



Hacettepe University Graduate School Of Social Sciences  
Department of Economics

**THE IMPACT ASSESSMENT OF TURKEY'S FTAs:  
APPLICATION  
OF SYNTHETIC CONTROL METHOD AND GRAVITY MODEL**

Tahamuhammet SÜLEYMAN

Master's Thesis

Ankara, 2022

THE IMPACT ASSESSMENT OF TURKEY'S FTAS:  
APPLICATION  
OF SYNTHETIC CONTROL METHOD AND GRAVITY MODEL

Tahamuhammet SÜLEYMAN

Hacettepe University Graduate School Of Social Sciences  
Department of Economics

Master's Thesis

Ankara, 2022

## ACCEPTANCE AND APPROVAL

The jury finds that Tahamuhammet SÜLEYMAN has on the date of 24/05/2022 successfully passed the defense examination and approves his master's thesis titled titled "The Impact Assessment of Turkey's FTAs: Application Of Synthetic Control Method And Gravity Model".

---

Prof. Dr. Ayşe Yasemin YALTA (Main Adviser)

---

Assoc. Prof. Dr. Burcu FAZLIOĞLU

---

Asst. Prof. Dr. ZÜHAL KURUL

I agree that the signatures above belong to the faculty members listed.

Prof. Dr. Uğur ÖMÜRGÖNÜLŞEN

Graduate School Director

## YAYIMLAMA VE FİKRİ MÜLKİYET HAKLARI BEYANI

Enstitü tarafından onaylanan lisansüstü tezimin/raporumun tamamını veya herhangi bir kısmını, basılı (kağıt) ve elektronik formatta arşivleme ve aşağıda verilen koşullarla kullanıma açma iznini Hacettepe Üniversitesine verdiğimi bildiririm. Bu izinle Üniversiteye verilen kullanım hakları dışındaki tüm fikri mülkiyet haklarım bende kalacak, tezimin tamamının ya da bir bölümünün gelecekteki çalışmalarda (makale, kitap, lisans ve patent vb.) kullanım hakları bana ait olacaktır. Tezin kendi orijinal çalışmam olduğunu, başkalarının haklarını ihlal etmediğimi ve tezimin tek yetkili sahibi olduğumu beyan ve taahhüt ederim. Tezimde yer alan telif hakkı bulunan ve sahiplerinden yazılı izin alınarak kullanılması zorunlu metinlerin yazılı izin alınarak kullandığımı ve istenildiğinde suretlerini Üniversiteye teslim etmeyi taahhüt ederim.

Yükseköğretim Kurulu tarafından yayınlanan “**Lisansüstü Tezlerin Elektronik Ortamda Toplanması, Düzenlenmesi ve Erişime Açılmasına İlişkin Yönerge**” kapsamında tezim aşağıda belirtilen koşullar haricince YÖK Ulusal Tez Merkezi / H.Ü. Kütüphaneleri Açık Erişim Sisteminde erişime açılır.

- Enstitü / Fakülte yönetim kurulu kararı ile tezimin erişime açılması mezuniyet tarihimden itibaren 2 yıl ertelenmiştir. <sup>(1)</sup>
- Enstitü / Fakülte yönetim kurulunun gerekçeli kararı ile tezimin erişime açılması mezuniyet tarihimden itibaren ... ay ertelenmiştir. <sup>(2)</sup>
- Tezimle ilgili gizlilik kararı verilmiştir. <sup>(3)</sup>

...../...../.....

İmza

Tahamuhammet SÜLEYMAN

i

“Lisansüstü Tezlerin Elektronik Ortamda Toplanması, Düzenlenmesi ve Erişime Açılmasına İlişkin Yönerge”

- (1) Madde 6. 1. Lisansüstü teze ilgili patent başvurusu yapılması veya patent alma sürecinin devam etmesi durumunda, tez **danışmanın** önerisi ve **enstitü anabilim dalının** uygun görüşü üzerine **enstitü** veya **fakülte yönetim kurulu** iki yıl süre ile tezin erişime açılmasının ertelenmesine karar verebilir.
  - (2) Madde 6. 2. Yeni teknik, materyal ve metotların kullanıldığı, henüz makaleye dönüşmemiş veya patent gibi yöntemlerle korunmamış ve internetten paylaşılması durumunda 3. şahıslara veya kurumlara haksız kazanç imkanı oluşturabilecek bilgi ve bulguları içeren tezler hakkında tez **danışmanın** önerisi ve **enstitü anabilim dalının** uygun görüşü üzerine **enstitü** veya **fakülte yönetim kurulunun** gerekçeli kararı ile altı ayı aşmamak üzere tezin erişime açılması engellenebilir.
  - (3) Madde 7. 1. Ulusal çıkarları veya güvenliği ilgilendiren, emniyet, istihbarat, savunma ve güvenlik, sağlık vb. konulara ilişkin lisansüstü tezlerle ilgili gizlilik kararı, **tezin yapıldığı kurum** tarafından verilir \*. Kurum ve kuruluşlarla yapılan işbirliği protokolü çerçevesinde hazırlanan lisansüstü tezlere ilişkin gizlilik kararı ise, **ilgili kurum ve kuruluşun önerisi** ile **enstitü** veya **fakültenin** uygun görüşü üzerine **üniversite yönetim kurulu** tarafından verilir. Gizlilik kararı verilen tezler Yükseköğretim Kuruluna bildirilir.  
Madde 7.2. Gizlilik kararı verilen tezler gizlilik süresince enstitü veya fakülte tarafından gizlilik kuralları çerçevesinde muhafaza edilir, gizlilik kararının kaldırılması halinde Tez Otomasyon Sistemine yüklenir
- \* Tez **danışmanın** önerisi ve **enstitü anabilim dalının** uygun görüşü üzerine **enstitü** veya **fakülte yönetim kurulu tarafından karar verilir.**

## ETİK BEYAN

Bu çalışmadaki bütün bilgi ve belgeleri akademik kurallar çerçevesinde elde ettiğimi, görsel, işitsel ve yazılı tüm bilgi ve sonuçları bilimsel ahlak kurallarına uygun olarak sunduğumu, kullandığım verilerde herhangi bir tahrifat yapmadığımı, yararlandığım kaynaklara bilimsel normlara uygun olarak atıfta bulunduğumu, tezimin kaynak gösterilen durumlar dışında özgün olduğunu, **Prof A. Yasemin YALTA** danışmanlığında tarafımdan üretildiğini ve Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Yazım Yönergesine göre yazıldığını beyan ederim.

*İmza*

**Tahamuhammet SÜLEYMAN**

## ABSTRACT

SÜLEYMAN Tahamhammet. *The Impact Assessment of Turkey's FTAs: Application Of Synthetic Control Method And Gravity Model*, Master's Thesis, Ankara, 2022.

For almost 30 years, free trade agreements (FTAs) have been one of the most crucial types of economic integration. As a result of the World Trade Organization's (WTO) failure to provide additional levels of liberalization, countries use bilateral and regional free trade agreements broadly to promote trade and growth. Thus, utilizing the benefits of free trade agreements is vital for countries. Turkey signed 38 FTAs and there are 22 FTAs in force. Considering the importance of FTAs, this research aims to analyze the effect of Turkey's free trade agreements on Turkey's exports and imports. The gravity model is used as a workhorse to analyze international trade. This thesis contributes to the literature by using a synthetic control method in addition to gravity model in order to obtain robust inferences and compare the findings. The dataset covers 160 countries and 1990-2020 period. According to gravity model and synthetic control method results, only Israel, Morocco, Egypt, South Korea, Tunisia, Serbia, Malaysia, and Montenegro FTAs have significant impact on Turkey's exports, while FTAs with Israel, Morocco, Egypt, Bosnia and Herzegovina, and Malaysia have significant effect on Turkey's imports. The empirical results obtained in this study suggest that most of the FTAs do not have a significant effect on Turkey's exports. The effects of FTAs can be increased with revisions aimed at enhancing the scope of the agreements and adopting new generation FTAs.

### Keywords

Gravity Model, Synthetic Control Method, Free Trade Agreements

## ÖZET

SÜLEYMAN Tahamuhammet. *Türkiye'nin Serbest Ticaret Anlaşmalarının Etki Değerlendirmesi: Sentetik Kontrol ve Çekim Modeli Uygulaması*, Master Tezi, Ankara, 2022.

Serbest ticaret anlaşmaları son 30 yıldır en sık kullanılan ekonomik entegrasyon türlerinden bir tanesidir. Özellikle Dünya Ticaret Örgütü'nün liberalizasyon konusunda yetersiz kaldığı durumlarda ülkeler ticaretlerini ve büyümelerini artırmak için ikili veya çok taraflı serbest ticaret anlaşmalarını kullanmıştır. Bu nedenle ülkeler açısından serbest ticaret anlaşmalarının faydalarından tam olarak istifade etmek önemlidir. Türkiye günümüze kadar 38 STA imzalamış olup 22 tanesi yürürlükte. Bu çalışmanın amacı Türkiye'nin imzalamış olduğu ve yürürlükte olan STA anlaşmalarının Türkiye ihracatı ve ithalatı üzerindeki etkisini ölçmektir. Literatürde ticaret analizlerinde sıkça kullanılan modelin çekim modeli olması nedeni ile bu çalışmada da çekim modeli kullanılmıştır. Bu tez, sağlam çıkarımlar elde etmek ve bulguları karşılaştırmak için çekim modeline ek olarak sentetik kontrol yöntemi metodu kullanarak literatüre katkıda bulunmaktadır. Çekim modelinde kullanılan panel veri setini 160 ülke oluşturmakta ve 1990-2020 dönemi kapsamaktadır. Çekim modeli ve sentetik kontrol metodu sonuçlarına göre İsrail, Fas, Mısır, Güney Kore, Tunus, Sırbistan, Malezya ve Karadağ ile imzalanan serbest ticaret anlaşmalarının Türkiye'nin ihracatı üzerine anlamlı bir etkisi varken, İsrail, Fas, Mısır, Bosna Hersek ve Malezya ile imzalanan serbest ticaret anlaşmalarının Türkiye'nin ithalatı üzerine anlamlı etkisi bulunmaktadır. Bu çalışmada elde edilen ampirik sonuçlar imzalanan serbest ticaret anlaşmalarının çoğunun Türkiye'nin ihracatı üzerinde anlamlı bir etkisi olmadığını göstermektedir. Serbest ticaret anlaşmalarının kapsamının genişletilmesine yönelik revizyonlar ve yeni nesil serbest ticaret anlaşmalarının benimsenmesiyle serbest ticaret anlaşmalarının etkileri artırılabilir.

### Anahtar Sözcük

Çekim Modeli, Sentetik Kontrol Metodu, Serbest Ticaret Anlaşmaları

## TABLE OF CONTENTS

ACCEPTANCE AND APPROVAL .....	i
YAYIMLAMA VE FİKRİ MÜLKİYET HAKLARI BEYANI.....	ii
ETİK BEYAN.....	iii
ABSTRACT .....	iv
ÖZET .....	v
LIST OF TABLES .....	viii
LIST OF FIGURES .....	x
INTRODUCTION.....	1
CHAPTER 1:THE EFFECTS of FREE TRADE AGREEMENTS.....	3
1.1. STATIC EFFECTS of FTAs.....	3
1.2. DYNAMIC EFFECTS of FTAs.....	4
CHAPTER 2: DEVELOPMENTS IN TURKEY'S TRADE POLICY AND FREE TRADE AGREEMENTS .....	8
2.1. TRADE OUTLOOK.....	9
2.2. FREE TRADE AGGREMENTS of TURKEY.....	14
CHAPTER 3: OVERVIEW of STUDIES EVALUATING THE IMPACT OF FTA.....	16
3.1. THEORETICAL FOUNDATION of the GRAVITY MODEL .....	16
3.2. DIFFERENCE IN DIFFERENCES METHOD .....	20
3.3. SYNTHETIC CONTROL METHOD.....	22
CHAPTER 4: LITERATURE REVIEW.....	26
4.1. LITERATURE .....	26
4.1.1 Literature on Gravity Model .....	26
4.1.2 Literature on Synthetic Control Method .....	32
CHAPTER 5:DATA AND EMPIRICAL METHODOLOGY .....	37
5.1. GRAVITY MODEL RESULTS .....	38
5.2. DIFFERENCE IN DIFFERENCE METHOD AND SYNTHETIC CONTROL METHOD RESULTS .....	43
5.2.1. EFTA .....	44
5.2.2. Israel Free Trade Agreement.....	48



<b>5.2.3. N. Macedonia Free Trade Agreement</b> .....	<b>50</b>
<b>5.2.4. Bosnia and Herzegovina Free Trade Agreement</b> .....	<b>52</b>
<b>5.2.5. Tunisia Free Trade Agreement</b> .....	<b>54</b>
<b>5.2.6. Morocco Free Trade Agreement</b> .....	<b>55</b>
<b>5.2.7. Egypt Free Trade Agreement</b> .....	<b>57</b>
<b>5.2.8. Georgia Free Trade Agreement</b> .....	<b>59</b>
<b>5.2.9. Albania Free Trade Agreement</b> .....	<b>60</b>
<b>5.2.10. Serbia Free Trade Agreement</b> .....	<b>62</b>
<b>5.2.11. Montenegro Free Trade Agreement</b> .....	<b>63</b>
<b>5.2.12. Chile Free Trade Agreement</b> .....	<b>64</b>
<b>5.2.13. Mauritius Free Trade Agreement</b> .....	<b>66</b>
<b>5.2.14. South Korea Free Trade Agreement</b> .....	<b>67</b>
<b>5.2.15. Malaysia Free Trade Agreement</b> .....	<b>69</b>
<b>5.2.16. Moldova Free Trade Agreement</b> .....	<b>71</b>
<b>5.2.17. Singapore Free Trade Agreement</b> .....	<b>72</b>
<b>CONCLUSION</b> .....	<b>76</b>
<b>REFERENCES</b> .....	<b>79</b>
<b>APPENDIX A – COUNTRY LIST USED IN GRAVITY MODEL</b> .....	<b>79</b>
<b>APPENDIX B - COUNTRY LIST USED IN SYNTHETIC CONTROL METHOD</b> .....	<b>83</b>
<b>APPENDIX C – DESCRIPTIVE STATISTICS</b> .....	<b>84</b>
<b>APPENDIX D – UNIT ROOT TESTS</b> .....	<b>85</b>
<b>APPENDIX E – PLACEBO TEST RESULTS</b> .....	<b>87</b>
<b>APPENDIX F – ETHICS COMMISSION FORM</b> .....	<b>101</b>
<b>APPENDIX G – ORIGINALITY REPORT</b> .....	<b>103</b>

## LIST OF TABLES

TABLE 1: TURKEY FOREIGN TRADE STATISTICS.....	10
TABLE 2: TURKEY'S FREE TRADE AGREEMENTS AND ENTERED IN FORCE DATES .....	15
TABLE 3: DIFFERENCE IN DIFFERENCES METHOD.....	20
TABLE 4: DATASETS AND SOURCES .....	37
TABLE 5: GRAVITY MODEL RESULTS .....	39
TABLE 6: GRAVITY MODEL RESULTS FOR TURKEY EXPORT .....	40
TABLE 7: GRAVITY MODEL RESULTS FOR TURKEY IMPORT.....	41
TABLE 8: GRAVITY MODEL RESULTS: IMPACT OF THE FTAS ON THE TURKEY'S EXTERNAL TRADE .....	41
TABLE 9: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S EXPORT - TUNISIA FTA .....	54
TABLE 10: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S IMPORT - TUNISIA FTA.....	55
TABLE 11: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S EXPORT – MOROCCO FTA .....	56
TABLE 12: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S IMPORT - MOROCCO FTA .....	57
TABLE 13: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S EXPORT – EGYPT FTA .....	58
TABLE 14: MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S IMPORT - EGYPT FTA.....	59
TABLE 15 GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S EXPORT – GEORGIA FTA .....	60
TABLE 16 GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S IMPORT - GEORGIA FTA .....	60
TABLE 17 GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S EXPORT – ALBANIA FTA .....	61
TABLE 18 GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S IMPORT - ALBANIA FTA .....	62

TABLE 19: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S EXPORT – SERBIA FTA .....	63
TABLE 20: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S IMPORT - SERBIA FTA .....	63
TABLE 21: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S EXPORT – MONTENEGRO FTA .....	64
TABLE 22: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S IMPORT - MONTENEGRO FTA .....	64
TABLE 23: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S EXPORT – CHILE FTA .....	65
TABLE 24: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S IMPORT - CHILE FTA .....	66
TABLE 25: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S EXPORT – MORITIUS FTA .....	67
TABLE 26: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S IMPORT - MORITIUS FTA .....	67
TABLE 27: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S EXPORT – SOUTH KOREA FTA .....	68
TABLE 28: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S IMPORT - SOUTH KOREA FTA .....	69
TABLE 29: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S EXPORT – MALAYSIA FTA.....	70
TABLE 30: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S IMPORT - MALAYSIA FTA.....	70
TABLE 31: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S EXPORT – MOLDOVIA FTA .....	71
TABLE 32: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S IMPORT - MOLDOVIA FTA .....	72
TABLE 33: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S EXPORT – SINGAPORE FTA.....	73
TABLE 34: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY’S IMPORT - SINGAPORE FTA.....	74
TABLE 35: THE IMPACT OF FREE TRADE AGGREGMENTS (1000 \$ PER UNIT).....	74

## LIST OF FIGURES

FIGURE 1: TURKEY'S TOP 20 IMPORT PARTNERS IN 2021 .....	13
FIGURE 2: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S EXPORT .....	45
FIGURE 3: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S IMPORTS .....	45
FIGURE 4: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S EXPORT .....	46
FIGURE 5: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S IMPORTS .....	46
FIGURE 6: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S EXPORT .....	47
FIGURE 7: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S IMPORTS .....	47
FIGURE 8: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S EXPORT .....	49
FIGURE 9: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S IMPORT .....	49
FIGURE 10: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S EXPORT .....	51
FIGURE 11: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S IMPORT .....	51
FIGURE 12: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S EXPORT .....	53
FIGURE 13: GRAVITY MODEL AND THE SYNTHETIC CONTROL METHOD RESULTS FOR TURKEY'S IMPORT .....	53

## INTRODUCTION

International trade plays a crucial role in a globalized and financially integrated world, benefiting both developing market economies and industrialized countries. Turkish economy experienced a series of structural changes since the 1980s. As a result, open market policies were adopted instead of protectionist policies. To this aim, tariff rates were decreased, restrictive foreign trade policy tools were reduced or eliminated, and free trade agreements (FTA) were signed to increase the economic integration level. FTAs were used as a foreign trade policy tool since the 1990s, and Turkey has negotiated various free trade agreements with different countries especially after 2010. Understanding the potential impacts of FTAs on exports and imports of a country is an important research question which will guide policymakers in formulating trade policies.

Although there are various studies examining the effects of FTAs, most of these studies utilize a gravity model. It is argued in the literature that the gravity model approach has several disadvantages in evaluating the effects of trade agreements. Firstly, countries tend to use FTAs with significant trade partners, which leads to an endogeneity problem. Secondly, the evaluation is based on the predicted values, not the observed values making it more difficult to evaluate the impact of FTA. Several approaches have been proposed to deal with the issue of selection bias in observational data, such as matching estimators. However, these methods cannot control the unobservable country heterogeneity. It is proposed in recent years that Synthetic Control Method (SCM) can be used to analyze the impacts of FTAs due to its various advantages: SCM take into account the unobservable country heterogeneity and allow the impact of unobserved time-varying characteristics. Furthermore, SCM can be used even if there is a small number of treated and control units, and finally it does not rely on parallel pre-implementation trends like the difference in difference methods.

This study aims to evaluate the impact of Turkey's FTAs on Turkey's foreign trade by utilizing gravity approach and synthetic control method (SCM). To the best of our knowledge there is only one study (Aytuğ, Kütük, Oduncu, and Togan, 2016) employing SCM to analyze the effect of trade policy and that study considers the Customs Union agreement. Therefore, this thesis will be the first study applying this newly developed model in the context of evaluating the effect of FTAs in Turkey. Another contribution of

the thesis is to extend the country group with new countries such as Singapore and Moldova. The analysis used in this thesis provides information regarding whether the synthetic control method is a useful tool for assessing the effects of free trade agreements or not.

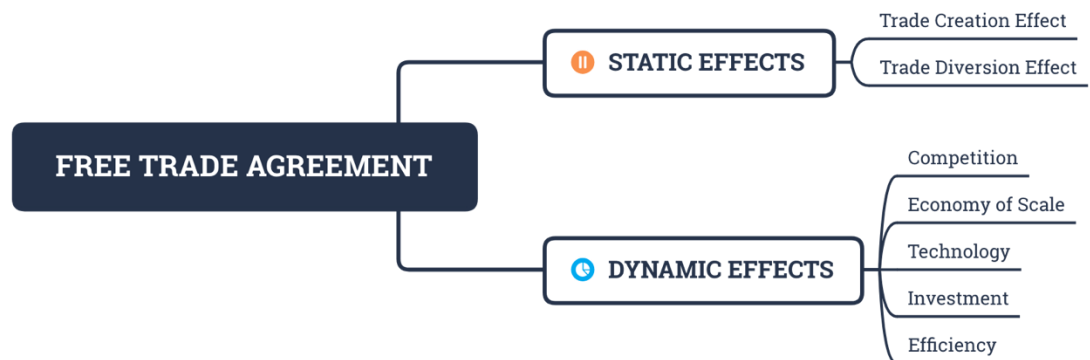
To this aim, we utilize a panel dataset containing 160 exporters for the 1990-2020 period. The donor pool used for SCM contains 80 countries selected according to the IMF country classification. The results obtained from gravity model reveal that FTAs increase exports by 52.6% on average and increase imports by 53.87% on average. According to gravity model and synthetic control method results, Israel, Morocco, Egypt, S. Korea, Tunisia, Serbia, Malaysia, and Montenegro FTAs have significant effect on Turkey's export, while FTA with Israel, Morocco, Egypt, Bosnia and Herzegovina, and Malaysia have significant effect on Turkey's imports.

The remainder of the thesis is organized into five sections: Section I outlines the effects of free trade agreements, section II describes the recent developments in Turkey's trade policy and free trade agreements. Section III reviews the related literature and section IV outlines research methodology and data. This is followed by section V, which presents the empirical results and the last section discusses the findings and policy implications.

## CHAPTER I

### THE EFFECTS of FREE TRADE AGREEMENTS

As an economic integration type, FTAs contain a mutual commitment of countries to remove tariff rates and trade barriers. Until Viner (1950), it was thought that FTAs would affect the country's economies through a single positive channel. After the Viner's study, it was revealed that FTAs affect countries through both positive and negative channels, so economic integration agreements are called the second best. On the one hand, free trade agreements reduce trade barriers by eliminating customs duties and trade barriers by bilateral or multilateral sides. On the other hand, a free trade agreement can lead to problems such as trade diversion, price differentiation, and national interest groups. The effects of free trade agreements are grouped under two headings: Static effects and dynamic effects.



This section attempts to address some crucial issues about the impact of Free Trade Agreements (FTAs). First, the static effects of FTAs are explained. Secondly, the dynamic effects of FTAs are presented.

#### 1.1. STATIC EFFECTS of FTAs

Static effects are the total of trade creation- trade diversion effects arising from price changes caused by tariff changes. The trade creation effect, described as thanks to the most efficient country's production, decreases products' price and increases consumption.

Trade creation effect is the rise in trade that happens between trading bloc members following the founding or enlargement of the trading bloc. This is because the elimination of trade barriers permits more specialization based on comparative advantage. This implies that prices can decline, and therefore trade can grow. Trade diversion is the decline in trade that results from the replacement of trade with low-cost non-trading bloc members with trade with comparatively high-cost trading bloc members. The competitiveness provided through tariffs strengthens the trade flows between the partner countries while weakening the trade flows with other countries (Plummer, Cheong, and Hamanaka, 2010, p.10). If the trade creation effects are greater than that of the trade diversion, it can be inferred that the free trade agreement contributes to the economic welfare of the member countries. Static effects are related to changes in foreign trade volume and welfare level due to eliminating tariffs without changing the economic structure.

## 1.2. DYNAMIC EFFECTS

While static effects are composed of single instantaneous effects, dynamic effects occur in the medium and long term. Countries access the larger market thanks to trade agreements. When the countries access the international market, different effects occur besides static effects. Dynamic effects consist of expanding the market volume, which means replacing a national market with a unified, more extensive market, and the effects increase competition, which means that domestic firms cannot produce efficiently in the domestic market. Thanks to trade agreements, firms tend to be more competitive and efficient due to increased competition (Seyidođlu, 2003, p.210). The most critical dynamic effects of the agreements are economies of scale, technology transfer and investments, structural policy changes and reforms, competition, and long-term growth effects (Rogowsky and Shiells, 1993, p. 8).

Dynamic effects are reviewed as follows:

**Competition:** Tariffs and trade barriers protect national firms from external competition, allowing national firms to access monopoly power, causing inefficient resource use. Removing trade barriers with trade agreements increases resource utilization efficiency



by forcing national firms to open up to international competition. Firms that are ineffective in production cannot compete and withdraw from the market; companies that can compete can effectively survive and access new markets (Arkolakis, Costinot, and Donaldson, 2013, p. 14).

**Economies of scale:** The factor that creates economies of scale is the expansion in the production volume. Cost-reducing factors that occur with the expansion in production volume can divide into internal scale economies and external scale economies. The first effect arises from the processes within the enterprise itself and are called internal economies of scale. As the company increases its production volume, it has price advances in stocking, marketing, R and D, planning, and management. It can also increase the quality of employment and optimize business processes and ensure efficiency, which leads to decreasing operating costs and opportunity to get competition power (Corden, 1972, p. 474).

The benefit of firm-level long-run average cost decrease thanks to industry expansion called external economies of scale. With the expansion of the industry, external benefits arise for companies within the industry. For example, the rapid development of industries increases the need for a qualified workforce. It attracts the attention of workforce training institutions that are trying to be covered by rising wages. Educational institutions train highly qualified employees for these areas that promise high returns. Due to the industry's development, the companies can easily access the developed workforce without paying any costs, without the companies needing to bear any additional training costs. The development and dissemination of technical knowledge bring with it mass production and ensures the mass production of products such as raw materials and intermediate products, cheaper and higher quality. Mass production needs some requirements in order to be realized and sustained. These are the increase in the need for infrastructure services to produce goods such as energy, access to finance, and transportation. Increased production reveals the desire for a more qualified and extensive infrastructure system.

**Technological progress:** Trade agreements increase the speed of technological progress of countries (Ping and Shuai, 2011, p. 3). With trade agreements, commercial and economic interactions between countries increase. Asymmetric knowledge of the parties

in the technical and technological field decreases. A large market leads to the establishment of large enterprises as it will increase the production requirement. Companies that have access to broader markets increase the pace of technological progress by starting to search for more efficient ways. Companies pay attention to technology transfer and RandD activities in order to be more competitive.

**Investments:** The purpose of trade agreements is to increase the efficiency of national resources. Trade agreements create a new window of opportunity between the parties. Firms want to benefit from the opportunity provided due to relative price differences. Investment opportunities in both mutually and third-party countries occurred, and the efficient use of resources provided by trade agreements causes an increase in national income, savings, and investments. Trade agreements with rules of origin cause third-country producers to expand their investments in the parties to the agreement to avoid the shared customs duty. Tariff factories are investments intended to avoid paying high tariff rates.

**Resource mobility:** Trade agreements provide a price advantage to both parties. National resources like labor and capital flow the most efficient production center. Resource mobility improves the efficiency of resource using in production. Efficiency increasing affects the welfare of both parties positively.

The reduction in product costs provided by trade agreements provides large-scale production. In this way, an increase in technical efficiency, a decrease in costs per product, discounts from suppliers, and high volume production logistics activities can be improved. Trade agreements contribute to economies of scale by increasing the size of the market to be reached for producers in parties to the agreement (Çeştepe and Mıstaçoğlu, 2010, p. 13). Thanks to competition lead to decrease production costs. The trade agreement allows the production between the parties to be concentrated in more efficient producers by liberalizing trade between the parties and expanding the market volume. Thanks to this, it enables foreign capital investments to be attracted to the parties. While foreign investments increase the trade volume of the country and increase the income from trade, they also provide solutions to problems such as unemployment by creating employment (Çeştepe and Mıstaçoğlu, 2010, p. 13).

Another important dynamic effect is the development of economic integration, the emergence of reforms, and structural policy changes by increasing investment activities between the parties to benefit from price competition. Recent FTAs contain much broader provisions, especially including tariff reductions. These broad provisions bring along policy changes and structural reforms. In addition, there is an increase in competition with the effect of liberalization due to FTA. With the increase in competition, efficiency increases in terms of resource distribution. Which positively affects growth in the long term (Plummer, Cheong, and Hamanaka, 2010, p.20)

## CHAPTER II

### DEVELOPMENTS IN TURKEY'S TRADE POLICY AND FREE TRADE AGREEMENTS

After World War II, Turkey joined international organizations like IMF and World Bank, an indicator of increasing economic relations. As a result of conjunctural change in the world, Turkey has loosened trade policy tools, such as tariffs, quotas, and import bans. With external aids like the Marshall plan, Turkey's consumption and production structure changed from a self-sufficiency policy to import-oriented production and consumption. In 1960s, Turkey changed its trade policy to import substitution industrialization with high tariffs and trade barriers to decrease trade deficits and growth. Protectionism was used as a primary tool in trade policy, including increasing tariffs, limiting imports, and quotas for many imported products. As a result, the government's share in the economy is drastically increased with investments, subsidizing local producers, and building new facilities for a self-sufficient economy.

Turkey experienced structural reform in 1980, which consisted of eliminating protectionisms like quotas, import bans, and high tariff rates and adapting liberal policies. The main reasons for structural reform are the failure of import substitution policies on economic growth targets, current account deficit, need for currency to sustain production, and unsustainable inflation and economic structure. To embrace liberal policies, the government eliminated quotas, import bans, and high tariff rates in foreign trade policies. Furthermore, decreasing or removing subsidies on local producers and adopting a new tax system in fiscal policies, and devaluation of TL and high-interest rates were used to increase competition power and attract foreign investment on the monetary policy side (Gündüz, 1999, pp. 4-5).

In the 1990s, Turkey increased its economic integration level by participating World Trade Organization (WTO) and custom union, which expanded its market power. Furthermore, Turkey increased its participation level in global value chains and production capacity through foreign direct investments. After the 2008 crisis, Turkey

used free trade agreements (FTAs) intensively to increase economic integration levels and economic growth.

The first part of the section gives a brief overview of the trade outlook, and the second part assesses the FTAs of Turkey.

## **2.1. TRADE OUTLOOK**

Turkey is a developing country with a GDP of 719 billion dollars and ranks as the 20th in the world. The share of foreign trade in GDP is 54%, and it follows an upward trend with the effect of many external and internal factors.

According to Table 1 below, Turkey has a trade deficit problem that reached about 100 billion dollars in 2011, and Turkey's trade volume reached almost 500 billion dollars in 2021. According to statistics, an increase in export followed the increase in imports which can be inferred as an import dependency on export. Therefore, imports and exports trend volatile and affected by external shocks like global shocks, and international issues are also affected by internal shocks like political and economic crises.

**Table 1: Turkey Foreign Trade Statistics**

<b>Year</b>	<b>Export</b>	<b>Change(%)</b>	<b>Import</b>	<b>Change(%)</b>	<b>Balance of Trade</b>	<b>Trade Volume</b>
1980	2.910.122	28,7	7.909.364	56,0	-4.999.242	10.819.486
1981	4.702.934	61,6	8.933.374	12,9	-4.230.439	13.636.308
1982	5.745.973	22,2	8.842.665	-1,0	-3.096.692	14.588.639
1983	5.727.834	-0,3	9.235.002	4,4	-3.507.168	14.962.836
1984	7.133.604	24,5	10.757.032	16,5	-3.623.429	17.890.636
1985	7.958.010	11,6	11.343.376	5,5	-3.385.367	19.301.386
1986	7.456.726	-6,3	11.104.771	-2,1	-3.648.046	18.561.497
1987	10.190.049	36,7	14.157.807	27,5	-3.967.757	24.347.856
1988	11.662.024	14,4	14.335.398	1,3	-2.673.374	25.997.422
1989	11.624.692	-0,3	15.792.143	10,2	-4.167.451	27.416.835
1990	12.959.288	11,5	22.302.126	41,2	-9.342.838	35.261.413
1991	13.593.462	4,9	21.047.014	-5,6	-7.453.552	34.640.476
1992	14.714.629	8,2	22.871.055	8,7	-8.156.426	37.585.684
1993	15.345.067	4,3	29.428.370	28,7	-14.083.303	44.773.436
1994	18.105.872	18,0	23.270.019	-20,9	-5.164.147	41.375.891
1995	21.637.041	19,5	35.709.011	53,5	-14.071.970	57.346.052
1996	23.224.465	7,3	43.626.642	22,2	-20.402.178	66.851.107
1997	26.261.072	13,1	48.558.721	11,3	-22.297.649	74.819.792
1998	26.973.952	2,7	45.921.392	-5,4	-18.947.440	72.895.344
1999	26.587.225	-1,4	40.671.272	-11,4	-14.084.047	67.258.497
2000	27.774.906	4,5	54.502.821	34,0	-26.727.914	82.277.727
2001	31.334.216	12,8	41.399.083	-24,0	-10.064.867	72.733.299
2002	36.059.089	15,1	51.553.797	24,5	-15.494.708	87.612.886
2003	47.252.836	31,0	69.339.692	34,5	-22.086.856	116.592.528
2004	63.167.153	33,7	97.539.766	40,7	-34.372.613	160.706.919
2005	73.476.408	16,3	116.774.151	19,7	-43.297.743	190.250.559
2006	85.534.676	16,4	139.576.174	19,5	-54.041.499	225.110.850
2007	107.271.750	25,4	170.062.715	21,8	-62.790.965	277.334.464
2008	132.027.196	23,1	201.963.574	18,8	-69.936.378	333.990.770
2009	102.142.613	-22,6	140.928.421	-30,2	-38.785.809	243.071.034
2010	113.883.219	11,5	185.544.332	31,7	-71.661.113	299.427.551
2011	134.906.869	18,5	240.841.676	29,8	-105.934.807	375.748.545
2012	152.461.737	13,0	236.545.141	-1,8	-84.083.404	389.006.877
2013	151.802.637	-0,4	251.661.250	6,4	-99.858.613	403.463.887
2014	157.610.158	3,8	242.177.117	-3,8	-84.566.959	399.787.275
2015	143.838.871	-8,7	207.234.359	-14,4	-63.395.487	351.073.230
2016	142.529.584	-0,9	198.618.235	-4,2	-56.088.651	341.147.819
2017	156.992.940	10,1	233.799.651	17,7	-76.806.711	390.792.592
2018	167.920.613	7,0	223.047.094	-4,6	-55.126.481	390.967.708
2019	180.832.722	2,1	202.704.320	-9,1	-31.239.375	374.169.264
2020	169.637.755	-6,2	219.516.807	4,4	-49.879.052	389.154.562
2021	225.233.654	32,8	271.423.093	23,6	-46.189.440	496.656.747

Source: Turkish Statistical Institute (TURKSTAT) (2022)

**Table 2: Turkey's Top 20 Exporter in 1990**

1	Germany	24.1
2	Italy	7.5
3	United States	7.5
4	United Kingdom	5.9
5	France	5.6
6	Soviet Union	4.2
7	Iran, Islamic Rep.	3.9
8	Netherlands	3.4
9	Saudi Arabia	2.7
10	Belgium-Luxembourg	2.5
11	Switzerland	2.3
12	Japan	1.9
13	Libya	1.7
14	Iraq	1.7
15	Algeria	1.6
16	Spain	1.6
17	Syrian Arab Republic	1.5
18	Austria	1.4
19	Egypt, Arab Rep.	1.3
20	Others	17.8
	Total	100.0

Source: TURKSTAT (2022)

Germany was the leading trade partner of Turkey in 1990, and the other large economies followed. Especially neighbor countries, Middle East and North Africa (MENA) countries, and European countries are at the first place.

