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Abstract

Between 1914 and 1918, the Ottoman Empire was involved in the First World War, which caused economic disruptions, huge budget deficits, surmounted inflation rates and excessive devaluation of Lira, the Ottoman currency. Based on the value of Lira against the currencies of three selected countries that were not in the war, we focus on the effects of news about the war on the foreign exchange rates at the Istanbul bourse from 1918 to 1919. Our results signify some dates, which match the official announcements of the war events and/or the official treaties.

JEL classification: G1, N25, N45

Keywords: The Istanbul bourse, foreign exchange trading, the First World War, the armistices, economic recovery

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1. Introduction

Wars impose destructive impacts on societies, impairing the physical, psychological and economic conditions. In economics literature, it is debated that war news affects the value of money beyond the changes in the money supply and the inflationary pressures from the budget spending (Mitchell, 1903; Willard et al., 1996; Weidenmier, 2002). Before the outbreak of the First World War (WWI), many countries, based on the amount of their national gold reserves, implemented the gold standard. The standard fixed the value of their local currencies in terms of gold. However, when the WWI began, they had to abandon the gold standard and the governments used paper money and bond issues for war spending needs.

The Ottoman Empire adopted the gold standard on 13 December 1879 and replaced the bimetallism, which called for the use of gold and silver together. The new monetary system was called as *Topal Mikyas* ("limping" standard), as silver had still been used on a constant rate against gold (Kuyucak, 1947: 197–198; Pamuk, 2000: 216–221). Pamuk (2004) and Fertekligil (2000: 52) argue that the value of Lira was stabilised after the adoption of the gold standard. However, during the WWI, the Ottoman state also had to abandon the gold standard as was done by the other belligerent countries, which increased the financial instability (Eldem, 1994: 25–131; Pamuk, 2000: 223–224; Pamuk, 2005).

Four years after the start of the war, the Central Powers[1] were defeated and the Armistice of Mudros was signed by the Ottoman Empire on 30 October 1918. The Allies[2] immediately started to invade Anatolia by mid-February 1919, which was backlashed by the resistance of the Turkish National Movement (TNM)[3]. The WWI and other hostilities in the Ottoman Empire deteriorated the economic condition and eroded the power of the state in foreign exchange interventions. Al and Akar (2014: 179) document the depreciation of Lira against the currencies of the neutral countries during the WWI. The war also brought about trade and market disruptions, as the Ottoman Empire imported goods and war materials only from her allies (Eldem, 1994:

[1] Germany, Austria-Hungary, the Ottoman Empire, Bulgaria.
[2] The UK, France, Greece, Russia.
[3] TNM was formed by Turkish revolutionaries in June 1919 to struggle against the occupation.

25–131). In the last days of the WWI, some commentaries in *Vakit* reported serious hunger and inflation problems (Vakit, 27 August 1918: 1; Ahmed Emin, 31 August 1918: 1). It is important to note that conflicting views appeared in the newspapers then. On the one hand, *Vakit* announced that as the end of the war was approaching, there was higher trade of goods, heralding lower price levels. This was explained by the expectations that the end of the conflicts would have positive effects on economic life (Vakit, 6 October 1918: 2; 8 October 1918: 2; 13 October 1918: 2; 17 October 1918: 2). When the WWI was about to end, the monetary instabilities were to a lesser extent, as a consortium of banks tried to re-establish control on foreign exchange trading (Eldem, 1994: 25–131; Pamuk, 2000: 223–224; Pamuk, 2005; Al and Akar, 2014: 179). On the other hand, different commentaries in *Vakit* argued that the end of the war might not ameliorate the Ottoman economy, broadcasting lower demand for goods, prices, and trading activity (Vakit, 2 November 1918: 2; Vakit, 14 November 1918: 2). Eldem (1994: 144) states that as it was not possible to borrow gold from Germany, thus printing money without counterpart depreciated the Lira even after the Armistice of Mudros. Moreover, by the beginning of 1919, *Vakit* disseminated that a severe stagnation was on the scene (Vakit, 3 January 1919: 2).

