at the same time as the curfew period, and with the lifting of the curfew, increases in transportation and accommodation were observed. On the other hand, the use of credit and debit cards in online shopping decreased during the curfew, but often increased radically.

plot 2: COVID−19 Period
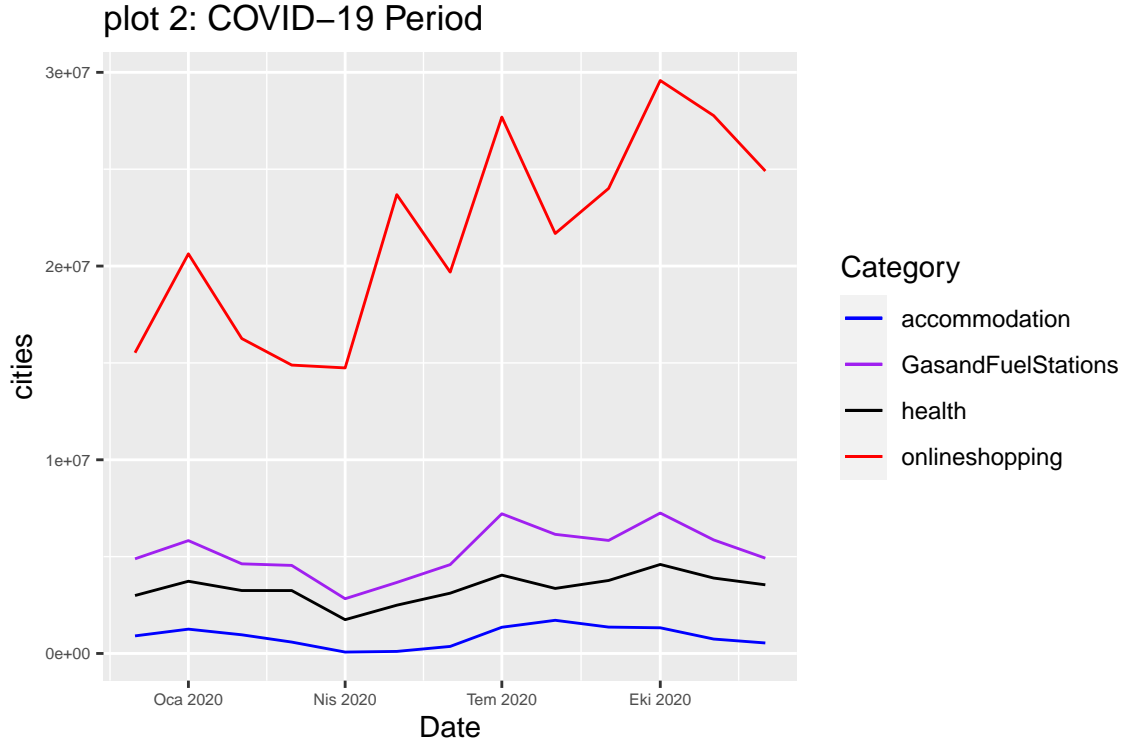
5 Conclusion

In this study, the reasons for the use of bank and credit cards in the last 5 years in Turkey and the effects of the factors affecting the use of bank and credit cards were investigated. In this context, various literature studies were examined. These studies were used and the data were taken from the Central Bank's website and various graphs were prepared with these data, and the understanding and observation of the data was facilitated by linear regression and correlation analysis. Various analyzes were made as a result of the quantitative and qualitative methods used in the study. The important results of these analyzes are as follows: In linear regression analysis, it explains the relationship between the number of tourists visiting Turkey and the total amount of spending by bank and credit card. It is seen that the data fit the normal distribution quite well. The dots are distributed almost above the line and no significant divergence or spread is observed in the tail regions. A normal

Q-Q plot is a graph that shows errors. errors fit the normal distribution, and it can be said that the linear regression analysis model is well-fitted and the estimations are reliable. In conclusion, this linear regression analysis shows that there is a positive relationship between the number of tourists visiting Turkey and the total amount of spending by debit and credit cards.

As a result of the correlation analysis, a correlation matrix with the blue color in the majority was obtained. It was observed that there was a strong and positive relationship between the observed variables. In public payments, there are low correlations between all other variables. A positive relationship is also observed between Electronic Goods and other variables. The highest correlation was with Online Shopping (0.98). Correlation coefficients with other variables vary between 0.74 and 0.98. Since there is a positive correlation between credit card use and another variable, it shows that these two variables increase together. Other variables have strong or low relationships with each other, but correlation does not examine causality, so it would be wrong to make a general comment without knowing other factors.

The number of visitors to Turkey in the last 5 years is shown together with the other data received from the central bank of turkey. Looking at these graphs, it is seen that the increase in the number of tourists increases the use of credit and debit cards, albeit slightly. It is observed that tourism has a positive effect on the use of cards. As we mentioned in the literature, the cash problem of tourists and it shows that you can shop without the need to convert foreign currency.

As seen in the IPSOS surveys, 70% of them have credit cards and 37% of them prefer credit cards for their payments, and 55% of them use credit cards due to lack of income. In this case, people's behavior is affected by technological developments, economic situation and habits. increases the use of cards in payments made by people's behavior.

Considering the Covid-19 period, a noticeable decrease was observed in accommodation. It is seen that online shopping has increased in this period. The reason for this can be said that as I mentioned in the literature, there is a curfew during the covid-19 period and this situation increases online shopping expenditures.

In this study, Turkey's credit and debit card usage in the last 5 years was examined and it was examined in which direction individuals spent and which factors were affected by them. Among the investigated factors, factors such as covid-19, tourism, technology, economic reasons were examined. In order to improve this study, more research can be done on these factors and the scope of the research can be expanded.

6 References

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