Sosyoekonomi

2021, Vol. 29(50), 11-33

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.01
Date Submitted: 13.04.2020
Date Revised: 28.06.2021
Date Accepted: 02.08.2021

Effects of the US Trade Policy Uncertainty on the Turkish Financial Markets and Bank Loans

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ABD Ticaret Politikası Belirsizliğinin Türk Finansal Piyasalarına ve Banka Kredilerine Etkileri

Abstract

For many decades, the transmission of uncertainty among countries has been one of the hottest topics in the literature. This study aims to contribute to this literature by studying the impact of the U.S.'s trade policy uncertainty (TPU) on the Turkish stock market, bank loans, and investor sentiment. We employ a non-linear autoregressive distributed lag (NARDL) approach. An existing cointegration between variables is demonstrated. Our findings also show that while the U.S.'s TPU significantly influences both share prices and bank loans, it does not seem to substantially impact Turkey's investor sentiment in the long run or the short run. This paper demonstrates that the effects of U.S. policies on financial market players and investors in Turkey are not negligible.

Keywords : Trade Policy Uncertainty, NARDL, Stock Market, Bank Loans, Investor Sentiment.

JEL Classification Codes : F13, G10, G20.

Öz

Uzun yıllar boyunca, belirsizliğin ülkeler arasında aktarılması, literatürdeki en sıcak konulardan biri olmuştur. Bu çalışma, ABD'nin ticaret politikası belirsizliğinin Türkiye'deki hisse-senedi piyasasının, bankalarca verilen kredilerin ve yatırımcı duyarlılığının üzerindeki etkisini inceleyerek bu literatüre katkıda bulunmayı amaçlamaktadır. Doğrusal olmayan otoregresif dağıtılmış gecikme (NARDL) yaklaşımı kullanılarak değişkenler arasında eşbütünleşmenin varlığı gösterilmiştir. Bulgularımız, ABD'nin ticaret politikası belirsizliğinin Türkiye için hem hisse fiyatları hem de banka kredileri üzerinde önemli bir etkiye sahip olduğunu gösterirken ne uzun ne de kısa vadede yatırımcı duyarlılığı üzerinde önemli bir etkisinin olmadığını ortaya koymaktadır. Bu çalışma, ABD politikalarının Türkiye'deki finansal piyasa oyuncuları ve yatırımcıları üzerindeki etkilerinin göz ardı edilemeyeceğini göstermektedir.

Anahtar Sözcükler : Ticaret Politikası Belirsizliği, NARDL, Hisse Senedi Piyasası, Banka Kredileri, Yatırımcı Duyarlılığı.

1. Introduction

The cross-border spillovers of uncertainty shocks become the central point of hot debate in the literature. Ample studies demonstrate that economies can be suffered from external uncertainties, even when the level of domestic uncertainty remains the same (see Biljanovska et al., 2017; Bonaime et al., 2018: 531-558). As emerging markets are affected by the interrelationship of uncertainties across borders, these markets get considerable attention from economic and finance researchers. Turkey deserves special devotion among these markets as it is one of the most critical and comparatively large emerging markets to analyse (Bown, 2013: 193-218). Foreign trade has an essential influence on Turkish domestic and foreign policies, as the portion of international trade in the Gross Domestic Product (GDP) is almost 50 percent of the GDP of Turkey (Kirişçi & Kaptanoğlu, 2011: 705-724). By having nearly $20 billion total trade amount in 2019, the United States (U.S.) is the second-largest trade partner of Turkey. This fact suggests the existence of the possible effects of the uncertainty in the U.S. trade policy on the Turkish real economy and capital markets.

Additionally, due to the high interaction between these two countries, it is worth examining the impact of changes in trade policy uncertainty in the U.S. on investor sentiment in Turkey. In this regard, the primary purpose of this study is to examine the transmission of the U.S.'s trade policy uncertainty to the Turkish financial markets and bank loans by empirically analysing the non-linear cointegration relationships among trade policy uncertainty in the U.S., Turkey's share price index, bank loans, and investor sentiment. No prior studies to our knowledge have examined the impact of the U.S.'s TPU on the financial markets and bank loans in Turkey.

Our contribution to the literature is mainly four-fold. First of all, although the high trade volume between U.S. and Turkey suggests the possible impact of trade policy uncertainty in Turkish capital markets, we verify the direct evidence of this effect both in the long-run and short-run by employing non-linear autoregressive distributed lag (NARDL) methodology presented by Shin et al. (2014: 281-314). This methodology has several advantages over the previous methods employed in the literature. First, unlike its counterparts like Vector Error Correction Model (VECM), NARDL models allow variables to be integrated of different orders. Second, the asymmetric effects of negative and positive shocks in both the long- and short-run can be obtained with this model. The linearity and symmetry assumptions of ARDL are overly restrictive and unrealistic, particularly for variables related to economics. Because with the increase in the interconnection of economies, these variables become more unpredictable (Hamzah & Masih, 2018). Finally, this methodology is free from the convergence and endogeneity problems that other models like non-linear threshold VECM can suffer from (see Mensi et al., 2017: 258-279; Kocaarslan & Soytas., 2019).

Moreover, instead of examining one aspect of the uncertainty in trade policy, the aggregate index constructed by Caldara et al. (2019) is employed in this study. Therefore,

the interpretations of our results are more comprehensive than the existing studies. The findings of this paper suggest changes in the uncertainty have a significant impact on the share prices both in the long- and short-run. Moreover, negative and positive changes influence share prices asymmetrically in the short run.

Second, we contribute to the literature by offering direct evidence of the link between TPU in the U.S. and investor sentiment in Turkey. With the increase in economic integration and financial globalization, changes in uncertainty in one country are expected to affect investor sentiment. By considering asymmetric impacts among variables, the NARDL findings show no significant effect of uncertainty in the U.S.'s trade policy on the sentiment of investors in Turkey, neither in the long- nor short-run. These findings can be considered as less than perfect economic and financial harmonization between the U.S. and Turkey.

The third contribution of our study to the literature is that we propose direct evidence of the relationship between investor sentiment and bank loans. To the best of our knowledge, this study is the first one that investigates the asymmetric relations between these two variables for Turkey. Our results demonstrate that only negative changes in investor sentiment directly impact private loans in the long run. Additionally, while the negative changes in investor sentiment still have a significant positive impact on bank loans, the positive changes in investor sentiment affect loans given by banks significantly (and asymmetrically) negatively. These findings are consistent with Caglayan and Xu (2016), who demonstrate the increase in bank loans as investors become pessimistic for G7 countries. On the other hand, bank loans affect investor sentiment only in the short run, which is negative.

Finally, as financial institutions are considered the primary transmission of uncertainty, we examine whether the policy uncertainty spread to the Turkish market via banks and the loan accessibility to households and firms. Baum et al. (2009) demonstrate the negative impact of macroeconomic uncertainties on bank loans. They state that bank managers behave more conservatively and diminish the number of credits in case of macroeconomic uncertainty as it influences the capability of bank managers to assess returns from possible lending opportunities. Empirical studies examined developed markets like Italy, Canada, and the U.S. also present similar results (Calmes & Theoret, 2014: 388-402; Quagliariello, 2009: 323-336). Our findings reveal that uncertainty in the U.S. significantly affects the Turkish banking system both in the long- and short-run. Moreover, we provide evidence that positive and negative changes in TPU affect bank loans asymmetrically. While the reduction in uncertainty influences the bank loans positively, the increase in uncertainty in the U.S. reduces the amount of credit given by Turkish banks in the short run.

This paper is related and aims to contribute many strands of literature. First, the uncertainty about government policies in the last decades emphasizes the importance of understanding its effect on the real economy and financial markets. Uncertainty in policies might occur due to unanticipated macroeconomic developments and the application of the procedure itself (Kurov & Stan, 2018: 127-142). Uncertainty in trade policy, which is the

level of flexibility that is offered by trade agreements, is one of the policy uncertainties that affect the real economy (Osnago et al., 2015). Decisions of households regarding investment and saving are influenced by trade policy uncertainty (Steinberg, 2019: 175-195). As investments are not fully reversible, uncertainties in trade policy might operate as a tax, making firms postpone their investments (Rodrik, 1991: 229-242). Handley & Limao (2017) state that the U.S.'s trade policy uncertainty reduces the welfare of the U.S.'s households by influencing imports of the U.S. firms from China. Studies also demonstrate that an increase in the TPU causes a reduction in GDP, which is in line with a massive amount of literature presenting the inverse impacts of other types of uncertainties (Caldara et al., 2019).

