Have Commodity Markets Political Nature?

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Abstract This chapter examines whether good markets have political aspects, based on unique data for daily prices in İstanbul between 1918 and 1924. To set a convincing causal estimate for the impacts of political uncertainty on good prices, we focus on political risk changes during this historical episode that was not related to confounding factors, such as economic depression. Our findings shed light on the presence of higher political risk due to the resignations of governments, leading to good price fluctuations through sudden changes in supply and trade disruptions. Based on a natural experiment relating to the end of the Ottoman Empire, our results fill the gap in the literature, which covers limited research on the positive link between political events and fluctuations in commodity market prices.

Keywords Good markets · Commodity prices · Political uncertainty · Natural experiment · Counterfactual analysis · Risk

1 Introduction

Our research aims to explore whether good markets could react to political events. This issue has been discussed extensively for the financial markets which are subject to excessive speculation and arbitrage. Since the security of commodity trade depends on the political turmoil imposing significant costs on businesses and investments, political risk is also one of the important determinants of commercial activity. This would reflect fluctuations in the prices of commercial goods, for instance, if economic agents perceive a serious threat to investments and production. Over the last decade, the volatility of commodity prices is rising over time because of serious political events such as wars and regime changes (Bittlingmayer 1998; Anderson and

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Marcouiller 2002; Su et al. 2019; Hou et al. 2020). The effects of political changes on commodity prices have not received adequate attention yet. In this respect, our research question is how the real economy responds to the uncertainties created by political events. Our results could herald a further discussion of the role of the uncertainties on commodity prices.

The literature on the relationship between political uncertainty and economic outcomes addresses several mechanisms to induce commodity price fluctuations in case of serious political risk. First, political events are generally less predictable in comparison to economic ones. So this nature could generate significant levels of supply disruptions and economic hardship expectations in the future. Second, the political turmoil could lead to an environment of uncertainty about future economic policy decisions. This could create lower demand for households through increasing transaction costs. Third, higher political uncertainty provides negative signals on the future of firms and traders' life, leading to lower investments and decreasing demand for inputs (Anderson and Marcouiller 2002; Julio and Yook 2012; Baker et al. 2016; Jens 2017). Last, during the persistent political unrest and turmoil, commodity producers might cut back on their production and lay off workers, heralding lower economic growth (Asteriou and Price 2001; Hou et al. 2020).

In the last decades, regime changes and armed conflicts are more often observed. These events disrupted markets worldwide, which could be responsible for the remarkable volatility in commodity prices in the presence of higher speculation. However, there is a dearth of research for the effect of political risk on commodity price volatility (Hou et al. (2020) and Zhu et al. (2020) for discussion on economic policy uncertainty in case of political turmoil). One exception is the energy market, covering many discussions on the role of the uncertainties for the price fluctuations. The remarkable volatility of energy goods' prices has sparked a debate about the positive impacts of political risk (Yin and Han 2014; Bouoiyour et al. 2019; Shen 2020). This is because energy goods are essential materials for production and are closely related to political patterns (Su et al. 2019). The lack of research on how political uncertainty induced good price fluctuations is an important motivation of our study. We also find it relevant to understand what type of political crises could generate larger shocks of commodity markets, while riots in Africa and Asia of the 2000s due to agricultural good price fluctuations triggered new tensions (Yin and Han 2014).

Another important contribution of our chapter is its original methodology, which is based on a historical experiment allocating observations to different treatments randomly. There are increasing number of papers that are exploiting natural experiments based on historical rare events. For instance, the Great Mississippi Flood of 1927 is used to test the effects of lower agricultural labor on agricultural development (Hornbeck and Naidu 2014). Besides, the reunification of Germany is selected as a natural experiment to test the role of market access on economic development (Redding and Strum 2008). In a similar vein, our paper uses a historical case to deal

with bias because of omitted factors. These variables relating to political risk and prices, such as economic depression, might conflate the effects of the political events on prices and volatility, suggesting a $cov(Prices, u_t/\beta_1) \neq 0$. This means that the OLS estimate for the effects of political risks on good prices, β_1, might be biased. More recently, to address this issue, research has focused on a natural or quasi-experiment as a source of exogenous variation in the variable of interest such as political risk, which is not related to confounding factors. Like our study, Wang (2019) and Wang and Boatwright (2019) used 1995–1996 Taiwan Strait Crisis as a natural experiment to establish a persuasive causal link between political risks and financial markets.

