Hacettepe University Graduate School Of Social Sciences

Department of Economics

TURKEY'S ANTI-DUMPING POLICY AND ITS IMPACTS ON FIRMS' BEHAVIORS

Serdar AKBAŞ

Ph.D. Dissertation

Ankara, 2022

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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, **Tez Danışmanım Doç. Dr. Bahar BAYRAKTAR SAĞLAM** danışmanlığında tarafımdan üretildiğini ve Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Yazım Yönergesine göre yazıldığını beyan ederim.

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ABSTRACT

AKBAŞ, Serdar. *Turkey's Anti-Dumping Policy and Its Impacts on Firms' Behaviors*, Ph.D. Dissertation, Ankara, 2022.

Dumping is a well-known concept in international economics and has significant consequences on trade patterns and firm imports behavior. The study attempts to make a coherent and comprehensive evaluation of Turkish anti-dumping policy and focuses on empirical aspects with special emphasis on firm behavior under different circumstances. The first chapter is a summary and introduction of basic concepts, historical developments, institutional framework, application procedures and stylized facts of anti-dumping policies. The second chapter explains the determinants of anti-dumping investigations in Turkey, which is one of the most frequent users of such investigations in the world. Additionally, rising global protectionism after 2012 stimulated the implementation of new measures in many countries. Most notable of such measures is the extensive use of Additional Customs Duty in Turkey. The study examines this policy tool for the first time in the literature among anti-dumping determinants. Negative binomial regression models used for 1989-2019 period to illustrate different variables such as retaliation motives, deterioration in trade deficit, productivity of the manufacturing sector and real GDP growth as important factors affecting investigations. The findings indicate that certain protectionist motives matter more in Turkish anti-dumping policy rather than unfair competition dynamics. The last chapter examines the impacts of different stages of anti-dumping investigations over steel industry by using intervention analysis. Turkey is among the major global actors in steel products, and steel imports have always been most important targets of Turkish anti-dumping policy. The study investigates the impacts of different actions of anti-dumping investigations over firms' import decisions in this industry. Different stages of selected investigations are analyzed, and intervention analysis is used for 2009-2021 period. The findings indicate that certain interventions have considerable signaling effects over firms' import decisions.

Keywords Dumping, Anti-Dumping, Additional Customs Duty, Trade Defense Instruments, Trade Policy, Steel Industry, Imports

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LIST OF ABBREVIATIONS

ACD	: Additional Customs Duty
AD	: Anti-Dumping
ADD	: Anti-Dumping Duty
CN	: Combined Nomenclature Codes
DSB	: Dispute Settlement Body
FTA	: Free Trade Agreement
GATT	: The General Agreement on Tariffs and Trade
GTIP	: Turkish Harmonized System Code in 12 digits
HS	: Harmonized System Codes
IFS	: International Financial Statistics
ISIC	: United Nations International Standard Industrial Classification
LTFV	: Less Than Fair Value
MoT	: Republic of Turkey, Ministry of Trade
NBR	: Negative Binomial Regression
NV	: Normal Value
PR	: Poisson Regression
SITC	: United Nations Standard International Trade Classification
TUIK	: Turkish Statistical Institute
WTO	: World Trade Organization

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INTRODUCTION

Dumping has extensive usage in international economics and has various impacts on trade patterns and firm imports behavior. To defend their domestic industries, governments take actions against dumping by comprehensive firm-based investigations. In case of the detection of dumping, they may impose anti-dumping duties to eliminate the margin determined.

Dumping may be accepted as an economically harmful disease, and anti-dumping is the medication (Prusa, 2005). Dumping, or sales at LTFV, occurs when a firm exports a product at a price lower than the price it normally charges in its home market (ITC, 2007).

During the last three decades, the use of anti-dumping policy has grown rapidly and become an important instrument of trade remedy (Niels, 2000). The US, Canada, and the European Union countries have been traditional users, while developing countries (i.e., China, India) also have begun to initiate increasing number of anti-dumping investigations in last few decades.

97.5 per cent of 1,200 anti-dumping measures in the 1980-88 period were taken by 4 developed countries. However, after the foundation of the WTO, there has been a great transformation in anti-dumping user profile and developing countries dominated the global anti-dumping investigation initiations. Of the 5,944 investigations in the post WTO period of 1995-2019, 52.48 percent were initiated by 10 developing countries. India (16.35), Brazil (7.03), Argentina (6.53), China (4.85), S. Africa (3.94), Turkey (3.85), Mexico (2.71), S. Korea (2.56), Indonesia (2.39) and Pakistan (2.27) are the main actors of this period.

Although there were some provisions about dumping in Turkey's Customs Code (Law No:1615, 1972), they lacked systematic structure and Turkey enacted its first anti-dumping code in 1989 (The Legislation on Prevention of Unfair Competition in Importation, Law No: 3577). The Code consists anti-dumping / anti-circumvention measures, and countervailing duties. As the MoT determines foreign goods are sold at LTFV and an industry is injured materially from the sale of the imported goods, a consequential anti-dumping policy can charge extra

import duties according to the provisions of this Code to bring the price closer to its normal value.

Turkey is consistently among top 10 countries that initiated the greatest number of investigations in the world. The total number of investigations initiated between 1989 and 2020 is 323; while 55 of them were terminated, 21 were withdrawn by domestic producers and 244 anti-dumping measures were taken at the end of these investigations.

In Turkish investigations, 31 percent of all investigations initiated, and 37 percent of all measures taken are against China which is followed by Taiwan (5.9), India (5.6), S. Korea (4.9), Thailand (4.6), Russia (4.0), and Indonesia (3.7). The textile industry comes first with 86 investigations and followed by mining-metal (80), petro-chemicals (59), plastics (31), machinery (21), electric-electronics (7), and other industries (39).

Turkey is increasingly using such trade remedies and current situation of the world economy fosters protectionist movements again where trade defense instruments regain importance both in international sphere and Turkey.

Especially after 2008 financial crisis, the discourses of economic nationalism and new protectionist policies became more evident. Domestic production motivation (introduced by several initiatives in the US, China, Japan, France, Canada, and many other countries) and the policies of turning the industries which produce abroad back to the home country have become frequent items of the global trade agenda. After 2012, the political discourses began to be implemented and the impacts of the trade wars increased over global trade by Increasing tariffs, additional duties, and non-tariff barriers. These initiatives are mostly leaded by the US but followed by many other countries especially by China and the EU.

Turkey also engaged in rising protectionist movements in this period and introduced different policy measures that had not been used before. Additional Customs Duty is among the most important instruments that have been applied and affected extensive volume of imports. The first ACD Decision was taken in 2011 and has gained momentum afterwards. Due to its procedural advantages,

ACD policy carries a potential to constitute a considerable alternative to traditional trade defense measures.

The dissertation attempts to make a coherent and comprehensive evaluation of Turkish anti-dumping policy and focuses on empirical aspects with special emphasis on firm behavior under different circumstances including alternative policy measures.

Following a detailed background on global and Turkish anti-dumping applications in the first chapter, the determinants of Turkish anti-dumping policy with prominent attention to ACD is discussed in the second chapter. The last chapter urges upon the impacts of different stages of anti-dumping investigations over Turkish steel industry by using intervention analysis.

In the first chapter, a comprehensive theoretical and practical framework both for global and Turkish anti-dumping applications are provided. As a useful theoretical and practical manual, some stylized facts and detailed statistics are given both for the world and Turkish practices. Since some discrepancies are detected and there were missing data points, Global Anti-Dumping Database is updated for Turkey by comparisons with original Communiques published in Turkish Official Gazettes. In addition to such data improvements, detailed imports statistics both for ACD and AD are prepared in this section by using tariff lines (namely 12 digits GTIP in Turkish practices) which may be used by future research. The imports statistics are computed by this motivation for the first time for ACD coverage since they have been implemented.

In the second chapter, special attention is paid to some country specific factors and a comprehensive account of ACD is employed in Turkish anti-dumping policy. The study is the first one identifying ACD among the determinants of anti-dumping decisions. The findings indicate that certain protectionist motives matter more in Turkish anti-dumping investigations rather than unfair competition dynamics. Thus, ACD policy seems to keep its importance and carries a potential to reduce anti-dumping investigation initiations against some countries over time.

The last chapter examines the impacts of different stages of Turkish investigations over import decisions again for the first time in the literature. Three largest anti-dumping investigations, which accounted 76 percent of all Turkish anti-dumping investigations against steel industry are selected for the analysis.

There are many different key dates and decisions in a typical anti-dumping investigation, and the nature of any initiative during the process has the potential to affect the import decisions of firms. By using intervention analysis, the quantitative effects and durability of prespecified interventions are estimated by using imports data. Although the model is designed for a specific industry, it is easily applicable to any other investigation since the defined interventions are totally compatible with the interventions in every other investigation. Thus, the study provides an objective comparison basis to measure the impact of any anti-dumping investigation that may be a useful resource for future economic evaluations. Additionally, quantifying the overall effects of an investigation and impacts of different interventions separately over imports would be beneficial to all decision makers both from public sector and industry to measure the results of different anti-dumping actions.

CHAPTER 1

CONCEPTUAL FRAMEWORK

1.1. HISTORICAL DEVELOPMENT

The concept of dumping has been known and used for a long time both in terms of economic theory and business practices. However, it could not be subject to common understanding until the beginning of the 20th century due to unsystematic definitions and not clearly specified coverage. For example, Adam Smith emphasized the motives of some manufacturers to export some of their goods less than domestic prices in 1776 (Smith, 1904). According to him, such a practice allowed them to increase their domestic prices substantially by bearing lower losses outside. Hamilton approached to the matter in terms of negative effects of dumping behavior over domestic industry (Hamilton et al.,1892).

Although these arguments seem intuitively noticing that dumping behavior involves significant economic dimensions, they are still far from addressing the issue in a comprehensive way in standardized domain (CRS, 2020, p. 2). Jacob Viner is the first economist explicitly studied the “problem” of dumping in his seminal book (Viner, 1923).

As the industrialization efforts intensified by late 19th century, dumping had begun to emerge as a problem among rapidly developing and competing countries. By more countries industrialized and seek to develop their exports capacities, a more sophisticated pricing strategy is needed across different markets and market segments. Higher tariffs and transaction costs, and different types of barriers to trade across countries were the essential elements that physically separate the markets and provide a favorable environment for dumping practices.

In some instances, even some public authorities encouraged their exporters to use dumping option for better market access options to foreign markets. In an official report in 1880, the U.S. Secretary of State advised cotton manufacturers to "*sacrifice profits for a time, if necessary, to secure trade-standing in … several markets*" (DCL, 1905, p. 45.).

As Finger (1993) has pointed out, "*These tariffs provided national firms the opportunity to price monopolistically at home and at the same time protected them from reimports of goods they sold competitively abroad*." As an extension of this thought, dumping had been widely accepted by some countries as a right of industrially advanced countries to offset changes in domestic demand by selling large surpluses abroad.

Under these economic conditions the first anti-dumping law was adopted by Canada in 1904 with the motive of protecting domestic steel industry from "cheap" US imports. Although USA had anti-trust acts dated back to 1890 (Sherman Antitrust Act), Canada's effort is the first initiative specifically aimed to combat dumping.

Following Canada, New Zealand (1905), Australia (1906), South Africa (1914), the United States (1916), Japan (1920) and Britain (1921) introduced their anti-dumping legislation successively. The general characteristics of these regulations were to take the matter as an extension of their competition laws and to focus on the benefits of their leading industries. In these preliminary arrangements, monopolization concerns and predatory dumping strategies of capturing the market are the essential elements concentrated (Niels, 2000).

The Great Depression of 1929, however, caused a serious break for anti-dumping policy worldwide. Since anti-dumping measures were discretionary and selective in nature, more comprehensive instruments are designed and

implemented for protectionist policies. Serious tariff increases and quota restrictions were the main tools of long-lasting protectionism at the height of the global crisis at this period.

Nevertheless, anti-dumping measures became popular again in 1947 with GATT in international trade sphere during the rule-based model searches. Article VI of the GATT which allows signing countries to impose anti-dumping measures and countervailing duties is essentially a natural result of these efforts and is an adapted version of US Anti-Dumping Act (Irwin, 2005).

From 1948 to 1994, GATT stayed in force as a “provisional” agreement among the signatories. During this time, the third organizational structure envisaged in Bretton Woods, International Trade Organization, could not be established.

Still different rounds under GATT had introduced gradual but accelerated liberalization efforts for global trade environment. Finally, these efforts concluded with Uruguay Round and WTO is established after the most comprehensive and largest participated trade arrangement ever.

The Tokyo Round (1973–79) and The Uruguay Round (1986–94) made substantial changes in anti-dumping provisions of the original Agreement. By these elaborations, the dominance of the US anti-dumping legislation over GATT had been balanced with other developed countries’ national regulations.

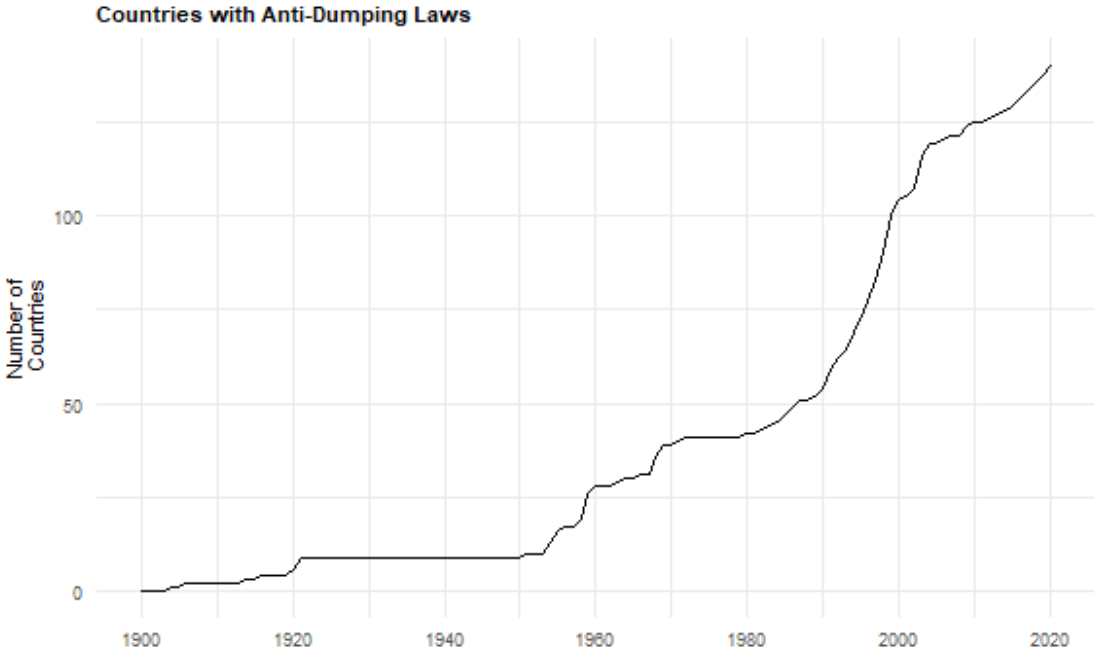
Although anti-dumping measures were subject to international negotiations and entered the agenda of many more countries in a much wider context, the use of these measures did not go beyond the traditional users until the 1990s. During the mid-1980s, Australia, Canada, EC (predecessor of the EU), and the United States conducted more than 95 percent of all anti-dumping initiatives (Blonigen and Prusa, 2016). As Bodkhe (2017) indicates, 1,200

anti-dumping actions were initiated between July 1980 and June 1988 and 97.5 per cent of all these actions accounted by 4 countries. The US, Canada, Australia, and some developed Western Europe countries were the dominant users of this instrument aiming to protect their domestic industries and enhancing fair competition practices.

However, post WTO era shows a substantial change in the composition of the users. Despite the historical background and national regulations dates back to 19th century, anti-dumping measures has begun to be adopted by more countries after the establishment of the WTO. This is mostly due to the development of legal and technical infrastructure provided by multinational trade framework. Long-lasting trade negotiations during 80s and early 90s contributed developing countries' capacity building activities and strengthen their institutional capabilities. Standardized procedures in terms of anti-dumping measures under WTO Framework enhanced their skills to initiate such investigations. Many developing countries leaded by India, Brazil, Argentina, China, South Africa, Turkey, and Mexico have begun to use anti-dumping measures effectively beginning from the late 90s. Compared to 42 countries that had anti-dumping laws in 1980, the number reached to 104 by the end of 2000. As of 2020, 140 countries have anti-dumping regulations.[1]

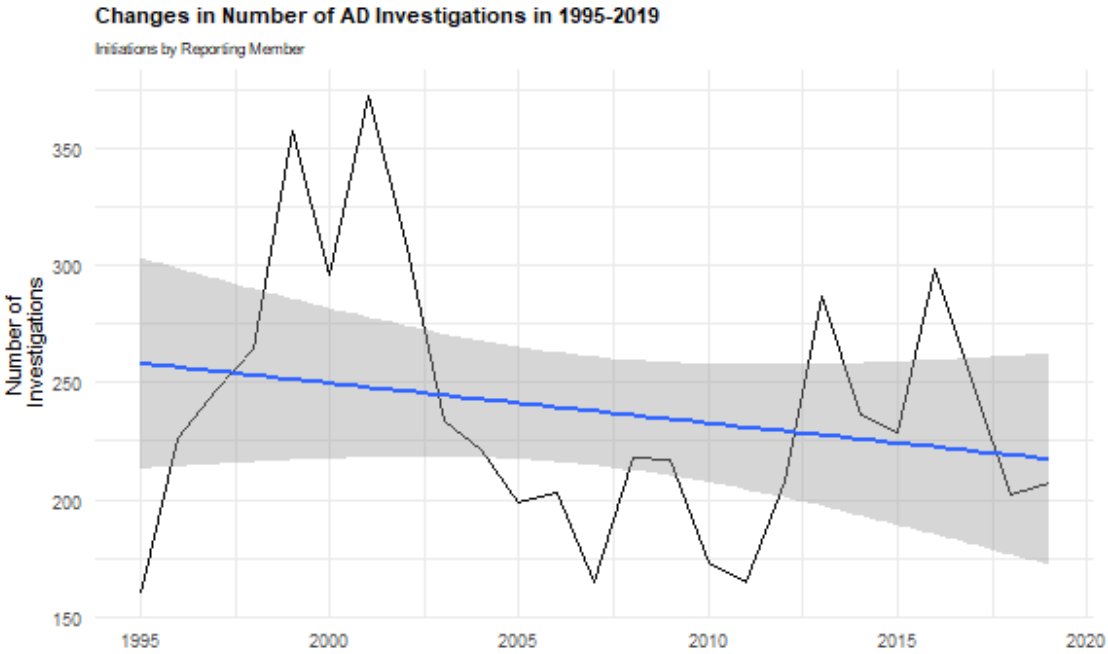
[1] I would like to especially thank Prof.Bruce Blonigen for sharing the dataset in (B. A. Blonigen & Prusa, 2016). I updated it with new adoptions after 2016.

Figure 1: Countries with AD Laws



Source:Author's update of the dataset of Blonigen (2016)

Figure 2: AD Initiations in post WTO period

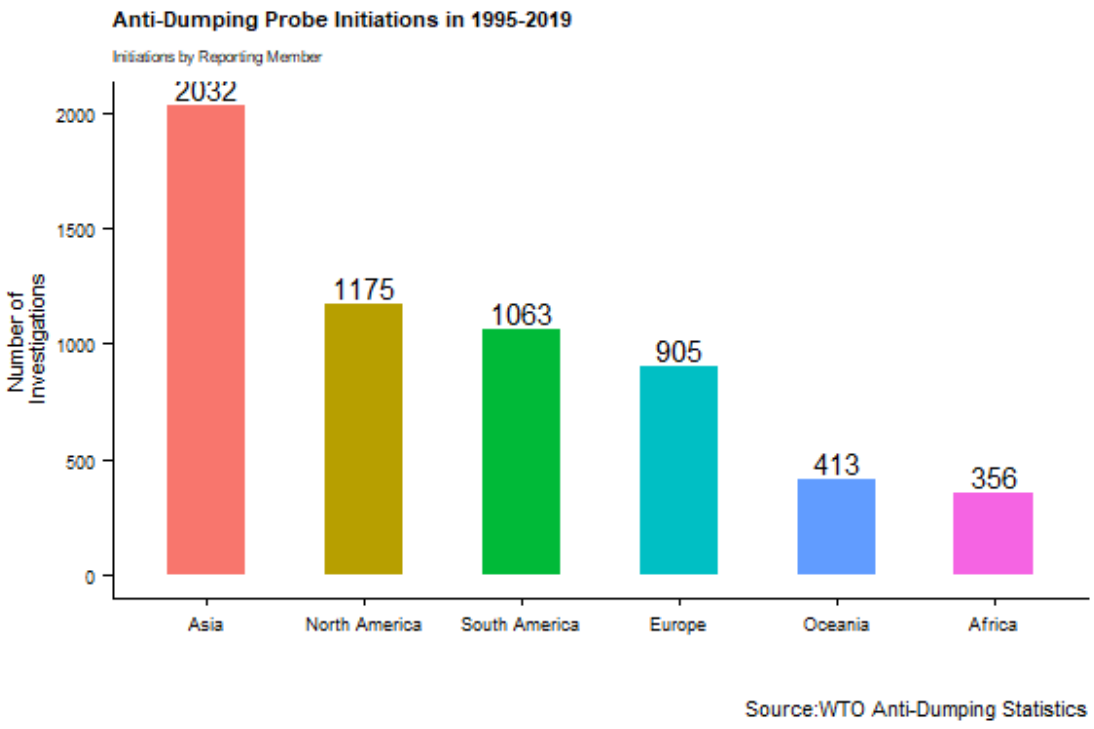


Source:WTO Anti-Dumping Statistics

According to WTO AD Stats, India holds the lead in initiation of anti-dumping investigations with 972 cases for the period of 1995-2019 by far exceeding the second handler (USA-728 cases).

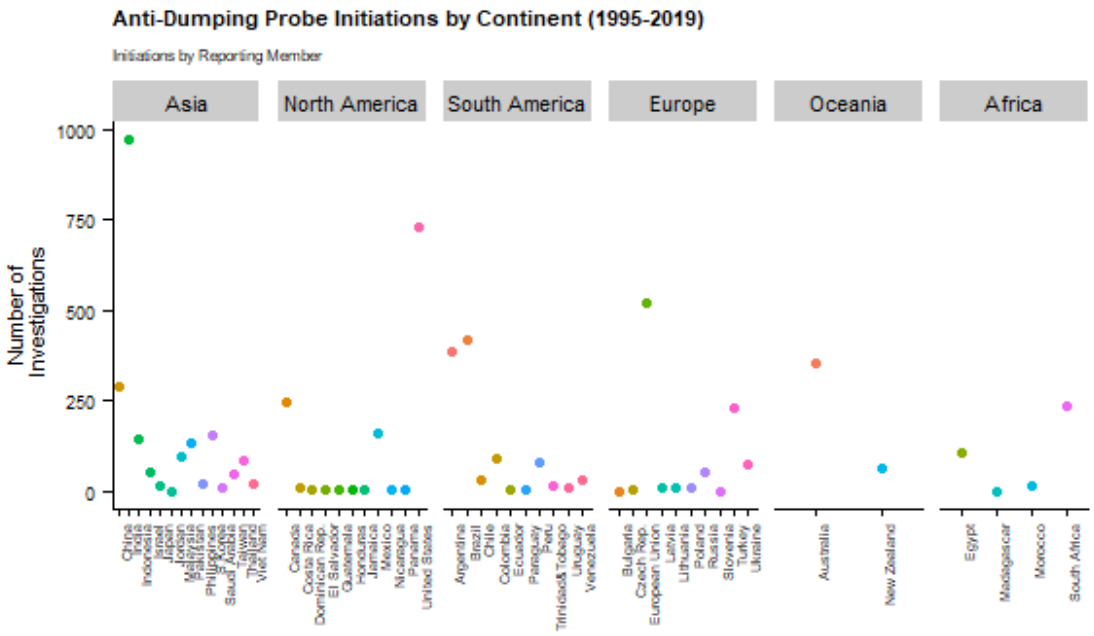
5,944 anti-dumping investigations initiated in this period and 52.47 percent of them are launched by 10 developing countries. The percentage share of these countries are as follows: India (16.35), Brazil (7.03), Argentina (6.53), China (4.85), South Africa[2] (3.94), Turkey (3.85), Mexico (2.71), South Korea (2.56), Indonesia (2.39) and Pakistan (2.27). The figures 3 and 4 clearly indicate the dominant position of developing countries in launching anti-dumping investigations in post-WTO era. 2001 is the local peak of the anti-dumping investigations and 372 investigations were initiated in this year far exceeding the period average of 237.76. The number of investigations on global scale declined to lowest levels in 2007 and 2011 by 165 investigations.

Figure 3: Geographical Distribution of AD Initiations



[2] WTO reports all anti-dumping actions notified by South Africa operate at the level of the Southern African Customs Union.

Figure 4: Geographical Distribution of AD Initiations



Source:WTO Anti-Dumping Statistics

The usage of anti-dumping measures so intensely by developing countries has significantly changed both the form of protectionism and targeted sectors. Since the developing countries dominated the general picture, geographical and sectoral priorities of the investigations had exposed a new structure. Contrary to earlier period, South-South protection and focusing on labor intensive sectors emerged as more apparent characteristics (Bown, 2012).

Statistics and discussions in the literature clearly show that dumping will remain in trade agenda. As economic and social vulnerabilities around the world feed the protective tendencies, dumping seems to be discussed for a long time with its different dimensions.

There are various factors why dumping itself and then anti-dumping measures have been “problem” in international trade after those many years they have been subject to discussion.

The regulations at the beginning of the 20th century were basically designed on predatory dumping concept. However, it was quickly realized that there was no practical way to detect which activities are predatory and which are not based on

firm behavior in market dynamics. The detection of destructive nature of a company's act was quite vague in this respect and impossible to determine with the clarity required by a legal text. Thus, new set of definitions were introduced such as "fair value" and "material injury" which they still have the same vagueness problem with poor economic rationality.

These concepts had been defined in the GATT, which was signed under the protectionist and prudent understanding of the post-war period, but they are still the key concepts of modern anti-dumping policies. Agreement on Implementation of Article VI of the General Agreement on Tariffs and Trade 1994 (Anti-Dumping Agreement) is based on the outputs of GATT conjecture. Blonigen and Prusa (2003) extensively discuss the costs of anti-dumping protection with special emphasis on uncertainty and lack of economic rationality of "fair value" and "material injury."

Currently, not considering the gains of consumers from more productive exporters or improvement of competition via imports for the domestic industry are important handicaps of the generally accepted forms of anti-dumping practices.

Protective nature of anti-dumping far exceeds its focus on anti-competition both in terms of legislative framework and application procedures. On the other hand, retaliation (or the probability of it as a negotiation position) is quite common practice in anti-dumping probes which significantly deteriorates efficiency of the markets.

Additionally, the lobbying activities, differences in concentration rates of domestic industries which file petition against imports, substantial transaction costs are among other factors which cause selection bias in protected industries due to their own dynamics. Gallaway, Blonigen and Flynn (1999) and Blonigen and Prusa (2003) provides a comprehensive account of the costs accompanied by anti-dumping measures.

Nevertheless, some developed countries, especially the EU, started to focus more on public interest in their anti-dumping legislation rather than solely on domestic production.

In this regard, Turkey is recently out of this comprehensive approach and employs more protectionist and non-selective instruments against imports such as “Additional Customs Duty” and Safeguard Measures. In such an environment, public interest, consumer benefit, overall productivity improvements, time-limited implementation of the measure and performance measurement after the anti-dumping protection still seem to be quite far from Turkish Trade Defense Policy agenda.

1.2. KEY CONCEPTS AND DEFINITIONS

Since some terms related to dumping practices will be used frequently in the following chapters, it is important to discuss them here to provide a general understanding.

Trade Remedies: International trade agreements acknowledge parties’ right to take some measures against imports to protect their domestic industries under some certain conditions. Such measures are classified as trade remedies or trade defense instruments in WTO terminology. WTO categorizes unfair practices as dumping and subsidies; and remedies against these practices are called anti-dumping and countervailing duties or safeguard measures.

Dumping: Anti-Dumping Agreement defines dumping in its Article 2.1 as:

> *For the purpose of this Agreement, a product is to be considered as being dumped, i.e., introduced into the commerce of another country at less than its normal value, if the export price of the product exported from one country to another is less than the comparable price, in the ordinary course of trade, for the like product when destined for consumption in the exporting country.*

In its most general form, WTO defines dumping as a sort of international price discrimination where the price of a product in the importing country is less than the price of that product in the market of the exporting country.

Dumping itself is not solely illegal under WTO legislation and the importer country is required to prove the negative effects of the dumped products over its domestic producers. Imposing anti-dumping measures can be possible only when these conditions are met. Anti-Dumping Agreement allows WTO Members to impose anti-dumping duty against another Member when the products under consideration are exported less than its “normal value,” and this “dumping” causes or threatens to cause “material injury” to the domestic industry.

Although the dumping is defined simply as of price discrimination of a product in different countries, the comparison across markets is not as easy as is said. Normal value and export price are needed to be adjusted by some computational steps to have a fair ground for reliable comparison.

Normal Value: It is essentially defined as the price of the product under consideration in the exporting country. NV is calculated as “the comparable price actually paid or payable in the ordinary course of trade for the like product intended for consumption in the exporting country or the country of origin (Gaines et al., 2012).

In some instances, such as non-market economies or lack of adequate comparison basis, it may not be possible to calculate NV in ordinary course of trade in exporting country. Two alternative methods are introduced with Anti-Dumping Agreement for such situations. These methods are (1) considering third country price as normal value or (2) using constructed value. There are no objective criteria in choosing the third country for benchmarking. Constructed value, on the other hand, is specified to be calculated by selling, general and administrative expenses, and profits. As it is obvious, such methods recognize considerable flexibilities, initiative fields and in most cases non-detectable preferences for the investigation authorities.

The vagueness of the definition and the unstandardized nature of computing methods of “normal” value causes conflicts and unpredictable consequences in

practice. Additionally, there is a growing literature criticizing the economic irrationality of such definitions specifically depictured with the concepts like “normal” or “fair.” Finding a comparable price in the ordinary course of trade for a product under consideration may be sometimes impossible based on the heterogeneity of the product across the markets. In most of the circumstances, investigation authorities use “like products” across the compared markets and this deepens the concerns mentioned above.

Non-Market Economies: GATT 1994 and Anti-Dumping Agreement emphasizes price controls by state and different levels of state monopolies as the indicators of not functioning market economy. In such economies, comparison of prices would be misleading and different methodology should be employed in dumping determination.

Fair Comparison: As a general principle of the Agreement export price and normal value should be compared in equal grounds. For this purpose, same level of trade, same sales stage (i.e., ex-factory), same time interval should be compared as much as possible. The determination and application procedures should be transparent and open to participation of all related parties.

Dumping Margin: Dumping margins are defined as the difference between normal value and export price. Anti-Dumping Agreement specifies three methods in margin computation in its Article 2.4.2. These alternatives are: 1) comparisons of normal value and export price on weighted averages, 2) comparison of these values on transaction-to-transaction, and 3) comparison of these values a weighted average normal to export prices in individual transactions under special cases.

