Research Article/Araştırma Makalesi

The Effect of Turkey's Free Trade Agreements (FTAs) on Its External Trade: Counterfactual Impact Analysis[1]

Türkiye'nin Serbest Ticaret Anlaşmalarının (STA) Dış Ticaretine Etkisi: Karşı Olgusal Etki Analizi

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Abstract

The study aims to estimate the impact of Turkey's Free Trade Agreements (FTAs) on its average external trade level by three novel approaches, which are the fixed effects counterfactual estimator (FEct), interactive fixed effect counterfactual (IFEct) estimator, and matrix completion (MC) method introduced by Liu et al. (2022). The results show that while Turkey's FTAs have a positive impact on Turkey's exports to the economies that Turkey has FTAs, we do not find any effect on its imports on average. The findings show that Turkey's FTAs has increased its exports to these economies by 54.7% on average over five years after the FTAs entered into force. Moreover, placebo test results signal that the impact of these agreements on Turkey's export might occur before the agreements entered into force. As far as we know, this is the first study considering the effects of FTAs on countries trade by counterfactual estimators introduced by Liu et al. (2022).

Jel Codes: *F14, F15, F41*
Keywords: *Free Trade Agreements (FTAs), Turkey, Ex-Post Analysis, Counterfactual Impact Analysis*

Öz

Bu çalışmanın amacı, Türkiye'nin Serbest Ticaret Anlaşmalarının (STA) ortalama dış ticaret üzerindeki etkisini, Liu vd. (2022) tarafından tanıtılan sabit etkiler karşı olgusal tahmin edici (Fect), etkileşimli sabit etkiler karşı olgusal (IFEct) tahmin edici ve matris tamamlama (MC) yöntemi olmak üzere üç yeni yaklaşımla tahmin etmektir. Sonuçlar, Türkiye'nin serbest ticaret anlaşmalarının Türkiye'nin STA'sı bulunan ekonomilere yaptığı ihracatı olumlu yönde etkilerken, ithalatında ortalama olarak bir etkiye sahip olmadığını göstermektedir. Çalışmanın bulguları, Türkiye'nin STA imzaladığı ülkelere ihracatını serbest ticaret anlaşmalarının yürürlüğe girdikten sonraki beş yıl içinde ortalama %54,7 oranında artırdığını göstermektedir. Ayrıca, plasebo testi sonuçları, bu anlaşmaların Türkiye'nin ihracatı üzerindeki etkisinin anlaşmalar yürürlüğe girmeden önce gerçekleşmiş olabileceğine işaret etmektedir. Bilgimiz dahilinde bu çalışma, Liu vd. (2022) tarafından tanıtılan karşı-olgusal tahmin ediciler aracılığıyla STA'ların dış ticarete etkilerini ele alan ilk çalışmadır.

Jel Kodları: *F14, F15, F41*
Anahtar Kelimeler: *Serbest Ticaret Anlaşmaları (STA), Türkiye, Ex-Post Analiz, Karşı Olgusal Etki Analizi*

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1. Introduction and the Brief Overview of Empirical Studies

A Regional Trade Agreement (RTA)[3] is an agreement between two or more nations that define the rules of trade for all parties. One main advantage of RTAs is that the signatory countries can trade their goods with little or no customs tariffs reciprocally. However, in recent years, RTA negotiations have gone beyond the tariff rates and have begun to include services, non-tariff measures, public procurements, investments, labor markets, intellectual property rights, product standards, competition policies, dispute settlements, environment, and so on.

In recent years, many countries/regions have been directed to establish bilateral or regional trade agreements because of the outdated and inefficient structure of the World Trade Organization (WTO) under today's trade system (Hoekman, 2020). According to the Regional Trade Agreements database of WTO[4] although only 81 RTAs entered into force in 2000, they reached 355 in 2022. Since it is a side of the General Agreement on Tariffs and Trade (GATT) and a member of the WTO, Turkey has signed Free Trade Agreements (FTA) with countries/regions. Today, Turkey has 22 FTAs in force, 5 FTAs at the approval stage and 14 FTAs in the negotiation process[5].