To test the existence of an unbiased causal relationship between political risk and good prices, we choose an important historical period from 1918 to 1924 of the Ottoman Empire. We have three special reasons for choosing this case. First, for this period, a unique data set on the good prices in İstanbul is available. Second, the events during this period are of a political nature, whose timing was independent of local and global economic conditions.[1] Last, this historical period offers an opportunity to estimate a counterfactual analysis to capture the impact of political risk on the economy (Bittlingmayer 1998; Estevadeordal et al. 2003; Wang 2019). The causal effect would be derived from the difference between counterfactual outcomes assuming full control of the state on prices and actual prices under the effect of different political events.[2] During WWI, the Ottoman state intervened in the commodity markets with urgent and strict regulations (Eldem 1994, pp. 18–19),[3] which represents our lower price fluctuations benchmark. A period of higher risk could be after the ceasefire period between September and November 1918. This is because members of governments resigned at the end of 1918, and the future of the country was uncertain by the beginning of 1919. The administrative structure deteriorated, although people expected that economic progress would happen soon thanks to peace, creating a price fall for a while (Tasvir-i Efkar 16 December 1918, p. 1). Moreover, the occupation and civil war had begun after February 1919 while two separate government authorities in different parts of the Ottoman Empire controlled the economy (Ediger 2007, p. 340). As shown in Fig. 1, the number of articles in the Ottoman newspapers on economic policy regulations—such as price ceiling—decreased by 1922. The number of articles on economic regulations reached its highest point in 1923 when the strong control of the economy was established thanks to the end of the occupation by October 1923 (Çavdar 1983, pp. 64–65).[4] Meanwhile, the amount of news on price instabilities increased as the occupation began in 1919. The higher number is parallel to decreasing amount of news on the

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[1] Recently, Hanedar et al. (2018) find that the outbreak of many political events from 1918 to 1924 was not related to bond prices at the İstanbul bourse, supporting the independence of such events from the economic conditions.

[2] For instance, between 1918 and 1925, the Ottoman newspapers, such as *Vakit*, had sections of the price ceiling that was imposed by the government. The efficiency of this policy could be related to the government's power, which could be diminished by the regime changes.

[3] See also Toprak (1982) and Hanedar (2018) for a detailed discussion on economic policies.

[4] Under the lack of detailed data, for instance, the articles in the newspapers could reflect outcomes of the economic policies and fluctuations efficiently (Shiller 2017).
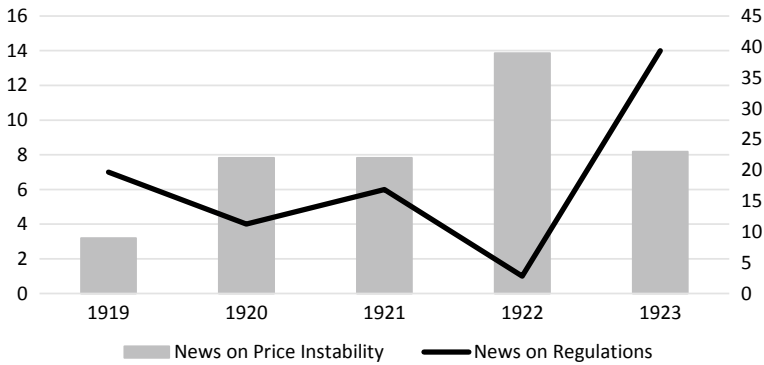
Fig. 1 The number of newspaper articles on economic policy regulations and price instability in the Ottoman newspapers, 1919–1923. The data are compiled from *Vakit* and *Tasvir-i Efkar*. Point cover the number of price ceiling lists that could be daily published during the period. This is because there is not sufficient information at this stage about whether these lists were regularly published in *Vakit* during the period. The data after 1923 are not included, as the newspapers included news on the political transformation of the country

economic policy regulations. This could support our paper's usage of a natural experiment based on the positive effect of political problems on decreasing control of the economy and price instability.

