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The Impact of Expectations and Uncertainty on Export Dynamics:

Evidence from Türkiye

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Abstract

Becoming integrated into global markets has long been recognized as a key driver of economic growth and development. Uncertainty, especially in policy and market expectations, is increasingly shaping the landscape despite the acknowledged benefits of trade. The specific mechanisms through which expectations and uncertainty affect export dynamics in Türkiye are investigated in this study. The study aims to provide nuanced insights into exporters' behavior in response to different levels of uncertainty and expectations by employing a rigorous empirical approach and using comprehensive data sources. The Nonlinear Autoregressive Distributed Lag (NARDL) model (Shin et al. 2014) is employed to investigate the asymmetric effects of the real exchange rate and foreign trade expectations on Turkish exports. Quarterly data from Türkiye, ranging from 2011.Q1 to 2023.Q4, are used to investigate the asymmetric effects of exporting expectations on exporting volume. By addressing these issues, this research aims to contribute to a deeper understanding of how expectations and uncertainties shape export dynamics and provide practical recommendations for policymakers to promote sustainable economic growth through enhanced trade strategies.

1. Introduction

Trade integration into global markets has long been recognized as a key driver of economic growth and development. From classical theories proposed by Adam Smith to the more contemporary frameworks of endogenous growth theory (Grossman and Helpman, 1993), the consensus is clear: trade plays a fundemental role in facilitating the transfer of knowledge, innovation, and technological advancements. These mechanisms not only enhance productivity but also create opportunities for countries to specialize, exploit comparative advantages, and achieve higher growth trajectories. Empirical evidence consistently reinforces this narrative. Seminal studies, such as those by Dollar and Kraay (2003) and Frankel and Romer (2017), illustrate how trade integration has led to improved economic performance across diverse regions and income levels, emphasizing its universal relevance.

However, despite the widespread acknowledgment of trade's benefits, the evolving global economic landscape presents new challenges, particularly in the form of heightened uncertainties. Policy ambiguities and fluctuating market expectations have emerged as critical factors that complicate the trade environment. Recent research underscores the profound impact of trade policy uncertainty on exporters' strategic decisions. For instance, studies by Caldara et al. (2020) and Handley (2014) highlight how uncertainty can delay market entry and dampen exporters' responsiveness to tariff reductions, thus stifling potential gains from trade liberalization. This growing body of work underscores the importance of expectations in shaping trade behaviors and, by extension, broader economic outcomes.

In addition to policy uncertainty, exchange rate volatility has been a longstanding issue in international trade. Volatile exchange rates can introduce substantial risks and costs for exporters, influencing both short-term trade flows and long-term investment decisions. The international trade literature offers a nuanced perspective on this phenomenon. Studies such as De Grauwe (1988) and Doganlar (2002) suggest that the effects of exchange rate fluctuations are contingent on market conditions and traders' risk tolerance. More recently, Arize et al. (2021) have explored how these dynamics evolve under different economic environments, shedding light on both the adverse and potentially positive impacts of exchange rate volatility on trade performance.

Building on this rich body of literature, the aim of this paper is to analyze the asymmetric effects of exchange rate volatility and export expectations on exports after controlling for the other factors that have an impact on export decisions for Türkiye. By employing robust empirical methodologies and leveraging comprehensive datasets, the research provide detailed insights into how exporters adapt to varying levels of uncertainty and evolving expectations.

Türkiye presents a compelling case study for examining the interplay between expectations, uncertainty, and export dynamics due to its unique position in the global economy and its exposure to various economic and geopolitical risks. As a strategically located emerging market, Türkiye acts as a bridge between Europe, Asia, and the Middle East, making it a critical hub for international trade flows. Over the past two decades, the country has experienced significant trade liberalization and economic integration, reflected in its Customs Union agreement with the European Union and its expanding trade partnerships in diverse regions. However, Türkiye's economy has also been characterized by persistent exchange rate volatility, high inflation, and political uncertainties, all of which have significant implications for trade and investment decisions. These factors make Türkiye an ideal case for understanding how exporters adapt to fluctuating economic conditions and policy changes.

