

Impact of Consumer Loans on Inflation and Current Account Deficit: A Toda Yamamoto Causality Test for Turkey¹

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Abstract

This study aims to investigate the causality relationship between consumer loans and inflation, and consumer loans and current account deficit in Turkey. In this scope, Toda Yamamoto causality test is used for the periods between 1994:1 and 2015:3. According to test results, we found that there is no causal relationship between consumer loans and inflation rate, and consumer loans and current account deficit. In other words, changes in consumer loans do not lead neither high current account deficit rates nor high inflation rates in Turkey. Therefore, limiting consumer loans is not the solution for inflation and current account deficit problems of Turkey and policy makers should apply some other effective policies to solve high CA deficit and high inflation problems.

Keywords: Consumer Loans, Inflation, Current Account Deficit, Toda Yamamoto Causality Test

JEL Codes: E31, E51, F32

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1. Introduction

The amount of consumer loans in Turkey increased very much in recent years, due to the decrease in interest rates (Dücan et. al., 2016). This increase affects economic growth of the country positively because of increase in the amount of consumption (Mercan, 2013). It was also accepted that increase in consumer loans causes some problems, such as higher inflation rate (Arsene and Guy-Paulin, 2013). The main reason behind the inflationary effect of consumer loans is that the loans cause a shift in the consumption amount, and that shift leads to higher inflation rates. In other words, higher loans allow people to increase their consumption level and their demand for goods and services which leads the prices of goods and services to increase as well.

Current account deficit is another problem that may be caused by higher consumer loans (Tiryaki, 2014). If consumer loans lead to increase in the consumption of the imported goods and services more than domestic goods and services, this will affect the current account balance of the countries negatively. In other words, an increase in the demand for imports may cause current account deficit to increase. This is an important problem for a country because if the ratio of current account deficit to GDP exceeds 5%, it is accepted as an early signal for an economic crisis (Yüksel, 2016).

Higher inflation increases uncertainty in the market, and the economy becomes more fragile (Kessel and Alchian, 1962). Current account deficit is also significant for the overall economy because of the balance of payments. Therefore, these economic variables should be analyzed continuously to manage the problems effectively. Ergo, studies related to these variables present important results for policy makers.

In this study, we tried to identify whether there is a causality relationship between consumer loans and inflation rate, and consumer loans and current account deficit in Turkey. We used Toda Yamamoto causality test for the periods between 1994:1 and 2015:3 to achieve this objective.

The paper is organized as follows. After introduction part, we give information about similar studies in the literature. In the third part, the development of consumer loans in Turkey will be emphasized. The fourth part includes research and application to understand the relationship between consumer loans with inflation rate and current account deficit in Turkey. Conclusion part presents the results and the discussion part.

2. Literature Review

Consumer loans, inflation and current account deficit are the subjects examined in many studies in the literature. Some of them are emphasized on table 1.

Table 1 shows that most of the studies are related to the relationship between bank loans and current account deficit problem. Hoshi and others (1991) analyzed this relationship in Japan. As a result of the regression analysis, there is a positive relationship between bank loans and current account deficit. Also, Motonishi and Yoshikawa (1999), Kunieda and Shibata (2005), Biztis and others (2008), Telatar (2011), Göçer and others (2013), Kılıç (2015), Morel Benito and Roehn (2016), Dücan and others (2016), Davis and others (2016) and Akçayır and Albeni (2016) reached equivalent results in their studies. On the contrary, Begeç (2015) concluded that loan amount does not have any effect on current account deficit by using Johansen co-integration analysis.