Previous literature suggests that foreign exchange markets are affected by war-related news in different aspects. Wars and military spending increase budget deficits, inflation and interest rates leading to the dissolution and the economic disruption of the belligerent countries, which depresses the value of their currencies. Additionally, the possibility of a defeat lowers the survival probability of the defeated countries, in which case their currencies will be void (Willard, Guinnane & Rosen, 1996; Weidenmier, 2002; Hall, 2004; Kanago and McCormick, 2013). Phillips (1988) investigates the value of the South Vietnamese currency at the black market during the Vietnam War and finds an appreciation in the value of the South Vietnamese currency at times of increased frequency and intensity of the fight by the U.S. army to defend South Vietnamese territories. During the US Civil War, Willard, Guinnane & Rosen (1996) find statistically significant changes in the gold price of the 'greenback', which was the official currency of the United States then. In a similar vein, Weidenmier (2002) points out the different impact of war events on the prices of 'greyback' and 'greenback' for the Northern and Southern traders during the US Civil War. However, research on the impacts of the WWI on foreign exchange rates is more confined. Hall (2004)

examines the relationship between war related events and exchange rates during the WWI, where he uses Swiss Franc against five of the belligerent currencies. He shows a statistically significant correlation between exchange rates and some war events, by which the currencies of the Allies appreciate as they win. In a recent study, Kanago and McCormick (2013) evince the depreciation of Sterling against US Dollar during the Second World War, which disturbs the British economy and the state's power on managing the foreign exchange rate regime.

There is a lack of comprehensive research on the Ottoman economy for the period ended by the WWI. Despite the limited information on the Ottoman economy during the war years, this paper attempts to contribute to the literature by analyzing the effects of the WWI on the foreign exchange rates at the Istanbul bourse. We use daily foreign exchange rate data announced at the Istanbul bourse from May 1918 to June 1919. The data are manually collected from the Ottoman Empire's official newspaper *Takvim-i Vekayi*, which have never been used before for an empirical examination of the war-related information flow to the Istanbul bourse foreign exchange rates. To the best of our knowledge this paper is the first of its kind to elaborate the influence of political risks on the foreign exchange rates at the Istanbul bourse during the WWI.

In order to identify the abrupt changes in the data series as a response to the war-related events, our study pinpoints the structural breaks in the value of Lira against the currencies of the neutral countries at the Istanbul bourse. We select the currencies of three neutral economies, the Dutch Guilder, the Swedish Krona and the Swiss Franc to isolate the influence of the war events on the Ottoman Lira. The news impact can be blurred when both economies are in war, especially if they are fighting against each other. To this end, we apply an econometric model proposed by Bai and Perron (1998, 2003) which determines the structural breaks endogenously. We use the foreign exchange rates of the Lira against the currencies of the neutral countries as they have more or less stable economies and trade with both sides of the war. The structural break dates that are identified endogenously match important war-related events pointing out that the end of WWI was approaching. Furthermore, we conduct a dummy regression analysis to exogenously test the impact of the war-related events on the time-series. The results from the dummy regression analysis underlie the significance of the official announcements about the war on the foreign exchange rates. Moreover,

from the time series, it can be seen that by September 1918, as the result of the expectations that the war would end soon, the Lira appreciated against the above three currencies for a short while. However, after the Armistice of Mudros and the Armistice of Compiégne, the Lira displays a significant and continuous depreciation.

The remainder of the paper is organized as follows; Section 2 discusses the effects of WWI on the Ottoman economy. Section 3 provides information on foreign exchange trading at the Istanbul bourse at the time of the study and the impacts of WWI. Section 4 explains the methodology applied. Section 5 undercovers the characteristics of the data set. Section 6 canvasses the empirical results and finally section 7 concludes.

2. The Ottoman Economy during WWI

On 28 July 1914, WWI had begun, when Serbia declared war against Austria-Hungary as the result of the ongoing problems among the major European powers[4] (Hall, 2000: 11) (See Table 1). On 2 November 1914, the Ottoman Empire joined the long running conflicts on the side of Germany. The conflicts were ending in favour of the Allies, when Bulgaria offered truce on 28 September 1918. The Ottoman Empire signed the Armistice of Mudros on 30 October 1918 to end the war (Erickson, 2001: 25–42; Henig, 2002: 3–24). During the war, the Allies restricted the foreign trade activities, which were also disrupted by the security concerns. The Ottoman Empire could only import from her allies. The budget deficit in 1914 was five times larger than that of 1913, and it was financed by both foreign borrowings from Germany and the issue of paper money. As a result, the inflation rate rocketed to 400 percent. The value of gold rose to 452 *Kuruşes (1/100th of a Lira)* in 1918, from 131 *Kuruş*es in 1916 (Criss, 1994: 59; Eldem, 1994:. 25–131; Pamuk, 2000: 223–224; Pamuk, 2005).