Material Injury: According to Agreement, detection of dumping is necessary but not sufficient for anti-dumping measure. The Investigation Authority should expose the injury of the domestic industry. The injury may be: (1) material injury or (2) threat of material injury on domestic industry or (3) material retardation of

the establishment of a domestic industry. The scope or extent of “material” is not defined on the Agreement and left to the initiative of the investigating member.

Causal Link: The Agreement does not consider the existence of dumping and material injury sufficient to take measures against dumping. It also stipulates that a causal relationship should exist between these two facts. This requirement is known as “causal link.”

Cumulative Analysis (Cumulation): It is a method not mentioned in neither GATT 1994 nor Anti-Dumping Agreement but used by many users such as the EU, the US and Canada. In cumulation approach, the investigation authority considers the “combined” effect of total imports from all the countries under investigation in material injury determination. Many studies show that the choice of this method substantially affect the probability of affirmative duty (Hansen and Prusa, 1996), (Tharakan, Greenaway,1998).

Zeroing: As mentioned before, Anti-Dumping Agreement recognizes 3 different methods for dumping margin calculation. Generally, an investigation authority calculates the margin by comparing the average of the differences between the export prices and normal value. Some practitioner countries adopt an unconventional approach and when the export price is higher than normal value, they accept the difference as zero rather than accepting the negative value as it is. This practice is called “zeroing” and widely used by the US. It is subject to heated debates especially between the EU and the US in many multi-national platforms. Many exporting countries criticize this approach by defending that it causes unfair results for exporters by wrongly inflating the dumping margins.

Lesser Duty Rule: There is a fundamental difference among countries in terms of eliminating the negative effects of dumping over their producers. While some aim to eliminate the determined dumping margin totally, it is sufficient for others to remove the part that causes the injury. In this regard, the EU and the US again are major representatives of these two different approaches. The EU focuses on

the volume of the material injury and determines the anti-dumping duty at a lower rate which is sufficient to eliminate the injury.

Single Agency System: Institutional structures of the investigation authorities differ across the member countries. In some countries, dumping margin calculation and injury determination are done by the same institution, while in others these two tasks are performed by different institutions. There is a widespread consensus in the literature that the lobbying activities of domestic production and political pressure will be concentrated in the unit that performs the injury determination even in the case of two separate legal entities.

De Minimis: According to the Anti-Dumping Agreement, a dumping investigation should be immediately terminated when the volume of imports or the dumping margin calculated is below the thresholds specified. These numerical thresholds are named as de minimis.[3]

Circumvention: Circumvention essentially refers to activities undertaken by exporters of goods to evade or circumvent, either in full or part, anti-dumping duties imposed by the countries importing these goods.

Since anti-dumping duties constitute significant burden over exporters, some economic incentives may arise for them to employ various methods to circumvent the existing ADDs. Trade facilitation mechanisms and ease of trade across borders, on the other hand, resulted in lower transaction costs and enrichment in circumvention methods.

[3] The margin of dumping shall be considered as de minimis if this margin is less than 2 per cent, expressed as a percentage of the export price. The volume of dumped imports shall normally be regarded as negligible if the volume of dumped imports from a particular country is found to account for less than 3 per cent of imports of the like product in the importing Member, unless countries which individually account for less than 3 per cent of the imports of the like product in the importing Member collectively account for more than 7 percent of imports of the like product in the importing Member (Article 5.8).

Circumvention (or evasion) of ADDs had been subject to long discussions especially in Uruguay Round negotiations but no concrete result could be reached neither in definition nor its coverage. The only output of these negotiations is a Ministerial Decision which is a 3-paragraph statement (Decision on Anti-Circumvention). Therefore, there is not a legal basis in WTO texts regarding circumvention and member states regulates the field with their own initiatives. Turkey, like many other countries, applies its own methods to prevent circumvention activities against the existing anti-dumping measures. Turkey adopted circumvention concept and anti-circumvention measures in its domestic legislation with the amendment in 1999.

However, as a global problem, there are substantial difficulties in detecting legitimate commercial activities and malicious acts of circumvention. The need of standardized international legal texts and categorization of evasive acts arise in an increasing way as supply chains get sophisticated across the world. Thus, establishing legal framework and enforcement basis against these activities has begun to become significant priorities specifically for countries extensively engaged in international trade.

The characteristics of firms' behavior and lack of formal definition of circumvention, however, causes vivid discussions about the matter. Some countries defend the impossibility of distinguishing legitimate commercial activities from the activities that might be evaluated as circumvention.

1.3. THE INSTITUTIONAL SETUP AFTER WTO

As mentioned before, Article VI of GATT 1994 outlines the basic conditions of anti-dumping measures that could be taken by any contracting party. The existence of dumping, material injury of domestic industry and a causal link between these two are the requirements specified by the Article.

Agreement on Implementation of Article VI of The General Agreement on Tariffs and Trade 1994 (Anti-Dumping Agreement) includes detailed regulations in many areas such as the initiation procedures of investigations, the way they are conducted, and the implementation period of the measures taken.

1.3.1. The General Framework of the Application Procedures

There are comprehensive arrangements in Anti-Dumping Agreement specifically aiming to clarify application procedures to prevent discrete approaches of the Member States to a certain extent.

Furthermore, it is natural for the Agreement to contain detailed provisions regarding every stage of anti-dumping investigation since there are many grey areas and easily manipulated concepts such as “fair,” “normal,” “material,” “injury” in the notational domain.

Determination of “normal value” is among the most vague and disputable subjects. The Agreement introduces many auxiliaries to clarify the procedures under different circumstances. Definition of ordinary course of trade, alternative computational methods, no domestic sales situations, composition of the cost of the product, time and volume requirements for a fair comparison, conditions where third country values should be used, procedures required when a different country is involved in trade route, evaluation methods of non-market economies are among such special and widely used conditions.

Similar detailed procedures and explanatory steps are needed in determination of export price as well. Barter transactions, internal transfers, relation between buyer and seller, legal status of contractual arrangements, currency regimes and conversion methods are main determinants of export price and each of them needs further elaboration for a fair basis of comparison. The Agreement also includes detailed provisions on these issues in order to ensure more standardized procedures.

The method used in dumping margin calculation is another component of an investigation that requires additional clarification. Since the adopted method significantly affects the result of the calculated margin, it is important to specify the acknowledged methods. The Agreement have also detailed provisions for this purpose. Refund or reimbursement methods, conditions of calculating individual margins for exporters, prerequisites to launch a new investigation for the new exporters that engage in trade after the original investigations are also regulated under this category.

Injury detection and forming the causal link between dumping and injury constitute yet another contentious field. The criteria that provide the transitivity between product under investigation and like product is a vital factor that substantially affect result of injury determination and hence the overall result of an investigation. Thus, it is required to have a general outline to prevent discretionary methods in choosing “like products.” The Agreement reveals the basic characteristics of selection methods and acceptance conditions to be involved as domestic industry for an investigation. Furthermore, injury is defined in detail with its types. Material injury concept is explained by reference to rate of increase in imports, exporter’s capacity utilization or enlargement, prices of imports across time and the change in domestic industry’s inventories.

The Agreement’s efforts to standardize the methods of analysis in an investigation is noteworthy. Some key indicators like jump in dumped imports, analyzing the price and volume effects both in relative and absolute terms over domestic prices and economic indicators of domestic producers are among these arrangements.

There are many procedural requirements in the Agreement to improve transparency at every stage of an investigation. The conditions to launch an investigation, objective necessities of requiring an investigation by domestic industry, application methods, acceptable evidence in a petition, involvement

methods of interested parties, categorization, and sampling of the investigated firms, guaranteeing confidentiality, and preventing breaches, verification necessities and methods, review of an investigation and notification times and types are among such procedural issues which are strictly arranged by the Agreement.

Finally, there are considerable number of provisions in the Agreement regarding the measures could be taken by an investigation. Provisional measures, price undertakings, acceptance of collateral, collection methods of duties, conditions for retroactivity of the duties constitute the coverage of these provisions.

1.3.2. Committee on Anti-Dumping Practices

The Committee is a platform among the member states to discuss the implementation of the Anti-Dumping Agreement. Problematic issues are discussed in semi-annual meetings and the compliance of national legislation with the Agreement is also finalized within the Committee.

Conflicting parties regarding dumping practices submit their arguments to the Committee aiming to solve these conflicts with Agreement provisions. There is also an Ad Hoc Group on Implementation under the Committee to improve best practices across the members' investigation authorities.

1.3.3. Informal Group on Anti-Circumvention

As mentioned before, the negotiations to determine a legal basis to circumvention could not reach to an end. It is declared in a Ministerial Statement that the negotiators were unable to agree on specific text and decided to refer the matter to the Committee on Anti-Dumping Practices.

Following this Decision, an Informal Working Group on Anti-Circumvention formed in 1997. Participation to this Working Group is open to all members,

however, the Group could not make any decisions on the issues discussed. Still it can make recommendations for consideration by Anti-Dumping Committee (Minutes of the Regular Meeting Held on 28-29 April 1997).

1.3.4. Notification Requirements

There are different types of notification requirements to enhance transparency and the participation of all related parties.

One of the main types of notification is related to monitor the compatibility of domestic legislation with the Anti-Dumping Agreement. Member States are obliged to notify the other Members about the amendments of existing regulations or newly introduced domestic legislation that arrange anti-dumping procedures. Although the Committee does not have the authority to approve or reject the changes, the notifications improve early contribution of related parties and help them to take action to prevent domestic legal texts of other members violating WTO rules. Additionally, it provides an open platform of discussion among the members to standardize the applicable procedures.

As a second type of notifications, Members are required to inform the Anti-Dumping Committee via official statements made semiannually about all their initiatives for anti-dumping practices. These notifications are circulated among the Members and evaluated in the Committee. They are open to public unless otherwise is explicitly specified by the notifying member.

Third type of notifications are for specific actions of newly initiated anti-dumping investigations. Member states are obliged to notify the other Members about all preliminary or final actions taken.

The last category of notifications is about publicizing the “competent authorities” those are authorized to conduct anti-dumping investigations. The list of such

notifications includes addresses and contact information of these authorities and should be periodically updated.

1.3.5. Dispute Settlement

DSB is the main organizational body in WTO devoted for the disputes among the members with respect to GATT 1994 and the Agreements annexed to it. Thus, Anti-Dumping disputes among members are also under this scope. Imposition of anti-dumping measures, procedural inconsistencies or violations, preliminary findings, extension and duration of the measures are among the most common disputes with respect to anti-dumping applications.

Representatives of the members are the constituent of DSB. It is the sole authority in deciding whether to establish a Panel for the disputes among the members and the decisions about them are based on Panel and Appellate Body Reports which are technical investigation of the matter. These reports are advisory and the DSB has the authority to finalize the decision. Appellate Body is a supreme authority of a Panel that appeals their reports.

The decision-making process of DSB is called as “reverse consensus” where it is required that the recommendations of the Panel (or Appellate Body’s Report if Panel Report is modified) cannot be rejected unless there is a consensus against it. DSB decisions are binding for the parties of the dispute.

1.4. THEORIES OF DUMPING

There are many approaches and models in the literature that attempt to explain dumping and its economic effects. Although it is possible to divide them in different ways, the classification should be simple and functional to serve a better understanding. For this purpose, it is more appropriate to consider the approaches that can be named dumping theories under two main headings. If we leave aside the historical debates before the industrial revolution, we see that

dumping has become an important issue in the literature with the emergence of the industrial society and dynamics. In this sense, the dumping literature in the first half of the 20th century can be classified as approaches under the scope of Viner's theoretical framework. This approach, which can be named as classical dumping theory, price discrimination in international trade, monopolistic profit maximization, oligopolistic decision-making mechanisms stand out as the dominant factors. Additionally, predatory dumping is extensively examined mostly due to its popularity in politics rather than its economic rationality.

Especially starting from the 1980s, enrichment in economic theory began to penetrate the dumping literature. Increasing sophistication and new forms of production patterns in international trade have made it necessary to deal with the subject through extended dimensions.

Uncertainty, firms' strategic entrance, exit, and collusion decisions in a game theoretical framework, reciprocal actions, price discrimination in oligopolistic rivalry environment are some elements beyond the scope of classical theory. Hence, Modern Dumping Theory carries important elements from many other theories such as Game Theory, Theory of Risk Dominance, Oligopoly Theory, General Theory of Equilibrium Selection in Games.

1.4.1. Classical Dumping Theory

There were some orderly studies and attempts to define dumping in early 20th century. European economists such as Taussig, Hobson, Dietzel, Pigou, and Shortt focused on different aspects of dumping. Taussig have studies during this period that defined dumping as we use it today. There were significant articles of some economists focusing on price discrimination as the main nature of dumping at this early period (Cantono and Marchionatti, 2012).

Since dumping is evaluated as price discrimination between markets in essence, the framework of the subject naturally has begun to emerge from this point of view. Despite some other similar studies about dumping prior to him, Viner (1923) is the first comprehensive theoretical attempt to analyze the dumping in terms of price discrimination across different markets. He makes a distinction between

standard (principal) market(s) and subsidiary (occasional) market(s). In his terminology the important element is differences of the prices across different markets rather than the direction. The price may be lower in domestic market in this set up and he defines this situation as reverse dumping. According to him, dumping occurs when the higher price is charged in the standard market(s). The exporter sells the product in the standard market at a higher price for monopoly profits and sells in the subsidiary market with a lower price to absorb the surplus (Viner, 1923, p.6)

In international trade domestic and export markets are separated by various factors and transaction costs such as tariffs, trade barriers and transportation costs hindering resale or arbitration possibilities. This, in turn, eliminates the transitivity between markets, which is one of the most important preconditions of price discrimination.

Before going into the details of Viner's theoretical elements, it will be useful to dwell on basic conditions of price discrimination.

In more technical terms Stigler (1987) defines price discrimination as the prices of two or more similar goods sold at different ratios to their marginal costs.

For price discrimination to occur, imperfect competition conditions and/or market failures should prevail.[4] Perfect competition eliminates the chance of any level of market power of a firm to impose different prices apart from the market price.

However, developments in marketing techniques and information sources add new insights to the matter. Both producers and consumers have new instruments to reach information which complicate the conventional price discrimination techniques. Still, it is important to note that any firm that does not have any kind and level of market power cannot discriminate its prices.

H. Varian (1989) counts 3 necessary prerequisites for price discrimination. 1) The firm must have a market power to some extent, 2) an ability to sort its customers

[4] In some situations, price discrimination may cause fall in prices and yield a trajectory towards an intensified competition (Armstrong, 2006).

and 3) an ability to prevent resale options. Different price elasticities across different markets or market segments provide seller to impose different prices for these buyers. Since the degree of the willingness of the customers naturally differs for a certain product, there is always an incentive to sell different prices to different customers whenever there is possibility of imposing prices exceeding the marginal cost.

Price discrimination is generally classified under 3 broad categories in the literature depending on the differentiation intensity of the price across consumers and consumer groups. In first-degree, or perfect price discrimination different prices are charged for each unit considering maximum willingness of the consumer for that unit. In second-degree price discrimination prices are determined through the quantity demanded. Third-degree price discrimination occurs when the price scheme is valid across predetermined categorization of the consumers (Varian, 1989).

Following the simple model of Varian (1992, p.242), let's assume there are n different consumers with different utility functions. Their utility functions are defined as $u_i(x) + y$ for $\mathrm{i}=1,2..,\mathrm{n}$ As a reasonable expectation we can assume $u_i(0) = 0$ and denote the maximum willingness of consumer i for the consumption level x as $w_i(x)$. Then,

$$u_i(0) + y = u_i(x) - w_i(x) + y$$

Since we assumed no utility with no consumption, the willingness of a consumer to pay becomes equal to the utility from consuming x units by definition, namely $w_i(x) = u_i(x)$.

Inverse demand function, on the other hand, is defined as marginal willingness to pay and it shows the unit price acceptable by the consumer to demand x units of the good. In this set up the consumer's utility maximization problem is

$$\max_{x,y} u_i\,(x) + y$$

$$\text{subject to: } px + y = I$$

where p is price and I is income. According to the the first order condition of this problem, $p = u_i'(x)$. Thus, consumer i is willing to pay $p_i(x)$ at consumption level x and $p = p_i(x) = u_i'(x)$.

To indicate different levels of willingness of consumers, we will assume $u_{i+1}(x) > u_i(x)$ for all x. In this set up consumers with higher utility with the same level of x are considered as high demand consumers. Thus, they are ready to pay higher prices for the same consumption level.

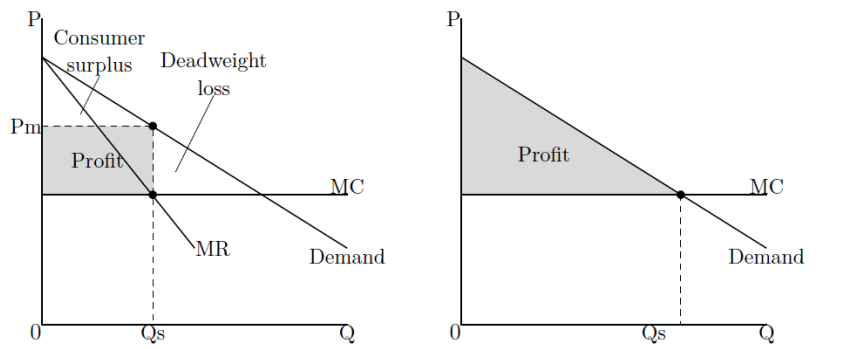
We can show all types of price discrimination within this model by defining i. If it is defined for each and every consumer separately, first-degree price discrimination is the case. Discriminating price for each i is *perfect price discrimination* and neither consumer surplus nor deadweight loss is left. Monopolist sets the price according to each consumer's maximum willingness to pay.

In *second-degree price discrimination*, i refers to the sales terms based on quantity demanded. Different consumers face objectively the same price for the same quantities. However, it is discriminated across different volumes. In our set up, when i is defined as different sales terms, the model describes non-linear pricing scheme.

Firms may also differentiate their prices for pre-defined consumer groups in some instances. For example, discounted rates for students or teachers, adults or children may be possible and this time, i is the index of such groups.

Since second and third-degree price discrimination are both aggregation across consumers to some extent, consumer surplus or deadweight loss are not fully obtained by the firm. In these aggregated groups, still there remains some consumers who paid less than their maximum willingness to pay. Figure 5 of Ko (2019) depicts economic consequences of these two ends of perfect price discrimination and non-discrimination.

Figure 5: Monopoly Profit and Price Discrimination



(a) Single Price (b) Perfect Price Discrimination

After this general introduction, it will be useful to examine how Viner deals with the issue of dumping and which points he focuses on.

He explicitly defines dumping as price discrimination in different markets and illustrates unordinary situations of trade patterns even there is no “domestic” market, but dumping may still arise. Thus, in his approach “domestic” market refers to “standard” market in which the producer or trader operates. For an English cotton producer where he does not sell any product to domestic market but exports all his products for example to China and India with different prices, dumping must be evaluated with comparisons between these markets. In addition to this flexibility in his definition, dumping may be possible in both directions in his terminology, namely both from standard to distant market and vice versa. According to him, “reverse dumping” occurs when domestic market is relatively less important than the foreign market. In this situation, prices for the domestic market are less than the foreign market and dumping is reversed (Viner, 1923, pp.4-6).

Viner makes many classifications of dumping according to different criteria and **spurious-genuine dumping** categorization is the one he did at the first level. He acknowledges various courses of trade such as credit terms, grades of goods, operational and methodological differences across agents, transportation conditions, buying options, quantity demanded etc. When dumping occurs in “fictious appearance” stemming from such causes, it is classified as spurious. Different volumes of buying decisions of domestic and foreign purchasers

accepted as the most important cause of spurious dumping. Foreign buyers tend to order in larger volumes compared to domestic buyers because of physical distance, frequency, and availability preferences.

In today's more complicated trade environment we may extend such factors that can cause spurious dumping in Viner's view. There are substantial differences in consumer buying behavior, structure, and establishment of distribution channels between domestic and foreign markets. The quality and availability of packing and transportation facilities show significant variations in domestic and international trade. Correspondingly, many invisible costs arise depending on dissimilarity of facilities that render services to domestic or foreign markets. There are also considerable qualitative differences of administrative staff employed in domestic or foreign transactions. Generally, transactions in international trade are more sophisticated compared to domestic trade and requires more qualified employees to handle complex processes. The negotiation strength of customer types also differs in these markets. Structural discrepancies in acquiring information are another important field of divergence. Different methods of building agency relationships, cancellation behaviors of buyers, uncertainty level, contract conditions are some other unavoidable factors which naturally cause that unit selling cost of domestic sales to be greater than exports.

Viner emphasizes the importance of considering such terms and conditions of business rigorously that inherently arise from the different natures of domestic and international trade. Thus, focusing solely on price variations across markets will not be adequate to understand dumping. It can be said that the basis of Viner's categorization of dumping aims to draw attention that every type of trade practices does not cause dumping even there exists a clear price discrimination across markets.

To illustrate his approach, he defines *exchange*, *freight*, and *concealed dumping*. Among them, only concealed dumping is accepted as genuine because same prices are imposed to different markets even there are significant differences in conditions (Viner, 1923, pp.15-17).

His second layer of categorization is based on time dimension and the continuity of dumping behavior. 10 different motives are defined for dumping and they had been classified according to their duration as of **sporadic**, **short-run (intermittent)** and **long-run (continuous)**.

Table 1: Viner's Dumping Classification

Type	Motive	Continuity
A	To dispose of a casual overstock	Sporadic
B	Unintentional	Sporadic
C	To maintain connections in a market in which prices are on remaining considerations unacceptable	Short-run or intermittent
D	To develop trade connections and buyers goodwill in a new market	Short-run or intermittent
E	To eliminate competition in the market dumped on	Short-run or intermittent
F	To forestall the development of competition in the market dumped on	Short-run or intermittent
G	To retaliate against dumping in the reverse direction	Short-run or intermittent
H	To maintain full production from existing plant facilities without cutting domestic prices	Long-run or continuous
I	to obtain the economies of larger scale production without cutting domestic prices	Long-run or continuous
J	on purely mercantilistic grounds	Long-run or continuous

Source: Viner (1923)

Since the very beginning, predatory dumping assessed as an important type of price discrimination motive for dumping and widely discussed by economists. In general, predatory dumping is defined as the deliberate action of a firm to eliminate its rivals in the foreign market to obtain a monopoly power. Until that time, the dumper stands for the losses with the expectation to have monopoly profit when its competitors pushed out. Many economists attributed great importance to predatory dumping and found it quite effective factor for price discrimination across different markets. Furthermore, it had been used as a strong argument by policymakers to convince public for raising tariffs. However, even early economists like Viner (1931) and Haberler (1936) defend that predatory dumping is less common in practice than discussed in the literature or public debates.

Predatory dumping behavior is not common in because more rational strategies are used by firms in practice. To eliminate all rivals via predatory strategy is almost impossible especially in an integrated world market structure. Hindley

(1991) shows collusion or cooperative strategies are more applicable for a firm rather than predatory actions.

1.4.2. Modern Dumping Theory

Traditional dumping theory has 2 important pillars; i) monopolistic price discrimination in two different markets and ii) segmentation of these markets to prevent arbitration. However, some contemporary factors in recent state of international trade have not been considered by classical dumping theory basically due to its narrow dumping definition.

In modern form of international trade, imperfect factor markets, pricing behaviors shaped by market penetration motives or domestic price differences stemmed from protectionist policies may be reasons of price discrimination. Furthermore, degree of uncertainty and adjustment mechanisms of production factors in trading markets may be different and market specific. Sticky wages and/or differences in structure of labor markets are some other factors that may affect pricing behaviors. Such contemporary dynamics urged many economists to develop new approaches for dumping theory in 1980s and 90s. Many studies added different insights into classical theory to understand better the international economics of protection.

Ethier (1982) is one of the earliest papers that attempts to develop an alternative theory by allowing interaction between factor and commodity markets across trading economies. In such a set up monopoly and price discrimination are not only sources of dumping phenomenon. Indeterminate nature of demand, wage equivalence of unemployment and skilled-unskilled labor endowment of trading countries are other essential factors that should also be considered.

In defining dumping, Ethier focuses on sluggish adjustment mechanisms of factor market equilibrium of both countries under uncertainty. Although he does not fully ignore traditional theory and its arguments on market differentiation, he emphasizes that dumping emerges as a natural result of international equilibrium

with respect to factor markets. In many instances, dumper sells the traded good below its cost because of sticky wages and inflexible labor market regulations.

Additionally, some sectors which must work continuously, and changeover is costly, selling lower than costs may be a feasible option for a definite time. He defends that all such contemporary problems must be covered and attempts to endogenize them in a new dumping theory.

Many economists added some other contemporary dimensions of international trade in simultaneous or succeeding studies. These efforts constitute a comprehensive literature that may be classified as modern extensions of traditional theory. Strategic entrance decisions, pricing in oligopolistic environment, excess capacity are among the most important concepts which were analyzed with regard to dumping until today. Beginning from the 1990s, game theoretical approaches have begun to have dominance anti-dumping literature. Many empirical studies are accompanied by theoretical ones which were focused on strategic behavior of the firms in the presence of anti-dumping law. Niels (2000) provides a detailed list of these studies which may be accepted as extensions of modern dumping theory.

1.5. FIRM MOTIVATIONS FOR DUMPING

As mentioned in Section 1.1, the emergence of dumping in economics literature dates to late 19th century. Sophisticated production methods, diversified markets and upsurging global trade led to more complicated pricing strategies across industries. In addition, strengthened cartels and trusts carried competition policies among the priorities of public authorities. Under these conditions, dumping discussions gained great momentum among economists as well. Definition of dumping and its causes constituted one of the most important areas of discussion.

Viner (1923) classifies dumping motives under 10 categories, and they are given in Table 1. We may aggregate them under 4 main headings as: i) Stock and capacity considerations, ii) improving trade relations via price adjustments, iii)

seeking, or keeping competition advantages by using prices, and iv) retaliation motives.

Both Viner, who systematized dumping in economics, and many other subsequent economists attributed great importance to predatory actions in explaining the motives behind dumping.

Predatory motives can be defined as the destructive pricing strategy of companies acting with the aim to eliminate future competition. Dumped prices force the competitors out of market and prevents new entrants. US anti-dumping legislation is among the earliest regulations and Antidumping Act of 1916, adopted the predatory motives as the only cause of dumping.[5]

Although it has been widely discussed for many years in theory, empirical evidence show that predatory dumping is rare in practice (Tharakan, 2000). In addition, to detect predatory dumping implies attempting to measure intensions which is not possible in legal terms.

Due to the difficulty of defining predatory dumping and its rarity in practice, modern dumping regulations use “unfair price” as a measure of dumping. By this, comparison of prices across different markets (mostly home and exports) is relocated to the focus of dumping determination (B. A. Blonigen & Prusa, 2016). The most important motive of a firm charging different prices across markets (i.e., price discrimination) is to utilize from the different elasticities of demand. By doing so, discriminating firm takes advantage of improving its market power within the market in which elasticity of demand is lower.

Excess capacity is among the most important motives of an exporting firm which may be subject to dumping accusation. The firm may find more feasible to export rather than stop the production. Demand structure of different markets that complement each other in terms of time may constitute an incentive for a firm to

[5] The Act defines dumping as: *“to sell imports at low prices with the intent of destroying or injuring an industry in the United States, or of preventing the establishment of an industry in the United States.”*)

export rather than increasing its inventory. B. A. Blonigen & Wilson (2010) find evidence of this kind of dumping.

As mentioned in Section 1.4.2, Ethier (1982) attempts to develop an alternative dumping theory by allowing interaction between factor and commodity markets of trading economies. Different endowment of trading countries exposes firms to react accordingly. Some institutional factors, rigidities, and inflexible factor prices may force exporter firm to behave differently across home and foreign markets.

Finally, some papers focus on the relation between learning by doing and dumping. Gruenspecht (1988) studies the impact of current output level and future production costs. To reach the economies of scale, some firms may charge their prices lower than the current costs. As they gain experience and specialized with learning by doing their future costs tend to fall. During this process, their pricing behavior may be classified as dumping by the public authorities.

1.6. STRATEGIC FIRM BEHAVIOR AND DUMPING

Schelling (1960) defines strategic move as the behavior of one party that affects the choice of other. More precisely, an act is strategic when a party aims an advantageous position by considering the expected reaction of its rivals.

There are a vast number of actors and strategic decisions regarding anti-dumping practices. Competing countries and governments, domestic industries and pressure groups, importers, exporters, and consumers are the main parties of the decision-making processes. In this multidimensional interaction tiers, especially the strategic decisions of importing and exporting companies have been subject of more research in the literature.

Since anti-dumping measures fundamentally affect the competition conditions of exporting firms, the most important changes occur in their strategic decisions. To illustrate the decision set of the exporter, price leadership model of Bagchi, Bhattacharyya, & Narayanan (2014) will be used below. In their set up, the optimal anti-dumping duty could be computed to remove its effects and a credible

threat of anti-dumping duty causes significant changes in exporter's pricing decisions. As a result of a sequential game, both dumping is suppressed, and mutually beneficial result occurs for importer and exporter. Not only anti-dumping measure but also its credible threat also would change the pricing decision of the exporting firm.

Following the model of Bagchi et.al (2014), let's assume a domestic and a foreign firm produce "like products" and "price leader" is specified by the technological superiority.

Suppose foreign firm (Firm F) is the price leader and utilizes cost advantage of exporting q_F amount of its product to country H with an export price below its "normal value." Domestic firm (Firm D) produces at amount of q_D and is the only producer in country H. In country H, both firms face the same linear market demand function of $Q = a - bp \; and \; a, b > 0$ and their cost functions are as follows:

$$c_F(q_F) = \alpha q_F + F_F; \alpha > 0 \; and \; c_D(q_D) = \frac{q_D^2}{2} + F_D$$

F_F and F_D are the fixed costs of the firms. Under autarky, the profit maximizing problem of domestic firm is:

$$\max_Q \Pi = p(Q)Q - C(Q) - F_D = \left(\frac{a - Q}{b}\right)Q \; - \left(\frac{Q^2}{2}\right) - F_D$$

Solving the problem gives Firm D's monopoly equilibrium of price and quantity under autarky:

$$Q^M \; = \frac{a}{b+2} \; , \; P^M = \frac{a(b+1)}{b(b+2)} \; and \; \Pi^M \; = \; \frac{a^2}{2b(b+2)} \; - \; F_D$$

Let's assume the trade begins and firm D faces foreign competition. The monopoly equilibrium price, quantity and profit are not applicable anymore. Facing competition, domestic firm may seek protection from its government via anti-dumping investigation. We may observe strategic decisions of the firms under 3 different scenarios and compute optimal price, output, and profits for both firms as follows.

