The Impact of US Sanctions on the Consumer Price Index (CPI) of Turkey

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Abstract

This paper addresses the assessment of effect of the sanctions imposed on Turkey by the United States of America in the year 2018 on the Consumer Price Index (CPI) of Turkey.

The study used a cross sectional data from the 81 provinces in Turkey for the periods of 2016 to 2018 from Turkish Statistical Institute (TUIK). Dummy variable with Ordinary Least Squares (OLS) estimation method is used to determine that how the sanctions affected the CPI over that period by looking at the years before 2018, the year the sanctions were imposed.

Keywords: *CPI, OLS method, Sanctions, Crisis*

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1. Introduction

Turkey's economy has risen in the last decade to 17th rank among global economic powers (Newsletter fanack, 2018) . This is due to the restructuring of the banking sector in the 2000s by adopting the floating exchange rate regime within the scope of fiscal adjustment program from International Monetary Funds (IMF, 2009). The dynamism of a young population buying on credit, the change of a lot of its provinces such as Mersin and Kayseri among others into industrial zones as well as the country's ability to export its manufactured products to the domestic neighboring countries such as Iraq. However, the economy of Turkey has been facing chronic deficit in its foreign trade in recent years. (Newsletter fanack, 2018).

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From the 2019 report of the International Trade Administration, Turkey exported the eighth highest volume of steel in the year 2018 amidst the sanctions from USA. From history, exporters of steel in Turkey have European industries as their largest market with Italy as the largest market taking up 9 percent and USA importing 7 percent while Israel been the lowest with percentage of 5 in the year 2018. Turkey saw a rise in its steel export from 16.2 million to 19.8 million representing 22% increases from 2017 to 2018. The imposition of the tariffs on aluminum and steel in the US section 232 reduced the export of the USA by 38 percent. Contrarily, steel exporters in Turkey balanced their losses by increasing the volume of exports to Canada (92%) followed by Italy (80%) the Spain (54%) and lastly Romania (53%). Also, in the same year, Italy imported 25 percent of the flat steel, 15 percent went to Spain, 11 percent to Israel and the least of 9 percent to Belgium. Furthermore, steel pipes, tubes, stainless steel and semi-finished steel products saw increase in exports to Europe, the Middle East and Asia (Group and Holding, 2019).

Employment rate has been increasing throughout the country and about 80% of the population residing in urban areas. A data from TURKSTATS shows agricultural employment has fallen to 19.8% of the labor force while 19.6% is employed in industry and 5.5% in construction. The service sector being the largest source of employment employs 55.1% of the workforce which is a decrease from 57% in December 2018 (TURKSTATS, 2019).

In September 2008, the financial crisis in USA affected all economies in the world as well as Turkey's this led to a decrease in GDP in the fourth quarter by 7% and an end of year growth of only 0.7%. The World Bank Annual report of 2016 indicated a decline of growth in Turkey's economy from 6.1% in 2015 to 2.1% in 2016. This is due to the effect of loss of confident of business and consumers after the coup attempt in July 2016 and a yearly reduction in tourism revenues of about 36%. Again, the ongoing war in Syria as well as economic slowdown in Europe affected the economy of Turkey.

In the first quarters of 2018, Turkey reported a growth of 7.22 percent in GDP which was higher than some economics giants like China and India. This achievement was fueled by foreign currency debt. According to (IMF, 2018), the country's foreign currency debt now stands at more than 50 percent of its GDP which was denominated in US dollars.

Turkey is one of the world's largest steel exporters and USA was the country's largest market until last year where Italy and Spain took over in the first half of the year. Amidst the tariffs imposed by the USA last year, Turkey's iron and steel industry still enlarged in the global market (Sabah, 2018). The question is: What are the effects of this on the consumer price index? How did this affect the economic growth of Turkey within this period?

2. Literature review

In an attempt to look at the impact of this crisis there are a lot of literature on impact of financial and economic crisis on CPI as well as the determinant of CPI. These studies evaluate the subject with wide range of views from reasons, influences on the sector and economies to possible recommendation and solution.

