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STRONG UNION OR JUST FRIENDSHORING? ASSESSING TRADE UNCERTAINTY AND EXPORT PATTERNS IN TÜRKİYE AND EU-27 COUNTRIES: A GWR APPROACH

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ABSTRACT

In the last twenty years, the world has witnessed many structural shocks originating from political, financial, and epidemic diseases. While these shocks deeply affect countries' economies, they also increase the level of uncertainty on a global scale. In order to establish more resilient systems based on the shocks experienced, countries have turned to developing their trade relations and reviving the trade that has shrunk during crisis periods. In this context, the concept of "friendshoring" that emerged refers to strengthening trade between countries with similar political and economic values. This study examined the connection between trade uncertainty and bilateral trade relations within Türkiye and EU-27 countries using the Geographically Weighted Regression (GWR) method. An analysis of bilateral export flows from 2003 to 2022, in conjunction with the World Trade Uncertainty Index (WTUI) developed by Ahir, Bloom, and Furceri (2022), indicates that trade uncertainty significantly affected exports in only four EU member states: Poland, Hungary, Slovakia, and Croatia. This result shows that, despite the overall unity of the European Union, only certain groups of countries demonstrate trade resilience in times of crisis and that the friendshoring approach is gaining increasing importance within the Union.

Keywords: Exports, Trade Policy Uncertainty, GWR, EU-27.

GÜÇLÜ BİRLİK Mİ YOKSA SADECE SINIR İŞ BİRLİĞİ Mİ? TÜRKİYE VE AB-27 ÜLKELERİNİN İHRACAT VE TİCARET BELİRSİZLİĞİ ARASINDAKİ İLİŞKİNİN GWR TEKNİĞİ İLE İNCELENMESİ

ÖZ

Son yirmi yılda dünya, politik, finansal ve salgın hastalıklar kökenli birçok yapısal şoka sahne olmuştur. Bu şoklar ülkelerin ekonomilerini derinden etkilerken aynı zamanda da küresel ölçekte belirsizlik düzeyini de arttırmaktadırlar. Ülkeler yaşanılan şoklardan hareketle daha dayanıklı sistemler kurabilmek adına ticari ilişkilerini geliştirme ve kriz dönemlerinde daralan ticareti yeniden canlandırma arayışlarına yönelmişlerdir. Bu bağlamda ortaya çıkan "friendshoring" kavramı, benzer siyasi ve ekonomik değerlere sahip ülkeler arasında ticaretin güçlendirilmesini ifade etmektedir. Bu çalışmada, ticari belirsizlik ile Türkiye ve AB-27 ülkeleri arasındaki ikili ticaret ilişkileri arasındaki bağlantı Coğrafi Ağırlıklı Regresyon (GWR) yöntemiyle incelenmiştir. 2003-2022 dönemi verileriyle oluşturulan analizde, Ahir vd. (2022) tarafından geliştirilen Dünya Ticaret Belirsizliği Endeksi (WTUI) kullanılmıştır. Bulgular, ihracat ile belirsizlik arasındaki ilişkinin yalnızca Polonya, Macaristan, Slovakya ve Hırvatistan için anlamlı olduğunu göstermektedir. Bu sonuç, Avrupa Birliği'nin genel bütünlüğüne rağmen, yalnızca belirli ülke gruplarının kriz zamanlarında ticari dayanıklılık sergilediğini ve friendshoring yaklaşımının Birlik içinde giderek önem kazandığını ortaya koymaktadır.

Anahtar Kelimeler: İhracat, Ticari Belirsizlik Endeksi, GWR, AB-27.

I. INTRODUCTION

Following World War II, efforts toward integration were initiated, particularly in Germany, France, Italy, the Netherlands, Belgium, and Luxembourg, with the aim of addressing the economic devastation caused by the conflict. Integration initiatives across various economic sectors gradually replaced the earlier successful merger movements that had originated in the coal and steel industries (Kiraç & İlhan, 2010). Later, the foundation of the European Economic Community (ECC) in 1957 was one of the most significant results of this integration. With the help of this community, it is anticipated to improve national welfare and adhere to a harmonious economic policy among the member nations by creating a common market and lifting the tariff for selected goods and services (Nart, 2010).

Based on the decisions made under the Treaty of Rome, customs duties were reduced in 1959. Later, the Customs Union (CU) was established in 1968 to eliminate similar procedures at the borders for goods move between member countries (Seymen, 2009). The CU, which aims to reduce tariffs and eliminate trade barriers between neighbouring countries, has led to increase trade relations between countries as the number of countries joining the European Union increases.