Focusing on Türkiye, a country with a dynamic trade environment, researchers have extensively studied the link between exchange rate volatility and exports. Acaravcı and Öztürk (2002) investigated the

period from 1989 to 2002, revealing that heightened volatility and uncertainty significantly curtailed export demand. Conversely, Tatlıyer and Yiğit (2016) presented a more complex picture, identifying a long-term positive relationship between exchange rate volatility and exports while noting that this effect diminishes in the short term. These findings highlight the intricate and context-dependent nature of the relationship, underscoring the need for further investigation.

The contribution of this study is two fold. Although the impact of expectations on export decisions are theoretically discussed in international trade literature, to the best of out knowledge this study is the first that empirically tests this relation. This approach not only contributes to the academic discourse but also holds practical implications for policymakers striving to enhance export competitiveness in an uncertain global economic environment.

The second contribution of this study is that it employs a unique data on export expectations. Ministry of Trade of Türkiye conducts foreign trade expectations survey which reflects the current assessments and future expectations of the companies that direct Turkish foreign trade, every quarter. To the best of our knowledge, this study is the first that utilize this data to identify the asymmetric effects of export expectations on export decisions.

The model used in this paper is the Nonlinear Autoregressive Distributed Lag (NARDL) model, developed by Shin et all (2014). It is a robust econometric framework used to examine asymmetric relationships between variables over both short and long-term horizons. By decomposing explanatory variables into their positive and negative partial sums, the NARDL model enables the identification of differential impacts that increases and decreases in an independent variable have on the dependent variable. This nuanced approach provides a deeper understanding of complex economic dynamics (Ghorbel et al,2022).

In this study, the NARDL model has been employed to investigate the positive and negative effects of the real effective exchange rate and expectations on Turkish exports. The analysis reveals distinct short- and long-run dynamics influencing Turkish export performance. In the long run, previous export levels negatively impact current exports, potentially reflecting structural constraints or market saturation, while negative export expectations significantly reduce exports, underscoring exporters' sensitivity to pessimism. Real exchange rate depreciation boosts exports by enhancing competitiveness, though exchange rate volatility weakly dampens export volumes due to uncertainty aversion.

Short-run dynamics mirror some of these trends, with past exports again showing a negative influence and negative expectations reducing export performance. However, EU GDP emerges as a key short-term driver, underscoring Türkiye's economic interdependence with its largest trading partner. Unlike the long run, exchange rate changes and volatility are less impactful in the short term, likely due to contract rigidities. The NARDL model underscores the asymmetry in exchange rate volatility and expectations, highlighting the need for exchange rate stability and strategic communication to mitigate negative market sentiments, alongside efforts to strengthen trade relations with the EU.

The next section discuss the methodology of the paper. Section 3 explains the key variables and the data sources used in the analysis. Section 4 provides the evidence on the effects of expectations on exports in Türkiye and Section 4 also presents the roubustness analysis. The final section concludes.

2. Methodology

This section provides a step-by-step guide to the methodology of the NARDL model, detailing the processes of model specification, estimation, and interpretation. It highlights the essential procedures for analyzing asymmetric relationships over both short and long-term horizons. The section also includes a thorough explanation of asymmetry testing, covering the decomposition of explanatory variables into

positive and negative changes, the development of hypotheses to capture asymmetric effects. These methodological steps are designed to enable a precise and reliable application of the NARDL model, offering deep insights into the varying impacts of changes in independent variables.

Symmetric ARDL (Autoregressive Distributed Lag) model, is a combination of autoregressive (AR) capturing the lag effects of the dependent variable on itself and distributed lag (DL) components capturing the lagged effects of the independent variable on the dependent variable, is widely used to analyze the dynamic relationship between at least two variables over time. The representation of symmetric ARDL bound test approach based on unrestricted error correction model is;

$$\Delta y_t = \beta_0 + \rho y_{t-1} + \theta x_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta y_{t-i} + \sum_{i=0}^{k} \pi_i \Delta x_{t-i} + e_t \tag{1.1}$$