Table 1: Similar Studies in the Literature

Author	Method	Scope	Result
Hoshi et. al. (1991)	Regression	Japan	There is a positive relationship between loan amount and current account deficit.
Motonishi and Yoshikawa (1999)	Regression	Japan	Policies that limit loan usage are effective to decrease current account deficit.
Groen (2001)	VECM	Holland and US	Increase in bank loans leads to higher inflation rate.
Boyd et. al. (2001)	Regression	65 different countries	Higher inflation affects bank loans negatively.
Alper et. al. (2001)	Regression	Turkey	Higher inflation decreases the usage of the loans.
Tang (2001)	VECM	Malaysia	There is not a relationship between inflation and loans.
Bikker (2004)	Panel Data Analysis	26 OECD countries	There is a strong relationship between loans and inflation rate.
Kaya and Doğan (2005)	Data Envelopment Analysis	Turkey	Decrease in inflation rate leads to increase in loans amount.
Kunieda and Shibata (2005)	GMM	US	Increase in the amount of the loans causes current account deficit problem.
Calza and Sousa (2006)	VAR	European Union	There is a relationship between loans and inflation.
Eslamloueyan and Darvishi (2007)	Bound Test Approach	Iran	There is a long – term relationship between inflation rate and loans.
Haight (2007)	Descriptive Statistics	US	Lower inflation rate increases the demand for loans.
Biztis et. al. (2008)	Johansen Co-integration Analysis	Greece	Increase in the loans amount causes current account deficit problem.
Arslan and Yapraklı (2008)	VECM	Turkey	There is a positive relationship between bank loans and inflation rate.
Atta-Mensah and Din (2008)	Descriptive Statistics	Canada	Increase in the amount of bank loans leads to higher inflation.
Ziramba (2008)	VECM	South Africa	There is not a relationship between bank loans and inflation rate.
Geanakoplos and Dubey (2009)	Descriptive Statistics	Literature Review	Credit card usage increases inflation rate.
Bilgin and Kartal (2009)	Descriptive Statistics	Turkey	The policies aimed to lower inflation rate leads to increase bank loans.
Hülsewig et. al. (2009)	Descriptive Statistics	Euro Area	Prices of the goods are affected by the loans.
Huy Vu (2010)	Panel Data Analysis	Denmark, Norway and Sweden	Increase in the amount of the loans causes higher inflation.
Akinboade and Makina (2010)	VAR	South Africa	It was determined that bank loans do not have any effect on inflation.

Telatar (2011)	Granger Causality Analysis	Turkey	There is a causality relationship between consumer loans and current account deficit.
Moinescu (2012)	Panel Data Analysis	European Union	Consumer loans have an increasing effect on inflation rate.
Asongu (2012)	Regression	34 African countries	It was seen that precautions to decrease bank loans are successful to decrease inflation rate.
Gambetti and Musso (2012)	VAR	UK and US	Amount of the bank loans affects inflation rate.
Göçer et. al. (2013)	Johansen Co-integration Analysis	Turkey	There is a long-term relationship between loans and current account deficit.
Arsene and Guy-Paulin (2013)	VAR	Cameroon	It was defined that bank loans increase inflation rate.
Tiryaki (2014)	Granger Causality Analysis	Turkey	There is a causality relationship between inflation and consumer loans.
Tinoco-Zermeño et. al. (2014)	ARDL	Mexico	Increase in the inflation rate affects the amount of the bank loans negatively.
Kılıç (2015)	Granger Causality Analysis	Turkey	Consumer loans cause current account deficit.
Begeç (2015)	Johansen Co-integration Analysis	Turkey	Bank loans have impact on inflation rate however, they do not cause current account deficit.
Akinlo and Oni (2015)	VECM	Nigeria	Lower inflation rate leads to increase in the amount of the loans.
Pool et. al. (2015)	Panel VAR	12 OECD countries	Inflation rate does not affect the amount of the bank loans.
Kılıç (2015)	Granger Causality Analysis	Turkey	There is a two-way causality relationship between bank loans and inflation rate.
Korkmaz (2015)	Panel Data Analysis	10 European countries	Bank loans do not have any effect on inflation rate.
Morel Benito and Roehn (2016)	Panel Data Analysis	31 different countries	Increase in the amount of bank loans causes current account deficit problem.
Dücan et. al. (2016)	Granger Causality Analysis	Turkey	Consumer loans lead to increase current account deficit.
Davis et. al. (2016)	Regression	35 different countries	There is a relationship between loans and current account deficit problem.
Akçayır and Albeni (2016)	Bound Test Approach	Turkey	There is a two-way causality relationship between loans and current account deficit.
Ngerebo-A (2016)	Regression	Nigeria	It was concluded that higher loans lead to inflation problem.

