The Relationship Between Selected Financial and Macroeconomic Variables with Consumer Confidence Index[1]

Seçilmiş Finansal ve Makroekonomik Değişkenler ile Tüketici Güven Endeksi Arasındaki İlişkinin Analizi

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Abstract:The financial crises experienced by countries affect the confidence of both consumers and investors in the economies of the country. The economies, which have been experiencing constant difficulties since the Great Depression of 1929, once again entered into a difficult period with the 2008 crisis. In this context, it is important to know the relationship between the Consumer Confidence Index, which is an indicator of consumer confidence in economies, and some macro and financial variables. The positive changes in the variables that may affect the confidence levels of both consumers and investors can lead to an increase in confidence levels in the country's economy.This study was aimed to investigate the relationship between the Consumer Confidence Index with selected macroeconomic and financial variables by using VAR model in Turkey.

As a result of the study, a causality relation was determined from the consumer confidence index to the industrial production index and to the consumer confidence index from BIST100, USD Exchange rates and CPI.Moreover, when the results of VAR model are analyzed, it is found that the shock in the USD exchange rate has a negative impact on the consumer confidence index and that the shock in the consumer confidence index has negative effects on the BIST100 index and the dollar exchange rate.

Keywords: Consumer Confidence Index, Macroeconomic Variables, Financial Variables, VAR Model

Öz:Ülkelerin yaşamış oldukları finansal krizler, gerek tüketicilerin gerekse yatırımcıların ülke ekonomilerine olan güvenlerini etkilemektedir. 1929 Büyük Buhranından beri dönem dönem sürekli sıkıntılar yaşayan ekonomiler 2008 krizi ile bir kez daha zor bir dönemece girmiştir. Bu bağlamda tüketicilerin ekonomilere olan güveninin bir göstergesi olan Tüketici Güven Endeksi ile bazı makro ve finansal değişkenler arasındaki ilişkinin bilinmesi önem arz etmektedir. Davranışsal yaklaşımların oldukça önem kazandığı günümüzde gerek tüketicilerin gerekse yatırımcıların güven düzeylerini etkileyebilecek değişkenlerde meydana gelecek olumlu değişimler, ülke ekonomisine olan güven düzeylerinin de yükselmesine neden olabilmektedir.Bu amaçla çalışmada Türkiye'de Tüketici Güven Endeksi ve seçilmiş makroekonomik ve finansal değişkenler arasındaki ilişki VAR modeli ile araştırılmıştır.

Araştırma sonucunda, tüketici güven endeksinden sanayi üretim endeksine ve BİST100, USD ve TÜFE'den tüketici güven endeksine doğru bir nedensellik ilişkisi tespit edilmiştir. Ayrıca VAR modeli sonuçları incelendiğinde, USD döviz kurunda meydana gelecek bir şokun tüketici güven endeksi üzerinde olumsuz etkisi olduğu ve tüketici güven endeksinde meydana gelecek şokun BIST100 endeksi ve dolar döviz kuru üzerinde olumsuz etkisinin olduğu yönünde bulgulara ulaşılmıştır.

Anahtar Sözcükler:Tüketici Güven Endeksi, Makroekonomik değişkenler,FinansalDeğişkenler, VAR Modeli

1. Introduction

The course that macroeconomic and financial indicators will follow is significantly affected by the expectations of economic actors. Monitoring financial and macroeconomic indicators provides pre-information on the course that indicators will follow in the future. For this reason, policy makers, financial market actors and representatives of real sector monitor confidence indexes that reflect expectations as leading indicators besides the economic indicators.

Keynes associated the sensitivity towards developments in the economy (sentiment) with "situation of long-term expectations" and "confidence situation". In the analysis of Keynes, the sensitivity of producers and consumers to economic developments plays a key role in terms of explaining economic fluctuations.

It was stated that consumers' consumption requests are determined not only by consumers' reactions to economic variables but also by factors that are not based on an amount and not related to the economy such as political crises and wars. In addition, it was stated that consumers make their consumptions in the framework of their expectations towards their financial situation in the future, and in the direction of their capacities and demands. The information that consumers share in their social environments is also as important as the announced economic data in terms of formation of consumption expenditures (Katona, 1975).