where ρ and θ represent the long term coefficients, γ_i and π_i represent short term coefficients and e_t represents the error term (Pesaran et al. 2001). The linearity assumption in ARDL models may be unrealistic and unable to account for asymmetric relationships between variables. Shin et al. (2014) developed asymmetric ARDL called NARDL model to insert asymmetric relationship between variables. The asymmetric long-run regression model is defined by Shin et al .(2014), and is represented as follows;

$$y_t = \beta_0 + \beta_1^+ x_t^+ + \beta_1^- x_t^- + e_t \tag{1.2}$$

where y_t and x_t are I(1) variables with x_t decomposed into $x_t = x_0 + x_t^+ + x_t^-$ where x_t^+ and x_t^- are partial sum process of positive and negative changes in x_t respectively;

$$x_t^+ = \sum_{j}^{k} \Delta x_j^+ = \max(\Delta x_j, 0) \tag{1.3}$$

$$x_t^- = \sum_{j}^{k} \Delta x_j^- = \min(\Delta x_j, 0) \tag{1.4}$$

Equations (1.3) and (1.4) offer a simple way to model asymmetric cointegration. The generalized form of the equations (1.3) and (1.4) is;

$$z_t = \beta_0^+ y_t^+ + \beta_0^- y_t^- + \beta_1^+ x_t^+ + \beta_1^- x_t^- \tag{1.5}$$

The stationary linear combination of the partial sum components (Schorderet, 2001) is defined by equation (1.5) where y_t and x_t are asymmetrically cointegrated if z_t is stationary, y_t and x_t can be symmetrically cointegrated in the special case of equation (1.5) ($\beta_0^+ = \beta_0^-$ and $\beta_1^+ = \beta_1^-$). Shin et al. (2014) consider the $\beta_0^+ = \beta_0^- = \beta_0$ restriction which is an implication of $\beta^+ = \beta_1^+/\beta_0$ and $\beta^- = \beta_1^-/\beta_0$. On this basis, the following nonlinear ARDL (p,q) model is proposed by Shin et al. (2014):

$$y_t = \sum_{i=1}^{p} \phi_j y_{t-i} + \sum_{i=1}^{q} (\theta_i^{+'} x_{t-i}^+ + \theta_i^{-'} x_{t-i}^-) + \varepsilon_t \tag{1.6}$$

where x_t is a $kx1$ explanatory variable vector, defined as $x_t = x_0 + x_t^+ + x_t^-$, θ_i is the autoregressive parameter, θ_i^+ and θ_i^- are the asymmetric distributed lag parameters and ε_t is an *i.i.d.* with zero mean and constant variance error term. Combining model (1.1) and (1.6) Shin et al. (2014) provided the following NARDL ECM;

$$\Delta y_t = \rho y_{t-1} + \theta_1^+ x_{t-1} + \theta_2^- x_{t-1} + \sum_{i=1}^{p-1} \gamma_i \Delta y_{t-i} + \sum_{i=0}^{q-1} (\pi_i^+ \Delta x_{t-i}^+ + \pi_i^- \Delta x_{t-i}^-) + e_t \qquad (1.7.a)$$

$$\Delta y_t = \rho \xi_{t-1} + + \sum_{i=1}^{p-1} \gamma_i \Delta y_{t-i} + \sum_{i=0}^{q-1} (\pi_i^+ \Delta x_{t-i}^+ + \pi_i^- \Delta x_{t-i}^-) + e_t \qquad (1.7.b)$$

Where ρ and θ_i indicate long term parameters, γ_i and π_i indicate short term parameters and e_t is an *i.i.d.* with zero mean and constant variance error term. In the model (1.7.2) $\xi_{t-1} = y_t - \beta^+ x_t^+ - \beta^- x_t^-$ is the nonlinear error correction term. $\beta^+ = \frac{-\theta^+}{\rho}$ and $\beta^- = \frac{-\theta^-}{\rho}$ indicate the long term asymmetric coefficients and $\sum \pi_i^+$ and $\sum \pi_i^-$ are short term asymmetric coefficients.