In a nutshell, our paper has two specific purposes. First, we aim to quantify the causality between commodity prices and political risk. To capture the causal effect of the political crisis, we construct a counterfactual analysis based on the dissolution of the Ottoman Empire between 1918 and 1924. The effect of the political events will be measured as the gap between the actual prices and the counterfactual path during the end of WWI when the state had relatively enough power to control prices. In other words, to determine the magnitude of the political risk leading to higher prices, our paper answers what if the political fluctuations had not happened in the Ottoman Empire after November 1918. Then we can test the presence of sufficient evidence for the political uncertainty priced. Second, our study applies ARCH methodology on volatility changes to ensure the magnitudes of the political risk premium for a group of events. We examine which political crises had a noticeable impact on commodity prices. More specifically, this exercise is helpful to predict the responsiveness of good markets to various political events. Here, it is necessary to state that marrying this historical case with an econometric perspective would reveal the importance of the study's contribution to literature without sufficient quantitative information on this subject. Thus, we have three important findings. First, our findings shed light on the presence of higher risk perception only when the government's survival was problematic. This result may offer a policy suggestion that the worst government is better for the economy and social order than no government case in case of political uncertainties. Second, we find that political risk generated the biggest volatility in the prices of energy goods that were imported abroad, adding the findings of the literature on political risk. Last, our study shows how researchers can use natural

experiments and counterfactual models to provide persuasive causal evidence without lab-controlled settings.

The rest of this chapter is organized as follows. Section 2 presents previous literature on the effects of political risk on commodity markets and papers about natural experiments. Section 3 presents the data and method. Section 4 discusses our empirical findings. In the last section, concluding remarks are summarized.

2 Literature Review

In the literature, the effects of political risk on good markets have not received attention, as there is a lot of research on the impacts of political uncertainty on bonds and stocks (Wang 2019). Good prices might be highly responsive to political events as well. To sum up, wars could disrupt trade routes and cause damage to products, meaning a high risk for traders. In case of regime changes, governments could not control the markets efficiently. Also, there could be disruptions in the economic policies and firm activities, which deteriorates the value of goods (Asteriou and Price 2001; Anderson and Marcouiller 2002; Hou et al. 2020). A pioneering paper on the relationship between political uncertainty and economic outcomes is Bittlingmayer (1998)'s study. Bittlingmayer (1998) examines the changes in the link between economic outcomes and stock market volatility during exogenous political events of the early twentieth century in Germany, such as regime changes. These events are natural experiments, that were exogenous determinants of political risk creating stock market volatility and output shocks, to eliminate the bias due to endogeneity. Bittlingmayer (1998) shows a strong and unbiased causal effect from political risk to stock market volatility and economic output shock. More recently, to deal with such problems, natural experiments are often used to create exogenous factors affecting dependent variables. Unlike lab experiments, natural experiments are based on real exogenous phenomena that can be a product of environmental, social, or political forces. For instance, like our study, Redding and Strum (2008) employed political events, such as the division and reunification of Germany, to deal with bias in econometric analysis to test the role of market access on economic development.

Different from conventional studies on the relationship between political uncertainty and financial markets, Wang (2019) and Wang and Boatwright (2019) examine the link between political risks and financial outcomes from the perspective of natural experiments. In Wang (2019) and Wang and Boatwright (2019)'s study, Taiwan Strait Crisis between 1995 and 1996 is used as a natural experiment. They construct a counterfactual model to check the causal link further. These papers find a positive effect of political risks on financial volatility during the Crisis. There is a lack of such literature for the collapse of good markets in case of political risk. One exception is Hou et al.'s (2020) working paper. Similar to Wang (2019) and Wang and Boatwright (2019)'s papers, they show that political uncertainty is statistically correlated with changes in the volatility of good prices in 12 countries. As political risk could be related to confounding factors such as economic uncertainty, an unbiased estimate is

possible after testing the uncertainty during the US presidential election, which is a natural experiment to predict the political risk. While this paper covers preliminary results, its findings are in line with a related branch of the literature focusing on the impact of political uncertainty on firm decision and growth. This literature indicates that during higher political uncertainty demand by households would shrink, which would lead to a price decrease. Also, producers could stop production, which brings lower employment and higher price (Asteriou and Price 2001; Julio and Yook 2012; Baker et al. 2016; Jens 2017).

3 Data, Setup, and Model

3.1 *Data and Setup*

To unveil the effects of political changes on risk perception for the economy's future, we use prices of various goods in İstanbul from 30 May 1918 to 16 May 1924. The daily price data are elaborated from the Ottoman newspapers, *Vakit* and *Tasvir-i Efkar.* The prices are expressed in Turkish Lira. We collect various parts of the data using the list of price ceiling, which are reported in the newspapers as shown in Fig. 2. The market prices could be different from those in the lists, as the traders could charge higher prices in case of lower power of government to protect consumers and impose laws.[5] The data sources include daily observations of more than twenty different products. For instance, the data cover prices of gas and petroleum products used for heating and lighting, such as Romanian and Georgian gas and petroleum. In addition, there were prices of agricultural commodities such as barley, bread, olive oil, and wheat.