Consumer confidence has a strong association with macroeconomic variables. Thoughts, emotions and decisions of the economic decision units are affected by various macroeconomic variables as they are affected by psychological,

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sociological and political decisions. The confidence index, which is an economic situation indicator, has an influence on the expectations and behaviors of economic decision units towards the future (Garner, 1991).

One of the most useful confidence indexes in terms of monitoring expectations in the Turkish economy is the real sector confidence index and the other one is the consumer confidence index. The Turkish Statistical Institute (TSI) through the monthly Consumer Tendency Survey results calculates the consumer confidence index. The survey that is conducted by TSI provides information towards determining financial situations of consumers, the current situation of the general economy, expectations regarding the future, and consumption and saving tendencies. The consumer confidence index, which is calculated by survey results, is a leading indicator towards expectations and demonstrates whether the situation regarding consumers' confidence in economic activities is positive or not (TSI, 2018).

Monitoring the consumer confidence index as a leading indicator, how this index influences macroeconomic and financial indicators or how it is affected by the relevant indicators are intriguing issues. In this study, the causality relationship between the selected macroeconomic and financial indicators and the consumer confidence index are analyzed by Granger causality test and VAR model.

The study consists of four sections. After addressing the calculation of the consumer confidence index and its relation with economic indicators in the introduction section, a number of studies that were conducted on the subject in the previous years were given a place in the second section. The third section of the study is the section where the data and method concerning the research study were explained and the research findings were reported. The last section of the study is the section where research findings were interpreted and discussed in comparison with the previous studies.

2. Literature Review

The relationships between confidence indexes that have an important role in terms of monitoring expectations in the literature and financial and macroeconomic indicators - such as securities market index, stock return, exchange rate, price indexes, gross domestic product and industrial production index- were analyzed through various time-series analyses in different periods. In addition to that, studies that are conducted on the relationship between confidence indexes and economic fluctuations can also be found in the literature. A few of these studies are summarized below.

Afshar, Arabian and Zomorrodian (2007) analyzed relationships between the consumer, investor and business confidence indexes in the United States of America and economic fluctuation by using quarter data for the United States of America in the 1980-2005 period through VAR model and vector error correction model. Variance decompositions demonstrate that consumer confidence, stock returns and purchasing managers' index explain the huge discrepancy in the GDP. In general, the results confirm the opinions that indicate confidence indexes play an important role in terms of economic fluctuations.

Korkmaz and Çevik (2009) analyzed the relationship between the Real Sector Confidence Index and the BIST 100 index return by the two-stage dynamic causality test. After estimating the relationship between the variables through the EGARCH model as the first step, they examined the causality relationship between the standardized error terms obtained from the model in the average and variance. As a result of the causality relations, the EGARCH model was expanded and as consequence, they reached the result that both two variables have a positive impact on each other. Finally, the EGARCH model and expanded EGARCH model results were compared and they determined that the expanded EGARCH model produces better results

Bildirici and Bozoklu (2010) analyzed the impacts of expectations on the economy in Turkey by using the variables of the industrial production index, real sector confidence index and the BIST 100 index through the MS-VAR approach. In the study, the impact of expectation and belief on the economy was tested by performing the MS-VAR test after the application of different asymmetries on the variables. The obtained findings indicate that there is a relationship between optimism and pessimism fluctuations of economic decision-making units' expectations and fluctuations occur in the economy.

Topuz (2011) analyzed the relationship between consumer confidence and stock prices in Turkey for 2004:01 and 2009:01 periods. In the study, the Granger causality relation between the BIST 100 index and consumer confidence index was tested by using monthly data regarding the variables. As a result of the study, a one-way causality relation was found from stocks to consumer confidence.

Arısoy (2012) formed two different VAR models by using the monthly data concerning the variables of Industrial Production Index, consumption expenditures, Consumer Confidence Index, Employment Rate, Real Sector Confidence Index and BIST Index between 2005: 01 and 2012: 01 periods, for the purpose of measuring the impact of consumer and real sector confidence indexes on the economy in Turkey. As a result of the study, it was determined that the Consumer Confidence Index impacts consumption expenditures and Real Sector Confidence Index impacts developments in industrial production and stock index.