Venkadasalam (2015) checked the importance of some macroeconomics variables namely broad money, household expenditure and GDP on the CPI of Malaysia in the long run. He found that these variables have positive and significant relationship with CPI and this indicates that the final consumption of household expenditure is passed through to the CPI in the long run. Also,(Estelami, Lehmann and Holden, 2001) used a framework of meta-analytic to analyze the result of 297 studied price knowledge to see the impact of selected macroeconomic variables (inflation, GDP growth, interest rate, country of study and the passage of time on the consumer's knowledge of price). His findings show that economic factors have reasonable influence on the explanation of the variation in the consumer price knowledge.

Singh and Singh (2015), they studied the long run relationship between growth and consumer price index (CPI) in Japan for a 35 years period. They found that there exist a long run relationship and a co-integration within the variables. This is line with the work of (Ayyoub, Chaudhry and Farooq, 2011) who re-examined the effect of inflation on the GDP as well as the existing relationship of inflation growth in the economy of Pakistan. They concluded that there is a negative and significant relationship between inflation and GDP which is harmful to the economy after certain threshold level.

The study of (Comunale and Kunovac, 2017) analyzed the exchange rate pass-through (ERPT) in the euro and four of its members. They found that over a period of time the pass through is not constant and may rely on other factors like the nature of the economic shocks governing the rate of exchange. The effect of the pass through is strongest when the exchange rate instability is caused by monetary policy and the exchange rate shocks.

Other research (Gün and Yigit, 2016) studied the impact of global economic crisis on the economic structure of Turkey's economy. They investigated the structure of the Turkey's economy between the periods of 1998 to 2012 using data from the central bank of Turkey. They found that the global economic crisis of 2008 did not affect the economy of Turkey temporarily but rather led to a new structural trend which was contrary to their initial assumption of the effect of the crisis reflecting on the country's Gross Domestic Product.

On the other hand, (Barro, 1991), accounted for a lot of variables that affects the economics growth in a cross section of countries. He concluded that economic growth has an inverse relationship with the share of government consumption in GDP, but it has a significant relationship with the share of public investment. There exists a positive relationship between growth rates and the measures of political stability and contrary a negative relation to a proxy for market distortions.

The current crisis in Turkey is an attack on the monetary sector which devalued the lira against the dollar. The effect of such crisis has been raised in an empirical paper by (Kouki et al, 2017) where in their work they analyzed the impact of financial crisis on GDP growth. They stated that monetary crisis attacks a nation's currency significantly by reducing the national currency reserves which leads to depreciation or nominal devaluation of the country's currency. This in the end facilitates the growth of risk panic and investment while diminishing the credit capacity.

Furthermore, (Yeldan, 2006) in his neoliberal global remedies from speculative-led to IMF-led crisis in Turkey argued that the economic and political crisis in 2008 is not as a result of technical errors or administrative mismanagement unique to Turkey rather it is as a result of series of pressures from the process of integration with the global capital market. He further stated that although Turkish financial and fiscal system is fragile, IMF programs led to an increase in vulnerability of the system throughout 2000-2001 while the recent wave of structural reforms destined for stability and credibility rather serve the interest of foreign financial capital and aims at securing debt obligations of the Turkish arbiters.

(Macovei, 2009) asserted that due to chronic macroeconomic instability in the 1980s the boom bust growth of Turkeys economy in 1990 were marked as volatile which culminated in the 2000\2001 economic crisis. From this experience Turkey revamped its political and democratic institutions and economic structures with bold structural reforms and macroeconomic stability. This explains the resistance of Turkey's economy during the 2008 economic crisis which affected a lot of OECD and emerging countries. Although Turkey's economic performance under this shock validates the success of its past reforms, the decline in economic activity and the rise in unemployment rates reveal that the Turkish economy is still vulnerable at some areas.

(Gazioglu, 2003) in his capital flows to an emerging financial market pointed out that the foreign share of a domestic economy determines the rate at which a financial crisis affects the economy. Foreign share in Istanbul Stock Exchange has been increasing since 1995 and it is about 50 percent in total currently. This indicates that an external shock will affect the economy drastically.