On the other hand, the unemployment rate is expected to increase due to the reduction in trade policy uncertainty (Pierce & Scott, 2016; Autor et al., 2013: 2121-2168). Even though the impacts of TPU for real sector variables have been examined widely by macroeconomists, the relationship between TPU and capital market prices is just starting to get attention in finance literature (see Black, 1976: 529-543; Davis et al., 2006: 107-179; Bianconni et al., 2019). Moreover, the studies on the transmission mechanism of trade policy uncertainty among countries are even more scarce. By employing the H.H. volatility spillover test, Ordu-Akkaya (2019) presents evidence that this transmission of uncertainty in the U.S. to Turkey occurs via financial institutions. She documents a significant impact of economic policy uncertainty in the U.S. on bank loan growth in Turkey. Our study contributes to Ordu-Akkaya (2019) by analysing whether the financial markets and banks are a transmission channel for trade policy uncertainty.

In another growing literature, academic researchers have devoted considerable effort to understanding investor sentiment transmission mechanisms among countries. Empirical studies document that investor sentiment is contagious among countries with highly connected economies (Baker et al., 2012). Factors that increase the possibility of a spillover of market sentiment between markets can be listed as high economic interrelations and geographic proximity (Perez-Liston et al., 2018). Sayim and Rahman (2015) state that although Turkey and the U.S. are located on a different continent, the U.S.'s investor sentiment act as a systematic risk factor for the Turkish stock market because of their high economic relation. Moreover, the magnitude of trade between countries is also a significant determinant of a level of contagion of investor sentiment (Verma & Soydemir, 2006). Apart from the extant ones, this study explores whether the uncertainty in trade policy also plays an essential role in investor sentiment contagion between countries.

The U.S. policymakers give less significance to Turkey after the Gulf War and the breakdown of the Soviet Union. This period, from 1991 to 2002, is called the Reassessment period. Starting in 2003, the relationship between the two countries rose due to Turkey's expanding economic and political influence in the Middle East (Zanotti & Thomas, 2020). Therefore, the monthly data from January 2003 to December 3019 is analysed in this study. Moreover, this period is preferred to prevent biased inferences that can arise because of the economic crisis in 2001 and 2002.

Our paper proceeds as follows: The Second section discusses the existent literature. The data and methodology are presented in section three. In the fourth section, empirical results are discussed. The fifth section concludes the paper.

2. Literature Review

Uncertainty about future conditions, which can result from economic shocks or policy shocks, has many impacts on firms regarding their demand, profitability, and expenses. Many companies are reluctant to invest if the future condition is uncertain enough to decide irreversible investments like making production or entering the new market (Handley & Limao, 2015: 189-222). Among these uncertainties, the effects of the trade policy uncertainty on the real economy have recently gathered more attention in the literature. Although the trade policy changes are not very frequent, the magnitude is enormous and continuing (Handley & Limao, 2015: 189-222). When the future circumstances of trade are not certain, firms hesitate to enter foreign markets as the uncertainty generates an option value of waiting to penetrate a new market. By acting as a fixed cost, uncertainty in trade policy affects the margin of trade negatively (Handley, 2014: 50-66). By constructing TPU measures at both the firm and aggregate levels, Caldara et al. (2019) investigate the impact of TPU on investment. For a firm level, Caldara et al. (2019) present that more significant rises in TPU lead to lower accumulated capital for companies after a year. They assert that an increase in TPU leads to lower investment and output levels for the aggregate level. By demonstrating TPU leads preventative raise in markups, Caldara et al. (2019) support Fernandez-Villaverde et al. (2015: 3352-3384), who show uncertainty reduces economic activity as companies increase their markups. From the firm level to the aggregate level, studies demonstrate TPU reduces investment (Caldara et al., 2019).

Unlike the literature on TPU and the real economic variables, the studies on the link between TPU and capital markets are scarce. As stock returns are a crucial element of the wealth of households and value and investment decisions of firms, this side of the relationship deserves more interest. Uncertainty in trade policies can influence the expectations of investors about future performances and risks of the firms, which cause the stock returns of companies to be affected (see Black, 1976: 529-543; Davis et al., 2006: 107-179; Bianconni et al., 2019). By defining the TPU as the gap between normal trade relations (NTR) and non-NTR rates, Bianconni et al. (2019) demonstrate that industries subjected to higher uncertainty generate significantly higher stock returns between 1990 and 2001. For example, stock returns of the U.S. manufacturing industries have 4.3% higher stock returns per year than industries that have lower exposure to TPU.

Additionally, Bianconni et al. (2019) claim that this disparity between stock returns can be considered a risk premium for compensation for risk related to policy uncertainty. Performing portfolio analyses demonstrates that TPU portfolios yield significantly higher returns and are considered a systematic, non-diversifiable risk factor. The volatility of firms' stock prices also varies with the level of exposure to TPU. Firms subjected to higher TPU have greater realized volatility than companies with less exposure during the uncertainty

period. Finally, on an industry level, more concentrated industries demonstrate a lower increase in stock returns during uncertainty period, as they can transfer their greater input costs to their buyers easier than less concentrated ones (see Ali et al. 2008: 3839-3871; and Bianconni et al., 2019). Although the effect of trade policy in another county on the Turkish stock market has not been analysed before, there are studies on the relationship between foreign economic policy uncertainty (EPU) and Turkey. For instance, Demir and Ersan (2018) present the significance of European EPU on the stock returns' changes in Turkey.

Another strand of literature related to our paper is the literature on investor sentiment. The greater is the diversity in possible scenarios about prospect economic development. The lesser is the knowledge about the probability distribution of future outcomes. Investors become less confident regarding their trading capability (Nowzohour & Stracca, 2017). Therefore, it is expected that trade policy uncertainty will have a significant effect on investor sentiment.

Moreover, the relationship between investor sentiment and the stock market is examined in the literature extensively. Investors affected by their sentiment while trading put additional risk on the assets, called "noise-trader risk". Both in the short- and long-run, this additional risk influences stock prices positively, as assets subjected to the same noise-trader sentiment face undiversifiable risk, which is priced in equilibrium (Delong et al., 1990: 703-738). There is also substantial literature on the relationship between stock returns and investor sentiment in Turkey. For example, by employing vector autoregressive (VAR) methodology and Granger causality test, Canbaş and Kandır (2009) demonstrate that returns of stock portfolios influence investor sentiment in Turkey. Moreover, the impact of investor sentiment on Turkish stock returns is robust, even after controlling for economic variables (Canbaş & Kandır, 2006: 26-39).

The relationship between TPU and private loans is another concern of this paper. Studies show that financial institutions are the primary ones influenced by uncertainty (see Kaufman, 1994: 123-150; Ordu-Akkaya, 2019). An increase in the economic policy uncertainty reduces the growth of loans across U.S. banks (Bordo et al., 2016: 90-106). Ordu-Akkaya (2019) investigates the transmission channel of uncertainty across economies and demonstrates that economic policy uncertainty in the U.S. affects bank loans in Turkey, indicating economic uncertainty spreads across countries via loan accessibility. Studies including Bloom et al. (2007) and Bradley et al. (2016) show that the future cash-flows of firms become more uncertain as to the TPU increases. This leads bank managers to adopt more strict credit policies to prevent risk. As Turkey and the U.S. have a close business relationship, an increase in the risk of the U.S. firms might transmit to the firms in Turkey, which will affect the credit policies of the bank managers in Turkey. By investigating the impact of TPU in the U.S. on private loans in Turkey, we aim to demonstrate if the TPU in one country can also influence the loan growth in another country.

Finally, the relationship between investor sentiment and bank loans is examined in this study. Studies show that the amount of bank loans decreases in financial crisis times

because of the reduction in the demand side as firms postpone their expansion plans (Ivashina & Scharfstein, 2010; Puri et al., 2011). By investigating G7 countries, Caglayan and Xu (2016) present that investor sentiment and volatility negatively influence bank loans. They conclude that the expectations of agents influence the lending decisions of banks. However, no study investigates this relationship in Turkey, and this paper aims to fill this gap.

3. Data and Methodology

3.1. Data

Our sample period is between January 2003 and December 2019. Only the data for consumer opinion is started from January 2005, due to data availability. The aggregate trade policy uncertainty (TPU) index, developed by Caldara et al. (2019), is employed. This index is constructed based on newspaper coverage of the regularity of the joint existence of trade policy and uncertainty terms. They examine seven newspapers' electronic records by operating the automatic text searches for the trade policy terms and uncertainty terms (Caldara et al., 2019).

Bank lending is proxied by log levels of private loans, hereafter LNPRIVATE, given to individuals and companies, and the data is achieved from the Central bank of Turkey database. Investor sentiment, hereafter OPINION, is proxied by the "Consumer Opinion Surveys: Confidence Indicators" data, which is obtained from the OECD "main economic indicators" complete database. This data is constructed by applying a monthly survey for 2000 households who are asked their tendencies and expectations for the economy, employment, and finance. Share price index, hereafter SHARE, is employed as an indicator of the Turkish stock market, obtained from the OECD databank. We also include the discount rate of Turkey, D.R., in our analysis as a control variable to uncover a reliable relationship between TPU, bank loans, investor sentiment, and stock markets.