Scenario 1: Exports below Normal Value with No AD Initiation:

In this case, firm F exports to country H with price p below its normal value and firm D takes the price as given. The domestic output is produced accordingly with the profit maximization problem:

$$\max_{q_D} \pi_D = pq_D - \left(\frac{{q_D}^2}{2}\right) - F_D$$

Firm D as the price taker choose its output level according to its marginal cost. The demand firm F faces is the residual demand in country H. So, its profit maximization problem is:

$$\max_{q_F} \pi_F = \left(\frac{a}{b+1} - \frac{q_F}{b+1}\right) q_F - \alpha\, \mathrm{q}_F - F_F$$

In this set up equilibrium price, output, and profit set of the two firms is as follows:

$$q_F^* = \frac{a - \alpha\,(b+1)}{2}\ ; q_D^* = \frac{a + \alpha\,(b+1)}{2} = p^*$$
$$\pi_F^* = \frac{[a - \alpha\,(b+1)]^2}{4(b+1)} - F_F\ ; \pi_D^* = \frac{[a + \alpha\,(b+1)]^2}{8(b+1)^2} - F_D$$

To see the impact of “material injury” and anti-dumping duty Bagchi et.al (2014) calibrates their model for different values of a,b and α. Then compare the outputs with autarky values. According to their findings, price competition is not sustainable for firm D and it will utilize more from an anti-dumping duty as “material injury” increases. However, the elasticity of demand is an essential factor that effect the result which is case specific. The size of the material injury determines the rate of anti-dumping duty and imposed rate cause export price to rise. Hence, the profit margin of the foreign firm falls.

Scenario 2: Exports below Normal Value with Affirmative Anti-Dumping Investigation:

Let’s assume firm F exports below normal value at a price p^* and faces an advalorem anti-dumping duty at a rate of t in country H. In this case, the price that Firm D will take a higher price of $\hat{p} = p^* + tq_F$ due to the ad-valorem anti-

dumping duty t imposed. Firm D will set its output level according to this price with the maximization problem below:

$$\max_{\widehat{q_D}} \widehat{\pi_D} = \hat{p}\widehat{q_D} - \left(\frac{\widehat{q_D}^2}{2}\right) - F_D$$

Again, the demand that firm F faces in country H will be the remaining demand from firm D and its maximization problem will be:

$$\max_{\widehat{q_F}} \widehat{\pi_F} = \left(\frac{a}{b+1} - \frac{\widehat{q_F}}{b+1}\right)\widehat{q_F} - \alpha\,\widehat{\mathrm{q_F}} - F_F$$

Equilibrium price, output and quantity set in this scenario is:

$$\widehat{q_F}^* = \frac{a - \alpha\,(b+1)}{2(bt+t+1)}\,;\widehat{q_D}^* = \frac{a + \alpha\,(b+1)}{2(b+1)} + t\left\{\frac{a - \alpha(b+1)}{2(bt+t+1)}\right\} = \hat{p}^*$$

The output levels in equation 1.8 and 1.11 show that imposing anti-dumping duty causes an increase in output level of firm D and a decrease in firm F. Hence domestic production rises and imports fall in this scenario.

Scenario 3: Exports above Normal Value with an Anti-Dumping Investigation Threat:

In this scenario, there is trade, and we assume firm F exports its products to country H above the normal value $\bar{p} = p^* + \sigma \;\; and\; \sigma > tq_F$ where t is ad valorem anti-dumping duty. Firm D does not have information if firm F exports its products below or above the normal value. Hence, filing an anti-dumping petition is an uncertain action. The same is also valid for foreign firm because course of action of a foreign government is indeterminate in its perspective. In addition, uncertainty during the investigation period is a significant financial burden. Thus, an anti-dumping investigation brings some implicit and explicit costs for both firms and their cost functions given before need to be modified as follows:

$$c_F(q_F) = \alpha q_F + \bar{F_F}; \alpha > 0 \; and \; c_D(q_D) = \frac{q_D^2}{2} + \bar{F_D}$$

In this cost structure, $\bar{F_i} = F_i + \theta_i$ where $i = F, D$ and θ_i is the associated open and hidden costs of a probable anti-dumping investigation. The profit mazimization problem of firm D is:

$$\max_{\bar{q_D}} \bar{\pi_D} = \bar{p}\,\overline{q_D} - \frac{\overline{q_D}^2}{2} - \overline{F_D}$$

Firm F is again the follower facing the remaining demand and its profit maximization problem is:

$$\max_{\bar{q_F}} \bar{\pi_F} = \left(\frac{a}{b+1} - \frac{\bar{q_F}}{b+1} - \sigma\right)\bar{q_F} - \alpha\,\bar{q_F} - \bar{F_F}$$

Equilibrium price, output and quantity set in this scenario is:

$$\bar{q_F}^* = \frac{a - (\sigma + \alpha)\,(b+1)}{2}\ ;\ \bar{q_D}^* = \frac{a + (\sigma + \alpha)\,(b+1)}{2(b+1)} = \bar{p}^*$$

Comparing scenarios 1 and 2, the equilibrium output of firm F will decrease if it sells its products above the normal value unless an ad valorem duty is imposed. Thus, there should be an anti-dumping duty that forces it to export to country H above the normal value. The required ad valorem anti-dumping duty of country H should hold the following condition:

$$t^* > \frac{\sigma}{a - (\sigma + \alpha)(b+1)}$$

In other words, t^* is a credible threat that forces firm F to export above the normal value and provides its output in this scenario to be more than from the previous one. In addition, the market share of firm D will be higher because the firm F exports above the normal value. Compared to other 2 scenarios firm D's output is largest here. ($\bar{q_D}^* > \widehat{q_D}^* > q_D{}^*$)

When firm F exports below the normal value, the only option for firm D to raise its profits would be an affirmative anti-dumping duty. However, considering threat of an anti-dumping file petition with uncertain outcome brings significant financial burdens to firm D. It has substantial incentives to prevent such a counterfeit application because of its associated costs. Consequently, if firm F exports above

normal value, and firm D does not apply with a counterfeit application, the result will be a win-win outcome for both parties.

As the threat of file petition becomes more credible, it has more potential to change the pricing strategy of foreign firm.

1.7. TURKISH ANTI-DUMPING POLICY AND APPLICATIONS

1.7.1. Historical Background

Additional restrictions on imports had been introduced in Turkey with the Great Depression to prevent probable trade deficits. As a result of precautionary motives, quotas and quantitative restrictions became the basic rule for Turkish imports policy for many years. Starting from this period, the import of foods, textiles and luxury goods banned, and allocation mechanisms established for the import of raw materials and intermediate goods needed by industry (Boratav,2008).

Although the scope of quotas narrowed with a more liberal approach in the 1950-53 period, persistent and frequent balance of payments problems urged the country to adopt restrictive regulations for imports until the 1980s (Serin, 2001).

Turkey's import regime until 1980 is based on a negative list approach, and imports are principally prohibited except for the quota lists declared as "liberated," "allocated goods" and "contracted countries." Raw materials and intermediate goods, which are indispensable for production, and some drugs that are completely foreign-dependent or cannot meet the domestic demand are included in the liberated lists. Liberated lists are also organized in a dual structure where some goods were subject to authorization and the others totally liberated (Karluk, 2009).

In this general framework, Turkey adopted a particular import substitution economy by supporting its domestic industry with high tariffs and protectionist policies until the Decisions announced on Jan. 24, 1980. These decisions are

clear and radical change in policies from import substitution to export-oriented industrialization. Prior to them, there was a serious quota management and quantity restriction system with an allocation according to the field of usage approach in the import regime. Protectionism had been realized with these instruments for the development of domestic industries. Therefore, until 1989, when the first legal text was prepared, there was no need for selective policy tools such as dumping and subsidies in Turkey's legislation.

The main purpose of liberalization both in foreign exchange and import regimes, which have intensified since 1984, is to increase the competitiveness of industry and to facilitate the supply of raw materials needed. However, these liberalization efforts have brought some problems that the Turkish economy has not faced before.

The removal of quantity restrictions, reduction of tariffs, and elimination of non-tariff barriers led some Eastern European and Far Eastern countries to intensively export low-quality, non-standard, and low-priced products to Turkish market.

The main reason behind the preparation of dumping legislation is the increasing density of such imports. In the official report of the drafted Law in 1989, it is stated that the existing provisions regarding dumping are insufficient and that it is not possible to implement them since the application methods are determinate.

The first provisions relating to anti-dumping measures can be found in the Turkish Customs Code (Law No: 1615 in 1972) and the Council of Ministers were authorized to take counter measures against the countries that export dumped products. However, the method of implementation was not clearly specified. Therefore, until 1989, these provisions were not used or no legal regulation was made regarding the way dumping investigations carried out with any regulatory sub-action. Thus, Turkish anti-dumping and countervailing measures policy begins with 1989 Law.

It is clearly stated in the preparatory documents of the 1989 law that it is aimed to create a legislation that will not contradict the liberal import policies introduced thus far. It is also stated that the relevant provisions of the GATT and European

Community legislation, which was aimed to be a full member then, were also considered.

The provisions in 1615 Law were lacked a basic systematic structure and in response Turkey enacted its first complete anti-dumping code in 1989 under the title of “The Legislation on Prevention of Unfair Competition in Importation” (Law No: 3577). The Law consists anti-dumping and countervailing duties, and anti-circumvention measures.

Since the Law is titled as “Law on the Prevention of Unfair Competition in Imports,” it is obvious that the issue is considered in a perspective of distortions in fair trade and prevention of competition. However, it is controversial to give such an inclusive title to an Act that covers only a limited part of the situations that cause unfair competition in imports such as dumping and subsidies. The fact that a law in which the consumer is not involved in any form, shows that the title is too broad both in terms of scope and application methods. Moreover, changes in trade practices, differences in international production forms and the deepening integration models bring along the handling of the situation that cause unfair competition without the distinction of imports-domestic trade. Therefore, in general, unfair competition is defined in a much broader sense in many developed countries and is subject to more comprehensive main regulatory legal texts.

1.7.2. Operational Procedures

According to the Law, the President is given extensive authority to enact additional arrangements about the application procedures. In its current implementation, anti-dumping laws in Turkey, is legislated and enforced by the Law, the Presidential Decree and Regulation on the Prevention of Unfair Competition in Import.

The Law designates MoT as the investigation authority, and establishes the institutional structure of the *Board of Evaluation of Unfair Competition in Imports* (hereafter Board). It also specifies types of measures against dumping, subsidy, and circumvention activities.

In Turkish anti-dumping legislation, MoT (DG Imports) is the sole responsible technical authority in all stages of trade remedy investigations. There is no institutional distinction in Turkish practices regarding dumping margin calculation and injury determination. The organizational structure of the investigation authority has changed many times since 1989. (Undersecretariat of Treasury and Foreign Trade:1989-94, Undersecretariat of Foreign Trade: 1994-2011, Ministry of Economy: 2011-18 and MoT: after 2018)

The basic responsibilities of the MoT are checking the compliance of petitions filed with the legislation, conducting investigations, and making correspondence management with all relevant parties including WTO.

Board, on the other hand, is a bureaucratic mechanism aiming to enhance the coordination across different public organizations. Deputy General Director of DG Imports is the chair of the Board, and the relevant Head of Department is a natural member. Recently Ministry of Agriculture and Forestry, Ministry of Industry and Technology, Strategy and Budget Administration, The Union of Chambers and Commodity Exchanges of Turkey (TOBB), and The Union of Agricultural Chambers of Turkey (TZOB) are represented by one member in the Board.

The decision-making mechanism of the Board comprises in areas of opening decisions and closing investigations with or without provisional/ measures. It should be noted that, the decision of the Board is ultimately subject to approval of the Minister of Trade. DG Imports may conduct a preliminary analysis ex officio or upon the petition filed by domestic producers who carries the preconditions to represent its industry.

The initiation of anti-dumping investigations is obliged to have certain thresholds. If a domestic producer files an anti-dumping petition, it should also prove it has produced at least 25 percent of total production in Turkey in current or previous calendar year. This provisional requirement is necessary, but not sufficient for initiating an anti-dumping investigation. Following the preliminary phase, the MOT requires the applicant firm to disclose its production volume to ensure that the firm itself and its supporting producers reach a minimum of 50 percent of total production in the last calendar year (Ticaret Bakanlığı,2019).

Depending on the preliminary assessment, the MOT submits the case to the Board for decision. If approved by the Board and the Minister, a formal investigation is officially launched and announced in the Official Gazette. The general outline of the procedures is given in Figure 6.

Anti-dumping measures are principally imposed for 5 years but may be extended or modified with review investigations. There are 3 types of review investigations in Turkish anti-dumping legislation.

1. **Sunset Review (Expiry) Investigations**: Anti-dumping measures automatically expires at the end of 5 year. Prior to the allocated time lasts, it is notified in the Official Gazette in the form a Communique that the measure will be revoked. Domestic producers have the right to apply for extension of the existing measures before the expiration. In the case of review of the investigation, extensions are granted if adequate evidence of dumping and injury still exist.

2. **Interim Review Investigations**: After one year from the imposition of the final measure, an interim review investigation may be initiated based on submitted evidence and justifiable reasons from the relevant parties.

3. **New Exporter Review Investigations**: Exporters and producers have the right to file an application for individual margin calculation if they did not export their products to Turkey during the original investigation. Under certain conditions MoT may initiate a new-comer investigation based on such requests.

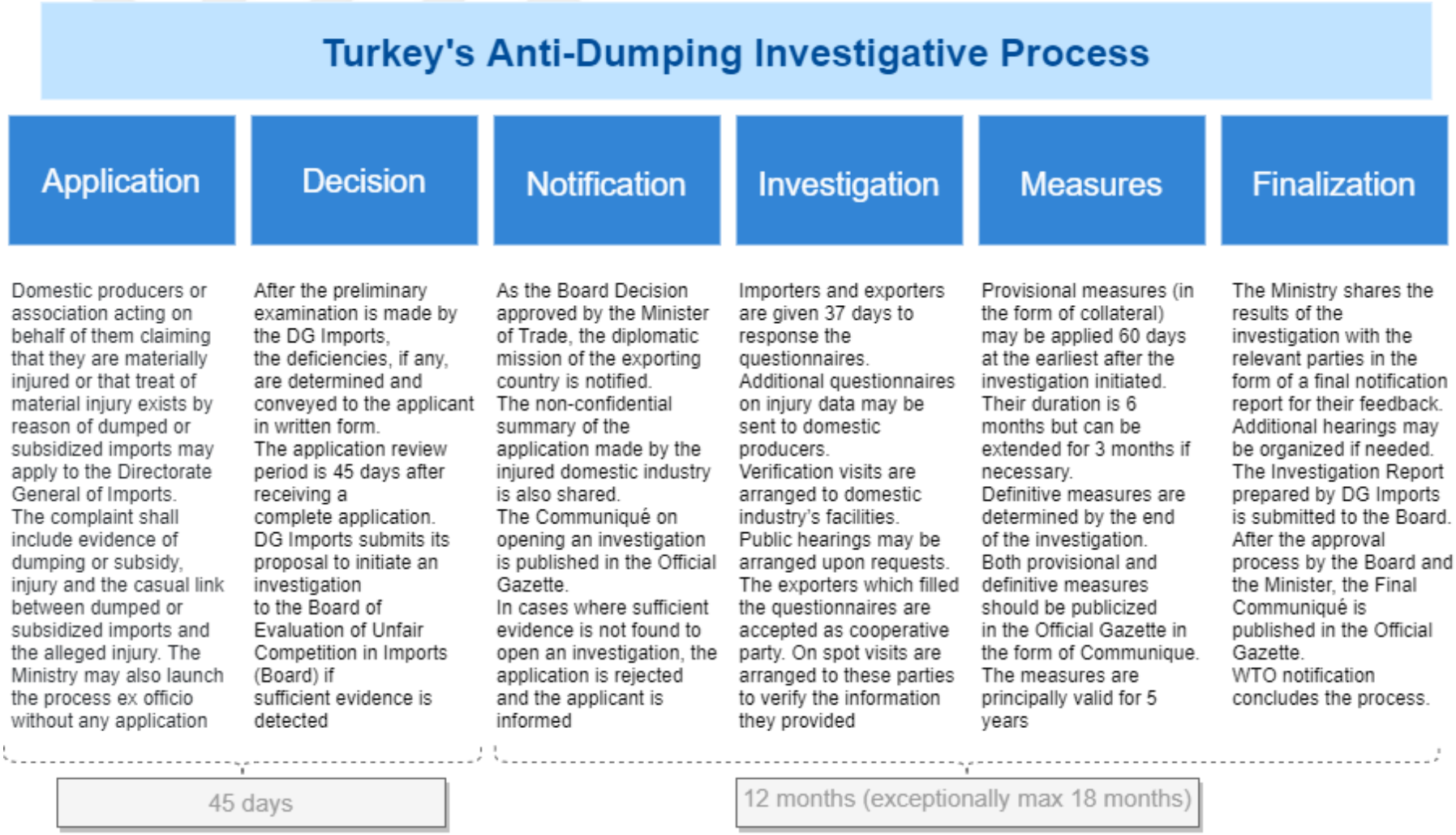


Figure 6: Turkey's Anti-Dumping Investigative Process

1.7.3. Brief Summary of Turkish Anti-Dumping Investigations

An extended summary of Bown (2016) on Global Anti-Dumping Database is provided in this section. The database is updated and revised by the data obtained from Turkish Official Gazette and the publicized tables in MoT website.

After nearly 5 months of the entry into force of the Law, Turkey, announced its first anti-dumping investigations and 5 investigations were publicized in the Official Gazette dated December 7, 1989. These investigations were against the products imported from Far East and Eastern Europe countries and were compatible with the justifications put forward in law preparation stages.

According to the information provided by the Turkish Official Gazette, since 1989 to 2020 Turkey initiated 161 anti-dumping investigations. In the context of Bown's classification parameters, where the product and country groups are defined separately by individual cases, the respective number of anti-dumping cases reach to 323 in the aforementioned period. The conditions for filing a petition are explained in detail in the previous section. Initiated investigation refers to these approved preconditions and official opening of the investigation. In certain circumstances, the investigative authority may decide to terminate investigation if the dumping or injury determination is negative after the initiation. Similarly, the petitioners may decide to withdraw their applications at early stages of an initiated investigation. These factors are also taken into account and listed in the following tables.

Table 2: Summary of Turkish Anti-Dumping Investigations

	Initiated	Terminated		Measures	
Period	Investigation	Negative	Withdrawn	Number	Rate (%)
1989-2000	100	43	0	57	57.00
2001-2010	137	7	0	130	94.89
2011-2020	86	5	21	57	66.28
Total	**323**	**55**	**21**	**244**	**75.54**

Source: Author's update of Bown(2016)
[1] Three investigations initiated in 2020 still continue

Table 2 - provides the number of anti-dumping investigations conducted over the span of three decades, according to processes and investigation results. It should be noted that early investigations had a high termination rate, primarily due to early capacity building activities and learning curve of investigation procedures which were not applied before. During this period, a total of 57 measures were imposed from 100 initiated investigations. 2001-2010 is the peak of Turkish anti-dumping investigation initiations and implementation of measures where roughly 95 of investigations resulted with anti-dumping duties. The last decade can be regarded as a relatively stable period with low investigation numbers and taken measures compared to prior years. The most striking feature of this period is the high amount of withdrawal rate, where a quarter of the applications were withdrawn.

The complete list of all initiated anti-dumping investigations and measures taken according to the targeted countries are given in Table 27 in the Appendix. It should be highlighted that Far East and Eastern Europe have been the focus of Turkish anti-dumping practices from the very beginning. Among the countries subject to AD investigation, China has maintained its leadership by far both in terms of initiated investigations and measures taken. Other countries subject to high rates of investigation include Taiwan, India, South Korea, and Thailand. A total 52 percent of the initiated investigations and 58 percent of measures taken were against these 5 countries between 1989-2020 period. Turkey has trade agreement with only South Korea out of the previously mentioned five countries. This agreement provides additional insight into Turkey's ACD policy, which will be examined and discussed in the following section.

In Table 3- the investigations and measures are summarized in 3 subcategories by using MoT industry definition and AD statistics. The most frequent industries subject to dumping investigations have been textiles and iron steel. In addition to the importance of these sectors in the national economy, the lobbying power and experience of domestic producers in these industries are also apparent factors in initiation decisions. However, number of AD investigations has been decreasing for textiles but increasing in machinery in recent years.

Table 3: Dumping Investigations and Measures Across Industries

Industry	Investigation	1989-2000	2001-2010	2011-2020	Total
Textile	Initiated	39	35	12	86
	Measure	21	30	11	62
Mining & Metals	Initiated	21	31	28	80
	Measure	15	30	14	59
Petro-Chemistry & Chemistry	Initiated	13	24	22	59
	Measure	9	23	9	41
Plastics & Rubber	Initiated	0	28	3	31
	Measure	0	28	3	31
Machinery	Initiated	8	2	11	21
	Measure	3	2	11	16
Electrics & Electronics	Initiated	3	2	2	7
	Measure	3	2	2	7
Others	Initiated	16	15	8	39
	Measure	6	15	7	28

Turkey's Anti-Dumping Investigations (1989-2020)
Source: Author's update of Bown(2016)
[1] Three investigations initiated in 2020 for Baby Food, Steel Tubes and Low Density Polyethylene still continue

The duration of dumping measures is not subject to a specific limitation, whether by domestic law or WTO regulations. The measure is applied for 5 years unless otherwise is demanded by domestic industry or other interested parties with legitimate reasoning. The original measure can be reinstated for another 5 years with the review investigations initiated with the application of the domestic industry before the measure automatically ends. Based on past practices, measures have shown a clear tendency to be extended many times. The average duration of all implemented measures since 1989 is 4.123 days, which corresponds approximately 2,26 times of the original 5-year period. The top 10 measures of the longest duration are given in Table 4 and 9 of them are still in force.

Table 4: Turkey's Longest Anti-Dumping Measures

Country	Product	Intitiation Date	Measure Date	Revoke Date
Russia, Bulgaria, Romania	Low Density Polyethylene	1993-10-09	1995-01-26	2020-03-03
China	Refillable Pocket Flint Lighters	1997-06-27	1998-05-29	
South Korea, Indonesia	Polyester Synthetic Staple Fibers	1999-03-04	2000-03-13	
Brazil, China	Fittings	1999-07-13	2000-04-27	
India, Taiwan	Polyester Textured Yarn	1999-03-04	2000-06-27	
China	Woven Fabrics of Synthetic and Artificial Stable Fibers	2000-09-30	2001-02-15	
China	Wall Clocks	2001-01-26	2001-11-07	
China, Taiwan, Malaysia,Thailand	Woven Fabrics of Synthetic Filament Yarn	2000-11-01	2002-02-13	
China	Pocket Lighters and Parts (Gas Fueled/Non-Refillable)	2001-11-11	2002-05-08	
Germany, USA	Polivinyl Chloride	2001-11-02	2003-02-06	

Top 10 Measures in terms of longest duration
Source: Author's update of Bown(2016)

Table 5 – illustrates both the distribution of the initiated dumping investigations examining the value of imports and product coverage. Even if the investigation was initiated in 4-, 6- or 8-digits HS or CN codes, tariff lines-based statistics (i.e., GTIP in Turkish foreign trade legislation in 12 digits) are provided for better

comparison. For conversion, Turkish Harmonized Commodity Description and Coding System (TGTC) is used, which was valid in the year of the initiated investigation.

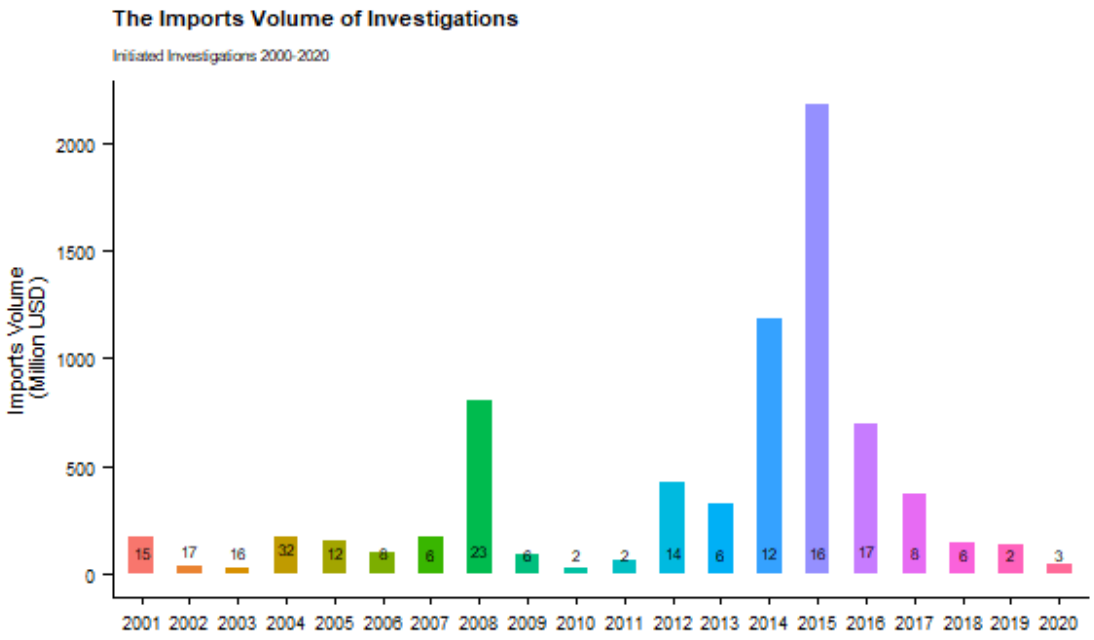
The value of the imports of products under investigation from the prior year are displayed in US dollars. The last column displays the weight of this value in total imports of the country at the same year. Figure 7 - provides both value of imports and number of initiated investigations within the same graph. The values are listed as the affected imports volume in USD and the initiated anti-dumping investigations. By 2015, the import volume coverage of the initiated investigations reach a peak point of approximately 1 percent of total imports of that year.

Table 5: Share of Anti-Dumping Initiations in Imports

Year	Initiated Investigations	Number of Tariff Lines	Imports (T_1) (USD)	Share in Total Imports (%)
2001	15	15	166,163,139	0.30
2002	17	41	35,304,379	0.09
2003	16	19	20,767,197	0.04
2004	32	110	169,952,086	0.25
2005	12	75	152,751,737	0.16
2006	8	23	98,233,873	0.08
2007	6	14	166,882,906	0.12
2008	23	176	807,506,974	0.47
2009	6	91	83,236,850	0.04
2010	2	9	26,140,252	0.02
2011	2	3	56,482,133	0.03
2012	14	175	422,154,953	0.18
2013	6	21	319,871,117	0.14
2014	12	65	1,183,760,118	0.47
2015	16	161	2,179,364,466	0.90
2016	17	71	693,869,279	0.33
2017	8	15	372,262,222	0.19
2018	6	6	143,788,079	0.06
2019	2	34	134,210,742	0.06
2020	3	3	45,762,697	0.02

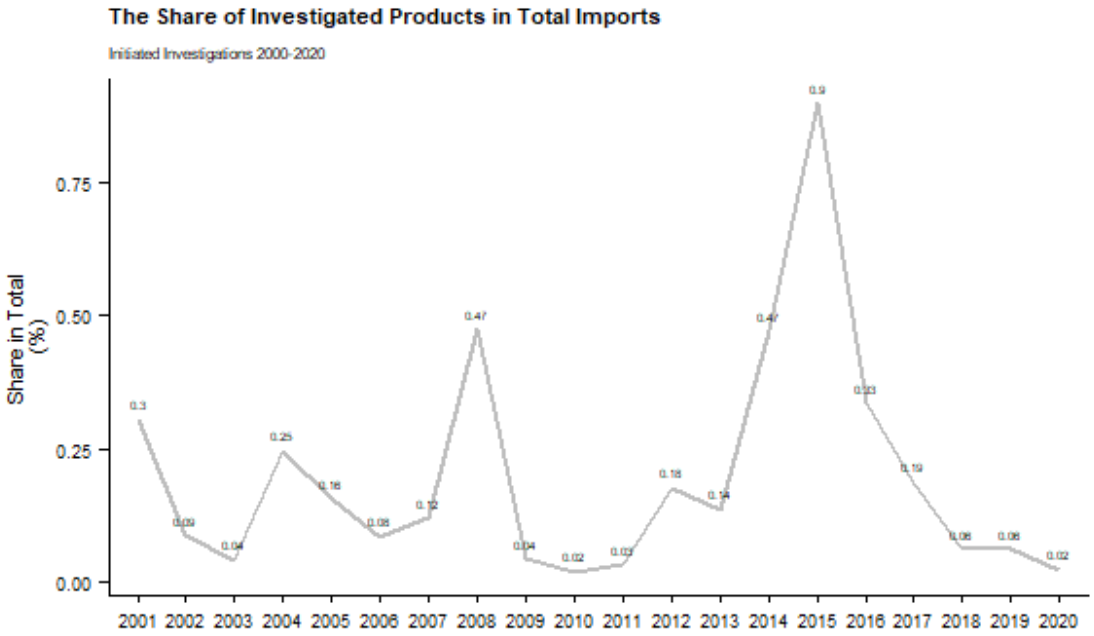
Turkey's Anti-Dumping Initiations in Last 20 years
Source: TUIK, MoT

Figure 7: The Weight of Anti-Dumping Investigations in Total Imports



Source:TUIK,MoT

Figure 8: The Weight of Anti-Dumping Investigations in Total Imports



Source:TUIK,MoT

CHAPTER 2

DETERMINANTS OF TURKISH ANTI-DUMPING INVESTIGATIONS

2.1 INTRODUCTION

Dumping and anti-dumping measures have the ability to disrupt trade patterns and firm behaviors. Dumped imports possess risks both for domestic firms and workers. States act against dumping practices by launching comprehensive firm-based investigations to protect domestic industries and prevent unfair trade practices.

As mentioned before, following the post-WTO era, a substantial change in the states employing anti-dumping investigations occurred. This is predominately due to the development of technical infrastructure provided by multinational trade scheme. The WTO framework standardized procedures which enabled developing states to initiate investigations and anti-dumping measures following the late 1990's. Figure 1- illustrates the number of countries that have imposed anti-dumping legislation since 1900. By 1980, 42 countries enforced anti-dumping laws and this number of states reached to 104 in 2000. As of 2020, 140 countries have anti-dumping regulations.

Historically, import policies have been vital area of concern in Turkey. As a developing country, various financial instruments have been implemented to overcome issues in trade deficit and industrial policy. According to WTO statistics, between the period of 1996 and 2019, Turkey was ranked as the 10th country in the world which employed the most anti-dumping investigations (WTO, 2020). However, with the global surge in protectionist measures after 2012, new measures were implemented in addition to the existing practices (Evenett & Fritz, 2015). Most notable change was the inclusion of ACDs as a new trade policy

instrument. Following its implementation in 2011, billions of dollars of ‘additional’ tariffs were enforced on textiles and apparel products from countries holding no preferential trade agreements with Turkey.

Although this first set of ACDs were launched as a result of a safeguard investigation, a rapid shift in its application is followed. In 2014, investigation process is eliminated, and an administrative Decree has been the only legal requirement to impose ACD for certain countries. Additionally, the new measure incorporated all types of goods and products, including industrial and agricultural goods which possibly entailed additional duties.