**Table 3: Turkey's Top 20 Exporter in 2021**

1	Germany	8.7
2	United States	6.5
3	United Kingdom	6.1
4	Italy	5.1
5	Iraq	5.0
6	Spain	4.3
7	France	4.1
8	Netherlands	3.0
9	Israel	2.9
10	Russian Federation	2.6
11	United Arab Emirates	2.4
12	Romania	2.3
13	Belgium	2.2

14	Poland	2.1
15	Egypt, Arab Rep.	2.0
16	Bulgaria	1.8
17	China	1.5
18	Greece	1.3
19	Morocco	1.3
20	Others	34.8
	Total	100.0

Source: TURKSTAT 2022

Turkey has increased export and import volume dramatically after 2001 thanks to globalization and the participation in the global value chain. Although there was a decrease in the foreign trade increase in the post-2008 crisis period, the foreign trade figures returned to their former levels.

**Table 4: Turkey's Top 20 Import Partners in 1990**

1	Germany	15.86388
2	United States	10.36086
3	Italy	7.64167
4	France	6.030419
5	Soviet Union	5.168665
6	Japan	5.094232
7	Iraq	4.644705
8	United Kingdom	4.587647
9	Saudi Arabia	3.286723
10	Netherlands	2.588097
11	Switzerland	2.436988
12	Belgium-Luxembourg	2.358232
13	Iran, Islamic Rep.	2.240273
14	Libya	2.216663
15	Spain	1.540193
16	South Africa	1.383846
17	Korea, Rep.	1.372519
18	Algeria	1.229325
19	Yugoslavia, FR(Serbia/Montenegr	1.182544
20	Others	18.77251

Source: TURKSTAT (2022)

According to the Table 4, Germany was the leading trade partner of Turkey in 1990, and the other large economies followed. Especially neighbor countries, Middle East and North Africa (MENA) countries, and European countries is at the first place.



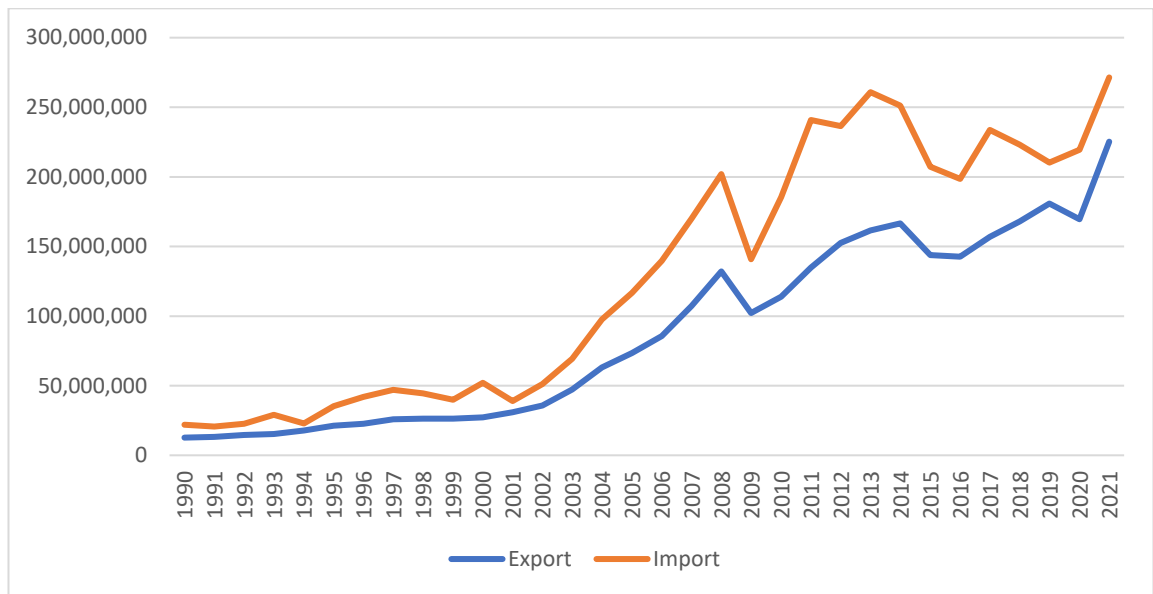
**Table 1: Turkey's Top 20 Import Partners in 2021**

1	China	13.6
2	Germany	9.1
3	Russian Federation	8.4
4	United States	5.4
5	Italy	4.9
6	India	3.3
7	France	3.3
8	Korea, Rep.	3.2
9	Spain	2.7
10	Belgium	2.4
11	United Kingdom	2.3
12	Ukraine	1.9
13	Netherlands	1.9
14	Japan	1.8
15	Brazil	1.6
16	Poland	1.5
17	Saudi Arabia	1.5
18	Romania	1.4
19	Malaysia	1.3
20	Others	28.4

Source: TURKSTAT (2022)

According to the Table 5, Turkey diversifies import locations and decreases the concentration and interdependency of markets individually. After the Customs Union Agreement, European countries and FTA countries ranked in the top of the list compared to 1990.

**Figure 1: Turkey External Trade 1990-2021 (Thousand Dollar)**



Source: TURKSTAT (2022)

According to the Figure 1, Turkey has increased its export and import volume dramatically after 2001 thanks to globalization and the participation in global value chains. Although there was a decrease in the volume of foreign trade in the post-2008 crisis period, the foreign trade figures returned to their former levels.

## 2.2. FREE TRADE AGREEMENTS of TURKEY

World Trade Organization (WTO) has some achievements in the liberalization of international trade. Countries seeking to further liberalization tend to be interested in trade agreements. WTO's rules bind whole members, and countries occasionally require improved market access conditions, which are ensured by trade agreements. The primary objective of an FTA is to maximize economic benefits and to promote bilateral commerce by shaping it to be more efficient and profitable. Generally, agreements eliminate tariffs on commodities, streamline customs procedures, eliminate arbitrary limits on what can and cannot be exchanged internationally, and facilitate business people to travel to another country. Because FTAs are legally binding, they give exporters, importers, and investors assurance and security. They assist businesses in establishing and maintaining a competitive position in such markets. The basic logic of FTAs is trade agreements that are realized by eliminating or reducing taxes on imports and giving other countries

freedom regarding tax rates to be applied. Therefore, there is a desire to increase FTA's countries, gaining competition power against the outside world due to tax reductions. In FTA agreements provide;

- That determines which products the agreement will apply to
- Provisions regarding the reduction and eventual elimination of tariffs
- Provisions for the removal of trade barriers other than tariffs
- Provisions regarding the preferential regime to be applied by the parties to each other.
- Provisions on customs procedures
- Provisions on rules of origin

Turkey has established FTAs with 38 nations, 11 of which have been revoked following their entrance to the EU. Turkey currently has 22 FTAs in force.

**Table 6: Turkey's Free Trade Agreements and Entered in Force Dates**

<b>Country</b>	<b>Entered in Force Date</b>
Albania	1.May 2008
Bosnia and Herzegovina	1 July 2003
Chile	1 March 2011
EFTA	1992
Egypt	1 March 2007
Fareo	1 October 2017
Georgia	1 November 2008
Israel	1.May 1997
Kosova	1 September 2019
Malaysia	1 August 2015
Mauritius	1 June 2013
Moldova	1 November 2016
Montenegro	1 March 2010
Morocco	1 January 2006
Nort Macadenia	1 September 2000
Palestine	1 June 2005
Serbia	1 September 2010
Singapore	1 October 2017
South Korea	1.May 2013
Tunusia	1 July 2005
United Kingdom	29 December 2020
Venezuala	21 August 2020

Source: Republic of Turkey Ministry of Trade (2022)

## CHAPTER III

### OVERVIEW of STUDIES EVALUATING THE IMPACT OF FTAs

Countries have started to use FTAs as a policy tool to increase economic activity. Following that, there is a growing body of literature on FTAs. This chapter reviews the previous theoretical and empirical studies. The first part of the section gives a brief overview of theoretical literature and the Gravity Model. The second section describes the difference-in-difference methodology and synthetic control method.

#### 3.1. THEORETICAL FOUNDATION of the GRAVITY MODEL

The gravity model is a model used in international economics to explain trade flows between countries. The model's roots have been based on Newton's law of gravity which was conceived in the 17th century. In the law of gravity, the gravitational force between two substances affects the masses of the substances positively, while the distance between them affects them negatively. While trade flows are positively affected by the economic size of the two countries, they are negatively affected by the distance between the two countries. Therefore, economically larger countries and closer countries trade more with each other. Economic size is assumed to indicate the exporter side's production power and the consumer's disposable income. The distance between the two countries has been accepted as the most important indicator of trade costs.

The first example of the gravity model was studied by Tinbergen (1962). Over 50 years, many gravity studies have been conducted to determine trade flows and trade policies. According to Tinbergen, the export capacity of a country depends on its economic size, and the amount of product that can be sold to a country is related to the economic size of the importing country.

Tinbergen used the Gravity Model as below;

$$E_{ij} = a_1 \ln Y_i + a_2 \ln Y_j + a_3 \ln D_{ij} + a_4 \ln N + a_5 \ln Pc + a_5 \ln Pb + e_{ij}$$

The expression of  $E$  denotes the bilateral trade flows, while the expression  $D$  denotes the distance between the exporting country  $i$  and the importing country  $j$ .  $Y$  gives the GNP values for  $i$  exporting country and the  $j$  importing country.  $P_c$  and  $P_b$  are dummy variables denoting countries' Commonwealth and Benelux memberships. The coefficients at the beginning indicate the flexibility since the model is logarithmic. In other words, it expresses how much a percent change in distance will change trade flows. With his study, Tinbergen (1962) tried to find the potential of trade flows between the two countries in a situation where there are no trade barriers.

Tinbergen tried to find the expected trade value between any two countries based on the main factors determining the trade volume between the two countries (Tinbergen, 1962: 262). Suppose that the trade between these two countries is below or above the expected value, representing the discriminatory trade policies. Given that the trade is above the theoretically calculated expected value indicates a preferential trade regime compared to the trade of these countries with other countries in the trade between the two countries and that the importing country makes positive discrimination (Tinbergen, 1962: 262). Because that the trade is below the theoretically calculated value indicates that the importing country makes negative discrimination imports originating from that country compared to imports from other countries (Tinbergen, 1962, p. 262). Linnemann (1966) expanded the gravity model with the share of domestic demand and the variables of population size, factor densities, and natural trade barriers. The theoretical deficiency of the gravity model has been corrected by Anderson (1979). Anderson tried to explain the gravity model with the Armington Assumption and CES assumption, which express the differentiation of tradable goods according to the country of origin. The fact that countries produce goods that do not have close substitutes causes each country to trade and each product to be subject to trade. Wealthy countries will produce and export more, generate more income, and import more. Trade costs are modeled as "iceberg" costs. Anderson (1979) stated that the most successful model regarding foreign trade is the gravity model. Krugman (1980) tried to explain the gravity model with the theory of monopolistic competition and its theoretical framework. Bergstrand (1985) tried to explain the gravity model with the supply side in his study. It was stated that prices by GDP deflator should be included in the gravity model. The model, including Bergstrand's price variable, is

expressed as the generalized gravity equation. Trade flows; revenue is determined by the tariff rate, transport costs, price, and exchange rate. Deardorf (1998) determined in his study that the gravity model is compatible with the Heckscher -Ohlin theory. Trade between two countries depends on income and distance and also on the relative difference between the production and consumption averages of the countries from the world average and the relative distance differences. According to Eaton and Kortom (2002), it was stated that production technology determines trade sensitivity between countries to costs and geographical barriers. In their study, Anderson and van Wincoop (2003) found that the determinant of bilateral trade is not mutual inter-country trade costs. Relative trade costs with other countries are significant as a determinant of trade.

It is stated in the literature that it is crucial to control relative trade costs (Bacchetta, 2012, p. 105). Anderson and van Wincoop (2012) distinguish between multilateral and bilateral trade resistance. While multilateral trade resistances are valid in countries' trade with all countries, bilateral trade resistance refers to the trade resistance between two countries. Trade between these two countries will be more attractive if multilateral trade resistance increases relative to bilateral trade resistance. Conversely, if bilateral trade resistances increase compared to multilateral trade resistance, it is expected that the trade between these two countries will decrease.

In general, the economic size of the countries shows the production power of the exporter country and the spending power of the importer country. On the other hand, distance denotes communication, cultural distance, and market research costs, especially transportation costs. The study, which Anderson and van Wincoop (2003) called the structural gravity model, is the most frequently used model in the literature. It is a model with  $N$  countries and product differentiation with exporting countries. Moreover, they used the gravity model as a demand function in their study called "Gravity with Gravititas." In the model, consumer preferences were based on the CES assumption. Therefore, consumers aim to consume more and reach a wider variety of products.

In this form, which is frequently used in the literature today,  $Y$  denotes GDP,  $t$  ( $1+t$ ) denotes tariff equivalent of trade costs,  $\pi$  denotes the elasticity of substitution, and  $P$  is

the ease of market access (internal and external multilateral resistance terms). It is high when its proximity to world markets is close (Yotov, Piermartini, Monteiro, and Larch, 2012, p. 18).

$$X_{ij} = \frac{Y_i Y_j}{Y} \left( \frac{t_{ij}}{\pi_i P_j} \right)^{1-\sigma}$$

The model can be transformed into logarithmic form as below;

$$\ln X_{ij} = a_0 + a_1 \ln Y_i + a_2 \ln Y_j + a_3 \ln t_{ij} + a_4 \ln \pi_i + a_5 \ln P_j + e_{ij}$$

In summary, a 1% increase in the independent variables is interpreted as a 1% in export increase and is called elasticity. While the trade costs were used as a proxy with the distance variable in the studies, expanded with dummy variables (common language, common border, colonial history, trade agreements). Thanks to dummy variables, it provides consideration of information cost and searches cost.

To control the Multilateral Resistance Terms, remoteness indexes was used widely in the literature.

$$\text{RemotenessExporter}_{i,t} = \left( \sum \frac{\text{DIST}_{ij}}{\frac{E_{j,t}}{Y_t}} \right)$$

$$\text{RemotenessImporter}_{i,t} = \left( \sum \frac{\text{DIST}_{ij}}{\frac{Y_{j,t}}{Y_t}} \right)$$

The  $Y_{jt}$  denotes the importing country's imports from the world, while the expression  $E_{(j,t)}$  denotes the exporting country's exports to the world. Finally,  $Y_t$  represents the total output.

Alternatively, country time in varying characteristics and country pair characteristics can be controlled with country pair fixed effects which control the country pair characteristics like contiguous bilateral distance, historical relations, exporter and importer time fixed effects which control the time varying characteristics of countries like GDP and population.

### 3.2. DIFFERENCE IN DIFFERENCES METHOD

The difference in difference approach is widely used in the literature to reveal the causal relationship between economic variables. The methods test whether the planned/implemented programs and projects reach the targeted results or not. Impact assessment analysis measures the causal impact of programs and projects. Although the programs implemented by the public promise potential before implementation, they may not comply with post-implementation expectations. The purpose of impact analysis is to assist policymakers in their decision-making to provide helpful information on which programs will deliver the expected results. In addition, impact analysis provide answers to questions. For example, which part of the project is working, which part is not, and which part of the change can be attributed to the policy change (Khandker, Koolwal, and Samad, 2010, p. 3).

The method is briefly explained below;

- With the expected result ( $Y(Y|D=1)$ ) in case of policy change.
- Expected result in the absence of policy change ( $Y(Y|D=0)$ )

calculated by measuring the difference between

$$\beta = E(Y|D = 1) - E(Y|D = 0) \quad \beta: \text{Equals the causal effect of the program.}$$

**Table7: Difference in Differences Method**

$D_{i,t}$	After	Before	Difference
Treatment	$D_{treatment,after}$	$D_{treatment,before}$	$D_{t,a} - D_{t,b}$
Control	$D_{control,after}$	$D_{control,before}$	$D_{c,a} - D_{c,b}$
Difference	$D_{t,a} - D_{c,a}$	$D_{t,b} - D_{c,b}$	$\beta = (D_{t,a} - D_{t,b}) - (D_{c,a} - D_{c,b})$



$t$  denotes group (treatment or control) and  $t$  denotes time after the policy change or before the policy change (Angrist and Pischke, *Mastering Metrics The Path from Cause to Effect*, 2015, p. 204).

To reach the actual value of  $\beta$ , it is necessary to know the values of the observation units when the program was realized (reality) and the values of the observation units if the program was not realized (counter-factual). The difference in differences method is performed by comparing the mean values observed before and after the intervention of participants and non-participants (Khandker, Koolwal, and Samad, 2010, p. 72).

The method used in impact analysis is designed to solve the opposite factual situation. The method solves the counter-factual problem by dividing it into an intervention group (influenced by policy) and a control group (unaffected by policy), identical but differentiated after policy implementation. The difference allows us to arrive at an unbiased estimate of the policy's impact. The difference of differences method offers a powerful and simple structure for the calculation of impact analysis (Cunningham, 2021, p. 476).

For the control group to be identical to the intervention group, it should have the following properties:

- Have the same characteristics as the intervention group if the program is not implemented, the parallel trend assumption states that unobserved characteristics that affect program participation time-invariant (Khandker, Koolwal, and Samad, 2010, p. 73) foundation, geography, historical background, and climate (Gertler, Martinez, Premand, Rawlings, and Vermeersch, 2016, p. 135). If the policy is endogenous, the parallel trend assumption cannot be valid (Cunningham, 2021, p. 480).
- The effect of the intervention has the same effect on both groups
- Exposed to the same external factors (Tolay, 2017, p.12)

Although its first applications are John Snow (1855), Card and Krueger (1994) investigated the effect of the increase in minimum wages on the interregional

unemployment rate as the first basic study of the difference of differences method. With the difference in differences method, the internal dynamics of each group are taken within itself, and then the external dynamics are controlled by taking the difference between the groups. The first part of the study will be completed by the counter-factual structure established with no free trade agreement signed and subtract from the intervention group.

The gravity model's evaluation of trade agreements has some disadvantages, like evaluating the effect by estimating results and endogeneity problems. Countries tend to use trade agreement policy tools with significant trade partners, which causes an endogeneity problem that occurs from omitted variable bias. As a result, unobservable characteristics of country pairs are correlating with error terms. Fixed effects cannot solve this problem entirely because, in the literature, experimental methods have been used for evaluating trade agreements. Alternatively, a natural experiment or quasi-experimental method can be used to overcome endogeneity. The synthetic control method developed by Abadie and Gardeazabal (2003) investigates the impact of terrorism on economic growth in the Basque Country. Later SCM got popular in impact assessment research but it has some limitation; convex hull problems and a long observation period needed for the pre-treatment period. Thus, this research extended with the synthetic control method for robust inferences.

### **3.3. SYNTHETIC CONTROL METHOD**

Traditional impact analysis techniques are insufficient to produce reliable results, even based on the whole dataset. To perform a more comprehensive analysis, Abadie and Gardeazabal (2003) propose a data-driven method in their study. Synthetic units are formed using a convex combination of control units instead of specifying a single unit as a control group with synthetic control. While working on the change in a variable with the difference in differences method, unobservable characteristics are considered in the synthetic control method (Abadie, Diamond, and Hainmuell, 2010, p. 494).

According to Abadie and Diamond (2010), this approach provides many distinguishing advantages over regression-based methods. It employs extrapolation rather than interpolation, as the estimated causal influence is always based on a comparison of some

occurrence in a given year to a counterfactual outcome in the same year. Contrary to popular belief, the counterfactual design does not gain access to post-treatment outcomes during the study's design phase. This prevents "peeking" at the model's results while it is being specified. While caution and candor are still required, the point is that it is theoretically possible to focus exclusively on the design and not on estimation. Another advantage, frequently cited as a reason for objecting to a study, is that the weights used explicitly state what each unit contributes to the counterfactual. A fourth advantage, which I believe is frequently overlooked, is that it bridges the qualitative and quantitative worlds. Ferman and Pinto (2019) investigate the properties of data that has been de-trended. They discover that it can outperform difference in difference regarding bias and variance.

Assumptions of Synthetic Control Method are listed as follows:

- 1) The treated unit and the control unit have the same characteristics.
- 2) There is no spread of the spillover effect to the control units.
- 3) Control units were not exposed to different external shocks (Bouttell, Craig, Lewsey, Robinson, and Popham, 2018, p. 4).

The Synthetic Control Method is one of the effective methods used in impact assessment. The basic logic of impact analysis is finding and comparing a control group with similar characteristics to the treated group. However, the absence of a control group that is always identical to the policy-affected group reduces the validity of the studies. At this point, the synthetic control method creates itself by weighting the data set it has instead of selecting the control group from a specific sample. The control group obtained by weighting shows the situation in which policy implementation did not occur.

$$Y_{1t} - \sum_{j=2}^{J+1} w_j * Y_{jt}$$

$J+1$  is the output of unit  $j$ ,  $Y_{jt}$  in different units and time intervals of  $t$ . To find the effects of the intervention, the synthetic control method is obtained by the linear combination of the other groups of the affected group before the intervention. It creates a synthetic control unit that has the characteristics of the affected group. Post-intervention synthetic control

estimators arrive at the causal effect using the formula above (Abadie, Diamond, and Hainmuell, 2010). Here  $w_j$  is the optimal weight.

$$\sum_{m=1}^k V_m = (X_{1m} - \sum_{j=2}^{J+1} w_j X_{jm})$$

Counterfactual units created with certain weight units in donor pools are called synthetic units. It answers the question of what would have happened if the effect had never occurred. The weighted synthetic unit represents the unit that resembles the treated unit's characteristics affected by the pre-impact policy change (Cunningham, 2021, p. 590). To apply the synthetic control method, there should be sufficient time intervals of data before and after the effect. By weighting the control units, counterfactual synthetic control units are created. The levels and trends of synthetic units are the same as the level and trend of the treated units before the intervention. The difference between the post-intervention tendencies of the synthetic units and the affected units gives the intervention effect.

The advantages of the synthetic control method are that it can be used when there are a small number of treated units and control units, and it does not rely on parallel pre-implementation trends like the difference in difference method does. Also, there is no agreement on what makes a good fit or how to judge how similar synthetic units and treated units are. Furthermore, with this approach, traditional statistical inference is not appropriate.

There is a problem with the selection of the donor pool process. It is important to select the correct countries in the dataset. To assess the statistical significance of the difference in estimated results, we need to placebo test. Placebo tests enable researchers to investigate the quality of a study design by examining for a relationship if the method is defective. Abadie, Diamond and Hainmueller (2010) recommend that as the test statistic for inference, a set of root mean squared prediction error (RMSPE) values for the pre- and post-treatment periods be calculated.

$$RMSP = \left( \frac{1}{T - T_0} - \sum_{t=T_0}^T \left( Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt} \right)^2 \right)^{\frac{1}{2}}$$

The synthetic control is intended to replicate the behavior of the treated unit's outcome variable in the absence of the treatment with  $\sum_{j=2}^{J+1} w_j^* Y_{jt}$ . Calculate the RMSPE for each placebo for both the pre- and post-treatment periods. Calculate the ratio of the post- to pre-treatment RMSPE.

This study will be conducted on the gravity model since it is a frequently used model in the literature and provides consistent results. After the model is established, a counterfactual control group is created within the gravity model using the difference of differences method. In the second stage, the study will be extended by applying the synthetic control method. The scope of the present study covers the years between 1990 and 2020, and in the study, bilateral export/import, nominal GDP and population will be used in the panel dataset.

In this study, the datasets in the table below will be used. The panel data set created to measure the impact of Turkey's FTAs includes export and import data taken from US ITC (US ITC, 2018), WITS, and trademap. In addition, GDP and population datasets were obtained from IMF, distance, and other country-specific feature variables obtained from the CEPII database. Moreover, finally, the trade agreements were acquired from Mario Larch's Regional Trade Agreements Database.

## CHAPTER IV

### LITERATURE REVIEW

#### 4.1. LITERATURE

Countries use Free Trade Agreements (FTAs) as a policy tool to increase economic activity. As a result, there is a growing body of literature on FTAs. This chapter reviews the previous theoretical and empirical studies. The first part of the section gives a brief overview of the literature on the impact analysis of Free Trade Agreements with the Gravity Model. The second section describes the difference-in-difference methodology and synthetic control method.

##### 4.1.1. Literature on Gravity Model

Rahman, Shadat and Das (2006) examined the trade of SAFTA with the Gravity Model. The data set covers 61 countries from 1991 to 2003, including standard gravity variables, exchange rate, CPI, and fta dummy variable with a two-stage methodology (Tobit model – OLS). The study results show that export creation and diversion effects are effective among the parties to the agreement. Although SAFTA has positive effects on Pakistan, India, and Bangladesh, it is indicated that other negative effects may be affected other countries like Nepal. The countries' export volumes under SAFTA increased by 135.4 percent, but the growth was due not to the countries' trade creation effect within the block but to the trade diversion effect from outside of the SAFTA countries.

Bhattacharya and Bhattacharyay's (2007) study of "The Impacts of Free Trade Agreements on Trade Flows" applied the weighted ordinary least square (WLS) with the GMM method on aggregated and disaggregated data (Country-level and Industry level). For the present study, a panel dataset including GDP, GDP per capita, bilateral distance, and dummy variables (common language, adjacency, and time dummy) was used. The dataset covered the date range of 1950-2005 and 178 countries. According to the results, while the FTA variable coefficient used in WLS is upward bias, according to the results obtained from GMM, FTA positively affects foreign trade flows. It is stated that trade-

diversion effects and trade creation effects are limited. The evaluation made regarding time shows that FTAs started to lose their impact after the first period. The country-level research stated that FTAs, such as NAFTA, AFTA and MERCOSUR, found the trade-creation effect positive. The study did not find the trade creation effect positive in ASEAN-China FTA, Japan-Singapore FTA, and Singapore-USA FTA. Furthermore, research was conducted at the product level, but findings at the product group level varied. Foreign Trade Agreements have significant trade diversion effects in the EU, Nafta, and MERCOSUR countries.

Bhattacharya and Bhattacharyay (2007) used the Gravity model in their study of "Gains and India-China trade cooperation losses: a gravity model impact analysis" to evaluate the impact of India-China trade cooperation under scenarios. The data used in the study cover the period between 1995-2005; GNP is GNP per capita, distance, and dummy variables (country-specific effect, temporal and random effects, country dummy variables). According to the study results, if India makes a 25% reduction in its tariffs in the trade agreement, its imports will increase by 31.97%. It appears that if the tariff rates increase to 50%, the imports from China will increase by 65.9%. It has been found that if a free trade agreement is signed between the two countries, imports from China will increase by 131.8%. According to the study conducted at the product group level, the items that will increase the most in India-China FTA's imports from China by India are metallic ore 349.6%, organic chemicals 226.9%, and electronics machines 206.6%, respectively. Furthermore, according to the report results, India's potential gains over the short term are less than China's due to the higher tariffs, while India's potential gains over the longer term are more significant due to India's lower tariffs.

Ekanayake, Mukherjee and Veeramach (2010) used the Gravity model to evaluate Regional trade agreements in Asia with OLS (Country-specific fixed effect). Economic Partnership Agreement (JPEPA) impact on trade by OLS methodology. The study uses a panel dataset that covers the years 1980- 2009 with standard Gravity variables. The researchers said that JPEPA has a significant effect on Phillipines and Japan. Based on this study, bilateral trade agreements were found to have an insignificant effect on overall trade. On the other hand, while the impact of the ASEAN, BA, and SAARC regional agreements on trade was positive and significant, the ECO regional agreement sign was

negative. Therefore, this shows us how multilateral trade agreements and RTA have more significant effects than bilateral trade agreements.

Dianniar (2013) examined the Impact of Free Trade Agreements on Indonesia's agricultural trade flows with a gravity model fixed estimation methodology. The researcher used GDP, GDP per capita, population, bilateral distance, and dummy variables (contiguous, common language, FTA) for 193 countries from 1991 through 2010 in this study. The research's results cited that AFTA and ACFTA have insignificant on Indonesia's Agricultural Trade Flows.

Abedini and Perfidy (2014) used Gravity Model in their study to evaluate the impact of GAFTA (Greater Arab Free Trade Agreement) with fixed effect, Hausman, Taylor, and GMM dynamic estimators. The researchers use data on paper from 1988 through 2005 for 35 countries. The results show that the GAFTA increased regional trade by more than 20%. Armstrong (2015) applied the Gravity Model in his study to evaluate the impact of the Australia – USA Free Trade Agreements. According to the results, FTAs have a negative effect on Australia with USA trade and a negative effect on the rest of the world.

The Gravity model was applied by Kalirajan and Paudel (2015) to test trade deficit reduction through the Trade Agreement. The research utilizes a panel data collection that contains standard gravity variables spanning the years 1996-2010. According to the study results, India's exports increased by 12 percent, while China's exports grew by 18 percent if a 50 percent reduction in simple tariffs was realized. China's earnings are higher since India's average tax rate is 11.5 percent and 7.7 percent in China.

Dembatapitiya and Weerahewa (2015) noted that, for NAFTA, SAFTA, and ASEAN, the impact of regional trade agreements on trade except for the EU was insignificant. The researcher implemented a gravity model with OLS included methodology. Kodithuwakku, Weerahewa and Boughanmi (2016) determine the effects of regional trade agreements in South Asia. The researcher collects a cross-sectional dataset that covers the years 2012 and 2555 country pairs. Results of SAFTA, ASEAN, BIMSTEC, and NAFTA suggest that there is no effect on exports.



Kumar and Prabhakar used the Gravity model to evaluate the impact of India's FTAs in Asia using OLS (country-specific constant effect). The study results suggest that the ASEAN FTA and the Bilateral FTA and ASEAN have a positive and significant impact on both export and import efficiency. The Southeast Asian Free Trade Agreement and the South Asian Free Trade Agreement effect on export and import efficiency are insignificant.

Navarrete and Tatlonghari (2018) used the Gravity model to evaluate Japan – Philippine Economic Partnership Agreement (JPEPA) impact on trade by OLS methodology. The study uses a panel data set that covers the years 2001 q4- 2014 q4. GDP, GDP per capita, bilateral distance, and dummy variables were used (common language, common country, common ethnicity, and EACU dummy variable). The researchers said that JPEPA has a significant effect on Phillipines and Japan.

Karlsson, Melin and Cullinane (2018) argued that impact assessments of “Potential Brexit scenarios on German car exports to the UK” based on the double log gravity model with OLS estimation. The data set used in the study includes standard gravity model variables and export quantity data for HS 8703 in the 2012-2015 period of time. The most significant feature of this research is its use of the ex-ante condition. Researchers attempted to forecast what impact Brexit will have on German passenger vehicle exports to the UK. Gravity model variables were significant at the 5% level, and Brexit's effects were forecasted based on these variables from 2020 through 2030. German passenger car exports to the UK have been declining according to all scenarios. It can cause losses as high as 15.4% for the German car export by 2030 in the worst-case scenario. On the other hand, export losses of 9.2% in the moderate scenario, based on 5% MFN and a moderate decrease in the UK's GDP.

Liu (2018) used OLS and random fixed effect estimation in the Gravity model to analyze the impact of China's free trade agreement on 23 partner countries. The data used in the study include the years 2000-2015. This data set covers the years 2000-2015, export volume, GDP, GDP per capita, and dummy variables used for China and 23 partner countries, and mutual distance and dummy variables. According to the study results, there is a positive and significant relationship between FTA and the level of self-esteem.

Chandran (2018) argued that Impact Assessments of the Free Trade Agreement between India and ASEAN based on the augmented gravity model. The data set used in the study includes GDP, GDP per person, population, bilateral distance, and dummy variables (a colony, common ethnicity, CEPII dummy variables, and FTA) for 26 countries in the 1991-2007 period of time. According to the results, the ASEAN dummy variable was statistically significant and positive for estimating methods other than the random effect model.