Source: Authors.

Furthermore, some other studies aimed to determine the relationship between consumer loans and inflation rate. Groen (2001) analyzed the effects of the increase in the amount of bank loans in Holland and US and identified that increase in bank loans leads to higher inflation. Bikker (2004), Eslamloueyan and Darvishi (2007), Arslan and Yapraklı (2008), Atta-Mensah and Din (2008), Geanakoplos and Dubey (2009), Huy Vu (2010), Moinescu (2012), Asongu (2012), Gambetti and Musso (2012), Arsene and Guy-Paulin (2013), Begeç (2015), Kılıç (2015) and Ngerebo-A (2016) also reached a similar conclusion by using different methods. In addition to them, Tang (2001) and Ziramba (2008) determined that there is no relationship between bank loans and inflation rate.

Existing literature shows that there are lots of different studies that focused on the relationship between consumer loans with inflation rate and current account deficit. It was also seen that various types of methods were used in those studies to achieve this objective, such as vector error correction method, regression and Granger causality analysis. Therefore, it can be said that there is a need for a study in which a new methodology was used to evaluate this relationship.

3. Descriptive Statistics

3.1. Consumer Loans in Turkey

Loans can be mainly divided into two categories which are commercial loans and consumer loans. Commercial loans refer to the loans which are used to support companies for their investment. The loans which are taken by consumers to satisfy their personal needs are categorized as consumer loans. According to the disclosure issued by Banking Regulation and Supervision Agency related to uniform chart of accounts, mortgage loans, auto loans, personal loans and credit cards are accepted as consumer loans (BRSA, 2014).

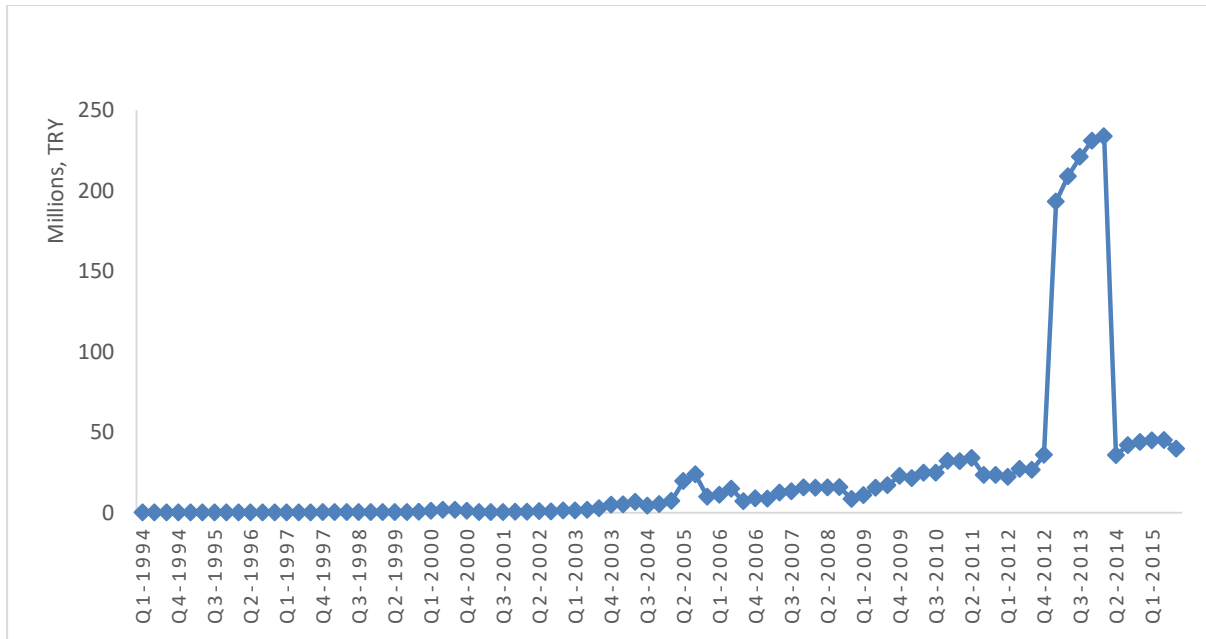
Increase in consumer loans leads consumption to raise in the country. This situation is beneficial for the economy because an increase in aggregate demand leads economy to grow in the short-run. Therefore, consumer loans enhance economic growth. On the other side, high amount of consumer loans may cause some problems for the economy. Because of increasing consumer loans, the demand and prices of goods and services will go up. So, the country may face high inflation problem.