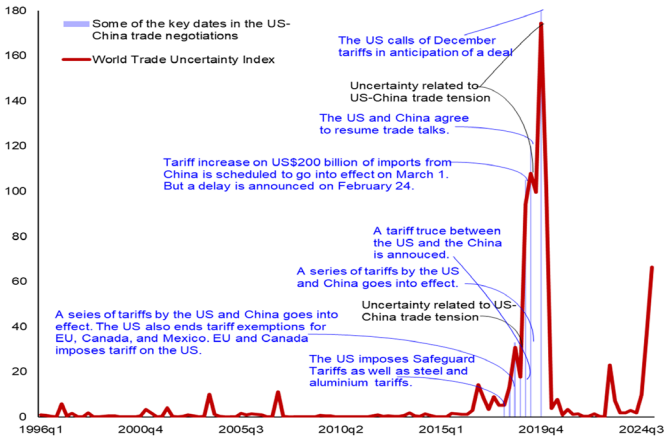
From the perspective of a significant portion of goods trade, the EU and Türkiye have long maintained well-integrated economies (Nowak-Lehmann et al., 2007). Thus, establishing the CU in 1996 marked a significant turning point in Türkiye's relationship with the EU. Through the participation in the CU agreement, Türkiye committed to enforcing EU common external tariffs against non-EU nations (Yilmaz, 2011). In contrast, the EU eliminated nominal tariff rates on Turkish industrial products imports on September 1, 1971, allowing Turkish items to be sold on EU markets (Aytuğ et al., 2017).

Even though the EU includes some of the world's largest economies, such as Germany, France, and Spain, most of its trade remains regional. This is primarily due to geographical proximity and the influence of national borders (Santamaría et al., 2023). Economic considerations lead one to believe that the geographical distance between countries may have an impact on bilateral trade (Jakubik & Ruta, 2023). Distribution cost is one of the most important economic factors. Moreover, trade ties between neighboring countries have been reported to be stronger in times of greater uncertainty, such as the COVID-19 pandemic and the Russian invasion of Ukraine (Hoekman et al., 2023). These developments have given rise to a new concept called "friendshoring." Friendshoring is a term used to describe trade relations with the immediate environment. It also indicates a tendency to receive inputs from economies that have similar ideals and share similar values (e.g., supporting peace or democratic institutions) (Javorcik et al., 2024).

The spread of national conflicts, wars, and epidemics worldwide, including Brexit, the COVID-19 pandemic, the US-China trade war, and the Russian invasion of Ukraine, has created an unprecedented level of unpredictability for global trade (Cavusgil et al., 2020). Therefore, as trade policy uncertainty has recently reached unprecedented levels globally, friendshoring has gained significant importance. In the increasingly unpredictable global trade environment, one of the main drivers of friendshoring is to reduce the impact of risks and uncertainties by forming alliances with "friends" (Jakubik & Ruta, 2023).

Figure 1 shows the course of the World Trade Uncertainty Index from the first quarter of 1996 to the third quarter of 2024, highlighting the impact of significant developments in US-China trade negotiations on the index. Although the index has remained relatively stable throughout the period under review, there have been sharp fluctuations at certain intervals. A significant increase was observed starting in 2018, overlapping with the US imposition of tariffs on China and subsequent retaliatory measures. The tariffs initiated in the first quarter of 2018 peaked in 2019, with the peak associated with the US cancellation of the December tariffs in anticipation of an agreement. This significant increase in the index clearly reflects the global impact of trade policy uncertainties and the sensitivity of market actors to these uncertainties. The chart also shows that diplomatic measures such as the postponement or removal of tariffs and the resumption of trade negotiations have had a calming effect on the index. This observation is important because it shows how policy uncertainties in international economic relations directly affect economic indicators.

FIGURE 1 | World Trade Uncertainty Index



Source: *Ahir et al. (2022)*

Trade policy uncertainty's effects on countries' economies and trade have been the subject of several studies in the literature. In this paper, we use the World Trade Uncertainty Index (WTUI) developed by Ahir et al. (2022) in order to indicate the link between export and trade policy uncertainty in EU-27 countries and Türkiye. The Geographically Weighted relationship (GWR) approach was employed in the study to reveal the relationship between two variables since all countries included in the analysis are border neighbours.