Timsina and Culas (2019) used the Gravity model to evaluate the impact of Australia's FTAs with Asia by applying the Pseudo Maximum Likelihood Estimator. The study results indicate that the MAFTA, JAEPA, CHAFTA, and TAFTA have a 10,3 billion dollar trade creation effect and an 8,4 billion dollar trade diversion effect. The researcher said that Australia's FTAs are more effective in the trade creation effect than trade diversion effects. Especially trade creation effect is higher in the agricultural sector.

The effects of preferential trade agreements on agricultural products have been argued by Cardamone (2019) with the gravity model. The researcher limited the analysis scope to five fruits with high import demand in the EU; "fresh grapes, apples, pears, oranges, and mandarins," subject to both tariffs and quotas. Researchers used disaggregated HS-8 level quantities of data from 2001 to 2004. The RTAs have a significant effect on the increase in imports of grapes, tangerines, and pears.

Stack and Bliss (2020) used the Gravity Model with LS and 2SLS method in their study to evaluate the impact of economic integration agreements with Brexit scenarios on trade. The researchers use data on paper between 1960 and 2016 for 15 established members of the EU and the rest of the world (100 countries), including GDP, GDP per capita, bilateral distance, bilateral imports, time-invariant explanatory variables, infrastructure-related variables, the vector of time-varying variables, and dummy variable (common language, Colony, adjacency, INFRAS, and EIA). According to the study results, it is stated that a decrease in the trade of the UK with the EU as a whole will decrease by one-third. The total trade loss rate with all countries is 12.8%. On the other hand, if the UK maintains its BREXIT stance with the EU and FTA signatory countries, it is stated that a one-third decrease will occur in trade with FTA and EPA countries. On the other hand, it is stated

that the bilateral trade volume of the UK may increase by more than 5% if FTA is signed with countries, such as England, the USA, China, and India after BREXIT.

Bilici, Erdil and Yetkiner (2008) argued that "Role of EU in Turkey's Trade Flows" with Gravity Model with OLS, Estimated Generalized Least Squares, and Fixed effect methodology. The scope of this study covers 90 percent of Turkey's exports and imports during the period 1992-2006. The researcher used GDP, population, bilateral distance, and dummy variables (EU, BSEC, common border) in this study. The results suggest that the Customs Union has a positive and statistically positive effect on trade in Turkey.

Turkcan and Piskin (2014) used the gravity model to evaluate the effects of the Custom Union and FTA's on Turkey's external trade extensive and intensive margins. The data set used in the study includes 172 countries from 1996-2011 period of time at HS 6 digit level. According to research results, the free trade agreement has less effective than the customs union.

Kütük (2015) used the gravity model with fixed effect estimation method to assess trade agreements' effect on trade flows signed by Turkey. The researcher use data on the paper include; study uses a panel data set that covers the years 1992-2013 and 126 countries. The data set used in the study includes GDP, GDP per person, population, bilateral distance, and dummy variables (a colony, common ethnicity, CEPII dummy variables, and FTA). According to the study, no effect on the Customs Union is insignificant on Turkey's exports but significant on Turkey's imports. On the other hand, Turkey's FTAs have insignificant both Turkey's exports and imports.

Kütük and Akbostancı (2016) used the Gravity model to determine the effects of Turkey's free trade agreements. Datasets cover 126 countries over the 1992-2013 period of time. According to results, FTA's and CU do not affect Turkey's export, but Custom Union affects Turkey's import.

Frede and Yetkiner (2017) used Gravity Model in their study to evaluate the trade dynamics of Turkey. The researchers use data on paper from 1960 through 2012 for 180

countries. The results show that the Customs Union has a positive effect on Turkey's imports. On the other hand, it has a negative effect on Turkey's export.

Demircioglu (2019) has used the gravity model for evaluating the Free Trade Agreement on Turkey's external trade. The dataset used in the study includes GDP, GDP per person, population, bilateral distance, and dummy variables (a colony, common ethnicity, CEPII dummy variables, and FTA) for 92 countries in the 1988-2016 period of time. According to the results, Turkey's FTA's macro effect positively affects both export and import but it is varying at country level FTA.

The gravity model has been used as a workhorse to analyze trade since Tinbergen (1952). The estimation methods solved some problems of the gravity model like the zero trade problem, country pair characteristics, and the heterogeneity problem. However, the gravity model approach has some disadvantages in evaluating trade agreements. The first one, countries tend to use FTAs with significant trade partners, which leads to an endogeneity problem, and the gravity model may solve this problem only part of it. Secondly, the evaluation can be based on the predicted values, not observed values, because of the error term, making it difficult to evaluate the impact of FTA. Several approaches have been used to deal with the issue of selection bias in observational data, such as matching estimators. However, these methods cannot control the unobservable country heterogeneity. The Synthetic Control Method (SCM) can control unobservable country heterogeneity. Also, it allows the impact of unobserved time-varying characteristics. Thus, literature has expanded with the synthetic control method for robust inferences.

#### **4.1.2. Literature on Synthetic Control Method**

Hosny (2012) used the Synthetic Control Method to evaluate the effects of Algeria's trade with GAFTA countries. The data set used in the study includes real GDP, real GDP per person, population, bilateral distance, and dummy variables for 15 countries (a colony, common ethnicity, common border, and GAFTA). According to research results, in 9 of the 15 countries that account for 96 percent of total GAFTA trade, Algeria would be better off if Algeria signed it GAFTA in 1998.

Hannan (2017) used Synthetic Control Method in their study to evaluate the impact of the Trade agreements (of 104 country pairs on trade). The researchers used data on paper from 1983 through 1995, including export, GDP and GDP per capita statistics, bilateral real exchange rate, distance, population, remoteness, export lags, and dummy variables. The results show that the FTA signature has affected 80% of the exports positively. EM (Emerging Country-Advanced Country) FTA cases have provided more export gains than others. Furthermore, according to the results, the trade diversion effect on export is insignificant and slightly significant for imports.

Barlow, Mckee, Basu and Stuckler (2017) applied the Synthetic Control Method in their study to evaluate the impact of the NAFTA on high-fructose syrup supply in Canada. - The researchers use data on paper from 1985 to 2000, including the supply of caloric sweeteners, US exports of HFCS beverage and other sugar syrups to Canada, GDP per capita, inflation, and US investments in the Canadian corn syrup industry statistics. According to the study results, with the agreement's signing, Canada's Daily supply of caloric sweeteners increased by 41,6 kilocalorie per capita.

Swarnali (2017) applied the Synthetic Control Method in his study to evaluate the impact of "Trade Agreements in Latin America." The scope of this study covers 64 pairs of countries and four trade agreements (Mercosur, Andean Community, NAFTA, and Group of Three) in Latin America from 1989 to 1996. The researcher used data on paper, including distance, GDP, GDP per capita, population, real exchange rate, the remoteness index, lagged value of the export variable, and dummy variables. According to the study results, Hanan concluded that trade agreements had increased Latin America's exports by an average of 76.4 points over ten years. Regarding countries and agreements, however, there are significant differences. Nafta provided more export gains than other trade agreements. Moreover, regarding export gains provided by the trade agreement, these results were reported below the world average (1983-1995). Finally, the researcher pointed out a "lack of institutional infrastructure and that non-tariff measures" played a significant role in low trade earnings of trade agreements in Latin America.

Adarov (2018) used the Gravity model and synthetic control methods to assess Eurasian Economic Integration's impact. The study uses a panel data set that covers the years 2000-

2015 and 188 countries. GDP, GDP per capita, bilateral distance, and dummy variables were used (common language, common country, common ethnicity, and EACU dummy variable). The study was performed at industry and aggregate levels. The EACU variable's impact is more significant than the effect of the individual FTA variables, which shows that EACU is more effective. According to results, a trade increase of 120-350 % percent occurred under various methods (Heckman, Panel FE and PPML) impact of EACU. Trade integration is one of the most potent economic factors influencing a destination trade diversion effect is also significant. Exports from inside the union decreased by 20 percent, while imports from outside the union decreased by about 30 percent. The research was carried out at the product group level across 14 different sectors. The results of a study showed that mineral products, animal products, and plastic products were the most positively affected product groups. Eurasian integration differs between countries and between sectors in terms of the magnitude of their effects. The results obtained using the synthetic control method are close to the gravity model's results. Anthony and Quimba (2019) used the Synthetic Control Method to evaluate the impact of the Japan -Philippines Economic Partnership Agreement. The study results suggest that the JPEPA has a positive effect on Philippine export at the aggregate level, but its varying at the sectoral level.

Verevis and Üngör (2020) applied the Synthetic Control Method in their study to evaluate the impact of the New Zealand -China Free Trade Agreement on trade and GDP profile. The researchers use data on paper from 1990 to 2015, including export, GDP, GDP per capita statistics. According to the study results, with the agreement's signing, New Zealand's exports increased by more than 200% but did not cause any change in terms of GDP per capita. In this respect, the Free Trade Agreement's effect has been limited to just the export sectors and has not affected the economy as a whole.

Reigado (2020) used Synthetic Control Method in his study to evaluate the impact of Mercosur on trade profile. The researcher use data on paper for four Member States and 1975–2000, including distance, GDP, GDP per capita, population, real exchange rate, the remote index, and dummy variables (CEPII variable and MERCOSUR). The researcher implemented the disaggregated data level (SNA product group level- Intermediates, capital, and final goods trade volume). According to the study's results, intermediate

growth rates for the post-intervention period were 14.8% positively affected, while that the rate for capital products ranged from 10.9% to 12.7%. This ratio is 20% for the consumer goods group. In short, over 100% increases were observed in the SCM study in all commodity groups in the first ten years following the intervention. The results were also compared with a Gravity Model with PPML estimation, and the effects of the MERCOSUR variable are statistically positive and significant, based on the results from the present study.

Aytuğ, Kütük and Togan (2016) used Synthetic Control Method in their study to evaluate the impact of the EU-Turkey Customs Union agreement on trade and GDP. The researchers use data on paper from 1990 through 2015, including export, GDP, GDP per capita statistics. The results show that Turkish exports and GDP signature have affected by 38% by the Customs Union positively. Turkey's GDP and exports would be lower by 38% if Turkey did not sign the deal.

In the previous studies, OLS and Tobit estimation methods were used to predict free trade agreements, which studies aimed to evaluate free trade agreements' trade creation and diversion effects. However, the zero trade flows problem caused biased results, so improved estimation methods were developed, and control variables called fixed effects were included in the model. The effects of FTAs have been evaluated separately. Contemporary studies were used the difference-in-difference approach to evaluate the effects of FTA by comparing the counterfactual control units of the trade flows. The approach is similar to the synthetic control method; the FTA effect is captured by the difference between counterfactual and treated control units.

Gravity model approach and synthetic method have some disadvantages at separately, affecting the robustness of inferences. Therefore, this study aims to reveal the effects of FTAs more robustly by combining the consistency of these two approaches.

This section reports the empirical results and conclusions. The gravity model and the aggregated results of Turkey's FTAs are provided in the first section. Followed by the

impact analysis of free trade agreements application with a difference in difference method and synthetic control method results included.



## CHAPTER V

### DATA AND EMPIRICAL METHODOLOGY

This section provides dataset and reports the empirical results and conclusions. The gravity model and the aggregated results of Turkey's FTAs are provided in the first section. Followed by the impact analysis of free trade agreements application with a difference in difference method and synthetic control method results included.

In this study, the datasets in the table below will be used. The panel data set created to measure the impact of Turkey's free trade agreements includes export and import data taken from US ITC (US ITC, 2018), WITS, and trademap. In addition, GDP and population datasets were obtained from IMF, distance, and other country-specific features variables obtained from the CEPII database. Moreover finally, the trade agreements were acquired from Mario Larch's Regional Trade Agreements Database.

**Table 8: Datasets and Sources**

Variable Name	Source
GDP (Current Dollar), Population	IMF, US ITC
Export – Import thousand \$	US ITC, WITS, Trademap
Distance	CEPII
Trade Aggrements	Mario Larch's Regional Trade Agreements Database

In unit root tests, Fisher-type unit root test for export and import suggest that variables are stationary. Detailed tables are provided in the Appendix – B.

## 5.1. GRAVITY MODEL RESULTS

One hundred sixty countries and territories were included in the panel dataset for the 1990- 2020 period. Kosovo, Liechtenstein, Faroe Islands, newborn countries, and small island countries were excluded from the sample because they would cause deviations in the study. In the model, firstly, the effects of FTA were estimated on the aggregated level. Afterward, the FTA effect is analyzed individually, and the summary results are presented in tables.

The model is estimated with the Poisson pseudo-maximum likelihood estimation (PPML) method. The Poisson estimator possesses various functional qualities for applied policy researchers working with gravity models. First, it is consistent when fixed effects are present, which may be intake as dummy variables, as in standard OLS. This is a distinctive trait of nonlinear maximum likelihood estimators, most of which exhibit poorly understood behaviors when fixed effects are included, which is especially true for gravity modeling, as most theory-consistent models demand the presence of fixed effects for both exporter and importer. Second, the Poisson estimator includes data with a zero observed trade value in the estimation process. Such observations are omitted in the OLS estimation due to the undefined logarithm issue. Excluding zero data on how OLS does may introduce sample selection bias, a problem that has been increasingly prominent in recent empirical studies. Thus, the capacity of Poisson to naturally accommodate zero observations without modifying the fundamental model is particularly desirable.

Third, the Poisson model's coefficients are uncomplicated to read and follow the same pattern as the OLS coefficients. Although the dependent variable is stated in levels rather than logarithms for the Poisson regression, the coefficients of any independent variables in logarithm form can still be interpreted as simple elasticity.

Table 5 provides information about the average effect of FTAs on the export and import of Turkey. According to the results, average free trade agreement effect on export is 52.65% and 53.87% for import. On the other hand, the average free trade agreement effect on Turkey's export and import below the World average of 31.25% and 20.32%.

According to Gravity Model results for Turkey's import, eight FTAs are statistically significant at 10%, and positive signs, five FTAs have statistically significant and have negative signs, and the rest are statistically insignificant. In addition, Moldova, Egypt, Israel, Georgia, Malaysia, Morocco, Bosnia and Herzegovina, Norway and Iceland FTAs positively affect Turkey's imports. Results are consistent with previous studies results.

**Table 8: Gravity Model Results**

<b>VARIABLES</b>	<b>(1) Import</b>	<b>(2) Export</b>	<b>(3) Export -Turkey</b>	<b>(4) Import -Turkey</b>
Indist	-0.711*** (0.00666)	-0.741*** (0.00620)	-0.852*** (0.00527)	-0.822*** (0.00549)
fta	0.423*** (0.0151)	0.431*** (0.0144)		
aggregated_fta_Turkey			0.272*** (0.0638)	0.185*** (0.0574)
Constant	21.68*** (0.0593)	21.84*** (0.0549)	22.95*** (0.0441)	22.79*** (0.0464)
R Square	0.9389	0.9403	0.9370	0.9382

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 2: Gravity Model Results for Turkey Export**

VARIABLES	(1) Chile	(2) Singapore	(3) Moritius	(4) Moldavia	(5) Egypt	(6) Malaysia	(7) Macedonia	(8) Israel	(9) Georgia	(10) Korea	(11) Morocco	(12) Bosnai	(13) Albania	(14) Tunusia	(15) Serbia	(16) Montenegro	(17) Switzerland	(18) Norway	(19) Iceland	
Chlfta	-0.340 (0.432)																			
sgpfta		-0.305* (0.161)																		
moritiusfta			0.588*** (0.174)																	
moldovyafta				0.0165 (0.0807)																
egyptfta					0.200** (0.0963)															
malesfta						0.468*** (0.124)														
makedoniafta							-0.154 (0.0950)													
Ä±srlfta								0.828*** (0.132)												
geofta									0.0675 (0.0718)											
korfta										0.301*** (0.0794)										
palestinafta																				
moroccofta											0.606*** (0.0936)									
bosnafta												0.214 (0.155)								
arnavutlukfta													-0.164*** (0.0547)							
tunusiafta														0.242*** (0.0558)						
sÄ±rbfta															0.349*** (0.0707)					
karadagfta																0.771*** (0.181)				
venfta																				
isvicreefta																		0.0870 (0.193)		
norvegafta																			0.426*** (0.0921)	
icelandefta																				1.208*** (0.193)
morityusfta																				
Constant	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)	20.08*** (0.0874)
Observations	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831	1,169,831

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

According to Gravity Model results for Turkey's exports, 11 free trade agreements are statistically significant at %10 and have positive sign, four free trade agreements have statistically significant effect and have negative signs, and the rest is statistically insignificant. In addition, Mauritius, Montenegro, Serbia, Tunisia, Morocco, Iceland, Norway, S. Korea, Israel, Malaysia, Egypt FTAs have a positive effect on Turkey's exports.



According to Gravity Model results for Turkey's import, eight free trade agreements are statistically significant at %10, and positive signs, five free trade agreements have statistically significant effects and have negative signs, and the rest are statistically insignificant. In addition, Moldova, Egypt, Israel, Georgia, Malaysia, Morocco, Bosnia and Herzegovina, Norway and Iceland FTAs positively affect Turkey's imports. Results are consistent with previous studies results.

**Table 4: Gravity Model Results: Impact of the FTAs on The Turkey's External**

---

Moldova	0.0165	0.344*
Egypt	0.200***	0.493***
N. Macedonia	-0.154	-0.701***
Israel	0.828***	0.749***
Georgia	0.0675	-1.009***
Morocco	0.606***	0.588***
Bosnia and Herzegovina	0.214	0.782***
Albania	-0.164***	0.233
Tunisia	0.242***	-0.118
Serbia	0.349***	1.406***
Montenegro	0.771***	-
Switzerland	0.0870	-0.227***
Mauritius	0.588***	-0.395**
Chile	-0.340	-0.156
Singapore	-0.305*	-0.0878
Malaysia	0.468***	0.444***
Korea	0.301***	0.0897
Norway	0.426***	0.408*
Iceland	1.208***	0.884*

---

## 5.2. DIFFERENCE IN DIFFERENCE METHOD AND SYNTHETIC CONTROL METHOD RESULTS

After the FTAs' effect is measured with the Gravity Model, counterfactual and treated values were estimated from the model as follows:

- Treated (Predicted) country:  $\widehat{Trade\ Value}$  for FTA dummy variable = 1
- Control country:  $\widehat{Trade\ Value}$  for FTA dummy variable = 0

In the difference-in-difference method, we can evaluate the policy impact with the difference between post and pre-values of control and treated units. In this structure, pre-values are common for both control and treated units. Thus, FTA effect is equal to the difference between the treated unit and the control unit.

Seventy-nine countries were included in the donor pool for constructing the synthetic control unit. Countries are selected according to the criteria below:

- Gross National Income (GNI) per capita level in 2021 (According to World Bank classification, below the 4096 dollars per GNI per capita countries classified as lower-middle-income countries excluded from the donor pools).
- G-7 countries
- Custom Union countries and FTA countries are excluded from the donor pool.

The model below were used for Synthetic Control Method;

$$[TV; TV_{t-1}, TV_{t-2}, TV_{t-3}, GDP_{t-1}, GDP_{t-2}, GDP_{t-3}, Pop_{t-1}, Pop_{t-2}, Pop_{t-3}]$$

TV: Trade Value

GDP: GDP Current Dollar for Destination Country

Pop: Population million for Destination Country

t: Treatment period

Placebo tests included in Appendix E provides information about robustness of inference of synthetic control approach.

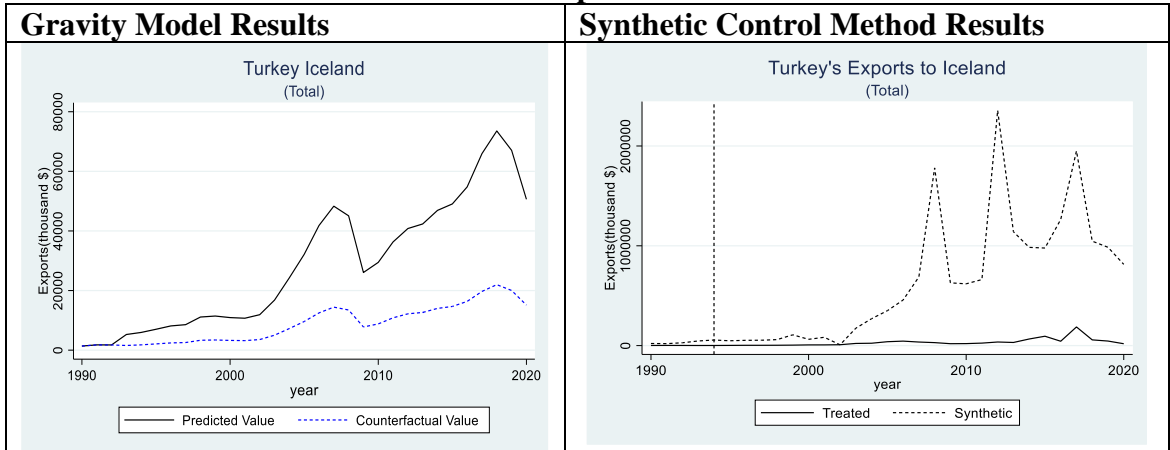
**5.2.1. European Free Trade Association (EFTA)**

The EFTA-Turkey Free Trade and Cooperation Agreement were signed in Geneva on 10 December 1991. The Cabinet Decision regarding the Agreement's ratification was published in the Official Gazette dated 18 April 1992 and numbered 21203. It entered into force on a reciprocal basis on 1 April 1992 with Switzerland and Liechtenstein, 1 April 1992 with Norway, and 1 September 1992 with Iceland (Ministry of Commerce of Turkey). Agreement Scope includes the following:

- Processed agricultural products
- Fisheries and aquaculture
- Intellectual Property Rights
- Competition law
- Government purchases
- Includes dumping-related topics.

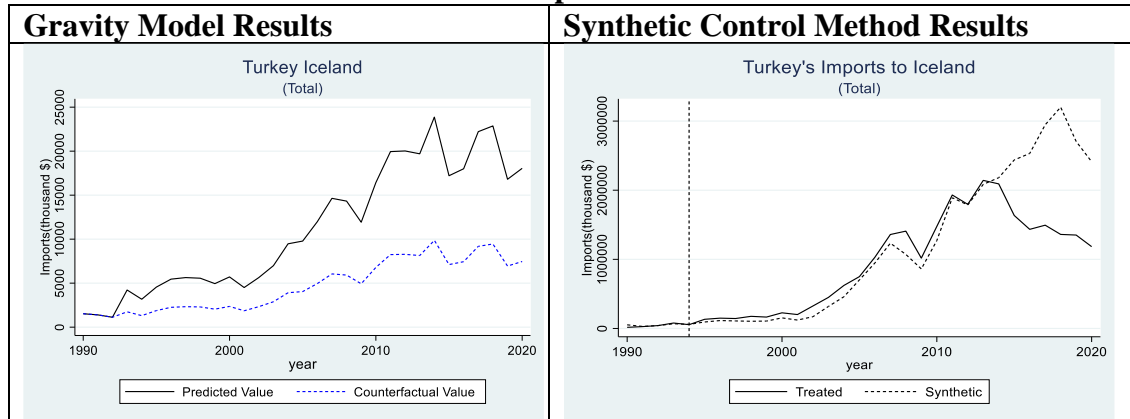


**Figure 2: Gravity Model and The Synthetic Control Method Results for Turkey's Export**

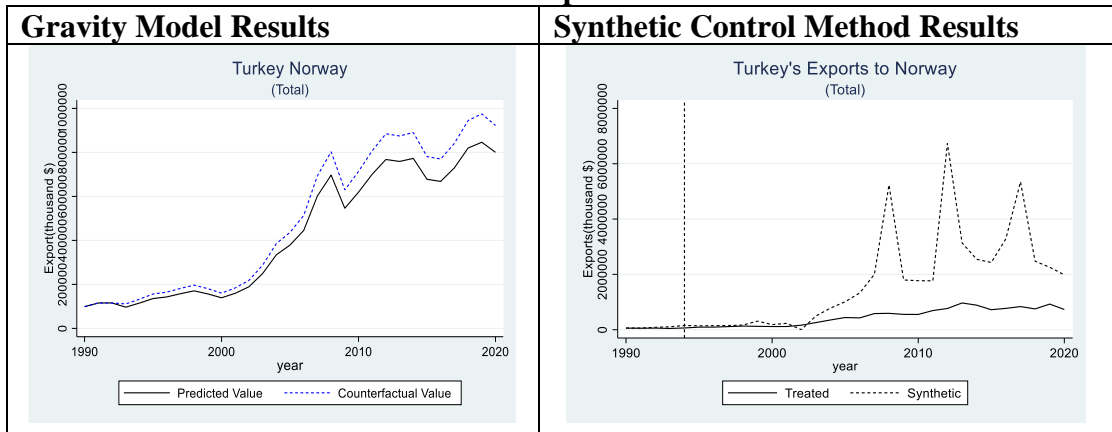


Both approaches provide contradicting results about the free trade agreement's impact on Turkey's exports and imports. However, SCM is not valid for short pre-treatment period studies. Because of that, in this study, SCM can be ignored.

**Figure 3: Gravity Model and The Synthetic Control Method Results for Turkey's Imports**

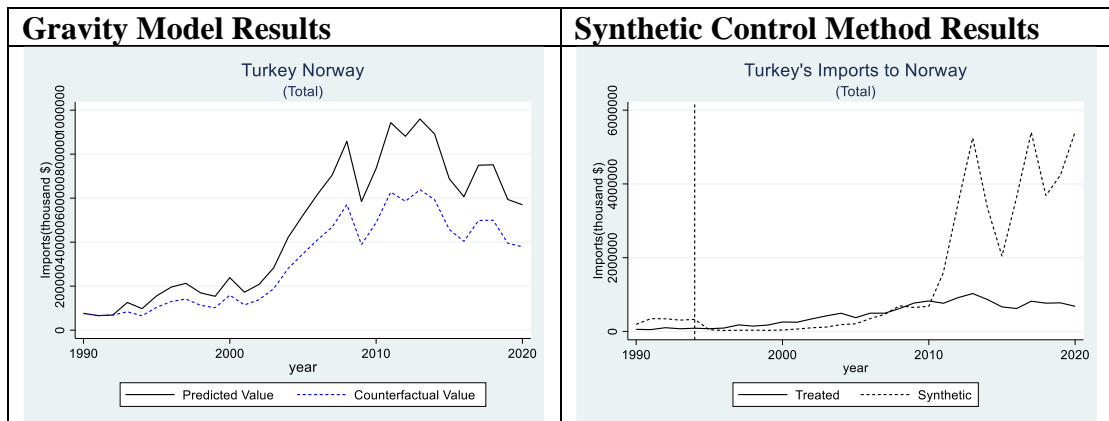


**Figure 4: Gravity Model and The Synthetic Control Method Results for Turkey’s Export**



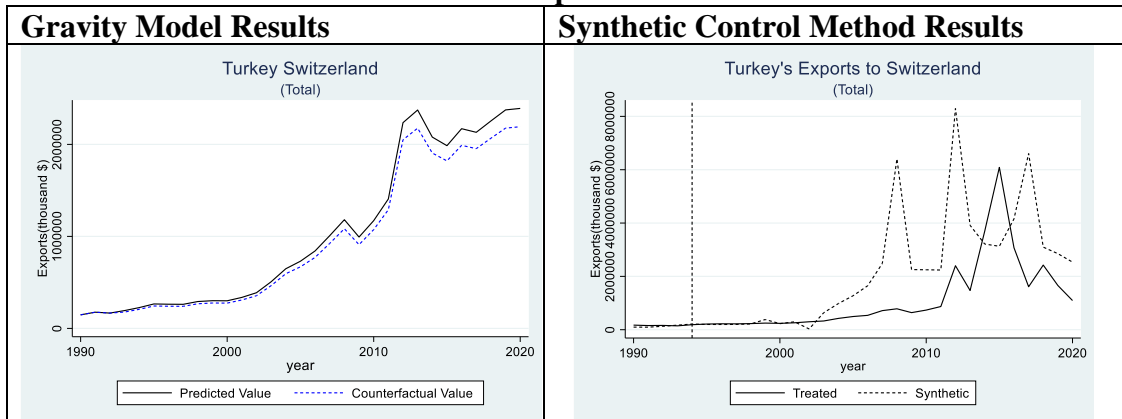
Both approaches present similar results for free trade impact on both Turkey's export and import. However, impact assessment in EFTA countries is not robust in this study because of is not enough pre-policy period observation in the model.

**Figure 5: Gravity Model and The Synthetic Control Method Results for Turkey’s Imports**



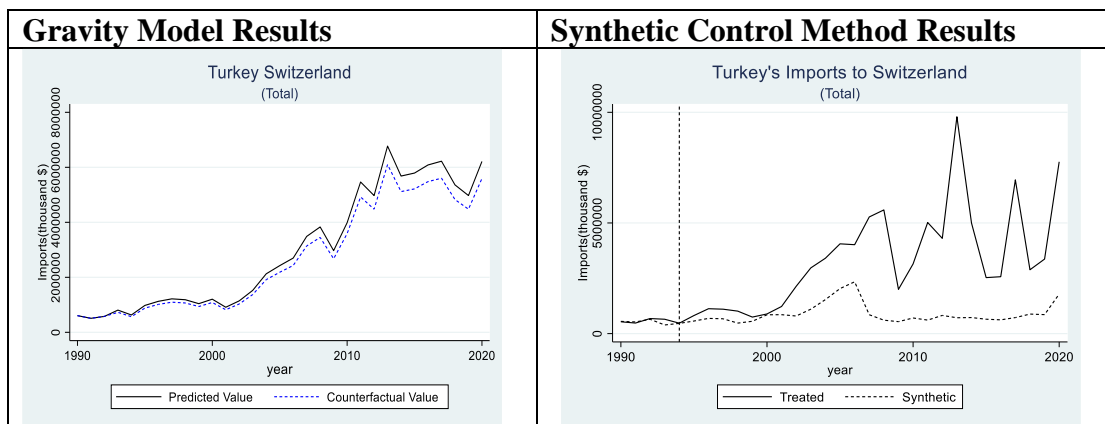
Both approaches present similar results for free trade affect Turkey's export and import. However, impact assessment in EFTA countries is not robust in this study because of is not enough pre-policy period observation in the model.

**Figure 6: Gravity Model and The Synthetic Control Method Results for Turkey’s Export**



Gravity model results show that the counterfactual value is above the predicted value, but synthetic control method results contradict to gravity model result. Furthermore, pre-treatment period observation in this study is limited. Thus, the findings could not be robust.

**Figure 7: Gravity Model and The Synthetic Control Method Results for Turkey’s Imports**



EFTA influenced Turkey’s exports positively to Switzerland according to both approaches. However, the integration level and MFN tariff rates changed dramatically, especially after the establishment of the World Trade Organization (WTO) in 1995 and the Customs Union agreement, which can be seen as an external shock. Furthermore, this research conducted for the 1990-2020 period and EFTA evaluation is not valid for the Synthetic control method because SCM needs a long pre-treatment period in the analysis. Thus, EFTA evaluation did not provide robust inferences.

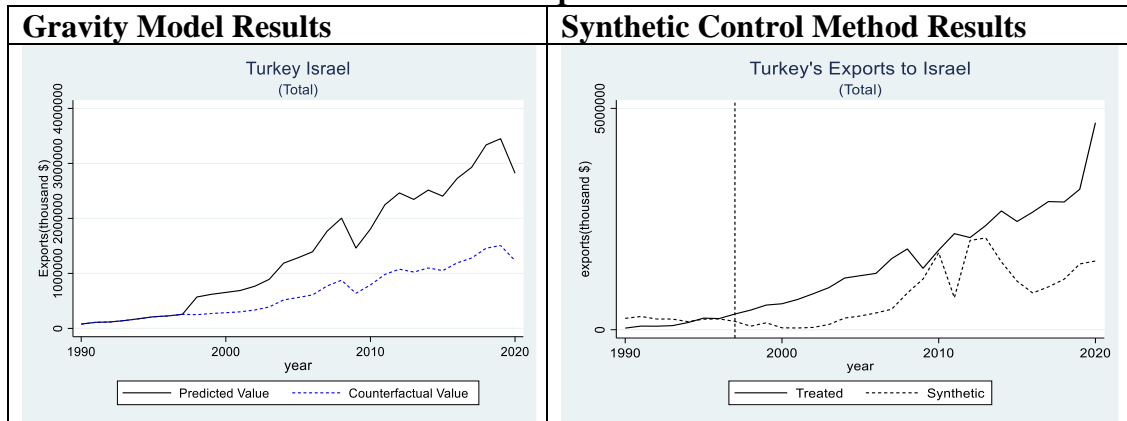
### **5.2.2. Israel Free Trade Agreement**

The Free Trade Agreement between Turkey and Israel was signed on 14 March 1996 and entered into force on 1 May 1997. It is the second free trade agreement that Turkey has signed. With Turkey's entry into the customs union, the importance of commercial partnership has increased.

Agreement scope includes the following:

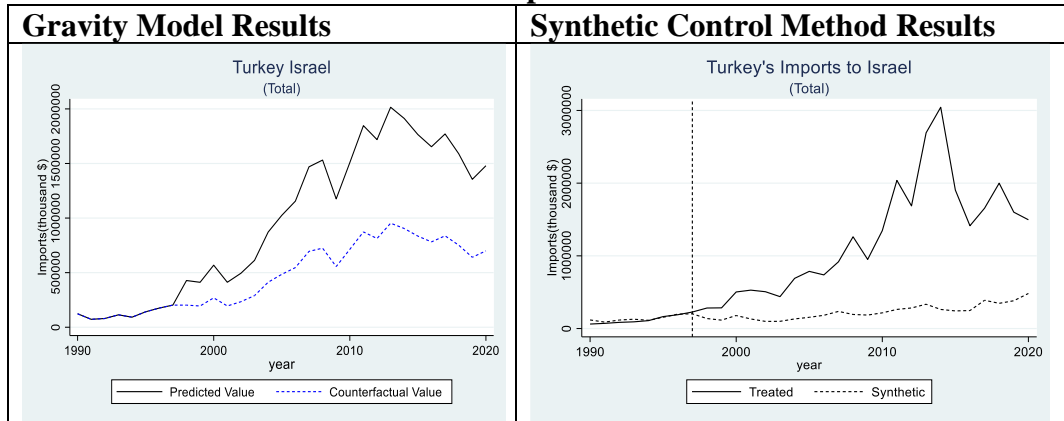
- Removal of tariff and non-tariff barriers to trade in goods
- Intellectual, industrial, and commercial property rights
- Rules of origin
- Taxation
- Anti-dumping
- Conservation measures
- Balance of payments measures
- State monopolies
- Public procurement
- Competition

**Figure 8: Gravity Model and The Synthetic Control Method Results for Turkey’s Export**



While gravity model results show that the Impact of the free trade agreement has been positive, the synthetic control method provides information about the opposite of the gravity model result. In addition, the synthetic control method findings are robust according to placebo tests<sup>1</sup>.