In addition to the inflation problem, consumer loans may cause current account deficit problem in the country as well. If the increasing consumption directed towards import goods, this will affect foreign trade balance of the country in a negative way. If this negative impact results with an increase in the current account deficit intensity in gross domestic product (CA deficit/GDP), the country may face some serious current account balance problems.

3.2. The Development of Consumer Loans in Turkey

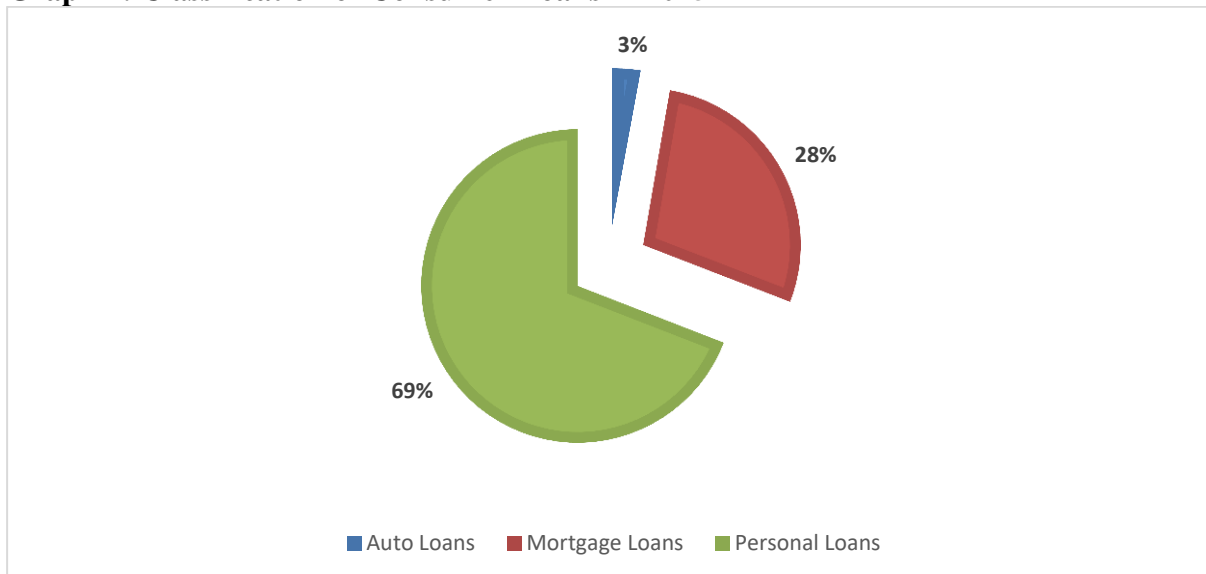
Especially after the 2001 economic crisis, there was an improvement in Turkish economy especially for rapid growth rates. Interest rates also went down thanks to the continuous growth rates and financial stability. The amount of consumer loans also increased due to decreasing interest rates.

Graph 1 illustrates the amount of consumer loans between 1994 and 2015 period. One can see the increase in the amount of consumer loans since 2003 to 2012. There was a stunning increase in the amount of consumer loans between third quarter of 2012 and second quarter of 2014. The main reason behind the sudden decrease is the actions of Banking Regulation and Supervision Agency to decrease the amount of consumer loans.