International trade depends on many factors such as geographical proximity of countries, trade costs, and intra-industry trade (Ivanova, 2009). Therefore, developments in econometric theory are needed to model trade flows between countries, sectoral feedback, technological diffusion, and intra-industry trade. In parallel with the developments in econometric theory, the determinants of international trade have been explained by the ordinary least squares (OLS) method (Pugel, 1980; Winters, 1984). Due to insufficient observations, OLS estimators yield biased results (Márquez-Ramos et al., 2012). With advancements in panel data methods, numerous empirical studies on the determinants of international trade have been conducted (Harrison & Rodríguez-Clare, 2010; Schneider, 2005). However, methods emphasizing spatial relationships have been developed since traditional panel data methods (such as unit root tests, cointegration, causality analysis, and parameter estimation) do not account for neighborhood relations. Gravity and Computable General Equilibrium models are useful for analyzing trade flows, as they are based on the economic size and distance between two countries (Disdier et al., 2008). However, the assumption of no spatial autocorrelation in error terms in gravity models does not correspond to reality (Baldassarre et al., 2023). Since gravity models account for the economic size of countries, the resulting outliers can cause the arithmetic mean to deviate from the central tendency, leading to a departure from normal distribution. There are several reasons why the GWR model is preferred in this study. The GWR model incorporates local fixed effects, as each location has its constant term (Liu et al., 2015). In this context, spatial error correlation can be reduced even when there is heterogeneity in the parameters obtained from the geographically weighted regression model (Fotheringham et al., 2002).

II. THEORICAL BACKGROUND AND BRIEF LITERATURE

To mitigate the effects of supply chain disruptions, many countries are exploring friendshoring as a strategy in response to current political uncertainty and geopolitical instability. They hope to reduce the societal costs of these disruptions by reducing their reliance on countries they view as hostile (Javorcik et al., 2024). This research section aims to clarify the notions of friendshoring and the link between trade policy uncertainty and exports. Additionally, studies conducted in this area will be addressed.

A. EXPORT AND TRADE POLICY UNCERTAINTY

The impact of uncertainty on global economic activity has gained new attention in light of events such as the 2008 financial crisis, Brexit

in 2016, the COVID-19 pandemic in 2019, the US-China trade war, and most recently, the Russian invasion of Ukraine. High levels of uncertainty are predicted to have a particularly strong impact on global market activity (Greenland et al., 2019). Furthermore, when businesses are uncertain about policy, they tend to postpone investments needed to expand into new markets and increase production (Bernanke, 1983).

Uncertainties around trade policy changes discourage exporters from entering new markets and negatively impact existing trade relations between countries (Handley, 2014; Handley & Limão, 2015). Jakubik and Ruta (2023) found that when Trade Policy Uncertainty (TPU) is increased, there is a significant negative impact on trade. Similarly, Constantinescu et al (2020) found that total trade as well as trade related to global value chains are significantly negatively affected by the Economic Policy Uncertainty (EPU) index.

Taglioni et al. (2012) conducted an empirical investigation that discusses the relationship between uncertainty and trade. The authors made an effort to investigate if uncertainty shocks which may explain changes in trade. According to their estimates, domestic uncertainty has minimal impact on exports but is a robust predictor of changes in imports.

Bilateral trade typically tends to decline after changes in uncertainty. This uncertainty may result due to economic shocks, sanctions, or arbitrary tariffs imposed by governments. Krol (2018) examined the relationship between economic uncertainty and US trade and investment and discovered that uncertainty hinders international trade. Similarly, increased uncertainty has a decreasing influence on US bilateral trade, according to Dennis & Taylor (2020) and Lee & Lee (2018). Ultimately, Caldara et al. (2020) came to the conclusion that company investments often decline as trade policy uncertainty rises. Because of this scenario's uncertainties, firms and investors are becoming more cautious when preparing for the future, which might result in a decline in trade volume.

Even while literature usually reports that uncertainty has a negative impact on bilateral trade, the contrary effect can also be seen. Increased uncertainty improves commerce because agents may obtain better conditions of trade, according to Baley et al. (2020). They also found that cross-border risk-sharing increases during times of uncertainty.