As a result of the rise in these agreements, studies analyzing the effect of RTAs on external trade have become prominent in trade literature. These studies are generally classified as the ex-ante and ex-post analysis regarding their methodology. The primary objective of ex-ante studies is to show the expected effects of the RTAs. The impact of Brexit (Jackson & Shepotylo, 2018; Oberhofer & Pfaffermayr, 2018; Nicita et al., 2019), Transatlantic Trade and Investment Partnership (TTIP) (Egger et al., 2015; Felbermayr et al., 2015; Ecorys, 2017; Bekkers & Romagosa, 2019), North American Free Trade Agreement (NAFTA) (United States-Mexico-Canada Agreement (USMCA)) (Baier et al., 2019), Regional Comprehensive Economic Partnership (RCEP) (Li & Moon, 2018), and RTAs of the European Union (EU) (Mayer et al., 2018; Timini & Viani, 2022) on signatory and non-signatory countries have been the main focus of ex-ante studies over the last few years. Some of these studies mention the possible impact of these RTAs on Turkey's trade and welfare level (Brakman et al., 2015; Egger et al., 2015, Felbermayr, 2015, Ecorys, 2017; Nicita et al., 2019). For instance, Brakman et al. (2015) examine the effect of TTIP on signatory and third countries via the structural gravity (SG) model. The results show that Turkey's trade will rise between 0.77% and 0.82% if TTIP enters into force. Moreover, Egger et al. (2015) analyze the effect of TTIP using a hybrid model that employs both Computable General Equilibrium (CGE) and SG models. They find that Turkey's export to the EU and the United States (US) will decline by 1.13%, and total export will decrease by 1.12% because of the TTIP. On the other hand, analyzing the impact of Brexit by the partial equilibrium model, Nicita et al. (2019) emphasize that under no Brexit deal scenario, the exports of Turkey to the United Kingdom (UK) decrease by 2.4 billion dollars, and Turkey is found as the most affected country from the Brexit.

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[3] RTA contains a Free Trade Agreements (FTA), a Custom Union (CU), an Economic Integration Agreements (EIA), and a Partial Scope Agreements (PSA) according to the WTO RTA database.

[4] For more details on RTAs in force in the world, see http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx

[5]See,https://ticaret.gov.tr/data/5e18288613b8761dccd355ce/Ekonomik%20G%C3%B6r%C3%BCn%C3%BCm%20Ocak%202023.pdf

On the other hand, the ex-post analysis of RTAs interests in the consequences of these agreements on countries'/regions' trade after they enter into force. Researchers have utilized methods used in the ex-ante studies to analyze RTAs ex-post impacts on economies in general (Kohl, 2014; Caliendo & Parro, 2015; Baier et al., 2018;). For instance, Kohl (2014) and Baier et al. (2018) estimate the impacts of countries' FTAs, including Turkey, by the structural gravity model and present their heterogeneous impacts on Turkey's trade. In addition, Caliendo & Parro analyze the impact of NAFTA via the computational general equilibrium model and show that while Turkey's welfare increased by 0.53% due to NAFTA, the contribution of terms of trade, and volume of trade on Turkey's welfare has been estimated by 0.20% and 0.33% respectively. Moreover, counterfactual estimation methods showing the causal effects of FTAs, such as difference and differences (DID) and Synthetic Control Method (SCM) developed by Abadie & Gardeazabal (2003) and Abadie et al. (2010) have become widespread to show the ex-post impact of these agreements on countries' trade level in the last few years (Hannan, 2016; Dinçer et al., 2018; Adarov, 2018; Brotto, 2020), but they are limited.