The NARDL model typically follows a similar structure with symmetric ARDL but incorporates non-linear terms. While ARDL models are effective for linear relationships and general dynamic analysis, NARDL models extend this capability by accommodating nonlinearities and asymmetric effects, offering richer insights into the complexities of real-world data. Since the NARDL model is linear in all parameters, it can be estimated using OLS and is able to explain not only long-run but also short-run asymmetries (Allen and McAleer, 2021).

Testing the Asymmetry

The following null hypothesis, which imply that there is no cointegration, are tested to investigate for the presence of cointegration.

$H_0: \rho = \theta_1^+ = \theta_1^-$

There is cointegration between variables when the null hypothesis is rejected (Pesaran, 2001 and Narayan, 2004)). The following hypothesis is then tested to investigate the existence of asymmetry.

$H_0: \theta = 0$
$H_1: \theta < 0 \ (precence \ of \ asymmetry)$

There is an asymmetric relationship between the variables when the null hypothesis is rejected (Banerjee, Dolado, and Mestre, 1998). The long term asymmetry can be tested via following null hypothesis.

$H_0: -\dfrac{\theta_1^+}{\rho} = -\dfrac{\theta_2^-}{\rho}$

There is no asymmetric effect of the explanatory variable on the dependent variable if the null hypothesis is not rejected.

The NARDL model offers significant advantages for analyzing time-series data, particularly in capturing asymmetric relationships between variables. By decomposing explanatory variables into positive and negative partial sums, it provides a nuanced understanding of how increases and decreases in an independent variable differently affect the dependent variable. The model accommodates both stationary and non-stationary variables, simplifying the process by reducing the need for pre-testing for unit roots. Its use of bounds testing to identify long-run relationships ensures robustness across varying integration orders, improving the reliability of long-term insights. The model is estimated using ordinary least squares (OLS), facilitating straightforward application and interpretation of short- and long-term effects. Additionally, its suitability for small sample sizes makes it a practical choice for cases with limited data availability (Shin et al, 2014, Allen and McAleer, 2020, and Ghorbel et al, 2022).

3. Data

Quarterly data for Türkiye are employed to explore the asymmetric effects of export expectations on export volume for Türkiye. The quarterly time-series data choice is based on the unavailability of reliable monthly or high-frequency data on macroeconomic indicators. This paper covers the period from 2011.Q1 to 2023.Q3. To identify the export expectations effects on export volume, we set up an export model which includes foreign demand, domestic product, export expectations, exchange rate, and exchange rate volatility. The data are derived from various databases that we explain below.

The export volume index based on 2015 is the dependent variable in the model which is accumulated from Turkish Statistical Institute (Turkstat).

Export expectation index are obtained from Ministry of Trade whom conducts foreign trade expectations survey every quarter. The survey reflects the current assessments and future expectations of the companies that direct Turkish foreign trade. And also the survey helps to produce indexes that are indicative. The Export and Import Expectation Indices are developed from aggregated responses to targeted survey questions, designed to capture firms' expectations across multiple dimensions, including economic trends and market conditions, for future periods. These indices serve as comprehensive measures, reflecting both overall business sentiment and more granular insights into sectoral and regional outlooks. By synthesizing data from carefully selected survey questions, the indices provide a nuanced understanding of the optimism or pessimism prevailing among firms regarding export and import activities. For the purposes of this study, the Overall Export Expectation Index has been utilized as a key indicator to analyze firms' aggregate expectations concerning export performance.

Since European Union is the biggest export market for Türkiye, GDP chain linked volumes (2015) of EU is used as foreign demand is derived from European statistics (Eurostat).

CPI based (2003=100) reel effective exchange rate data is gathered from The Central Bank of the Republic of Türkiye (CBRT) and the exchange rate GARCH volatility which is calculated according to 3 months end, is gathered from Bloomberg.