**Figure 9: Gravity Model and The Synthetic Control Method Results for Turkey’s Import**



Both approaches provide similar results. The free trade agreement positively impacts Turkey's export and import. Furthermore, placebo tests provide information about the robustness of the findings. The effectiveness of FTA is related to the scope of the

<sup>1</sup> Included in Appendix-E Figure 47-48

agreement, a short period of tariff reducing schedule and high export-import complementariness, and strong business relationships.

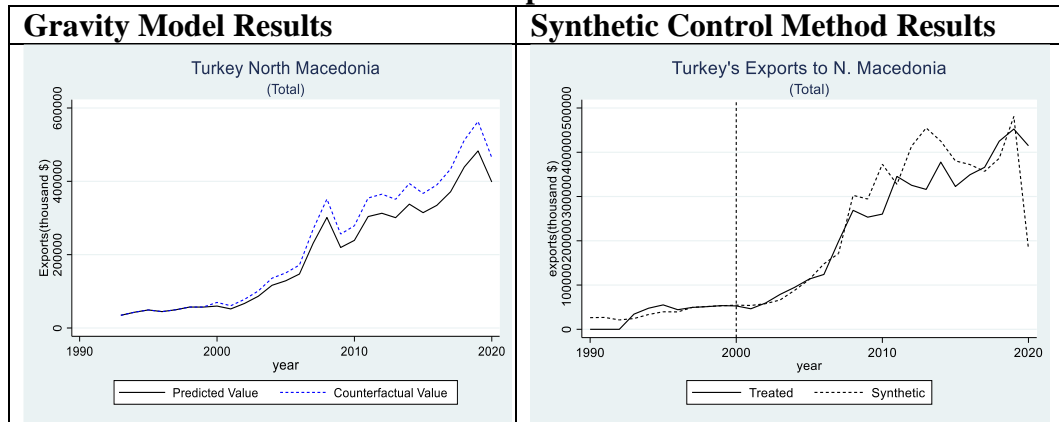
### **5.2.3. N. Macedonia Free Trade Agreement**

The Free Trade Agreement between Turkey and **Macedonia** was signed on 7 September 1999 and entered into force on 1 September 2000. It is the third free trade agreement that Turkey has signed. With Turkey's entry into the customs union, the importance of commercial partnership has increased.

Agreement scope includes the following:

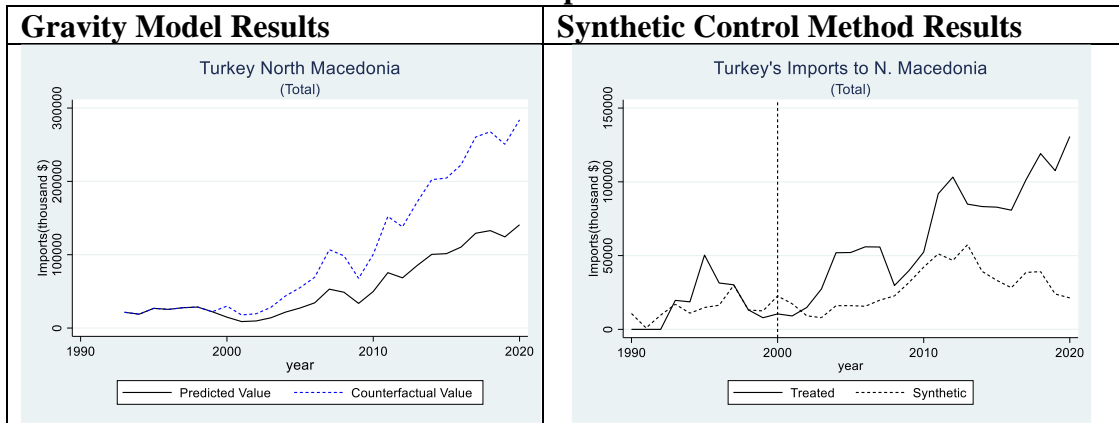
- Removal of tariff and non-tariff barriers to trade in goods
- Intellectual, industrial, and commercial property rights
- Rules of origin
- Taxation
- Anti-dumping
- Conservation measures
- Balance of payments measures
- State monopolies
- Public procurement
- Competition

**Figure 10: Gravity Model and The Synthetic Control Method Results for Turkey’s Export**



Both approaches provide similar outcome of the insignificant effect of FTA on Turkey’s export. Thus, the effect of free trade agreement is uncertain. In addition, the synthetic control method findings are not robust according to placebo tests<sup>2</sup>.

**Figure 11: Gravity Model and The Synthetic Control Method Results for Turkey’s Import**



The long period of tariff reduction schedule, temporarily increasing tariff rates, and other FTAs led to the ineffectiveness of FTA with Macedonia.

<sup>2</sup> Included in Appendix-E Figure 55-56

#### **5.2.4. Bosnia and Herzegovina Free Trade Agreement**

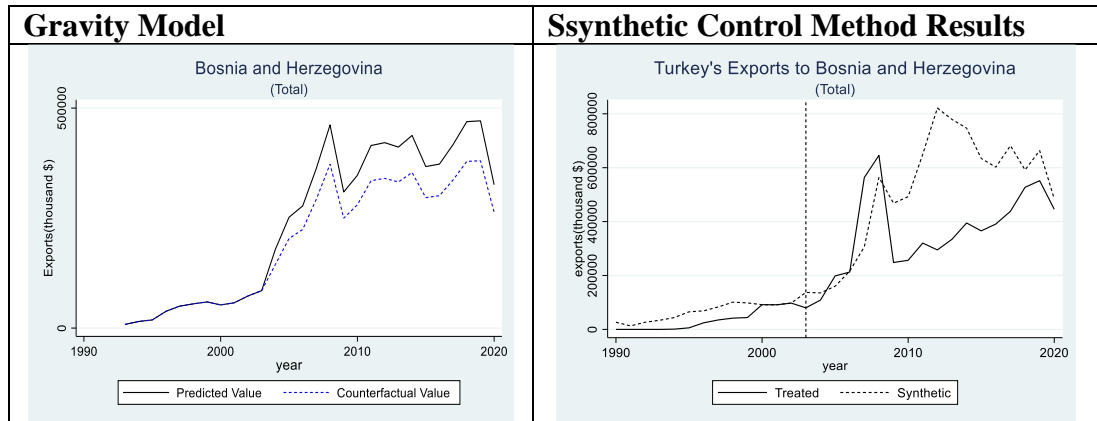
The Free Trade Agreement between Turkey, Bosnia, and Herzegovina was signed on 3 July 2002. It entered into force on 1 July 2003. As a result, a new step has been taken in trade relations with Bosnia and Herzegovina, which has a common historical background.

The FTA with Bosnia and Herzegovina includes the following:

- The scope of the products covered by the agreement and subject to tax reduction is quite broad; the tax reduction calendar is different between Bosnia and Herzegovina and Turkey, Turkey's commitment to abolish the taxes with the entry into force of the agreement,
- Commitment by Bosnia and Herzegovina to abolish taxes gradually over four years,
- Effectively realizing tax reductions on both sides as stipulated in the agreement, the same situation is valid for tariff lines with 0% tax,
- The intensity of trade between the parties, especially from Turkey to Bosnia and Herzegovina, is considerably higher than the world average in %,
- Before the FTA, Turkey applied a unilateral concession regime to Bosnia and Herzegovina, but tax reductions were made within this scope, but the taxes were not reset.
- It is noteworthy that with the entry into force of the FTA, the abolition of taxes was envisaged.
- Agreement Scope;
- Removal of tariff and non-tariff barriers to trade in goods
- Health and phytosanitary measures
- Rules of origin
- Dumping and protection measures
- Public procurement
- Services trading
- Settlement of disputes (Ministry of Trade, 2022)

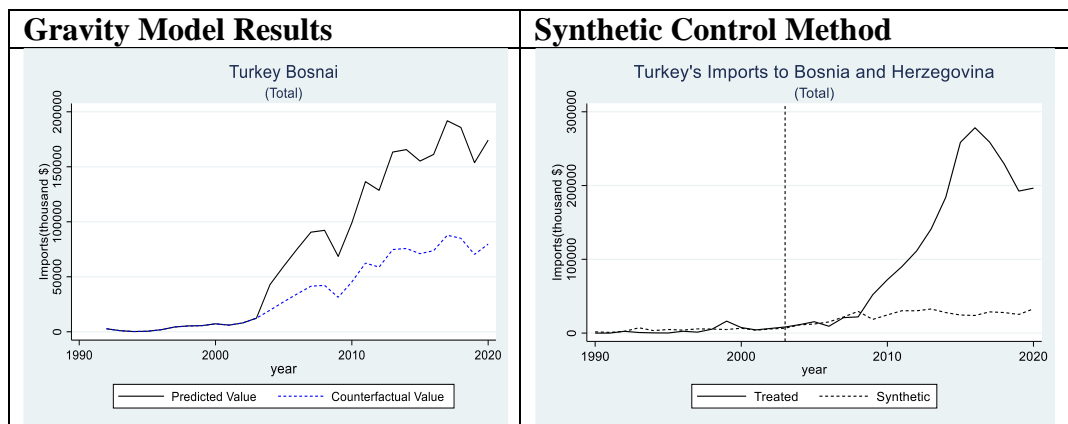


**Figure 12: Gravity Model and The Synthetic Control Method Results for Turkey’s Export**



According to the Gravity Model result, the predicted value diverged positively, indicating that the FTA positively impacts Turkey's export. On the other hand, the synthetic control method that provides information about FTA's impact on Turkey's export is ineffective.

**Figure 13: Gravity Model and The Synthetic Control Method Results for Turkey’s Import**



On the import side, the gravity model results provide information about FTA has been ineffective. On the contrary, the synthetic control method shows that FTA affects Turkey's imports positively. Therefore, the opposite results lead to the uncertain evaluation of FTA's impact on Turkey's imports. The scope of the agreement is limited. Other FTAs of Bosnia and Herzegovina and relatively insignificant tax advantages

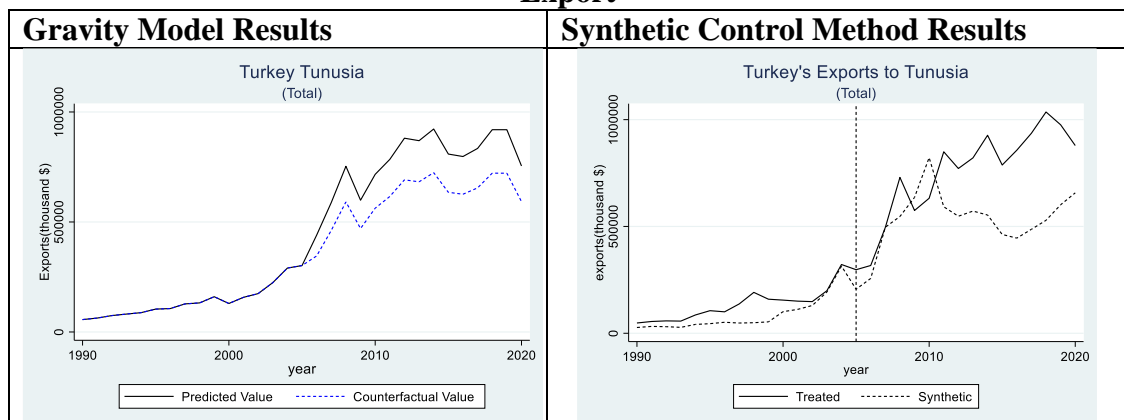
decrease the effect of FTA. In addition, the synthetic control method findings are not robust according to placebo tests<sup>3</sup>.

### 5.2.5. Tunisia Free Trade Agreement

Free Trade Agreement Between Turkey and Tunisia was signed on 25 November 2004. The agreement entered into force on 1 July 2005. Scope of the agreement;

- Removal of tariff and non-tariff barriers to trade in goods
- Animal and phytosanitary measures
- Economic and technical cooperation
- Internal taxation
- Public procurement and competition rules
- State monopolies and state aids
- Intellectual, industrial, and commercial property rights
- Rules of origin
- Balance of payments measures
- Anti-dumping

**Figure 19: Gravity Model and The Synthetic Control Method Results for Turkey's Export**

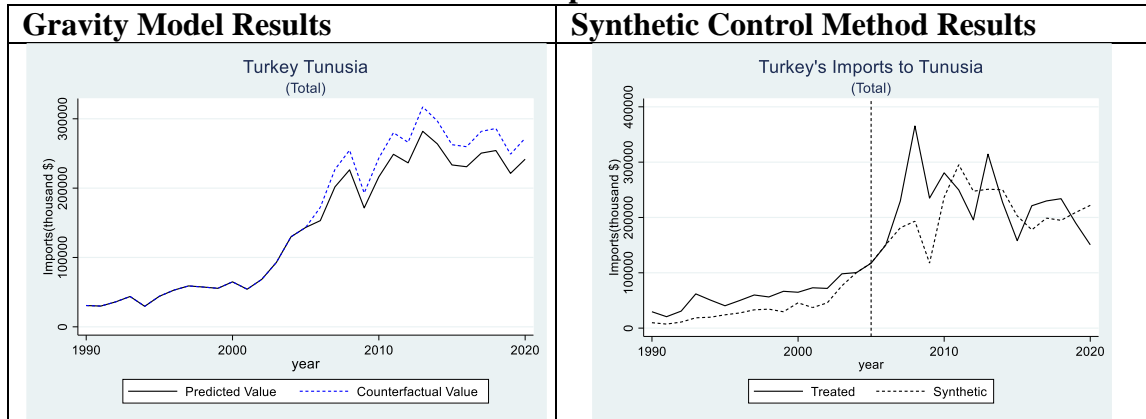


Gravity model results show us that the free trade agreement positively affects Turkey's export. On the other hand, according to the synthetic control method result, it affect Turkey's export positively. In addition, the synthetic control method findings are not

<sup>3</sup> Included in Appendix-E Figure 49-50

robust according to placebo tests<sup>4</sup>. Thus, the effect of the free trade agreement is unclear, and the FTA does not affect Turkey's imports.

**Figure 20: Gravity Model and The Synthetic Control Method Results for Turkey's Import**



### 5.2.6. Morocco Free Trade Agreement

The free trade agreement between Turkey and Morocco was signed in April 2004 and entered into force on January 1, 2006. Within the scope of the agreement, the Moroccan side has committed to abolishing taxes immediately and gradually over nine years for some products. It is noteworthy that the customs walls of Morocco before the agreement were relatively high.

The scope of the agreement includes the following:

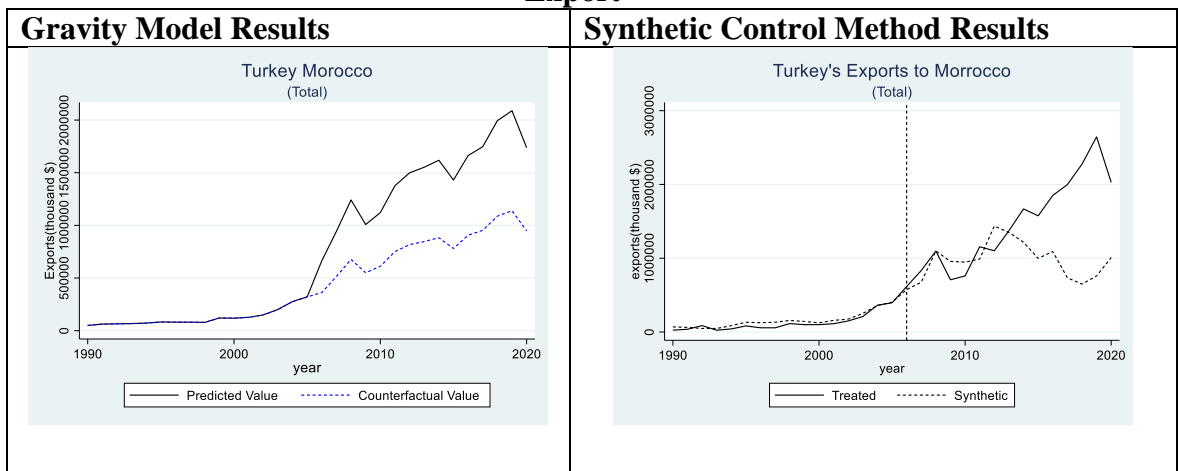
- Removal of tariff and non-tariff barriers to trade in goods
- Health and phytosanitary measures
- Service trading
- Foreign capital investments
- Internal taxation
- Anti-dumping and compensatory measures
- balance of payments
- Public procurement

<sup>4</sup> Included in Appendix-E Figure 68-69

- State aids
- Intellectual property rights
- State monopolies

Placebo tests provide information about synthetic control method findings that are not robust. Gravity model results show that the free trade agreement affects Turkey's export positively. Thus the conclusion is that the effect of free trade agreement is unclear.

**Figure 21: Gravity Model and The Synthetic Control Method Results for Turkey’s Export**

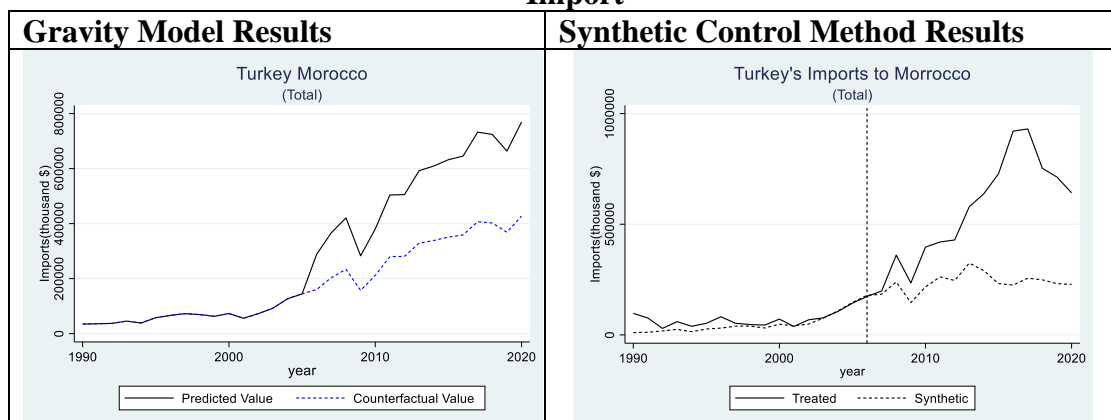


While the gravity model positively affects Turkey's imports, the synthetic control method provides a negative effect. Therefore, both approaches present opposite results. Therefore, the effect of the free trade agreement on Turkey's imports is unclear.

The scope of the agreement is broad but some goods are excluded, including all product groups, and significant tariff advantage has a vital role in the positive impact of the free trade agreement. In addition, the synthetic control method findings are robust according to placebo tests<sup>5</sup>.

<sup>5</sup> Included in Appendix-E Figure 64-65

**Figure 22: Gravity Model and The Synthetic Control Method Results for Turkey's Import**



### 5.2.7. Egypt Free Trade Agreement

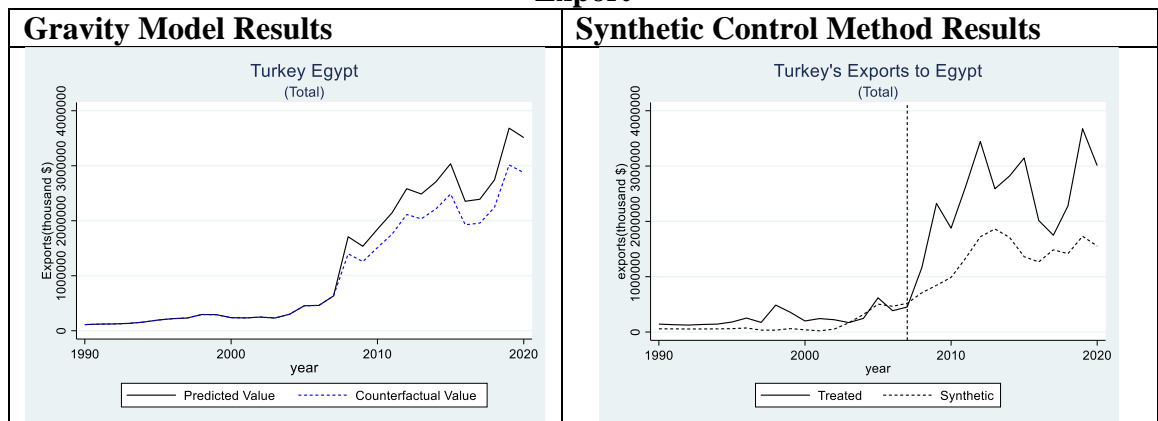
The FTA between Turkey and Egypt was signed in Cairo on 27 December 2005 and entered into force on 1 March 2007. In the FTA with Egypt;

- The tax reduction schedule is different between Egypt and Turkey,
- Commitment by Turkey to abolish taxes with the entry into force of the agreement,
- Commitment by Egypt that the taxes will be gradually abolished in a long period of 3, 9, 12, and 15 years as of the signing date of the agreement,
- Although there is an extended transition period for Egypt, a significant advantage has been created for Turkey due to the reductions; since the initial taxes are very high,
- It is noteworthy that Turkey has also made effective tax reductions.
- The scope of the agreement;
- Removal of tariff and non-tariff barriers to trade in goods
- Animal and phytosanitary measures
- Services
- Foreign direct investments
- Internal taxation
- Public procurement

- State Aids
- Intellectual, industrial, and commercial property rights
- Rules of origin
- Balance of payments measures
- Anti-dumping measures

Gravity model results show that prediction is above the counterfactual value, which indicates the impact of the free trade agreement on Turkey's export is positive. The synthetic control method also provides similar results to the gravity model. To ensure the robustness of estimates, placebo tests can ascertain whether our findings were the result of chance. The central issue is whether the estimated results are comparable to those from the random selection country dataset. Placebo tests show us that our findings are robust.

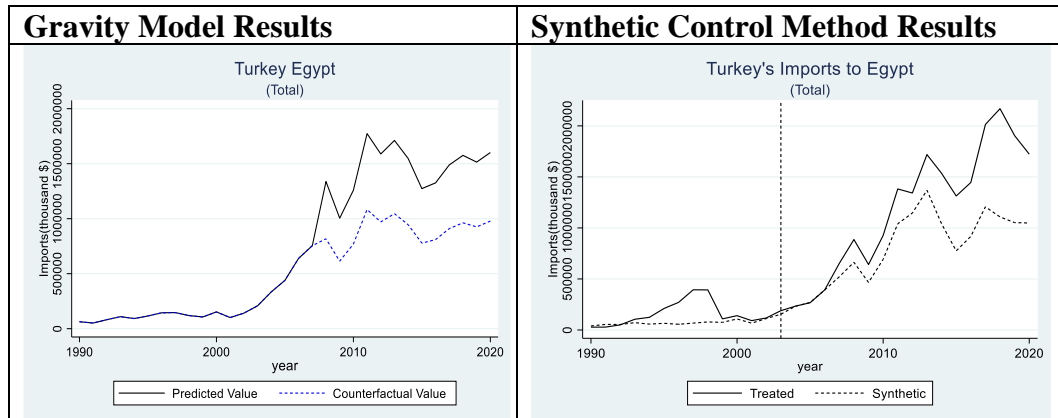
**Figure 5: Gravity Model and The Synthetic Control Method Results for Turkey's Export**



Both approaches confirm each other in the sense that free trade agreement has a positive effect on Turkey's imports. Also, the placebo test shows that the findings are robust. The scope of the agreement is broad, including all product groups, and significant tariff advantage has a vital role in the positive impact of the free trade agreement. In addition, the synthetic control method findings are robust according to placebo tests<sup>6</sup>.

<sup>6</sup> Included in Appendix-E Figure 51-52

**Figure 6: Gravity Model and The Synthetic Control Method Results for Turkey's Imports**



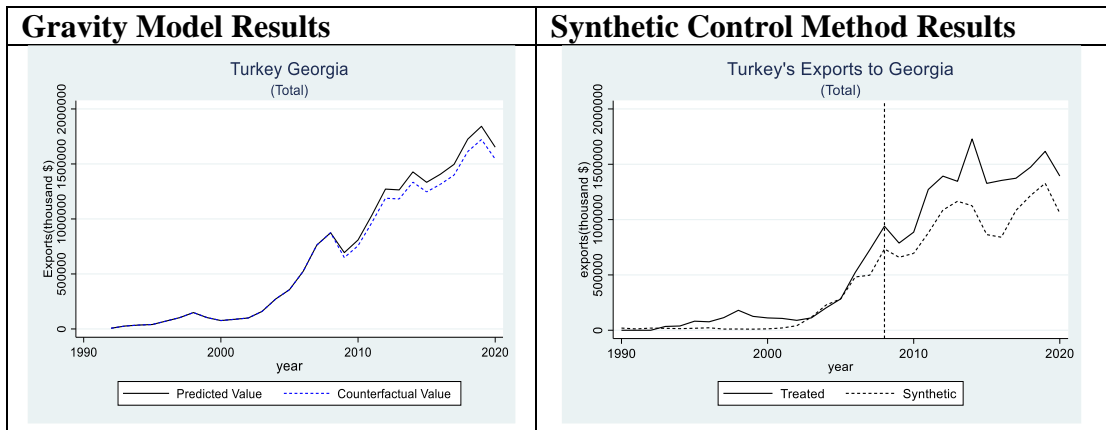
### 5.2.8. Georgia Free Trade Agreement

The Free Trade Agreement between Turkey and Georgia was signed on 21 November 2007 and entered into force on 1 November 2008. The scope of the agreement;

- Basic Taxes
- Customs Duties on Imports, Taxes with Equivalent Effect, and Import Duties of Financial Qualification
- Quantity Restrictions and Equivalent Measures
- Animal and Plant Health Measures
- Technical Barriers to Trade
- Origin Rules
- General Provisions (Internal Taxation, Trade Relations Regulated by Other Agreements, Structural Adjustment, Dumping, Safeguards, Rules of Origin)
- Intellectual Property Rights
- Competition
- State Monopolies

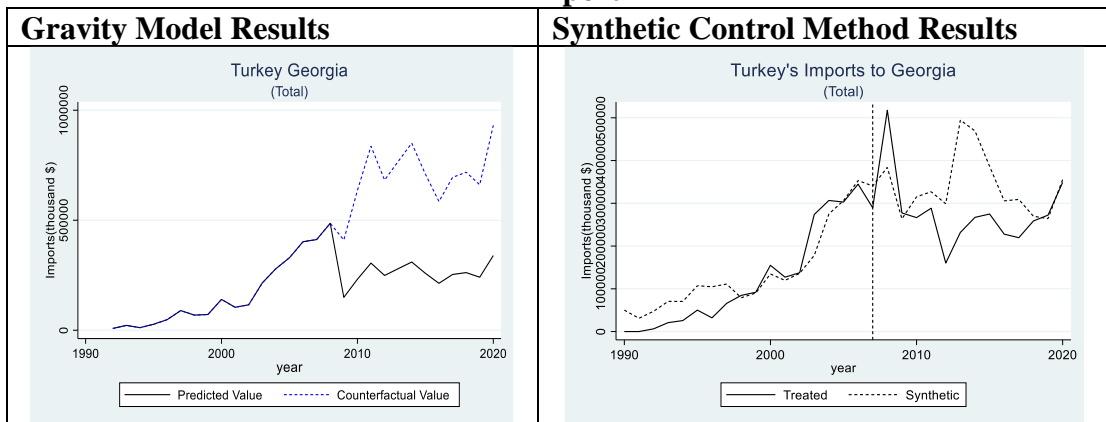
The gravity model result shows that the predicted value diverged positively, and the impact of free trade agreement on Turkey has been positive. However, on the contrary, synthetic control method results show that the free trade agreement is ineffective for Turkey's imports. Furthermore, the results and findings are not robust according to placebo tests.

**Figure 25: Gravity Model and The Synthetic Control Method Results for Turkey’s Export**



The gravity model result shows similar findings with the export side and gives information about the free trade agreement's impact on Turkey's export and import. In addition, the synthetic control method findings are not robust according to placebo tests<sup>7</sup>.

**Figure 7: Gravity Model and The Synthetic Control Method Results for Turkey’s Export**



**5.2.9. Albania Free Trade Agreement**

The Free Trade Agreement between Turkey and Albania was signed in 2006 and entered into force on 1 May 2008.

The scope of the agreement includes the following:

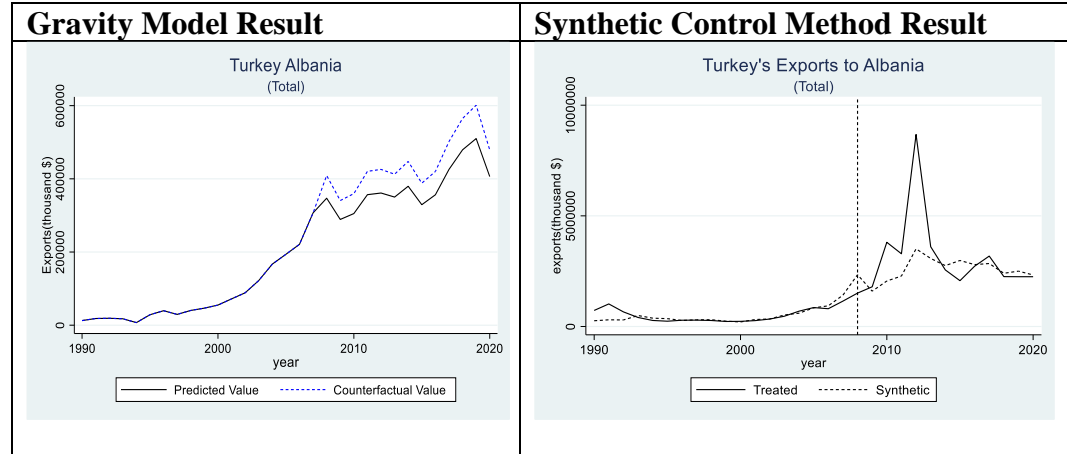
<sup>7</sup> Included in Appendix-E Figure 55-56



- Removal of tariff and non-tariff barriers to trade in goods
- Animal and phytosanitary measures
- Intellectual, industrial, and commercial property rights
- Rules of origin
- Taxation
- Dumping
- Conservation measures
- Payments

The gravity model result shows that Turkey's export diverges positively from the counterfactual value, indicating that FTA should not have been signed. On the other hand, the synthetic control method result provides obscure and close values with predicted and synthetic control units, indicating that the FTA impact is ineffective. In addition, the synthetic control method findings are not robust according to placebo tests<sup>8</sup>.

**Table 8: Gravity Model and The Synthetic Control Method Results for Turkey's Export**

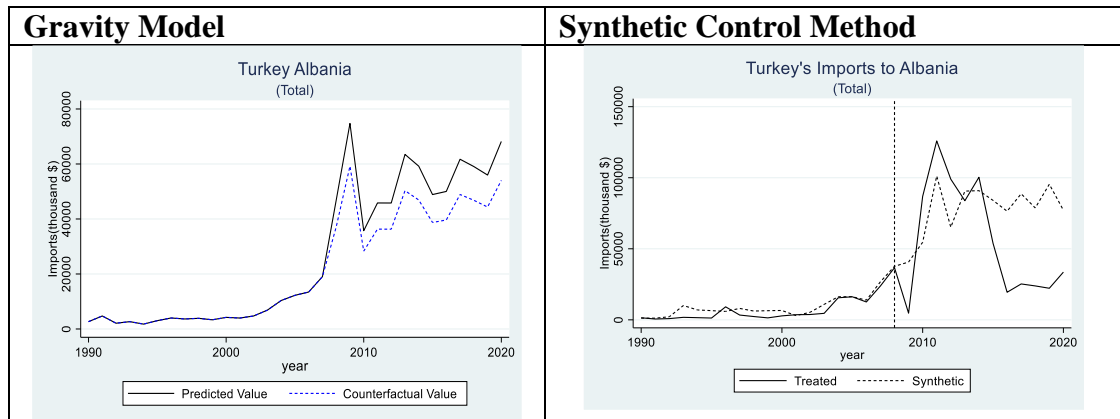


On the other hand, the predicted value diverges negatively from its counterfactual value, which indicates that the FTA does not affect Turkey's imports. The synthetic control method also provides similar results; synthetic units were above the treated unit, indicating the FTA did not affect Turkey's imports. According to placebo tests of synthetic control methods provided in Appendix – 2, FTA was ineffective in Turkey's

<sup>8</sup> Included in Appendix-E Figure 45-46

export and import. Therefore, according to both methodology, the effect of FTA on Turkey's exports is uncertain. The long period of tariff reduction schedule, temporarily increasing tariff rates, and trade facilitation led to the ineffectiveness of FTA.