In line with the trade literature, RTAs and their ex-ante and ex-post impacts on Turkey's trade have also been analyzed by the abovementioned methods in Turkish literature. Among ex-ante studies, Mavuş et al. (2013) analyze the likely impacts of the TTIP agreement on Turkey via CGE model. Using the Global Trade Analysis Project (GTAP) model, they show that Turkey's inclusion in TTIP increases Turkey's exports between 1.3% and 7% and raises the Gross Domestic Product (GDP) of Turkey within the range between 0.5% and 4% depending on the deepness of this agreement. Turanlı (2019) also analyzes the effects of TTIP initiatives on Turkey's foreign trade via the SMART model developed by the World Bank and suggests that Turkey benefits most if it becomes a partner of the agreement. As for ex-post studies, Özkaya (2011) analyzes the impact of RTAs on Turkey's export level by using the general gravity model and shows that bilateral trade agreements have no remarkable impact on Turkey's export level except for the Custom Union (CU). In addition, Kütük & Akbostancı (2016) emphasize the inefficiency of RTAs on Turkey's export using the gravity model suggested by Baier & Bergstand (2007). Türkcan & Pişkin (2014) demonstrate the impacts of the Customs CU and FTAs on the extensive and intensive margins. Their gravity model finds that the CU and the FTA impact both extensive and intensive margins, while the CU has a greater effect on both of them than the FTAs. The study also shows the insignificant effect of the CU on Turkey's exports. In addition, Demiroğlu & Alp (2021) focus on the heterogeneous impact of RTAs on Turkey's foreign trade with the structural gravity method. According to the model results, although the average positive impact of RTAs is 28%, some RTAs currently in force do not have any significance on Turkey's trade level. Frede & Yetkiner (2017) analyze Turkey's trade via the panel data gravity model, and they assert that the EU Customs Union has negatively affected the exports of Turkey and positively effects its' imports. Combining gravity structure with the SCM, Aytuğ et al. (2017) show the trade impact of the Custom Union on Turkey. The study reveals that Turkey's export level would have been 38% less if Turkey had not Customs Union agreement with the EU. Dincer et al. (2018) focus on the EU-Algeria FTA and its impact on Turkey's trade level using DID analysis embedded in a gravity model. The study shows that if the FTA between the EU and Algeria had not been signed, the export (import) of Turkey to (from) Algeria would have been 12% (17%) higher.

While studies showing the impacts of Turkey's FTAs on its foreign trade are limited, there is no study considering Turkey's FTAs holistically using counterfactual estimation methods to estimate their causal impacts on Turkey's external trade. Therefore, our objective is to fill the gap in the existing literature by analyzing the impacts of Turkey's FTAs on its external trade by three novel models, which are the fixed effects (FEct), (IFEct) (Gobillon & Magnac, 2016; Xu, 2017), and the matrix completion (MC) (Athey et al., 2021) introduced by Liu et al. (2022).

The rest of this paper is organized as follows. Chapter 2 presents a general overview of Turkey's FTAs. Chapter 3 demonstrates the FEct, IFEct, and MC estimators. Chapter 4 shows the results of each model and two diagnostic tests of these models. Concluding statements are presented in the last section.


2. General Overview of Turkey's FTAs

Turkey has 22 FTAs in force European Free Trade Association (EFTA) (1992), Israel (1997), Macedonia (2000), Bosnia and Herzegovina (2003), Palestine (2005), Tunisia (2005), Morocco (2006), Egypt (2007), Albania (2008), Georgia (2008), Montenegro (2010), Serbia (2010), Chile (2011), South Korea (2013), Mauritius (2013), Malaysia (2015), Moldova (2016), Faroe Islands (2017), Singapore (2017), Kosovo (2019), Venezuela (2020), United Kingdom (2021)), has 5 FTAs at the approval stage (Pakistan, Qatar, Lebanon, Sudan, Ukraine), and also conducts negotiations with 14 countries to sign an FTA (Japan, Thailand, Indonesia, UAE, Mexico, Ecuador, MERCOSUR, Peru, Colombia, Cameroon, Gulf Cooperation Council, Djibouti, Seychelles, Somalia).

One of the most important reasons why Turkey has conducted FTA negotiations with countries/regions is to eliminate the unfair trade competition against the EU and third countries. Although the EU-Turkey Customs Union Agreement entered into force in 1996 enabling merchandise trade without tariff barriers considerably between parties, the EU has signed many FTAs with which Turkey is not a party. It is possible that these agreements cause an uncompetitive trade condition against Turkey and adversely affect the welfare of the country (Dincer et al., 2018). Thus, Turkey has been directed to conduct FTA negotiations with these countries to reduce such risks. Secondly, Turkey targets to extend their FTA negotiations, including services, public procurements, investments, etc., to enhance its economic and political relations with countries.