Graph 1: The Developments of Consumer Loans in Turkey

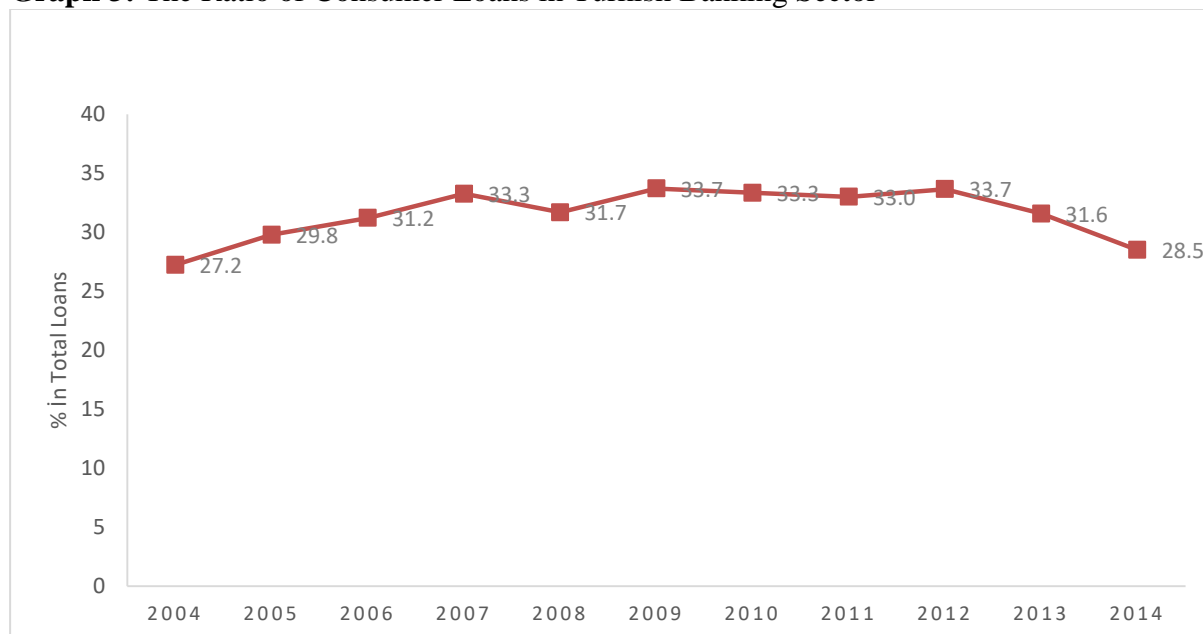
Source: The Bank Association of Turkey

Graph 2 shows the share of automobile, mortgage and personal loans in total consumer loans in Turkey. According to the Graph 2, personal loans have the highest ratio with 69.11% in consumer loans while mortgage loans have the second highest ratio with 28,17%. Auto loans have the lowest share with 2,72% in total consumer loans.

Graph 2: Classification of Consumer Loans in 2015

Source: The Bank Association of Turkey

Graph 3 demonstrates the share of consumer loans in total loans. According to Graph 3, there is an increase in the ratio of consumer loans between 2004-2007 period. One can see that the share of consumer loans in total loans is stable between 2007-2012 period and started to decrease in year 2013. After this year, the ratio of consumer loans started to decrease mainly because of the restrictions implemented by Banking Regulation and Supervision Agency.

Graph 3: The Ratio of Consumer Loans in Turkish Banking Sector

Source: The Bank Association of Turkey

4. Data and the Analysis

4.1. Data Set

In this study, quarterly data for the periods between 1994:1 and 2015:3 was used. This data was obtained from the websites of Turkish Banking Association and World Bank in 2016. The variable of consumer loans includes installment loans, mortgages, auto loans and credit cards. On the other side, as the inflation rate, changes in consumer price indexes were taken into the consideration. Moreover, the ratio of current account deficit to GDP was used to analyze the risk more effectively.