Price data on individual goods have missing observations. For instance, the data for gas from Romania are not available for several days. Price data for gas from Georgia have missing observations for different days. For many of the goods, at least two observations are available. We separately create price indices for different goods to get a variable with fewer missing observations by considering the earliest dated observation as base or 100. Then we take an average of all indices because of data limitation on the consumption weights. We divide them into two groups. These are energy goods and commodity price indices. The base date is 30 May 1918 for these indices. We have an important motivation to create two individual indices, which is to distinguish the effects of political risks on imported and domestically produced goods. Energy goods were imported as commodities were mostly agricultural goods, which were produced domestically. However, the negative effects of WWI on production might sometimes cause the purchase of the commodities from abroad (Eldem

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[5] In the list, it was stated the presence of some penalties in case of failure to comply the prices listed. In addition, there could be a limited flexibility to set prices for some of the goods such as unlisted commodities and coal (Vakit*, Azami fiyatlar, 14 June 1922, p. 4).*

Fig. 2 The price ceiling for goods in İstanbul. Point figure is taken from *Vakit* (Azami Fiyatlar, 14 June 1922, p. 4).

1994, pp. 48–50; Ediger 2007, pp. 339–340). The final sample consists of 170 daily observations for energy goods and 165 observations for consumer goods.

	$P_{t\text{-energy goods prices}}$	$P_{t\text{-commodity prices}}$
The First World War	129	90
	(51)	(51)
The resignation of governments	204	73
	(71)	(71)
The resistance and occupation	152	106
	(35)	(30)
The Republic of Turkey	161	77
	(13)	(13)

Table 1 The average prices during the political events between 1918 and 1924

The number of observations are reported in parentheses

Table 1 presents summary statistics on the average values of the prices in the periods during the events examined. To introduce the necessary background, we will discuss how the political uncertainty due to the different political events was reflected in the commodity market of İstanbul.

According to Table 1, when the end of WWI was approaching by November 1918, the energy goods' price is observed as 129 units and the commodity price is 90 units, on average. During WWI there were strict regulations on commodity markets due to close economy in case of war circumstances, although energy goods' prices had increased due to disruptions of trade link between the Ottoman Empire and its Allies by the end of the conflicts (Eldem 1994, pp. 18–19, 79–180; Hanedar 2018). For this period, Hanedar (2018) points out that while WWI had destructive effects on the economy, the ceasefire period created temporary economic progress and a price decrease. This is because traders expected that restrictions and damages would be lifted soon, creating an increased supply of goods.

After the end of WWI, the Allies organized several meetings to negotiate their demands from the defeated countries. The US proposed Wilsonian principles to secure the end of the conflicts and to deal with a long list of these demands, providing relative protection for the Ottoman Empire's lands. In 1919, the Allies suddenly occupied İstanbul and Greece controlled İzmir, which could have triggered resistance and civil war (Fromkin 2001, pp. 404–407). Before the Allies' occupation, the members of the war government fleet and the political instabilities become crucial (Hanedar et al. 2016). Because of the government's resignation, there was a period of institutional problems with the control of prices. During the resignation of governments after the end of 1918, the energy price is 204 units, as commodity price is 73 units, on average. Although commodity prices are slightly lower than that of WWI, the energy goods' price was twice as high. This could be related to increasing uncertainty and trade disruptions, as in December 1918 *Tasvir-i Efkar* argued an increase in prices of many goods, such as flour, gas, soap, due to institutional weakness during the resignation of governments in comparison to the armistices' period by November 1918.[6] The one part of the cartoon presented in Fig. 3 was taken from the article to provide further insight on this issue. In the cartoon, the flour was presented and increases in the prices are expressed by the growth in the picture of the good. Because of the resignations and weak institutions, Fig. 3 shows the price increase in the flour after the ceasefire period.

When a new and stable government was appointed at the beginning of 1919, the occupation had already begun, which would have created price fluctuations by 1923. In 1923, the civil war ended, and a strong government was established in Ankara (Çavdar 1983, pp. 64–65). During the resistance and occupation, energy price is 152 units, while consumer good price is 106 units, on average. In this period, due to ongoing political conflicts, the prices were higher than those of WWI. Price increase could be also mentioned in the Ottoman newspapers. For instance, *Vakit* provided news that the occupation of İzmir induced prices.[7] This could be arisen by lower

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[6] Tasvir-i Efkar (16 December 1918) Gala-yi es'ar, p. 1.