B. FRIENSHORING

Countries have started to examine their current supply chain networks and commercial partners as the frequency of geopolitical and economic crises in the world increased relative to previous times (Völlers et al., 2023). Over time, there has been a shift from offshore transactions to spatial cooperation as a result of the COVID-19 pandemic, which began at the end of 2019 and impacted individuals worldwide, disrupting international trade. These partnerships may involve fresh investments, or the bolstering of already-existing partnerships, and this partnership is newly called friendshoring (Kalvelage & Tups, 2024). Friendshoring is defined as trading mostly with countries that share your values in an attempt to ensure access to necessary inputs and reduce the likelihood that the trade will be used as a weapon (Javorcik et al., 2024).

Friendshoring has evolved as an important strategic solution to rising geopolitical risks and weaknesses in global supply chains. The EU, in particular, has increasingly adopted this notion to improve strategic autonomy in important areas and lessen dependency on potentially unreliable trading partners by prioritizing economic partnerships with politically aligned or "friendly" countries (Baldwin & Freeman, 2022). This represents a transition in EU trade policy from a solely market-oriented approach to one that includes geopolitical factors.

Under this changing context, the EU is reassessing its trade relations and focusing more on supply chain security, which is increasingly seen as important as trade liberalization (D'Ambrosio & Lavoratori, 2025).

This transition creates possibilities and challenges for countries with long-standing economic links to the EU, such as Türkiye. While Türkiye may profit from its geographic proximity and customs union ties, the further adoption of friendshoring practices might also deepen protectionist inclinations inside the EU and generate new forms of exclusion from vital value chains (Baldwin & Freeman, 2022).

Every and van Harn (2022) emphasize that friendshoring has come to the forefront as a strategic restructuring of the supply chain, especially for Western countries. While friendshoring aims to position production in more geopolitically compatible and "friendly" countries, this process is based not only on economic but also political and security concerns. In this context, it is predicted that supply chains moving away from China have the potential to turn to countries such as India, Bangladesh, and Vietnam, which could create a "J curve" effect that will transform the distribution of global production and employment. It is stated that although friendshoring is a costly and slow-moving process, it may accelerate under the influence of geopolitical tensions.

Since friendshoring is a new notion, the literature in this field is quite limited. Using a quantitative model that took into account links across different industries and countries, Javorcik et al. (2024) examined the estimates of the economic consequences of friendshoring. According to the authors' findings, friendshoring can result in real GDP losses of as much as 4.7% of GDP in some countries.

Using Tanzania's Chinese soybean GPN and Namibia's German-led green hydrogen investments as examples, Kalvelage & Tups (2024) attempted to explain how global production networks (GPNs) were changing in the face of growing uncertainty. Thus, the authors attempted to show how state-mandated compulsion or incentives are necessary for GPN friendshoring.

Vivoda (2023) evaluated the friendshoring employing the Minerals Security Partnership (MSP) within the scope of energy research As the author notes, friendshoring may help Western countries' supply chains become less vulnerable, but a balance between reducing dependence on China and other factors is necessary for MSP to be successful As the author notes, friendshoring may help Western countries' supply chains become less vulnerable, but a balance between reducing dependence on China and other factors is necessary for MSP to be successful. In a study conducted by Ayyagari et al. (2024), the implementation of the cronyism strategy at the corporate level was examined in the context of CEOs' political orientations. While friendshoring stands out as a strategy that involves companies shifting their global supply chains to more ideologically compatible countries, the authors show that this strategy is adopted more strongly by CEOs who are politically aligned with the US administration. The study found that imports from countries ideologically distanced from the US are reduced by approximately 40% more by politically aligned CEOs than by discordant CEOs.This finding reveals that friendshoring is shaped not only by economic but also by political motivations. In addition, the fact that these politically oriented supply chain changes cause a decrease in firm value draws attention to the potential costs of friendshoring.

In the study of Zarea and Su (2025), the concept of friendshoring, which has become increasingly important in the international business literature, is examined in depth. Going beyond traditional onshoring, nearshoring and reshoring approaches, friendshoring evaluates business-government relations from a more human-centered (anthropomorphic) perspective, examining global stakeholder strategies, polycentric external relations, ideological and geopolitical distance and informal institutional factors in a holistic framework. Drawing on the literature on multinational corporations' (MNE) external relations and institutional distance, the authors identified three fundamental variables that determine business-government relations: embeddedness-based partnerships, reciprocity-grounded resources and temporal considerations. In this context, six different relationship formats that govern friendshoring practices are defined: interest-based partnerships, assistance-friendships, character-friendships, agreement-friendships, goodwill formats and trust-money friendships. This typology reveals the multidimensional governance structures of friendshoring by varying the dimensions of degree of embeddedness and reciprocity asymmetry. This study makes an original contribution to the literature by addressing friendshoring not only in the context of geographical but also institutional and ideological alignment.