Table 1. Key military and political events during the end of WWI and the Allies' occupation

Dates	Events

[4] The UK, Germany, France, Austria-Hungary, Russia, and Italy

29 September 1918	The Armistice of Salonica was signed by Bulgaria
30 October 1918	The Armistice of Mudros was signed by the Ottoman Empire
11 November 1918	The Armistice of Compiègne
18 January 1919	The organization of the Paris Peace Conference to set peace terms for the Central Powers
15 May 1919	The occupation of Izmir

By the end of the war, serious economic problems emerged on the scene. On 27 August 1918, *Vakit* announced a famine, and as a solution, a ministry was founded to organize food supply (Vakit, 27 August 1918: 1). Ahmed Emin (*Vakit editor)* argued that the war had caused an income inequality (Ahmed Emin, 31 August 1918: 1). Commentaries in *Vakit* showed a 19 percent increase in the price of flour from 30 May 1918 to 29 August 1918 (Vakit, 31 May 1918: 2, 6 August 1918: 2).

By September 1918, the Allies were steadily successful in the Western Front, heralding the end of the war against the Central Powers (Tuncer, 2011: 127–129; Hall, 2004). On the other hand, the Ottoman officers did not expect the defeat of Germany (Bayur, 1983: 663–664). Thus, the Ottoman newspapers broadcasted conflicting news on the war. On 30 May 1918, a commentary of *İkdam* argued that the German army had been successful to fight against the Allies (İkdam, 30 May 1918: 1). Contrarily, *Tercüman-ı Hakikat* said that Germany was about to make a peace agreement with the Allies (Tercüman-ı Hakikat, 15 June 1918: 1). By September 1918, there was an important shift on the fate of the war, as people believed that the hostilities would end soon. *Vakit* argued that the war continued longer than expected and the citizens of the Ottoman Empire, Germany, and Austria-Hungary wanted an end to the war (Vakit, 10 September 1918: 1). Similarly, a commentary in *Vakit* disseminated news on the proposal of the Pope for peace (Vakit, 13 September 1918: 1). In September 1918, the news on peace became a reality. On 17 September 1918, *Tanin* and *Vakit* announced the official peace offer by Austria-Hungary (Vakit, 17 September 1918: 1; Tanin, 17 September 1918: 2). The truce offer of Bulgaria was in the news by the end of September (Tanin, 28 September 1918: 2). The defeat of Bulgaria suggested the end of

the war for the Ottoman Empire as well, since it was impossible to import military supplies from Germany anymore (Eldem, 1994: 30–31; Tuncer, 2011: 131–132).

Towards the end of the war, on 8 November 1918, a commentary of *Vakit* pointed out the appreciation of Lira, as the result of the news on peace (Vakit, 8 October 1918: 2). On 17 October 1918, *Vakit* broadcasted decreasing supply prices as the merchants started selling out inventories (Vakit, 17 October 1918: 2). Another commentary in *Vakit* remarked on lower demand for goods (Vakit, 2 November 1918: 2). *Vakit* on 14 November 1919 heralded worsening economic conditions (Vakit, 14 November 1918: 2). In line with the above arguments, on 23 November 1918, *Vakit* announced the shortages of coal. The inflation rate was suggested as 100 percent as imports from Greece and Egypt were not possible (Vakit, 23 November 1918: 2). After the end of the WWI, the economic conditions worsened further, as *Vakit* acquainted the price increases after the coal shortage (Vakit, 7 December 1918: 2). By the beginning of 1919, an economic recession was strongly expected (Vakit, 3 January 1919: 2).

The Allies organized the Paris Peace Conference on 27 January 1919 to come to a final decision on the peace terms of the Central Powers. The Allies invaded Anatolia by mid-February 1919 and these invasions flamed up the Turkish War of Independence (Özsoy, 2007: 96–98; Erikan, 2008: 21–14, 47–51). During the occupations, two different governments controlled the Ottoman Empire. One was located in Istanbul and controlled by the Allies. Another one was established in Ankara by the TNM. It is very hard to find data on the Ottoman economy during the occupation period. Some studies show that as foreign trade restrictions were abated, trade had increased in Istanbul. The imports increased by 8 times between 1919 and 1922 compared to those of the war years. But still, the inflation rates were high (Eldem, 1994: 137–152). Eldem (1994: 144) discusses that the money supply remained constant at 160 billion Liras after the Armistice of Mudros, however the budget deficit increased with lower tax collections. As the wealthy territories of the Ottoman Empire were under invasion, the Ottoman government had a much lower tax income after the Armistice of Mudros.

3. Foreign Exchange Trading at the Istanbul bourse and the WWI

During the 19th century, the Ottoman Empire faced severe financial problems, arising from political upheavals, famines, and the inefficiency of its fiscal system. The financial problems intensified with rising budget deficits and public debt. During the Crimean war between 1853 and 1856, the Ottoman Empire had to borrow foreign funds for the

first time by issuing *Konsolid* bonds. In order to finance the huge budget deficits, treasury bonds were issued at times. These bonds were informally traded at the Galata district of Istanbul (Kıray, 1995: 146; Kazgan et al., 1999: 371–375; Fertekligil, 2000: 15, 23; Birdal, 2010: 39).