[7] *Vaki* (19 May 1919) Piyasa, p. 2.

Fig. 3 Inflation after the Armistice of Mudros. Point figure is taken from *Tasvir-i Efkar* (Gala-yi es'ar, 16 December 1918, p. 1)

trade as the import and transportation of goods from Anatolia become problematic.[8] So, as the resistance was ongoing in 1920 it was argued that as compared with the other belligerents the Ottoman Empire had the highest price increase. The inflation rate was about 1300%. Prices in France and UK increased by 162 and 269%.[9] As the Allies' forces were defeated by the Turkish forces in 1922, there were short-run improvements in economic life thanks to government control.[10] After the establishment of the Republic of Turkey, the prices are 161 and 77 units, respectively. There was a decrease in the commodity prices, as there could be a lack of energy goods again. Table 1 shows that during the foundation process of the Republic of Turkey, energy prices have risen. By the foundation of the Republic of Turkey in October 1923, it seems that the value of the Lira was positively affected by government interference,[11] leading to lower speculations. Due to this situation, the prices of wheat, bread, and flour become stable.[12] Overall, the descriptive findings suggest that government changes and civil war could be parallel with higher price fluctuations through increasing political risk, while the establishment of a new regime could be inadequate to cope with problems at the beginning.

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[8] *Tasvir-i Efkar* (1 June 1919) Piyasa ahvali, p. 2.

[9] *Vakit* (2 October 1920) Nasıl yaşayabiliyoruz? p. 2; (4 October 1920) Piyasa, p. 3.

[10] *Tasvir-i Efkar* (7 August 1923) Borsada ihtikarın menine doğru, p. 3; (2 September 1923) Borsa komiseri Adli bey'in beyanatı, p. 3; (4 September 1923) Galata borsasında istihale başlıyor, p. 2.

[11] *Vakit* (23 September 1923) İktisadi hafta, p. 3; (6 October 1923) September maaşı, p. 2.

[12] *Vakit* (28 September 1923) Ekmek narhı, p. 3.

3.2 Econometric Model

Similar to Wang (2019) and Wang and Boatwright (2019), our paper runs an empirical analysis, grounded by a counterfactual model to examine the effect of political risk due to exogenous events. To identify whether there exists a causal effect of political risk on prices of energy goods and commodities, our study constructs a model as follows:

$$P_t = \beta_0 + \beta_1 ER_t + \beta_2 W_i + \beta_3 T_t + u_t, \tag{1}$$

where P_t is price indices of energy goods and commodities in day t.[13] We also use conventional determinants of the prices (Wang et al. 2019) to control the effects of other covariates. In order to approximate the prices of complementary and substitutes, we use ER_t, which is the value of Gold against the Turkish Lira in day t at the İstanbul bourse. This variable also captures the fact that the energy goods were imported abroad, whose prices were affected by exchange rates.[14] In Eq. (1), as daily observation for supply and quantity traded are not available, W_i is used as a proxy for economic outcomes. This variable reflects the average precipitation reported as centimeters, in year i. The higher precipitation could be expected to be positively related to demand and supply in an agricultural economy through increasing production and income.[15] T_t is a time trend to capture the impacts of economic progress and consumer preferences. u_t is an error term.

We design the analysis to capture the differences in prices between periods of high and low political uncertainty. The period before the end of WWI in November 1918 was the time of lower price fluctuations due to strict government control. The other periods are regarded as the time of high political uncertainty due to the occupation and resistance, which would have created serious price changes. Equation (1) finds the counterfactual prices as if there would not be serious and observed uncertainty like during the end of WWI. The causal link from political risks to commodity prices will be inferred by posing the following counterfactual question:

> What kind of a path would commodity prices have followed from 1918 to 1924 if government control remained the same as the periods of WWI?

Thus, we expect that the predicted prices would be lower than real prices if there is a causality running from exogenous political shocks to higher risk, through decreasing the government ability and leading to disruptions in the market mechanism.

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[13] To compare predicted prices with observed values easily, our paper does not use the logarithmic transformation of the variables.