III. DATA AND METHODOLOGY

This study measured global trade uncertainty using the World Trade Uncertainty Index (WTUI), developed by Ahir, Bloom, and Furceri (2022), based on reports from the Economist Intelligence Unit. To ensure comparability between with the export data, an arithmetic average was taken. Furthermore, the countries of Cyprus, Estonia, Luxembourg, and Malta were not included in the research because the

WTUI was not prepared to serve those four countries.

For the calculation of total exports for each country within the union, the aggregate bilateral trade matrix is built. Prior to building the matrix, the natural logarithm of the exports (dependent variable) was taken in order to reduce volatility. The export data prepared using the International Trade Center (ITC) export data will be shown in the study as lnEXP, and the world trade uncertainty index (independent variable) is shown in the study as UNCERT. The investigation covers WTUI as well as exports from 2003 to 2022.

Binary trading systems in matrix format (Santamaría et al., 2023);

$$X = \begin{bmatrix} X_{11} \cdots X_{1N} \\ \vdots \quad \vdots \quad \vdots \\ X_{N1} \cdots X_{NM} \end{bmatrix}$$

X_{NM} is the total value of merchandise shipped towards n→m units. The share of merchandise exports to each country in total exports is taken. Thus $\sum_n \sum_m X_{mn}=1$. The expression X_{mn} indicates the likelihood that a shipment of goods goes n→m.

Traditional global regression models, such as Ordinary Least Squares (OLS), presume spatial homogeneity, which implies that variables' correlations remain consistent across geographical boundaries. However, in the case of international commerce, particularly between the EU-27 and Türkiye this assumption may not be valid due to regional differences in economic structures, infrastructure, and sensitivity to trade risks. For these reasons, the Geographically Weighted Regression (GWR) model was used in this study.

GWR overcomes this weakness by allowing the model coefficients to fluctuate geographically, reflecting local differences in the linkages between variables. This feature is particularly useful for our research as it allows us to explore and assess regional differences in how trade uncertainty affects export performance across the EU and Turkey.

Recent studies have demonstrated the effectiveness of GWR in capturing geographic variability in economic assessments. As an example, Kalkan (2023) used GWR to investigate spatial correlations in high-technology exports and showed significant regional differences. Similarly, Baldassarre et al. (2023) established an adaptively robust GWR approach to handle outliers and improve estimation accuracy in geographic data studies.

IV. RESULTS

The economic theory is worth explaining the relationships between units that have neighborhood relations as well as between units that are economically integrated. According to Fotheringham et al. (2002), units have different slope coefficients because they have different neighborhood relations. Thus, the slope parameters for each unit reveal that the responses given by the independent variables are non-stationary. GWR model (Raiher et al., 2017);

$$y_i = \beta_0(u_i, v_j) + \sum_k \beta_k(u_i, v_k) x_{ik} + \varepsilon_i \qquad (1)$$

Dependent variable of unit i in the expression, (u_i, v_j)geographical coordinates of the i_{th} region in latitude and longitude, β_k (ui,vj) the local coefficient, which is a function of the geographical location of the i_{th} unit, x_{ik} independent variables of unit i, ε_i i. is the normally distributed error term of unit i. Regression based on the weighted least squares method;

$$\hat{\beta} = (u_i, v_j) = (X'W(u_i, v_j)X)^{-1}(X'W(u_i, v_j)Y)^{-1} \qquad (2)$$

$\hat{\beta}$ estimated β vector of 's, X vector of independent variables, Y vector of dependent variables, $W(ui,vj)$ nxn dimensional diagonal weighting matrix, $W(ui,vj)=wij$ The matrix where the parameters are estimated is designed as the main diagonal. The weights given to each parameter are selected by kernel spatial function to represent the distance of unit i from other regions. In this study, bisquare is used as the kernel function. In this regression where the independent variables are reversed $\hat{\beta}$ (u_i,v_j) expression β_{kxn} is the matrix showing the parameters of the dimensional independent variables. Parameter estimation for each local unit;

$$\hat{\beta}_n = (X'^{W_n} X)^{-1} X'^{W_n} Y \qquad (3)$$

is calculated as (Eckey et al., 2007).