Although Turkey has a significant number of FTA with economies, the share of these countries in its' total trade is limited. According to Turkish Statistical Institute (TURKSTAT) database, their share in Turkey's total exports was 11.1 percent, while these countries accounted for 8.9 percent of Turkey's total imports within the last ten years[6]. As it is shown in Figure 1 and Figure 2, Turkey's top export partners among countries with which Turkey has FTA were Israel, Egypt, Switzerland, Morocco, and Georgia, while the top importers were South Korea, Switzerland, Malaysia, Israel, and Egypt between 2012 and 2021.

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[6] We do not consider the UK as a country that Turkey has FTA in these calculations since it can cause a biased results because the UK was a member of Custom Union just before 2021 and one of the Turkey's top trade partners among the Custom Union members.

Figure 1: Share of Countries in Turkey's Exports to the Countries with which Turkey signed FTAs (2012-2021, %)
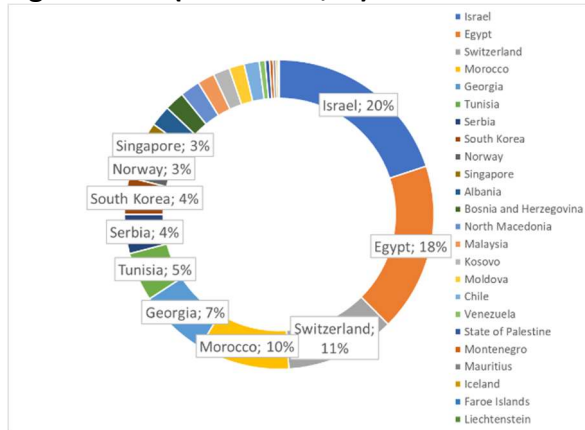
Source: *TURKSTAT*

Figure 2: Share of Countries in Turkey's Imports from the Countries with which Turkey signed FTAs (2012-2021, %)
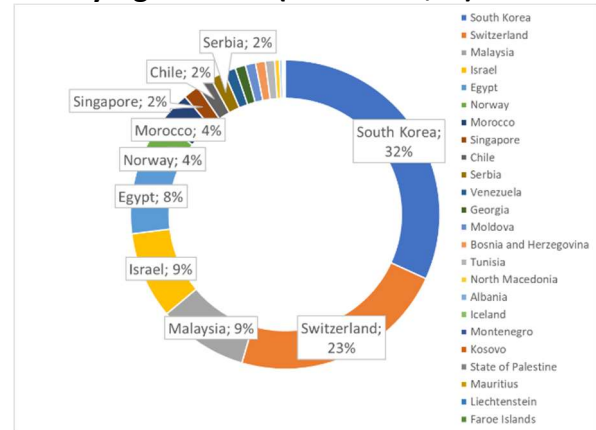
Source: *TURKSTAT*

3. The Empirical Methodology

Showing the effect of Turkey's FTAs on its export and import level, the study uses the FEct, the IFEct (Gobillon & Magnac, 2016; Xu, 2017), and the MC (Athey et al., 2021) estimators introduced by Liu et al. (2022).

The linear two-way fixed effect (TWFE) estimators are very prominent in social science studies since the model makes it possible to consider unobserved units and time-invariant confounders. However, it assumes that the impacts are constant among each treated data and ignores the effect of past outcomes on the current treatment assignment. In addition, TWFE does not consider its effects on future outcomes (Blackwell & Glynn, 2018; Imai & Kim, 2019).

Liu et al. (2022) present counterfactual estimator models taking observations under the treatment condition as missing. They build models using data under control and then produce counterfactuals based on the estimated models. These models present us robust estimates, particularly if the impacts are heterogeneous and there are some unobserved confounders in the data.

In addition, it is possible to make some diagnostic tests to evaluate our estimations thanks to the contribution of Liu et al. (2022). For instance, the paper introduces a placebo test by hiding some periods prior to the beginning of the treatment for treated units and re-run the model. When the identifying assumptions hold, the difference between observed and estimated outcomes in those years is expected to be zero. Moreover, the researchers provide an F test to determine whether there is a pre-trend with zero residual averages in pre-treatment years. A larger F-test implies a better pre-trend fitting.