[14] The data are compiled from the Ottoman newspapers, i.e., *Vakit and Tasvir-i Efkar.*

[15] The data come from National Oceanic and Atmospheric Administration (NOAA) and only available at the year level. The data on weather, such as precipitation, is a good proxy for production in economies based on the agricultural sector (Hanedar 2016; Kalemli-Özcan et al. 2020).

Data constraints on the determinants of the prices limit further analysis based on the counterfactual method. Without controlling many other covariates, we could check the changes in the volatility of prices using the ARCH model. Also, this model makes us understand which events were risky. After testing the causality between political events and prices, our paper estimates an ARCH model[16] including separate dummy variables for exogenous political events in Eq. (1):

$$h_t = \omega + \alpha EVENT_t + \beta h_{t-1} + \varepsilon_t, \tag{2}$$

where h_t is the variance of the return of price indices for energy and commodities at day t. The study calculates returns of the good prices as follows:

$$R_t = \ln(P_t/P_{t-1}). \tag{3}$$

Equation (2) relates to a long-term average (ω) and information about the variance of the last period (h_{t-1}) with volatility in the prices h_t. *EVENT* equals one for the dates of the events and zero for the period by the end of WWI. In our case, *EVENT* includes three separate dummy variables. First one takes one during the dates of the resignation of governments between November 1918 and the beginning of 1919, and zero otherwise. Second dummy variable is one for the dates of the resistance and occupation between 1919 and 1923, and zero otherwise. Third dummy variable takes one after the Republic of Turkey was established in 1923, and zero otherwise. If there was high political risk at the date of political events in our treatment group, then this implies a positive α. This points out the difficulty to deal with price fluctuations. For instance, the resignation of governments could mean increasing uncertainty, which would create higher price changes due to lower investments and supply of goods. This is because consumers and investors could not predict what would be in the future. In addition, in the case of weak institutions and lower state control, the prices could be more fluctuated.

4 Results

Table 2 shows the coefficient estimates in Eq. (1) to predict the prices with conventional determinants of demand and supply by assuming the absence of any uncertainty to set the prices. Our result implies that some conventional variables could statistically predict the prices of energy goods and commodities. We find that depreciation of the Lira is correlated with increasing prices of energy goods. This means that energy goods' demand was negatively affected by the costs of imports as these commodities were coming from abroad. A lower value of the Lira, however, decreased the commodity prices. This finding might imply that expensive commodities such as

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[16] The coefficient estimates of interests are robust to the inclusion of GARCH effects, which are not statistically significant.

Table 2 The prices under the absence of risk between 1918 and 1924

	$P_{t\text{-energy goods prices}}$	$P_{t\text{-commodity prices}}$
ER_t	0.356*	−0.108**
	(0.003)	(0.025)
W_i	2.598	0.711***
	(0.293)	(0.092)
T_t	−0.312	−0.019
	(0.148)	(0.845)
Constant	−2.784	152.660*
	(0.971)	(0.000)
No. of obs.	103	103
R^2	0.386	0.173

All equations are estimated by the OLS. Standard errors are heteroskedasticity-robust standard errors. *p*-values are reported in parentheses. *, **, and *** denote statistical significance at 1%, 5%, and 10%, respectively

wheat would be substituted for cheaper imports since the production had been permanently damaged by WWI (Çavdar 1983, pp. 64–65; Eldem 1994, pp. 47–50). Finally, higher precipitation led to an increase in commodity prices. This result could be explained by the devastation of crops in case of bad weather.[17]

In Fig. 4, we present observed and predicted prices based on models in Table 2. The vertical lines show the dates of the end of WWI (the first part), the resignation of the governments (the second part), the occupation and resistance (the third part), and the foundation of the Republic of Turkey (the fourth part), respectively. Predicted prices of energy goods and commodities are higher than the observed values during the end of WWI (the first part). This gap is low in commodity prices. The finding could provide evidence on the presence of relatively moderate risk. The lower fluctuation of prices is in line with Hanedar (2018)'s arguments showing that the end of the military conflicts was associated with temporary economic progress and lower prices for many goods, based on the Ottoman newspapers. During the resignation of the governments (the second part) predicted prices of energy goods and commodities are lower than the observed values. In particular for energy goods, this gap is high in favor of observed prices. These results mean that political uncertainty after the resignations of governments might create price fluctuations. When the occupation and resistance began (the third part), energy goods' prices were too high. At the same time, there was a decreasing trend in commodity prices. The predicted and the observed energy goods' prices are similar. On the other hand, in 1922 predicted prices of the