Considering this development, countries such as China, India, and other Asian countries were previously targeted by AD investigations, have naturally become exponents of this new policy instrument. In contrast to an AD investigation, ACD measures provide far greater advantages for policymakers in terms of cost efficiency and ease of implementation. They also provide protection for domestic producers and reduce pressure over policy makers stemmed from upsurging imports. Therefore, it could be postulated that these two measures compliment and substitute each other to a varying degree. In other words, both in domestic producers’ and policy makers’ perspective, ACDs provide practically similar results with less efforts compared to anti-dumping measures.

Evidently, domestic industries typically demand protectionist measures, which in return also is the leading cause for anti-dumping petitions. Therefore, ACD measures provide protection for domestic producers and reduce pressure over policy makers at the same time. Imposing ACD measures follow simple procedural steps which are complimented by policy makers possessing broad discretionary power, in contrast to the proceedings of AD investigations. In comparison, AD investigations are limited in terms of scope, by having a pre-determined investigation process, which are bounded by international arrangements and that is less valid for ACD practices.

Extensive research and literature exist on the determining factors of anti-dumping practices in developed and developing countries. Much of the existing research incorporate indicators such as political factors, lobbying activities, retaliatory motives, and macroeconomic factors as a general framework to study the phenomenon. Despite the wide-ranging research on the topic, studies on Turkish anti-dumping measures and investigations have been extremely sparse to date contrary to the predominant position of anti-dumping in Turkish trade policy.

In this study, special attention will be paid to some country specific factors and a comprehensive account of ACD will be provided. For this purpose, detailed imports statistics both for ACD and anti-dumping are prepared by using tariff lines (namely 12 digits GTIP in Turkish practices). The study is the first one identifying ACD among the determinants of anti-dumping decisions and the imports statistics are computed for the first time for ACD coverage since its implementation. Another contribution is updating and correction of data pertaining to Turkey on the Global Anti-Dumping Database (GAD). Inconsistencies are adjusted by comparisons with original Communiques published in Turkish Official Gazette.

Since many studies revealed that protectionism motive is remarkable in anti-dumping decisions, taking ACD practices and changes in industrial productivity into account may improve our understanding about Turkish approach to the subject. Similarly, balance of payment problems are historically important in Turkish economy and have constituted a material ground for imports policy. As trade deficit increases, some new policies were introduced to overcome these problems. For this reason, controlling trade deficit with explicit measures may enhance the explanatory power of the analysis. On the other hand, investigations are conducted with limited human resources and the number of investigations initiated in previous years may also be an important factor that should also be examined.

In addition to improvements in the data and the inclusion of ACD into the analysis, this study also aims to stimulate empirical inquiries in the rising global

protectionist environment especially for developing countries regarding AD investigations. Turkey as a developing country which has multidimensional trade structure and agreements with different trading blocs may provide a convenient starting point for this purpose.

Although ACD has been considered only in terms of anti-dumping in this study, future studies may be carried out in extended fields. Since it is applied in selective basis across countries and for large coverage in tariff lines, trade diversification effects, inflationary dynamics in domestic prices, impacts on production costs and losses in consumer welfare may be potential research questions in the future. The study also aims to rouse the impacts of other developing countries' similar protectionist policies over anti-dumping investigations moving from Turkish experience.

2.2 A NEW FACTOR IN TURKISH ANTI-DUMPING POLICY: ADDITIONAL CUSTOMS DUTY

Incorporation of the Customs Union with the EU and commitments to the WTO, prevents Turkey from autonomously setting tariffs. Thus, trade defense measures including dumping and safeguard measures have been the most frequently used instruments for protecting domestic industries. However, a new instrument under the name of *additional customs duty (ACD)* was introduced in 2011. Since its implementation, both its weight in tax collection and intense usage has led it to be applied as a protectionist tool. Compared to AD and safeguard investigations, ACDs are fast and easy to apply in terms of operational procedures.

In 2011, textile and apparel industries requested additional measures on the grounds that current tariffs and trade defense measures were insufficient in safeguarding domestic production against upsurging imports.[6] Following the request, a safeguard investigation commenced and ACD measures were imposed for the first time with using safeguard policy. EU member states and

[6] Communique on Safeguard Measures in Imports:2011/1

other nations which hold an FTA with Turkey were excluded and it has also been clearly stated that taken measures cannot exceed the WTO commitments.[7] However, it is evident that imposing additional duties by excluding certain countries in advance, violates the WTO Safeguards Agreement. As a result, this new duty which was initially carried out as a typical safeguard measure shifted into a different form with subsequent implementations.

Although the first set of ACDs were result of an investigation, all the rest imposed by Decrees of the Council of Ministers (Presidential Decrees after 2017) without any investigation. By changing the implementation procedures, it has been aimed to eliminate the incompatibility with WTO legislation. Still, the design is origin based and the issue continues to be problematic in the context of WTO, EU, and FTAs.

In addition, there are discussions in domestic law perspective that the additional duty cannot be accepted as tariff increase, and it has the nature of a new tax. Opponents advocate that the existing application is groundless, until a separate tax law is enacted with clear arrangements. Nevertheless, the legal dimension of the matter is beyond the scope of this study and ACDs will be examined with respect to their impacts on AD investigations.

After the limited application of ACD in its first years, recently there has seen a substantial increase both in scope and frequency. The utility of ACD measures has allowed for the reduction in pressure of imports over domestic industries and procedures. Therefore, there is an observable fall in file petitions requesting protection by anti-dumping measures.

Since 2011, 35 ACD decrees were introduced affecting almost every industry, with no application between the 2012-2014 period. By 2015 the frequency of Decrees substantially increased and ACDs emerged as the most frequently employed measure in Turkish imports policy. By 2020, ACD usage reached a new phase in the amount of imports volume covered, and agricultural products

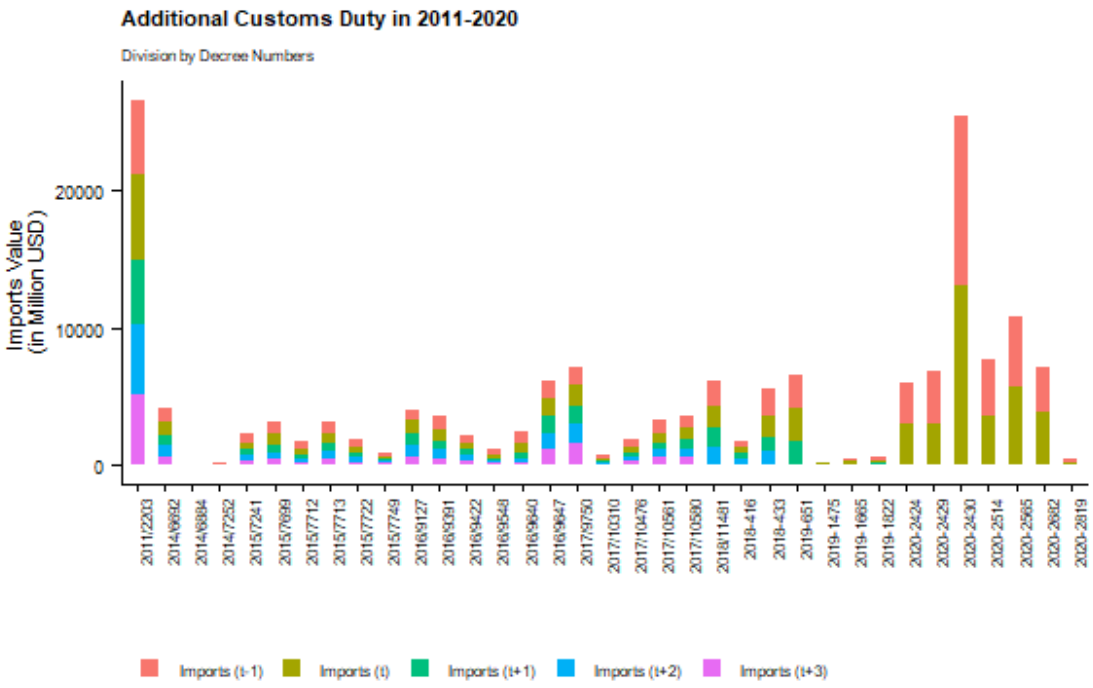
[7] Council of Ministers Decree:2011/2203

were also added to the scheme. The practicality of ACD measures has allowed to eliminate the pressure of imports over domestic industries by easier procedures. Therefore, there is an observable fall in anti-dumping file petitions by domestic industries after the adoption of ACDs.

Table 28 - shows the gradual transformation of the application. Since the volume of imports is among the most important factors that stimulate policy interventions, the value of imports of the previous year is also included in the table. For a clear comparison, the product coverage of the related Decree is transformed into tariff lines even it was originally designed in HS or CN codes. Top exporter countries are also included to show the most affected trade partners. A clear example of this can be seen, in the first Decree where Italy is out of scope and 4 biggest exporters of the previous year had been subject to ACD measures.

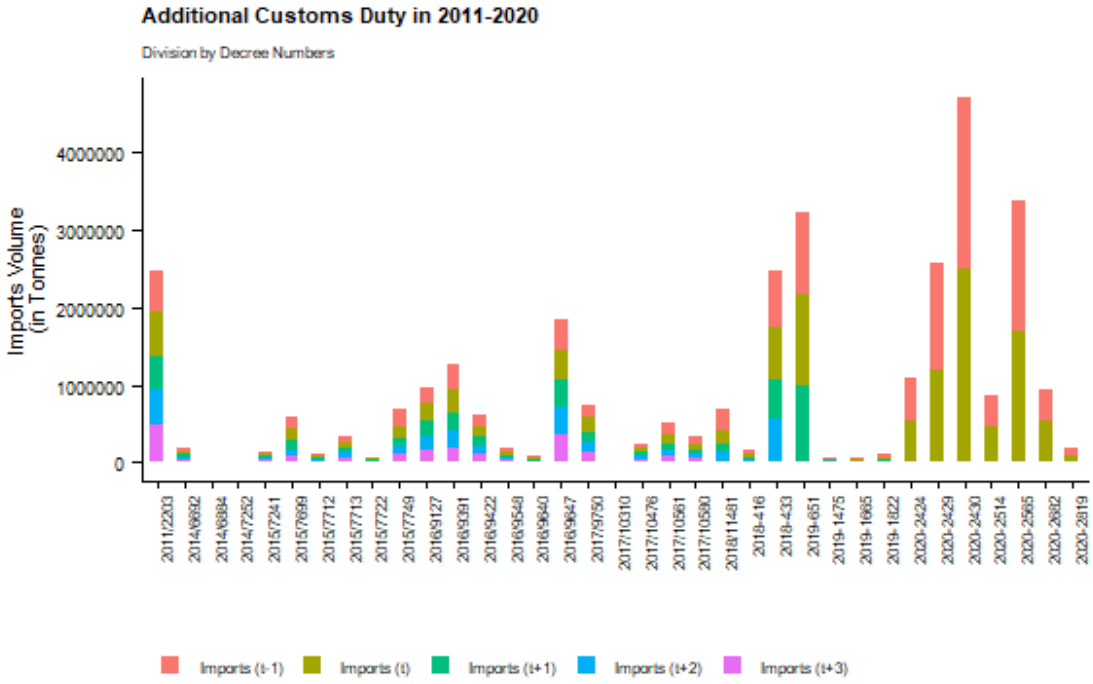
In Table 29 - the comparison in terms of physical unit of imports and changes across time in real terms is provided. The table clearly indicates the impact of the measure(s) over the top exporters when they are other than EU members or FTA signatories. For example, the decrease in imports is apparent in steel bars, rugs and floor coverings and garments, in which the top exporters of the previous year were generally have these specifications. Figures 9 and 10, on the other hand, visualize the changes both in imports volume and value based on Decree Number. t is the year where the relevant Decree is introduced, period change is reflected as the percentage change in physical volume of imports between $t-1$ and $t+3$.

Figure 9: Additional Customs Duty and Value of Imports



Source:TUIK

Figure 10: Additional Customs Duty and Physical Volume of Imports



Source:TUIK

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2.3 LITERATURE REVIEW

The policy area of dumping practices and its different aspects have been subject to numerous empirical research. Studies examining different economic and political factors and their effects on the initiation of dumping investigations constitute one of the most important research areas in anti-dumping literature.

Hansen & Prusa (1997) focus on economic and politic factors which affect investigation initiation decisions in the US for manufacturing industries. The authors attempt to model the decision-making process of the investigation authority by using a comprehensive industry, import, and political pressure dataset. According to their findings, political pressure is emphasized as an important factor in the US case.

Aggarwal (2003) attempts to identify the determining factors of dumping investigations by using macroeconomic, political and trade related variables. By using the panel data of 99 countries between 1980 and 2000, deterioration in balance of payments in developing countries, and macro-economic factors in developed countries are found to be more influential in initiation decisions.

Feinberg (2005) examines the macroeconomic factors that determine the anti-dumping file petition incentives of US domestic industries for 1981-1998. By comparing quarterly data of the macroeconomic state of the US economy with US firms' anti-dumping demand, the study finds positive relationship between real exchange rate and real GDP growth with anti-dumping file petitions.

Nielsen & Svendsen (2012) investigate the impact of lobbying activities in EU anti-dumping practices. The petitioners of an anti-dumping file, other firms in the same industry, civil society and non-governmental organizations are categorized as lobbyist, and their all type of efforts during each investigation process is defined as lobbying activity. The study recommends a measure of lobbying based on the theoretical foundations of public choice and indicates a significant

relationship between the domestic lobbying efforts and political position of the members in EU.

China is the country that faces the most anti-dumping investigations around the world. Li et al. (2018) investigates the determinants of anti-dumping investigations initiated against China by using a detailed country-industry data and Probit model. It is concluded that geographical distance cause less anti-dumping investigations against China, but increase of trade volume, GDP per capita, population, exchange rate, accession to WTO and financial crises rise the number of investigations.

Feinberg & Reynolds (2018) examine global anti-dumping filings in post-WTO era about retaliation motives. They evaluate the response of the targeted countries after an anti-dumping investigation whether to stay inactive, retaliate or take the case to WTO Dispute Settlement Mechanism (DSM). Evidence of generalized behavior pattern is found depending on the income level of the initial anti-dumping investigator country. Countries are less likely to retaliate with a new anti-dumping investigation against wealthier countries and DSM is a more applicable option in such circumstances.

Firme & Vasconcelos (2020) analyze developing and developed countries and illustrate that foreign income growth, domestic income, currency devaluation, current account surplus and reduction in imports are the factors in decreasing AD cases. Metal, chemical, and plastic products are found to be target of more AD investigations. The countries with higher income levels are likely to initiate more AD investigations and retaliation motives are quite significant among the determinants of anti-dumping investigations.

Ba & Coleman (2021) discuss anti-dumping decisions and evaluate protection demand in a de-industrialized world and integrated supply chains environment. They investigate the de-industrialization dynamics in anti-dumping petitions using a sample size of 34 industrialized and middle-income countries from 1978-2015.

According to their findings, real exchange rate fluctuations and retaliation motives affect demand for anti-dumping protection.

Turkey has also been subject to various analyses and econometric models. Most of these studies are extensions of Aggarwal (2003) and basically focus on macroeconomic indicators in determining the initiation of anti-dumping investigation decisions and none of them attempt to measure the impact of ACD in anti-dumping dynamics.

Disbudak and Turkcan (2005) is one of the earliest studies analyze anti-dumping initiations of Turkey from 1995 to 2003 by using a negative binomial model. GDP and imports growth rates are found to be statistically significant factors in anti-dumping investigations and Turkish AD investigations are essentially affected by macroeconomic variables.

Another noteworthy study is conducted by Avşar (2014) which uses some explanatory variables of Aggarwal (2003) including total employment of the industry, the percentage change in the total production of the industry and the percentage change in imports of that industry. It is concluded that the size of the local industry, the decrease in its production level and the increase in imported products of the same industry raise the number of AD investigations.

In another study, Özer & Erkal (2016) analyze the relationship between the number of AD investigations and macroeconomic indicators between 1989-2011. Import growth, domestic and foreign growth, and real exchange rates are the explanatory variables. According to their results, all these variables except for REER is found to be statistically significant in Turkey’s AD investigations.

As the most recent study about Turkey, the explanatory variables in Kaplan & Türkcan (2020) are domestic and foreign real GDP growth rates, import share of the country subject to AD investigation in Turkey’s total imports, share of Turkish exports to the country subject to AD investigation in Turkey’s total exports, and

reciprocal REER. It is found that all these variables except for REER and Turkey's GDP growth are statistically significant in Turkey's AD initiations. The general outline of the related literature is given below in Table 6.

In this study, various macroeconomic and trade related factors which have been found as significant determinants of anti-dumping investigations by the related literature are elaborated with respect to Turkish practices. As mentioned before, the impact of newly introduced ACD policy has not been examined yet in Turkish case and the study attempts to incorporate this new policy into the analysis.

Table 6: General Outline of Some Empirical Studies

Study	Time - Country	Methods	Results
Hansen & Prusa (1997)	1980-1988 US	Probit	Besides economic indicators, political pressure also affect investigation initiation in the US. The "name" of the targeted country and its market share in the domestic market are also significant factors.
Agarwal (2003)	1980-2000, 99 countries	Negative Binomial	Trade deficit and average tariff rates in developing countries; macroeconomic imbalances in developed countries are significant in AD initiations. Retaliation and past investigations against a certain country are also significant in both groups.
Feinberg (2005)	1981-1998, 15 countries	Negative Binomial	Real exchange rate and real GDP growth rate are significant determinants of AD file petitions.
Disbudak & Turkcan (2005)	1995-2013 Turkey	Negative Binomial	GDP and import growth rates are found statistically significant. Real exchange rate and GDP growth of the trading partner is not significant in Turkish anti-dumping initiations.
Nielsen & Svendsen (2012)	1995–2004 EU-15	Public Choice	Domestic lobbying activities cause changes in political position of member states in EU anti-dumping decision making process.
Avşar (2014)	1992-2008 Turkey	Negative Binomial	Size of the domestic industry, fall in its output and rising domestic competition due to surging imports cause increase in anti-dumping investigations.

Özer & Erkal (2016)	1989-2011 Turkey	Negative Binomial	Import growth rate of Turkey, and the GDP growth rates of 10 trading country which are subject to most Turkish anti-dumping investigations, positively effect investigation initiations. Turkey's GDP growth rate is also found statistically significant that negatively affects anti-dumping initiations.
Li (2018)	1997-2013, 20 countries	Probit	Exports, GDP per capita, population, nominal exchange rate, WTO accession, financial crises, and geographical distance are found statistically significant factors in anti-dumping initiations against China.
Feinberg & Reynolds (2018)	1995-2011 42 countries	Probit	In addition to the macroeconomic determinants of petitioning, retaliation is also found to be statistically significant. The income level of the dumping initiating country is found to affect the decision of respondent country.
Firme & Vasconcelos (2020)	1995-2013 46 countries	Poisson-Negative Binomial	A negative relationship is detected between anti-dumping cases and fall in imports, GDP growth, devaluation of the currency or improvements in current account balance.
Kaplan & Türkcan (2020)	1997-2017 Turkey	Negative Binomial	Real GDP growth rates of the country subject to AD investigation, its import share in Turkish total imports and share of Turkish exports to that country in overall exports found to be statistically significant in determining the number of AD investigations.
Ba & Coleman (2021)	1978-2015, 34 countries	Negative Binomial	Changes in exchange rates and effect of retaliation motives are found to be important elements behind anti-dumping investigations. Deindustrialization in advanced economies is also found as an emerging factor for anti-dumping demand.

2.4 EMPIRICAL METHODOLOGY

As an explanatory variable, initiated anti-dumping investigation is discrete count data. Therefore, choice of econometric model is highly dependent on this nature of the explanatory variable. Normal distribution of the error term is one of the basic assumptions of OLS regression and count data generally violates this assumption. Homoscedasticity assumption and non-negativity of the dependent variable are other problems in discrete variables. Thus, alternative methods are needed to be employed and count data may be estimated with Poisson-based

regression techniques. Poisson (log-linear), negative binomial and zero inflated negative binomial regression are the general techniques widely used in determinants of anti-dumping initiation studies.

Cameron & Trivedi (2013) define event count in its simplest form as the conditional mean of dependent variable which is restricted to be a non-negative random variable and depends on some vector of explanatory variables. Broadly,this is a nonlinear generalization of linear model but correct specification of mean and variance requires special attention. When the discrete random variable Y has Poison distribution with *intensity parameter* μ where $\mu > 0$ and t is a particular time or space unit of observation then it has density.

$$Pr[Y = y] = \frac{e^{-\mu t}(\mu t)^{y}}{y!},\ y = 0,1,2, \ldots.\ where\ E[Y] = V[Y] = \mu t$$

Accordingly, Poisson distribution is the probability distribution of a given number of independent events in an *exposure* with an average rate. If the length of t is set to unity then the exposure independent distribution is obtained. It is positively skewed and assumes the mean and variance of the distribution are equal.

In a time series count data analysis with Poisson regression model, given the vector regressors of $\mathbf{x_t}$, regressand $\mathbf{y_t}$ is independently Poisson distributed with density:

$$f(y_t|\ \mathbf{x_t}\ ) = \frac{e^{-\mu_t}\ {\mu_t}^{y_t}}{y_t!},\ y_t = 0,1,2, \ldots$$

and mean parameter is $\mu_t = exp(\mathbf{x_t'\beta})$ where $\boldsymbol{\beta}$ is a $kx1$ parameter vector. Mean parameter is estimated by maximum likelihood methods. Since, $\log(\mu_t) = \mathbf{x_t'\beta}$,the log in this equation is the link function used by most generalized linear models. It ensures the non-negativity of the mean which is aimed by count data.

However, Poisson regressions as the benchmark model have quite limiting requirement of mean and variance equity (equidispersion assumption) which is not common in real world circumstances. Over-dispersion (variance exceeding mean) or under-dispersion (mean exceeding variance) are more common cases compared to equidispersion. Thus, negative binomial and zero inflated negative

binomial regressions are designed to be alternatives depending on the characteristics of data.

Negative Binominal Regressions are extension of Poisson regression family. Mean structure does not change but over-dispersion is controlled by an extra parameter called dispersion parameter. It allows variance to exceed mean and its distribution is as follows:

$$Pr(y_t|\ \mu_t,\ v_t) = \frac{\Gamma(y_t + v_t)}{y_t!\,\Gamma(v_t)}\left(\frac{v_t}{v_t + \mu_t}\right)^{v_t}\ \left(\frac{\mu_t}{v_t + \mu_t}\right)^{y_t}$$

The v_t parameter captures the level of overdispersion. The conditional mean is $E[y_t|x_t] = \mu_t = exp(x_t\beta)$ and the conditional variance is

$$V(y_t\ |\ x_t\ ) = \mu_t\left(1 + \frac{\mu_t}{v_t}\right) = exp(x_t\ \beta)\left(1 + \frac{exp(x_t\ \beta)}{v_t}\right)$$

To identify this variance, we assume the heterogeneity parameter v_t is constant across all observations. Then $V(y_t\ |\ x_t\ ) = \mu_t + ({\mu_t}^2/v_t)$. As v_t gets larger dispersion dissappears and the variance converges to the mean.

Zero-inflated poisson (ZIP) regressions are other type of extensions designed for count data that includes excess of zero counts. The main idea of ZIP is modeling two alternative outcome sets separately. In one set (S1) the outcome is always a zero and in the other (S2) the counts follow a standard Poisson process. Lets assume $Pr[y_t \in S_1]\ = \omega_t\ \ Pr[y_t \in S_2]\ = 1 - \omega_t\ \ and\ t = 0,1,2,\ldots,n$. Then

$$Pr[y_t\ = 0]\ = \omega_t + (1 - \omega_t)exp(-\mu_t)\ and\ Pr[y_t = r]$$
$$=\ (1 - \omega_t)exp(-\mu_t)\frac{{\mu_t}^r}{r!}\ and\ r = 1,2,\ldots$$

As before, covariates enter the model through the conditional mean,μ_t, of the Poisson distribution and $\mu_t = exp(\mathbf{x_t'\beta})$ where $\boldsymbol{\beta}$ is a $kx1$ vector of coefficients.In this set up, $E[y_t|x_t] = (1 - \omega); V(y_t\ |\ x_t\ ) = (1 - \omega_t)(\mu_t + \omega_t{\mu_t}^2)$ and over-dispersion is subject when $\omega_t > 0$.

Despite the substantial increase in models of time series of counts in the literature, there has yet to be a widely accepted procedure. In count time series

models, the binding requirements are still the non-negativity condition of the observations and treating the dependency relations among observations with fitted instruments. According to Davis & Wu (2009) negative binomial models may be appropriately used in time series count data.

2.5.1. Model Specification

The aim of the study is to reveal the main determinants of the AD Investigations initiated by Turkey between 1989-2019. For this purpose, some macroeconomic variables of Firme & Vasconcelos (2020) and Ba & Coleman (2021) will be used with adaptations to Turkish case. Since the explanatory variable is count data, the econometric methods that can be used to find out the factors behind anti-dumping initiations is quite limited. Thus, the same econometric model, negative binomial model, is used as all other similar studies.

In determining the factors that affect anti-dumping initiations, macroeconomic variables such as Turkey's real GDP growth, real exchange rate, imports growth, trade deficit to GDP rate, manufacturing value added as of GDP, and imports penetration rate will be utilized.

In addition, the impact of newly introduced ACD policy over AD investigations, retaliation measures, formerly initiated anti-dumping investigations and financial crises are also analyzed as explicit factors.

$$AD_t = f\left(AD_{t-k}, Y^g_{t-k}, e_{t-k}, M^g_{t-k}, TD_{t-k}{}^{GDP_{t-k}}, MVA_{t-k}{}^{GDP_{t-k}}, ACD^{M_{t-k}}_{t-k}, ImpPen_{t-k}, Ret_{t-k}\right)$$

where $k = (0,1,2\ldots)$ and is lag of the variables.

It is widely emphasized in the literature that as the economic activities slow down, protection demand of the domestic industries rises. Conversely, a positive relationship is anticipated between the number of AD investigations and increase in imports (Aggarwal,2003). Similarly, a retaliation motive is also expected to cause more AD investigations for a given country (Kaplan & Türkcan, 2020). Trade deficit to GDP ratio and import penetration rate are also expected to move in the same direction with AD investigations. However, the relationship of initiated

investigations with real GDP growth and real exchange rates remains ambiguous in the literature.

AD_{t-k} as the lag of AD investigations is in the function because the administrative capacity may be a factor in deciding to initiate new investigations. GDP variations are included in anti-dumping determination literature to control the effects of business cycles over anti-dumping demand of the industries. For this purpose, annual real GDP growth denoted by Y_{t-k}^{g} is used. e_{t-k} is CPI Based annual real exchange rate. Depreciation or appreciation of REER is closely related to imports and accepted as one of the most important determinants of imports and demand for protection.

The level or growth of imports is expected to influence anti-dumping decisions via different channels. Thus, three different variables are included to control different aspects of imports.M_{t-k}^{g} is annual growth of imports and ${TD_{t-k}}^{GDP_{t-k}}$ is trade deficit percentage to GDP. Import penetration ratio is a specification used in the literature to observe the impact of imports over domestic demand. According to OECD definition it is specified as:

$$ImpPen_{(t-k)} = 100 * \frac{M_{(t-k)}}{Y_{(t-k)} - M_{(t-k)} + X_{(t-k)}}$$

where Y_{t-k} is the output, M_{t-k} is the imports and X_{t-k} is the exports. Hence, the denominator of the equation is domestic demand.

${MVA_{t-k}}^{GDP_{t-k}}$ is manufacturing value added (% of GDP). Manufacturing activities are classified under ISIC divisions 15-37 and value added is the net output of an industry in World Bank National Accounts Data. The change of the manufacturing activities across time may be an explanatory variable to control anti-dumping expectations of the manufacturing industry. Intuitively, as the value-added increase (decrease) anti-dumping demand is expected to decrease (increase).

ACD is a relatively new instrument in Turkey's import policy as mentioned in previous sections. $ACD_{t-k}^{M_{t-k}}$ is a variable measures the percent of ACD-covered imports in total imports value.

In many studies, retaliation is widely accepted as one of the most important dynamics that substantially affects anti-dumping initiations. Thus, it is also explicitly included it in the analysis. Ret_{t-k} is the number of retaliated anti-dumping investigations.

Since the dumping investigations are initiated depending on past performances, the number of lags chosen is an important and frequently discussed in the literature. It is not specified in Turkish anti-dumping investigation initiations on which periods are taken as investigation and injury determination periods. These periods are included in the closing Communiqués in which the measures are publicized. Furthermore, they depend on case basis and due to these limitations, only first lags of the variables are incorporated. According to Aggarwal (2003) and Knetter & Prusa (2003), such a lag preference is adequate and applicable.

Prior to elaboration of the regression equations, it will be appropriate to check the data regarding over-dispersion as well. Number of initialed investigations (AD_t) shows a clear sign of over-dispersion with a mean 10.32 and variance 60.36. Since variance is 5.85 times the mean, negative binomial regressions for the analyses are used.

2.5.2. Data

AD_t is the number of anti-dumping initiation in a given year and it is produced from updating GAD by using Turkish Official Gazette. Since 1989, all investigations carried out in GAD have been verified with published official gazettes. Especially in first 5 years of Turkish anti-dumping practices some discrepancies are observed between the original texts and WTO notifications. Since these notifications are the core source of GAD, some modifications and adjustments are made according to the original texts in the Official Gazette.

Y_t^g is the annual real GDP growth of a given year t and taken from IMF International Financial Statistics. e_t is CPI based annual real exchange rate and the data is utilized from Bruegel's real effective exchange rate (REER) database (Darvas, 2012). The database consists of a narrow index, examining 67 trading partners and is available from 1960 and that version is used in the analysis.

M_t^g and ${TD_t}^{GDP_t}$ is computed from Turkish Statistical Institute (TUIK) Foreign Trade Statistics Database. The figures are based on current USD value of imports in this database and ${TD_t}^{GDP_t}$ is the percentage of trade deficit over GDP. GDP statistics is from World Bank's World Development Indicators database in current USD.

${MVA_t}^{GDP_t}$ as the rate of manufacturing value added (% of GDP) is available in World Bank World Development Indicators (WDI) database. Turkey is among the countries which keeps this data since 1960.

In calculating $ImpPen_t$, imports and exports data of foreign trade statistics database of TUIK in current US dollar is used. The output data is obtained from WDI database in current USD.

Ret_t is calculated as the number of anti-dumping investigations launched by a country in which Turkey has also initiated investigation to that country at the same year. No order of precedence considered for this variable and the only criteria is both countries conducting anti-dumping investigations against each other at the same year. Since WTO statistics keep records of most countries' anti-dumping investigations against each other, they are mainly used as the source for this variable. However, they include the data for the period of 1995-2020. Thus, all the information in GAD and MoT statistics is combined to create a retaliation table for the period of 1989-1995.

$ACD_t^{M_t}$ is defined as the rate of protected imports value in year t ccompared to the total imports value of that year. It is computed from the data of TUIK Foreign Trade Statistics Database. ACD_t is a dummy variable that controls the existence of ACD measure in a given year. As the measure exist it takes the value of 1; and 0 otherwise. $Crisis_t$ is a dummy variable that controls the financial crisis of Turkish economy. It takes value of 1 for 1994, 2000-01 and 2008; and 0 for the others. Descriptive statistics of the variables are given in Table 7.