**Figure 9: Gravity Model and The Synthetic Control Method Results for Turkey's Import**



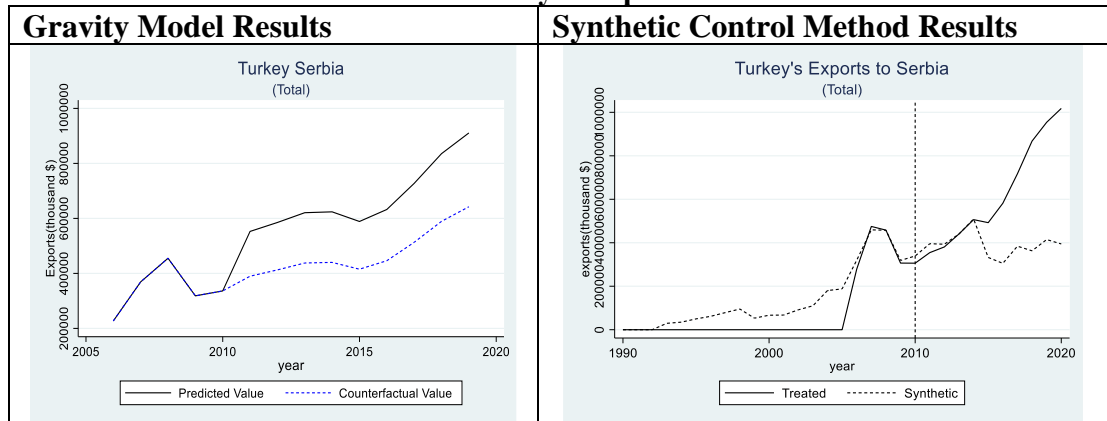
### 5.2.10. Serbia Free Trade Agreement

The Free Trade Agreement between Turkey and Serbia was signed on 1 June 2009 and entered into force on 1 September 2010.

The scope of the agreement;

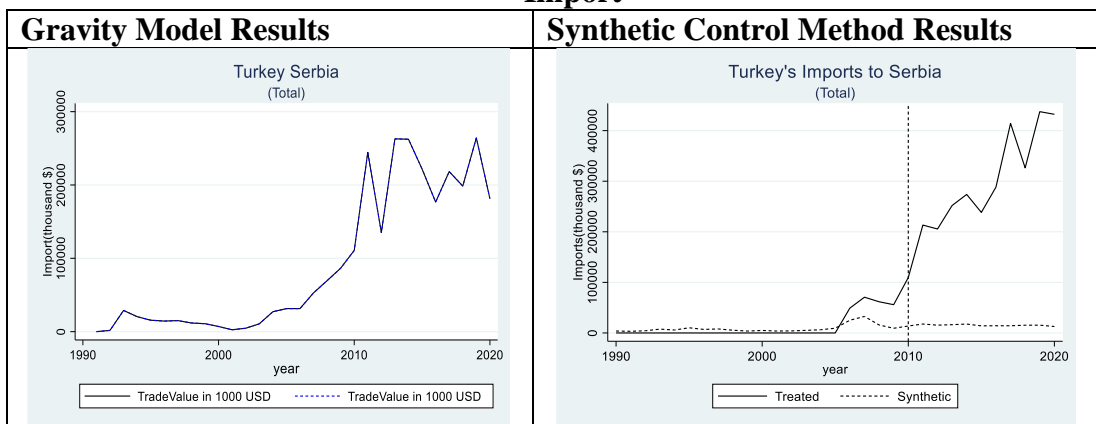
- Removal of tariff and non-tariff barriers to trade in goods
- Health and phytosanitary measures
- Intellectual, industrial, and commercial property rights
- Rules of origin
- Taxation
- Competition rules regarding undertakings, state aids
- Conservation measures
- Balance of payments measur

**Figure 10: Gravity Model and The Synthetic Control Method Results for Turkey's Export**



According to the Gravity model, results predicted that export value diverged positively from the counterfactual value. On the contrary, there is no effect in the synthetic control method result. The synthetic control period is unsuitable for Serbia's FTA because the pre-treatment period is not long for robust inferences.

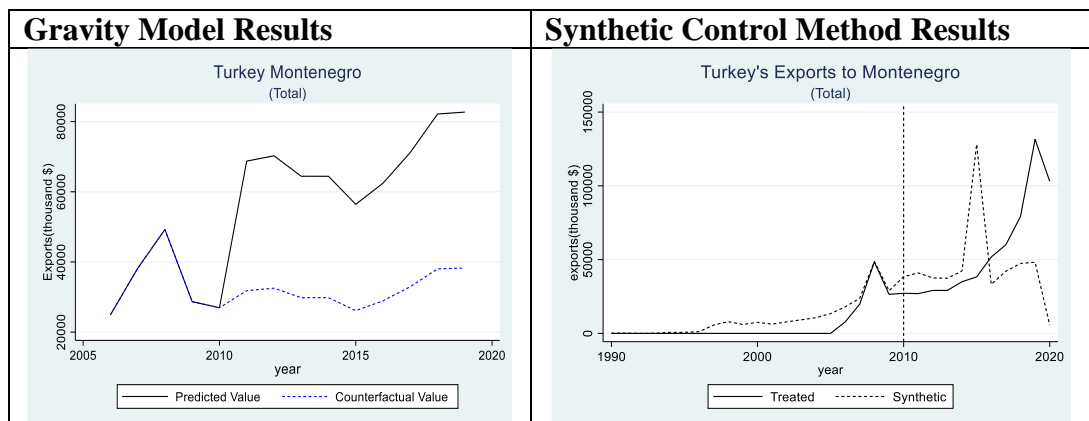
**Figure 11: Gravity Model and The Synthetic Control Method Results for Turkey's Import**



### 5.2.11. Montenegro Free Trade Agreement

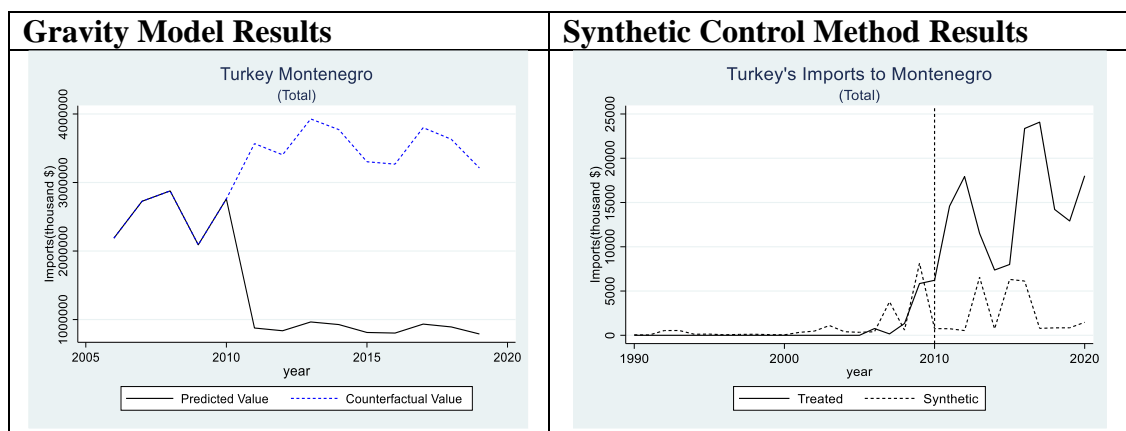
The Free Trade Agreement between Turkey and Montenegro was signed on 26 November 2008 and entered into force on 1 March 2010.

**Figure 12: Gravity Model and The Synthetic Control Method Results for Turkey's Export**



Synthetic control method findings are not robust according to placebo test results. Gravity model findings show us that the free trade agreement positively affects Turkey's export and is meaningless for imports. The synthetic control period is unsuitable for Montenegro's FTA because the pre-treatment period is not long for robust inferences.

**Figure 13: Gravity Model and The Synthetic Control Method Results for Turkey's Import**



### 5.2.12. Chile Free Trade Agreement

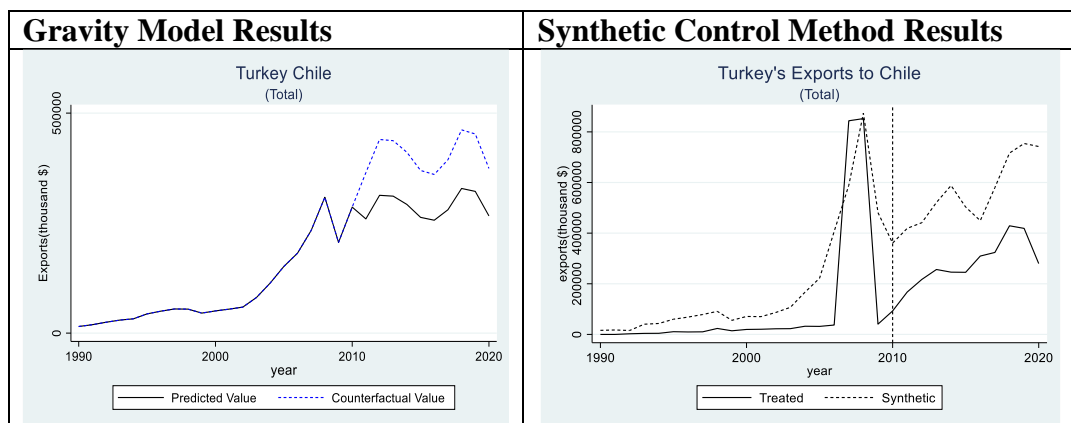
A Free Trade Agreement was signed between the Republic of Turkey and Chile on 14 July 2009 and entered into force on 1 March 2011. The scope of the agreement includes the following:

- Removal of tariff and non-tariff barriers to trade in goods
- Animal and phytosanitary measures
- Intellectual, industrial, and commercial property rights

- Rules of origin
- Taxation
- Anti-dumping
- Conservation measures
- Balance of payments measures

The gravity model result shows that the impact of Turkey – Chile FTA on Turkey's Export is ineffective. Also, the synthetic control method provides a similar result, but the divergence of the synthetic unit began before the FTA. The placebo test provides the synthetic control method findings not robust.

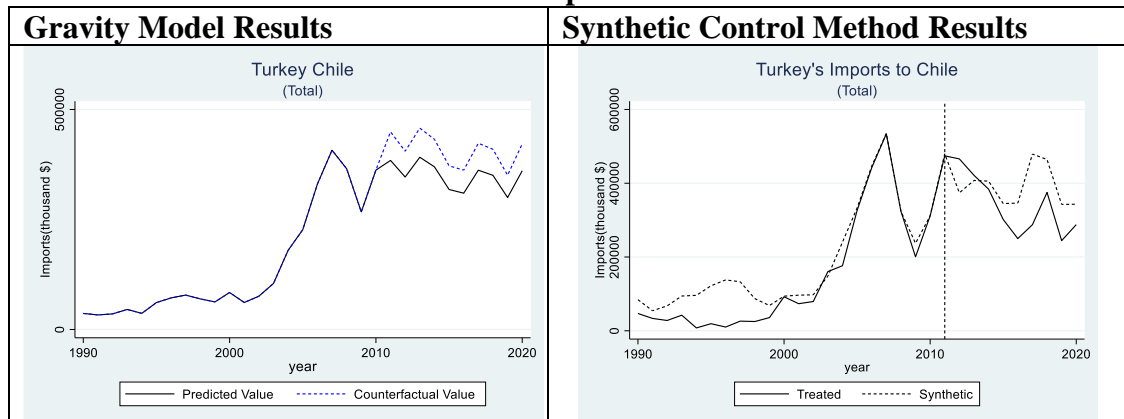
**Figure 14: Gravity Model and The Synthetic Control Method Results for Turkey's Export**



According to both approaches, the free trade agreement with Chile has not affected Turkey's imports. Furthermore, according to placebo tests, findings are not robust for Turkey's exports and imports. Therefore, it can be concluded that Chile's free trade agreement has no positive effect on Turkey's exports and imports. Significant tax advantages, trade facilitation problems, Chile having an effective FTA with trade blocs, and a low level of export-import complementary lead to the Turkey-Chile FTA being ineffective. In addition, the synthetic control method findings are not robust according to placebo tests<sup>9</sup>.

<sup>9</sup> Included in Appendix-E Figure 50-51

**Figure 15: Gravity Model and The Synthetic Control Method Results for Turkey's Import**



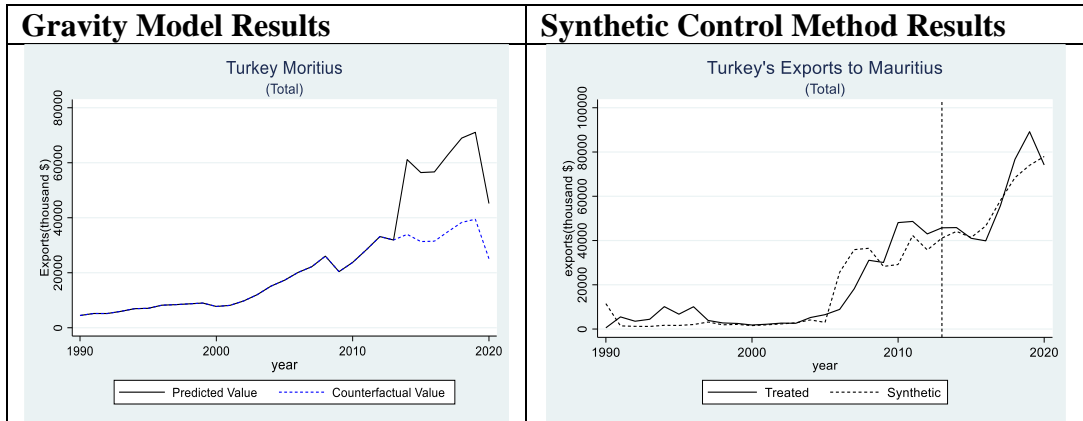
### 5.2.13. Mauritius Free Trade Agreement

A Free Trade Agreement between Turkey and Mauritius on 9 September 2011 entered into force on 24 June 2013.

The scope of the agreement;

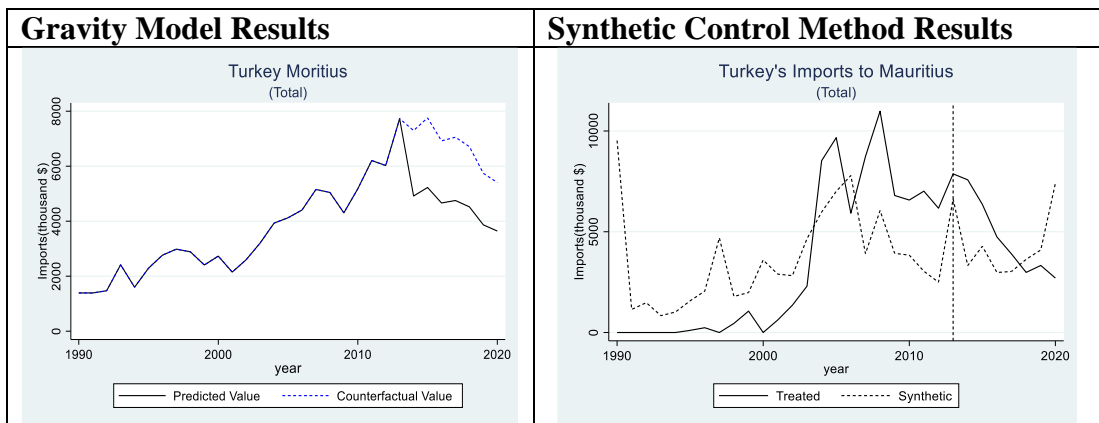
- Removal of customs duties, quantity restrictions, and taxes and measures with equivalent effect
- Change of concessions in agricultural products
- Health and phytosanitary measures
- Technical barriers to trade
- Intellectual, industrial, and commercial property rights
- Rules of origin
- Internal taxation
- Dumping
- Conservation measures
- Balance of payments measure

**Table 16: Gravity Model and The Synthetic Control Method Results for Turkey’s Export**



Gravity model results show that the free trade agreement's impact is insignificant for Turkey's exports and imports. Placebo tests show us that the findings of the synthetic control method are not robust. Low tariff advantages have a vital role in the insignificant impact of the free trade agreement. In addition, the synthetic control method findings are not robust according to placebo tests<sup>10</sup>.

**Figure 17: Gravity Model and The Synthetic Control Method Results for Turkey’s Import**



**5.2.14. South Korea Free Trade Agreement**

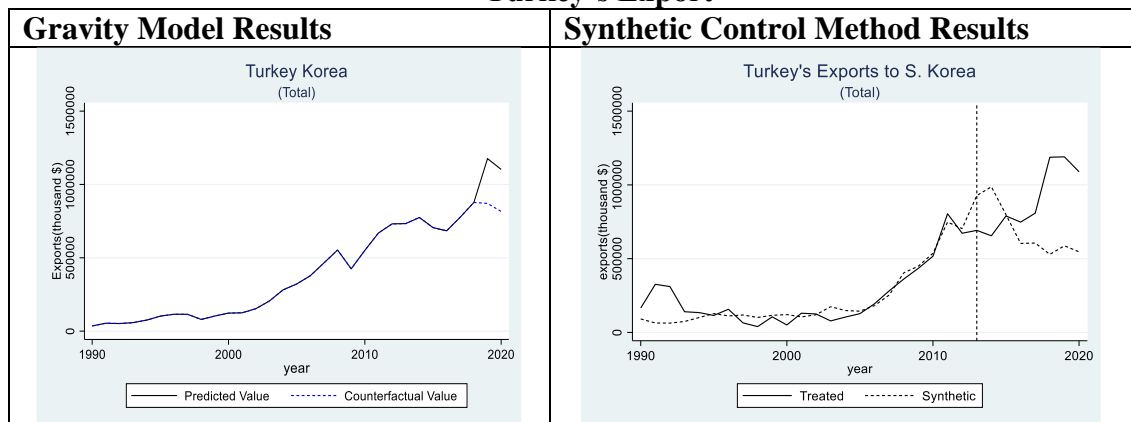
Free Trade Agreement (FTA) scope between Turkey and South Korea, the goods trade part of the trade agreement entered into force in 2013.

<sup>10</sup> Included in Appendix-E Figure 57-58

The scope of the agreement;

- Removal of tariff and non-tariff barriers to trade in goods
- Rules of origin
- Customs and trade facilitation
- Technical barriers to trade
- Trade policy measures
- Settlement of disputes
- Service trade and investment
- Intellectual property rights
- Competition
- Transparency
- Trade and sustainable development
- Institutional provision

**Figure 18: Gravity Model and The Synthetic Control Method Results for Turkey's Export**

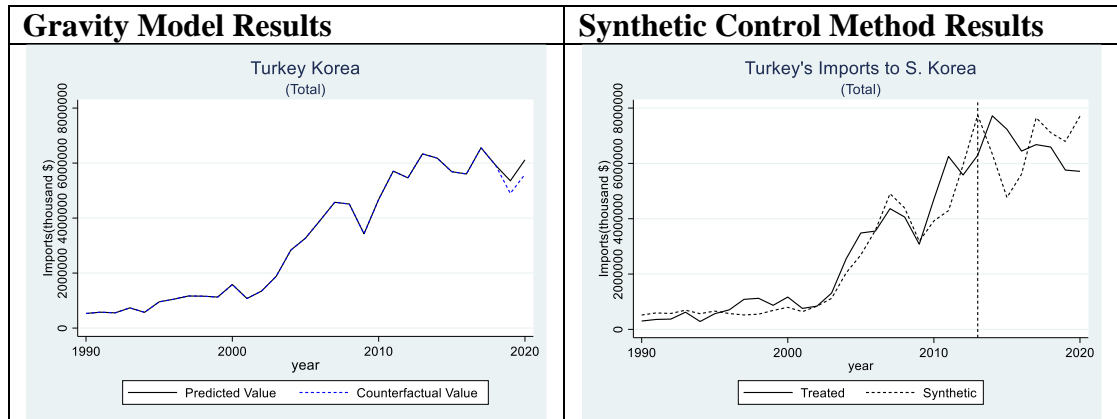


According to placebo tests, the synthetic control method findings are not robust. Moreover, according to the gravity model results, the free trade agreement has been effective for Turkey's exports and has positively affected Turkey's imports. In addition, the synthetic control method findings are not robust according to placebo tests<sup>11</sup>.

<sup>11</sup> Included in Appendix-E Figure 63-64



**Figure 19: Gravity Model and The Synthetic Control Method Results for Turkey's Import**



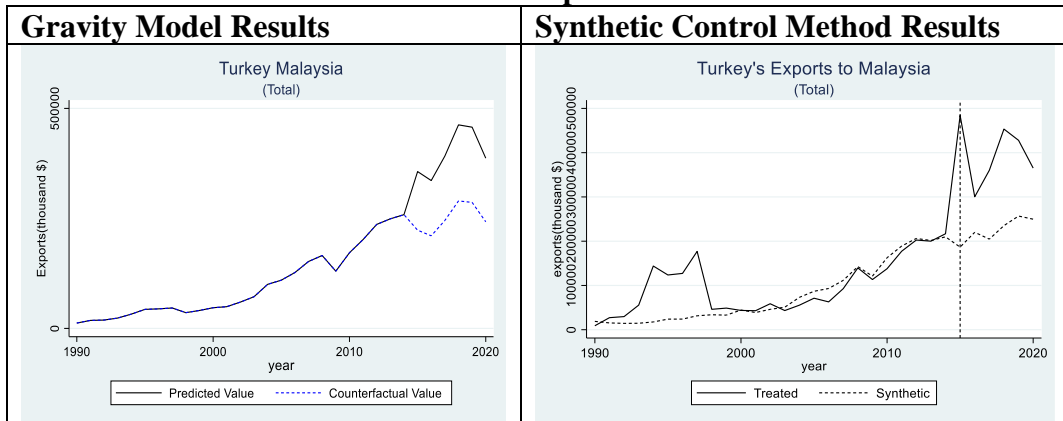
### 5.2.15. Malaysia Free Trade Agreement

The Free Trade Agreement signed between Turkey and Malaysia in 2014 entered into force on 1 August 2015.

The scope of the agreement;

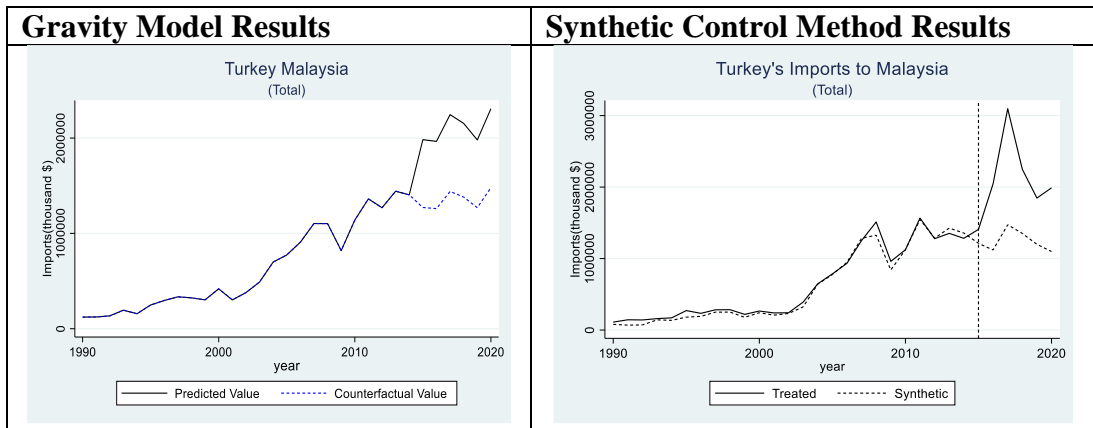
- Removal of Tariff and Non-Tariff Barriers in Goods Trade
- Origin Rules
- Customs Transactions and Cooperation
- Health and Phytosanitary Measures
- Technical Barriers to Trade
- Trade Policy Measures
- Economic and Technical Cooperation
- Transparency
- Settlement of Disputes
- Institutional Provisions

**Figure 20: Gravity Model and The Synthetic Control Method Results for Turkey’s Export**



According to Figure 39, both approaches provide similar results for both exports and imports. Malaysia's FTA does not affect Turkey's exports and imports. The scope of the agreement is broad, but the tariff reductions are scheduled for an extended period, and it is not utilized totally.

**Figure 21: Gravity Model and The Synthetic Control Method Results for Turkey’s Export**



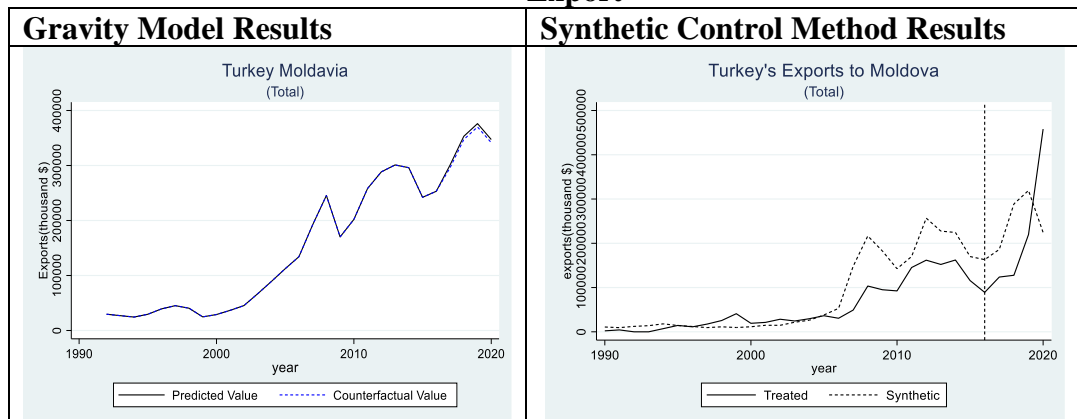
### 5.2.16. Moldova Free Trade Agreement

The Free Trade Agreement signed between Turkey and Moldova in 2014 entered into force on 1 November 2016.

The scope of the agreement;

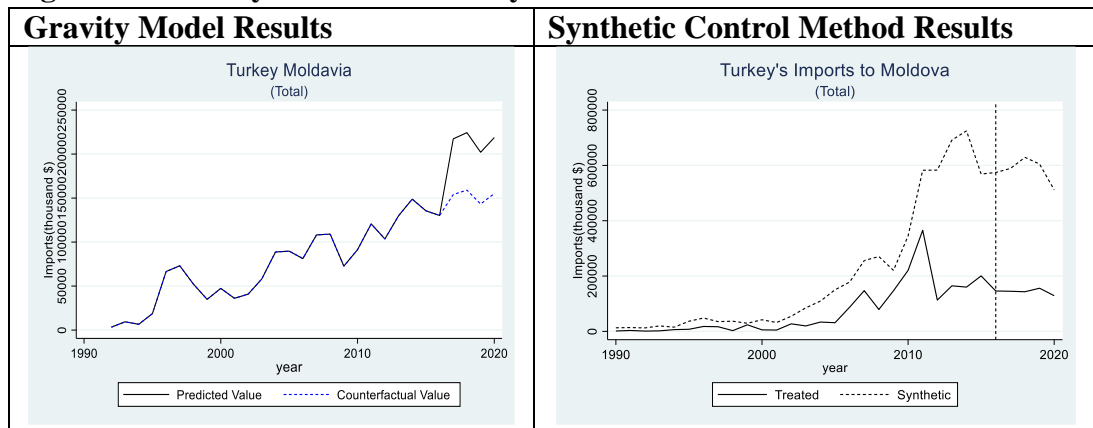
- Removal of Tariff and Non-Tariff Barriers in Goods Trade
- Origin Rules
- Customs clearance
- Health and Phytosanitary Measures
- Technical Barriers to Trade
- Trade Policy Measures
- Economic and Technical Cooperation
- Settlement of Disputes
- Institutional Provision

**Figure 22: Gravity Model and The Synthetic Control Method Results for Turkey's Export**



Placebo tests provide information about findings of synthetic control method is not robust. Gravity model results show that the free trade agreement had been affected positively on Turkey's export and import. Thus the effect of free trade agreement is uncertain. . In addition, the synthetic control method findings are not robust according to placebo tests<sup>12</sup>.

**Figure 23: Gravity Model and The Synthetic Control Method Results for Turkey's**



**Import**

### 5.2.17. Singapore Free Trade Agreement

The Free Trade Agreement between Turkey and Singapore was signed on 14 November 2015 and entered into force on 1 October 2017.

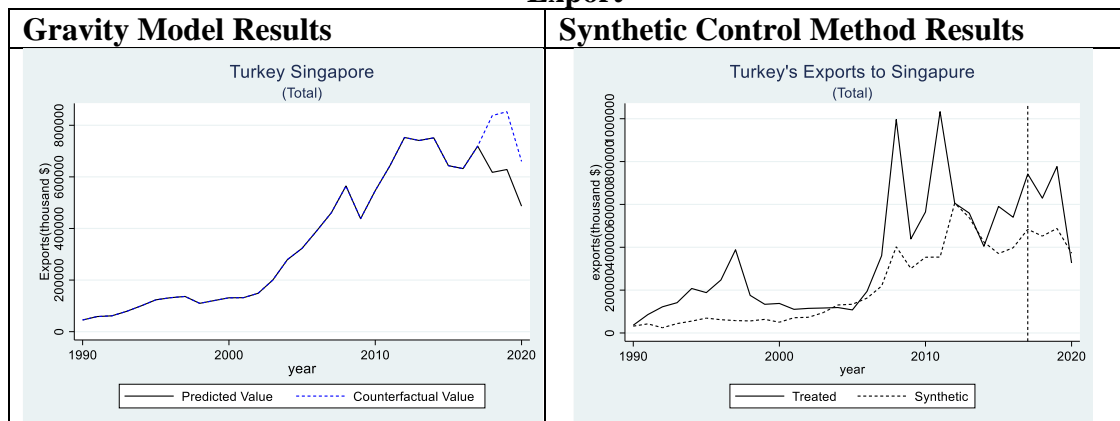
The scope of the agreement includes the following:

- Merchandise trade
- Rules of origin
- Trade policy measures
- Health and phytosanitary measures
- Technical barriers to trade
- Customs and trade facilitation
- Service trading
- Telecommunications
- e-Commerce

<sup>12</sup> Included in Appendix-E Figure 57-58

- Financial services
- Temporary circulation of natural persons
- Investment, public procurement
- Competition and related issues
- Intellectual property
- Transparency and dispute resolution mechanism
- It consists of 18 chapters.

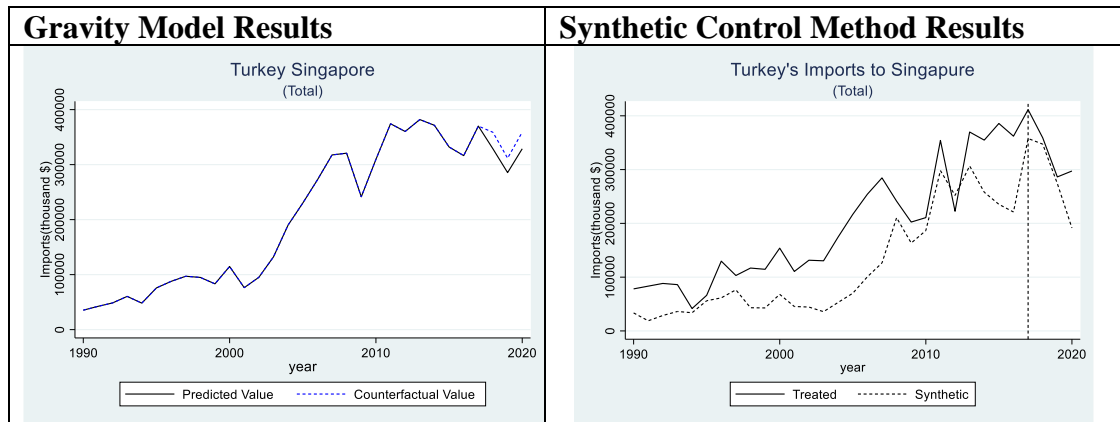
**Table 24. Gravity Model and The Synthetic Control Method Results for Turkey's Export**



Synthetic control method findings are not robust according to placebo tests. Singapore's FTA did not affect neither Turkey's exports and imports. The low tariff advantages and long schedule tariff reduction period cause an insignificant effect on FTA for Turkey's export and import. In addition, the synthetic control method findings are not robust according to placebo tests<sup>13</sup>.

<sup>13</sup> Included in Appendix-E Figure 57-58

**Figure 25: Gravity Model and The Synthetic Control Method Results for Turkey's Import**



**Table 26: The Impact of Free Trade Agreements (1000 \$ per unit)**

FTA	Difference in Difference		Synthetic Control	
	Export (2020)	Import (2020)	Export (2020)	Import (2020)
Georgia	-	-	335,475	73,016
Korea	1,493,074	-	542,614	-491,175
Israel	1,329,984	779,812	3,123,357	1,115,967
Morocco	1,171,248	342,011	1,019,950	414,052
Egypt	652,069	623,002	1,454,538	674,930
Tunisia	442,761	-	221,477	-71,328
Albania	-274,007	-	39,329	-43,542
Bosnia and Herzegovina	-	94,526	-38,294	163,617
Moldova	-	63,658	233,704	-382,666
North Macedonia	-	-194,858	232,857	109,407
Mauritius	11,102	-	-3,817	-4,705
Iceland	35,494	10,589	-795,123	-5,577,469
Norway	273,176	190,959	-180,831	-4,699,332
Chile	-	-	-462,319	-55,399
Malaysia	144,587	827,808	109,613	891,317
Singapore	-	-	-45,931	105,902
Switzerland	-	-952,316	-1,600,539	3,299,631
Serbia	210,649	-	239,971	410,096
Montenegro	39,402	-	99,060	16,553

Source: Author Calculations

According to the results of both approaches, Turkey's export increased

1,3 billion - 3,1 billion with Israel FTA,

1 billion -1.1billion with Morocco FTA,

652 million -1.4 million with Egypt FTA,

542 million – 1,5 billion with S. Korea FTA,

221 million - 442 million with Tunisia,

210 - 239 million dollar with Serbia FTA,

109 million -144 million with Malaysia FTA.

39 million – 99 million dolar with Montenegro FTA in 2020.

According to the results of both approaches, Turkey's import increased by

780 million – 1,1 Billion with Israel FTA,

342 million - 414 million with Morocco FTA,

623 million - 1.4 million with Egypt FTA,

163 million - 166 million with Bosnia and Herzegovina FTA,

827 million -891 million by Malaysia FTA in 2020.