Dees and Brinca (2013) analyzed the relationship between the variables through VAR and Threshold Models by employing the Consumer Confidence Index for the USA and Eurozone, consumption expenditures, Real Disposable Income, Financial and Real Estate Wealth, Real Stock Prices, Short Term Interest Rates and Unemployment Rates, and quarter data in the 1985-1 and 2010-2 periods. As a consequence, in the periods that fundamental change occur in the consumer confidence index, the power of consumers' estimations on consumption expenditures. They determined that the USA consumer confidence index directs the Eurozone consumer confidence index, and constitutes a "security channel" that ensures the transitivity of the shocks.

In their study, Møller, Nørholm & Rangvid (2014) investigated the impact of consumer confidence on the output gap and stock return in eleven countries, which are Eurozone members. In the study, monthly data between the years of 1990-2010 were used. As a result of the "forecasting regression" and bootstrap simulations" analyses, it was understood that consumer confidence does not carry a meaning in terms of "output gap" and "stock return". In the study, it was stated that Europe-based consumer confidence should be employed instead of a country –based consumer confidence in order to explain stock returns.

Kale & Akkaya (2016) analyzed the relationship between the consumer confidence in Turkey, and real sector confidence and five different stock indexes (aggregate, financial, industrial, service and technology) through VAR Model. In the study, the monthly data between 2004 January and 2015 June were used. As a result of the analyses, no significant causality was identified between consumer confidence index and stock return. In addition, it was found out that stocks have a positive and significant impact on the consumer confidence index.

Usul, Küçüksille and Karaoğlan (2017) tried to measure the impact of changes in confidence indexes on Istanbul Stock Exchange. In the study, they used the monthly data of 2007: 01 and 2017: 01 periods. They measured the short and long-term relation of the Consumer Confidence Index and Real Sector Confidence Index on BIST100 by conducting a KSS co-integration analysis. As a result, they determined that both Consumer and Real Sector Confidence Indexes affect the BIST 100 positively both in the short and long term.

Eyüboğlu and Eyüboğlu (2018) tested the relationship between the Istanbul Stock Exchange sector index returns and real sector confidence index through the ARDL bounds testing approach. In the study, both short and long-term relations between the variables were addressed, and it was found out that there is a relationship between the real sector confidence index and all sector indexes both in the long and short term. Furthermore, it was seen that the increase in the real sector confidence index in the short term affects stock index returns positively. According to the causality findings, it was observed that there is a causality relation from the sector indexes to real sector confidence index.

3. Data, Methodology and Empirical Results

In the study, monthly time-series concerning 2012:1-2018:6 period pertain to the variables of consumer confidence index, industrial production index, BIST 100 closing prices, consumer price index and dollar exchange rate were used. Empirical literature and causality relations were determining factor in the selection of the series used in the study. Time period started from 2012 January because Turkish Statistical Instute made main revision on consumer confidence index in 2012. Data The time-series regarding the data were received from Central Bank of Turkey's electronic data delivery system. For controlling whether the series are stationary before the VAR model estimation and to turn the series -which are not stationary- into stationary, a unit root test was performed. As a result of the unit root test, "D" letter was used for first difference at the beginning of the symbols of the series that are determined as not stationary and used in the model estimation by taking their difference, After the unit root test, the causality relationship between the variables was analyzed with the Granger causality test. Afterwards, the VAR model estimation was carried out. After performing the tests regarding the determination of the lag length that will be used in the VAR model estimation, the VAR model was estimated. The impulse response functions and variance decomposition tables concerning the estimated VAR model were reported and interpreted.

For the purpose of controlling whether the series are stationary or not before passing on to the Granger causality test and VAR model and to make the series -which are not stationary- stationary, a unit root test was conducted. As a result of the unit root test, "D" letter was put for the first difference, at the beginning of the series that are determined as not stationary and used in the model estimation by taking the difference—After the unit root test, the causality relationship between the variables was analyzed with the Granger causality test. Afterwards, the VAR model estimation was carried out. After performing the test regarding the determination of the delay count that will be used in the VAR model estimation, the VAR model was estimated. The impulse response functions and variance decomposition tables concerning the estimated.VAR model were reported and interpreted.