Table 7: Descriptive Statistics of the Variables

	vars	n	mean	sd	min	max	range	se
AD	1	31	10.323	7.769	0.000	32.000	32.000	1.395
Y_g	2	31	4.487	4.582	-5.800	11.200	17.000	0.823
e	3	31	78.967	15.477	52.725	106.748	54.024	2.780
M_g	4	31	10.943	21.118	-30.221	53.455	83.676	3.793
TD_GDP	5	31	-7.726	2.319	-12.630	-3.890	8.740	0.417
MVAD_GDP	6	31	18.629	2.542	15.054	23.122	8.068	0.456
ImPen	7	31	20.463	3.950	13.365	26.760	13.395	0.709
Ret	8	31	0.839	1.241	0.000	4.000	4.000	0.223
ACD_M	9	31	0.367	0.762	0.000	2.621	2.621	0.137
ACD	10	31	0.226	0.425	0.000	1.000	1.000	0.076
Crisis	11	31	0.129	0.341	0.000	1.000	1.000	0.061

2.5 RESULTS

ACDs are still a relatively new instrument but has gained momentum in recent years. Due to low number of observations, the first regression group was applied without considering ACD. In the second group, ACD is also included with different controlling variables over anti-dumping investigations.

In selecting best fitted models, both zero inflated and negative binomial regressions are implemented. All the regression results provided in Tables 2.3 and 2.4 are negative binomial regressions due to their better performance compared to zero inflated models. The models in the last columns are best performing models based on AIC to explain the determinants of anti-dumping investigation initiations for the period of 1989-2019.

Table 8- presents seven models controlling various variables associated with different aspects of macroeconomic indicators, retaliation behavior and manufacturing sector's value-added characteristics. In this group of models, explanatory variables of past year's investigations (AD_{t-1}), annual real GDP growth (Y_{t-1}^{g}), import growth (M_{t-1}^{g}), log of real exchange rate ($log(e_t)$), trade deficit over GDP (${TD_{t-1}}^{GDP_{t-1}}$), retaliation (Ret_t), and financial crises ($CrisisDummy_t$) are positively correlated with initiation of anti-dumping investigations. Manufacturing value added over GDP (${MVA_{t-1}}^{GDP_{t-1}}$) and import

penetration rate ($ImpPen_{t-1}$) have inverse relationship with new investigation initiations.

Contrary to expectations, AD_{t-1} has positive sign in all regressions but among many other iterations in different model specifications it is statistically significant only in Model 3. The investigations are conducted by limited human capital in predetermined time frames. In a general sense, it is expected that previous year's investigations to have negative effects on current year anti-dumping investigation initiations. However, the regression results display an opposite direction, but this result is not robust across different specifications.

According to many studies, the demand for anti-dumping protection rises during recession periods, similarly protectionist pressure increases when GDP growth is low or negative. However, the results do not verify such a relationship with respect to GDP growth. The sign on the coefficient of Y_{t-1}^{g} is positive in all models specified but statistically significant in only 3 of them. On the other hand, the coefficient of financial crisis is consistent with this expectation but not statistically significant. Similarly, real exchange rate has a positive sign, but it is not a robust factor in anti-dumping investigations. Its log of first lag to different regressions is also included but the result did not change, and its log level performed better.

Rather than import growth, trade deficit as a percentage of GDP is more important determinant of anti-dumping initiations. It is statistically significant in each model used as an explanatory variable. Retaliation motives also seem substantially important in Turkish case and in each of the model used it is statistically significant too.

Manufacturing value added as a percentage of GDP is another significant determinant of investigations and have a negative sign across all the models used. Despite its consistent negative relationship with the investigations, import penetration rate is statistically significant only half of them.

Table 9- shows the results of regressions when ACD is included with 2 different explanatory variables. Both control variables indicate a consistent negative relationship between ACD and anti-dumping investigations. As substitutes to

each other, both variables are used in different models but none of them are statistically significant. Due to the relatively recent implementation period, more time is required to observe their long-term impacts on anti-dumping investigations. Still, consistent negative coefficients maybe evaluated as a signal for the need of persistent follow up in the near future.

In negative binomial regression, rather than the coefficients, the incident rate ratios (IRRs) are used for interpretation. IRR is exponentiated coefficients and the IRR value of a variable indicates how much a one percent change in this variable cause a change in the dependent variable while all other variables are constant.

Table 8: Regression Results

Regression Results

	Number of Anti-Dumping Investigation Initiations in year t (AD_t):						
				AD			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
AD_{t-1}	0.02	0.03	0.04*				
	(0.02)	(0.02)	(0.02)				
Y^g_{t-1}	0.001	0.07	0.02	0.09*	0.03	0.08*	0.09*
	(0.05)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
M^g_{t-1}	0.01						
	(0.01)						
$\log(e_t)$	0.20						
	(0.78)						
$TD_{t-1}^{GDP_{t-1}}$		0.20*		0.30***		0.24*	0.30***
		(0.10)		(0.08)		(0.10)	(0.08)
$MVA_{t-1}^{GDP_{t-1}}$		−0.15*	−0.15*	−0.16**	−0.24**	−0.21**	−0.15**
		(0.07)	(0.07)	(0.05)	(0.07)	(0.07)	(0.05)
Ret_t		0.40***	0.35***	0.34**	0.25*	0.34***	0.37***
		(0.11)	(0.10)	(0.11)	(0.10)	(0.10)	(0.10)
$ImpPen_{t-1}$		−0.05	−0.13*		−0.16**	−0.07	
		(0.06)	(0.05)		(0.05)	(0.06)	
$CrisisDummy_t$		0.02		0.20			
		(0.41)		(0.39)			
Constant	1.14	6.66**	6.81**	6.56***	9.62***	8.62***	6.72***
	(3.33)	(2.39)	(2.30)	(1.40)	(2.25)	(2.09)	(1.37)
Observations	31	31	31	31	31	31	31
Log Likelihood	−103.12	−94.02	−95.90	−95.62	−97.76	−95.26	−95.76
θ	1.91** (0.61)	4.33* (1.74)	3.48** (1.28)	3.70** (1.43)	2.89** (1.00)	3.74** (1.42)	3.64** (1.39)
Akaike Inf. Crit.	216.24	204.03	203.81	203.24	205.52	202.52	201.52

Note: *p< 0.05; **p< 0.01; ***p< 0.001

Table 9: ACD Included Regression Results

ACD Included Regression Results

	Dependent variable:						
	Number of Anti-Dumping Investigation Initiations in year t (AD_t):						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
AD_{t-1}	0.02	0.03					
	(0.02)	(0.02)					
Y^g_{t-1}	0.02	0.07*	0.09**	0.08*	0.08*	0.09**	0.09**
	(0.06)	(0.04)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)
M^g_{t-1}	0.004						
	(0.01)						
$\log(e_t)$	0.21						
	(0.78)						
$ACDDummy_{t2}$	−0.17				−0.22		−0.30
	(0.40)				(0.32)		(0.29)
$TD_{t-1}^{GDP_{t-1}}$		0.21*	0.30***	0.26*	0.26*	0.30***	0.31***
		(0.10)	(0.08)	(0.10)	(0.10)	(0.08)	(0.08)
$MVA_{t-1}^{GDP_{t-1}}$		−0.15*	−0.17**	−0.20**	−0.20**	−0.17**	−0.17**
		(0.07)	(0.05)	(0.07)	(0.07)	(0.05)	(0.06)
Ret_t		0.41***	0.37**	0.36***	0.35***	0.38***	0.36***
		(0.12)	(0.12)	(0.10)	(0.10)	(0.09)	(0.09)
$ImpPen_{t-1}$		−0.04		−0.05	−0.04		
		(0.07)		(0.07)	(0.06)		
$CrisisDummy_t$		0.003	0.10				
		(0.42)	(0.41)				
$ACD^{M_{t-1}}_{t-1}$		−0.08	−0.14	−0.10		−0.16	
		(0.17)	(0.17)	(0.18)		(0.16)	
Constant	1.11	6.49**	6.86***	8.26***	8.31***	6.96***	7.15***
	(3.32)	(2.42)	(1.43)	(2.16)	(2.08)	(1.38)	(1.44)
Observations	31	31	31	31	31	31	31
Log Likelihood	−103.06	−93.92	−95.29	−95.11	−95.03	−95.32	−95.22
θ	1.92** (0.61)	4.37* (1.76)	3.78** (1.45)	3.80** (1.45)	3.87** (1.50)	3.76** (1.44)	3.85* (1.50)
Akaike Inf. Crit.	218.12	205.84	204.57	204.21	204.07	202.64	202.45

Note: *p< 0.05; **p< 0.01; ***p< 0.001

The coefficients and IRRs of these selected models are provided in Table 10. As the IRRs indicate, 1 percent increase in real GDP growth is associated with 9 percent increase in AD investigations. This effect is more apparent both for trade deficit over GDP ratio and retaliation behavior. 1 percent increase in trade deficit over GDP and retaliation is accompanied by 35 and 45 percent increase in dumping investigations respectively.

Table 10: Coefficients and IRRs of the Selected Models

	Model 1		Model 2	
	Coefficient	IRR	Coefficient	IRR
Y^{g}_{t-1}	0.09	1.09	0.09	1.09
$TD_{t-1}{}^{GDP_{t-1}}$	0.30	1.35	0.31	1.36
$MVA_{t-1}{}^{GDP_{t-1}}$	-0.15	0.86	-0.17	0.84
Ret_t	0.37	1.45	0.36	1.44
$ACD\ Dummy_{t2}$			-0.30	0.74

However, one percent increase in manufacturing value added over GDP causes 14 percent fall in anti-dumping investigations. These figures slightly differs when ACD in model 2 is included. In this case, existence of ACD in a given year yields 26 percent fall in anti-dumping initiations. However, the coefficient of ACD indicator is not statistically significant contrary to all other variables mentioned.

The findings with respect to domestic GDP growth supports the findings of Kaplan & Türkcan (2020) which is the most recent study about Turkey. Although their result is not statistically significant, this study finds a positive and statistically significant relationship between real GDP growth and anti-dumping investigations.

According to Ba & Coleman (2021) there is a robust and statistically significant relationship between anti-dumping investigations and retaliation. The same way relationship is also found for Turkish case. Although they used industrial value added due to lack of manufacturing data to control productivity, the availability of data for Turkey allowed to use manufacturing value added in this study for the

same purpose. The results also show the same way interaction with anti-dumping investigation and value added by the related industry.

Aggarwal (2003) emphasizes the number of anti-dumping cases is related to trade deficit and import growth. Nevertheless, all the studies about Turkey used share of imports or imports growth rate rather than trade deficit. In this study, both imports growth and trade deficit are controlled via different models. It is found that trade deficit indicator works better to explain the relationship compared to imports growth.

2.6 DISCUSSION

Import policies have been traditionally important for Turkey and as many other developing countries trade-related measures have been used in different time spans especially for trade deficit problems and industrial policy design. Trade defense instruments and most notably anti-dumping measures have been widely used in this perspective and Turkey has consistently been among the top users of anti-dumping investigations in last 3 decades. With global rising of protectionist movements, a new trade policy instrument (ACD) was introduced in 2011 which has considerable potential to affect anti-dumping initiation decisions due to its ease of application procedures. In this study, the main determinants of Turkish anti-dumping investigations with special emphasize to ACD are investigated.

The determinants of anti-dumping initiations are analyzed with different control variables and 2 bunches of models are conducted with and without ACD intervention. In this set of regressions, various macroeconomic indicators, retaliation behavior and manufacturing sector's value added are controlled. According to our findings, the most important factors that affect investigations are retaliation motives, deterioration in trade deficit and productivity of the manufacturing sector. Although it is statistically less significant compared to these factors, real GDP growth is also an important element in Turkish practices. A negative relationship between anti-dumping investigations and ACD is also detected but since it is applied since 2011 more time is needed for further inference.

As our findings indicate, more structural areas of the economy such as trade deficit, retaliating trade partners, changes in manufacturing value added, and GDP growth are dominant factors in Turkish anti-dumping policy. These factors are mostly related to protectionist motives, industrial productivity problems and overall macroeconomic stability. Thus, it seems more likely that the importance of ACD will substantially increase and it can be a serious alternative to AD investigations soon. Recent fall in file petitions strengthen this expectation and ACD provide a more practical tool for Turkish authorities compared to anti-dumping investigations. Because imposing ACD does not require any additional administrative burden or rigid legislative requirements based on WTO Agreements contrary to AD investigations. In addition to its convenience for protection purposes, traditionally targeted countries via anti-dumping investigations can be subject to substantial additional tariffs with less administrative efforts and large import tax revenues.

However, ACD is more distortive tool compared to AD based on its extensive coverage, less selective nature and there is no time limit on its duration of validity. In such a setting, lobbying power of different actors become more important than anti-dumping investigations and predictability of application procedures fade away. AD and ACD have quite different policy implications especially in terms of allocation problem. Thus, comparison of similar protective measures in other developing countries with anti-dumping investigations offer productive outputs for researchers. In Turkish case, losses in consumer welfare, distortions in investment decisions across industries and rise in inflation via pass through of import prices due to ACD policy are most important aspects that could be examined.

2.7.1. Visual View of the Variables' Effects

Figure 11: High-Order Effects of the Selected Model

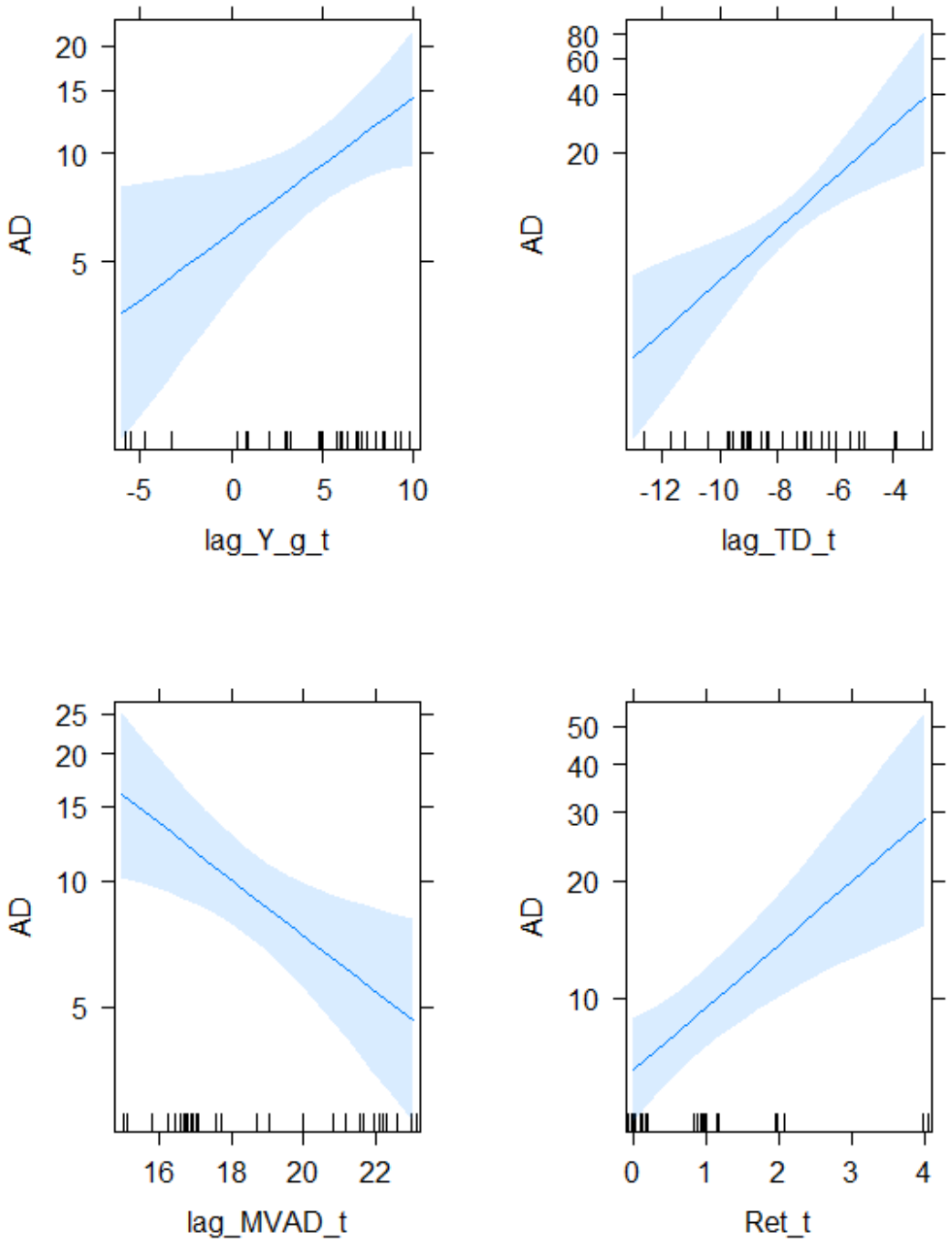
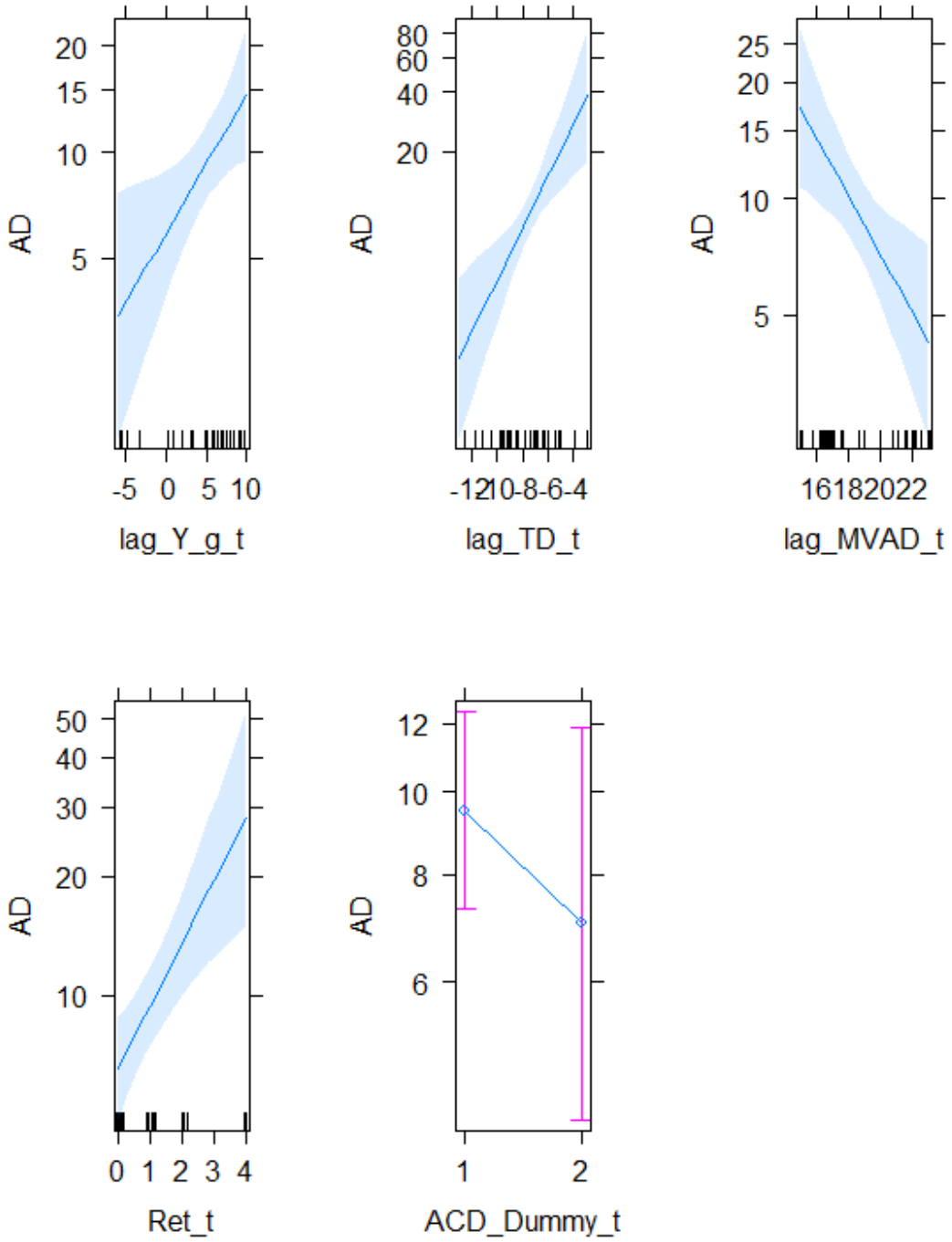


Figure 12: High-Order Effects of the Selected Model for ACD



CHAPTER 3

INTERVENTION ANALYSIS OF TURKISH ANTI-DUMPING INVESTIGATIONS: EVIDENCE FROM STEEL INDUSTRY

3.1 INTRODUCTION

Steel is one of the most important materials of the industrial society and is among the key commodities of the global economy. Automotive, construction, energy, machinery, transportation, and packaging are the top industries where the steel is intensely used as the most critical input. It is such a crucial commodity for the global economy that some studies suggest using world steel production as a measure to predict the global real economic activity (Ravazzolo & Vespignani,2020). Rising digitization in informatics, expanding infrastructure investments, rebuilding activities for smart cities and changing patterns in urban development are important factors that support worldwide steel demand. Covid-19 pandemic is also a new element for stimulating additional demand in construction, manufacturing, machinery, and transportation industries (WSA,2021).

Figure 13: World Crude Steel Production

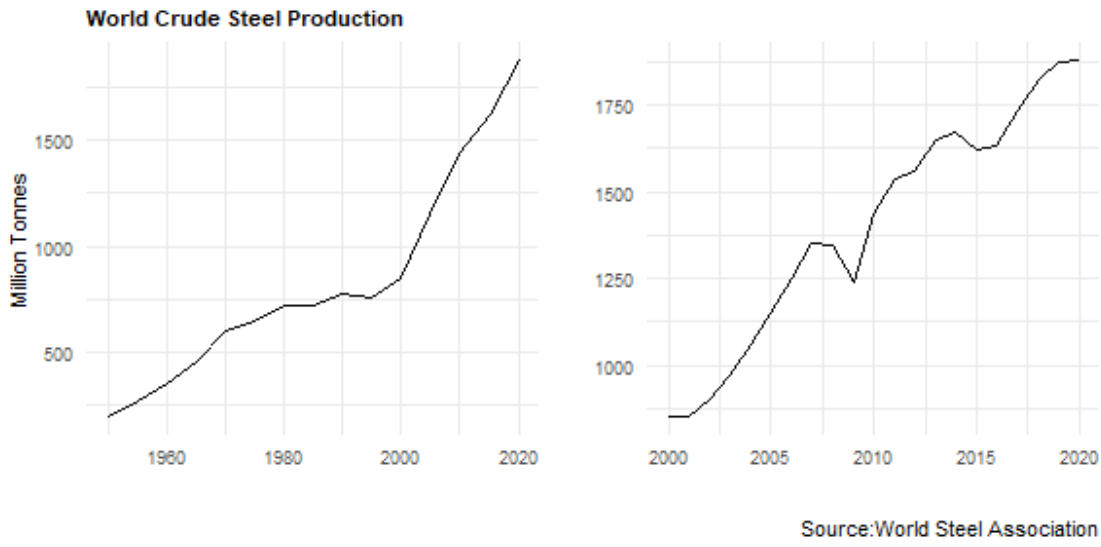
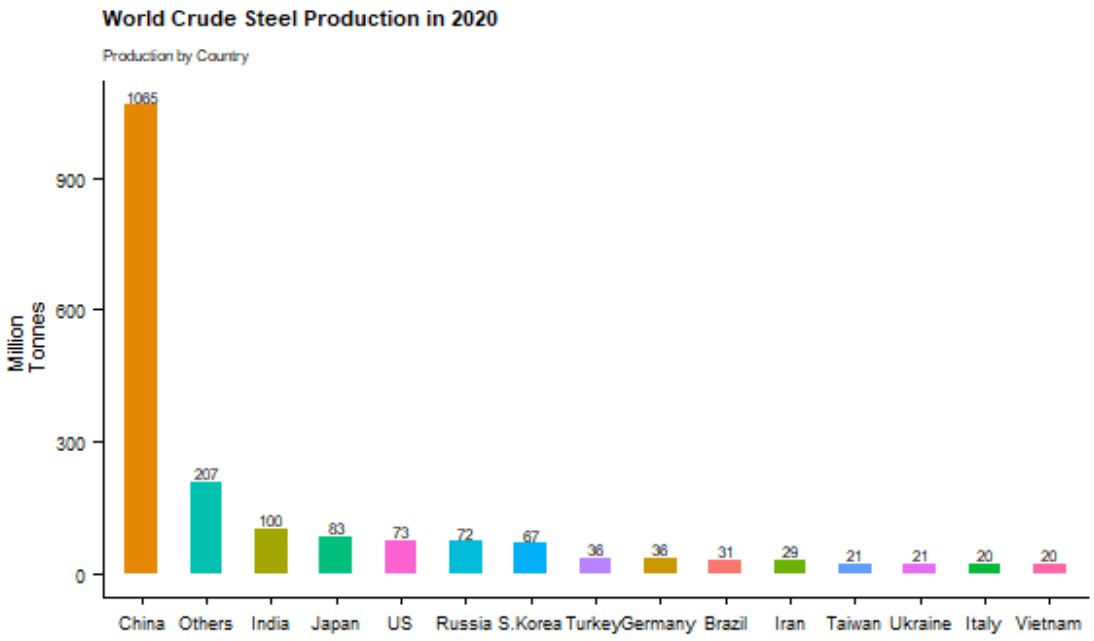


Figure 14: World's Top Crude Steel Producers



Source:World Steel Association

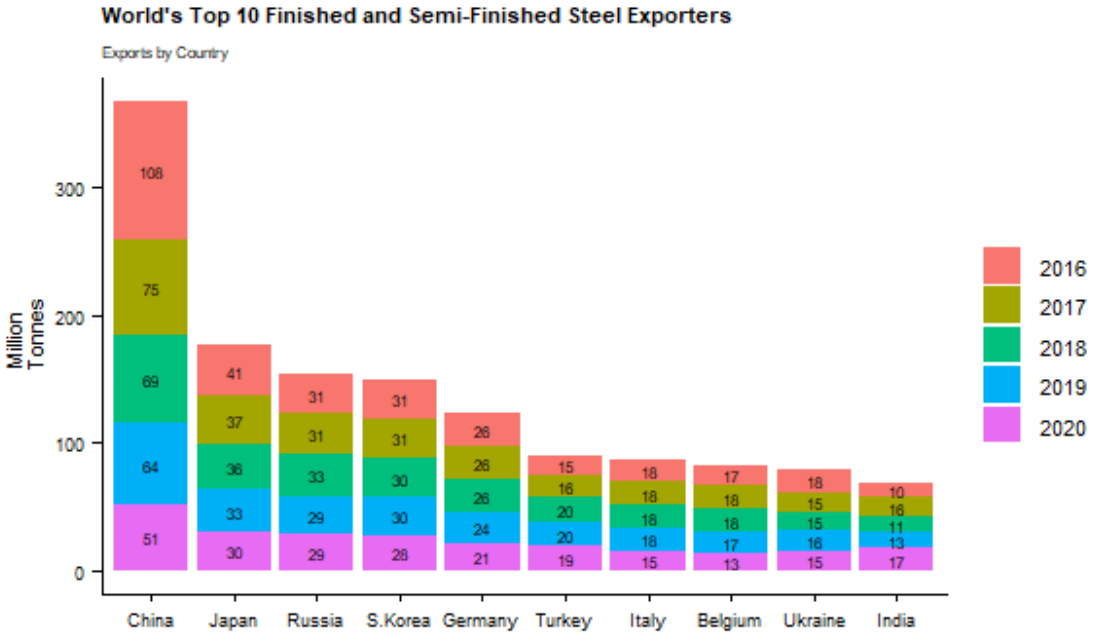
Compared to 189 million tons (Mt) production in 1950, global crude steel production reached 1,864 Mt in 2020. The left panel of Figure 13 shows the world production in last 70 years and the right panel provides a closer look for last 2 decades. Beginning from 2000, both world steel production and demand surged mostly due to China's unsurpassed economic growth. However, as the left panel clearly indicates, the production volume has started to show periodical pauses since 2007. World Steel Association computes compound annual growth rates of world steel demand as 5.0 % for 1950-70; 1.1 % for 1976-2000; 6.7% for 2001-2007; 3.8% for 2008-13 and 2% for 2014-20. The current trend is a leading indicator of slowdown in the industry after two decades of strong growth.

Asian countries accounted 73.76 percent of global production and China alone made 56.5 percent of all production in 2020. India, Japan, and South Korea are other most important producers in the region. US, Russia, Turkey, Germany, and Brazil are other key actors of world steel market. Chinese firms are the largest producers in terms of capacity in the world, and they are mostly state-owned businesses. The producer composition in other countries is not state dominant and are mostly private enterprises.

Turkey's crude steel production is above 30 million tonnes for the last 10 years and as of 2020, Turkish steel industry ranks 7th in the world and 1st in Europe. This rise has occurred despite the protectionist policies initiated by the US in 2019 which continued by the EU and other countries, and the stagnation in the global economy due to the Covid-19 pandemic. The industry is also prohibited to receive any state aid under the Turkey-ECSC Free Trade Agreement (NTO, 2021).

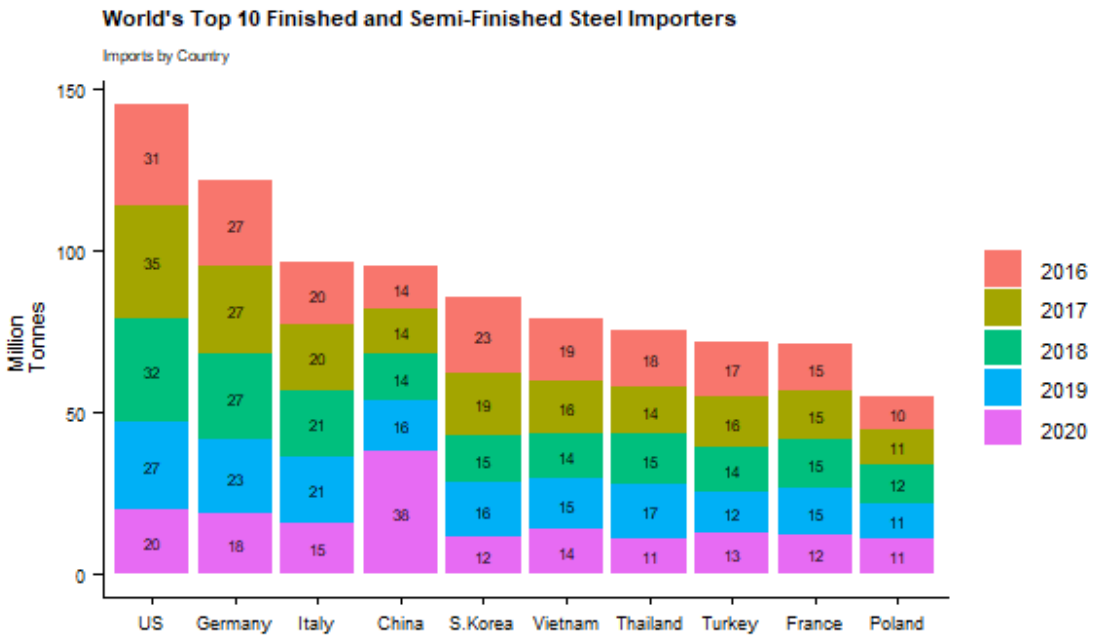
Raw materials such as iron ores, energy and scrap are especially important in steel production and there exists a constantly increasing global trade among raw material and semi-finished / finished goods exporters. Africa and South America are raw material abundant locations while China, Europe and North America are specialized in semi-finished and finished steel products.