## CONCLUSION

FTAs are a foreign trade policy tool used by countries to increase their economic integration by eliminating tariffs. FTAs affect countries' economy through static and dynamic effects and they can increase bilateral trade volume and economic relationships among countries. Therefore, countries increasingly use FTAs to take certain advantages. Nevertheless, whether FTAs have a positive or negative effect on exports and imports is uncertain in the literature. Understanding whether FTAs can increase countries' trade volume is crucial to formulate effective foreign trade policies. Due to its significance, there is a large literature analyzing the effects of FTAs. Most of these studies use a gravity approach. However, because this approach has some disadvantages, a new method, namely synthetic control method is proposed in the literature to examine the impacts of FTAs. In this study, the effects of FTAs signed by Turkey on Turkey's exports and imports have been examined by employing a synthetic control approach using data for the period between 1990 and 2020.

First, aggregated results are obtained by estimating Turkey's entire aggregated FTAs by using a dummy variable. The effects of individual coefficients are later obtained for each FTA, and the results are compared with the difference in the differences method and the synthetic control method.

The results provide evidence regarding the heterogeneous effects of FTAs. It is seen that tariff reductions and the scope of the agreements have different results for each country. In addition, empirical results obtained from gravity model suggest that the FTAs increase exports by 52.6% on average and increase imports by 53.87% on average. Furthermore, it is found that Israel, Morocco, Egypt, South Korea, Tunisia, Serbia, Malaysia, and Montenegro FTAs have a significant effect on Turkey's exports. Israel, Morocco, Egypt, Bosnia and Herzegovina, and Malaysia FTAs have a significant effect on Turkey's imports. The differences in the effects of the agreements are generally due to the different conditions of the agreement and country-specific factors influencing the parties of the agreement.



The results also reveal that the effect of FTAs on Turkey's exports and imports is below the world average, which are 31.25% and 20.32% for exports and imports respectively

The empirical results obtained in this study suggest that FTAs do not have a significant effect on exports, which can be attributed to several factors. First of all, Customs Union agreement is partly responsible for this finding because of the fact that effective FTAs of Turkey has been eliminated from the list by the establishment of the Customs Union. FTAs can be seen as a foreign trade policy tool that reveals the desire of countries to increase their economic integration. When the countries with which Turkey has signed a free trade agreement are examined, it is seen that apart from EFTA, Georgia, and Venezuela, it cannot sign an FTA with its own independent foreign trade policy because Turkey is a member of Customs Union, and it has to negotiate FTAs with the countries with which it has signed an agreement with the EU. The EU does not include Turkey in the decision processes of FTAs and only makes a declaration of intent upon signing an FTA with another country. To obey the provisions of the Turkey-EU Association Council Decision No. 1/95, Turkey complies with the common trade policy of the EU. In this framework, it signs FTAs with the countries and country groups with which the EU has already signed a free trade agreement. Therefore, the main reason for the implementation of Turkey's free trade agreements depends on obligations rather than trade enhancing behaviour. Because of this reason, the FTAs signed by Turkey can not achieve the expected rise in exports. It is also observed that FTA agreements that Turkey signed with the countries with which the trade relations were more effective before the agreement have a greater impact on exports. However, the effect was lower in countries where the trade relationship was limited before the agreement.

Another factor responsible for FTAs being ineffective is nontariff trade barriers (NTBs). Because NTBs cannot be quantified and monitored easily, they lead to efficiency loss. Overall, NTBs, trade facilitation factors, the scope of the agreement, tariff rate volatility (increasing after the FTA is in force), the complementary of the exporter producers and importer consumers, and other FTAs have the power to determine the effects of the trade agreement on exports and imports. Especially some countries eliminate tariff rates for a long period and increase tariff rates and not the trade facilitation during the period of FTA

and these can be seen as a reason for the ineffectiveness of FTAs. Furthermore, Turkey has used an inward processing regime that eliminates tariff rates for processing activities and re-exports. Therefore, tariff elimination in FTAs is losing its effectiveness.

These findings suggest important policy implications. The effects of FTAs can be enhanced with revisions aimed at enhancing the scope of the agreements, adopting new generation FTAs and increasing the trade relationship with the partner countries signing FTAs. New generation FTAs are trade agreements that include provisions on competition, e-commerce, public procurement, intellectual property, and foreign investment in addition to lowering tariffs and other trade barriers. In a nutshell, the new generations of FTAs combine trade in goods, services, and investment agreements into a single agreement with a broader scope, which have the potential to increase the trade enhancing effects of FTAs.

There are some limitations of the study. One limitation is the mismatches in trade dataset and lowest pre-treatment period observation requirement problem in the synthetic control method. The use of aggregated level of trade statistics is another limitation of this study. Further studies may adopt a disaggregated analysis which may shed more light on the impacts of FTAs.

## REFERENCES

- Abedini, J., and Péridy, N. (2014). *The Greater Arab Free Trade Area(GAFTA): an Estimation of Its Trade Effects*. *Journal of Economic Integration*, 23(4), 848-872.
- Adarov, A. (2018). *Eurasian Economic Integration: Impact Evaluation Using the Gravity Model and the Synthetic Control Methods* (No. 150). *wiiw Working Papers*.
- Angrist, J. D., and Pischke, J. S. (2015). *Mastering 'Metrics The Path from Cause to Effect*. New Jersey: Princeton.
- Angrist, J. D., and Pischke, J.-S. (2009). *Mostly Harmless Econometrics An Empiricist's Companion*. New Jersey: PRINCETON UNIVERSITY PRESS.
- Anthony, M., and Quimba, F. M. (2019). *JPEPA, a Decade After: Evaluating the Effects in Philippine Exports using the Synthetic Control Method* (No. 2019-33). *PIDS Discussion Paper Series*.
- Arkolakis, C., Costinot, A., and Donaldson, D. (2013). *The Elusive Pro-Competitive Effects of Trade*. *Acta Universitatis Sapientiae, The Review of Economic Studies*, 86(1), 46-80.
- Armstrong, S. (2015). *The Economic Impact of the Australia–US Free Trade Agreement*. *Australian Journal of International Affairs*, 69(5), 513-537
- Asian Development Bank (2008). *How to Design, Negotiate, and Implement a Free Trade Agreement in Asia*. Philippines: Office of Regional Economic Integration.
- Aytuğ, H., Kütük, M. M., and Togan, S. (2016). *Twenty Years of the EU-Turkey Customs Union: A Synthetic Control Method Analysis*. *JCMS*, 55(3), 419-431.
- Balan, D. (2016). *Türkiye'de Küresel Ticaret*. Bursa: Dora.
- Barlow, P., Mckee, M., Basu, S., and Stuckler, D. (2017). *Impact of the North American Free Trade Agreement on High-fructose Corn Syrup Supply in Canada: a Natural Experiment Using Synthetic Control Methods*. *CMAJ*.
- Bhattacharya, S., and Bhattacharyay, B. (2007). *Gains and losses of India-China trade cooperation-A gravity model impact analysis*. *CESifo Working Paper Series*.
- Bilici, Ö., Erdil, E., and Yetkiner, H. (2008). *The determining role of EU in Turkey's trade flows: a gravity model approach* (No. 08/06). *Working Papers in Economics*.
- Bouttell, J., Craig, P., Lewsey, J., Robinson, M., and Popham, F. (2018). *Synthetic control methodology as a tool for evaluating population-level health interventions*. Bouttell J, et al. *J Epidemiol Community Health*, 72(8), 673-678
- Cardamone, P. (2019). *Preferential Trade Agreements Granted By The European Union: An Application of The Gravity Model Using Monthly Data*. *PUE and PIEC WP09*.
- Chandran, S. (2018). *Trade Impact of the India-ASEAN Free Trade Agreement (FTA): An Augmented Gravity Model Analysis*. *SSRN*.
- Corden, W. (1972). *Economies of Scale and Customs Union Theory*. *Journal of Political Economy*, 80(3), 465-475.
- Cunningham, S. (2021). *Causal inference*. In *Causal Inference*. Yale University Press.
- Dembatapatiya, P., and Weerahewa, J. (2015). *Effects of Regional Trading Agreements on South Asian Trade: A Gravity Model Analysis*. *Tropical Agricultural Research Vol. 26 (3)*, 468-485.

- Demircioglu, Ö. (2019). *Serbest Ticaret Anlaşmalarının Dış Ticarete Etkisi: Türkiye İçin Karşılaştırmalı Bir Analiz*. Doktora Tezi, İstanbul Ticaret Üniversitesi, İstanbul
- Dianniar, U. (2013). *The Impact of Free Trade Agreements on Indonesia's Agricultural Trade Flows: An Application of the Gravity Model Approach*. Unpublished Master Thesis. The Hague, the Netherlands.
- Ekanayake, E. M., Mukherjee, A., and Veeramach, B. (2010). *Trade Blocks and the Gravity Model: A Study of Economic Integration among Asian Developing Countries*. Journal of Economic Integration, 627-643.
- Freda, J., and Yetkiner, H. (2017). *The Regional Trade Dynamics Of Turkey: A Panel Data Gravity Model*. The Journal Of International Trade And Economic Development, 627-643.
- Gertler, P. J., Martinez, S., Premand, P., Rawlings, L. B., and Vermeersch, C. M. (2016). *Impact Evaluation in Practice*. Washington, DC: World Bank Publications..
- Gündüz, A. Y. (1999). *Türkiye Ekonomisindeki Yapısal Değişiklikler ve 1980 Sonrası Uygulanan İstikrar Politikaları*. Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi (15), 277-288.
- Hannan, S. A. (2017). *The Impact of Trade Agreements in Latin America using the Synthetic Control Method*. IMF Working Paper.
- Hosny, A. S. (2012). *Algeria's trade with GAFTA countries: A synthetic control approach*. Transition Studies Review Springer, 19(1), 35-42.
- Kalirajan, K., and Paudel, R. (2015). *India's Trade Deficit with China: Will Free Trade Agreement (FTA) Work for India?* Global Economy Journal 15(4), 485-505.
- Karlsson, J., Melin, H., and Cullinane, K. (2018). *The Impact of Potential Brexit Scenarios On German Car Exports To The UK: An Application Of The Gravity Model*. Journal of Shipping and Trade. 3(1), 1-22.
- Khandker, S. R., Koolwal, G. B., and Samad, H. A. (2010). *Handbook on Impact Evaluation Quantitative Methods and Practices*. Washington, D.C.: World Bank.
- Kodithuwakku, S., Weerahewa, J., and Boughanmi, H. (2016). *Food and Agricultural Trade in the GCC: An Opportunity for South Asia?* Rev. Middle East Econ. Fin. De Gruyter .
- Kütük, M. M. (2015). *Do Regional Trade Agreements Actually Increase*. Thesis, ODTÜ, Ankara.
- Liu, M. (2018). *An Anaylsis of Chinese Trade and FTA using Gravity Model*. Applied Economics Thesis.
- Navarrete, A., and Tatlonghari, V. (2018). *An Empirical Assessment Of The Effects Of The Japan–Philippine Economic Partnership Agreement (JPEPA) On Philippine Exports to Japan: A Gravity Model Approach*. Journal of Economic Structure. 7(1), 1-20
- Ping, L., and Shuai, K. (2011). *The Effect Of Free Trade Area On Technology Innovation: An Analysis Of Mechanism And Empirical Test*. International Conference on E-Business and E-Government (ICEE) (pp. 1-4). IEEE
- Plummer, M. G., David, C., and Shintaro, H. (2010). *Methodology for Impact Assesment of Free Trade Agreements*. Asian Development Bank.

- Rahman, M., Shadat, W. B., and Das, N. C. (2006). *Trade Potential in SAFTA: An Application of Augmented Gravity Model*. Centre for Policy Dialogue (CPD). 61, 512.
- Regional Trade Agreements Database*. (2021). World Trade Organization: from <https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx>
- Reigado, A. B. (2020). *The Impact of MERCOSUR on the trade profile of its members using the Synthetic Control Method*. Master Thesis.
- Rogowsky, R., and Shiells, C. (1993). *The Dynamic Effects of Trade Liberalization: A Survey*. United States International Trade Commission.
- Stack, M. M., and Bliss, M. (2020). *EU Economic Integration Agreements, Brexit and Trade*. Review of World Economics, 156(3), 443-473.
- Swarnali, A. H. (2017). *The Impact of Trade Agreements in Latin America Using Synthetic Control Method*, . IMF Working Paper.
- Timsina, K., and Culas, R. J. (2019). *Do Free Trade Agreements Increase Australian Trade: An Application of Poisson Pseudo Maximum Likelihood Estimator?* Journal of East-West Business Journal of East-West Business, 26(1), 56-80.
- Turkish Statistical Institute. (2022, 05 01). *tuik.gov.tr*. Tuik: from <https://data.tuik.gov.tr/Kategori/GetKategori?p=dis-ticaret-104anddil=2>
- Türkcan, K., and Pişkin, E. (2014). *The Effects of the Trade Agreements on the Dynamics of Turkey's Export: Extensive and Intensive Margins*. Turkish Economic Association. MPRA Paper, (59841).
- Urata, S., and Okabe, M. (2010). *The Impacts of Free Trade Agreements On Trade Flows: An Application of The Gravity Model Approach*. World Scientific, 11, 195.
- US ITC. (2018, 02). *The Dynamic Gravity Dataset: 1948–2016*. Washington, USA.
- Verevis, S., and Üngör, M. (2020). *What Has New Zealand Gained From The FTA With China?: Two Counterfactual Analyses*. Scottish Journal of Political Economy. 68(1), 20-50.
- World Trade Organization. (2021). *Regional trade agreements*. World Trade Organization: from [https://www.wto.org/english/tratop\\_e/region\\_e/region\\_e.htm](https://www.wto.org/english/tratop_e/region_e/region_e.htm)
- Yotov, Y. V., Piermartini, R., Monteiro, J. A., and Larch, M. (2012). *A Practical Guide to Trade Policy Analysis*. World Trade Organization.

## APPENDIX A – COUNTRY LIST USED IN GRAVITY MODEL

**Table 36: Country List Used In Gravity Model**

Aruba	Congo, Rep.	Guinea-Bissau	Luxembourg
Afghanistan	Cook Islands	Equatorial Guinea	Latvia
Angola	Colombia	Greece	Macao
Anguila	Comoros	Grenada	Morocco
Albania	Cape Verde	Greenland	Moldova
Andorra	Costa Rica	Guatemala	Madagascar
Netherlands Antilles	Czechoslovakia	French Guiana	Maldives
United Arab Emirates	Cuba	Guyana	Mexico
Argentina	Christmas Island	Hong Kong, China	Marshall Islands
Armenia	Cayman Islands	Honduras	Macedonia, FYR
Antigua and Barbuda	Cyprus	Croatia	Mali
Australia	Czech Republic	Haiti	Malta
Austria	German Democratic Republic	Hungary	Myanmar
Azerbaijan	Germany	Indonesia	Mongolia
Burundi	Djibouti	India	Northern Mariana Islands
Belgium	Dominica	Ireland	Mozambique
Benin	Denmark	Iran, Islamic Rep.	Mauritania
Burkina Faso	Dominican Republic	Iraq	Montserrat
Bangladesh	Algeria	Iceland	Martinique
Bulgaria	Ecuador	Israel	Mauritius
Bahrain	Egypt, Arab Rep.	Italy	Malawi
Bahamas, The	Eritrea	Jamaica	Malaysia
Bosnia and Herzegovina	Western Sahara	Jordan	Namibia
Belarus	Spain	Japan	New Caledonia
Belize	Estonia	Kazakhstan	Niger
Bermuda	Ethiopia (excludes Eritrea)	Kenya	Norfolk Island
Bolivia	Finland	Kyrgyz Republic	Nigeria
Brazil	Fiji	Cambodia	Nicaragua
Barbados	Falkland Island	Kiribati	Niue
Brunei	France	St. Kitts and Nevis	Netherlands
Bhutan	Faeroe Islands	Korea, Rep.	Norway
Botswana	Micronesia, Fed. Sts.	Kuwait	Nepal
Central African Republic	Gabon	Lao PDR	Nauru
Canada	United Kingdom	Lebanon	New Zealand
Cocos (Keeling) Islands	Georgia	Liberia	Oman
Switzerland	Ghana	Libya	Pakistan
Chile	Gibraltar	St. Lucia	Panama
China	Guinea	Sri Lanka	
Cote d'Ivoire	Guadeloupe	Lesotho	
Cameroon	Gambia, The	Lithuania	

## APPENDIX B - COUNTRY LIST USED IN SYNTHETIC CONTROL METHOD

**Table 37: Country List Used In Synthetic Control Method**

Aruba	Cuba	Kazakhstan	Peru
Argentina	Djibouti	Kenya	Papua New Guinea
Armenia	Dominica	Kuwait	Korea, Dem. Rep.
	Dominican		
Antigua and Barbuda	Republic	Lao PDR	French Polynesia
Australia	Algeria	Lebanon	Russian Federation
Azerbaijan	Fiji	Libya	Saudi Arabia
Bahrain	Faeroe Islands	St. Lucia	Sudan
Belarus	Gabon	Sri Lanka	El Salvador
Belize	Ghana	Macao	Somalia
Bermuda	Gibraltar	Maldives	Suriname
Bolivia	Equatorial Guinea	Mexico	Swaziland
Brazil	Grenada	Mongolia	Seychelles
Barbados	Greenland	Mauritius	Thailand
		New	
Brunei	Guatemala	Caledonia	Turkmenistan
Bhutan	Guyana	Nigeria	Trinidad and Tobago
Botswana	Hong Kong, China	Nicaragua	Taiwan
China	India	New Zealand	Ukraine
Cote d'Ivoire	Iran, Islamic Rep.	Oman	St. Vincent and the Grenadines
Cape Verde	Iraq	Pakistan	Venezuela
Costa Rica	Jamaica	Panama	South Africa

## APPENDIX C – DESCRIPTIVE STATISTICS

**Table 36: Descriptive Statistics**

<b>VARIABLES</b>	(1) <b>N</b>	(2) <b>mean</b>	(3) <b>sd</b>	(4) <b>min</b>	(5) <b>max</b>
year	1,492,050	2,005	8.602	1990	2019
export	1,492,050	211,642	3326000	0	539500000
dist	1,492,050	8,499	4,680	10.48	19,951
fta	1,492,050	0.0998	0.300	0	1
import	1,492,050	190,286	3155000	0	555800000



## APPENDIX D – UNIT ROOT TESTS

### Unit Root Tests

Fisher-type unit-root test for  $\ln x$   
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots                      Number of panels = 37482  
Ha: At least one panel is stationary                    Avg. number of periods = 17.97

AR parameter: Panel-specific                              Asymptotics: T -> Infinity  
Panel means: Included  
Time trend: Not included  
Drift term: Not included                                      ADF regressions: 2 lags

		Statistic	p-value
Inverse chi-squared(454)	P	2571.3785	0.0000
Inverse normal	Z	-39.9979	0.0000
Inverse logit t(1139)	L*	-46.7032	0.0000
Modified inv. chi-squared	Pm	70.2677	0.0000

P statistic requires number of panels to be finite.  
Other statistics are suitable for finite or infinite number of panels.

Fisher-type unit-root test for  $\ln x$   
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots                      Number of panels = 37482  
Ha: At least one panel is stationary                    Avg. number of periods = 17.97

AR parameter: Panel-specific                              Asymptotics: T -> Infinity  
Panel means: Included  
Time trend: Included  
Drift term: Not included                                      ADF regressions: 2 lags

		Statistic	p-value
Inverse chi-squared(55948)	P	7.84e+04	0.0000
Inverse normal	Z	-9.8503	0.0000
Inverse logit t(120349)	L*	-34.3439	0.0000
Modified inv. chi-squared	Pm	67.0626	0.0000

P statistic requires number of panels to be finite.  
Other statistics are suitable for finite or infinite number of panels.

Fisher-type unit-root test for import  
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots                      Number of panels        = 53440  
Ha: At least one panel is stationary                  Avg. number of periods = 27.94

AR parameter: Panel-specific                              Asymptotics: T -> Infinity  
Panel means: Included  
Time trend: Included  
Drift term: Not included                                      ADF regressions: 2 lags

	Statistic	p-value
Inverse chi-squared(102648)P	1.19e+05	0.0000
Inverse normal                      Z	-81.6938	0.0000
Inverse logit t(174809)            L*	-90.3741	0.0000
Modified inv. chi-squared Pm	36.2016	0.0000

P statistic requires number of panels to be finite.  
Other statistics are suitable for finite or infinite number of panels.

Fisher-type unit-root test for import  
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots                      Number of panels        = 53440  
Ha: At least one panel is stationary                  Avg. number of periods = 27.94

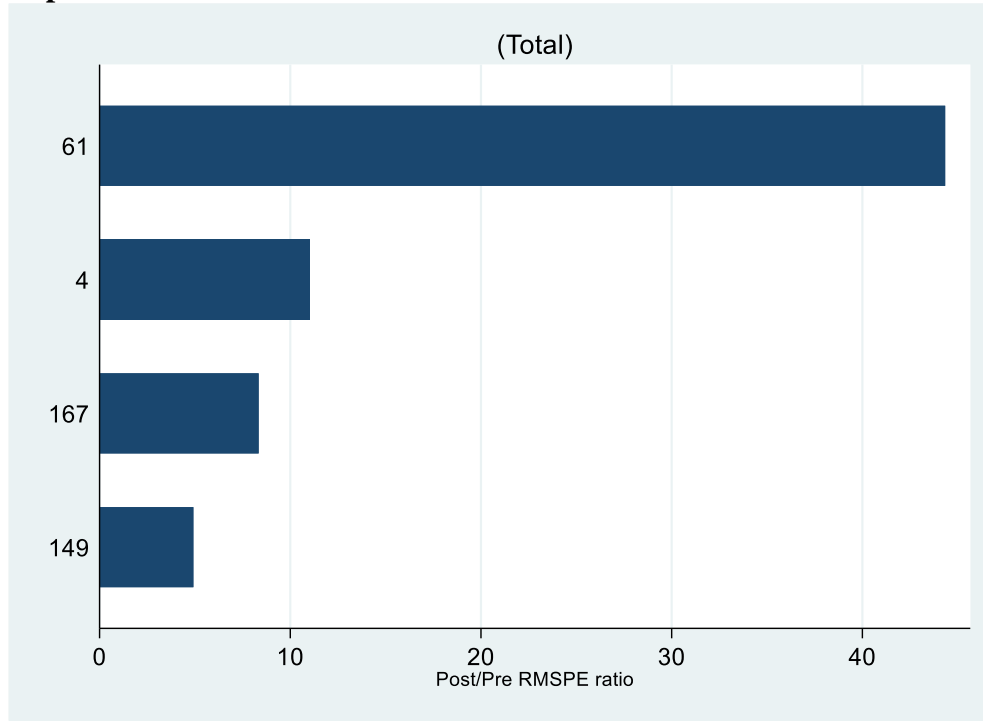
AR parameter: Panel-specific                              Asymptotics: T -> Infinity  
Panel means: Included  
Time trend: Not included  
Drift term: Not included                                      ADF regressions: 2 lags

	Statistic	p-value
Inverse chi-squared(102648)P	1.33e+05	0.0000
Inverse normal                      Z	-89.2730	0.0000
Inverse logit t(176939)            L*	-94.8111	0.0000
Modified inv. chi-squared Pm	67.4223	0.0000

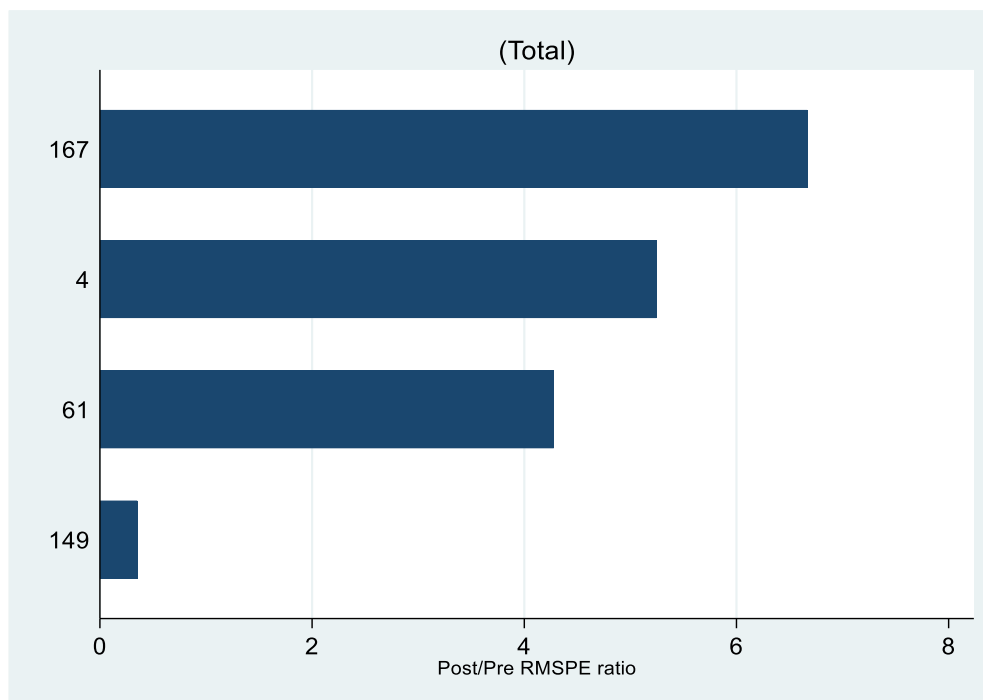
P statistic requires number of panels to be finite.  
Other statistics are suitable for finite or infinite number of panels.

## APPENDIX E – PLACEBO TEST RESULTS

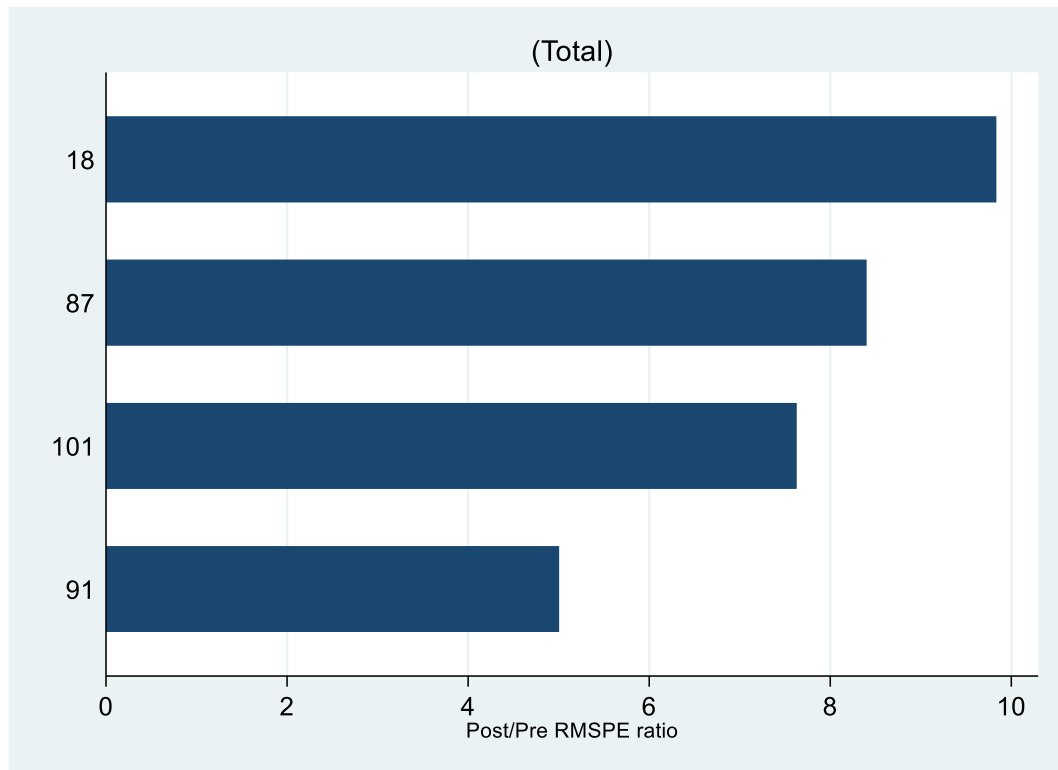
**Figure 45: Placebo Test of Albania FTA's Effect on Turkey's Export (4-Albania, Export)**



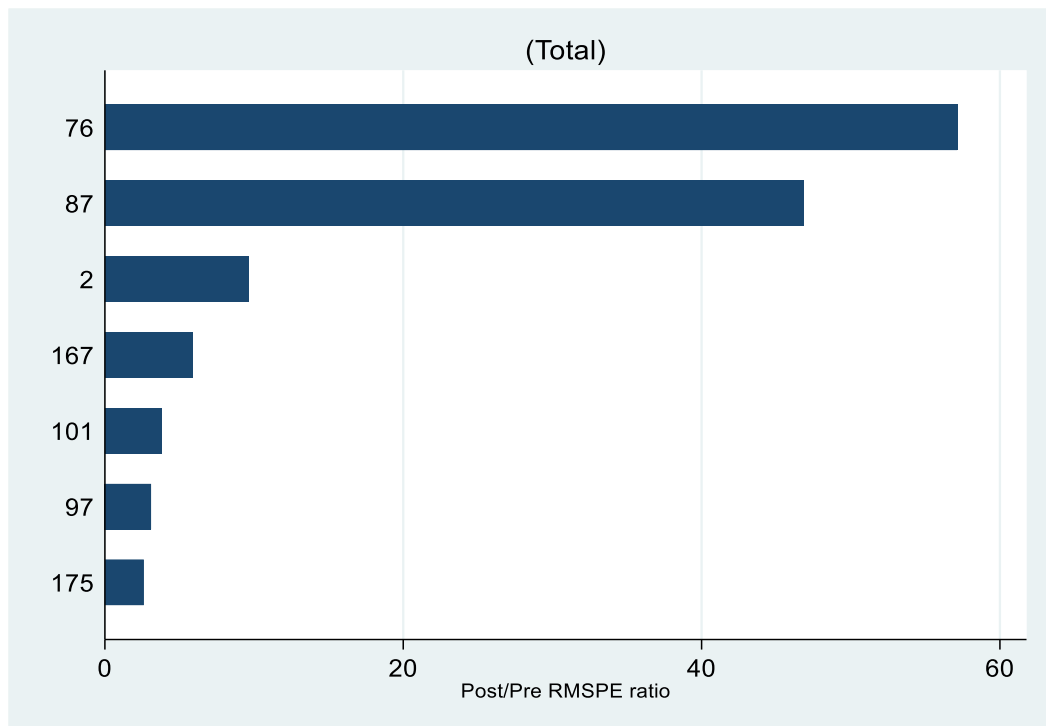
**Figure 46: Placebo Test of Albania FTA's Effect on Turkey's Import (4-Albania, Import)**



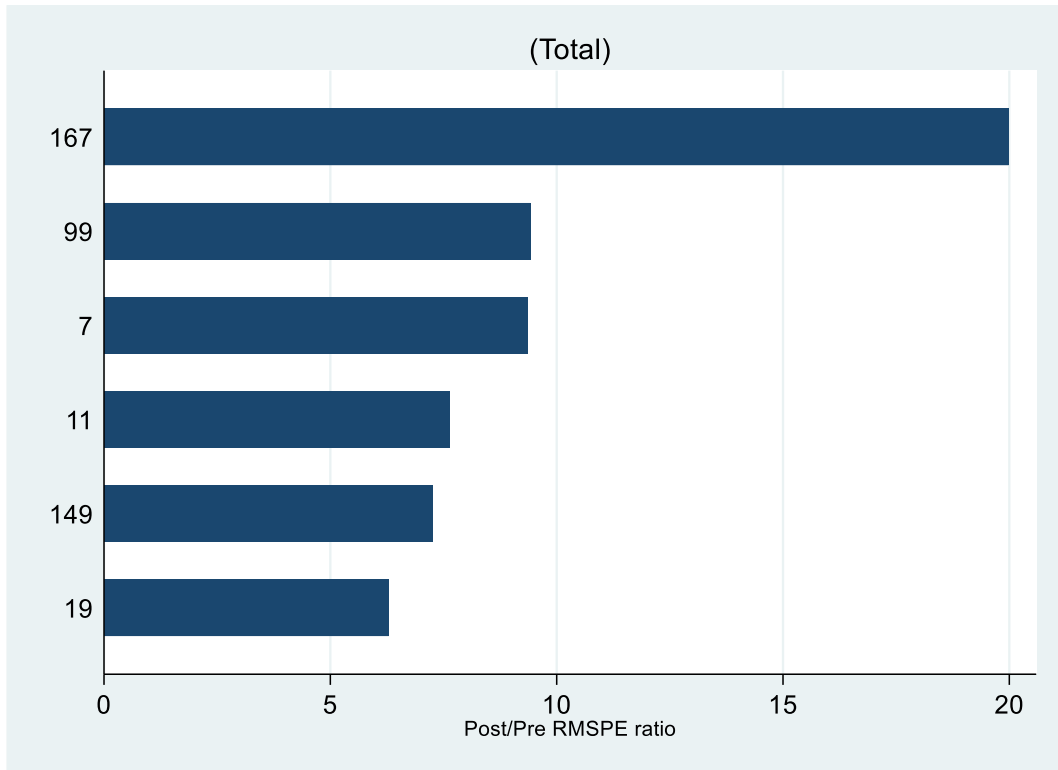
**Figure 47: Placebo Test of Israel FTA FTA's Effect on Turkey's Export (87-Israel, Export)**