4.2. Toda Yamamoto Causality Analysis

Toda Yamamoto causality analysis also examines whether there is causality relationship between the variables. The main difference of this method from the others is that there is not a requirement for the variables to be stationary. In Toda Yamamoto analysis, maximum degree of integration and lag length in VAR model should be calculated. In other words, if the lag length is “k” and the maximum co-integration number in VAR model equals to “d”, this model is estimated with the lag number of “k+d” (Toda and Yamamoto, 1995).

4.3. Analysis Results and Findings

In this study, first, we made an analysis to define whether the variables are stationary or not. Within this context, Zivot-Andrews unit root test was used. The details of this analysis are given in table 2.

Table 2 shows that all variables are stationary on their level values. After stationary analysis, appropriate lag lengths of VAR model were calculated and the results are given in Table 3.

Table 2: Zivot-Andrews Unit Root Test Results

Variables	Level Value (Probability)
Consumer Loans	0.0009
Current Account Deficit	0.0457
Inflation Rate	0.0026

Source: Authors.

Table 3 shows that 5 lag lengths are significant for VAR model. Additionally, according to Zivot-Andrews unit root test results, all variables seem to be stationary at their level values. Hence, the number of maximum co-integration is calculated as 0. On the other side, as it can be seen in table 3, appropriate lag lengths are defined as 5. As a result, the model should be estimated on 5. (5+0) degree in Toda Yamamoto analysis.

Table 3: Analysis Results to Define Lag Lengths

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2055.926	NA	8.71e+18	52.12472	52.21470	52.16077
1	-1830.144	428.7017	3.60e+16	46.63655	46.99646*	46.78074
2	-1814.314	28.85461	3.03e+16	46.46364	47.09349	46.71597*
3	-1809.110	9.090372	3.35e+16	46.55974	47.45953	46.92022
4	-1790.987	30.28120	2.67e+16	46.32878	47.49851	46.79741
5	-1778.084	20.57963*	2.44e+16*	46.22997*	47.66963	46.80674
6	-1769.775	12.62157	2.51e+16	46.24746	47.95706	46.93238
7	-1764.076	8.223863	2.78e+16	46.33103	48.31057	47.12409
8	-1758.573	7.522217	3.10e+16	46.41957	48.66905	47.32078

Source: Authors.

The results of this analysis are demonstrated on table 4. Table 4 shows, p values of all six tests are greater than 0.05. This means that there is not any relationship between any of the variables in the analysis. In other words, changes in consumer loans do not cause the inflation or current account deficit problems according to Toda Yamamoto causality analysis.

Table 4: Toda Yamamoto Causality Analysis Results

The Way of Causality	Lag Length	P Value	Result
Consumer Loans → Inflation Rate	5	0.8815	There is no causality relationship.
Consumer Loans → Current Account Deficit	5	0.7986	There is no causality relationship.
Inflation Rate → Consumer Loans	5	0.9724	There is no causality relationship.
Current Account Deficit → Consumer Loans	5	0.9888	There is no causality relationship.
Inflation Rate → Current Account Deficit	5	0.7483	There is no causality relationship.
Current Account Deficit → Inflation Rate	5	0.8315	There is no causality relationship.

Source: Authors.

5. Conclusion

In this study, first we made an analysis to identify whether the determinants of consumer loans, inflation and current account deficit are stationary or not. It was concluded that all 3 variables are stationary on their level values. After that, appropriate lag lengths are defined as 5 and the model is estimated on 5. (5+0) degree in Toda Yamamoto analysis.

The popularity of the topic of consumer loans is increasing in the literature especially in the last years. Because of that, many researchers examined this issue in their studies by using different methods. We used Toda Yamamoto causality test to see if the consumer loans are the reason for higher inflation or current account deficit of Turkey. Our results based on Toda Yamamoto causality analysis showed that consumer loans are not the causation of the problems of high inflation and current account deficit in Turkey. In other words, changes in the amount of consumer loans are not the reason of inflation and current account deficit problems.

It is not possible to say what is the solution to reduce high inflation and the current deficit without conducting more detailed analyses, but limiting consumer loans is certainly not a solution. For the future research, it will be quite beneficial to make analyses about the effects of consumer loans in different countries.

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