In 1866, the Istanbul bourse (*Dersaadet Tahvilat Borsası*) was established to regulate the informal trade. The regulations of the Istanbul bourse were similar to those of the European markets. The trading activity in the Istanbul bourse was controlled by a committee and supervised by the Ministry of Finance. Traders (*Mubayaacı*s), brokers (*Tellal*s), and middlemen (*Simsar*s) conducted all the trading activities (Fertekligil, 2000: 33; Toprak, 2008: 151). After the establishment of the Istanbul Bourse, the trade volume and the variety of instruments increased dramatically. In 1914, 104 bonds and stocks were traded (Kazgan et al., 1999: 344; Fertekligil, 2000: 44–45). Foreign currencies started to trade in 1906 and 17 different currencies were listed in the Istanbul bourse by 1914. However, transactions at the Istanbul bourse were halted after the beginning of WWI. Nevertheless, trading activity continued out of the Istanbul bourse and the bourse opened again in 1917. During the war, the Istanbul bourse was not strictly controlled by the Ottoman Empire, although there was a commission to decide the daily value of Lira against foreign currencies in 1917. Regulatory interventions became possible only after 1923 with the establishment of the Republic of Turkey (Borsa Rehberi 1928, 1990: 259; Kazgan, 1995: 103–110; Fertekligil, 2000: 45; Al and Akar, 2014: 172, 179).

The depreciation in Lira against Sterling was associated with the victories of the Allies during WWI (Borsa Rehberi 1928, 1990: 18–19) and the defeat of the Central Powers also led to the devaluation of Lira against other currencies (Al and Akar, 2014: 182). The Ottoman economy highly depended on the borrowings from Germany (Eldem, 1994: 125) and Lira continued to depreciate as the result of the increasing current account deficits after the end of conflicts (Borsa Rehberi 1928, 1990: 158–159). Kazgan (1995: 104–105) and Kazgan et al. (2000: 410–412) state that the value of Lira against the Allies' currencies was sharply decreasing, while the Allies were occupying the Ottoman Empire.

4. Methodology

We use the structural break test developed by Bai and Perron (1998, 2003) to identify the impulsive changes in the value of Lira against the neutral countries' currencies. The

Bai-Perron test endogenously designates the break dates which reveal the information effect on the time series. Hereby, the endogenous structural breaks can acknowledge the investor attitude for Lira in relation to the war-related news.

In our study, by the Bai and Perron's (1998, 2003) methodology we focus on the sudden breaks in the value of Lira against the other currencies. Bai and Perron (1998, 2003) framework is based on the endogenous selection of break points, in contrast to alternative methodologies with exogenously identified break points. The exogenous identification may result in biased and speculative estimates due to prior information about the break times. To estimate the break points, Bai and Perron (1998, 2003) framework uses following system of linear regressions:

$$y_t = c_j + \varepsilon_t \qquad t = T_{j-1}+1, \ldots..T_j \qquad (1)$$

where y_t is Lira's value against three neutral countries' currencies at time t and j (j=1, ..., m+1) denotes segments defined by m structural breaks in sudden change points. In the equation, c_j is an estimated intercept and ε_t represents a white noise error term. Bai and Perron (1998, 2003) identify the break points using the Wald (F) test. Equation (1) is estimated under the assumption of one break point against the absence of break points and the Bai-Perron method assumes maximum five endogenous break points.

5. Data

We use daily foreign exchange rate data at the Istanbul Bourse for the currencies of the neutral countries (Swiss Franc, Dutch Guilder, and Swedish Krona). The neutral countries are the least affected by the effects of the war which enables us to isolate the impact of war related news in determining the value of Lira. Moreover, the neutral countries engage in trading with the belligerent countries no matter their political affiliation. We select the above foreign exchange rates for this study as we can obtain the maximum data range for these currencies.

The data are manually collected from *Takvim-i Vekayi*. *Takvim-i Vekayi* was the official newspaper of the Ottoman Empire which started to be published in 1831. The newspaper provided the maximum and minimum foreign exchange rates. In this paper, we take the averages of the minimum and maximum rates.