3.1 Unit Root Test Result

If a stochastic process is not stationary, the behavior of the series will only be valid for the estimation period. However, a generalization will be made for the other periods about the series. In fact, it is important in time-series that shocks are temporary and this impact disappears after some time. The purpose in the time-series is making estimations towards the future and trying to determine the general attitudes or tendencies of variables (Bozkurt, 2007). Therefore, in terms of time-series, it is required to determine the stationarity of the series before starting to perform analyses. In the study, Augmented Dickey Fuller and Philips Perron unit root tests were employed in order to determine the stationarity of the variables. The ADF and PP unit root test results to the variables of consumer confidence index, industrial production index, BIST 100 closing prices, consumer price index and dollar exchange rate are given in Table 1.

Table 1. Unit Root Test

UNIT ROOT TEST TABLE (PP)						
				At Level		
		CCI	CPI	ER	BIST100	IPI
WithConstant	t-Statistic	-3.1562	3.9162	1.8681	-1.8167	-3.5819
	Prob.	0.0266	1.0000	0.9998	0.3699	0.0083
		**				***
WithConstant& Trend	t-Statistic	-3.6512	1.4253	-1.4023	-2.5022	-9.6009
	Prob.	0.0320	1.0000	0.8527	0.3264	0.0000
		**				***
				At First Difference		
		d(CCI)	d(CPI)	d(ER)	d(BIST100)	d(IPI)
WithConstant	t-Statistic	-16.5880	-5.4038	-4.9340	-7.6855	-32.0931
	Prob.	0.0001	0.0000	0.0001	0.0000	0.0001
		***	***	***	***	***
WithConstant& Trend	t-Statistic	-23.5996	-6.4218	-5.1396	-7.6362	-31.4591
	Prob.	0.0001	0.0000	0.0004	0.0000	0.0001
		***	***	***	***	***
UNIT ROOT TEST TABLE (ADF)						
				At Level		
		CCI	CPI	ER	BIST100	IPI
With Constant	t-Statistic	-3.3499	3.9824	1.0834	-1.7424	0.9027
	Prob.	0.0159	1.0000	0.9971	0.4062	0.9950
		**				
With Constant& Trend	t-Statistic	-3.8018	2.3646	-1.8717	-2.2659	-1.2175
	Prob.	0.0216	1.0000	0.6594	0.4469	0.8984
				At First Difference		
		d(CCI)	d(CPI)	d(ER)	d(BIST100)	d(IPI)
With Constant	t-Statistic	-7.4310	-3.3612	-5.1871	-7.7448	-7.3155
	Prob.	0.0000	0.0156	0.0000	0.0000	0.0000
		***	**	***	***	***
With Constant& Trend	t-Statistic	-7.4120	-5.0379	-5.4728	-7.7004	-7.3409
	Prob.	0.0000	0.0005	0.0001	0.0000	0.0000
Notes: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1%.						

According to the results given in Table 1, it was determined that the series regarding the consumer confidence index is stationary at the level, and the series regarding the variables of consumer confidence index, industrial production index, BIST 100 closing prices, consumer price index and dollar exchange rate are stationary at the first difference.

3.2 Granger Causality Test

According to Granger 1969, it is stated that causality is - in the case that b_j is non-zero- Y_t causes X_t and in a similar way in the case that c_j is non-zero, X_t causes Y_t in the equations given below.

$$X_t = \sum_{j=1}^{m} a_j X_{t-j} + \sum_{j=1}^{m} b_j Y_{t-j} + \varepsilon_t$$

$$Y_t = \sum_{j=1}^{m} c_j X_{t-j} + \sum_{j=1}^{m} d_j Y_{t-j} + \eta_t$$

In the Granger causality analysis, for the determination of the lag length, the decision was made by taking Likelihood (LogL), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Information Criterion into the consideration and controlling whether there is an autocorrelation problem in the appropriate lag length or not. According to that, the most appropriate lag length for the causality relationship between the consumer confidence index and consumer price index was determined as 4, and the most appropriate lag length for the causality relationship between the BIST 100, industrial production index and dollar exchange rate was determined as 1.