Figure 15: World's Top Finished and Semi-Finished Steel Exporters



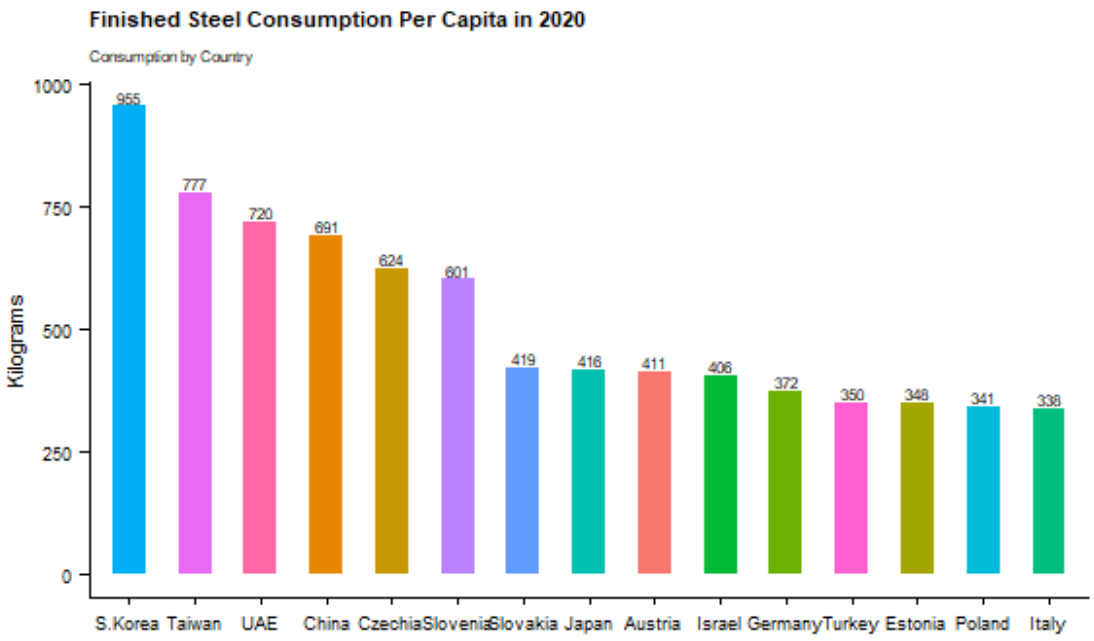
Source:World Steel Association

Figure 16: World's Top Finished and Semi-Finished Steel Importers



Source:World Steel Association

Figure 17: World's Top Finished Steel Users



Source:World Steel Association

Figures 15 and 16 show major exporter and importer countries in 2020. Although China is the world's top exporter, the decline in its export performance in recent years is remarkable. Turkey and India are the only countries among top exporters which increased their exports in 2021 compared to 2016. In terms of imports, US has been the largest importer for long years but China's share in world total imports made a strong jump in 2020.

Although Turkey is the 6th largest exporter of iron and steel products in the world, it is also among the most important importers. Despite its significant position both in global production and exports, the reason behind being a large importer is the industry's high dependency to foreign sources. The import requirement of the industry is quite high, and domestic resources are insufficient to meet the needs of the most important raw materials such as iron ore, coal, and scrap. Two thirds of the iron ore and scrap, and almost all the hard coal used in production as raw materials are met through imports in 2020. Since most of Turkish steel is produced from scrap, the country with insufficient domestic supply is the world's largest scrap steel importer.

Until recently, majority of Turkish exports consisted of long products such as rebar with relatively low added value. But the introduction of new investments in flat products in the last 10 years have begun to change the composition of Turkish exports and products with more added value have begun to increase their shares in total exports. The European Union and the US are traditionally the major markets for exports. However, increasing protectionist policies in these markets after 2018 caused Turkish companies to seek new markets especially in Far East, South America, and Africa.

Steel consumption per capita is considered as an important criterion reflecting the development level of a country and it is a clear sign of the intensity of industrial and construction activities. As Figure 17 indicates, per capita consumption in Turkey is above the average of many developed countries. However, the main source of this consumption is construction sector, and consumption in flat steel, which is a very important raw material especially in industrial use, remains seriously low.

Steel market is widely accepted as the most distorted market in the world due to many factors such as government interventions, relatively limited number of producers, tough entrance conditions, high investment costs, supply-demand imbalances, and difficulties in raw material supplies. Due to the required economies of scale, there are large firms but in limited numbers producing and trading in the global market. In 2020, 58.04 percent of world steel production is made by 50 global firms (WSA, 2021). Thus, the industry has been subject to numerous economic analyses in terms of oligopolistic behavior since early 50s. The wide usage area of iron and steel products and intense consumption in almost every country result in these products being among the most important commodities in international trade. However, the industry is also considerable addressee of harsh protectionist measures and subsidies in global scale. Many countries use trade defense measures as industrial policy to establish and improve domestic steel production. In line with global trends, Turkish steel industry is also one of the leading sectors in anti-dumping investigations. As Table 3 shows, second biggest number of investigations are initiated in this industry between 1989 and 2020.

The information given above reveals the importance of the industry both on global scale and for Turkish economy. In such a market with few but large-scale actors, monitoring and analyzing the reactions of the actors against trade policies promises significant results from an empirical point of view.

The purpose of the study is to analyze the impacts of different stages of Turkish anti-dumping investigations on the imports of steel industry. There are many different key dates and decisions in a typical anti-dumping investigation. It is a long and multi-step process and some of the decisions are publicized, and some others are not. Still, the nature of any initiative has the potential to affect the import decisions of firms. By using intervention analysis, the quantitative effects and durability of prespecified interventions are estimated by using imports data.

Intervention analysis method, introduced by Box & Tiao (1975), is designed to measure the impacts of exogenous factors (i.e., interventions) over time series. The changes in series can be estimated with respect to the effects of

interventions. The method has favorable advantages compared to traditional models due to less data requirements and modelling efforts.

In Turkish anti-dumping practices, most critical interventions during the process are announced via Communiques published in the Official Gazette. Therefore, the study defines 3 important policy actions as interventions and attempts to estimate the effects of these actions over imports. Initiation decision, imposition of temporary and definitive measures are the interventions studied.

Quantifying the overall effects of the investigation and impacts of different interventions separately over imports would be beneficial to all decision makers both from public sector and industry to measure the results of different anti-dumping actions. It also contributes to understand the value of an investigation over changing dynamics of imports.

3.2 RECENT EXCESS CAPACITY PROBLEMS

As mentioned in the previous sections, the performance of the steel industry has always been closely related to state of the global economy. However, 2008-09 financial crisis caused a more serious structural turning point for the industry and global excess capacity problem gained momentum afterwards.

In addition to negative demand shocks, energy crises, challenges in the accessibility and prices of raw materials, environmental constraints are some other main supply side problems that the industry faces. In such an environment, the gap between global capacity and demand emerged as crucial problem for the stability of the industry. Despite the weakening global demand, new investments continued in different regions of the world, and thus global capacity increased even after the financial crisis. Government interventions and sector specific business dynamics (such as limited number of producers, economies of scale, and technology requirements) cause market mechanism not to work efficiently in steel industry (Silva & Mercier, 2020). Hence, both new investment and closing decisions are not purely made according to market dynamics. On the other hand,

downsizing or closing decisions have higher costs compared to other industries. Pull-down costs of the existing facilities, difficulties in eliminating the environmental impacts, and bearing the costs of laid-off workers constitute high exit barriers for the industry. Due to such factors adjustments in capacity is not a short-run and easily resolvable phenomena. Uncertainties in world steel demand cause many firms to risk idle capacity costs instead of reducing their capacities. Figure 18 shows the world overall capacity changes in last 2 decades decomposed by China and all other countries. As the figure clearly indicates, global excess capacity problem is basically stemmed from Chinese over-investment in the same period. It implemented an extremely aggressive investment plan in 2001-2012 and increased the capacity almost fivefold. In Chinese excess capacity problem government subsidies and interventions are the dominant factors. Land allocation and loose environmental regulations for steel production provide investment opportunities at much more favorable terms compared to other countries. Additionally, 2008 stimulation plan had deepened the market failures for steel industry and funded the creation of uncontrolled new capacity. Moving rural population to urban areas and especially to heavy industries, increasing young population, rising savings rates and investments are other country specific structural factors supported the problem for China (Hu, Liu, & Fan, 2020). Figure 19 gives the capacity changes of the major steel producers other than China. Changes in India's capacity is the most striking among these countries and there exists an easily observable trend in 2000-2018. The upward momentum of South Korea, which started in 2007, is also eminent but has become stagnant as of 2018. Serious capacity change for Turkey has spread over a long range, and the increase which started in the early 2000s reached a stable position as of 2015.Turkey's crude steel capacity is about 50 million tons for the last 8 years. In addition to these countries, which have been the leading actors of the steel industry for many years, the capacity changes observed in Iran and Vietnam in recent years is also remarkable. The upward trend of Iran's investments in 2007 has evolved to a further step in 2016. Similarly, there are significant changes in Vietnam's capacity started in 2006 and accelerated after 2016.

Figure 18: Capacity Change of Top Steel Producers

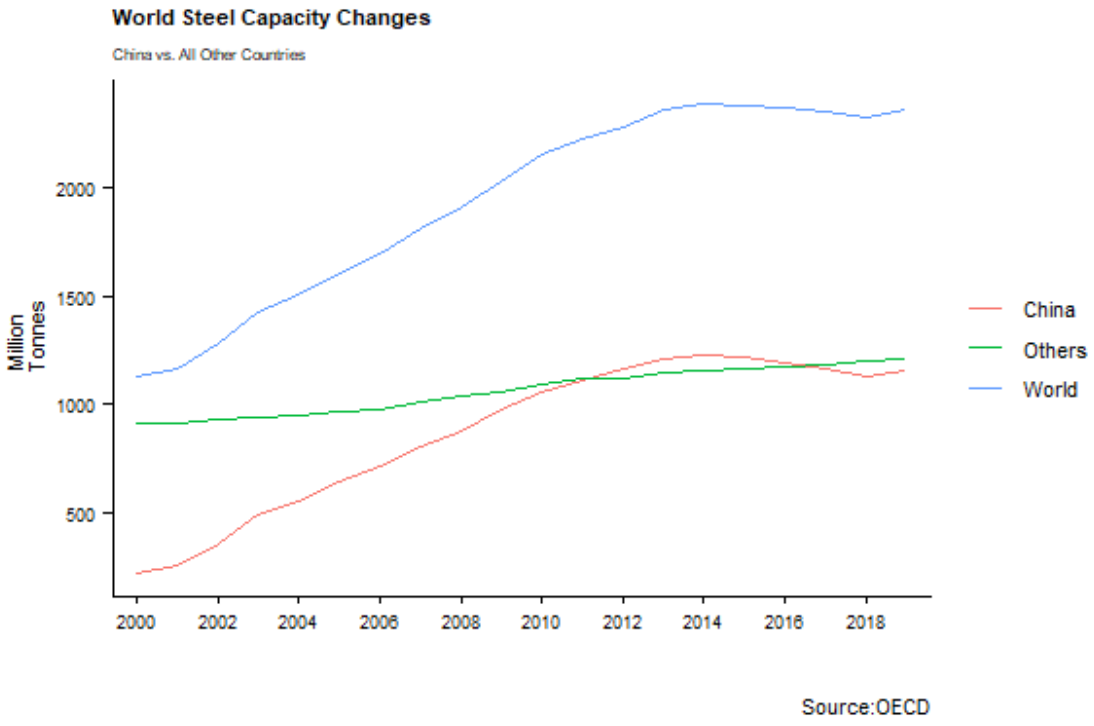
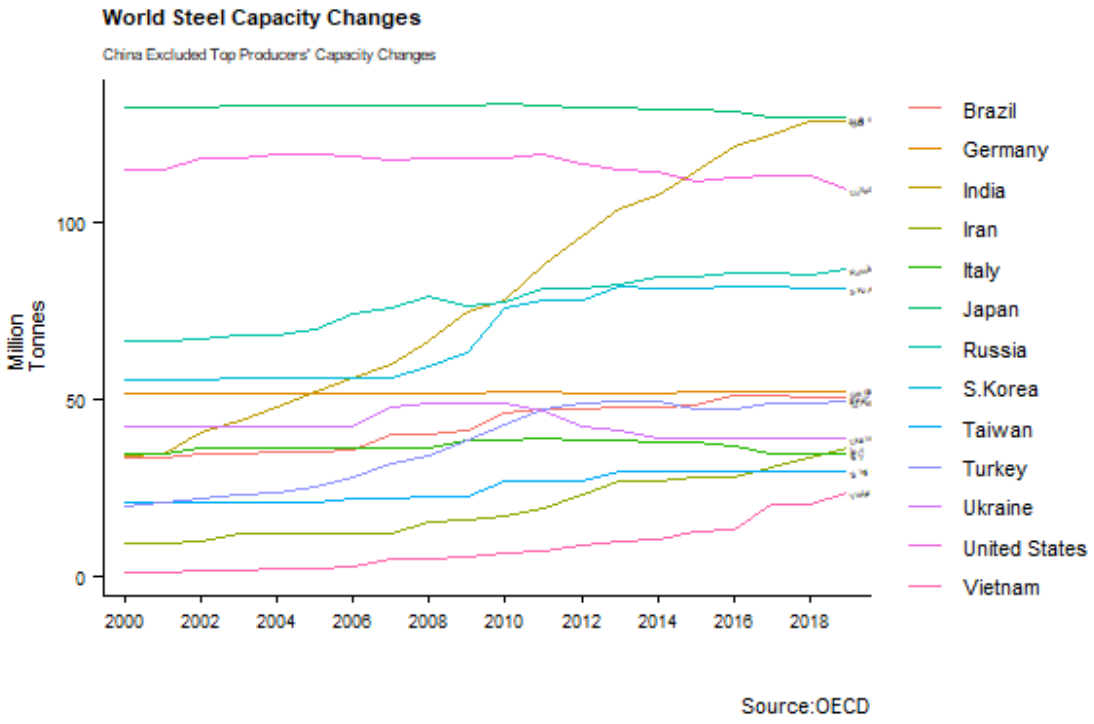


Figure 19: Capacity Change of Top Steel Producers



There is a strong relationship between excess capacity and rising protectionist policies in global scale for steel industry. Excess capacity of a country can easily be the problem of others via international trade especially when the global demand is sluggish. Countries that have excess capacity tend to focus on exports, however, potential markets act against imports to keep their domestic producers. Thus, excess capacity problem has significant implications over trade policies of every country involved.

3.3 RISING PROTECTIONIST POLICIES AND TRADE WARS

International trade witnessed a paradigm shift in last decade and economic integration efforts have begun to lose their importance. The ratio of average imports to global GDP growth, which reached to 2 before the 2009 financial crisis, has fallen to 1 after 2011. A new consensus emerged among economists that lower trade growth will be the prominent feature of the global economy and international trade will not turn back to its pre-2011 growth trend soon (Gunnella, Quaglietti, et al.,2019).

In many studies protectionist policies are identified as one of the most important factors in falling trade volumes across different countries and economic blocs. The distinctive nature of post–World War II era was falling tariffs and there was a strong political will for the elimination of non-tariff barriers and restrictive regulations as well. However, trade distortive protectionist measures have begun to gradually increase after 2009. Protective measures such as subsidies, licensing requirements, regulatory arrangements for foreign direct investment and procurement are introduced by many countries.

Table 11: Number of Government Interventions

Years	Harmful	Liberalising	Total
2009	1,336	329	1,665
2010	1,357	396	1,753
2011	1,299	364	1,663
2012	1,452	406	1,858
2013	1,585	374	1,959
2014	1,675	373	2,048
2015	1,753	423	2,176
2016	1,687	426	2,113
2017	1,770	407	2,177
2018	1,845	437	2,282
2019	1,691	326	2,017
2020	2,601	649	3,250

Total Number of Implemented Interventions for 2009-2020
Source: Global Trade Alert

Global Trade Alert (GTA) database records and classify more than 33.000 trade related state interventions taken since November 2008. The interventions are categorized as protective (harmful) or liberalizing based on the nature of the act. Table 11 summarizes all such interventions for 2009-2020. Protective acts have risen steadily after 2011 and reaches its peak in 2020 where the Covid 19 pandemic took such policies one step further. Subsidies, tariffs and contingent trade protective measures (anti-dumping and countervailing duties or safeguard measures) constitute the major part of the government interventions (Table 12).

Table 12: Types of Government Interventions

Policy instrument	Interventions
Subsidies (excl. export subsidies)	13,038
Tariff measures	2,807
Contingent trade-protective measures	2,044
Government procurement restrictions	802
Non-automatic licensing, quotas etc.	677
Trade-related investment measures	372
Instrument unclear	201
Price-control measures, including additional taxes and charges	91
G: Finance measures	16
Technical barriers to trade	2
Sanitary and phytosanitary measure	1
Others	4,910

Types of Implemented Interventions for 2009-2020
Source: Global Trade Alert

Steel industry traditionally receives protection in different forms across the world mostly as trade remedies such as anti-dumping, countervailing duties, and safeguard measures. Iron and steel, motor vehicles, fabricated metal products,

electrical equipment and chemicals are among the top five sectors that have been adversely affected by trade barriers. It is also noteworthy that steel products are always in the first place when the comparison is made under product basis. Tables 13 and 14 display the number of interventions on sectoral and product basis respectively.

Many countries used anti-dumping measures as the most frequent means of protection and major steel producers especially US and EU intensely used anti-dumping and countervailing duty investigations for this aim.

According to WTO (2020) anti-dumping statistics, 6,422 anti-dumping investigations are initiated in 1996-2020 period all over the world. 2,031 of all these investigations are for base metals and articles which are mostly iron and steel products. In other words, metal industry constitutes roughly one third of all anti-dumping initiations in the world and particularly steel products are the dominant subject of these investigations.

For the same period, 1,507 anti-dumping investigations targeted China and again imports of metal industry from China has the largest share with 468 investigations. As the figures indicates, steel imports from China are indisputably the most important target of anti-dumping investigations.

Table 13: Industries Subject to Most Number of Government Interventions

Sector Code	Sector	Interventions
412	Products of iron or steel	2,145
491	Motor vehicles, trailers & semi-trailers; parts	1,953
429	Other fabricated metal products	1,709
171	Electrical energy	1,415
354	Chemical products n.e.c.	1,250
352	Pharmaceutical products	1,246
452	Computing machinery & parts	1,238
449	Other special-purpose machinery & parts	1,141
439	Other general-purpose machinery & parts	1,124
469	Other electrical equipment & parts	1,122
461	Electric motors, generators & transformers; parts	1,103

Number of Implemented Interventions for 2009-2020
Source: Global Trade Alert

Table 14: Products Subject to Most Number of Government Interventions

HS Code	Product	Interventions
7307	Tube or pipe fittings (for example, couplings, elbows, sleeves), of iron or steel.	1,253
2716	Electrical energy. (optional heading)	1,216
8708	Parts and accessories of the motor vehicles of headings 87.01 to 87.05.	1,202
7326	Other articles of iron or steel.	1,123
7229	Wire of other alloy steel.	1,106

Number of Implemented Interventions for 2009-2020
Source: Global Trade Alert

In addition to conventional trade remedies, the US carried protectionist policies into a new stage in 2018 and this stimulated actions of many other governments. Additional tariffs were introduced for several countries with a Presidential Decree in late March and tariffs of 25 percent on steel and 10 percent on aluminum were imposed. Additional tariffs on almost all forms of steel products were designed on the ground of national security. Infrequently used Trade Expansion Act of 1962 was used for this purpose and it had been a popular instrument for US trade policy afterwards. Almost a quarter of all Section 232 investigations are initiated after 2018 and steel investigation is one of the most comprehensive one both in value and volume of the imports covered (Lincicome, Manak, et al.,2021).

The first reaction came from China imposing additional tariffs on 3 billion of US imports. The tension escalated with US response by raising tariffs on USD 50 billion of Chinese goods which was followed by another retaliation of China. Although China produced 56.5 percent of world steel in 2020, the US steel imports from China dramatically fell due to new arrangements. In 2015, US steel imports from China were about 2.18 million Mt whereas it drew back to 363.3 thousand Mt in 2020 (Monitor, 2020). The EU also introduced import quotas for steel products with similar protectionist motives in February 2019 and switched its initial global quota administration to country-based application in July 2020.

Although the tension of trade war between the US and China climbed especially in 2018 and 2019, Covid 19 pandemic interrupted the trend and caused additional uncertainty for future projections. Still, it is expected that non-orthodox tools like national security-based investigations will lose their effectiveness over time and conventional measures will again be regular methods of trade policy. Every

trading country will benefit from eliminating uncertainty and increasing openness and predictability. Thus, tracking the effects of conventional trade remedies specifically anti-dumping measures will provide more reliable and efficient results.

3.4 TURKEY'S ANTI-DUMPING INVESTIGATIONS IN STEEL INDUSTRY

Steel imports has traditionally been one of the most important targets of Turkish anti-dumping policy. In Table 15, the biggest Turkish anti-dumping investigations are given according to the imports value covered since the very start of anti-dumping applications in 1989. Although the EU hot-rolled flat steel investigation continues and France, Ukraine and Russia hot-rolled coil steel investigations are finalized with non-measure, the table still indicates the weight of steel industry in initiated investigations. Among all other industries 5 of the top 10 investigations are launched against steel imports.

Table 30 in Appendix A summarizes all the investigations initiated for steel industry by Turkey since 1989. The investigated articles classified under the chapters of 72 and 73 of customs tariff are considered in classifying the investigations. Initiated investigations of total 30 are listed according to the targeted import volume of the related investigation. Calculated imports figures indicate the previous year's import values of the products covered and status column provides details for the measure taken. Terminated or withdrawn investigations are aggregated under no measure status in this column. Finished status means the abolished measures after its legal duration.

Table 15: Turkey's Biggest Anti-Dumping Investigations

Country	Product	Industry	Initiation Date	Imports_t-1 (USD)
USA	Cotton	Textile	2014-10-18	869,367,705
EU	Hot-rolled flat steel	Steel	2021-01-09	683,407,617
France	Hot-rolled coil steel	Steel	2015-01-28	502,401,705
Ukraine	Hot-rolled coil steel	Steel	2015-01-28	348,463,156
Russia	Hot-rolled coil steel	Steel	2015-01-28	340,864,786
China	Solar panels	Electrics	2016-07-01	295,798,741
India	Yarn of man-made or artificial staple fibers	Textile	2008-01-11	214,145,983
China	Seamless tubes/pipes and hollow profiles of iron and steel	Steel	2015-05-15	182,603,661
China	Porcelain and ceramic tableware and kitchenware	Other	2016-09-24	174,285,719
S.Korea	Terephthalic acid	Chemistry	2017-02-23	170,531,098

Top 10 Investigations in terms of Imports Coverage: 1989-2020
Source: Author's update of Bown (2016)

As one of the world's leading steel producers, changes in global environment deeply affects Turkish trade policy. Many significant initiatives are taken by its competitors in recent years and Turkey reacted to these policies both raising tariffs or initiating trade defense investigations. Thus, anti-dumping investigations against steel industry substantially increased by the effect of global developments both in terms of number and coverage especially after 2015.

In this study, three biggest Turkish steel investigations are analyzed, and they are basically chosen according to their import volumes. Since different stages of an investigation and their impacts on imports are studied, unfinished investigations without measures are eliminated. Thus, seamless tubes/pipes and hollow profiles of iron and steel, cold-rolled painted galvanized sheet metal, and heavy plates investigations against China are separately studied to determine the impacts of different stages of anti-dumping investigations over import decisions. In terms of value, the share of these 3 investigations among all other steel anti-dumping investigations is 75.98 percent.

3.5.1. Seamless Pipes and Tubes Investigation

An anti-dumping investigation is initiated for seamless tubes, pipes, and hollow profiles of iron (other than cast iron) or steel originating from China in May 2015.

The investigation is the eighth biggest investigation in Turkish anti-dumping history in terms of the value of imports covered.

Seamless pipes and tubes are more resistant to pressure than welded products and are among the most important inputs of defense, construction, energy, and automotive industries. Both hot drawn and cold drawn pipes are under the coverage of the investigation. Hot drawn pipes are used in oil and natural gas pipelines, automotive, mining, defense industry and ship construction. Cold drawn seamless steel pipes are used especially in the automotive, defense and manufacturing of machinery. The products under investigation have more sophisticated production processes, higher added value and produced in a limited number of countries in the world. The production volume in Turkey is not adequate for the domestic demand, and most of the industrial need is met through imports. Thus, great importance is attributed to improve domestic production (Sanayi ve Teknoloji Bakanlığı, 2021).

High investment costs are the most significant factor that prevented new entrants as producers to the market and there were not domestic producers in Turkey for many years. The producer that had begun to its production in 2009 filed an anti-dumping petition in 2015 as China has been the major supplier in Turkish market. The applicant firm initially claimed to be the only domestic producer of the seamless pipes and tubes in Turkey. However, following the opening of the investigation, MoT determined that the applicant is not the only domestic producer. According to Ministry's findings, it was stated that there were other domestic producers of cold drawn pipes in the market, and their support for the investigation was also sought.

This situation had been evaluated as a violation of WTO rules by some importers. It has been brought to the agenda that the definition of domestic producer cannot be changed after the investigation is launched. However, the Ministry did not take these objections into account and concluded the investigation with a different set of domestic producers other than the one filed the petition.

Imports of the products subject to complaint have climbed from 96,643 tons in 2009 to 169,961 tons in 2014. The imports from China have dramatically increased in this period and its corresponding share had reached to 56.94 from 25.74 percent. Table 16 shows the volume of imports, annual share of suppliers and total import volumes for 2009-2021 period of the investigated products for some selected years. Between 2009-2021, China has been biggest exporter, but its share in Turkey's total imports changed significantly after 2016.

After a 15-month of investigation, MoT concluded that the imports from China are dumped, and the domestic industry is materially injured from the imports. A temporary measure in February 2016 and a definitive measure in August 2016 is taken with company-specific margins. Due to the large number of Chinese manufacturers and exporters, sampling method was used in margin calculation. Separate duty rates have been applied at 100 USD/Tons for 8 Chinese manufacturers and 120 USD/Tons for others.

The enforcement duration of a measure is 5 years in normal circumstances and the taken measure is fully implemented for seamless tubes and pipes. Prior to the end of the measure, the domestic producer filed a new petition in August 2021 for a sunset review investigation. According to the information provided in the application, the domestic producer claimed that the measure had substantially improved its competitiveness but if the measure ends in its normal duration, the imports will surge again and cause probable injury for the domestic industry. The firm also stated that its profitability could only be possible in 2019 thanks to the falling market share of Chinese products during the measure period (2016-2021) from 66 percent to 25 percent. The firm demanded additional protection to realize its planned investment which would increase the established capacity to 100 thousand tons. Based on this application, a review investigation is initiated on 30th July 2021. Thus, August 2021 imports is excluded from the dataset to isolate the impacts of the new investigation. In this regard, the dataset provides basis to

evaluate the full impact of the original anti-dumping investigation with various interventions during the whole implementation period.

3.5.2. Cold-Rolled Painted Galvanized Sheet Metal Investigation

An anti-dumping investigation is initiated for cold-rolled painted galvanized sheet metal originating from China in July 2015. The investigation is the second biggest investigation in steel industry concluded with anti-dumping measure following the seamless tubes.

The products subject to investigation are cold rolled, galvanized, and painted sheets classified under GTIP Codes 7210.70.80.90.11 and 7210.70.80.90.19. The stages of the production process are defined as opening the flat metal in coil form, chromating the lower and upper surfaces after washing and rinsing with special chemicals to increase corrosion resistance. The investigation is launched based on the application of the domestic manufacturer MMK Metalurji Sanayi Ticaret ve Liman İşletmeciliği A.Ş. which was supported by Tezcan Galvanizli Yapı Elemanları San. Trade Inc.

The product subject to investigation has an extremely wide usage area. It has many different uses especially in the construction sector, white goods, heating systems, lighting products, electricity equipment, billboards, silo and shelter production in the agriculture and livestock sectors etc. Importers had strong objections during the process for the products under 0.25 mm to be included in the investigation. They defended that the domestic industry does not produce such items and they should be excluded. However, the Ministry did not accept such arguments and verified production capability of the domestic industry with an on-spot visit.

Table 16: Imports of Seamless Tubes and Pipes

Country	2010	Share in Total (%)	2015	Share in Total (%)	2020	Share in Total (%)	2021 (1)	Share in Total (%)	Period Total	Period (%)
China	44.69	33.33	95.70	60.21	33.89	26.90	25.25	18.92	726.97	39.52
Russia	33.88	25.26	8.80	5.54	32.29	25.63	38.08	28.53	297.60	16.18
Ukraine	17.36	12.95	12.35	7.77	11.83	9.39	15.58	11.67	202.06	10.98
Germany	8.51	6.35	13.63	8.58	14.69	11.66	19.29	14.45	168.58	9.16
Romania	6.25	4.66	6.10	3.84	9.71	7.71	10.20	7.64	101.74	5.53
Slovakia	2.81	2.10	3.75	2.36	8.24	6.54	6.99	5.23	67.46	3.67
Austria	4.23	3.15	3.02	1.90	2.44	1.94	2.39	1.79	41.08	2.23
Italy	3.75	2.80	2.01	1.26	1.77	1.40	1.68	1.26	36.87	2.00
France	3.08	2.30	2.56	1.61	1.61	1.28	0.81	0.61	29.79	1.62
Çorlu Europe Free Zone	0.79	0.59	2.09	1.31	2.88	2.29	2.78	2.08	25.10	1.36
Japan	1.25	0.93	2.28	1.43	0.94	0.75	2.83	2.12	24.52	1.33
Belgium	0.52	0.39	0.58	0.36	0.55	0.44	0.35	0.26	13.69	0.74
USA	1.14	0.85	0.82	0.52	1.48	1.18	2.59	1.94	13.58	0.74
Czech Republic	0.48	0.36	0.41	0.26	0.97	0.77	1.13	0.85	12.49	0.68
Belarus	0.00	0.00	0.01	0.00	0.20	0.16	0.07	0.05	10.53	0.57
Spain	0.50	0.37	0.67	0.42	0.50	0.40	0.92	0.69	9.98	0.54
India	1.26	0.94	0.87	0.55	0.64	0.51	0.58	0.43	7.62	0.41
South Korea	0.92	0.69	0.53	0.34	0.46	0.36	0.62	0.46	6.39	0.35
Brazil	0.00	0.00	0.08	0.05	0.00	0.00	0.00	0.00	4.83	0.26
Netherlands	0.80	0.59	0.60	0.37	0.05	0.04	0.11	0.08	4.22	0.23
Others	1.86	1.39	2.10	1.32	0.80	0.63	1.24	0.93	34.54	1.88
Total	**134.11**	**100.00**	**158.94**	**100.00**	**125.97**	**100.00**	**133.48**	**100.00**	**1,839.65**	**100.00**

Imports of selected years (Thousand Tons)

Source: TUIK

[1] January-August

Imports of the products subject to complaint have climbed from 52,247 tons in 2009 to 60,949 tons in 2014. The rise of imports from China surpassed the general growth rate and China's share in total imports had reached to 66.50 from 41.40 percent. Table 17 shows the volume of imports, annual share of suppliers and total import volumes for 2009-2021 period of the investigated products for some selected years. Between 2009-2021, China has been biggest exporter, but its share in Turkey's total imports changed significantly after the initiation of the dumping investigation.