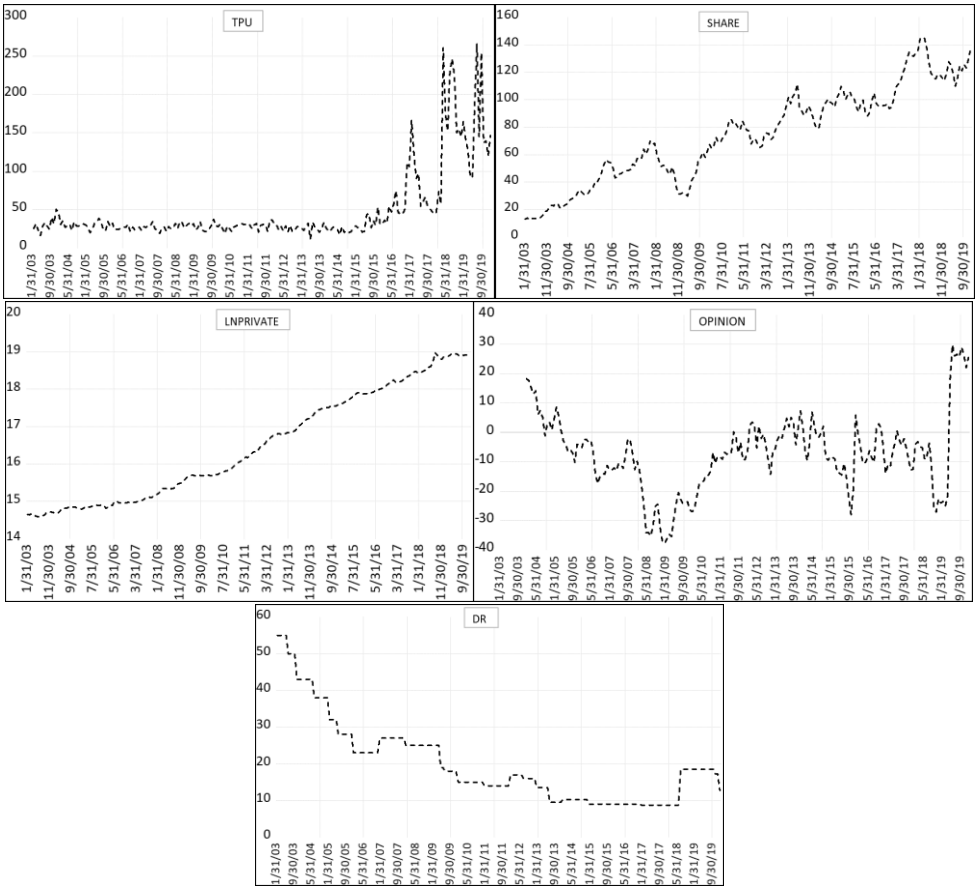
Table: 1
Descriptive Statistics

	TPU	SHARE	LNPRIVATE	OPINION	DR
Mean	48.2537	74.3658	16.49115	-7.434352	19.9939
Median	29.647	75.5069	16.20628	-6.92	17
Maximum	266.005	144.686	18.98161	29.9	55
Minimum	11.2991	12.515	14.59203	-37.81	8.75
Std. Dev.	49.2612	34.5065	1.448183	13.1599	11.4459
Skewness	2.68127	-0.0012	0.267137	0.231958	1.30251
Kurtosis	9.85356	2.03854	1.612617	3.717735	4.25084
Jarque-Bera	643.69	7.85756	18.78739	5.873315	70.9807
Probability	0	0.01967	0.000083	0.053043	0
Observations	204	204	204	193	204

TPU, SHARE, LNPRIVATE, OPINION, and D.R. refer to the trade policy uncertainty index in the U.S., the share price index for Turkey, logarithmic values of private credit in Turkey, investor sentiment in Turkey, and discount rate in Turkey, respectively.

Descriptive statistics of each variable are provided in Table 1. The graphical demonstration of each variable is represented in Figure 1. We get the logarithmic transformation for the private loans to reduce the nonnormality and heteroscedasticity. As shown in Figure 1, there is no requirement for the seasonal adjustment as there are no seasonal fluctuations in data. However, except OPINION, all variables have a trend, which is considered in the unit-root tests.

Figure: 1
Historical TPU, SHARE, LNPRIVATE, OPINION, and D.R.



TPU, SHARE, LNPRIVATE, OPINION, and D.R. refer to the trade policy uncertainty index in the U.S., the share price index for Turkey, logarithmic values of private credit in Turkey, investor sentiment in Turkey, and discount rate in Turkey, respectively.

While applying the linear and non-linear ARDL models, the variables should not be integrated of order 2 (see Peseran & Shin, 1998: 371-413; Shin et al., 2014). Therefore, to

avoid spurious regression and invalid results, the stationarity characteristics of the variables are examined by unit root tests. Rejecting the null hypothesis of these tests indicates variables are integrated of order 0. The order of integration presents the number that a series has to be differenced to become stationary.

In this paper, augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1979: 427-431), generalized least squares (GLS) detrended Dickey-Fuller (DF-GLS), and Phillips-Perron (P.P.) (Phillips & Perron, 1988: 335-346) are employed to test stationarity characteristics of series. The lag lengths are determined by the Akaike Information Criterion (AIC). The results of unit root tests are shown in Table 2 and Table 3 for levels and first differences, respectively. As all of the results suggest the variables are integrated of either order 0 or 1, ARDL and NARDL models can be employed in the analysis without hesitation (Peseran & Shin, 1998: 371-413; Shin et al., 2014).

Table: 2
Unit Root Test Results (Levels)

		ADF		DF-GLS		PP
		Statistics	**Lag**	**Statistics**	**Lag**	
TPU	*Intercept*	-2.414	1	-2.174	1	-3.160**
SHARE		-1.018	1	0.692	1	-0.95
LNPRIVATE		1.559	0	4.504	1	1.412
OPINION		-2.633*	2	-1.413	2	-2.904**
DR		-3.575***	0	0.618	0	-3.634***
TPU	*Intercept and Trend*	-3.441*	1	-3.247*	1	-4.769***
SHARE		-3.756***	1	-3.706***	1	-3.269*
LNPRIVATE		-2.702	0	-0.71	0	-2.676
OPINION		-2.857	2	-1.639	2	-2.954
DR		-2.597	0	-0.567	0	-2.59

*Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively. ADF, DF-GLS, and P.P. refer to Dickey-Fuller, Dickey- Fuller GLS detrended, and Phillips-Perron, respectively. Lag lengths are determined by automatically Schwarz Information Criterion (SIC). TPU, SHARE, LNPRIVATE, OPINION, and D.R. refer to the trade policy uncertainty index in the U.S., the share price index for Turkey, logarithmic values of private credit in Turkey, investor sentiment in Turkey, and discount rate in Turkey, respectively.*

Table: 3
Unit Root Test Results (First Differences)

		ADF		DF-GLS		PP
		Statistics	**Lag**	**Statistics**	**Lag**	
TPU	*Intercept*	-20.930***	0	-19.820***	0	-27.839***
SHARE		-11.342***	0	-11.293***	0	-11.122***
LNPRIVATE		-12.257***	0	-3.708***	3	-12.23***
OPINION		-11.028***	1	-10.92***	1	-11.416***
DR		-14.099***	0	-14.119***	0	-14.127***
TPU	*Intercept and Trend*	-20.896***	0	-20.363***	0	-28.327***
SHARE		-11.312***	0	-11.108***	0	-11.189***
LNPRIVATE		-12.425***	0	-11.764***	0	-12.402***
OPINION		-11.144***	1	-11.173***	1	-11.889***
DR		-14.543	0	-12.519***	0	-14.544***

*Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively. ADF, DF-GLS, and P.P. refer to Dickey-Fuller, Dickey- Fuller GLS detrended, and Phillips-Perron, respectively. Lag lengths are determined by automatically Schwarz Information Criterion (SIC). TPU, SHARE, LNPRIVATE, OPINION, and D.R. refer to the trade policy uncertainty index in the U.S., the share price index for Turkey, logarithmic values of private credit in Turkey, investor sentiment in Turkey, and discount rate in Turkey, respectively.*

3.2. Methodology

To investigate the asymmetric effects and cointegrating links between variables, the non-linear autoregressive distributed lag (NARDL) approach is employed in this paper. Autoregressive distributed lag (ARDL) models that perform well even for small sample sizes have some shortcomings. This methodology has two assumptions, which are symmetric adjustment and linearity. While the symmetric adjustment refers to the stable modification speed from the equilibrium, the linearity assumption indicates that every 1% change in the independent variable always causes a proportional change in the dependent one. However, these assumptions are not realistic and limiting to hold. Specifically, an increase in globalization and the interrelation between economies make economic variables very inconsistent with keeping the assumptions of ARDL (Hamzah & Masih, 2018). NARDL model, which is the comprehensive edition of the linear ARDL model, relaxes these assumptions and enables us to catch both the positive and negative shocks in the long- and short-run, no matter the variables are integrated of order 0, 1, or mixed (Peseran et al., 2001; Shin et al., 2014; Mensi et al., 2017; Ahmad et al., 2020).