We compute the returns on the average foreign exchange rates by the following equation:

$$R_t = log(FX_t/FX_{t-1}) \qquad (2)$$

In order to have a more detailed analysis on the price and return dynamics, we document the summary statistics of the price and return time series. Table 2 presents the descriptive statistics on the price variables while Table 3 reports the same statistics on the returns. As can be seen from the associated values on the return series Lira provides negative average returns to investors against the Dutch Guilder, the Swiss Franc, and the Swedish Krona. The highest volatility in the returns is observed in the Lira/Swiss Franc exchange rate, which is followed by the Lira/Dutch Guilder exchange rate. The returns on the Lira/Swiss Franc exchange rate are negatively skewed implying that negative returns dominate the positive returns during the study period, while positive skewness is documented on the returns of the other foreign exchange rates. For all the return series under investigation, excess kurtosis values greater than 3 are reported, implying that extreme outcomes are more probable in the return distributions. These two higher moment statistics indicate non-normal distribution which is also validated by the Jarque-Bera test statistics of normality.

Table 2. Descriptive Statistics on the Price Series, 1918–1919

	DUTCH GUILDER	**SWISS FRANC**	**SWEDISH KRONA**
Mean	5.803	11.685	9.235
Median	6.375	13.375	9.350
Maximum	7.975	15.750	11.600
Minimum	2.800	7.050	6.250
Std. Dev.	1.647	3.084	1.628
Skewness	-0.471	-0.331	-0.414
Kurtosis	1.799	1.442	2.257
Jarque-Bera	23.233	28.523	12.330
P-value	0.000	0.000	0.002

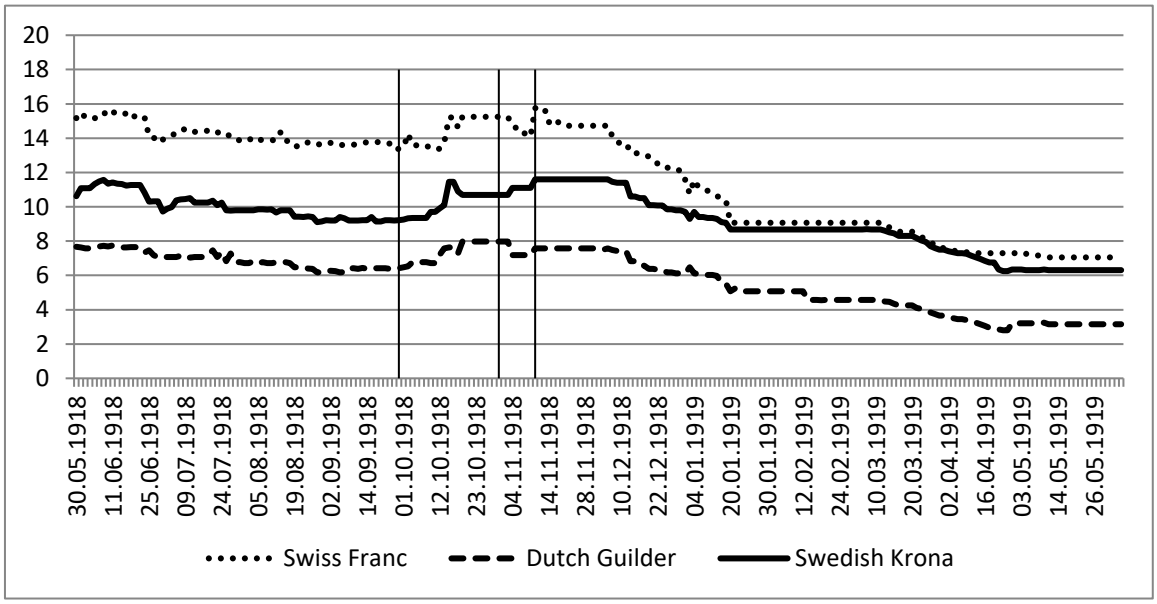
Table 3. Descriptive Statistics on the Return Series, 1918–1919

	DUTCH GUILDER	**SWISS FRANC**	**SWEDISH KRONA**
Mean	-0.002	-0.023	-0.006
Median	-0.007	-0.009	-0.007
Maximum	0.133	0.108	0.125
Minimum	-0.105	-0.136	-0.072
Std. Dev.	0.046	0.053	0.028
Skewness	0.743	-0.948	0.842
Kurtosis	4.403	4.002	5.575
Jarque-Bera	41.625	45.891	94.304
P-value	0.000	0.000	0.000