After an 11-month of investigation, MoT concluded that the imports from China are dumped, and the domestic industry is materially injured from the imports. No temporary measure is taken during the investigation and the definitive measure is imposed in June 2016 without any company-specific margins. None of the manufacturers or exporters from China responded to the questionnaires and involved in the investigation. Thus, country specific anti-dumping duty rate against China have been applied at 23.4 percent for all the firms.

Since there was no request of domestic producers to the contrary, the measure was repealed on the date of its normal duration on 24 June 2021 after remaining in force for 5 years. Thus, the dataset is finished by June 2021 to measure the full impact of the original anti-dumping investigation.

3.5.3. Heavy Plates Investigation

An anti-dumping investigation is initiated for heavy plates originating from China in December 2016. The investigation is the third biggest investigation in steel industry concluded with anti-dumping measure following the cold-rolled painted galvanized sheet metal. The investigation is launched based on the application of the domestic manufacturer Ereğli Demir ve Çelik Fabrikaları T.A.Ş.

Table 17: Imports of Galvanized Sheet Metal

Country	2010	Share in Total (%)	2015	Share in Total (%)	2020	Share in Total (%)	2021 (1)	Share in Total (%)	Period Total	Period (%)
China	35.48	58.76	29.01	55.23	4.73	16.25	4.34	18.50	298.44	49.38
Italy	5.01	8.30	7.47	14.22	8.96	30.80	7.28	31.00	98.11	16.23
Belgium	0.86	1.42	4.57	8.70	4.65	16.00	4.44	18.89	40.78	6.75
S.Korea	2.55	4.23	0.41	0.79	4.56	15.67	3.34	14.23	34.00	5.63
Germany	2.43	4.03	2.90	5.51	0.48	1.63	0.38	1.64	30.83	5.10
Austria	0.76	1.26	1.36	2.58	2.47	8.48	1.46	6.23	13.86	2.29
India	0.51	0.85	0.98	1.86	0.00	0.00	0.00	0.00	13.11	2.17
Egypt	1.60	2.64	0.92	1.75	0.29	0.99	0.00	0.00	11.95	1.98
Spain	1.07	1.78	1.88	3.58	0.13	0.46	0.25	1.05	8.59	1.42
N.Macedonia	3.48	5.76	0.75	1.43	0.38	1.30	0.29	1.23	8.59	1.42
France	0.82	1.35	0.83	1.57	0.99	3.39	0.04	0.16	5.80	0.96
Romania	0.69	1.15	0.00	0.00	0.43	1.46	0.68	2.89	5.44	0.90
Sweden	2.02	3.35	0.05	0.10	0.07	0.24	0.04	0.17	5.19	0.86
UK	0.94	1.56	0.18	0.35	0.02	0.06	0.00	0.00	4.69	0.78
Morocco	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.95	0.65
Ukraine	0.42	0.70	0.00	0.00	0.45	1.56	0.00	0.00	3.45	0.57
Yumurtalık Free Zone	0.01	0.01	0.39	0.74	0.00	0.00	0.08	0.32	2.84	0.47
Slovakia	0.19	0.32	0.00	0.00	0.00	0.00	0.00	0.00	2.60	0.43
Netherlands	0.06	0.10	0.04	0.07	0.16	0.55	0.69	2.93	2.50	0.41
Others	1.48	2.45	0.81	1.53	0.34	1.15	0.17	0.74	9.68	1.60
Total	60.39	100.00	52.53	100.00	29.09	100.00	23.49	100.00	604.42	100.00

Imports of selected years (Thousand Tons)

Source: TUIK

[1] January-June

The products subject to investigation are heavy plates of hot rolled non-coil flat steel classified under 16 GTIP Codes. They are in the group of alloyed or unalloyed carbon steels and the production process can be summarized as follows. Mixtures of iron ore and coke are turned into liquid raw iron in blast furnaces. Afterwards, it is turned into slab by passing through various stages by using the basic oxygen furnace method. After the slab, which is a semi-finished product, is reached to the appropriate temperature in the heating furnace and takes its final form in the plate rolling mill in accordance with the demands of the customer.

Heavy plates are mainly used in shipbuilding, pressure boilers, machinery, construction (structural large-scale projects such as steel, bridge, and highway), defense industry, automotive, wind tribunes, petrochemical refineries, pipe, and profile sectors.

Imports of the products subject to complaint have climbed from 286,815 tons in 2009 to 442,310 tons in 2015. The imports from China have dramatically increased in this period from 2,792 tons to 49,294 tons and its corresponding share had reached to 11.14 from 0.97 percent. Table 18 shows the volume of imports, annual share of suppliers and total import volumes for 2009-2021 period of the investigated products for some selected years. Between 2009-2021, China has been 5th biggest exporter continuously increasing its share in Turkish imports until the anti-dumping investigation.

After an 11-month of investigation, MoT concluded that the imports from China are dumped, and the domestic industry is materially injured from the imports. In the evaluation made by the Ministry, it was determined that China had a production surplus of 82.3 million tons in 2014. Although the downward trend in domestic demand recovered with the mobilization in infrastructure investments as of the first half of 2016, it was concluded that this increase was temporary. Therefore, it has been concluded that measures should be taken against Chinese imports for the products under investigation.

During the investigation, it was frequently argued by the importers that certain types of products were not produced by the domestic industry. However, the Ministry decided to accept the disputable types as “similar products” and did not take objections into account. No temporary measure is taken during the investigation and the definitive measure is imposed in November 2017 with company-specific margins. Two of the manufacturers or exporters from China responded to the questionnaires and involved in the investigation. Thus, company specific anti-dumping duty rate is calculated for a firm as 16.89 and 22.55 percent for all other Chinese firms.

The measures are taken for 5 years and is expected to finish as of 29 November 2022. Thus, the dataset is extended with the latest available data to measure the full impact of the anti-dumping investigation.

Table 18: Imports of Heavy Plates

Country	2010	Share in Total (%)	2015	Share in Total (%)	2020	Share in Total (%)	2021	Share in Total (%)	Period Total	Period (%)
Romania	136.50	31.85	108.96	24.64	101.64	17.26	101.41	14.64	1,421.08	23.91
Italy	145.66	33.99	133.54	30.19	115.38	19.59	92.05	13.28	1,281.75	21.56
Ukraine	45.34	10.58	26.32	5.95	15.91	2.70	22.49	3.25	574.59	9.67
S.Korea	0.65	0.15	15.05	3.40	121.47	20.62	164.68	23.76	476.54	8.02
China	1.75	0.41	49.29	11.14	44.39	7.54	104.16	15.03	364.44	6.13
Bulgaria	29.81	6.96	15.42	3.49	20.00	3.40	18.60	2.68	265.09	4.46
N.Macedonia	8.91	2.08	13.04	2.95	25.90	4.40	30.36	4.38	239.48	4.03
Spain	0.44	0.10	2.46	0.56	47.30	8.03	42.88	6.19	213.76	3.60
Germany	14.68	3.43	13.68	3.09	25.84	4.39	21.71	3.13	198.98	3.35
France	1.19	0.28	11.72	2.65	12.84	2.18	20.13	2.90	143.80	2.42
Russia	8.15	1.90	8.95	2.02	24.27	4.12	17.50	2.53	132.22	2.22
Sweden	7.07	1.65	6.68	1.51	14.65	2.49	14.94	2.16	125.84	2.12
Austria	2.99	0.70	5.68	1.28	3.40	0.58	7.96	1.15	99.85	1.68
Luxembourg	1.62	0.38	2.44	0.55	3.46	0.59	3.45	0.50	83.10	1.40
Belgium	5.52	1.29	4.49	1.01	2.12	0.36	5.28	0.76	63.77	1.07
Finland	1.69	0.39	6.45	1.46	2.92	0.50	5.39	0.78	58.25	0.98
Poland	0.03	0.01	0.11	0.03	1.53	0.26	1.44	0.21	34.14	0.57
Netherlands	0.66	0.15	3.63	0.82	1.93	0.33	2.39	0.35	26.43	0.44
Slovenia	5.96	1.39	1.38	0.31	1.38	0.23	2.05	0.30	24.34	0.41
Others	9.91	2.31	13.01	2.94	2.69	0.46	14.07	2.03	117.21	1.97
Total	428.55	100.00	442.31	100.00	589.02	100.00	692.95	100.00	5,944.67	100.00

Imports of selected years (Thousand Tons)

Source: TUIK

3.5 LITERATURE REVIEW

Anti-dumping investigations cause substantial variations in existing trade patterns both before and after their initiations. Moreover, in some cases even the rumor of an investigation could give rise to significant changes in firms' import decisions. In the relevant literature, the effects of anti-dumping duty over imports are categorized under 3 classes as investigation effect, trade depression (duty) effect, and trade diversion effect.

Investigation effect is directly related to the actions taken during the investigation. Staiger, Wolak, Litan, Katz, & Waverman (1994) discusses the pricing behaviors of both exporters and importers in case of preliminary LTFV determination in US anti-dumping practices. After an affirmative preliminary LTFV decision, if the importers expect this is a sign of a final affirmative determination, then the fall in imports and rise in prices would be realized even at the very early stages of the investigation. According to their findings, even anti-dumping petition itself provide serious advantages for domestic producers. They find evidence of file petition as a strategy for domestic producers regardless of its outcome. During the investigation, petitioners can benefit from falling imports that reach about half of what would be possible in case of positive final determination and anti-dumping duty. Some producers use file petition because of its trade restrictive effects and use petition as an instrument even the investigation reaches to negative determination. However, they do not find any evidence for withdrawn petitions causing any changes in trade.

Lloyd, Morrissey, & Reed (1998) studied investigation effects of the anti-dumping action in European film market by using intervention analysis. They aimed to identify the impact of anti-dumping actions and cartelization in a concentrated industry. Intervention analysis is used to estimate separate effects of anti-dumping actions and anti-cartel fines.

Wan, Sun, & Grebner (2010) studied the separate actions of US anti-dumping investigation against China for wooden bedroom furniture imports by using intervention analysis. The study found positive effect of petition announcement over imports. However, preliminary LTFV determination had negative effect and final determination had ambiguous duty effect over US imports from China for the investigated products.

The effect of anti-dumping duty over falling imports is referred as trade depression effect in the literature (Dale, 1980). There are many studies focusing on trade depression and substitution effects after the imposition of anti-dumping duty. The practical goal of anti-dumping actions is to eliminate the unfair competition conditions for domestic producers. Thus, following the changes in production quantities of domestic industry, productivity improvements and substitution dynamics after the investigation are other important research areas. Additionally, strategic interactions among market actors may cause different tax evasion behaviors and duty effect can be eroded to certain extent depending on the nature of the interaction.

Anti-dumping measures are significant financial burdens and directly affect the prices of the imported products. Therefore, they have potential to divert existing demand to other markets not subject to the measure. If there are alternative suppliers, duty effect becomes less effective due to trade diversion effect. The intensity of competition among different supplier countries determines the effectiveness of the taken measure and in some instances, imports may be fully replaced by another country making the measure totally useless (Prusa & Blonigen, 2001).

Geographical distance, production capacity, the degree of competition, transaction costs of changing existing contracts are the most important factors that determine the degree of trade diversion. (Luo, Sun, Jiang, Zhang, & Meng, 2015)

Durling & Prusa (2006) examined the effects of anti-dumping investigations on the hot-rolled steel market all over the world for 1996–2001. By creating a detailed database of bilateral trade for the product groups classified in six-digit HS level, they found strong evidence of trade destruction but little evidence of trade diversion.

On the other hand, according to the findings of Yamazaki & Paggi (2005), which examines the impact of US anti-dumping duties against Chinese fresh garlic, the measure caused a significant trade diversion effect. US imports from other suppliers such as Thailand, Vietnam and Spain substantially increased in post-duty period.

Trade diversion effect and circumvention actions are closely related outcomes in anti-dumping practices and there is an increasing bunch of literature focusing on circumvention actions. Liu & Shi (2019) study Chinese exporters circumvention actions on U.S. anti-dumping duties through trade rerouting. The result of the study reveals that anti-dumping duties caused an increase in US imports from third countries but also a rise in Chinese exports to the same countries. The simultaneous positive correlation in changing trading countries is more apparent for the products subject to anti-dumping duties.

3.6 EMPIRICAL METHODOLOGY

Since the stages of an anti-dumping investigation is well defined and known prior to imports decisions, intervention analysis is used in this study to examine the impact of Turkey's anti-dumping action against certain steel imports from China.

Box & Tiao (1975) developed a method to measure the effect of interventions on a given response variable. Their approach has been widely used to analyze the effect of external interventions in many empirical analyses from different fields. For example, anti-dumping action on film imports in Europe (Lloyd et al.,1998), room tax on hotel revenues (Bonham & Gangnes, 1996), regulatory policies on air pollutants (Lee & List, 2004), and US anti-dumping action on wooden bedroom

furniture imports from China (Wan et al., 2010) are among the empirical studies that used intervention analysis.

An external factor that causes a sudden and apparent change in a time series is called an **intervention**. An intervention changes the routine dynamics of the dependent variable and is usually represented by a dummy variable. Intervention may be natural or artificial and may arise because of natural events, policy changes, procedural differences in legal provisions etc.

Suppose that at time $t = T$ (and where T is known), there has been an intervention to time series Y_t and it changes the values of the series. In intervention analysis (also known as interrupted time series), response variable,Y_t, is observed before and after the intervention at T and the impact of the intervention over the mean level of the series is measured. As the main assumption of the method, the same ARIMA structure for the series is accepted to hold both before and after the intervention. Thus, it is aimed to estimate how much the intervention has changed the series and how persistent is the effect with its decaying patterns.

Box and Tiao (1975) depict a dynamic form of intervention model for a time series for Y_t as follows:

$$Y_t = f(\kappa, X_t, t) + Z_t$$

where $f(.)$ is a function incorporating the effects of interventions.κ is a set of unknown parameters, and Z_t is the stochastic part or noise.

Following Wan et al. (2010), the general form of the equation can be characterized by the following deterministic and stochastic components which also allows to formulate all types of interventions subject to consideration in a given problem:

$$Y_t = C + \sum_{i=1}^{I} f\left(X_{i,t}^{k}\right) + N_t$$

where Y_t is dependent (response) variable, C is constant, $X_{i,t}^k$ is input variables for each interventions. $f(.)$ is a function incorporating the effects of known interventions and N_t is stochastic term. $i = 1,2,\ldots,I$ and I is the number of interventions, k is the type of intervention (i.e.,step, pulse or compound) and t is time.

The transfer function can be specified in distributed lag form as follows:

$$f\left(X_{i,t}^k\right) = v_i(B)X_{i,t}^k = \frac{\omega_i(B)B^{bi}}{\delta_i B}X_{i,t}^k$$

where $v_i(B)$ is specified as a ratio of several finite-order polynomials.B^{bi} is the dead time of the intervention where its impact vanishes, and no effect remains on Y_t. $\omega_i(B) = \omega_{i,0} + \omega_{i,1}B + \ldots + \omega_{i,h_i}B^{hi}$ measures the separate effects of previous values and indicates evolution of these values. In other words,$\omega_i(B)$, represent the dynamic effects of the input over different time periods. On the other hand, the denominator $\delta_i(B) = 1 - \delta_{i,1}B - \ldots - \delta_{i,r_i}B^{ri}$ shows decay patterns of the intervention. In this set up, (b_i,h_i,r_i) are important parameters to observe the effects of intervention i over response variable. Koyck model is widely used rational distribution lag specification in empirical studies, and it takes these parameter values as (b_i,0,1). In this case, the transfer function becomes:

$$v_i(B) = \frac{\omega_{i,0}B^{b_i}}{1 - \delta_{i,1}B}$$

Stochastic disturbance, N_t, is the usual ARIMA model. ARIMA is an acronym for Autoregressive Integrated Moving Average model. An ARIMA model of (p, d, q) order can be shown as:

$$N'_t = c + \phi_1 N'_{t-1} + \cdots + \phi_p N'_{t-p} + \theta_1 \varepsilon_{t-1} + \cdots + \theta_q \varepsilon_{t-q} + \varepsilon_t$$

where N'_t is d times differenced series. Additional seasonal terms may be added to capture seasonal variations. In a seasonal ARIMA model of (p, d, q) $(P, D, Q)_s$ order, second part is the lag values of seasonal terms. In such a model,N_t may be shown as:

$$N_t = \frac{\theta_q(B)\theta_Q(B^s)}{\phi_p(B)\phi_P(B^s)\Delta^d\Delta_s^D} a_t$$

where B is backshift operator, s is a seasonal indicator (i.e., s is 1,4,12 for annual, quarterly, and monthly data respectively), and a_t is white noise. The numerator of equation is MA polynomial, and the denominator is AR polynomial with their seasonal extensions. Δ^d is d-order regular lag operator and Δ_s^D is D-order seasonal lag operator. The other components of ARIMA model of (p, d, q) $(P, D, Q)_s$ order are:

$$\phi_p(B) = 1 - \phi_1(B) - \phi_2(B) - \cdots .. - \phi_p(B^p)$$
$$\phi_P(B^s) = 1 - \phi_1(B) - \phi_2(B) - \cdots .. - \phi_P(B^P)$$
$$\theta_q(B) = 1 + \theta_1(B) + \theta_2(B) + \ldots.. + \theta_q(B^q)$$
$$\theta_Q(B^s) = 1 + \theta_1(B) + \theta_2(B) + \ldots.. + \theta_Q(B^Q)$$

The estimation of the model will be possible after the identification of number and types of interventions $X_{i,t}^k$, specification of the impulse response function v_i for each intervention, and determination of the orders of ARIMA model for disturbance term N_t.

3.6.1. Stages of an Investigation and Intervention Definition

An anti-dumping investigation is a long and multi-stage process. Stemming from the nature of the process, many different decisions and actions made before, during and after the investigation. Investigation authority and firms in particular, and all other interested parties in general, interact each other in a highly dynamic decision-making environment.

In such a setting the input variables for the interventions could not have a clear-cut definition. There are many candidate situations that may be regarded as interventions. Despite these difficulties, preliminary analyses and related literature show that the publicly known announcements of the investigation are the most influential factors that affect the import decisions.

Normal duration of an investigation in Turkey is 12 months but it may be extended for an additional 6 months. Detailed information about the anti-dumping investigative process is given in Figure 6. Basically, there are 6 main stages in an investigation:

- Filing an AD petition. Examination, and evaluation of the application by the Ministry (45 days).
- Submission of the proposed measure to the Board. Publication of the Investigation Opening Communiqué in the Official Gazette. Distribution of opening notifications (informing related parties about access to the questionnaires) (37 days).
- Submission of producer/exporter, importer, and trader questionnaires to the Ministry. Examination of the questionnaires by the Ministry (5-6 months).
- On-site verification (2-3 months).
- Final notifications. Collection of opinions about the investigation process and Ministry's findings. Organization of public hearings (1-2 months).
- Preparation of the Investigation Report. Submission of the Report to the Board. Publication of the Investigation Closing Notification and Communique in the Official Gazette. Distribution of closing notifications to all interested parties, related diplomatic missions, and WTO. (1-2 months).

As it is obvious, there are many critical actions among these stages that have the potential to affect import decisions. However, publicized decisions are more important and reaches to the knowledge of all related parties including importers. The timing of the actions and their duration are known, and all such developments have substantial impacts on firms' behavior and hence significantly effect trade patterns.

In Turkey's anti-dumping practices, 3 fundamental stages are announced in the Official Gazette which publicize Ministry's findings to the public. Thus, these

stages which are announced via Communiques published in the Official Gazette are compatible with our intervention definition.

Following a legitimate application of the domestic producers or an ex officio evaluation, MOT may decide to launch an anti-dumping investigation by publishing its decision in Official Gazette. The initiation decision is the first and most important step in an investigation. At this stage, the Investigation is launched which causes many importers to adopt a more precautionary motive. This is a natural result of avoiding future losses due to potential anti-dumping duty at the end of the process.

Depending on the findings during the Investigation, MOE may impose provisional anti-dumping duties. This intervention depends on the urgency of the situation, and it is not common in all anti-dumping investigations. Although the duties are temporary, still they have substantial effects on imports because of additional financial burden it creates and signaling effects for future expectations. In most cases, the existence of a preliminary provisional duty signals a definitive measure at the end of the final stage and may cause serious changes in import decisions.

At the final stage of an investigation, the result is announced by a closing notice. All information and documents collected in the whole process, analyses, inferences and findings of the Ministry and objections of the related parties are used to conclude the Investigation. Depending on these findings, termination or final measure is publicized in a closing Communique in the Official Gazette. These stages with their dates and related actions are given in following tables for each of the 3 investigations considered.

Table 19: Investigation Schedule on Seamless Tubes and Pipes

Date	Action
Stage 1: Initiation of the Investigation	
May 2015	Petition filed by domestic producer Sardoğan Endüstri ve Ticaret
May 2015	Preliminary analyses by MoT
May 2015	Submission of the initiation decision to the Board and Minister
15 May 2015	Initiation of the Investigation with the Communique 2015/19 published in the Official Gazette
May 2015	Notifications sent to Chinese Diplomatic Mission in Ankara and all known exporters/producers/importers
Stage 2: Imposition of Preliminary Anti-Dumping Duty	
22 June 2015	Collection of the Questionnaires
Feb 2016	Submission of the findings and proposals to the Board and Minister
12 Feb 2016	Provisional anti-dumping duty decision (28.71-50.35 %) with the Communique 2016/3 published in the Official Gazette
Stage 3: Imposition of Final Anti-Dumping Duty	
23-25 Feb 2016	Verification visit at domestic producer's facilities
Feb-June 2016	Additional representation and market analysis tests. Acceptance of Kalibre Boru as domestic producer.
20 June 2016	Distribution of Final Notification Reports with Chinese Diplomatic Mission in Ankara and all participated exporters/producers/importers and NGOs
30 June 2016	Public hearing
1 July 2016	Firm specific meetings
4 Aug 2016	Final anti-dumping duties decision (100-120 USD per ton) with the Communique 2016/35 published in the Official Gazette

Table 20: Investigation Schedule on Galvanized Sheet Metal

Date	Action
Stage 1: Initiation of the Investigation	
May 2015	Petition filed by domestic producer MMK Metalurji
May 2015	Preliminary analyses by MoT
June 2015	Submission of the initiation decision to the Board and Minister
23 July 2015	Initiation of the Investigation with the Communique 2015/27 published in the Official Gazette
July 2015	Notifications sent to Chinese Diplomatic Mission in Ankara and all known exporters/producers/importers
Stage 2: Imposition of Final Anti-Dumping Duty	
31 August 2015	Collection of the Questionnaires
September 2015	Verification visit at domestic producer's facilities
04 March 2016	Distribution of Final Notification Reports with Chinese Diplomatic Mission in Ankara and all participated exporters/producers/importers and NGOs
17 March 2016	Public hearing
24June 2016	Final anti-dumping duties decision (23,4 %) with the Communique 2016/15 published in the Official Gazette

Table 21: Investigation Schedule on Heavy Plates

Date	Action
Stage 1: Initiation of the Investigation	
September 2016	Petition filed by domestic producer Ereğli Demir-Çelik
September 2016	Preliminary analyses by MoT
November 2016	Submission of the initiation decision to the Board and Minister
21 Dec 2016	Initiation of the Investigation with the Communique 2016/51 published in the Official Gazette
December 2016	Notifications sent to Chinese Diplomatic Mission in Ankara and all known exporters/producers/importers
27 Jan 2017	Collection of the Questionnaires
Stage 2: Imposition of Final Anti-Dumping Duty	
Feb 2017	Verification visit at domestic producer's facilities
September 2017	Distribution of Final Notification Reports with Chinese Diplomatic Mission in Ankara and all participated exporters/producers/importers and NGOs
29 Nov. 2017	Final anti-dumping duties decision (16,89-22,55 %) with the Communique 2017/32 published in the Official Gazette

Source: Turkish Official Gazette

After identifying the interventions, another important problem is how to include them in the model. There are many possible forms of an intervention that affects the series for $T \geq t$ where T is the intervention point. Despite the wide variety of intervention forms, *step*, *pulse*, *mixed* and *ramp* types are the most common forms which are used in empirical analysis.

Step change depicts an abrupt and structural change where the series is shifted up or down after the intervention. This type of intervention is illustrated by a dummy variable with the value of 0 before the intervention, and 1 afterwards. It may also be defined for a particular period and is not needed to be permanent (Pankratz, 2012).

Such interventions may be a called as mixed interventions Some interventions cause the series to jump over for a certain period and then return to its initial level. In these instances, the intervention is called a pulse and takes the value of 1 on the date of the intervention, and 0 otherwise. Some other type of interventions changes the slope of the time series right after its occurrence. The dummy variable takes the value of 0 before the intervention and increases by 1 afterwards.

Categorized interventions may be illustrated as follows:

$$X_{i,t}^{S} = \begin{cases} 0, & if \quad t < T \\ 1, & if \quad t \geq T \end{cases} \quad ; \quad X_{i,t}^{P} = \begin{cases} 0, & if \quad t \neq T \\ 1, & if \quad t = T \end{cases}$$

$$X_{i,t}^{M} = \begin{cases} 1, & if \quad t_1 \leq T \leq t_2 \\ 0, & otherwise \end{cases} \quad ; \quad X_{i,t}^{R} = \begin{cases} 0, & if \quad t < T \\ t - T + 1, & if \quad t \geq T \end{cases}$$

The form of the intervention depends on the nature of the series under consideration, and it is preferable to determine its shape prior to the analysis. In some circumstances, related theory or the nature of the intervention clearly provide evidence to choose the suitable form. However, in our case, intervention type is ambiguous with respect to the impact of its duration over import decisions. Thus, it is not possible to envisage if the intervention causes temporary or permanent changes over import series and the type of intervention cannot be selected a priori. In such circumstances, fitted intervention types is recommended to be chosen empirically and examining pulse interventions first and then comparing the results with alternative specifications (Pankratz ,2012). Following this approach, different combinations of intervention types are used in different models to identify the best fitted one for each intervention.

The purpose of the study is to determine the impacts of 3 different interventions in seamless tubes and pipes investigations and 2 different interventions in painted galvanized sheet metal and heavy plates anti-dumping investigations on imports from China. Two parts of the overall model is estimated -the basic ARIMA model for time series of imports and the intervention effects of anti-dumping actions over imports. Although there are several approaches proposed in the literature, Box-Jenkins method is adopted, which is widely used in empirical studies. The method involves, model identification and selection, parameter estimation, and checking the model (Box, Jenkins, Reinsel, & Ljung, 2015).

Before the model is specified, exploring trends, seasonal fluctuations, and outliers is important aspects of preliminary analysis. If the data has changing variance, necessary transformation should be done to prevent econometric drawbacks of heteroskedasticity. ACF and PACF plots are significant tools to

decide p and q orders of the candidate models and choose seasonal components if necessary. Stationarity of the series is another important factor that should also be checked. If the series is not stationary, required differencing operations must be done. Following these steps, candidate models are estimated for pre-intervention period, and best model is identified by using Akaike Information Criteria (AIC). As a final step, residuals of the selected model are checked whether they are white noise or not. Residual plots and Ljung-Box test are used for this purpose. The second step is to include the interventions into the model. Pre-intervention ARIMA model is used to forecast rest of the series and fit a second ARIMA model to the difference between real time series and forecasts. This second model allow to specify the transfer function of the intervention components. In the final step, the overall model is specified, estimated and the model output and diagnostics is performed.

3.6.2. Data

In intervention analysis, the impacts of known interventions over a single time series data are used. Due to the nature of the method, the focus is on the autoregressive behavior of the series and data requirement is limited. Modest data need is among the most important factors that cause intervention analysis to become an increasingly useful tool for researchers.

Data used for this study is obtained from TUIK Foreign Trade Statistics Database. TUIK publishes Turkey's foreign trade statistics on an online database. The statistics are monthly basis and may be queried with various international product classifications (i.e., HS, BEC, ISIC, SITC). For the purpose of this study the most suitable one is the HS Codes with 12 digits (GTIP) since the Investigations are launched and resulted on this classification.

Monthly imports of seamless tubes and pipes from January 2009 to July 2021 is used for the intervention analysis. Original duration of an anti-dumping measure is 5 years and extension may be possible with the launch of a sunset review investigation. For the products concerned, a new investigation is initiated on 30th

July 2021 (Communique No:2021/40). Thus, the full cycle of the anti-dumping process for 5 years is completed as of July 2021 and the data set is prepared prior to the initiation of a new investigation to prevent the effect of this intervention.

To avoid inflationary effects, the response variable is defined as the import volume of certain tubes and pipes determined by the original anti-dumping investigation initiation by Communique in 2015. The Communique indicated products under investigation with publicizing 24 GTIP codes. TUIK Database provides country, import volume in kilograms and import values in USD dollar data based on GTIP classification. It includes monthly data for these variables imported from all the over the world. The data is aggregated in monthly basis and used as time series object for further analyses.

Similarly, import volumes are used for other investigations. According to opening Communiques, 2 GTIP codes are announced for painted galvanized sheet metals and 18 GTIP codes heavy plates. The data is taken from TUIK database with these codes. The latest data is taken as June 2021 for painted galvanized sheet metals since the measure is finished on that month. For heavy plates, the latest available data is used (December 2021). Detailed information about interventions is obtained from the relevant Communiques published in Turkish Official Gazette.

3.6.3. Specification of The Model

In determining the overall model, a four-step approach is adopted. In the first step, the ARIMA model of pre-intervention period is specified. In the second step, the interventions and their patterns are identified. In the third step, overall intervention model is set, and this model is checked with regard to its output and formal diagnostics are performed at the final step.

Figure 20 indicates monthly import volumes in thousand tons of investigated products from China and other 7 countries which has the biggest share for January 2009-July 2021. The interventions are illustrated with dotted lines in the same figure. As China imports show, the series seem to have both trend and a

mild seasonal component. Thus, the candidate models are specified according to this nature of the data and log transformation is made to increase the smoothness of the series.

ACF-PACF plots in Figures 22 and 23 show that the pre-intervention series is not stationary, and first difference of the series is also checked. Augmented Dickey-Fuller test is used to check if the series is stationary, and the log of differenced series is found to be stationary. There exists a complex ACF and PACF structure with seasonality and MA models seem to be more compatible with data characteristics. Although the seasonality is not clearly observable in differenced series, based on the spike in 12th lag in PACF plot, various seasonal candidate models are also checked.