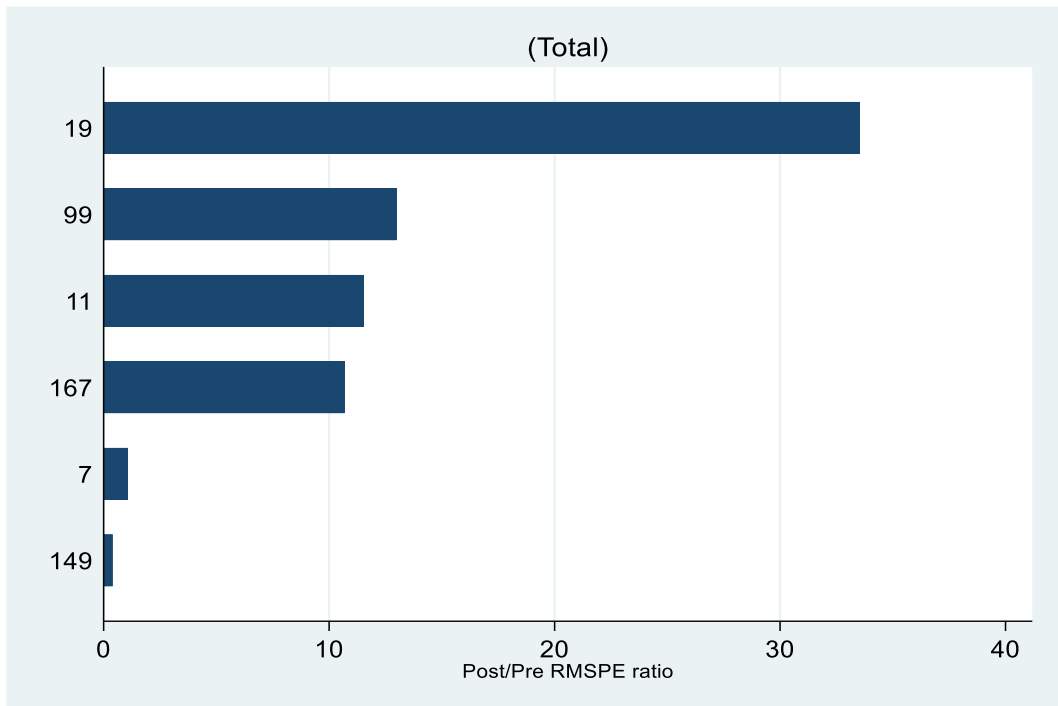
**Figure 48: Placebo Test of Israel FTA FTA's Effect on Turkey's Import (87-Israel, Import)**



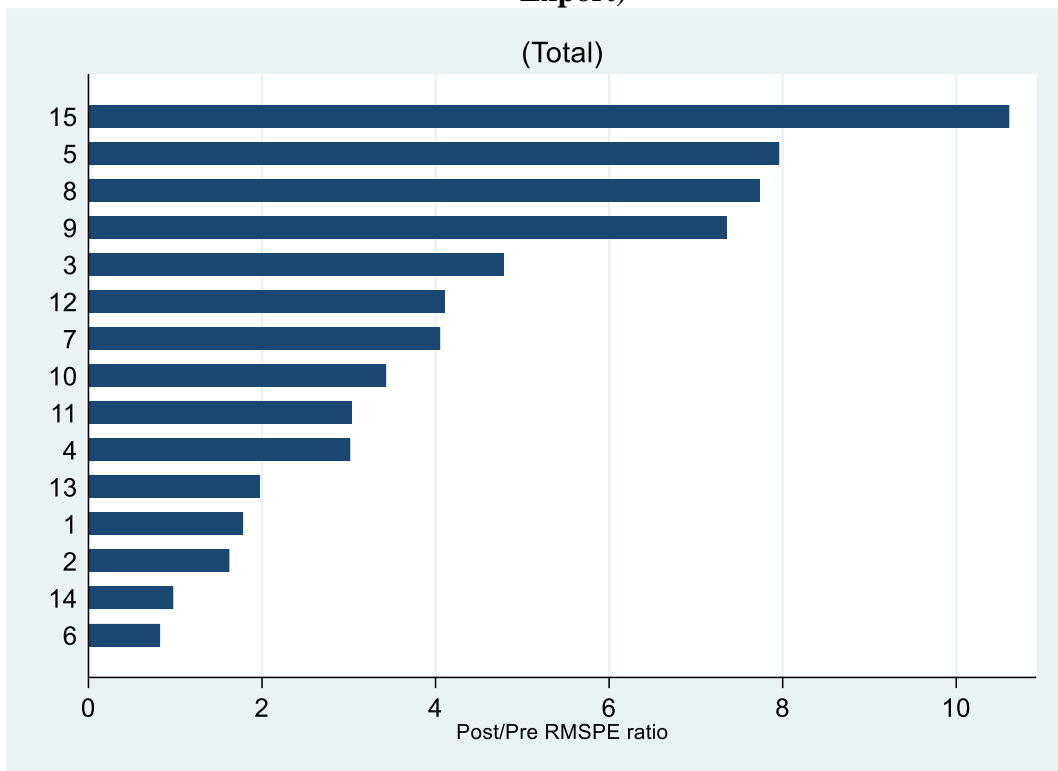
**Figure 49: Placebo Test of Bosnai' FTA's Effect on Turkey's Export FTA (19-Bosnai, Export)**



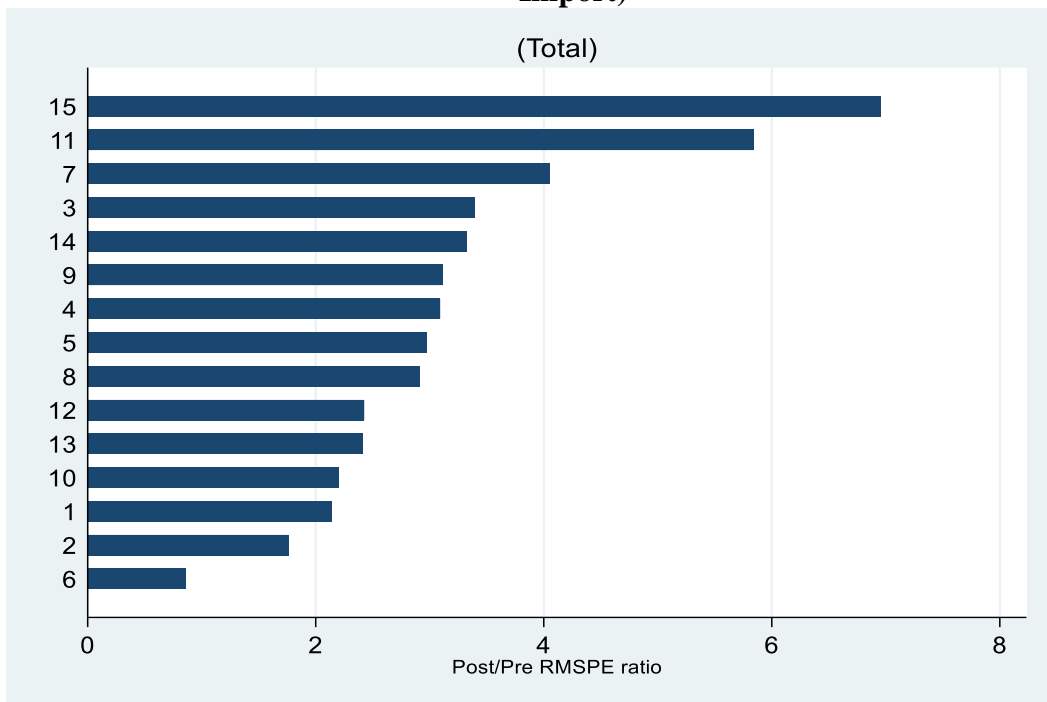
**Figure 49: Placebo Test of Bosnai FTA Effect on Turkey's Import (19-Bosnai, Import)**



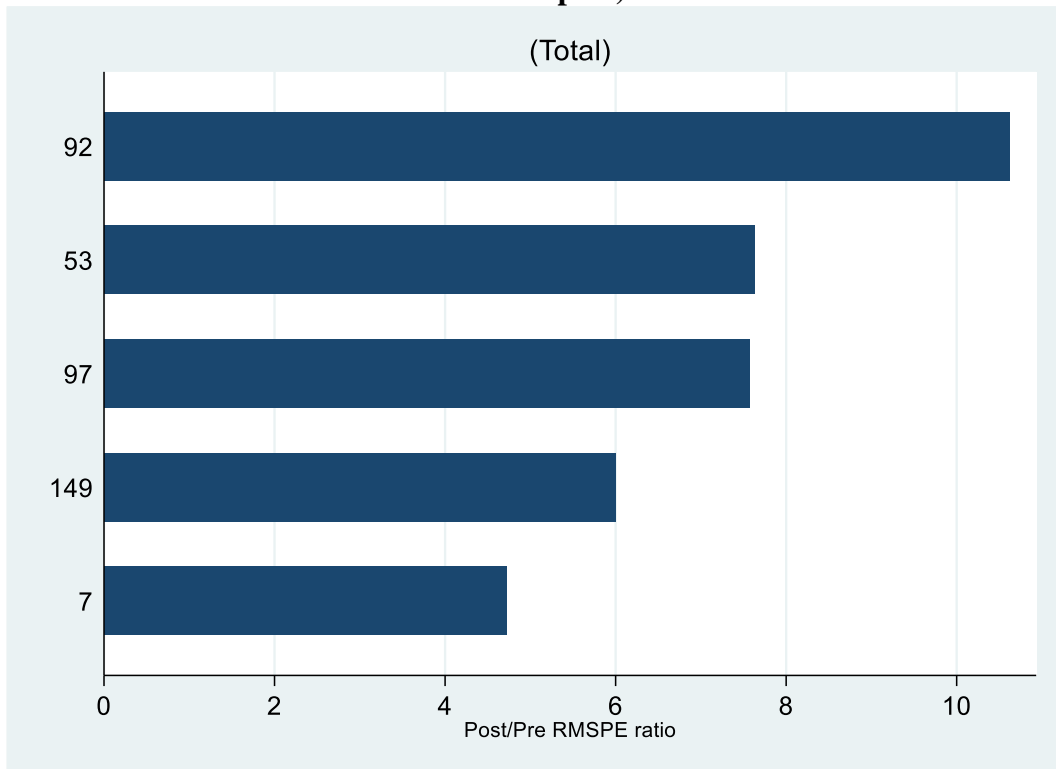
**Figure 50: Placebo Test of Chile' FTA's Effect on Turkey's Export FTA (6-Chile, Export)**



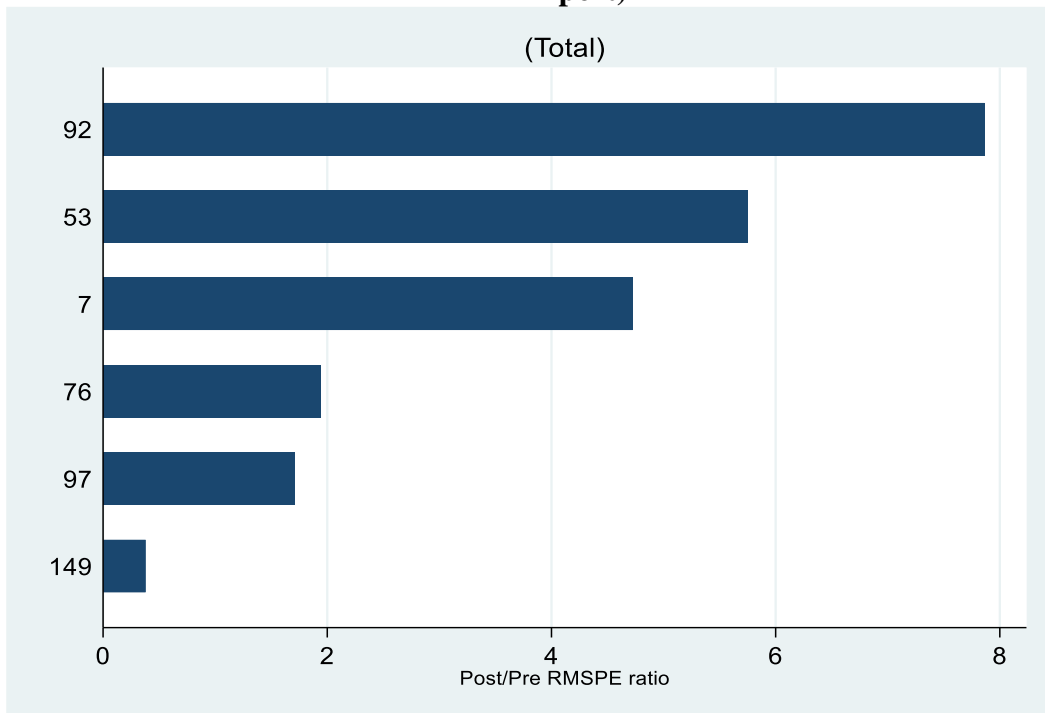
**Figure 50: Placebo Test of Chile FTA's Effect on Turkey's Import (6-Chile, Import)**



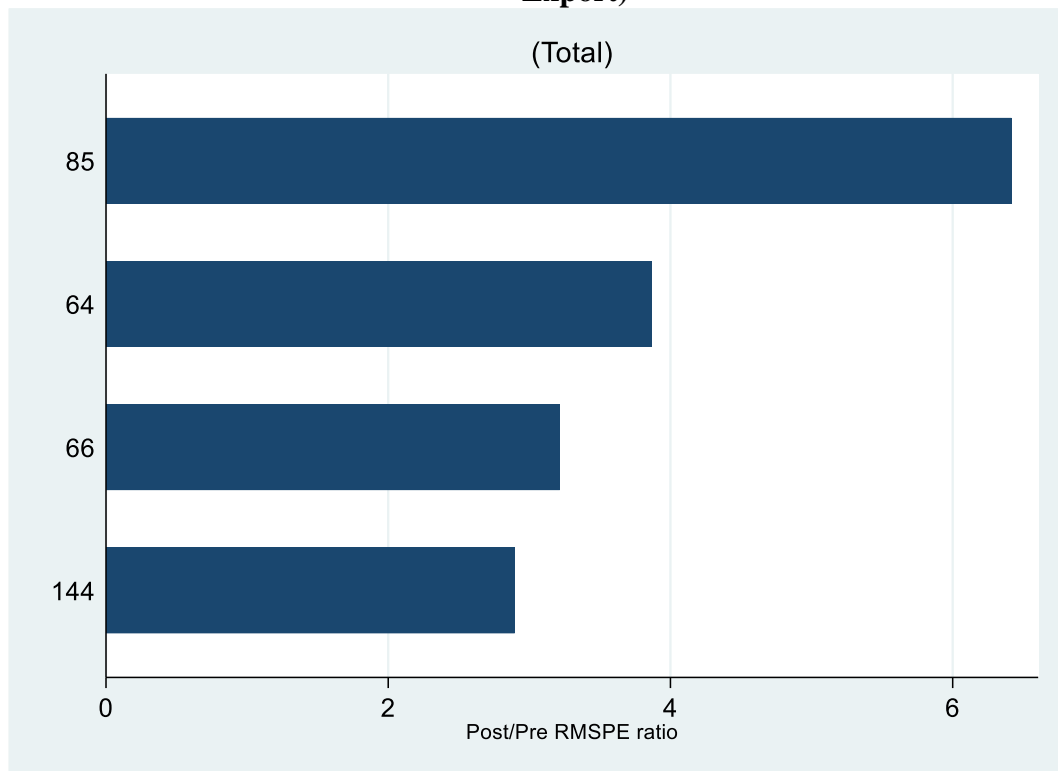
**Figure 51: Placebo Test of Egypt FTA's Effect on Turkey's Export (53-Egypt, Export)**



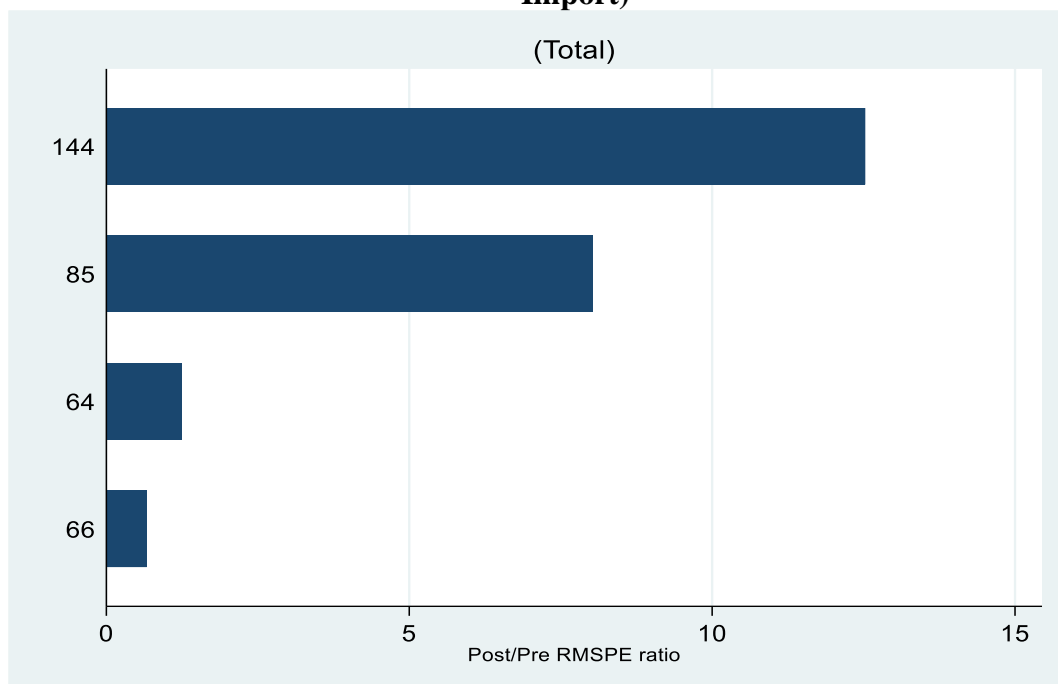
**Figure 52: Placebo Test of Egypt FTA's Effect on Turkey's Import (53- Egypt, Import)**



**Figure 53: Placebo Test of Georgia FTA's Effect on Turkey's Export (64- Georgia, Export)**

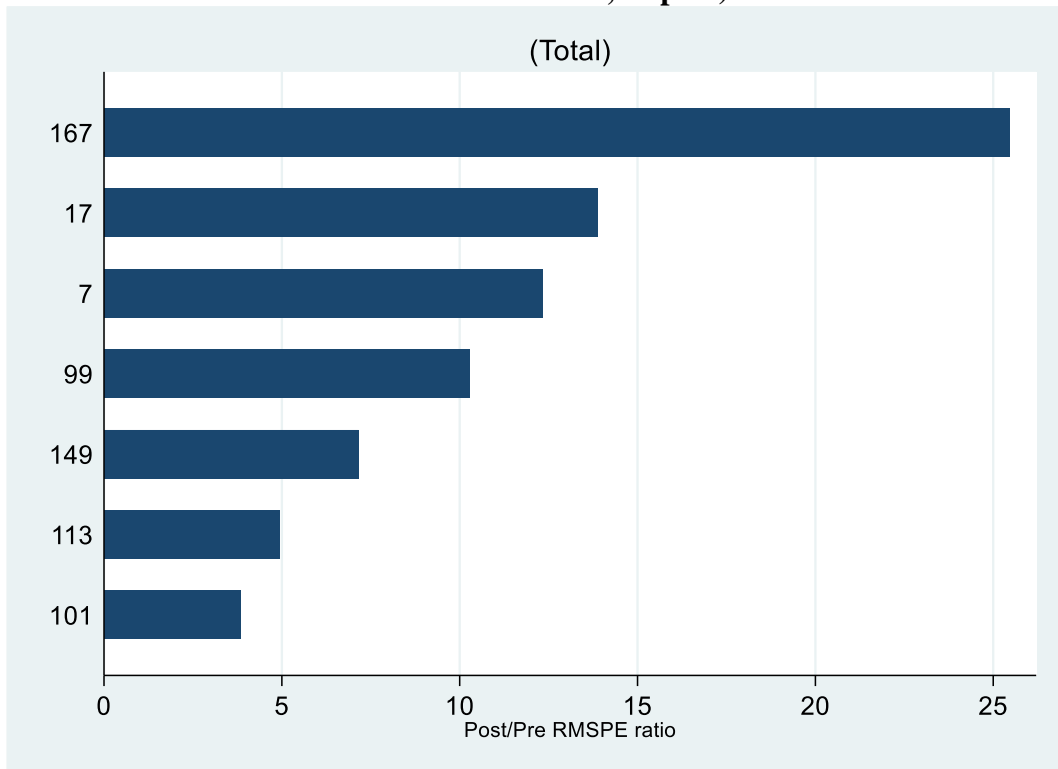


**Figure 54: Placebo Test of Georgia FTA's Effect on Turkey's Import (64- Georgia, Import)**

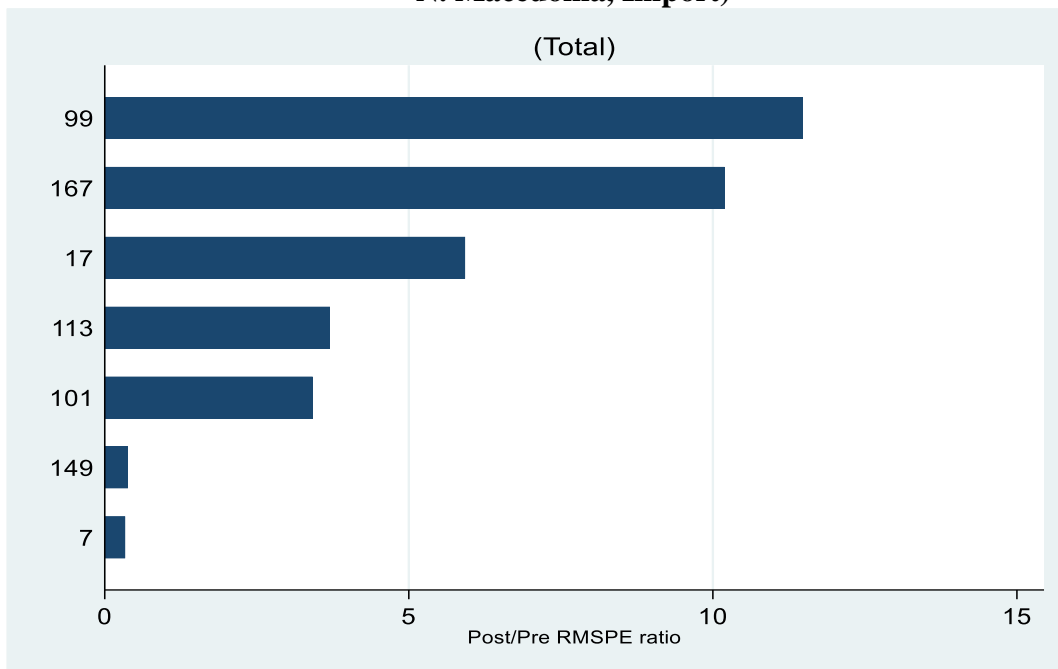




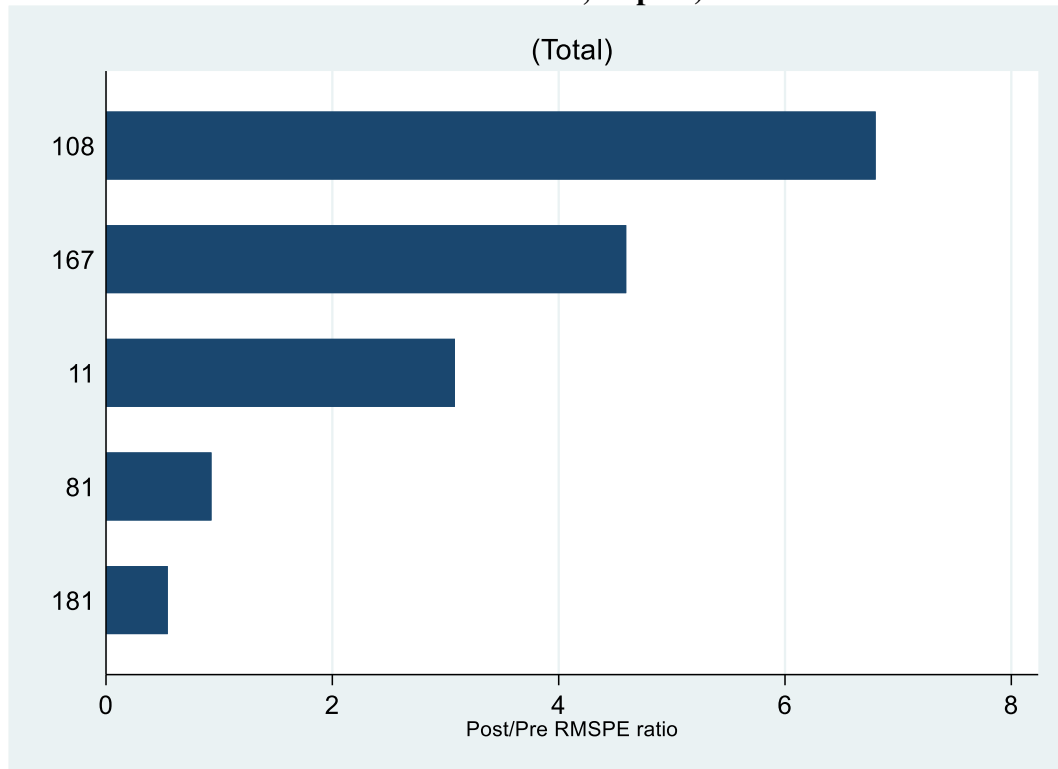
**Figure 55: Placebo Test of N. Macedonia FTA's Effect on Turkey's Export (113-N. Macedonia, Export)**



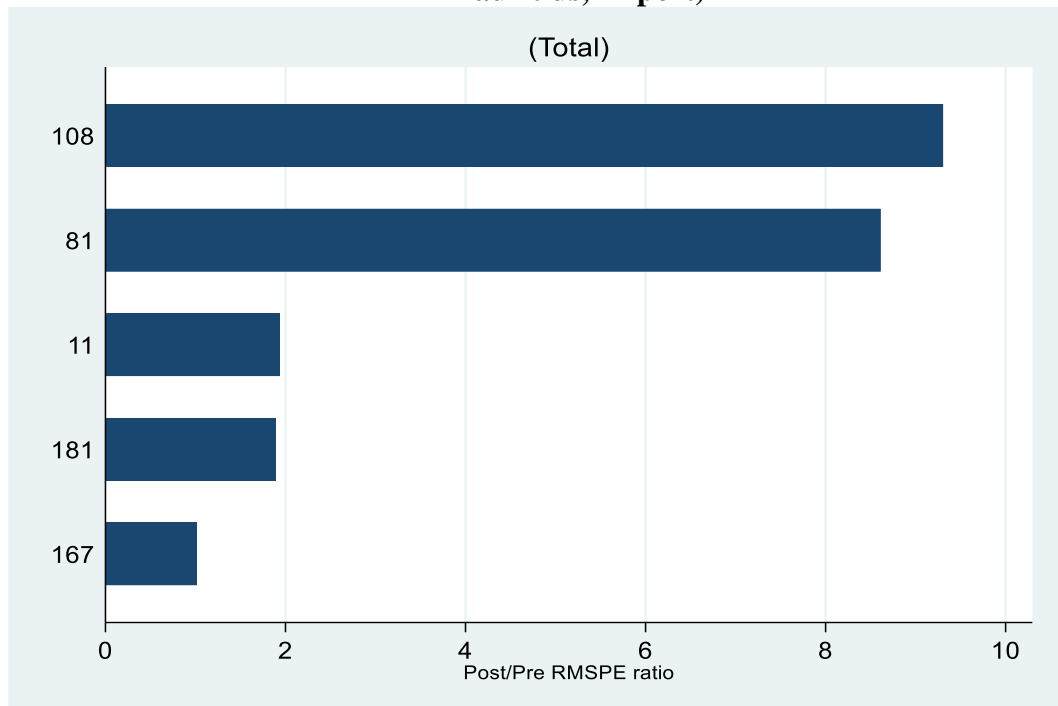
**Figure 56: Placebo Test of N. Macedonia FTA's Effect on Turkey's Import (113-N. Macedonia, Import)**



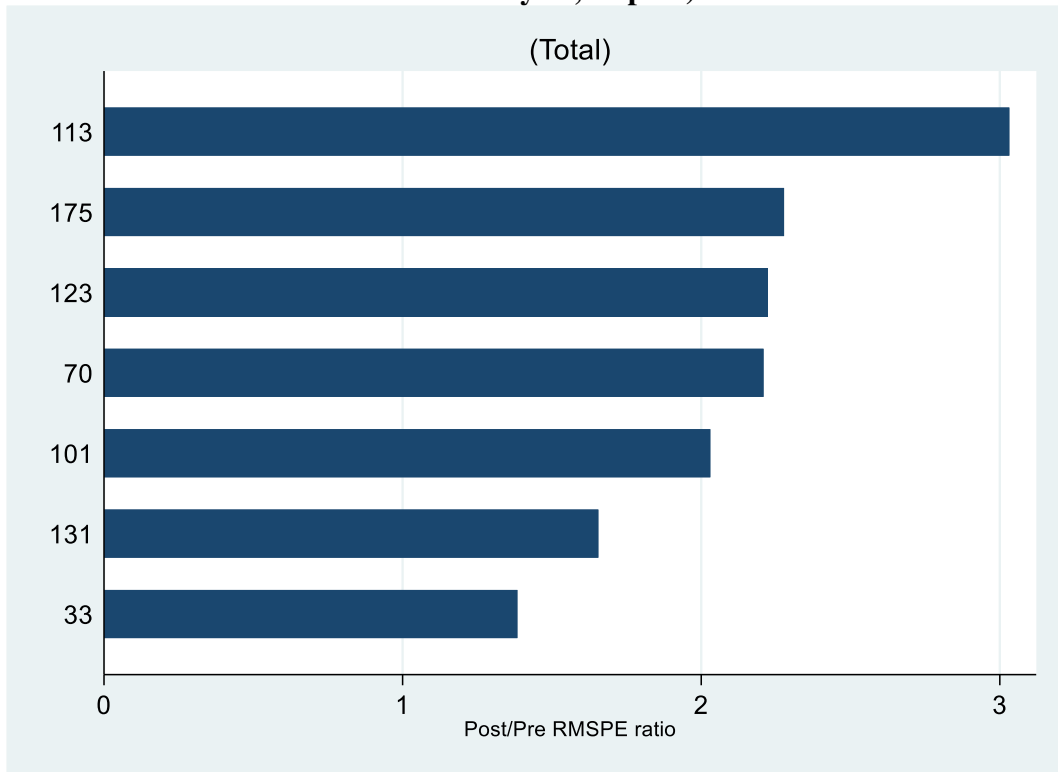
**Figure 57: Placebo Test of Mauritius FTA's Effect on Turkey's Export (108-Mauritius, Export)**



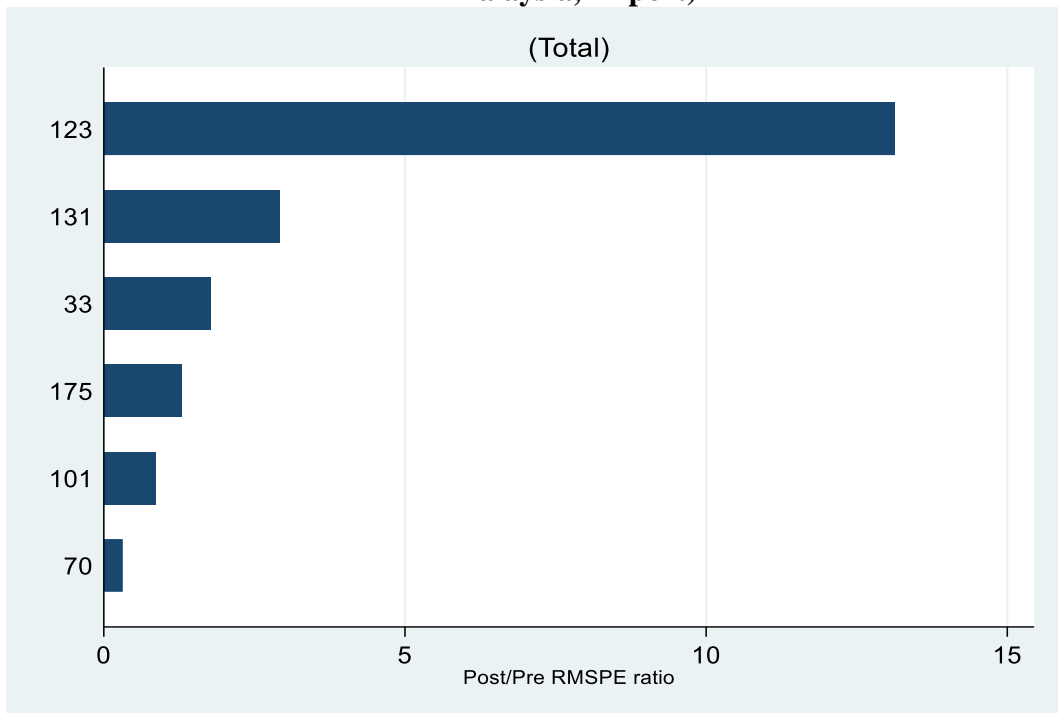
**Figure 58: Placebo Test of Mauritius FTA's Effect on Turkey's Import (108-Mauritius, Import)**