6. Empirical Findings

In order to depict the evolution of the foreign exchange rates throughout the sample period, in Figure 1 the value of Lira against Swiss Franc, Dutch Guilder, and Swedish Krona between 30 May 1918 and 11 June 1919 are plotted. The vertical lines represent the armistices signed by Bulgaria, the Ottoman Empire, and Germany, respectively. As can be seen from the figures, Lira showed a slight depreciation against the currencies of the neutral countries until the Armistice signed by Bulgaria. Immediately after the Armistice of Bulgaria, Lira experienced a sudden rise in value, to form a pattern of appreciation which continued until the Armistice of Mudros. Lira underwent another rise against the Swedish Krona, while it recorded a downfall both against the Dutch Guilder and the Swiss Franc in the immediate aftermath of the Armistice of Mudros. The Armistice of Compiégne, as the official ending of the WWI staged another period of an actual rise in the value of Lira for a short while. However, starting by December 1918, the devaluation of Lira paced up to a level much lower than the one during the war. On 27 January 1919, the Allies organized the Paris Peace Conference to negotiate on the peace terms for the losers, with a final verdict on the division of the Ottoman territories (Özsoy, 2007: 96–98), and aftermath of the Paris Conference witnessed a new time span for Lira, whereby, the depreciation accelerated.

Figure 1. The value of one Lira against Swiss Franc, Dutch Guilder, and Swedish Krona, 1918–1919



Source: *Takvim-i Vekayi*, 1918–1919.

Following Kanago and McCormick (2013), we also conduct a Bai-Perron multiple structural break test on the variables, pursuing to identify any abrupt changes in the time series endogenously. The results of the Bai-Perron analysis are listed in Table 4.

Table 4. Bai-Perron Test Results, 1918–1919

Foreign Exchange Rate	Structural Break Dates
Lira/Swiss Franc	14/11/1918
	20/01/1919
	11/03/1919
Lira/Dutch Guilder	03/10/1918
	07/12/1918
	18/02/1919
Lira/Swedish Krona	09/10/1918
	12/12/1918
	05/03/1919

Table 4 reveals three significant structural break dates for each foreign exchange rate under investigation. The first endogenously identified break date occurs in the beginning of October for the Dutch Guilder and Swedish Krona exchange rates, while it is the mid of November for the Swiss Franc rate. The end of September in 1918 dates the Armistice of Bulgaria, and it seems that the value of Lira against the Dutch Guilder and the Swedish Krona react significantly to the news of the Armistice of Bulgaria as an early harbinger of peace. On the other hand, the Lira/Swiss Franc rate demonstrates a significant and immediate response to the Armistice of Germany which dates 11 November 1918 and the occupation of Istanbul by the Allies in 13 November 1918. The second endogenously identified structural break date comes about by the beginning of December for the Dutch Guilder and Swedish Krona exchange rates, about a month after the Armistice of Germany, while it is 20 January 1919 for the Swiss Franc, which is a week before the Paris Peace Conference. The third endogenous structural break date takes place by the mid of February 1919 for the Dutch Guilder rate, while it is the beginning of March 1919 for the Swedish Krona and the Swiss Franc. In February 1919, the Allies started invading the Ottoman territories and in March 1919 the occupation widened to the mid-east of Anatolia. The second and the third

endogenously determined structural break dates mark the escalation of the value loss in Lira.

In addition to the endogenous estimation of the abrupt changes on the exchange rate returns via the Bai-Perron multiple structural break tests, we conduct an exogenous regression analysis with dummy variables. The dummy variable regressions are commonly used to examine the impact of the external shocks on the financial assets. Within the context of this study, the dummy variables are employed to assess whether the important events alter the return characteristics of the exchange rates. For this end, we run the following regression specification:

$$r_{i,t} = \alpha + \beta_1 d_{1,t} + \beta_2 d_{2,t} + \beta_3 d_{3,t} + \beta_4 d_{4,t} + \beta_5 d_{5,t} \quad (3)$$

where, r represents the returns on the exchange rate i at time t, α and β are the coefficients to be estimated and d denotes the dummy variables which take the value of 1 in case of an event and 0 otherwise. The events and dates are listed in Table 1.

Table 5. Results of the Dummy Regression Analysis

	Dutch Guilder	**Swiss Franc**	**Swedish Krona**
d1	0,006	-0,001	0,004
p-value	(0,897)	(0,974)	(0,879)
d2	**0,095**	0,066	-0,011
p-value	(0,041)	(0,212)	(0,680)
d3	0,057	**0,133**	**0,050**
p-value	(0,216)	(0,012)	(0,082)
d4	-0,006	0,012	0,003
p-value	(0,894)	(0,816)	(0,895)
d5	-0,028	0,017	-0,001
p-value	(0,538)	(0,745)	(0,963)