Table 1. Descriptive Statistics

Statistics	EU GDP	Export	Expectations	REER	Volatility
Mean	2981603	113.773	112.912	86.230	13.660
Median	2983535	111.351	111.700	92.838	11.870
Maximum	3344994	163.539	142.900	114.245	40.950
Minimum	2680038	77.161	83.506	48.280	5.800
Std. Dev.	183.572	22.370	10.534	20.904	7.063
Skewness	0.171	0.462	0.107	-0.319	2.413
Kurtosis	1.847	2.170	3.835	1.622	9.217
Jarque-Bera Probability	3.076 (0.215)	3.276 (0.194)	1.578 (0.454)	4.904 (0.086)	131.630 (0.000)

Table 1 presents the descriptive statistics for each variable, providing insights into the central tendency (mean, median), dispersion (standard deviation), and the distribution shape (skewness, kurtosis). Both EU GDP and Exports exhibit relatively stable distributions, characterized by slight positive skewness and moderate variability. Expectations have a low standard deviation, indicating a high degree of consistency, but their distribution is more peaked compared to a normal distribution. REER displays some skewness and a wide range of values, with a slight leftward skew, suggesting a concentration of

lower values. Finally, Volatility is highly variable, showing extreme fluctuations and a markedly non-normal distribution, as indicated by both its kurtosis and Jarque-Bera test results.

Table 2 shows the correlations between the variables. The relationship between EUGDP (GDP) and EX (exports) is strongly positive, indicating that as GDP increases, exports tend to grow as well. Conversely, EUGDP and REER (Real Effective Exchange Rate) are strongly negatively correlated, suggesting that a stronger economy (higher GDP) is linked to a lower REER, likely due to currency appreciation. Similarly, EX and REER exhibit a strong negative correlation, showing that higher exchange rates lead to lower exports. The variable EXPECT (expectations) displays weak or negligible correlations with most other variables, suggesting that expectations are not always in sync with other factors like GDP, exports, or the exchange rate. Lastly, VOL (volatility) shows moderate correlations with other variables, indicating that economic fluctuations are somewhat related to GDP, exports, and exchange rates.

Table 2. Correlations

Variable	EUGDP	EX	EXPECT	REER	VOL
EUGDP	1	0.924	0.118	-0.850	0.402
EX		1	0.128	-0.907	0.419
EXPECT			1	-0.102	0.162
REER		Symmetrical		1	-0.524
VOL					1

Although there is no high correlation between export and export expectation series in Türkiye, export expectation, is a function of firms' expectations for the future, shape for next period.

The lagged value of the expectation series is used in the model as the export expectation series measures the expectation for the next period in the current period. Using the log of one or more variables instead of the unlogged form makes the effective relationship nonlinear, while still maintaining the linear model (Benoit, 2011). Therefore, logarithmic forms of variables are used in the model. All the series in the model are seasonally unadjusted. The model includes the seasonal dummy variables to overcome the exhibited seasonal pattern. The dummy variable to distinguish the effects of covid 19 pandemic is inserted the model.

4. Empirical Results

In order to investigate the asymmetric effects of the real exchange rate and foreign trade expectations on Turkish exports, the NARDL model is employed. Table 3 shows the results of the estimated NARDL model, including expectation and REER asymmetries. The model includes both long-run and short-run effects of the variables. We have also tested for econometric problems.

Then we used the Wald test to determine the statistical significance of the variables in the short run and also in the long run. We also used the Wald test to test the existence of asymmetry. The results of the Wald test are shown in table 4.

Table 3. NARDL Model Estimation Results

Dependent Variable: D(LEX) and Selected Model: ARDL(4, 4, 0, 3, 2, 0, 0)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.610	5.141	0.508	0.617
LEX(-1)	-0.918***	0.185	-4.956	0.000
LEUGDP(-1)	0.122	0.372	0.329	0.745
LEXPECT_POS	0.090	0.128	0.705	0.488
LEXPECT_NEG(-1)	0.268*	0.133	2.022	0.055
LREER_POS(-1)	0.034	0.202	0.167	0.869
LREER_NEG	-0.435***	0.114	-3.825	0.001
LVOL	-0.043*	0.024	-1.771	0.09
D(LEX(-1))	0.265	0.159	1.670	0.108
D(LEX(-2))	-0.017	0.155	-0.111	0.913
D(LEX(-3))	-0.414**	0.166	-2.492	0.020
D(LEUGDP)	1.810***	0.500	3.620	0.001
D(LEUGDP(-1))	0.172	0.598	0.288	0.776
D(LEUGDP(-2))	0.171	0.537	0.318	0.753
D(LEUGDP(-3))	1.324**	0.478	2.770	0.011
D(LEXPECT_NEG)	0.087	0.148	0.591	0.560
D(LEXPECT_NEG(-1))	0.351**	0.161	2.175	0.040
D(LEXPECT_NEG(-2))	0.161	0.149	1.076	0.293
D(LREER_POS)	-0.074	0.181	-0.411	0.685
D(LREER_POS(-1))	-0.272	0.178	-1.531	0.139
@SEAS(1)	-0.024	0.051	-0.466	0.646
@SEAS(2)	-0.099*	0.050	-1.996	0.058
@SEAS(3)	-0.099**	0.041	-2.411	0.024
DUM_2020Q1Q2	-0.043	0.049	-0.880	0.388
JB	2.817		BG-LM	2.503*
ARCH (4)	0.472		RESET	0.169
*, ** and *** significant at 10%, 5% and 1% levels of significance respectively.				