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[17] Coefficient estimates are robust to the inclusion of additional control variables, such as the number of good and bad news mentioned by the Ottoman newspapers on the economy. In addition, the value of the Lira could reflect some political events' impacts on prices (Hanedar et al. 2019). To cope with this issue, we add separate dummy variables for political events examined in our study, which does not make large changes in the coefficients of interest. This also provides evidence supporting the exogeneity of the events.
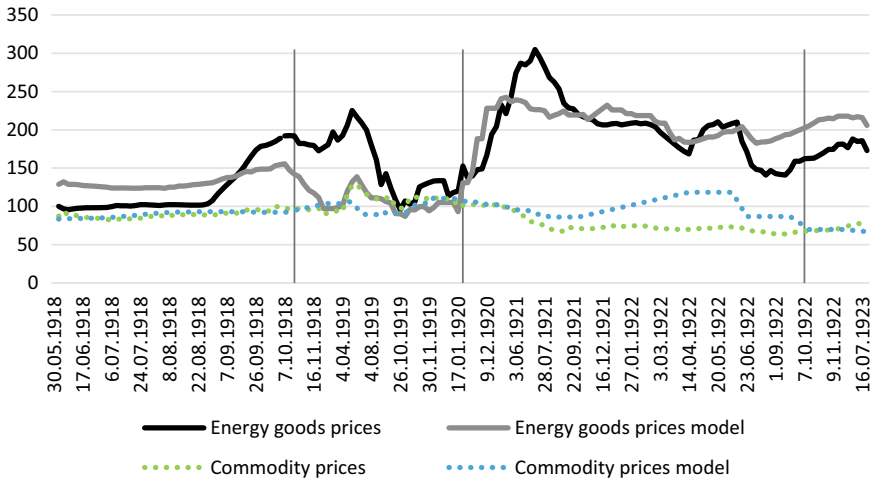
Fig. 4 The observed and predicted prices, 1918 and 1924. The data come from *Tasvir-i Efkar* and *Vakit* and are obtained related columns in Table 2

commodities are higher than the observed ones. This finding suggests a lower level of institutional weakness though the presence of occupation and resistance. During this period there could be a higher capacity of occupiers to control prices as well as mitigating the negative effects of WWI through increasing trade and production. In addition, a lack of demand and depression could have led to a lower increase in prices.[18] Finally, for energy prices, the observed values were lower than the predicted ones after the foundation of the Republic of Turkey (the fourth part). Meanwhile, the observed and predicted prices of commodities have a similar path. This situation can be regarded as a sign of lower political uncertainty thanks to the establishment of the new regime and the end of the occupation, which would lead to powerful institutions and an efficient price mechanism. To sum up, in line with our argument, we notice that by the end of WWI prices were relatively stable, as price fluctuations were observed during the resignations of governments, which could imply a higher risk for the business.

Table 3 presents the findings of the ARCH model in Eq. (2). The results indicate a statistically significant increase in volatility only during the resignation of governments. The coefficient estimates are 4.112 and 1.731, respectively. We have no evidence that people were worried about the supply of goods during the presence of a war government, occupation, and a continuing state. This finding suggests that when the governments resigned the price, fluctuations were high, reflecting higher political uncertainty. The result is in line with Fig. 4, showing the presence of a gap between observed and predicted prices, due to increasing uncertainties on the country's future during the resignation of governments (the second part). Also during

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[18] *Vakit* (16 June 1921) Piyasa, p. 3.

Table 3 Risk and political events

	$h_{t\text{-energy goods prices}}$	$h_{t\text{-commodity prices}}$
The resignation of governments	4.112[*]	1.731[**]
	(0.000)	(0.030)
The resistance and occupation	1.055	−0.256
	(0.317)	(0.737)
The Republic of Turkey	0.476	1.584
	(0.840)	(0.104)
h_{t-1}	0.751[**]	0.570[*]
	(0.049)	(0.003)
Constant	0.004	−4.130[*]
	(0.840)	(0.000)
No. of obs.	169	163

Standard errors are heteroskedasticity-robust standard errors. *P*-values are reported in parentheses. * and ** denote statistical significance at 1% and 5%, respectively. N. of obs. is the number of observations

this period, Fig. 1 shows a lower amount of the news on regulations imposed by the state, when the Ottoman newspapers often mentioned the news on price instabilities.