In addition to the aforementioned econometrical advantages of the NARDL model, this study's subject also requires employing this methodology. Bachman and Bayer (2013) state that while an increase in the uncertainty triggers firms and consumers to delay large consumptions, which decreases share prices, a decrease in the uncertainty during the end of the recession causes an overstated increase in the short-run purchases that cause immediate rebound. Liang et al. (2020) support them by presenting that variations in the U.S. uncertainty influence Asian capital markets by affecting the consumption of Asian products that influence the capital markets of Asian countries by various channels, which causes an asymmetric capital market response. Therefore, Liang et al. (2020) state that linear models cannot be employed to analyse the asymmetric impacts of uncertainty. Another disadvantage of the linear models is that these models overlook the possibility that the data used might have other fundamental nonlinearities. Given the facts above, linear models might be overly restrictive and unrealistic, resulting in biased conclusions (Katrakilidis & Trachanas, 2012: 1064-1069). For these reasons, employing linear models does not suit the aim of this study.

Given the disadvantages of the linear models, other non-linear models like Markov-switching models and quantile regression methodology have become popular lately in uncertainty literature. Unlike these models, the NARDL model adjusts asymmetry and cointegration subtleties between variables together (Apergis & Cooray, 2015: 155-172). Thanks to the NARDL methodology, the reaction of the dependent variable to the negative and positive variations in each of the independent variables can be tested (Lahiani et al., 2016: 443-456). Moreover, this methodology is free from convergence problems that other non-linear models suffer. Finally, this approach is free from endogeneity bias (Shin et al., 2014; Kocaarslan & Soytas, 2019: 117-125). Because of these advantages of NARDL, and as the order of integrations of our variable set is mixed, this paper adopts NARDL model to examine the cointegrating relationship. This methodology is used to seize anticipated

asymmetry in Turkey's share price index, investor sentiment, and bank loan responses to changing trade policy uncertainty in the U.S.

First of all, the bounds-test procedure is employed to figure out long-run cointegration. The linear ARDL models' error correction demonstrations are as follows.

$$\Delta SHARE_t = \mu + \propto_1 SHARE_{t-1} + \propto_2 TPU_{t-1} + \propto_3 OPINION_{t-1} + \propto_4 LNPRIVATE_{t-1} + \propto_5 DR_{t-1} + \sum_{i=1}^{p-1} \lambda_1 \Delta SHARE_{t-i} + \sum_{i=0}^{q-1} \lambda_2 \Delta TPU_{t-i} + \sum_{i=0}^{q-1} \lambda_3 \Delta OPINION_{t-i} + \sum_{i=0}^{q-1} \lambda_4 \Delta LNPRIVATE_{t-i} + \sum_{i=0}^{q-1} \lambda_5 \Delta DR_{t-i} + \varepsilon_t \quad (1)$$

$$\Delta OPINION_t = \mu + \propto_1 OPINION_{t-1} + \propto_2 TPU_{t-1} + \propto_3 SHARE_{t-1} + \propto_4 LNPRIVATE_{t-1} + \propto_5 DR_{t-1} + \sum_{i=1}^{p-1} \lambda_1 \Delta OPINION_{t-i} + \sum_{i=0}^{q-1} \lambda_2 \Delta TPU_{t-i} + \sum_{i=0}^{q-1} \lambda_3 \Delta SHARE_{t-i} + \sum_{i=0}^{q-1} \lambda_4 \Delta LNPRIVATE_{t-i} + \sum_{i=0}^{q-1} \lambda_5 \Delta DR_{t-i} + \varepsilon_t \quad (2)$$

$$\Delta LNPRIVATE_t = \mu + \propto_1 LNPRIVATE_{t-1} + \propto_2 TPU_{t-1} + \propto_3 OPINION_{t-1} + \propto_4 SHARE_{t-1} + \propto_5 DR_{t-1} + \sum_{i=1}^{p-1} \lambda_1 \Delta LNPRIVATE_{t-i} + \sum_{i=0}^{q-1} \lambda_2 \Delta TPU_{t-i} + \sum_{i=0}^{q-1} \lambda_3 \Delta OPINION_{t-i} + \sum_{i=0}^{q-1} \lambda_4 \Delta SHARE_{t-i} + \sum_{i=0}^{q-1} \lambda_5 \Delta DR_{t-i} + \varepsilon_t \quad (3)$$

Where SHARE, OPINION, TPU, LNPRIVATE, and D.R. refer to share price index for Turkey, consumer sentiment in Turkey, Trade policy uncertainty in the USA, bank loans given by Turkish banks to the private sector, and discount rate in Turkey, respectively. The "Δ" demonstrates the first differences of variables. Optimum lag lengths, shown by p and q, are selected based on the Akaike information criterion (AIC). Long-run coefficients are represented by $\propto$, and short-run coefficients are symbolized with λ.

The ARDL model assumes linearity, a restrictive and unrealistic assumption for economic variables (Hamzah and Masih, 2018). Therefore, the nonsymmetric ARDL (NARDL) model is applied in our analysis to depict probable long- and short-run asymmetries. In this study, the following non-linear long-run cointegrating regression is employed following Shin et al. (2014).

$$y_t = \beta^+ x_t^+ + \beta^- x_t^- + u_t \quad (4)$$

Where x_t refers to TPUt, SHAREt, and OPINIONt, y_t refers to SHAREt, OPINIONt, and LNPRIVATEt. Related long-run parameters are demonstrated by β^+ and β^-. x_t

demonstrates a k*1 vector of regressors, which can be written as $x_t = x_0 + x_t^+ + x_t^-$, where x_0, x_t^- and x_t^+ refer to initial value, positive partial sums, and negative partial sums, respectively.

$$x_t^+ = \sum_{i=1}^{t} \Delta x_i^+ = \sum_{i=1}^{t} \max(\Delta x_i, 0) \tag{5}$$

$$x_t^- = \sum_{i=1}^{t} \Delta x_i^- = \sum_{i=1}^{t} \min(\Delta x_i, 0) \tag{6}$$

Considering the control variable to represent macroeconomic situations, the following error correction demonstration of the NARDL models is employed in our empirical analyses.

$$\begin{aligned}\Delta SHARE_t = {} & \mu + \chi SHARE_{t-1} + \omega_1^+ TPU_{t-1}^+ + \omega_1^- TPU_{t-1}^- + \omega_2^+ OPINION_{t-1}^+ + \omega_2^- OPINION_{t-1}^- \\ & + \omega_3 LNPRIVATE_{t-1} + \omega_4 DR_{t-1} + \sum_{i=!}^{P-1} \tau \Delta SHARE_{t-i} + \sum_{i=0}^{q-1} \phi_1^+ \Delta TPU_{t-i}^+ \\ & + \sum_{i=0}^{q-1} \phi_1^- \Delta TPU_{t-i}^- + \sum_{i=0}^{q-1} \phi_2^+ \Delta OPINION_{t-i}^+ + \sum_{i=0}^{q-1} \phi_2^- \Delta OPINION_{t-i}^- \\ & + \sum_{i=0}^{q-1} \phi_3 \Delta LNPRIVATE_{t-i} + \sum_{i=0}^{q-1} \phi_4 \Delta DR_{t-i} + \varepsilon_t\end{aligned} \tag{7}$$

$$\begin{aligned}\Delta OPINION_t = {} & \mu + \chi OPINION_{t-1} + \omega_1^+ TPU_{t-1}^+ + \omega_1^- TPU_{t-1}^- + \omega_2^+ SHARE_{t-1}^+ + \omega_2^- SHARE_{t-1}^- \\ & + \omega_3 LNPRIVATE_{t-1} + \omega_4 DR_{t-1} + \sum_{i=!}^{P-1} \tau \Delta OPINION_{t-i} + \sum_{i=0}^{q-1} \phi_1^+ \Delta TPU_{t-i}^+ \\ & + \sum_{i=0}^{q-1} \phi_1^- \Delta TPU_{t-i}^- + \sum_{i=0}^{q-1} \phi_2^+ \Delta SHARE_{t-i}^+ + \sum_{i=0}^{q-1} \phi_2^- \Delta SHARE_{t-i}^- \\ & + \sum_{i=0}^{q-1} \phi_3 \Delta LNPRIVATE_{t-i} + \sum_{i=0}^{q-1} \phi_4 \Delta DR_{t-i} + \varepsilon_t\end{aligned} \tag{8}$$

$$\begin{aligned}\Delta LNPRIVATE_t = {} & \mu + \chi LNPRIVATE_{t-1} + \omega_1^+ TPU_{t-1}^+ + \omega_1^- TPU_{t-1}^- + \omega_2^+ OPINION_{t-1}^+ + \omega_2^- OPINION_{t-1}^- \\ & + \omega_3^+ SHARE_{t-1}^+ + \omega_3^- SHARE_{t-1}^- + \omega_4 DR_{t-1} + \sum_{i=!}^{P-1} \tau \Delta LNPRIVATE_{t-i} \\ & + \sum_{i=0}^{q-1} \phi_1^+ \Delta TPU_{t-i}^+ + \sum_{i=0}^{q-1} \phi_1^- \Delta TPU_{t-i}^- + \sum_{i=0}^{q-1} \phi_2^+ \Delta OPINION_{t-i}^+ + \sum_{i=0}^{q-1} \phi_2^- \Delta OPINION_{t-i}^- \\ & + \sum_{i=0}^{q-1} \phi_3^+ \Delta SHARE_{t-i}^+ + \sum_{i=0}^{q-1} \phi_3^- \Delta SHARE_{t-i}^- + \sum_{i=0}^{q-1} \phi_4 \Delta DR_{t-i} + \varepsilon_t\end{aligned} \tag{9}$$

Long-run coefficients are represented by χ, and ω_n, and short-run coefficients are symbolized with τ, and ϕ_{ji}. F-statistics is used to test the null hypothesis, which is no asymmetric cointegration.