Table 4. Wald test results

Wald Test Hypothesis	The Null Hypothesis	Chi-Square statistics	Result
C(4)=C(5)	The total long-run effect of positive expectation variation and the total long-run effect of negative expectation variation have the same effect on Turkish exports.	6.181** (0.012)	Expectations series have an asymmetric effect on Turkish total exports in the long run.
C(6)=C(7)	Total long-run effect of REER positive variation and total long-run effect of REER negative variation have the same effect on Turkish export.	10.051*** (0.002)	REER series have an asymmetric effect on Turkish total exports in the long run.
C(9)+C(10)+ C(11)=0	The total short-run effect of export lags on Turkish export is zero.	0.2313 (0.631)	Null hypothesis cannot be rejected at conventional significance levels. Export lags have no statistically significant on Turkish exports in the short run.

C(12)+C(13) +C(14)+C(15)=0	The total effects of European Union Gross Domestic Product on Turkish export is zero in short run.	7.602*** (0.006)	European Union's gross domestic product has a positive effect on Türkiye's total export in the short run.
C(16)+C(17) +C(18)=0	The total effects of negative export expectation on Turkish export is zero in short run.	2.804* (0.094)	Negative changes in export expectations have positive effect on Turkish export in the short run.
C(19)+C(20) =0	The total effects of positive REER on Turkish export is zero.	1.665 (0.197)	The null hypothesis cannot be rejected at conventional significance levels. Positive changes in the REER have no statistically significant effect on Turkish exports in the short run.

*, ** and *** significant at 10%, 5% and 1% levels of significance respectively. The values in the parentheses are the p values.

The empirical results provide a comprehensive understanding of the dynamics affecting Turkish exports. These findings collectively highlight the nuanced interplay between market conditions, exporter sentiment, and macroeconomic factors in shaping Türkiye's export dynamics Key findings include:

➢ Long-Run Dynamics:
- Previous export levels exhibit a negative impact on current exports, indicating potential structural or market saturation effects over time.
- While positive export expectations do not show a significant effect, negative expectations result in a measurable decline in exports. This asymmetry underscores the sensitivity of exporters to pessimistic market outlooks.
- Real exchange rate depreciation is observed to positively influence export performance, suggesting enhanced competitiveness of Turkish goods in foreign markets.
- Volatility in exchange rates weakly decreases export volumes, reflecting exporters' aversion to heightened uncertainty.

➢ Short-Run Dynamics
- Similar to the long run, past export levels negatively impact current exports, hinting at inertia or lagged adjustment mechanisms within the trade environment.
- EU GDP emerges as a critical driver of Turkish exports in the short term, emphasizing the interdependence between Türkiye and its largest trading partner.
- Positive export expectations fail to show a statistically significant impact, whereas negative expectations again lead to a decline in export performance, mirroring long-term patterns.
- In contrast to the long-run findings, real exchange rate movements and volatility do not exhibit a significant influence in the short run, possibly due to the temporal rigidity of trade contracts.