These models make it possible to analyze both balanced and imbalanced panel data. D_{it} is denoted as a treatment status. $Y_{it}(1)$ and $Y_{it}(0)$ are the potential outcomes when $D_{it} = 1$ and $D_{it} = 0$, respectively. In model-based counterfactual estimators, the study first trains the model using observation under control ($D_{it} = 0$). In the next step, models predict the counterfactual outcome $\widehat{Y_{it}}(0)$ for each observation under treatment condition ($D_{it} = 1$) and

obtain an estimate of the individual treatment effect: $\widehat{\tau_{it}} = Y_{it} - \widehat{Y_{it}}(0)$. Finally, we generate estimates for causal quantities of interest: $ATT_S = \mathbb{E}[\tau_{it}|D_{i-s} = 0, D_{t-s+1} = D_{t-s+2} = D_{t-s+3} = \cdots = D_t = 1, \forall_i \in \mathcal{T}]$, where s denotes the periods since the treatment's onset (s > 0).

The study first introduces FEct estimator and $Y_{it}(0)$ based on two way fixed effect model defined as follows; $Y_{it}(0) = X'_{it}\beta + \alpha_i + \xi_t + \epsilon_{it}$ for all (i,t), where α_i and ξ_t are the unit and time-fixed effects, respectively, and ϵ_{it} is the idiosyncratic error term . FEct is actually a special case of DID. In other words, if we have two periods and two groups, FEct turns into a DID. However, FEct estimates can be biased if some unobserved time-varying confounders exist. IFect considers this problem using a factor-augmented model formulated as follows: $Y_{it}(0) = X'_{it}\beta + \alpha_i + \xi_t + \lambda'_i f_t + \epsilon_{it}$ for all (i, t) and f_t and λ'_i denotes unobserved latent factors and factor loadings, respectively. In this equation, the model finds latent factors using a cross-validation procedure. Additive fixed effects are simply special cases of interactive fixed effects. If we keep f_t as constant, $\lambda'_i f_t$ becomes additive fixed effects, and if we keep λ'_i constant, $\lambda'_i f_t$ will be time-fixed effects. Gobillon & Magnac (2016) first suggest IFect in a DID setting, and IFEct has a close relationship with the generalized synthetic control method (gsynth) developed by Xu (2017). According to Liu et al. (2022), gsynth could be regarded as a special case of IFEct, if staggered adoption is valid in the treatment group.

On the other hand, the MC estimator proposed by Athey et al. (2021) is a generalization of factor-augmented models. As FEct and IFEct, the model treats a causal inference problem as a task of completing a (N x T) matrix with missing entries, where missing occurs when $D_{it} = 1$. The MC is formulated as follows: $Y_{it}(0) = X\beta + L + \epsilon$. Like IFEct, L is defined as the product of two r-dimension matrices, $L = \Lambda F$. However, MC model does not estimate Λ and F explicitly compared to IFect. L is estimated by the minimization problem formulated as follows: $\hat{L} = argmin_L \left[\sum_{(i,t)\epsilon} \frac{(Y_{it} - L_{it})^2}{|\varphi|} + \lambda_L \|L\| \right]$ where $\phi = \{(i, t) \mid D_{it} = 0\}$. $\|L\|$ is the chosen matrix norm of L, λ_L is a "tuning parameter". Athey et al. (2021) present an iterative algorithm to obtain $\hat{L}$ is an asymptotically unbiased estimator for L. We identify the tuning parameter in the penalty term using by cross-validation procedure considering minimal mean squared prediction error (MSPE) in the MC model as IFEct.

It should be noted that if IFEct estimator does not find any unobserved latent factors and if the tuning parameter is found zero in MC model, then both methods will find the same estimates of FEct because of the structure of the equations in each model. In addition, Liu et al. (2022) underscore that while MC works well under the condition of a significant number of weak factors, IFEct works well when there are a small number but strong factors in the data.