Finally, long and short-run asymmetries are tested using a standard Wald test (Shin et al., 2014). The symmetry indicates $\beta^{+} = \beta^{-}$. By using $\beta^{+} = -\omega_n^{+}/\chi$ and $\beta^{-} = -\omega_n^{-}/\chi$ equations, the long-run coefficients about positive and negative changes of the related explanatory variables are found. The null hypothesis of $\sum_{i=0}^{q-1}\phi_k^{+} = \sum_{i=0}^{q-1}\phi_k^{-}$ is tested to examine the presence of short-run symmetry, where k=1,2, and 3. The results of these empirical analyses are discussed in the next section.

4. Empirical Findings

First, a bounds test is employed to investigate the cointegrating relationships between variables in the long run. In this test, fail to reject the null hypothesis suggests there is no cointegrating relationship. Table 4 presents the existence of long-run cointegration between variables at least at a five percent level. Therefore, the presence of the asymmetric relations between trade policy uncertainty in the U.S., stock market prices, investor sentiment, and bank loans in Turkey in the short- and long-run can be examined with the NARDL model, which is the second step of our analysis.

Table: 4
Bounds Testing Procedure Results

Cointegration Hypotheses	F Stat.
$F(SHARE_t/TPU_t^{+},TPU_t^{-},OPINION_t^{+},OPINION_t^{-},LNPRIVATE_t, DR_t)$	8.316***
$F(OPINION_t/SHARE_t^{+},SHARE_t^{-},TPU_t^{+},TPU_t^{-},LNPRIVATE_t, DR_t)$	2.622**
$F(LNPRIVATE_t/SHARE_t^{+},SHARE_t^{-},TPU_t^{+},TPU_t^{-},OPINIONt+,OPINION_t, DRt)$	7.382***

*For the dependent variable (SHARE), the critical values are 2.27-3.28and 2.88-3.99 for 5% and 1% significance levels, respectively. For the dependent variable (OPINION), the critical values are 2.27-3.28and 2.88-3.99 for 5%, and 1 % significance levels, respectively. For the dependent variable (LNPRIVATE), the critical values are 2.17-3.21 and 2.73-3.9 for 5% and 1% significance levels, respectively. Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively.*

In Tables 5, 6, and 7, the results of the estimated NARDL models in equations 7, 8, and 9 are demonstrated. Results of the Wald tests that provide the short- and long-run asymmetries are shown in Table 8. As shown in Table 8, the null hypothesis of short- and long-run symmetry can be rejected in most of the analyses, if not all. Having variables with an order of integration less than two and demonstrating the asymmetry indicates that the NARDL model suits our data well. The asymmetry can arise because of the complicated and dynamic financial markets with different market participants (Shahzad et al., 2017: 211-230).

The effects of explanatory variables on share prices are shown in Table 5. According to the table, while share prices are positively affected by the positive changes in TPU, the negative changes in TPU do not significantly impact the share prices in the long run. This result resonates well with Bianconni et al. (2019), who find a similar relationship between TPU and share prices for industry and firm level, and state this is the risk premium for compensation for policy uncertainty associated risk. On the other hand, while the positive changes in TPU have a significant negative impact on share prices, the negative changes in TPU have a significant positive effect on share prices in the short run. Moreover, the Wald

tests, shown in Table 8, demonstrate this significant asymmetric effect in the short run. These findings indicate that increase in the U.S. trade policy uncertainty seems to affect the global uncertainty, which decreases the risk appetite of individuals and causes the stock market prices in emerging markets like Turkey to diminish in the short run. First, the causality between the US TPU and global economic policy uncertainty (EPU) is examined to test this hypothesis. Table A.1 of the appendix shows that the TPU is the Granger cause of global economic policy uncertainty. Then, the correlation between risk aversion and TPU is examined. The findings presented in Table A.2 of the appendix reveal a significant positive correlation between risk aversion and trade policy uncertainty.

Moreover, these findings indicate that a more certain trade environment in the U.S. makes investors decrease their savings and increase their investments in emerging markets like Turkey. A significant negative correlation between foreign stock investment in Turkey and TPU in the U.S. supports this argument. Table A.3 of the appendix presents these results.

Table: 5
NARDL Estimation Results (Dependent Variable: $\triangle SHARE_t$)

Panel A: Estimated coefficients (Adj. R^2= 0.3204)				
E.V.	Coefficient	Robust Std. Error	t-statistic	Prob.
C	35.582	33.364	1.066	0.288
$SHARE_{t-1}$	-0.122	0.028	-4.299	0.000
TPU_{t-1}^{+}	0.029	0.014	2.095	0.038
TPU_{t-1}^{-}	0.024	0.017	1.399	0.164
$OPINION_{t-1}^{+}$	0.117	0.046	2.532	0.012
$OPINION_{t-1}^{-}$	0.077	0.026	2.950	0.004
$LNPRIVATE_{t-1}$	-1.434	2.393	-0.599	0.550
DR_{t-1}	-0.204	0.090	-2.260	0.025
$DSHARE_{t-1}$	0.118	0.074	1.594	0.113
$DTPU_t^{+}$	0.000	0.012	-0.024	0.981
$DTPU_{t-1}^{+}$	-0.067	0.018	-3.644	0.000
$DTPU_{t-2}^{+}$	-0.041	0.021	-1.972	0.050
$DTPU_t^{-}$	-0.028	0.035	-0.800	0.425
$DTPU_{t-1}^{-}$	0.083	0.023	3.645	0.000
$DTPU_{t-2}^{-}$	0.070	0.030	2.337	0.021
$DOPINION_t^{+}$	-0.013	0.063	-0.209	0.834
$DOPINION_{t-1}^{+}$	-0.259	0.076	-3.393	0.001
$OPINION_t^{-}$	0.384	0.117	3.275	0.001
$DLNPRIVATE_t$	-31.085	7.417	-4.191	0.000
$DLNPRIVATE_{t-1}$	-16.442	10.368	-1.586	0.115
DDR_t	-0.220	0.271	-0.812	0.418
DDR_{t-1}	-0.100	0.169	-0.591	0.555
DDR_{t-2}	0.527	0.188	2.806	0.006
Panel B: Long-Run Coefficients for the asymmetric parameters				
TPU^{+}	0.2400**		TPU^{-}	0.1950
$OPINION^{+}$	0.9566**		$OPINION^{-}$	0.6309***

*Panel A contains the results from the error correction representation of the NARDL model for the case of the dependent variable $\triangle SHARE_t$. E.V. refers to the explanatory variables. The Newey-West (1987) autocorrelation and heteroskedasticity robust standard errors and t-statistics are reported. The superscripts "+" and "−" represent positive and negative partial sums, respectively. The estimated long-run coefficients associated with positive and negative changes of the corresponding variables are demonstrated in panel B. Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively.*

Results in the same table also show the effect of investor sentiment on the share prices. While both decreases and increases in investor sentiment significantly positively impact the share prices in the long-run symmetrically, the asymmetry arises in the short-run.

Share prices are negatively affected by positive changes in investor sentiment, while negative changes in sentiment are positive. So, the more pessimistic investors become, the higher share prices there are in the short run. The pessimism of investors could prompt speculative attacks in the financial markets in the short run. These results resonate well with Baker et al. (2012: 272-287), who document the predictive power of investor sentiment on stock returns.

In the short and long run, the bank loans given to the private sector do not significantly affect the share prices for Turkey. The discount rate has a significant negative impact on the share prices in the long and short run. This finding supports the literature that states an increase in the discount rate causes the reduction of investments in the stock market, which results in a decline in the stock prices.