Objective of the study

The main objective of this study is to check the effect of the 2018 sanctions of the USA on the Consumer Price Index of Turkey. It will assess this effect by looking at the data from 2016 to 2018 a cross sectional data for the 81 provinces of Turkey.

3. Methodology

Data source

The study is to check the effect of the economic sanctions imposed by the USA on Turkey in the 2018. In this study a cross sectional data from the 81 provinces in Turkey for the periods of 2016 to 2018 will be used from Turkish (TUIK) and the impact of the crisis on the CPI will be investigated. Ordinary Least Squares estimation method is used to regress the model of this paper in order to determine how the sanctions affected the CPI over that period by looking at the years before 2018, the year the sanctions were imposed.

Consumer price index (CPI) calculates how price level of goods and services changes over a period subject to time which represents the average for the whole country. In Turkey, the base year for CPI is 2003 which is calculated as a chained index while the items as well as their weight, the locations and outlets, and their definitions are updated every year. The table below shows the arithmetical details about the prices, outlets and index basket (Index *et al.*, 2020).

Arithmetical information relating to the CPI Scope.

Table 1

CPI	2016	2017	2018
Number of items	417	414	407
Number of varieties	924	910	895
Number of outlets	27 886	27 386	28 015
Number of prices	408 093	400 772	415 000
Number of rents	4 281	4 275	4 274

Source: Turkish statistical institute

The choice of variables and Research Hypotheses

The econometrics specification of Potential situation drivers of CPI models it by a number of variables such as exchange rate, interest rate, GDP, broad money, inflation rate, unemployment rate, real wages, fiscal deficit and literacy rate (Estelami, Lehmann and Holden, 2001; Singh and Singh, 2015; Venkadasalam, 2015). Since the main objective of this study is to check the effect of the economic sanctions imposed by USA on the CPI of Turkey and the data used is a cross sectional provincial data, variables (exchange rate, interest rate, broad money, Inflation rate and fiscal deficit) that affect the whole nation with same degree will be eliminated as this will cause heteroskedasticity in the result. Below is the descriptive statistics of the data summary of the variables used from 2016 to 2018:

Statistical data summary of the variables

Table 2

	Min	Max	Mean	StDev	Median
cpi2016	271.8	309.18	294.41	7.41	293.92
cpi2017	305.01	344.45	330.32	8.15	331.81
cpi2018	376.14	417.89	401.56	10.07	401.08
exp2016	37	7.61e+07	1750000	8560000	163226
exp2017	117	8.13e+07	1940000	9170000	166887
exp2018	208	8.51e+07	2070000	9600000	197239
gdp2016	1639191	8.09e+08	3.22e+07	9.41e+07	1.09e+07
gdp2017	1813701	9.72e+08	3.84e+07	1.13e+08	1.27e+07
gdp2018	1160000	3.30e+08	3.17e+07	5.00e+07	1.46e+07

litracyrate2016	90.64	98.68	95.53	2.16	96.03
literacyrate2017	91.21	98.8	95.83	2.01	96.3
literacyrate2018	91.78	98.91	96.14	1.87	96.53
unemploymentrate2016	4.5	28.3	9.84	5.38	8.9
unemploymentrate2017	3.6	26.9	9.75	5.11	9.8
unemploymentera~2018	5.1	25	10.56	5.39	9
netmigration2016	-37.09	121.52	1.21	19.05	1.24
netmigration2017	-118.97	20.84	-3.71	16.8	-1.39
netmigration2018	-17.25	138.51	9.82	20.65	4.91

The table above shows the statistical description of the data and variables used. As can be seen above there is a variation in the data from 2016 to 2018. The mean value of all the variables increases from 2016 to 2018 with the exception net migration which do not have that pattern. Their standard deviation also widens by the years but not with net migration, literacy rate while unemployment almost stayed the same throughout the three years.