To analyze the impact of Turkey's FTAs on its merchandise trade, we use yearly bilateral merchandise trade data of Turkey taken from TURKSTAT in USD for 1989-2021. We construct an unbalanced panel data set and take the logarithm of the data to construct our model[7]. The study selects 15 FTA partners of Turkey as treatment units and the top 50 export (import)

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[7] Since the estimation methods are convenient to make counterfactual estimation in unbalanced panel data setting, and Turkey's bilateral trade volume between these countries Turkey has FTA is changing one country to another significantly, we decide to exclude zero trade flows in our data to take the logarithm of trade data.

partners between 1989-2021 as a control group for analyzing the impact of FTAs on Turkey's exports (imports) to (from) these economies. Some countries that Turkey has FTA (treatment units) but do not have sufficient pre-treatment periods could not be analyzed in these models because of the structure of these methods. We also eliminate some countries which have not enough post-treatment periods. Thus, although Turkey has 22 FTAs, 7 out of 22 FTAs of Turkey have not been examined, which are Turkey-EFTA FTA entered into force in 1992, Kosovo, Serbia and Montenegro whose trade data start after 2006, Turkey –Venezuela (the UK) FTA signed in 2020 (2021). In addition, Turkey- Faroe Islands FTA has not been analyzed because Turkey has very negligible trade flows with this country, and its' bilateral trade with the Faroe Islands has not a stable trend, which is not convenient for these models according to Liu et al (2022).

Figure 3: Turkey's (Log) Exports to Economies in the Treatment and Control Group
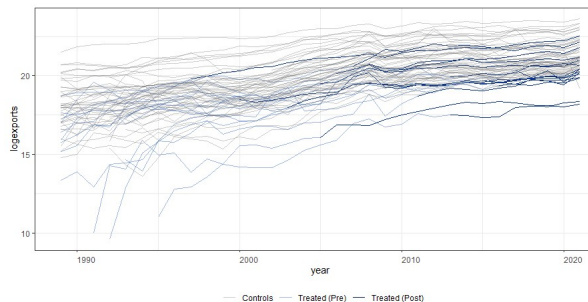
Source*: Author's calculations*

Figure 4: Turkey's Log (Imports) from Economies in the Treatment and Control Group
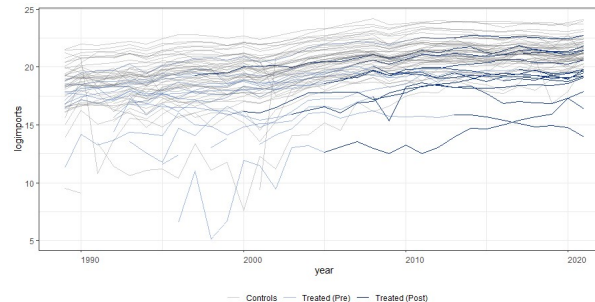
Source*: Author's calculations*

Turkey's bilateral trade between countries in the treatment and control group is shown in figure 3 and 4. In these figures, light grey and dark blue represent control and treatment conditions, respectively.

4. Results

In this section, counterfactual estimators (FEct, IFEct, MC) have been used to analyze the impact of Turkey's FTAs on its external trade with 95% confidence intervals based on block bootstraps of 200 times.

As can be seen in Figure 5, each method shows a positive impact of Turkey's FTAs on its exports. According to the average results of these three methods, Turkey's exports to FTA countries might have been 54.7% less on average over five years if Turkey had not signed FTA with these economies. However, it is seen that the residual averages in pre-treatment periods do not have a strong pre-trend around zero in FEct, compared to in IFEct and MC. We also see that the positive impact of FTAs on Turkey's export began to start one period earlier than that they entered into force according to FEct and MC, and partly IFEct method, although its' residual averages are still in 95% confidence interval one year before intervention. It should be noted that interventions can affect the treatment group before they enter into force in

practice (Abadie et al., 2010; Hannan, 2016; Dincer et al., 2018), which can be called an announcement effect.