Table: 6
NARDL Estimation Results (Dependent Variable: $\triangle$ OPINION$_t$)

Panel A: Estimated coefficients (Adj. R^2= 0.1662)				
E.V.	Coefficient	Robust Std. Error	t-statistic	Prob.
C	-16.0842	54.9003	-0.2930	0.7699
$OPINION_{t-1}$	-0.1370	0.0569	-2.4053	0.0172
$SHARE_{t-1}^{+}$	0.0131	0.0380	0.3443	0.7310
$SHARE_{t-1}^{-}$	0.0239	0.0554	0.4316	0.6666
TPU_{t-1}^{+}	-0.0592	0.0352	-1.6825	0.0943
TPU_{t-1}^{-}	-0.0714	0.0455	-1.5678	0.1188
$LNPRIVATE_{t-1}$	0.6020	3.6966	0.1629	0.8708
DR_{t-1}	0.1347	0.1187	1.1346	0.2581
$DOPINION_{t-1}$	0.2397	0.0758	3.1629	0.0018
$DOPINION_{t-2}$	-0.1751	0.0587	-2.9822	0.0033
$DSHARE_t^{+}$	0.2039	0.1411	1.4446	0.1504
$DSHARE_t^{-}$	0.1146	0.1864	0.6146	0.5396
$DTPU_t^{+}$	0.0075	0.0164	0.4593	0.6466
$DTPU_{t-1}^{+}$	0.0416	0.0334	1.2465	0.2143
$DTPUt^{-}$	-0.0601	0.0369	-1.6283	0.1053
$DLNPRIVATE_t$	4.8504	9.9939	0.4853	0.6281
$DLNPRIVATE_{t-1}$	-23.3744	10.5080	-2.2244	0.0274
DDR_t	0.0263	0.2908	0.0905	0.9280
Panel B: Long-Run Coefficients for the asymmetric parameters				
TPU^{+}	-0.4325		TPU^{-}	-0.5213
$SHARE^{+}$	0.0954		$SHARE^{-}$	0.1745

*Panel A contains the results from the error correction representation of the NARDL model for the case of dependent variable $\triangle OPINION_t$. E.V. refers to the explanatory variables. The Newey-West (1987) autocorrelation and heteroskedasticity robust standard errors and t-statistics are reported. The superscripts "+" and "−" represent positive and negative partial sums, respectively. The estimated long-run coefficients associated with positive and negative changes of the corresponding variables are demonstrated in panel B. Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively.*

Table 6 shows the influences of chosen variables on investor sentiment. None of the explanatory variables have a significant impact on investor sentiment in the long run. However, in the short run, the positive changes in share prices significantly affect investor sentiment. There is an inverse relationship between bank loans and investor sentiment. As shown in Table 8, the Wald test demonstrates no asymmetry in explanatory variables when investor sentiment is the dependent variable, neither in the long nor short run. These findings might suggest that an increase in the share prices, which can be interpreted as the increase in the investors' risk appetite, leads to a reduction in investors' sensitivity to macroeconomic

shocks, and they become more optimistic, in other words. Moreover, instead of being influenced by the U.S.'s TPU, investor sentiment in Turkey is affected by changes in domestic variables.

Last but not least, the findings of analysis when the bank loan is employed as a dependent variable are presented in Table 7. Results suggest that adverse changes in the share prices negatively affect the credit given by banks, while the positive changes positively influence bank loans in the long run. Moreover, these effects are asymmetric, as can be seen from Table 8. On the other hand, both the negative and positive changes in TPU in the U.S. positively impact bank loans in the long run. These results align with Ordu-Akkaya (2019), who shows the spillover from economic policy uncertainty to credit growth. She provides evidence that the transmission mechanism from policy uncertainty occurs primarily via financial institutions.

Moreover, Ordu-Akkaya (2019) provides evidence that the only economic policy uncertainty category that significantly impacts Turkish loan growth is the uncertainty about financial regulation and taxes. Credit availability in the Turkish financial industry is affected by the restrictive laws or tightening tax decisions, which is in line with our findings of the negative short-run impact of positive changes in TPU on bank loans. Finally, even though there is a direct relationship between negative changes in investor sentiment and private credit, the positive changes in investor sentiment have no significant effect in the long run. This result resonates well with Caglayan and Xu (2016), who demonstrate the inverse relationship between sentiment and banks' loan growth.

The picture has changed slightly in the short run, as seen from Tables 7 and 8. There is an asymmetry in the impact of TPU on private credits. While the negative changes in uncertainty positively affect the loans given by banks, positive changes in TPU influence them inversely in the short run. These findings are in line with Baum et al. (2009: 87-89), demonstrating that uncertainty affects bank managers' ability to forecast available lending opportunities' returns, which causes a reduction in the loans as they act more conservatively. Being a second trade partner of Turkey, the uncertain trade environment in the U.S. affects firms in Turkey directly or indirectly, making bank managers in Turkey cautious about giving loans to the firms in Turkey. This finding supports Bradley et al. (2016) that state banks apply more strict credit policies to prevent risk as their anticipation and trust for potential income flows diminish due to an increase in TPU. An increase in the U.S.'s TPU deepens the uncertainty of the future cash-flows of the firm in Turkey that have a business relationship with the U.S. firms. Table A.4 of the appendix shows a negative correlation between TPU and the Tukey-US foreign trade volume change indicating the cash-flow of the exporting and importing firms in Turkey are affected by the TPU in the U.S. Likewise, a similar pattern can be observed in the relationship between investor sentiment and private credits. While becoming more pessimistic increases the loans provided by banks, the amount of credits given by banks decreases as investors become more optimistic in the short-run. This finding supports Caglayan and Xu (2016), who show a similar relationship between

investor sentiment and bank lending decisions for G7 countries. Moreover, this effect is asymmetric, as can be seen from the results of Wald tests demonstrated in Table 7.

Table: 7
NARDL Estimation Results (Dependent Variable: $\triangle$ LNPRIVATE$_t$)

Panel A: Estimated coefficients (Adj. R^2= 0.4031)				
E.V.	Coefficient	Robust Std. Error	t-statistic	Prob.
C	0.9618	0.3071	3.132	0.002
$LNPRIVATE_{t-1}$	-0.0661	0.0216	-3.066	0.003
$SHARE_{t-1}^-$	-0.0012	0.0004	-2.823	0.005
$SHARE_{t-1}^+$	0.0008	0.0003	2.280	0.024
TPU_{t-1}^-	0.0004	0.0002	2.052	0.042
TPU_{t-1}^+	0.0003	0.0002	1.669	0.097
$OPINION_{t-1}^-$	0.0011	0.0003	3.456	0.001
$OPINION_{t-1}^+$	0.0004	0.0005	0.909	0.365
DR_{t-1}	0.0016	0.0008	1.891	0.061
$DSHARE_t^-$	-0.0042	0.0012	-3.484	0.001
$DSHARE_{t-1}^-$	0.0005	0.0012	0.457	0.648
$DSHARE_{t-2}^-$	-0.0009	0.0012	-0.793	0.429
$DSHARE_{t-3}^-$	-0.0024	0.0009	-2.537	0.012
$DTPU_t^-$	0.0009	0.0002	3.573	0.001
$DTPU_{t-1}^-$	0.0004	0.0003	1.447	0.150
$DTPU_t^+$	0.0000	0.0001	0.221	0.826
$DTPU_{t-1}^+$	-0.0002	0.0002	-0.895	0.372
$DTPU_{t-2}^+$	0.0002	0.0002	0.864	0.389
$DTPU_{t-3}^+$	-0.0004	0.0001	-3.262	0.001
$OPINION_t^-$	-0.0004	0.0012	-0.348	0.728
$OPINION_{t-1}^-$	0.0013	0.0010	1.343	0.181
$OPINION_{t-2}^-$	0.0028	0.0014	2.063	0.041
$DOPINION_t^+$	0.0001	0.0005	0.198	0.843
$DOPINION_{t-1}^+$	-0.0022	0.0006	-3.594	0.000
$DOPINION_{t-2}^+$	-0.0010	0.0006	-1.604	0.111
$DOPINION_{t-3}^+$	-0.0009	0.0006	-1.561	0.120
DDR_t	0.0024	0.0021	1.162	0.247
DDR_{t-1}	0.0012	0.0021	0.542	0.588
DDR_{t-2}	0.0054	0.0031	1.725	0.087
DDR_{t-3}	-0.0030	0.0016	-1.860	0.065
Panel B: Long-Run Coefficients for the asymmetric parameters				
TPU^+	0.0039*		TPU^-	0.0056**
$SHARE^+$	0.0117**		$SHARE^-$	-0.0181***
$OPINION^+$	0.0062		$OPINION^-$	0.016***

*Panel A contains the results from the error correction representation of the NARDL model for the case of the dependent variable $\triangle LNPRIVATE_t$. E.V. refers to the explanatory variables. The Newey-West (1987) autocorrelation and heteroskedasticity robust standard errors and t-statistics are reported. The superscripts "+" and "−" represent positive and negative partial sums, respectively. The estimated long-run coefficients associated with positive and negative changes of the corresponding variables are demonstrated in panel B. Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively.*