This study employs the following variables consumer price index, GDP, exports, unemployment rate, literacy rate and net migration. The effect of these sanctions is captured by a dummy which is 1 for the year 2018 and 0 for 2016 and 2017 and its interaction with all the independent variables. In order to make sure that the effect is due to the sanctions and not the change in year, we will first check for the period 2016/2017 and then for 2018/2019 periods respectively. The econometrics specifications are as follows:

$$CPIi = \alpha 0 + \alpha 1GDPi + \alpha 2EXPi + \alpha 3URi + \alpha 4LRi + \alpha 5NMi + \alpha 6GDPi.D + \alpha 7EXPi.D + \alpha 8URi.D + \alpha 9LRi.D + \alpha 10NMi.D + \delta D + \epsilon \quad (1)$$

From the model above, CPIi = consumer price index where i indicates the year, GDP is the gross domestic product, EXP is the export, UR is the unemployment rate, NM is the net migration. These variables are in terms of each of the 81 provinces in Turkey. Ordinary least squared will be used in estimating this model as it is simple and easy to interpret.

4. **Result and discussion**

Tables 3 and 4 show the results of the model in equation 1 for the combination of the years 2016/2017 and 2017/2018 respectively. The result in table 3 is used as controlled for the difference in time period when there are no tariffs. The main variables of interest are the dummy and its interaction with the variables. The period 2016/2017, the dummy has no effect on the CPI as well as all the other variables except net migration which is significant and have positive effect on CPI. On the other hand, the main result in table 4 when there were sanctions does not show a contradictory result to this. The dummy variable representing sanctions here as well do not affect CPI and any other variable but now makes the relationship between CPI and net migration negative. Although some of the variables (LR, UR and their interactions) are insignificant in both set of years, the variables have combined effect in both periods with a very strong R Squared as well as Adjusted R squared.

Summary of the result for the 2016/2017 variables

Table 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.597609***	0.29256	8.87877	0.00000
GDP_16_17	0.006523*	0.00386	1.69008	0.09310
EXP_16_17	-0.00098	0.00158	-0.61695	0.53820
LR_16_17	-0.08435	0.15167	-0.55615	0.57890
UR_17_18	-0.00323	0.00520	-0.62099	0.53560
NM_16_17	-0.00018**	0.00007	-2.58733	0.01060
GDP_D	0.00414	0.00593	0.69851	0.48590
EXP_D	-0.00259	0.00266	-0.97584	0.33070
LR_D	0.12249	0.22126	0.55358	0.58070
UR_D	-0.01203	0.00735	-1.63665	0.10380
NM_D	0.000302***	0.00010	3.05499	0.00300
DUMMY	-0.19751	0.42868	-0.46074	0.64570

Summary of the result for the 2016/2017 variables

Table 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.266975***	0.31476	7.20215	0.00000
GDP_17_18	0.010767**	0.00461	2.33349	0.02100
EXP_17_18	-0.00408*	0.00217	-1.88108	0.06190
LR_17_18	0.10352	0.16164	0.64041	0.52290
UR_17_18	-0.00957	0.00622	-1.53796	0.12620
NM_17_18	0.00013*	0.00007	1.77758	0.07750
GDP_D2	-0.00507	0.00581	-0.87305	0.38400
EXP_D2	0.00192	0.00277	0.69296	0.48940
LR_D2	-0.17822	0.24751	-0.72004	0.47260
UR_D2	0.00308	0.00950	0.32390	0.74650

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NM_D2	-0.00020**	0.00009	-2.14413	0.03360
DUMMY	0.46198	0.48394	0.95462	0.34130

5. Conclusion

The purpose of the paper was to analyze if there was an effect of the sanction imposed on Turkey on 2018 by US on the consumer price index. The results show no effect of the sanctions on the CPI of Turkey. This is because the steel exporters in Turkey balanced their losses by increasing the volume of exports to Europe, the middle East, Asia as well as North Africa. The only effect was observed on the net migration where the relationship changed to a negative one as compared to the years when there were no sanctions. However, the study could be extended by looking at the effect of subsequent sanctions or a comparison or a combine effect of these sanctions on Turkey's CPI.

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