Figure 5: Dynamic Treatment Impact of Turkey's FTAs on Its Exports
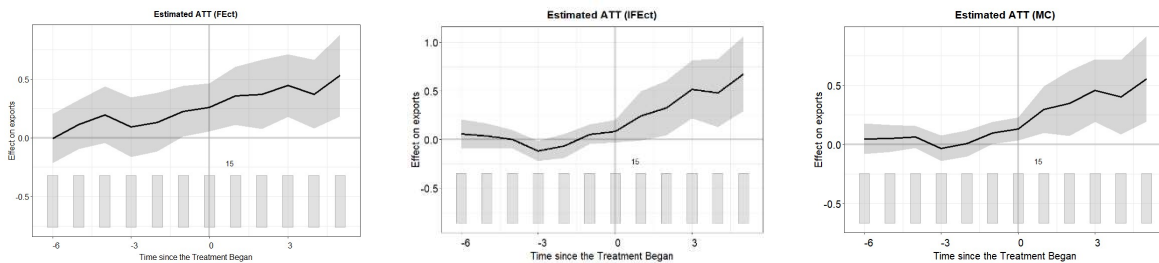
Note: *The bar graphs at the bottom in all panels demonstrate the treated units for each year*

As for imports, the study does not find any significant impact of Turkey's FTAs on its imports on average (Figure 6). Among these methods, while IFEct's residual averages have a better pre-trend fitting around zero, the pre-trend residuals of FEct and MC generally seem acceptable within a 95% confidence interval. However, Figure 6 shows that the residuals continued to fluctuate around zero after FTAs entered into force, which implies the inefficiency of FTAs on Turkey's imports on average.

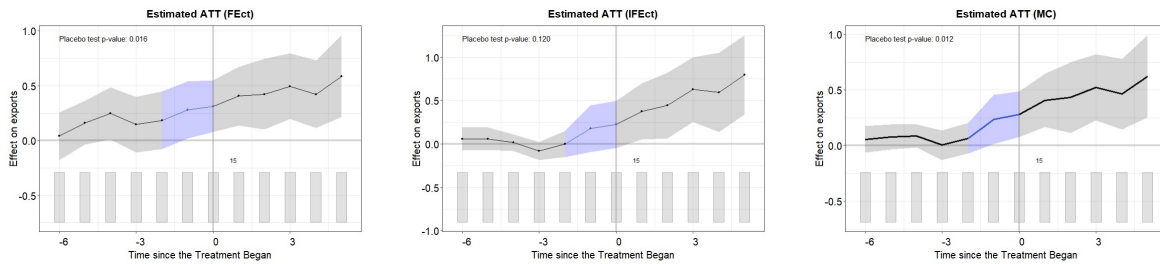**Figure 6: Dynamic Treatment Impact of Turkey's FTAs on Its Imports**
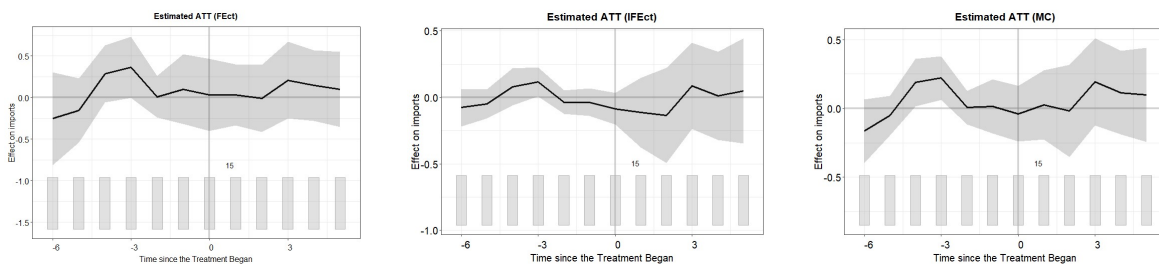
Note: *The bar graphs at the bottom in all panels demonstrate the treated units for each year*

Liu et al. (2022) present some diagnostic tests to help researchers check their models' robustness. In this study, we first use a placebo test, then make an F test to understand the presence of a (no) pre-trend in the models.