As can be seen from the results of the dummy regression analysis in Table 5, some of the war related events experienced during the sample period significantly affect the return behaviour of the exchange rates. For the Lira/Dutch Guilder exchange rate, the Armistice of Mudros is significant at the 5% level. The other dates are insignificant, which implies that the events do not bring forth a temporary shift on the Lira/Dutch Guilder return. The dummy regression analysis also denotes that the Armistice of Compiégne which marks the end of the war has a significant influence on both the Lira/Swiss Franc and Lira/Swedish Krona exchange rates at the 5% and 10% significance levels respectively. Our empirical findings depict that the official treaties related to the end of the war convey significant news impact on the foreign exchange rates under examination. It can be suggested that the expectations in the markets rather shape up by information flows from official treaties as these communicate clear evidence of what is coming ahead. The occupation of Izmir displays no significant effect on the foreign exchange rates. This may be due to the fact that the Armistice of Mudros and the Armistice of Compiégne already mark the end of the war in an undisputable defeat for the Central Powers and the occupation of the Ottoman territories were expected as a consequence, which had started by February 1919.

7. Conclusion

The end of the WWI forged important changes in the political arena for the countries in Europe and the Middle East. As the result of the defeat, the Ottoman Empire lost its autonomy and political power over its territories and was fractioned by the Allies. The war deteriorated the economy of the Ottoman Empire, whereby the inflation levels surmounted along with the huge budget deficits. These circumstances were also reflected in the foreign exchange rates and the Lira devaluated significantly against the currencies of the neutral countries by the end of the war.

In this paper, we examine the relationship between the war-related events and the foreign exchange rates for a time span of about two years between 1918 and 1919. In this end, firstly we apply a Bai-Perron analysis to identify the abrupt changes in the foreign exchange rates endogenously. The Bai-Perron test results reveal three significant endogenous structural break dates for each foreign exchange rate. The dates for the Armistice of Bulgaria, the Armistice of Compiégne, and the Paris Peace Conference match our endogenous structural break dates from the Bai-Perron analysis

with a few days of lag. When the conditions of that specific time are considered, these lags are reasonable since the flow of information was not instantaneous as it is in the 21st century then. The press houses were limited along with the distribution channels of the newspapers; therefore the spread of the news to the public was rather from mouth to mouth.

Furthermore, to test for the robustness of our results from the Bai-Perron analysis revealing the significant impact of the war-related events, we conduct a dummy regression analysis. The dummy regression analysis examines if there is a significant impact of the war-related events on the foreign exchange rates exogenously. Our results document the significant impact of the Armistice of Mudros on the Lira/Dutch Guilder exchange rate, while the significant effect of the Armistice of Compiégne is substantiated on the Lira/Swiss Franc and the Lira/Swedish Krona exchange rates. These armistices mark the end of WWI by the defeat of the Central Powers.

Therefore, we uncover the effect of the war-related events on the foreign exchange rates using data from WWI and validate the significance of these events at the beginning of the 20th century. A century ago, the financial markets were not integrated and the flow of information was relatively slow compared to the contemporary conditions. This finding can be interpreted in terms of efficient markets, whereby public information is instantaneously reflected in the current prices. For that reason, from our results it can be suggested that even at the war conditions, the Ottoman foreign exchange market displayed efficiency to some degree in the period marking the end of WWI.

References

Ahmed Emin (1918) İhracat ve ithalat muameleleri. *Vakit*. 31 August: 1.

Al, H. and Ş. K. Akar (2014) *Osmanlıdan günümüze borsa: dersaadet tahvilat borsası, 1874–1928*. Istanbul: Borsa Istanbul.

Bai, J. and P. Perron (1998) Estimating and testing linear models with multiple structural changes. *Econometrica* 66(1): 47-78.

Bai, J. and P. Perron (2003) Computation and analysis of multiple structural change models. *Journal of Applied Econometrics* 18(1): 1-12.

Bayur, Y. H. (1983) *Türk İnkılabı Tarihi-Fikir Cereyanları, İnkılap Hareketleri, İç Didişmeler, Birinci Genel Savaşın Patlaması*. Ankara: Türk Tarih Kurumu Yayınları.

Birdal, M. (2010) *The Political economy of Ottoman public debt, insolvency and European control in the late nineteenth century*. London: I. B. Tauris and Co Ltd.

Borsa Rehberi-1928 (1990, Istanbul: Istanbul Menkul Kıymetler Borsası.

Criss, B. (1994) *İşgal Altında Istanbul 1918-1923*. Istanbul: İletişim Yayınları.

Eldem, V. (1994) *Harp ve mütareke yıllarında Osmanlı İmparatorluğu'nun ekonomisi*. Ankara: Türk Tarih Kurumu Basımevi.

Erickson, E. J. (2001) *Order to die: A history of the Ottoman army in the First World War*. London: Greenwood press.

Erikan, C. (2008) *Kurtuluş Savaşı tarihi*. Istanbul: Türkiye İş Bankası yayınları.