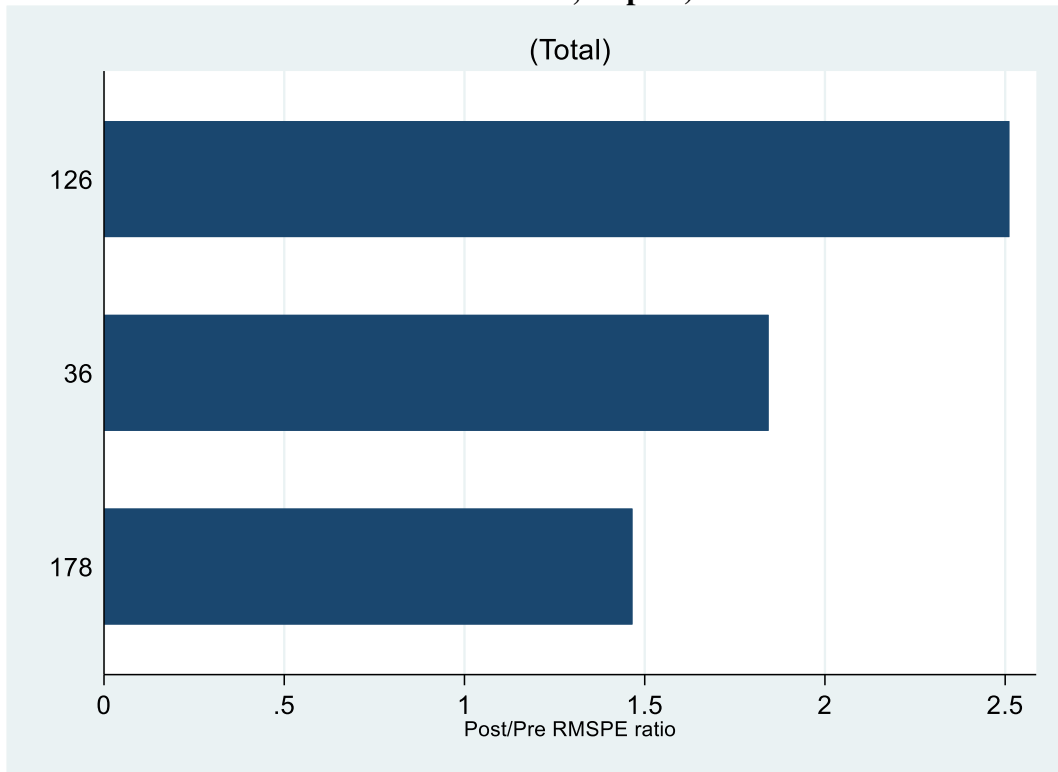
**Figure 59: Placebo Test of Malaysia FTA's Effect on Turkey's Export (123-Malaysia, Export)**



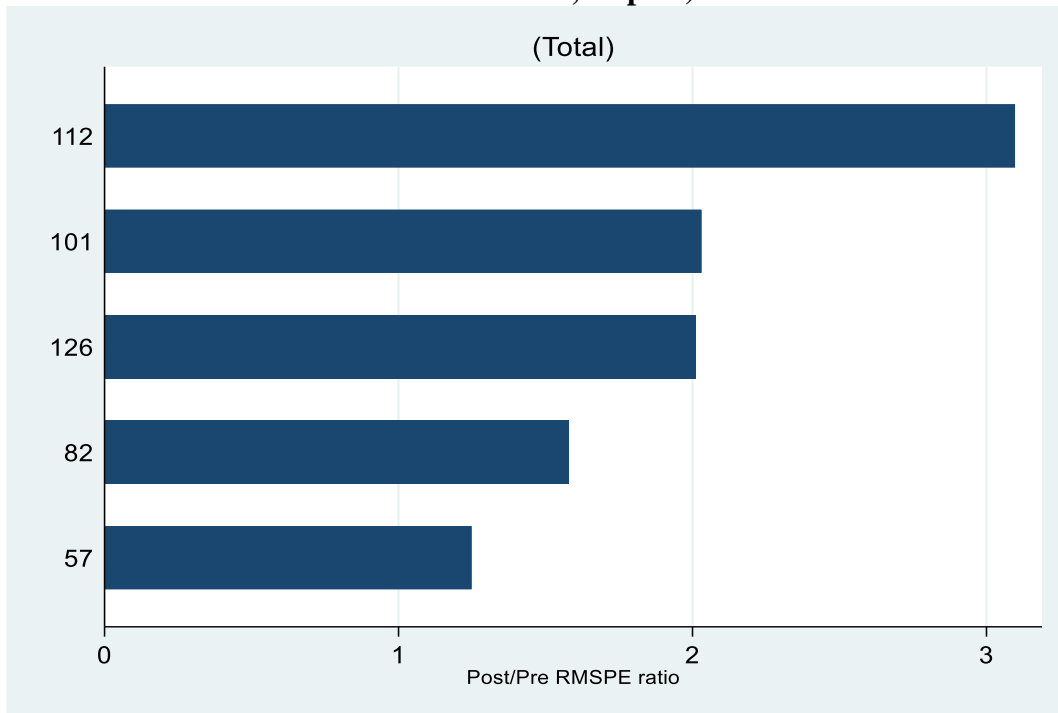
**Figure 60: Placebo Test of Malaysia FTA's Effect on Turkey's Import (123-Malaysia, Import)**



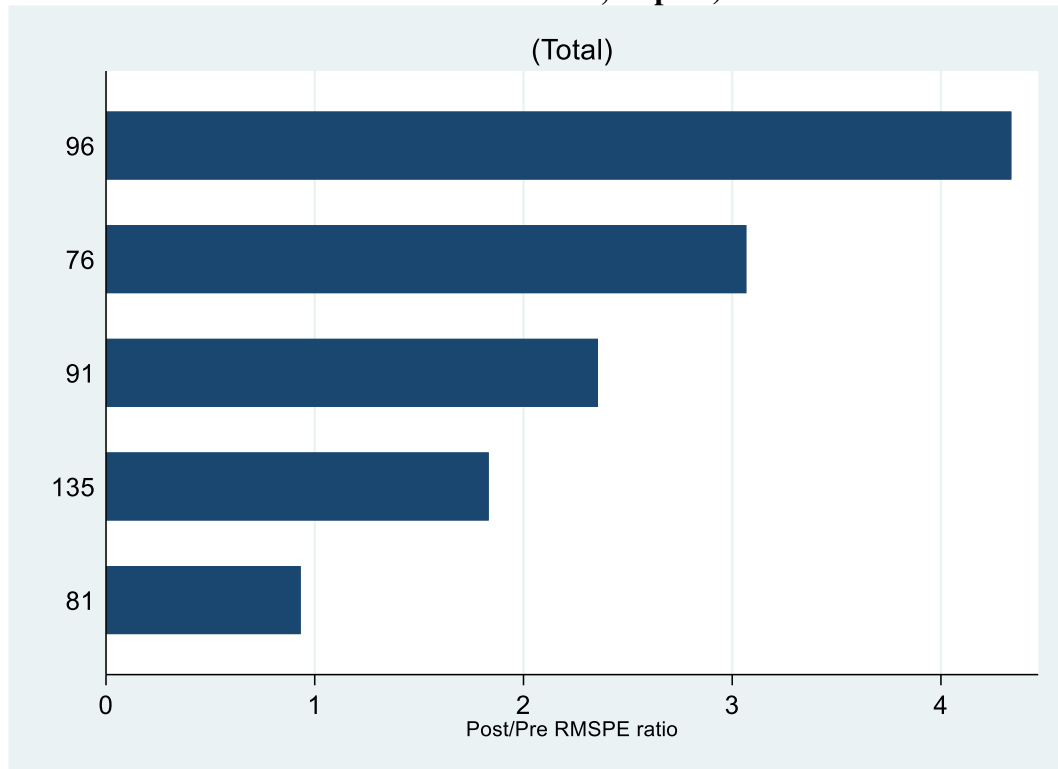
**Figure 61: Placebo Test of Moldova FTA's Effect on Turkey's Export (126-Moldova, Export)**



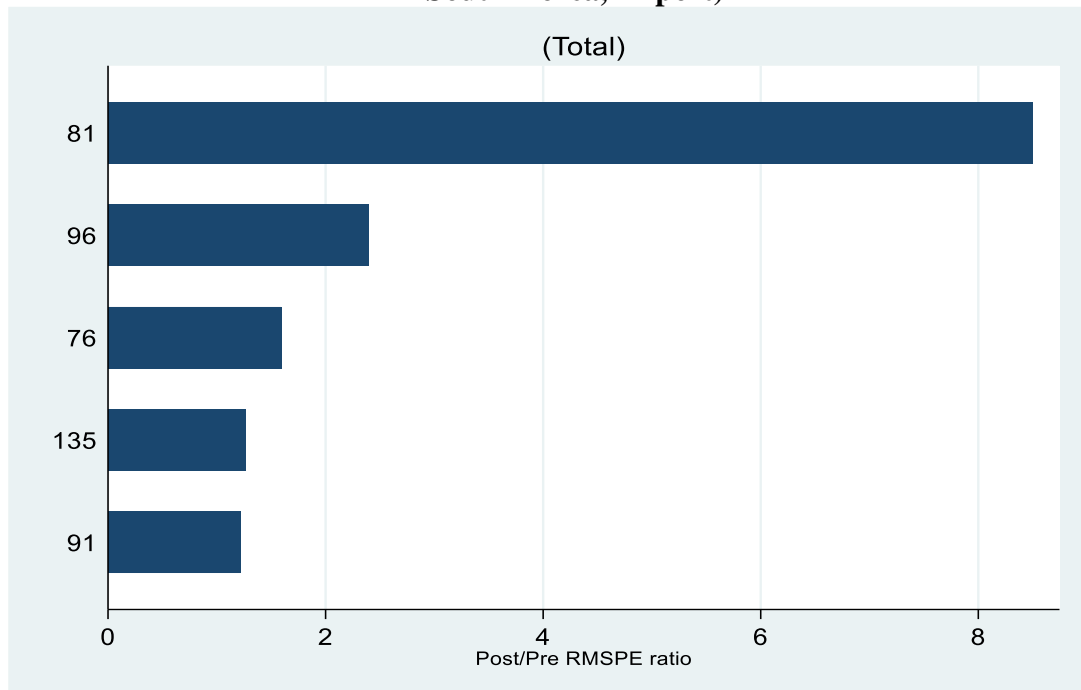
**Figure 62: Placebo Test of Moldova FTA's Effect on Turkey's Import (126-Moldova, Import)**



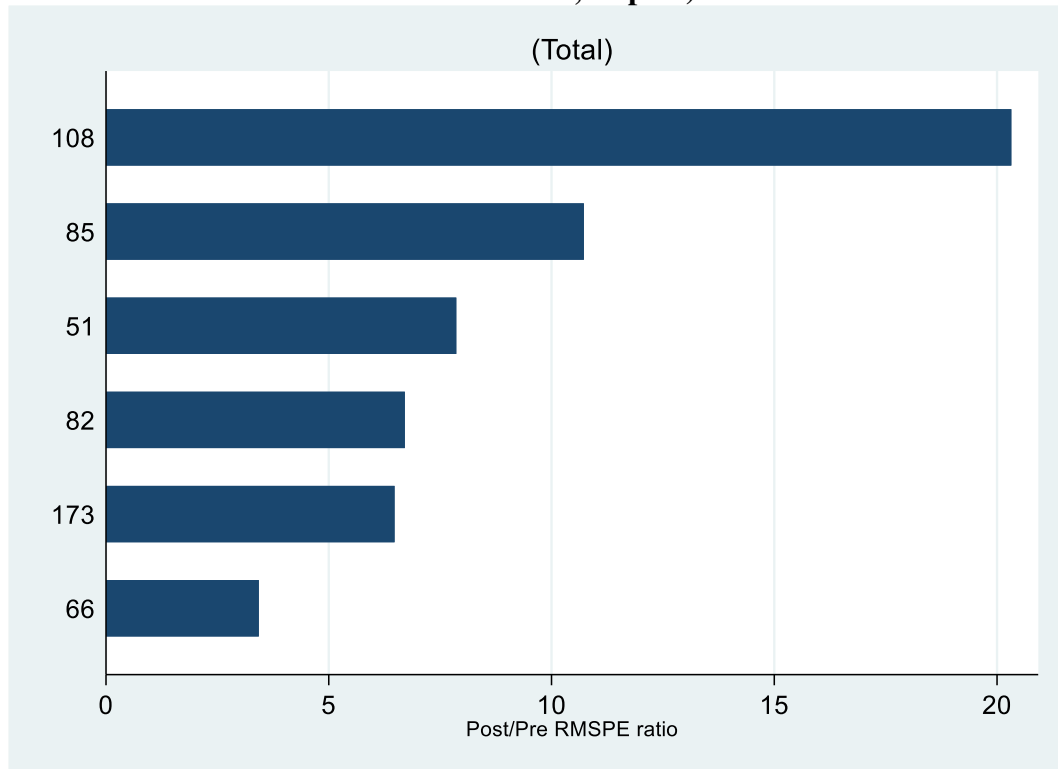
**Figure 63: Placebo Test of South Korea FTA's Effect on Turkey's Export (96-South Korea, Export)**



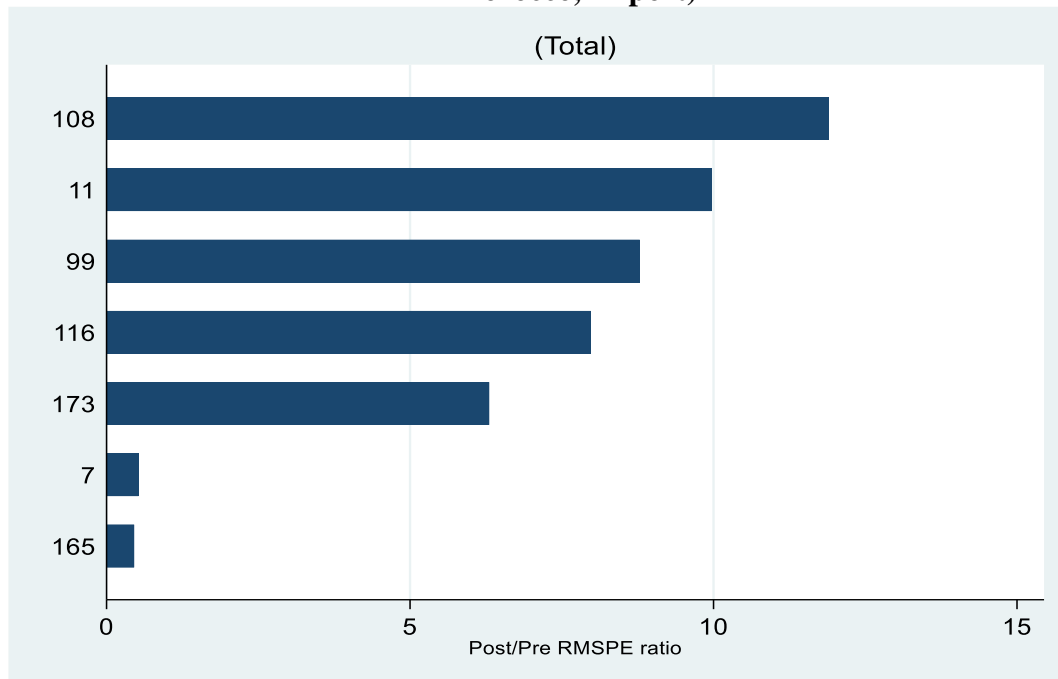
**Figure 64: Placebo Test of South Korea FTA's Effect on Turkey's Import (96-South Korea, Import)**



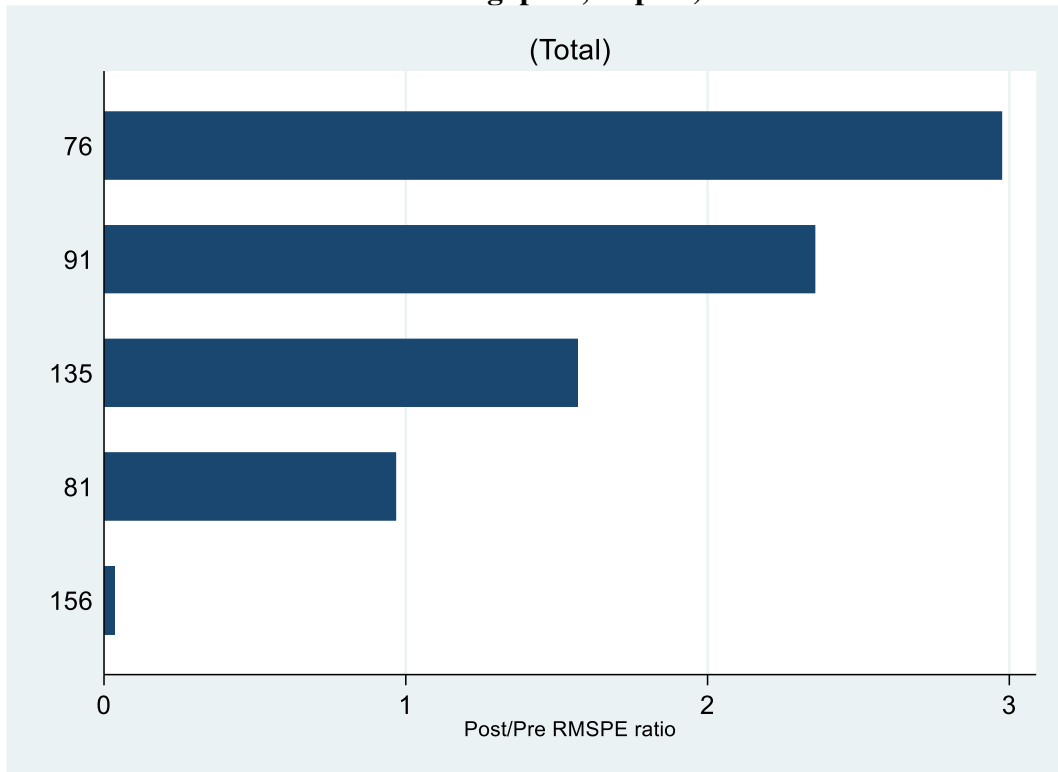
**Figure 64: Placebo Test of Morocco FTA's Effect on Turkey's Export (108-Morocco, Export)**



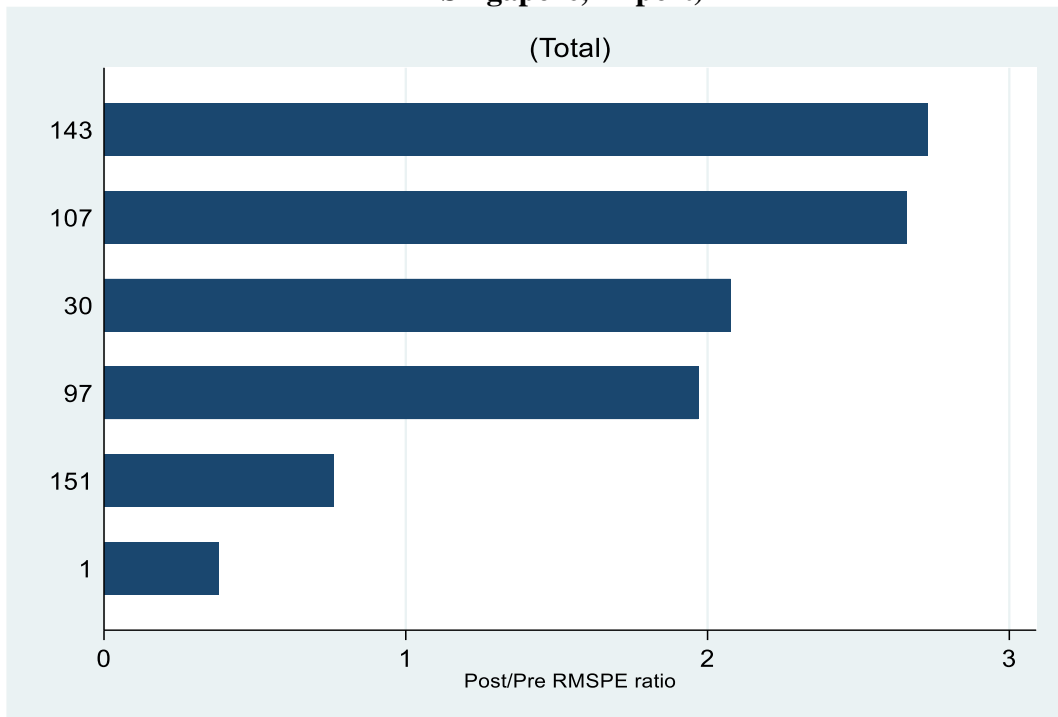
**Figure 65: Placebo Test of Morocco FTA's Effect on Turkey's Import (108-Morocco, Import)**



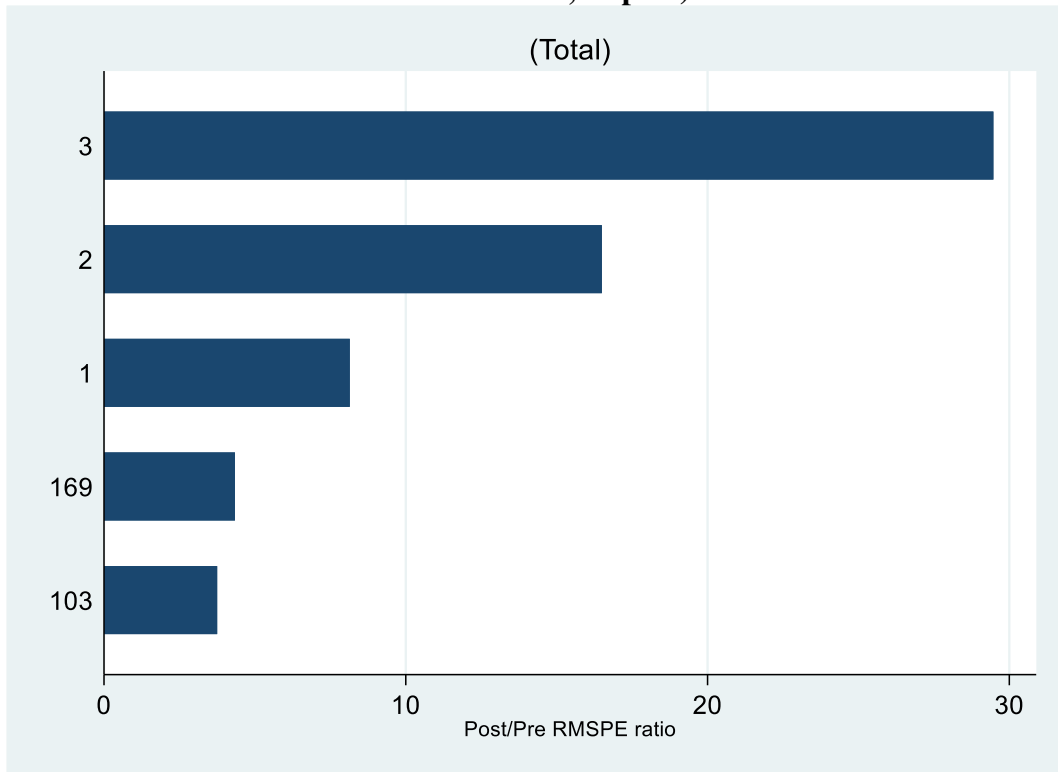
**Figure 66: Placebo Test of Singapore FTA’s Effect on Turkey’s Export (81-Singapore, Export)**



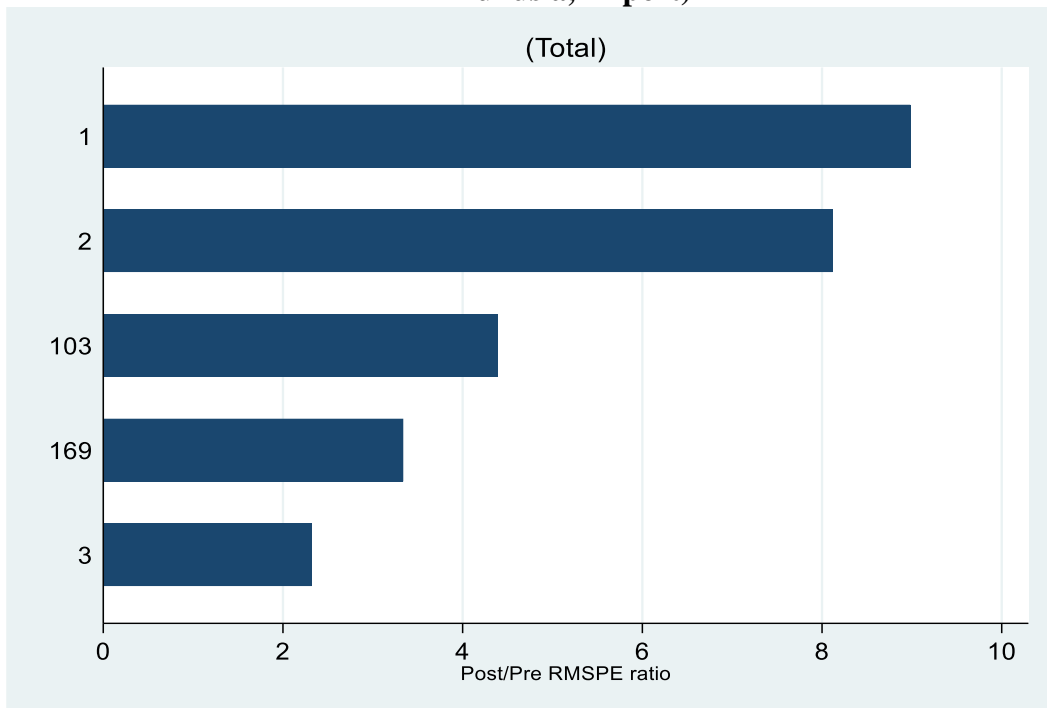
**Figure 67: Placebo Test of Singapore FTA’s Effect on Turkey’s Import (1-Singapore, Import)**



**Figure 68: Placebo Test of Tunisia FTA's Effect on Turkey's Export (169-Tunisia, Export)**



**Figure 69: Placebo Test of Tunisia FTA's Effect on Turkey's Import (169-Tunisia, Import)**





## APPENDIX F – ETHICS COMMISSION FORM

 <p><b>HACETTEPE ÜNİVERSİTESİ SOSYAL BİLİMLER ENSTİTÜSÜ TEZ ÇALIŞMASI ETİK KOMİSYON MUAFİYETİ FORMU</b></p>
<p><b>HACETTEPE ÜNİVERSİTESİ SOSYAL BİLİMLER ENSTİTÜSÜ İKTİSAT ANABİLİM DALI BAŞKANLIĞI'NA</b></p> <p style="text-align: right;">Tarih: 23/06/2022</p> <p>Tez Başlığı: Türkiye'nin Serbest Ticaret Anlaşmalarının Etki Değerlendirmesi: Sentetik Kontrol Ve Çekim Modeli Uygulaması.....</p> <p>Yukarıda başlığı gösterilen tez çalışmam:</p> <ol style="list-style-type: none"> <li>1. İnsan ve hayvan üzerinde deney niteliği taşımamaktadır,</li> <li>2. Biyolojik materyal (kan, idrar vb. biyolojik sıvılar ve numuneler) kullanılmasını gerektirmemektedir.</li> <li>3. Beden bütünlüğüne müdahale içermemektedir.</li> <li>4. Gözlemsel ve betimsel araştırma (anket, mülakat, ölçek/skala çalışmaları, dosya taramaları, veri kaynakları taraması, sistem-model geliştirme çalışmaları) niteliğinde değildir.</li> </ol> <p>Hacettepe Üniversitesi Etik Kurullar ve Komisyonlarının Yönergelerini inceledim ve bunlara göre tez çalışmamın yürütülebilmesi için herhangi bir Etik Kurul/Komisyon'dan izin alınmasına gerek olmadığını; aksi durumda doğabilecek her türlü hukuki sorumluluğu kabul ettiğimi ve yukarıda vermiş olduğum bilgilerin doğru olduğunu beyan ederim.</p> <p>Gereğini saygılarımla arz ederim.</p> <p style="text-align: right;">Tarih ve İmza</p> <p><b>Adı Soyadı:</b> TAHAMUHAMMET SÜLEYMAN</p> <p><b>Öğrenci No:</b> N19139905</p> <p><b>Anabilim Dalı:</b> İktisat</p> <p><b>Programı:</b> İngilizce İktisat - Yüksek Lisans</p> <p><b>Statüsü:</b> <input checked="" type="checkbox"/> Yüksek Lisans <input type="checkbox"/> Doktora <input type="checkbox"/> Bütünleşik Doktora</p>
<p><b><u>DANIŞMAN GÖRÜŞÜ VE ONAYI</u></b></p> <p style="text-align: center;">_____ Prof., A. Yasemin YALTA</p> <p><b>Detaylı Bilgi:</b> <a href="http://www.sosyalbilimler.hacettepe.edu.tr">http://www.sosyalbilimler.hacettepe.edu.tr</a></p> <p><b>Telefon:</b> 0-312-2976860 <b>Faks:</b> 0-3122992147 <b>E-posta:</b> <a href="mailto:sosyalbilimler@hacettepe.edu.tr">sosyalbilimler@hacettepe.edu.tr</a></p>



**HACETTEPE UNIVERSITY  
GRADUATE SCHOOL OF SOCIAL SCIENCES  
ETHICS COMMISSION FORM FOR THESIS**

**HACETTEPE UNIVERSITY  
GRADUATE SCHOOL OF SOCIAL SCIENCES  
ECONOMICS DEPARTMENT**

Date: 23/06/2022

Thesis Title: The Impact Assessment of Turkey's FTAs: Application Of Synthetic Control Method and Gravity Model

My thesis work related to the title above:

1. Does not perform experimentation on animals or people.
2. Does not necessitate the use of biological material (blood, urine, biological fluids and samples, etc.).
3. Does not involve any interference of the body's integrity.
4. Is not based on observational and descriptive research (survey, interview, measures/scales, data scanning, system-model development).

I declare, I have carefully read Hacettepe University's Ethics Regulations and the Commission's Guidelines, and in order to proceed with my thesis according to these regulations I do not have to get permission from the Ethics Board/Commission for anything; in any infringement of the regulations I accept all legal responsibility and I declare that all the information I have provided is true.

I respectfully submit this for approval.

Date and Signature

**Name Surname:** TAHAMUHAMMET SÜLEYMAN

**Student No:** N19139905

**Department:** Economics

**Program:** Economics M.A.

**Status:**  MA  Ph.D.  Combined MA/ Ph.D.

**ADVISER COMMENTS AND APPROVAL**

\_\_\_\_\_  
Prof., A. Yasemin YALTA

## APPENDIX G – ORIGINALITY REPORT

 <p><b>HACETTEPE ÜNİVERSİTESİ</b> <b>SOSYAL BİLİMLER ENSTİTÜSÜ</b> <b>YÜKSEK LİSANS TEZ ÇALIŞMASI ORJİNALLİK RAPORU</b></p>
<p><b>HACETTEPE ÜNİVERSİTESİ</b> <b>SOSYAL BİLİMLER ENSTİTÜSÜ</b> <b>İKTİSAT ANABİLİM DALI BAŞKANLIĞI'NA</b></p> <p style="text-align: right;">Tarih: 28/06/2022</p> <p>Tez Başlığı: Türkiye'nin Serbest Ticaret Anlaşmalarının Etki Değerlendirmesi: Sentetik Kontrol ve Çekim Modeli Uygulaması</p> <p>.....</p> <p>Yukarıda başlığı gösterilen tez çalışmamın a) Kapak sayfası, b) Giriş, c) Ana bölümler ve d) Sonuç kısımlarından oluşan toplam 109 sayfalık kısmına ilişkin, 28/06/2022 tarihinde tez danışmanım tarafından Turnitin adlı intihal tespit programından aşağıda işaretlenmiş filtrelemeler uygulanarak alınmış olan orijinallik raporuna göre, tezimin benzerlik oranı %17 'dir.</p> <p>Uygulanan filtrelemeler:</p> <ol style="list-style-type: none"> <li>1- <input checked="" type="checkbox"/> Kabul/Onay ve Bildirim sayfaları hariç</li> <li>2- <input checked="" type="checkbox"/> Kaynakça hariç</li> <li>3- <input type="checkbox"/> Alıntılar hariç</li> <li>4- <input checked="" type="checkbox"/> Alıntılar dâhil</li> <li>5- <input checked="" type="checkbox"/> 5 kelimedenden daha az örtüşme içeren metin kısımları hariç</li> </ol> <p>Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Çalışması Orijinallik Raporu Alınması ve Kullanılması Uygulama Esasları'nı inceledim ve bu Uygulama Esasları'nda belirtilen azami benzerlik oranlarına göre tez çalışmamın herhangi bir intihal içermediğini; aksinin tespit edileceği muhtemel durumda doğabilecek her türlü hukuki sorumluluğu kabul ettiğimi ve yukarıda vermiş olduğum bilgilerin doğru olduğunu beyan ederim.</p> <p>Gereğini saygılarımla arz ederim.</p> <p style="text-align: right;">Tarih ve İmza</p> <p><b>Adı Soyadı:</b> TAHAMUHAMMET SÜLEYMAN</p> <p><b>Öğrenci No:</b> N19139905</p> <p><b>Anabilim Dalı:</b> İKTİSAT</p> <p><b>Programı:</b> İngilizce İktisat - Yüksek Lisans</p>
<p><b><u>DANIŞMAN ONAYI</u></b></p> <p>UYGUNDUR.</p> <p>_____ Prof., A. Yasemin YALTA</p>



**HACETTEPE UNIVERSITY  
GRADUATE SCHOOL OF SOCIAL SCIENCES  
MASTER'S THESIS ORIGINALITY REPORT**

**HACETTEPE UNIVERSITY  
GRADUATE SCHOOL OF SOCIAL SCIENCES  
ECONOMICS DEPARTMENT**

Date: 28/06/2022

Thesis Title : The Impact Assessment of Turkey's FTAs: Application Of Synthetic Control Method and Gravity Model

According to the originality report obtained by my thesis advisor by using the Turnitin plagiarism detection software and by applying the filtering options checked below on 28/06/2022 for the total of 109 pages including the a) Title Page, b) Introduction, c) Main Chapters, and d) Conclusion sections of my thesis entitled as above, the similarity index of my thesis is 17 %.

Filtering options applied:

1.  Approval and Declaration sections excluded
2.  Bibliography/Works Cited excluded
3.  Quotes excluded
4.  Quotes included
5.  Match size up to 5 words excluded

I declare that I have carefully read Hacettepe University Graduate School of Social Sciences Guidelines for Obtaining and Using Thesis Originality Reports; that according to the maximum similarity index values specified in the Guidelines, my thesis does not include any form of plagiarism; that in any future detection of possible infringement of the regulations I accept all legal responsibility; and that all the information I have provided is correct to the best of my knowledge.

I respectfully submit this for approval.

Date and Signature

**Name Surname:** TAHAMUHAMMET SÜLEYMAN

**Student No:** N19139905

**Department:** Economics

**Program:** Economics M.A.

**ADVISOR APPROVAL**

APPROVED.

\_\_\_\_\_  
Prof., A. Yasemin YALTA