The results of the NARDL model indicate both short-run and long-run asymmetries in the relationship between exchange rate volatility, export expectations, and Turkish export performance. The significant negative impact of REER volatility on exports suggests that policy measures aimed at stabilizing exchange rates could enhance export competitiveness. Similarly, the finding that negative export expectations influence exports in the short run underlines the need for effective communication strategies to manage market sentiments and expectations.

Further, the analysis highlights the strong positive relationship between EU GDP and Turkish exports in the short term, reaffirming the critical role of Türkiye's integration with European markets. Policy efforts should continue to focus on strengthening trade agreements and partnerships with the EU.

Robustness

The robustness checks further validate the reliability of the model and its findings. Two alternative specifications were teste. Firstly, we estimated the model with only expectations asymmetry instead of both expectations and REER asymmetries. Secondly, we added a dummy variable for 2020.Q2. The robustness results are in table 5 and table 6 respectively.

Table 5. Robustness model-1 results

Dependent Variable: D(LEX) and Selected Model: ARDL(4, 4, 0, 3, 2, 0, 0)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	2.519	5.159	0.488	0.630
LEX(-1)	-0.903***	0.188	-4.811	0.000
LEUGDP(-1)	0.124	0.373	0.332	0.743
LEXPECT_POS	0.063	0.124	0.510	0.615
LEXPECT_NEG(-1)	0.260*	0.132	1.972	0.061
LREER_POS(-1)	0.042	0.203	0.207	0.838
LREER_NEG	-0.442***	0.115	-3.830	0.001
LVOL	-0.044*	0.025	-1.786	0.087
D(LEX(-1))	0.249	0.159	1.568	0.131
D(LEX(-2))	-0.032	0.154	-0.207	0.838
D(LEX(-3))	-0.422**	0.175	-2.409	0.024
D(LEUGDP)	2.081***	0.344	6.056	0.000
D(LEUGDP(-1))	0.350	0.521	0.672	0.508
D(LEUGDP(-2))	0.294	0.503	0.585	0.564
D(LEUGDP(-3))	1.363**	0.508	2.681	0.013
D(LEXPECT_NEG)	0.103	0.154	0.673	0.508
D(LEXPECT_NEG(-1))	0.360**	0.169	2.131	0.044
D(LEXPECT_NEG(-2))	0.157	0.150	1.045	0.307
D(LREER_POS)	-0.070	0.182	-0.384	0.704
D(LREER_POS(-1))	-0.275	0.185	-1.483	0.152
@SEAS(1)	-0.006	0.043	-0.135	0.894
@SEAS(2)	-0.091*	0.047	-1.957	0.063
@SEAS(3)	-0.088**	0.036	-2.438	0.023
DUM_2020Q1	-0.035	0.046	-0.761	0.454
JB	2.821		BG-LM	2.537*
ARCH(4)	0.450		RESET	0.296
*, ** and *** significant at 10%, 5% and 1% levels of significance respectively.				

The first model confirms the significance of negative export expectations in influencing export dynamics, aligning with the main findings. The exclusion of REER asymmetry did not materially alter the core results, indicating the robustness of the expectation effects.

Table 6. Robustness model-2 results

Dependent Variable: D(LEX) and Selected Model: ARDL(4, 4, 0, 3, 2, 4)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	1.707	6.890	0.248	0.807
LEX(-1)	-0.858***	0.201	-4.264	0.000
LEUGDP(-1)	0.384	0.481	0.799	0.434
LEXPECT_POS	0.045	0.139	0.325	0.749
LEXPECT_NEG(-1)	0.140	0.129	1.087	0.290
LREER(-1)	-0.686***	0.136	-5.039	0.000
LVOL(-1)	-0.057	0.038	-1.531	0.141
D(LEX(-1))	0.236	0.173	1.368	0.187
D(LEX(-2))	-0.164	0.187	-0.875	0.392
D(LEX(-3))	-0.342*	0.182	-1.876	0.075
D(LEUGDP)	2.196***	0.606	3.622	0.002
D(LEUGDP(-1))	-0.153	0.593	-0.258	0.799
D(LEUGDP(-2))	0.339	0.565	0.599	0.556
D(LEUGDP(-3))	0.950*	0.510	1.865	0.077
D(LEXPECT_NEG)	0.254	0.179	1.415	0.172
D(LEXPECT_NEG(-1))	0.544***	0.174	3.121	0.005
D(LEXPECT_NEG(-2))	0.267	0.162	1.651	0.114
D(LREER)	-0.232	0.174	-1.330	0.199
D(LREER(-1))	0.159	0.184	0.863	0.399
D(LVOL)	-0.021	0.033	-0.620	0.542
D(LVOL(-1))	-0.014	0.041	-0.348	0.732
D(LVOL(-2))	-0.027	0.027	-1.011	0.324
D(LVOL(-3))	-0.041*	0.022	-1.870	0.076
@SEAS(1)	0.011	0.056	0.188	0.853
@SEAS(2)	-0.081	0.052	-1.568	0.133
@SEAS(3)	-0.057	0.043	-1.316	0.203
DUM_2020Q1Q2	0.021	0.058	0.361	0.722
JB	1.391		BG-LM	1.209
ARCH (4)	2.454*		RESET	0.025
*, ** and *** significant at 10%, 5% and 1% levels of significance respectively.				