Table: 8
Wald Test Results for Long and Short Run Asymmetry

Panel A. Long-run asymmetry			
Dependent variables	W_{LR}(SHARE)	W_{LR}(TPU)	W_{LR}(OPINION)
DSHARE		0.6415	0.7475
DOPINION	0.8692	0.2996	
DLNPRIVATE	-3.8183***	2.0294**	1.3144
Panel B. Short-run asymmetry			
Dependent variables	W_{SR}(SHARE)	W_{SR}(TPU)	W_{SR}(OPINION)
DSHARE		15.4939***	11.0171***
DOPINION	0.7472	0.1395	
DLNPRIVATE	3.0879**	7.8428***	2.5252**

*W_{LR}(SHARE), W_{LR}(TPU), and W_{LR}(OPINION) refer to the Wald test for the null of long-run symmetry for the corresponding variable. W_{SR}(SHARE), W_{SR}(TPU), and W_{SR}(OPINION) refer to the Wald test for the null of the additive short-run symmetry condition for the corresponding variable. Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively.*

5. Conclusion

In this paper, we aim to examine whether the changes in uncertainty in one country transmit to another via financial markets and bank loans or not. Studies show that policy uncertainty in the U.S. leads to a more significant decline in the investment levels of emerging markets than developed ones. Therefore, emerging markets are affected by spillover more severely (see Carriere-Swallow & Cespedes, 2013: 316-325; Ordu-Akkaya, 2019). However, studies investigating the impacts of policy uncertainties in the U.S. on Turkish financial markets are scarce. Moreover, although there is a large body of theoretical and empirical work on the transmission of investor sentiment among countries (see Baker et al., 2012: 272-287; Bai, 2014: 259-290), research on the effect of policy uncertainties in developed countries on the investor sentiment in emerging ones are limited. For that instance, this paper examines the cointegrating relationship between trade policy uncertainty in the U.S., share prices, bank loans, and investor sentiment in Turkey by employing a novel approach (NARDL approach) that considers the asymmetric effects. Our results offer a vital demonstration of the impact of one country's policy uncertainty on another.

The findings show the significant impact of trade policy uncertainty in the U.S. on the financial markets in Turkey. Changes in the U.S.'s TPU affect share prices in Turkey both in the long- and short-run, and in the latter one, the effects of positive and negative changes in TPU are asymmetric. The positive (negative) changes in TPU influence share prices negatively (positively), and the magnitude of the negative changes in uncertainty is more significant. These results can be interpreted as the increase in uncertainty in the U.S.'s TPU leads investors to prefer to hold less risky assets. The findings support that by affecting the global uncertainty, the US TPU influences the risk appetite of the investors, which has an impact on emerging stock markets such as Turkey's. A significant negative correlation between foreign stock investment in Turkey and trade policy uncertainty in the U.S. found in this study indicates that a decrease in the U.S. might reduce the investors' incentive to save and increase the U.S.'s investors to invest in emerging markets such as Turkey. The U.S.'s TPU also influences the private loans in Turkey both in the long- and short-run. In the short run, the positive and negative changes in uncertainty affect bank loans

asymmetrically. A rise (decline) in the trade policy uncertainty reduces (increases) the bank loans in Turkey, and the magnitude of the impact of the decline in TPU is greater. It can be inferred as bank managers in Turkey hesitate to give loans if there is an uncertain environment in the U.S., as the US is Turkey's second trade partner. A significant portion of the Turkish firms is affected by the U.S.'s trade policy decisions directly or indirectly. Restrictive laws or tightening taxes in the U.S.'s trade policy affect credit availability in the Turkish financial industry.

Another important finding in this study is that, instead of being affected by U.S. trade policy uncertainty, investor sentiment in Turkey seems to be affected by local changes like changes in the share prices and changes in the loans provided by banks. In the short run, an increase in bank loans reduces investor sentiment. This finding implies that indebtedness reduces the confidence of consumers in the future economic prospect. Moreover, these effects are bidirectional. While the bank loans increase with the negative changes in investor sentiment, the increased optimism of investors reduces the credits given by banks. These findings imply that people and firms tend to reduce their debt level when they have positive beliefs about future economic conditions. Finding the insignificant impact of the U.S.'s TPU on investor sentiment in Turkey and its significant impact on bank loans can be interpreted as uncertainty in trade policy influences firms more than individual investors as firms hesitate to make investments during trade-related uncertain environments. Further studies will shed more light on this issue by investigating whether employing other types of uncertainties in the U.S. reveals a significant impact on investor sentiment in Turkey or not.

Overall, this study demonstrates the financial markets and institutions importance in transmitting uncertainty between countries. Though the results imply no perfect economic and financial integration between the U.S. and Turkey, the impacts of U.S. policies on financial markets players and investors in Turkey are not negligible. First, this study suggests investors consider the domestic TPU and the U.S.'s TPU while making an investment decision in the Turkish stock market. Second, as the findings present the significance of the U.S.'s TPU on private loans, bank managers can use these results in planning their future credit lines. Finally, firms and households can also benefit from these findings when they plan their leverage.

References

Ahmad, M. & S.I. Khattak & S. Khan & Z. U. Rahman (2020), "Do Aggregate Domestic Consumption Spending and Technological Innovation Affect Industrialization in South Africa? An Application of Linear and Non-linear ARDL Models", *Journal of Applied Economics*, 23(1), 43-64.

Ali, A. & S. Klasa & E. Yeung (2008), "The Limitations of Industry Concentration Measures Constructed with Compustat Data: Implications for Finance Research", *The Review of Financial Studies*, 22(10), 3839-3871.

Apergis, N. & A. Cooray (2015), "Asymmetric Interest Rate Pass-Through in the U.S., the U.K. and Australia: New Evidence from Selected Individual Banks", *Journal of Macroeconomics*, 45, 155-172.

Autor, D.H. & D. Dorn & G.H. Hanson (2013), "The China Syndrome: Local Labor Market Effects of Import Competition in the United States", *American Economic Review*, 103(6), 2121-68.

Bachman, R. & C. Bayer (2013), "Wait-and-See Business Cycles?", *Journal of Monetary Economics*, 60, 704-719.

Bai, Y. (2014), "Cross-border Sentiment: An Empirical Analysis on EU Stock Markets", *Applied Financial Economics*, 24(4), 259-290.

Baker, M. & J. Wurgler & Y. Yuan (2012), "Global, Local and Contagious Investor Sentiment", *Journal of Financial Economics*, 104(2), 272-287.

Baker, S.R. & N. Bloom & S.J. Davis (2016), "Measuring Economic Policy Uncertainty", *The Quarterly Journal of Economics*, 131(4), 1593-1636.

Baum, C.F. & M. Caglayan & N. Ozkan (2009), "The Second Moments Matter: The Impact of Macroeconomic Uncertainty on the Allocation of Loanable Funds", *Economics Letters*, 102(2), 87-89.

Bekaert, G. & E. Engstrom & N.R. Xu (2019), "The Time Variation in Risk Appetite and Uncertainty", National Bureau of Economic Research *Working Paper*, No. w25673.

Bianconi, M. & F. Esposito & M. Sammon (2019), "Trade Policy Uncertainty and Stock Returns", *Discussion Papers Series*, Department of Economics, Tufts University 0830, Department of Economics, Tufts University.

Biljanovska, N. & F. Grigoli & M. Hengge (2017), "Fear the Neighbor: Spillovers from Economic Policy Uncertainty", in: *IMF Working Paper* WP/17/240, November 2017.

Black, F. (1986), "Noise", *The Journal of Finance*, 41, 529-543.

Bloom, N. & S. Bond & J.V. Reenen (2007), "Uncertainty and Investment Dynamics", *The Review of Economic Studies*, 74(2), 391-415.

Bonaime, A. & H. Gulen & M. Ion (2018), "Does Policy Uncertainty Affect Mergers and Acquisitions?", *Journal of Financial Economics*, 129 (3), 531-558.

Bordo, M.D. & J.V. Duca & C. Koch (2016), "Economic Policy Uncertainty and the Credit Channel: Aggregate and Bank Level U.S. Evidence over Several Decades", *Journal of Financial Stability*, 26, 90-106.

Bown, C.P. (2013), "Trade Policy Flexibilities and Turkey: Tariffs, Anti-dumping, Safeguards and WTO Dispute Settlement", *The World Economy*, 37(2), 193-218.

Bradley, D.J. & C. Pantzalis & X. Yuan (2016), "Policy Risk, Corporate Political Strategies, and the Cost of Debt", *Journal of Corporate Finance*, 40, 254-275.

Caglayan, M. & B. Xu (2016), "Sentiment Volatility and Bank Lending Behavior", *International Review of Financial Analysis*, 45, 107-120.

Caldara, D. & M. Iacoviello & P. Molligo & A. Prestipino (2019), "The Economic Effects of Trade Policy Uncertainty", *Journal of Monetary Economics*, 109, 38-59.

Calmès, C. & R. Théoret (2014), "Bank Systemic Risk and Macroeconomic Shocks: Canadian and U.S. Evidence", *Journal of Banking and Finance*, 40, 388-402.