In this section, first of all Leung's F tests are used to examine whether both the regression and slope parameters of this model, which is expressed as a simple regression, have spatial differences. Then, both GWR and Global OLs results are explained. Finally, the parameters obtained from the GWR model, the probabilities of statistical significance of these parameters, and the local coefficients of determination are presented.

TABLE 1 | The Results of Leung's F-test

	F Value	Df1	Df2	Ss Ols Residuals	Ss Gwr Residuals	Ss Gwr Improvement
F(1) Test	0.866 (0.38)	16.547	22	31.432	16.93	-
F(2) Test	1.219 (0.33)	11.628	22	31.432	-	14.495
F(3) Test	F Value	Numerator Or D.F.	Denominator D.F.	Probablity		
β_0	1,84e+10	3.79	16.547	0.00[a]		
β_1	1,01e+10	3.28	16.547	0.00[a]		

p<0.01 a
***Source:** Authors' calculations*

Table 1 presents Leung's F test statistics. According to F(1) and F(2) tests, there is no spatial variation in the regression. However, it is observed that the GWR method minimizes the squares of the error term relatively more. According to the F(3) test statistic, both the constant term and the slope parameter show spatial variation and reveal different coefficients for each cross-section.

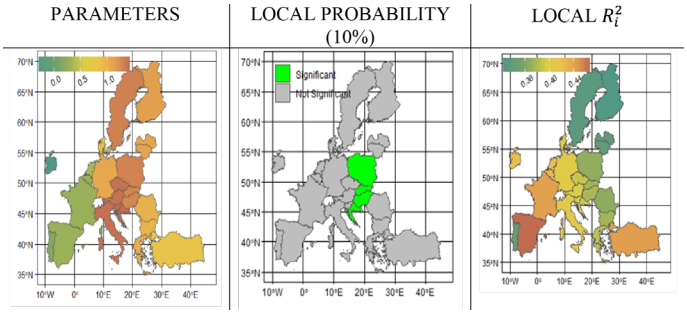
TABLE 2 | The Descriptive Statistics of the GWR and Global OLS Results

		GWR				GLOBAL OLS
Parameters	**Min**	**25%**	**Median**	**75%**	**Max**	
β_0	14.5553	15.3565	15.6170	16.8031	21.2687	16.354 (0.00)[a]
β_1	-11.4841	6.1882	10.9740	13.2219	15.0423	7.782 (0.157)
AIC	67.7544					80.5838
BIC	54.6979					69.6522
RSS	16.937					31.4323
R2	0.508					0.047

Notes: AIC Akaike Information Criteria, BIC Bayesyen Information criteria, RSS Residual Sum of Squares, Euclidean distance metric is used. p<0.01 a
***Source:** Authors' calculations*

Table 2 presents the regression results obtained according to the GWR and the Global OLS methods and the descriptive statistics of these regressions. According to the Global OLS model, the constant term is statistically significant at the 1% significance level, while the slope parameter is statistically insignificant. Nevertheless, the constant term obtained from the Global OLS model takes values close to the upper quartile in the GWR model. On the contrary, the slope parameter yields result close to the lower quartile. In terms of each criterion in the descriptive statistics, the GWR model gives more robust results. Considering the descriptive statistics R_i^2 the explanatory power is higher in the GWR model, and the Akaike (AIC) and Bayesian (BIC) information criteria are lower in the GWR model. Finally, the sum of error squares in the GWR model is lower than that of the Global OLS model.

FIGURE 2 | GWR Results



***Source:** Authors' own creation.*

According to the local probability values in Figure 2, just four countries (Poland, Hungary, Slovakia, and Croatia) have positive slope parameters that are statistically significant. These findings suggest that in these countries, export volumes are positively associated with levels of trade uncertainty. Moreover, the coefficient of determination (R^2) ranges between 20% and 30% for these cases, indicating a moderate explanatory power of the model in capturing the relationship between trade uncertainty and bilateral export performance.

The GWR analysis revealed no statistically significant findings for major EU economies, such as Germany and France, which may be attributed to structural and institutional differences between these economies and smaller or more trade-sensitive member states. Big economies tend to have more diverse export bases and wider global trade networks, which might lower their exposure to country-specific or regional trade uncertainty shocks (Margarita et al,,2022; Nana et al., 2024;) Furthermore, Germany and France have more advanced risk management systems, better adaptive capacities, and stronger institutional frameworks that can absorb or buffer the short-term impact of trade policy uncertainty (Handley & Limao, 2015).