The second model, which included a dummy variable capturing the impact of COVID-19 in the second quarter of 2020, showed consistency in the estimated effects of key variables. The pandemic-related dummy variable was not statistically significant, suggesting that its impact on exports may have been short-lived or absorbed by other variables.

We observed the same effects of the variables specially the expectation series' effect on Turkish exports in different models. These robustness checks reinforce the validity of the empirical results, demonstrating that the core findings are stable across alternative model specifications.

5. Conclusion

This study provides a comprehensive analysis of the impact of expectations and uncertainty on Turkish export dynamics. By employing the NARDL model, the findings reveal both short- and long-term asymmetries in the relationship between exchange rate volatility, trade expectations, and export performance.

In the long run, negative export expectations and exchange rate volatility are found to significantly dampen export levels. While real exchange rate depreciation enhances competitiveness and positively

influences exports, past export levels exhibit a negative impact, potentially due to market saturation or structural limitations. In the short run, the effects of EU GDP on Turkish exports stand out, highlighting the critical role of Türkiye's largest trading partner in driving export performance.

The robustness checks confirm the stability of these findings, even under alternative specifications. The inclusion of a COVID-19-related dummy variable and models focusing solely on expectation asymmetries further validate the core results.

These insights underline the importance of stabilizing macroeconomic conditions, particularly in managing exchange rate volatility, and addressing negative market expectations. By leveraging these findings, policymakers can implement strategies to enhance trade resilience and foster sustainable economic growth.

6. Policy Recommendation

The findings of this study underscore the critical role of macroeconomic stability, policy certainty, and strategic partnerships in enhancing Türkiye's export performance.

Firstly, the observed negative impact of exchange rate volatility on exports calls for immediate action by the Central Bank of Türkiye to stabilize the Turkish lira. Policies such as increasing foreign exchange reserves and implementing strategic market interventions could provide much-needed stability to the currency market.

Secondly, the asymmetric effects of negative export expectations highlight the importance of targeted interventions. Government-led export credit guarantees and promotional campaigns in key international markets could mitigate the pessimistic outlooks among exporters, encouraging a more favorable trade environment.

Additionally, the substantial short-term impact of EU GDP on Turkish exports reaffirms the importance of Türkiye's trade relationship with the European Union. Negotiating more comprehensive trade agreements that ensure access to emerging market segments while maintaining competitive tariff structures could yield significant benefits.

Furthermore, leveraging digital tools to streamline customs and export procedures is crucial. Such measures could reduce transaction costs, enhance efficiency, and help exporters navigate the complexities of global trade with greater ease.

Stable and predictable trade policies are also vital for reducing uncertainty and fostering an environment where exporters feel confident to explore new markets. Effective management of exchange rate dynamics is key to mitigating the adverse effects of volatility on exports and ensuring broader economic stability.

Finally, providing exporters with targeted support and timely information about market conditions and policy changes will enhance their resilience and competitiveness in the global marketplace. These recommendations collectively offer a pathway to strengthen Türkiye's position in international trade while addressing the challenges identified in this study.

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