Our study highlights that some kinds of political events posed risks to the economic activities reflected in the good price fluctuations. We find that political risk could produce large fluctuations in the prices during the resignations of governments because of the lack of powerful institutions to mitigate the negative impacts of WWI on trade and production, as argued by *Tasvir-i Efkar* (16 December 1918, p. 1). Our result also shows that the energy and import markets are more sensitive to political instability. By providing new insight on the energy market with a historical case, our paper contributes to the literature on the effects of political risk on energy goods (Yin and Han 2014; Bouoiyour et al. 2019; Shen 2020). From the Ottoman context, we can propose that in the case of weak political institutions or regimes, it could be difficult to cope with supply and price shocks due to the serious political transformation. Surprisingly, our analysis does not indicate the sensitivity of the commodity market to all kinds of political events, such as occupation and civil war. Economic progress under the control of occupiers might have mitigated the effects of political uncertainty on prices. Depression worldwide could have higher explanatory power on the price fluctuations. Furthermore, investors and consumers could have been barely aware of the outcomes of the occupation and the civil war in Anatolia, leading to a lower sensitivity of markets (Hanedar et al. 2016, 2018, 2019). Moreover, we observe that price fluctuations and uncertainty could not end promptly after the establishment of the new regime and the end of the military conflicts, which could mean that the political instabilities have long-lasting effects on the economy and prices. Our findings on the link between higher risk and price fluctuations are consistent with the limited literature on the positive relationship between political

risk and commodity prices (Asteriou and Price 2001; Hou et al. 2020). For instance, Hou et al. (2020) pointed out that political uncertainty is related to lower commodity prices through decreasing demand of consumers and firms for goods and inputs. In our case, we find increasing prices of goods in case of political uncertainty. This increase could be explained by a supply shortage and lower trade, while political uncertainties could have discouraged trade and production. As a final point, besides adding new empirical evidence, our paper adds to the literature (Bittlingmayer 1998; Wang 2019; Wang and Boatwright 2019) using historical episodes as natural experiments to test the impacts of political uncertainty. Our study has some concerns on bias in the estimation of the effects of risks because of other covariates which we could not put our models due to data constraints. Then we exploit a natural experiment experienced in the Ottoman Empire and the Republic of Turkey between 1918 and 1923 to set exogenous political shocks, providing an unbiased causal link from political risks to good prices.

5   Conclusion

In this chapter, we attempt to understand the types of political problems that are risky in terms of instability in commodity trading and prices. The causal link is often suffering from bias due to the other covariates of political risk and prices which are not included in our model due to data constraints. To address this issue, using unique price data of İstanbul during the end of the Great War, we present a counterfactual analysis and natural experiment. This methodology is based on the differences in goods' prices between days of high and low political uncertainty. To obtain a convincing causal estimate, this methodology is recently used in the literature about the effects of political risks on financial markets, showing that political problems would lead to volatility through disrupting trade. On the other hand, the literature does not provide detailed information on the relationship between political uncertainty and commodity markets. Our estimation fills the gap in the literature that aims to detect political risk due to omitted factors, by using a natural experiment from the early twentieth century.

We find that only one type of political uncertainty, namely the government resignations, might be related to serious fluctuations in good prices. The increasing volatility of prices could reflect that higher uncertainty on the future of the economy due to weak institutions in case of government turmoil might lead to lower production and trade through the willingness of traders and investors. Besides, our results introduce new evidence for the high response of energy market outcomes to this political problem much during the same period. This effect could be interpreted as evidence for the positive relationship between the lower survival probability of a government and the security of import links, as energy products were mainly obtained abroad. Our findings do not suggest that the political events between 1919 and 1923 created an unstable price system. So, we can conclude that in other political instabilities, such as the dissolution of a country and civil conflicts, political uncertainties do not

necessarily pose more unstable prices. Moreover, we find that the birth of a new regime or institution could not solve problems of food and energy supply promptly. These results could also mean that a good market could not evaluate all events as keys creating price changes.

To sum up, the econometric analysis based on the historical episode of our study reveals that political events played an important role in commodity price fluctuations. The Ottoman case is important because the country experienced an exogenous political shock, alleviating the bias because of omitted variables. However, the insufficient number of observations and the absence of many control variables in the counterfactual model would lead to future research by obtaining more data. Under the lack of data, the policy suggestion of our paper is still crucial for dealing with the relationship between political instability and good price fluctuations, which could herald social tensions over time. In particular, we could say that the uncertainties caused by lower government durability might bring crucial damages to the market mechanism and social order during serious political crises.

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