Canbas, S. & S.Y. Kandir (2006), "Examining the Effect of Investor Psychology Over Stock Returns by Closed-End Fund Discount", *Muhasebe ve Finansman Dergisi*, 29(1), 26-39.

Canbaş, S. & S.Y. Kandır (2009), "Investor Sentiment and Stock Returns: Evidence from Turkey", *Emerging Markets Finance and Trade*, 45(4), 36-52.

Carrière-Swallow, Y. & L.F. Céspedes (2013), "The impact of uncertainty shocks in emerging economies", *Journal of International Economics*, 90(2), 316-325.

Davis, S.J. & J. Haltiwanger & R. Jarmin & J. Miranda & C. Foote & E. Nagypal (2006), "Volatility and Dispersion in Business Growth Rates: Publicly Traded versus Privately Held Firms", *NBER Macroeconomics Annual 21*, 107-179.

De Long, J.B. & A. Shleifer & L.H. Summers & R.J. Waldmann (1990), "Noise trader risk in financial markets", *Journal of Political Economy*, 98(4), 703-738.

Demir, E. & O. Ersan (2018), "The Impact of Economic Policy Uncertainty on Stock Returns of Turkish Tourism Companies", *Current Issues in Tourism*, 21(8), 847-855.

Dickey, D.A. & W.A. Fuller (1979), "Distribution of the estimators for autoregressive time series with a unit root", *Journal of the American Statistical Association*, 74, 427-431.

Fernandez-Villaverde, J. & P. Guerron-Quintana & K. Kuester & J. Rubio-RamÃrez (2015), "Fiscal Volatility Shocks and Economic Activity", *American Economic Review*, 105(11), 3352-3384.

Hamzah, N.H. & M. Masih (2018), "Revisiting Effectiveness of Interest Rate as a Tool to Control Inflation: Evidence from Malaysia Based on ARDL and NARDL", *MPRA Paper* 87576, University Library of Munich, Germany.

Handley, K. & N. Limao (2012), "Trade and Investment under Policy Uncertainty: Theory and Firm Evidence", *American Economic Journal: Economic Policy*, 7(4), 189-222.

Handley, K. (2014), "Exporting Under Trade Policy Uncertainty: Theory and Evidence", *Journal of International Economics*, 94(1), 50-66.

Ivashina, V. & D. Scharfstein (2010), "Bank lending during the financial crisis of 2008", *Journal of Financial Economics*, 97(3), 319-338.

Katrakilidis, C. & E. Trachanas (2012), "What Drives Housing Price Dynamics in Greece: New Evidence from Asymmetric ARDL Cointegration", *Economic Modelling*, 29, 1064-1069.

Kaufman, G.G. (1994), "Bank contagion: A review of the theory and evidence", *Journal of Financial Services Research*, 8(2), 123-150.

Kirişçi, K. & N. Kaptanoğlu (2011), "The Politics of Trade and Turkish Foreign Policy", *Middle Eastern Studies*, 47(5), 705-724.

Kocaarslan, B. & U. Soytas (2019), "Asymmetric Pass-Through Between Oil Prices and the Stock Prices of Clean Energy Firms: New Evidence from a Nonlinear Analysis", *Energy Reports*, 5, 117-125.

Kurov, A. & R. Stan (2018), "Monetary Policy Uncertainty and the Market Reaction to Macroeconomic News", *Journal of Banking & Finance*, 86, 127-142.

Lahiani, A. & S. Hammoudeh & R. Gupta (2016), "Linkages between Financial Sector CDS spreads and Macroeconomic Influence in a Non-linear Setting", *International Reviews of Economics and Finance*, 43, 443-456.

Liang, C.C. & C. Troy & E. Rouyer (2020), "U.S. Uncertainty and Asian Stock Prices: Evidence from the Asymmetric NARDL Model", *The North American Journal of Economics and Finance*, 51, 101046.

Mensi, W. & S. Hammoudeh & S.J.H. Shahzad & M. Shahbaz (2017), "Modelling Systemic Risk and Dependence Structure Between Oil and Stock Markets Using A Variational Mode Decomposition-Based Copula Method", *Journal of Banking and Finance*, 75, 258-279.

Nowzohour, L. & L. Stracca (2017), "More than a Feeling: Confidence, Uncertainty and Macroeconomic Fluctuations", *ECB Working Paper No. 2100*.

Ordu-Akkaya, B.M. (2019), "US Economic Policy Uncertainty and Loan Growth: Evidence from Turkey", *Üçüncü Sektör Sosyal Ekonomi Dergisi*, 54, 1049-1063.

Osnago, A. & R. Piermartini & N. Rocha (2015), "Trade Policy Uncertainty as Barrier to Trade", *WTO Staff Working Papers ERSD-2015-05*, World Trade Organization (WTO), Economic Research and Statistics Division.

Perez-Liston, D. & D. Huerta-Sanches & J. Gutierrez (2018), "Do Domestic Sentiment and The Spillover of U.S. Investor Sentiment Impact Mexican Stock Market Returns?", *Journal of Emerging Market Finance*, 17, 1-28.

Pesaran, M.H. & Y. Shin (1998), "An autoregressive distributed-lag modelling approach to cointegration analysis", *Economic Soc. Monogr*., 31, 371-413.

Phillips, P.C.B. & P. Perron (1988), "Testing for a unit root in time series regressions", *Biometrica*, 75(2), 335-346.

Pierce, J.R. & P.K. Schott (2016), "Trade Liberalization and Mortality: Evidence from U.S. Counties", *NBER Working Papers* 22849, National Bureau of Economic Research, Inc.

Puri, M. & J. Rocholl & S. Steffen (2011), "Global Retail Lending in the Aftermath of the U.S. Financial Crisis: Distinguishing between Supply and Demand Effects", *Journal of Financial Economics*, 100(3), 556-578.

Quagliariello, M. (2009), "Macroeconomic Uncertainty and Banks' Lending Decisions: The Case of Italy", *Applied Economics*, 41(3), 323-336.

Rodrik, D. (1991), "Policy Uncertainty and Private Investment in Developing Countries", *Journal of Development Economics*, 36(2), 229-242.

Sayim, M. & H. Rahman (2015), "The Relationship Between Individual Investor Sentiment, Stock Return and Volatility: Evidence from the Turkish Market", *International Journal of Emerging Markets*, 10(3), 504-520.

Shahzad, S.J.H. & S.M. Nor & R. Ferrer & S. Hammoudeh (2017), "Asymmetric determinants of CDS spreads: U.S. industry-level evidence through the NARDL approach", *Economic Modelling*, 60, 211-230.

Shin, Y. & B. Yu & M. Greenwood-Nimmo (2014*)*, "Modelling asymmetric cointegration and dynamic multipliers in a non-linear ARDL framework", in: *Festschrift in Honor of Peter Schmidt*, Springer, New York, NY, 281-314.

Steinberg, J.B. (2019), "Brexit And the Macroeconomic Impact of Trade Policy Uncertainty", *Journal of International Economics*, 117, 175-195.

Verma, R. & G. Soydemir (2006), "The Impact of U.S. Individual and Institutional Investor Sentiment on Foreign Stock Markets", *Journal of Behavioural Finance*, 7(3), 128-144.

Zanotti, J. & C. Thomas (2020), "Turkey-US relations: Timeline and brief historical context", *Congressional Research Service*, version 5.

APPENDIX

Table: A.1
Granger Causality Test Result (EPUGLOBAL-TPU)

	H_0: TPU does not Granger cause EPUGLOBAL	H_0: EPUGLOBAL does not Granger cause TPU
Lags	2	
F-Statistics	3.2076	0.7655
Prob	0.0426	0.4665

Lag lengths are determined by using Schwarz Information Criteria. EPUGLOBAL refers to the global economic policy uncertainty index, which is constructed by Baker et al. (2016). EPUGLOBAL is obtained from <www.policyuncertainty.com.>.

Table: A.2
Correlation Table (RA-TPU)

Correlation Probability	RA	TPU
RA	1.0000	
TPU	0.6470	1.0000
	(0.0000)	

Values in the parentheses show the probabilities. R.A. refers to the time-varying risk aversion index constructed by Bekaert et al. (2019).

Table: A.3
Correlation Table (LNFI-TPU)

Correlation Probability	LNFI	TPU
LNFI	1.0000	
TPU	-0.2761	1.0000
	(0.0002)	

Values in the parentheses show the probabilities. LNFI refers to the log levels of the foreign stock investment in Turkey. The data is obtained from the Central bank of Turkey database.

Table: A.4.
Correlation Table (DLNFTV-TPU)

Correlation Probability	DLNFTV	TPU
DLNFTV	1.0000	
TPU	-0.0431	1.0000

DLNFTV refers to the log first difference of the foreign trade volume (import plus export) between Turkey and the U.S. The data is obtained from the Central Bank of Turkey database.