The process of the placebo test is quite simple. It is assumed that FTAs entered into force S years earlier than their actual onset for each FTA. Afterwards, the same routine of the counterfactual estimation methods is re-applied for this condition. We can determine a range of pre-treatment years as "placebo periods" for removing observations in this range and then analyze whether the results are different from zero. Should the t-test probability value be lesser than a pre-specified threshold (e.g., 5%), it signifies the failure of the test. Liu et al. (2022) suggest that the placebo periods should not be large because it means fewer pre-treatment periods remains for the estimation of models. Considering the authors' suggestion and our data constraint, we determine the range of S as (-1, 0) for the placebo test. Figure 7 demonstrates the findings of the placebo tests for each counterfactual export estimator. It is seen that while IFEct passes from the placebo test, FEct and MC fail.

Figure 7: The Effect of Turkey's FTAs on Its Exports – Placebo Test

Note: *The bar graphs at the bottom in all panels demonstrate the treated units for each year*

On the other hand, placebo test p-values are significantly greater than 5% threshold in our all-counterfactual import estimators (Figure 8), which means that all models pass from the placebo test.

Figure 8: The Effect of Turkey's FTAs on Its Imports – Placebo Test
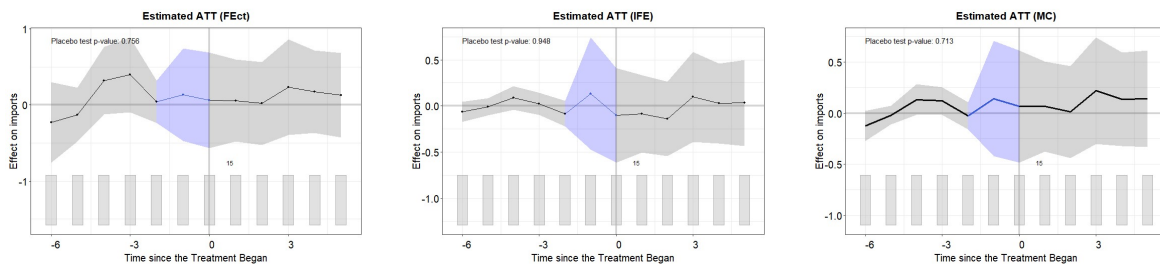
Note: *The bar graphs at the bottom in all panels demonstrate the treated units for each year*

The second diagnostic test in our study is the F test to verify whether our estimations have a pre-trend or not with zero residual averages in the pre-treatment period. If F test results have large probability value, it signifies a good pre-trend fitting. We test the pre-treatment trend of the last seven periods before the treatment to consider all examined FTAs of Turkey in our study at the same time[8].The F-test p.value in FEct, IFEct, and MC is realized as 0.21 (0.28), 0.31 (0.54), and 0.22 (0.21) for exports (imports), respectively, which signifies a good pre-trend fitting in each model.

5. Conclusion

Using the FEct, IFEct, and MC and considering 15 FTAs of Turkey, the study analyzes whether Turkey's FTAs have an impact on its foreign trade level. We demonstrate that the FTAs have significant effects on Turkey's exports, although we do not find any impacts on its imports.

The study also underscores the probability of announcement effects of FTAs on Turkey's exports to the economies with which Turkey has an FTA. The abovementioned results of MC and FEct and their placebo test results for exports imply the possibility of such effects. In addition, although IFEct passes the placebo test, its placebo p.value is not found to be

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[8] Since our data start with 1989, and Turkey-Israel FTA, first signed agreement in our model entered into force in 1997, we have at most 7 years to test the pretreatment trend of countries in the treatment group.

remarkably high, which signifies the possibility of the announcement effect of these agreements on Turkey's export to these economies.

It should be noted that although this study considers the heterogonous effect of each agreement, it does not interest the individual impacts of these agreements on trade. Therefore, the results of this study might be further tested by subgroup analysis to understand if there are some FTAs have an effect / not any impact on Turkey's exports/imports.

In addition, even if the impact of Turkey's FTAs on its total imports from these economies is found insignificant, it's impact may differ from one sector to another. Therefore, product-based analysis can be examined to understand the reasons behind the inefficiency of these agreements on Turkey's imports from FTA countries, and the heterogeneous effects of FTAs on different sectors can be studied in future research.

Moreover, this study does not consider the trade diversion effects of FTAs. Therefore, we do not present the impact of these agreements on Turkey's total exports (imports) to (from) the world in this study.

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