The causality relationship between the variables of consumer confidence index and industrial production index, BIST 100 closing prices, consumer price index and dollar exchange rate as tested in pairs as stated above and the results were provided in Table 2.

Table 2. Granger Causality Test and Results

Null Hypothesis:	Obs	F-Statistic	Prob.
DIPI does not Granger Cause CCI	77	1.363 29	0.24 67
CCI does not Granger Cause DIPI		4.334 35	0.04 08
DBIST100 does not Granger Cause CCI	76	9.477 39	0.00 29
CCI does not Granger Cause DBIST100		1.448 38	0.23 27
DER does not Granger Cause CCI	76	8.751 23	0.00 42
CCI does not Granger Cause DER		0.700 86	0.40 52
DCPI does not Granger Cause CCI	73	2.502 82	0.05 09
CCI does not Granger Cause DCPI		1.750 64	0.14 99

According to the causality test findings, there is a one-way causality from consumer confidence index to industrial production index, and there is also a one-way causality from BIST 100 closing prices, dollar exchange rate and consumer price index to consumer confidence index.

3.3. VAR Analysis

After the causality analysis, the relationship between the CCI, CPI, ER, BIST100 and IPI variables was addressed through a VAR analysis. The matrix presentation of the estimated VAR model is as given below.

$$
\begin{bmatrix} CCI_t \\ CPI_t \\ ER_t \\ BIST100_t \\ IPI_t \end{bmatrix} = \begin{bmatrix} C_1 \\ C_2 \\ C_3 \\ C_4 \\ C_5 \end{bmatrix} + \begin{bmatrix} \alpha_{1,1}^1 \alpha_{1,2}^1 \alpha_{1,3}^1 \alpha_{1,4}^1 \alpha_{1,5}^1 \\ \alpha_{2,1}^1 \alpha_{2,2}^1 \alpha_{2,3}^1 \alpha_{2,4}^1 \alpha_{2,5}^1 \\ \alpha_{3,1}^1 \alpha_{3,2}^1 \alpha_{3,3}^1 \alpha_{3,4}^1 \alpha_{3,5}^1 \\ \alpha_{4,1}^1 \alpha_{4,2}^1 \alpha_{4,3}^1 \alpha_{4,4}^1 \alpha_{4,5}^1 \\ \alpha_{5,1}^1 \alpha_{5,2}^1 \alpha_{5,3}^1 \alpha_{5,4}^1 \alpha_{5,5}^1 \end{bmatrix} \begin{bmatrix} CCI_{t-1} \\ CPI_{t-1} \\ ER_{t-1} \\ BIST100_{t-1} \\ IPI_{t-1} \end{bmatrix} + \cdots + \begin{bmatrix} \alpha_{1,1}^p \alpha_{1,2}^p \alpha_{1,3}^p \alpha_{1,4}^p \alpha_{1,5}^p \\ \alpha_{2,1}^p \alpha_{2,2}^p \alpha_{2,3}^p \alpha_{2,4}^p \alpha_{2,5}^p \\ \alpha_{3,1}^p \alpha_{3,2}^p \alpha_{3,3}^p \alpha_{3,4}^p \alpha_{3,5}^p \\ \alpha_{4,1}^p \alpha_{4,2}^p \alpha_{4,3}^p \alpha_{4,4}^p \alpha_{4,5}^p \\ \alpha_{5,1}^p \alpha_{5,2}^p \alpha_{5,3}^p \alpha_{5,4}^p \alpha_{5,5}^p \end{bmatrix} \begin{bmatrix} CCI_{t-p} \\ CPI_{t-p} \\ ER_{t-p} \\ BIST100_{t-p} \\ IPI_{t-p} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \\ \varepsilon_{3,t} \\ \varepsilon_{4,t} \\ \varepsilon_{5,t} \end{bmatrix}
$$

The Information Criterion values regarding the determination of the VAR model lag length were given below before the VAR model estimation.