In contrast to these results, the statistical significance of the relationship between exports and uncertainty in countries such as Poland, Hungary, Slovakia and Croatia may be related to their greater dependence on less diverse export points or industries, particularly within regional value chains (Pretorius et al., 2021; Fan & Liu, 2021; Zhuang et al., 2025).

This makes their trade flows more vulnerable to perceived trade risks, changes, or uncertainty. Furthermore, these economies frequently have deeper integration with the German industrial core, resulting in the faster transmission of uncertainty effects through intermediate goods trade (di Giovanni & Levchenko, 2010).

V. CONCLUSION

Throughout the past century, the world has experienced numerous crises, such as economic, health, and war-related ones. In order to rebuild their economy after every crisis, countries have placed a high value on exports, particularly to their neighbors. In this regard, eliminating regional political and economic disagreements was, from this perspective, one of the founding aims of the EU. The Union's member countries are able to export a wide range of goods without facing tariffs, which has boosted national GDP through exports and is intended to help the host countries flourish through easier imports. Despite not yet being an EU member, Türkiye can export a wide range of goods without customs tax through the CU, fostering strong trade ties with other EU countries.

Although the great trade uncertainty created by the COVID-19 pandemic has been overcome in global trade, the world trade patterns are changing. Developed countries have started to review their offshore investments due to various factors, including supply chain disruptions and political disputes during the COVID-19 pandemic. As a result, countries have started to reorganize their commercial ties, accounting for their proximity in terms of politics, culture, and geography. A relatively new concept called "friendshoring" evolved as the idea of "offshoring" lost significance.

This study was conducted to determine whether the EU remains a strong union in the face of uncertainties or if only countries with strong bilateral ties continue their exports when uncertainties rise. In this regard, the study investigated the relationship between exports and uncertainty in the EU-27 and Türkiye. According to the results, only four countries (Poland, Hungary, Slovakia, and Croatia) showed a significant relationship between bilateral exports and uncertainty, based on the data obtained using the GWR approach. According to parameter estimators, a one-unit increase in uncertainty causes a 1-1.2-unit increase in exports between these four countries. The fact that the increase in exports between neighboring countries is higher than the uncertainty shows that these countries have strong commercial ties as well as strong political and cultural relations.

There are multiple explanations for the statistical significance of these four countries. The first of these explanations is the similarity of the cultural structures among all four countries. The medium income range is another characteristic that is common. These countries' economies are typically categorized as middle-class. Although their income levels are generally lower than those of the more affluent Western countries of Europe, the time series of these four countries is very similar in terms of per capita income. Trade between countries benefits from this shared economic framework, which also leads to comparable preferences (Linder, 1961). Ultimately, the observation of striking similarities between the dynamics of the industry and service sectors was the final factor in the significance of these four countries. Economic activities in these countries are generally based on the industrial and service sectors. Poland and Slovakia, in particular, have strong industrial and service sectors in areas such as automotive, electronics, and information technology.

Although four countries were statistically significant, the results were not anticipated when the study was designed. The main European countries, as well as their neighbors, Germany, France, and Spain, are statistically insignificant, which is not the predicted outcome. However, these results are thought to be attributable to the study's limitations. In addition, it should be taken into account that only exports to countries within the union are subject to analysis, and developed countries in the union make the majority of their exports outside the EU. These findings indicate that the variation found in our results is consistent with the EU economies' differing vulnerability and resilience to trade uncertainty. The GWR method, by design, captures these spatially variable linkages and emphasizes the importance of tailoring policy responses to trade uncertainty to national economic structures rather than applying them uniformly throughout the EU-27.

Even though the findings are novel in the literature, this study has many limitations. The first of these limitations is that the Real Exchange Rate, one of the main determinants of exports, is excluded from the analysis. The currency of the countries included in the analysis is mostly EURO and this rate could not be included in the analysis separately for the remaining countries. Another limitation of the study is that trade cost, another determinant of exports, is not available for all countries included in the analysis between 2003 and 2022.

By providing insight for further research, this study contributes to the corpus of literature by highlighting the importance of friendshoring in times of uncertainty. However, by taking into account the limitations of this study and incorporating additional export factors in the analysis, future research might further explore the relationship between uncertainty and exports.

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