Fertekligil, A. (2000) *Türkiye'de Borsa'nın tarihçesi*. Istanbul: Istanbul Menkul Kıymetler Borsası,.

Guidolin, M. and E. La Ferrara (2010) The economic effects of violent conflict: Evidence from asset market reactions. *Journal of Peace Research* 47(6): 671–684.

Hall, G. J. (2004) Exchange rates and casualties during the First World War. *Journal of Monetary Economics* 51(8): 1711–1742.

Hall, R. C. (2000). *The Balkan Wars 1912–1913, prelude to the First World War*. London: Routledge.

Henig, R. (2002) *The origins of the First World War*. London: Routledge.

İkdam (1918) Üçüncü taarruz (Marne) nehrine do*ğru* şiddet ve muvaffakiyetle ilerliyor. 30 May: 1.

Kanago, B. and K. McCormick (2013) The Dollar-Pound exchange rate during the first nine months of World War II., *Atl. Econ Journal* 41(4): 385–404.

Kazgan, H. (1995) *Tarih boyunca Istanbul Borsası*. Istanbul: Istanbul Menkul Kıymetler Borsası.

Kazgan, H., T. Ateş, O. Tekin, O. Koraltürk, A. Soyak, N. Eroğlu, and Z. Kaban. (1999) *Turkish financial history from the Ottoman Empire to the present*. Volume 1. Istanbul: Istanbul Stock Exchange.

Kıray, E. (1995) *Osmanlı'da ekonomik yapı ve dış borçlar*. Istanbul: İletişim yayınları.

Kuyucak, H. A. (1947) Para ve banka. Vol. 1, Istanbul: Işıl yayınevi.

Mitchell, W. C. (1903) *A History of the Greenbacks: With Special Reference to the Economic Consequences of Their Issue: 1862-65 (Vol. 9).* University of Chicago Press.

Özsoy, O. (2007) *Saltanattan Cumhuriyet'e Kurtuluş Savaşı: Olaylar, belgeler, gerçekler*. Istanbul: Timaş yayınları.

Pamuk, Ş. (2000), *A monetary history of the Ottoman Empire*. New York: Cambridge University Press.

Pamuk, Ş. (2004), Prices in the Ottoman Empire, 1469–1914. *International Journal of Middle East Studies* 36 (3), 451–68.

Pamuk, Ş. (2005) The Ottoman Economy in World War I. *The Economics of World War I*, Broadberry, S. ve M. Harrison (Ed.). Cambridge: Cambridge University Press: 112–136.

Phillips, R. J. (1988) War news' and black market exchange rate deviations from purchasing power parity: wartime South Vietnam. *Journal of International Economics* 25(3–4): 373–378.

Tanin (1918) Avusturya-Macaristan sulh daveti. 17 September: 2.

Tanin (1918) Malinof'un mütareke teklifi. 28 September: 4.

Tercüman-ı Hakikat (1918) Sulha doğru.15 June: 1.

Toprak, Z. (1982) *Türkiye'de milli iktisat (1908–1918).* Ankara: Yurt yayınları.

Tuncer, H. (2011) *Osmanlı İmparatorluğu'nun Sonu, Osmanlı İmparatorluğu ve Birinci Dünya Savaşı.* Istanbul: Kaynak yayınları.

Vakit (1918) Avusturya notasının metni. 17 September: 1.

Vakit (1918) Dünkü Piyasa. 7 December: 2.

Vakit (1918) İaşe İşleri. 27 August: 1.

Vakit (1918) Kömür Buhranı. 23 November: 2.

Vakit (1918) Kont Çezernin'in bir makalesi. 10 September: 1.

Vakit (1918) Papa ve sulh. 13 September: 1.

Vakit (1918) Piyasa Ahvali. 2 November: 2.

Vakit (1918) Piyasa Ahvali. 8 October: 2.

Vakit (1918) Piyasa Buhran. 6 October: 2.

Vakit (1918) Piyasa. 14 November: 2.

Vakit (1918) Piyasamız ne halde. 17 October: 2.

Vakit (1918) Sulh cereyanlarının piyasalarda tesiratı. 13 October: 2.

Vakit (1918) Ticari ve iktisadi halimiz. 31 May: 2.

Vakit (1918) Ticari ve iktisadi halimiz. 6 August: 2.

Vakit (1919) Dünkü Piyasa. 3 January: 2.

Weidenmier, M. D. (2002) Turning points in the U. S. Civil War: Views from the Grayback market. *Southern Economic Journal* 68(4): 875–890.

Willard, K. L, T. W., Guinnane, and H. S. Rosen (1996) Turning points in the Civil War: views from the Greenback market. *American Economic Review* 86: 1001–1018.

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