Table 3. Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1208.470	NA	7.85e+08	34.67056	34.83117	34.73435
1	-1141.244	122.9273	2.35e+08	33.46411	34.42775*	33.84688*
2	-1123.821	29.36966	2.96e+08	33.68060	35.44728	34.38235
3	-1076.128	73.58290*	1.59e+08*	33.03224*	35.60195	34.05296
4	-1057.021	26.74966	1.99e+08	33.20061	36.57336	34.54031
5	-1035.176	27.46352	2.38e+08	33.29073	37.46651	34.94940
6	-1026.563	9.596566	4.38e+08	33.75895	38.73776	35.73659
7	-994.8435	30.81342	4.48e+08	33.56696	39.34880	35.86358

In the framework of the information criterion given in Table 3, the lag length was selected as three. Whether there is an autocorrelation problem or not in the selected lag length was tested. In addition, it was controlled to see that whether the opposite roots of the AR polynomial remain within the unit circle. The findings concerning these tests were given in the appendix of the study.

The results towards the interaction between the variables in VAR models are presented with impulse response functions and variance decomposition. Impulse response functions demonstrate the impact of a one standard deviation shock in random error term on internal variables. In VAR models, the most effective variable on a variable is determined with variance decomposition results (Özgen and Güloğlu, 2004).

3.3.1 Impulse Response Analysis Results

The impulse response analysis results were assessed in terms of the response of the consumer confidence index to the shocks given to the variables in the VAR model, and response of the variables that are included in the model to the shocks given to the consumer confidence index. In this way, the responses that consumer confidence index gives to the financial and macroeconomic indicators, and responses that financial and macroeconomic indicators give to the consumer confidence index would be assessed.
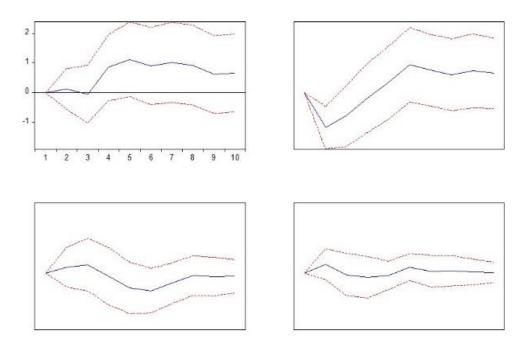

Figure 1. Response of the Consumer Confidence Index to the Other Variables

In Figure 1, the responses of the consumer confidence index to the consumer price index, exchange rate, BIST 100 and industrial production index are presented. The consumer confidence index is giving positive responses to the consumer price index, BIST 100 and industrial production index at the beginning. On the other hand, it gives a negative response to a shock in the exchange rate and this negative response is turning in to a positive response in the fifth period and its impact weakens after the eight periods. While the positive response that was given to the consumer price index, BIST 100 and industrial production index at the beginning continues for the consumer confidence index, it weakens at the end of the eighth period by following a fluctuating course for the variables of BIST 100 and industrial production index.

In Figure 2, the responses of consumer price index exchange rate, BIST 100 and industrial production index variables given to the shock occur in the consumer confidence index are shown. The consumer price index responding negatively to the consumer confidence index until the 3rd period, the positive response turns back to negative in the 4th period and weakens at the end of the 9th period. The exchange rate variable also gives a similar response to the shock in the consumer confidence index. The response, which is weak in the first two periods, progresses positively in the 3rd and 4th periods and turns, back to negative and weakens after the 8th period. While the BIST 100 index gives a negative response to the consumer confidence index at first and a positive response in the sequel, the response given by the industrial production index to the consumer price index follows a fluctuating course.
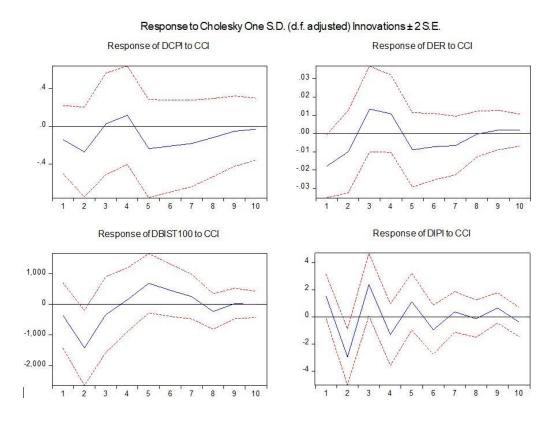

Figure 2. Response of the Other Variables to the Consumer Confidence Index

3.3.2 Results of the Variance Decomposition

The variance decomposition results that reflect the condition that which variable is the most effective on the variables of consumer confidence index, consumer price index, exchange rate, BIST 100 index and industrial production index in the estimated VAR model were presented in Table 4 until the tenth period.

According to the results given in Table 4, the variable that has the largest share in the prediction error variance of the consumer confidence index is the exchange rate with an average of 10.6%. Consumer price index follows the exchange rate with 8.4%. These variables are followed by the variables of BIST 100 index and industrial production index. According to the variance decomposition results regarding the consumer price index variable, the most effective variable on the consumer price index is the exchange rate variable with an average of 26%. After the exchange rate, BIST 100 index, consumer confidence index and industrial production become effective respectively on the consumer price index. According to the variance decomposition results regarding the exchange rate, it is seen that the most effective variable on the exchange rate is the consumer price index with an average of 12.1%. In terms of the impact on the exchange rate, the consumer price index is followed by the BIST 100 index, consumer confidence index and industrial production index respectively.

Table 4. Variance Decomposition Results

Variance Decomposition of CCI:

Period	CCI	CPI	ER	BIST100	IPI
1	100.000	0.000	0.000	0.000	0.000
2	89.787	0.093	0.227	9.282	0.610
3	87.515	0.092	11.181	0.691	0.522
4	85.102	3.619	10.056	0.665	0.559
5	79.679	8.697	9.437	1.667	0.520
6	74.401	10.636	11.571	2.779	0.613
7	70.743	13.260	12.490	2.934	0.573
8	68.312	15.351	12.974	2.797	0.566
9	66.415	16.017	14.268	2.747	0.552
10	64.689	16.917	15.154	2.701	0.539
Avg.	78.664	8.468	10.636	1.726	0.505

Variance Decomposition of CPI:

Period	CCI	CPI	ER	BIST100	IPI
1	0.803	99.197	0.000	0.000	0.000
2	2.502	77.430	15.992	1.560	2.516
3	1.959	61.307	30.095	4.229	2.409
4	2.034	62.973	28.185	4.130	2.678
5	2.921	59.714	30.589	3.938	2.839
6	3.577	57.866	31.775	3.817	2.965
7	4.025	58.369	30.961	3.758	2.887
8	4.231	58.001	30.986	3.736	3.046
9	4.240	57.904	30.998	3.723	3.136
10	4.233	57.642	31.049	3.832	3.245
Avg.	3.053	65.040	26.063	3.272	2.572

Variance Decomposition of ER:

Period	CCI	CPI	ER	BIST100	IPI
1	5.620	14.531	79.849	0.000	0.000
2	5.056	12.634	71.672	9.880	0.758
3	6.650	11.741	69.620	10.611	1.378
4	7.742	11.460	67.915	11.065	1.817
5	8.290	11.696	66.068	11.839	2.105
6	8.700	11.890	65.212	11.930	2.268
7	9.089	11.857	64.874	11.925	2.256
8	9.051	11.809	64.624	12.005	2.510
9	9.077	11.794	64.593	12.006	2.530
10	9.081	11.764	64.576	12.030	2.550
Avg.	7.836	12.118	67.900	10.329	1.817

Variance Decomposition of BIST100:

Period	CCI	CPI	ER	BIST100	IPI
1	0.601	2.912	18.042	78.445	0.000
2	8.804	5.587	16.836	68.376	0.398
3	9.051	6.276	16.871	67.342	0.459
4	8.536	8.576	16.634	65.808	0.446
5	9.933	8.360	16.933	63.648	1.127
6	10.590	8.305	16.798	62.977	1.329
7	10.675	8.463	16.759	62.760	1.343
8	10.788	8.559	16.955	62.351	1.348
9	10.748	8.710	17.031	62.117	1.393
10	10.682	9.125	16.953	61.823	1.417
Avg.	9.041	7.487	16.981	65.565	0.926

Variance Decomposition of IPI:

Period	CCI	CPI	ER	BIST100	IPI
1	4.672	2.110	11.029	2.565	79.624
2	15.341	1.685	14.628	3.063	65.283
3	18.686	6.793	16.496	5.190	52.835
4	16.319	16.632	17.023	5.841	44.185
5	17.079	16.668	16.714	6.065	43.473
6	17.413	16.827	17.254	5.976	42.531

				17.103	16.479	16.840	5.881	43.697			
			7								
			8	16.903	16.297	16.809	5.945	44.045			
			9	16.968	16.256	17.035	6.193	43.549			
			10	16.712	17.254	17.175	6.175	42.683			
			Avg.	15.720	12.700	16.100	5.289	50.191			

When the BIST 100 variance decomposition results are examined, it is seen that the exchange rate is effective on the BIST 100 index with an average of 16.9%, and after that, the consumer confidence index is effective with an average of 9.04%. In terms of the impact on the BIST 100 index, the exchange rate and consumer confidence index are followed by the consumer price index and industrial production index respectively. While the exchange rate becomes effective on the industrial production index with an average of 16.1% according to the industrial production index variance decomposition results, it is followed by the consumer confidence index with an average of 15.1%, the consumer price index with 12.7% and BIST 100 index by 5.2%.

4. Conclusion

The consumer confidence index is a leading indicator in terms of monitoring of the expectations. In the study, evidence on the existence of a causality from the consumer confidence index to the industrial production index, and existence of a causality from the BIST 100 index, dollar exchange rate and consumer confidence index to the consumer confidence index were obtained.

According to the VAR model impulse response functions results, shocks in the exchange rate have a significant negative impact on the consumer confidence index. On the other hand, the shocks in the consumer confidence index demonstrate negative impacts on the BIST 100 and exchange rate. When the variance decomposition results are assessed in the framework of the consumer confidence index, it is seen that the consumer confidence index is affected to a great extent from the self-caused shocks and shocks that occur in the exchange rate and consumer price index. Furthermore, consumer confidence index shocks are effective on industrial production index and the BIST 100 index.

It is seen that while the results obtained in the study show parallelism with some of the studies in the literature (i.e Usul, Küçüksille and Karaoğlan, 2017; Topuz, 2011 etc.); they are different than the results of several studies (i.e Kale ve Akkaya, 2016; Afsar, 2007 etc.). It is thought that these differences that occurred arise from the use of data sets that belong to different periods in the analyses, the use of different macroeconomic-financial variables, the use of different countries as a base, and the use of different analysis methods.

The results of the study reveal that the consumer confidence index that is used to provide information about the general condition of the economy can affect the consumption expenditures of the consumers, and in this respect, their purchasing behavior.

In analysed period Turkish economy causality results showed that consumer confidence affected from exchange rates, stock index and price movements. On the other hand movements in consumer confidence index affected industrial production index. These relations are acceptable evidence for determining that: in Turkish economy financial indicators and price movements affect the consumer confidence and then consumer confidence affected the real sector.

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APPENDIX. 1. Staionarity Tests

App: VAR model serial correlation and staionarity tests

Lag	Nullhypothesis: No serialcorrelation at lag h					
	LRE* stat	df	Prob.	Rao F- stat	df	Prob.
1	29.548 86	25	0.24 16	1.2009 41	(25, 183.5)	0.24 33
2	22.631 57	25	0.59 91	0.9032 79	(25, 183.5)	0.60 07
3	17.115 13	25	0.87 76	0.6733 50	(25, 183.5)	0.87 83
4	17.672 05	25	0.85 60	0.6962 69	(25, 183.5)	0.85 68

Inverse Roots of AR Characteristic Polynomial