For model specification, pre-intervention data (Jan 2009- April 2015) is used to fit an ARIMA model. R software with its various statistical packages is used for econometric analysis in the study. The output of (auto.arima) function in forecast package is used as a baseline model for further elaborations and the best fitted model is selected according to AIC for the intervention free series. The best model is indicated as ARIMA (0,1,1) by the algorithm of the forecast package and several other alternatives are compared with this model in Table 22. The model selected by automatic algorithm does not have seasonal part and has an AIC value of 180.95. However, based on the seasonal demand characteristics of the products concerned, more attention is attributed to seasonal alternatives.

The result of the comparison of seasonal models are given in Table 23. Among the seasonal models, first model in the table $(0,1,1)\ (0,1,1)_{12}$ has the lowest AIC and its coefficients are significant in 1 percent level. Thus, first model is chosen as pre-intervention ARIMA model.

Following the specification of the ARIMA structure for the pre-intervention period, it is needed to check if the residuals of the model is white-noise or not. The residual plots and formal test of autocorrelation as Ljung-Box test are given in Figure 24 which shows that the chosen model is also suitable in terms of these concerns. There is no significant autocorrelation, and the model has a good fit.

Figure 20: Imports from Top 8 Countries (Seamless Tubes and Pipes)

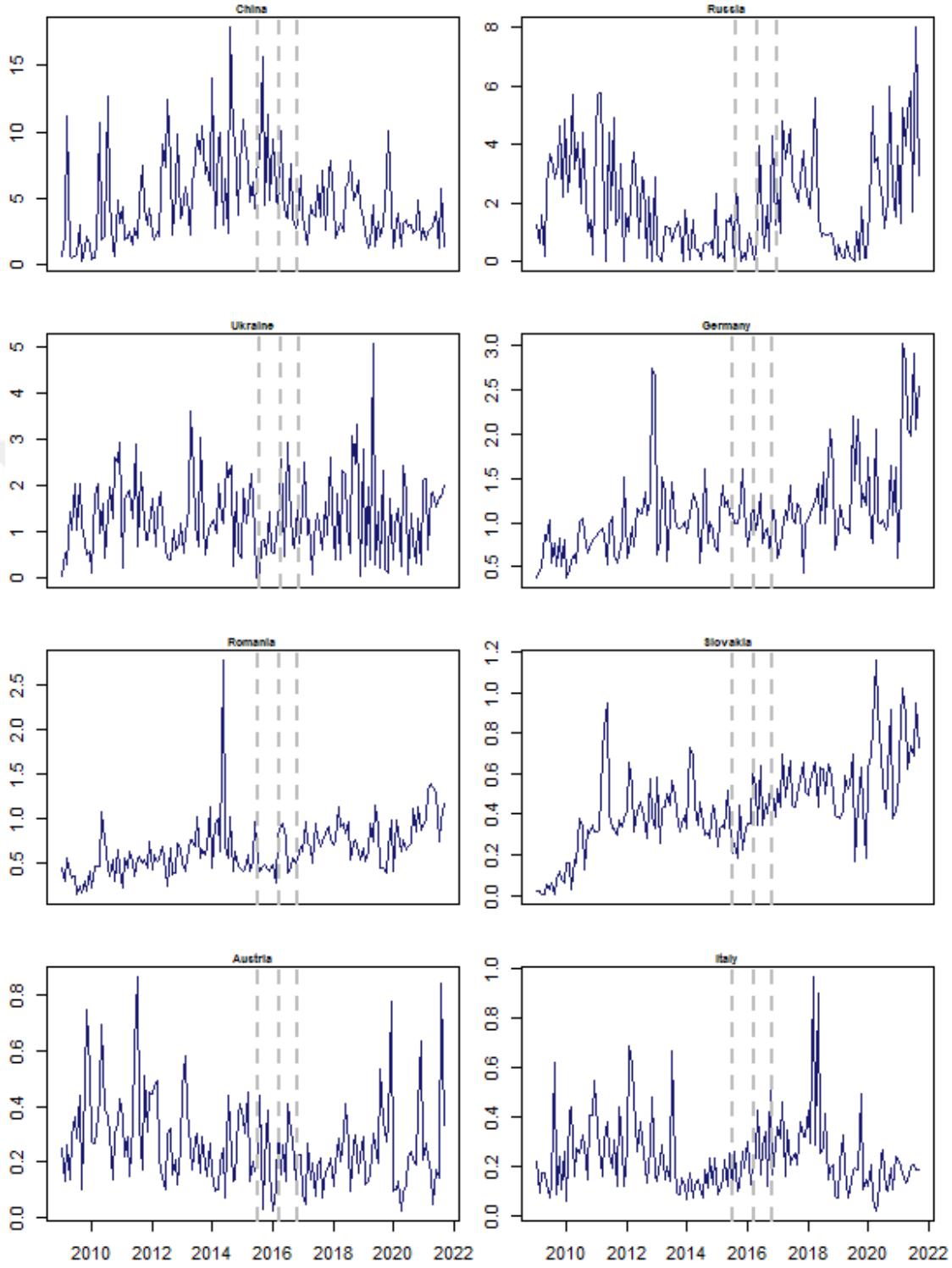


Figure 21: STL Decomposition (Seamless Tubes and Pipes)

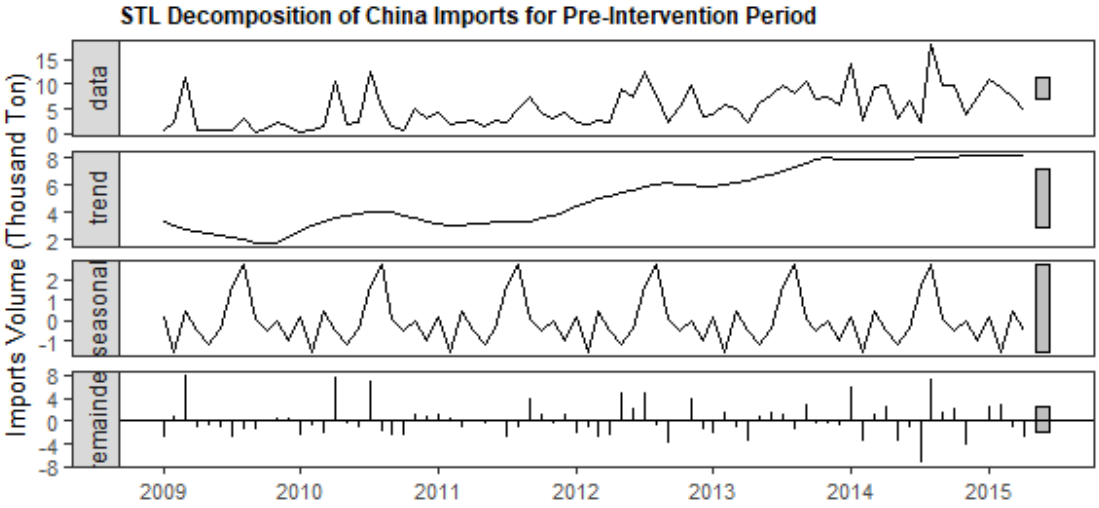


Figure 22: Pre-Intervention ACF-PACF (Original Series)

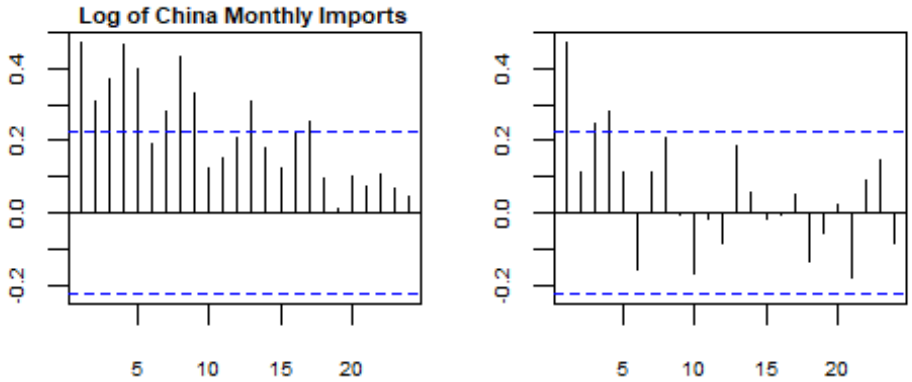


Figure 23: Pre-Intervention ACF-PACF (Differenced Series)

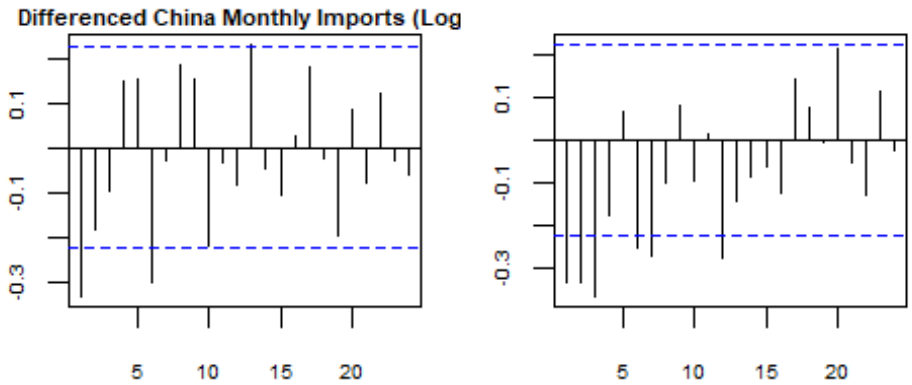


Table 22: Pre-Intervention Non-Seasonal Regression Results

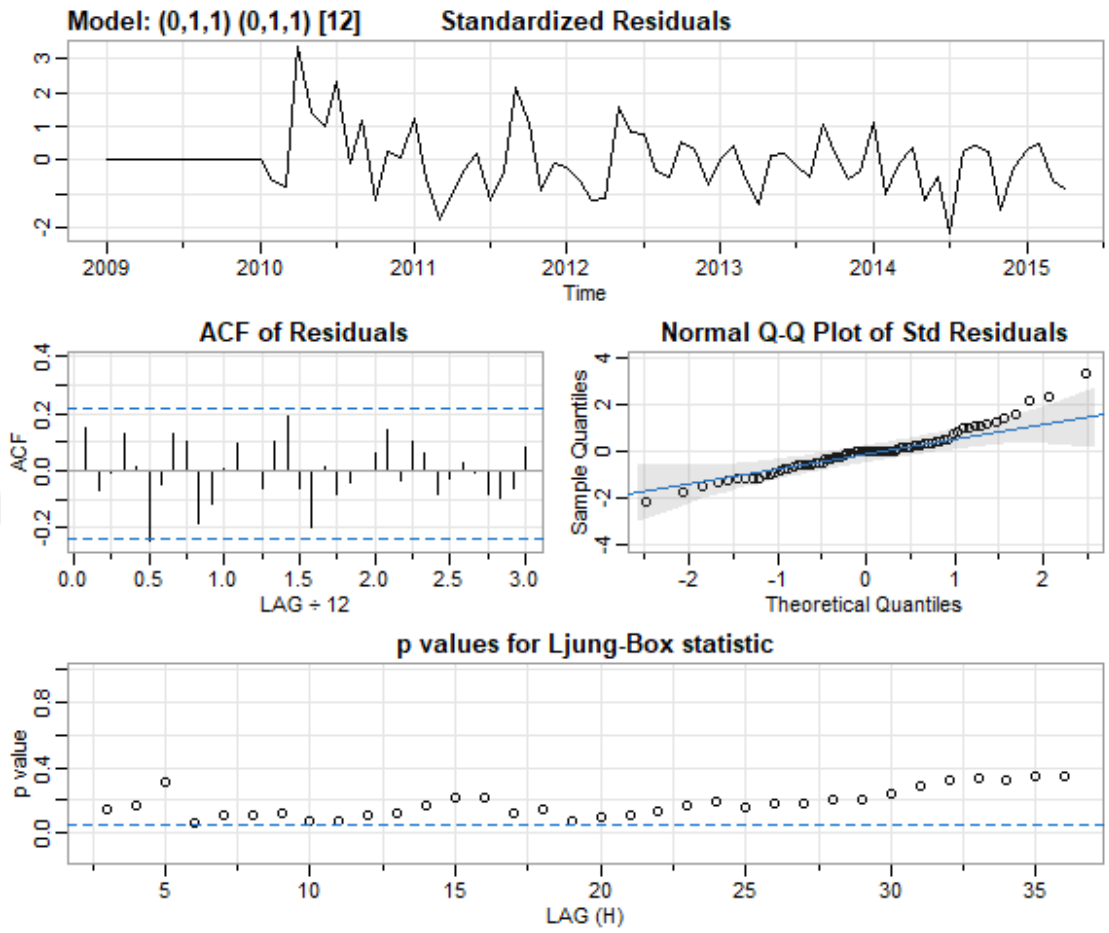
	Dependent variable: Log Difference of Imports Volume (Thousand Tons)						
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
ma1	−0.836***		−0.691***	−0.860***	−0.366	−0.816***	−0.998*
	(0.057)		(0.126)	(0.054)	(0.654)	(0.078)	(0.427)
ar1		−0.337**		0.126	−0.337	0.102	0.280
		(0.109)		(0.128)	(0.699)	(0.131)	(0.427)
ma2			−0.150		−0.420		0.161
			(0.120)		(0.540)		(0.364)
ar2						−0.195	−0.227
						(0.124)	(0.134)
Observations	75	75	75	75	75	75	75
Log Likelihood	−88.474	−99.469	−87.761	−87.994	−87.551	−86.793	−86.692
σ^2	0.610	0.829	0.599	0.603	0.595	0.583	0.581
Akaike Inf. Crit.	180.948	202.937	181.522	181.987	183.103	181.585	183.383
Note:							*p<0.05; **p<0.01; ***p<0.001

Table 23: Pre-Intervention Seasonal Regression Results

	Dependent variable: Log of Imports Volume (Thousand Tons)						
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
ar1				0.096	0.098		
				(0.134)	(0.134)		
ar2				−0.235	−0.230		
				(0.133)	(0.131)		
ma1	−0.960***	−0.833***	−0.833***	−0.792***	−0.794***	−0.681***	−0.833***
	(0.095)	(0.059)	(0.059)	(0.092)	(0.091)	(0.131)	(0.059)
ma2						−0.156	
						(0.122)	
sma1	−0.786**		−0.030		−0.108	−0.046	0.149
	(0.247)		(0.130)		(0.135)	(0.137)	(1.584)
sar1		−0.032		−0.121			−0.183
		(0.135)		(0.144)			(1.582)
Observations	63	75	75	75	75	75	75
(d, D)	(1,1)	(1,0)	(1,0)	(1,0)	(1,0)	(1,0)	(1,0)
Log Likelihood	−84.494	−88.445	−88.447	−86.447	−86.481	−87.703	−88.440
σ^2	0.680	0.609	0.609	0.576	0.577	0.598	0.609
Akaike Inf. Crit.	174.988	182.891	182.894	182.895	182.962	183.407	184.881

Note: *p<0.05; **p<0.01; ***p<0.001

Figure 24: Pre-Intervention Model Inspection



In the second step the intervention type is specified. For this purpose, the identified ARIMA model for pre-intervention period is used to forecast the values for the period after intervention. The difference between the actual and forecasted values is calculated to fit a second ARIMA model. This model is used to determine the order model of the interventions and it is identified as (1, 0).

After the intervention type is specified, both models are combined, and overall intervention model is fitted. In Table 24, overall intervention regression results for seamless tubes and pipes are given and all the models in the table have the same MA and seasonal part (i.e.,$(0,1,1)\ (0,1,1)_{12}$) due to pre-intervention model specified and transfer argument is followed by a list c (1,0) for each three interventions. Same procedures are applied for other 2 investigations and the results are reported in Tables 3.15 and 3.16 respectively. The details of the regression procedures are provided in Appendix B.

Table 24: Intervention Regression Results: Seamless Tubes and Pipes

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ma1	−0.874***	−0.882***	−0.875***	−0.840***	−0.841***	−0.849***
	(0.043)	(0.040)	(0.042)	(0.049)	(0.049)	(0.045)
sma1	−0.811***	−0.803***	−0.811***	−0.835***	−0.837***	−0.835***
	(0.110)	(0.109)	(0.110)	(0.115)	(0.116)	(0.115)
Int1Pulse.1.T.-AR1	−0.966***	0.853		−0.965***	−0.966***	
	(0.035)	(0.488)		(0.036)	(0.045)	
Int1Pulse.1.T.-MA0	0.384	−0.245		0.379	0.306	
	(0.236)	(0.479)		(0.237)	(0.232)	
Int2Pulse.1.T.-AR1	−0.889***		−0.843***	−0.783		−0.828**
	(0.098)		(0.194)	(0.585)		(0.257)
Int2Pulse.1.T.-MA0	−0.656*		−0.432	−0.670		−0.416
	(0.377)		(0.403)	(0.697)		(0.431)
Int3Step.1.T.-AR1	0.260	0.099	0.268			
	(0.677)	(0.939)	(0.680)			
Int3Step.1.T.-MA0	−0.483	−0.813	−0.468			
	(0.466)	(0.861)	(0.474)			
Int2mix.1.T.-AR1		−0.768***			−0.884***	
		(0.213)			(0.134)	
Int2mix.1.T.-MA0		−0.710			−0.432	
		(0.508)			(0.466)	
Int1mix.1.T.-AR1			−0.019			0.714*
						(0.280)
Int1mix.1.T.-MA0			0.017			0.102
			(0.250)			(0.119)
Int3Pulse.1.T.-AR1				−0.889***	−0.835	−0.219
				(0.197)	(0.699)	
Int3Pulse.1.T.-MA0				0.259	0.048	0.010
				(0.732)	(0.532)	(0.534)
Log Likelihood	−150.1	−150.9	−151.5	−151.5	−152.3	−152.5
σ^2	0.450	0.457	0.459	0.456	0.461	0.462
AIC	318.2	319.9	321.0	321.2	322.7	323.0

Table 25: Intervention Regression Results: Galvanized Sheet Metals

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ma1	−0.999***	−1.000***	−1.000***	−0.905***	−0.857***	−0.842***
	(0.018)	(0.018)	(0.020)	(0.058)	(0.047)	(0.048)
sar1	0.075	0.023	−0.891***	0.383	0.279	0.327
	(5.189)		(0.073)	(0.722)	(0.641)	(0.516)
sma1	−0.030	0.022	1.000***	−0.318	−0.191	−0.241
	(5.203)		(0.119)	(0.736)	(0.654)	(0.527)
gInt1Step.1.Tg.-AR1	1.000***	0.991***				
	(0.013)	(0.015)				
gInt1Step.1.Tg.-MA0	0.120	0.123*				
	(0.073)	(0.057)				
gInt3Step.1.Tg.-AR1	0.948***			0.903***		
	(0.020)			(0.045)		
gInt3Step.1.Tg.-MA0	−0.495**			−0.314*		
	(0.182)			(0.140)		
gInt3mix.1.Tg.-AR1		0.943***	0.770***			
		(0.022)	(0.152)			
gInt3mix.1.Tg.-MA0		−0.468***	−0.500			
		(0.129)	(0.336)			
gInt1mix.1.Tg.-AR1			0.899***		0.836***	
			(0.064)		(0.130)	
gInt1mix.1.Tg.-MA0			0.203		0.356	
			(0.104)		(0.211)	
gInt1Pulse.1.Tg.-AR1				0.034		−0.038
				(0.440)		(0.447)
gInt1Pulse.1.Tg.-MA0				−2.526		−2.154
				(1.528)		(1.517)
gInt3Pulse.1.Tg.-AR1					0.698	0.665**
					(0.456)	(0.255)
gInt3Pulse.1.Tg.-MA0					1.028	1.977
					(1.450)	(1.362)
Log Likelihood	−273.401	−273.920	−275.180	−278.536	−279.838	−280.804
σ^2	2.225	2.240	2.180	2.433	2.481	2.515
AIC	562.8	563.8	566.4	573.1	575.7	577.6
RMSE	1.49	1.49	1.47	1.55	1.57	1.58

Table 26: Intervention Regression Results: Heavy Plates

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ar1	−0.508**	−0.514**	−0.454*	−0.453*	−0.461*	−0.475*
	(0.175)	(0.179)	(0.183)	(0.185)	(0.191)	(0.186)
ma1	−0.159	−0.141	−0.230	−0.234	−0.222	−0.196
	(0.149)	(0.156)	(0.159)	(0.163)	(0.174)	(0.165)
ma2	−0.666***	−0.650***	−0.619***	−0.624***	−0.618***	−0.614***
	(0.117)	(0.117)	(0.129)	(0.130)	(0.129)	(0.125)
sma1	−0.912***	−0.950***	−0.842***	−0.842***	−0.863***	−0.859***
	(0.146)	(0.259)	(0.098)	(0.098)	(0.104)	(0.102)
hInt1mix.1.Hg.-AR1	−0.975***	−0.975***				
	(0.021)	(0.021)				
hInt1mix.1.Hg.-MA0	−1.126*	−1.097				
	(0.680)	(0.692)				
hInt3mix.1.Hg.-AR1	0.838***					
	(0.161)					
hInt3mix.1.Hg.-MA0	−0.532					
	(0.543)					
hInt3Pulse.1.Hg.-AR1		0.709*			0.708*	0.689*
		(0.454)			(0.327)	(0.391)
hInt3Pulse.1.Hg.-MA0		1.101			2.031	1.750
		(2.890)			(2.916)	(2.934)
hInt1Pulse.1.Hg.-AR1			−0.153		0.835***	
			(1.280)		(0.209)	
hInt1Pulse.1.Hg.-MA0			1.877		2.451	
			(3.176)		(2.613)	
hInt3Step.1.Hg.-AR1			0.846***	0.833***		
			(0.153)	(0.160)		
hInt3Step.1.Hg.-MA0			−0.492	−0.546		
			(0.501)	(0.533)		
hInt1Step.1.Hg.-AR1				−0.564		−0.533
				(0.840)		(1.436)
hInt1Step.1.Hg.-MA0				1.202		0.676
				(2.206)		(2.503)

3.7 RESULTS

Since their structure cannot be determined theoretically, it is not possible to foresee if the interventions cause temporary or permanent effects on firm imports behavior and hence each of them could be step, pulse, or mix. In such circumstances, Pankratz (2012) suggests selecting the type of dummy variables for interventions empirically. Based on this approach, all possible step, pulse and mix combinations for each intervention are tested. Relatively superior 6 models in the Tables are the ones which has the lowest AIC among these combinations. First models of each Tables are the best performing ones both in terms of AIC and significance of the coefficients and chosen as the fitted model. In this set up, ma1 and sma1 are pre-intervention coefficients; MA0 and AR1 extensions of an intervention represent the immediate and the lingering effects respectively. Most of the models in the Tables present strong correlation with past imports and seasonal fluctuations. However, the responses in terms of interventions show substantial variations.

For seamless tubes and pipes, all the models indicate significant response in terms of MA and seasonal autoregressive parts. The type of intervention is given as variable names in each model. In model 1, for instance, first and second interventions are temporary (pulse), and the third intervention is multi-period (step). Similarly, other models in the table are designed according to temporary or permanent nature of the interventions.

The impact of first intervention may be called **announcement effect**; the *Int1Pulse.1.T.-MA0* variable indicates immediate effect and *Int1Pulse.1.T.-AR1* shows the lingering effect of investigation initiation announcement and pulse function is the appropriate one for the first intervention of the investigation. According to the selected model, the immediate reaction of imports to investigation announcement decision is positive which means an increase in imports. This relation is compatible with the findings of other similar studies (Staiger et al.,1994 and Wan et al., 2010). However, despite the positive sign of the coefficient, it is not statistically significant. The lingering impact of the announcement, on the other hand, is statistically significant and negatively affects

the import volume in the following months. To compute the magnitude of the impact, the coefficients are needed to be transformed back to their original metrics since the variables are in logarithmic forms. For this purpose, the estimates are transformed back to the original series via taking exponential. For instance, the log level AR coefficient of the first intervention (i.e., -0.966) is transformed to original metric by the formula of $(e^{-0,966} - 1) \times 100$. Thus, the import volume of seamless tubes and pipes fall 62 percent compared to the pre-intervention period after the first intervention in May 2015 until the second intervention in February 2016. This fall is relative to the intervention free import volumes, namely considering what would be the original series whether there was no intervention at all.

The coefficients of the second intervention are statistically significant both in terms of immediate and lingering effects. As the intervention announced in February 2006, the immediate effect is realized as 48% decrease in imports compared to pre-intervention situation. Since the lingering effect is also statistically significant, the total effect of the second intervention should be accounted by considering both coefficients together until the third intervention. Then the combined effect has the following coefficient of $0.889 \times 0.656^6 = 0.071$ and this value can be transformed to original metric as 7.36% decrease in imports during the period when the provisional measure stayed in force.

For seamless tubes and pipes, the definitive measure did not cause any considerable results in import decisions and neither of the coefficients of the third intervention are statistically significant.

In galvanized sheet metals investigation, there are 2 interventions as initiation of the investigation in July 2015 and imposition of the definitive anti-dumping duty in June 2016, and there is no provisional duty during the investigation. Thus, the models in Table 25 are designed according to these 2 interventions. Announcement of the investigation did not cause an immediate effect, but lingering effect is significant in this case as before. After the necessary transformation is made, it is found that the announcement effect caused 171.83

percent increase in imports during the investigation period of 11 months relative to pre-intervention import trends.

Definitive duty decision, on the other hand, have both immediate and lingering effects over import volumes and both coefficients are statistically significant, and these effects have opposite coefficients. This result is compatible with general sense because after the substantial increase in duties imports are expected to fall as an immediate reaction. However, as time passes the markets adjust accordingly and endogenize the imposed duties into their cost structures. Based on the coefficients, the immediate effect of the definitive duty is computed as 39.04 % fall in imports compared to pre-intervention imports. The measure stayed in force for 5 years and in computing the overall lingering effect the whole period between intervention date and June 2021 is considered. The duty intervention caused a total of 1.38% fall in imports after 6 months of application compared to pre-intervention import structure.

There are 2 interventions in heavy plates investigation and no provisional duty is applied as in the galvanized sheet metal investigation. In this case, contrary to the previous cases announcement of the investigation caused both immediate and lingering effects. The immediate effect caused 67.57 percent fall in imports volume. Since the investigation continued 11 months, lingering effect is computed for the whole duration of the investigation, and it is found as 97.26% fall in imports relative to pre-intervention import trends.

Finally, definitive duty decision, have not immediate effect but carries lingering effects over import volumes, and these effects have opposite coefficients as expected. Based on these coefficients, the lingering effect of the definitive duty is computed as 131.17 % rise in imports compared to pre-intervention level. The measure is still in force and in computing the overall lingering effect the whole period between intervention date and December 2021 is considered.

The announcement of an investigation cause consistently significant results in all the models tested for the three investigations. This means although the immediate reaction is ambiguous, the investigations cause significant changes in imports of the products under investigation after the initiation. It is reasonable to

expect firms not to change their import decisions immediately as the investigation is initiated. Natural results of ordinary course of trade such as existence of previously signed contracts, orders in transit constitute substantial inflexibilities for the importers to change their import decisions as soon as the investigation begins. However, as it proceeds, impacts of initiation over import decisions become more observable in all three cases. Although the change in imports is statistically significant for all cases, fall or rise depends on the types of the products. The dependency to imports, lack of alternatives of the exporting country, inventory conditions of the industry, expectations about the result of the investigation constitute major factors that determine the fall or rise of the imports at these stages of the investigation. Provisional duty is applied only in seamless tubes and pipes investigations, and its impacts over import decisions are quite significant both in terms of immediate and lingering effects. Since such decisions are made at early stages of investigations, they cause substantial signaling effects about the course of investigation and the probable results at the end of the process. When a provisional duty decision is made, a strong expectation arises for the overall result. In such cases, firms earn adequate time to redesign their supply chains and can even fully substitute their supplier countries with others considering worst-case scenarios. Seamless tubes and pipes investigation is the only case where the last intervention is statistically insignificant both in terms of immediate and lingering effects. This supports the importance of provisional duty in investigation processes which erodes the effects of final decision stages. In both galvanized sheets and heavy plates investigations, final intervention imposing anti-dumping duty caused statistically significant results over import decisions in terms of lingering effects and the imports gradually have risen after the final decision. It is a sign of the limited effect of an anti-dumping duty and importers adapt to new market conditions by reflecting the additional costs to their prices to some extent depending on the elasticity of demand of their products. In this respect, it would not be a realistic approach for domestic producers to expect the dumping measure to be effective for a long time. Additionally, alternative suppliers from other countries not subject to measure create additional pressure over the effectiveness of the duty.

3.8 DISCUSSION

Steel is among the most important materials in international trade and has kept its importance in commodity markets for decades. Due to its sophisticated demand and supply conditions, government interventions, incentive and protection schemes, the industry is accepted as one of the most distorted markets in the world and has received considerable attention from economists especially after 1950s.

Global excess capacity problems and recent wave of rising protectionist movements added new insights to the market dynamics and stimulated additional interest with respect to trade defense policies of different countries and economic blocs. The industry, which has been the subject to most anti-dumping investigations historically by far, is still prominent addressee of many new anti-dumping investigations after the current protectionist policies of developed countries.

Turkey is among the major global actors in steel products both in terms of production and international trade, and steel imports have always been most important targets of Turkish anti-dumping policy as well. Among all other industries, 5 of the top 10 anti-dumping investigations are launched against steel imports. As the strategic competitors took new initiatives about steel trade in recent years, Turkey has immediately reacted both raising tariffs or initiating more comprehensive trade defense investigations. Anti-dumping investigations against steel industry has substantially increased by this perspective both in terms of number and coverage especially after 2015.

The stages of anti-dumping investigations are certain and predetermined processes. Thus, the nature of different policy actions during an investigation may cause similar consequences regarding import decisions of firms. Studying the impact of anti-dumping interventions may provide important contributions in

understanding the response of economic agents and quantifying the effectiveness of a measure with respect to different intervention steps.

In this study the impacts of different stages of Turkish anti-dumping investigations on the imports of steel industry is investigated. The three largest anti-dumping investigations, which accounted 76 percent of all Turkish anti-dumping investigations against steel industry, were selected for analysis and intervention analysis is used. Seamless tubes and pipes, cold-rolled painted galvanized sheet metal, and heavy plates investigations again China are the selected representative investigations.

To obtain an objective intervention definition, publicized decisions of an anti-dumping investigation is used. In Turkish anti-dumping practices, most critical interventions during the process are announced via Communiques. Therefore, the study defined 3 important and publicized policy actions as interventions and attempted to estimate the effects of these actions over imports. Initiation decision, imposition of temporary and definitive measures are the actions accepted as interventions. The announcement of an investigation is found to be an important factor over import decisions. Although the immediate reaction to the initiation decision is ambiguous, the investigations caused significant changes in imports during the investigation process.

Provisional duty, on the other hand, is only applied in seamless tubes and pipes investigation, and found to be quite important factor for following import decisions. Compared to other investigations, the final intervention has lost its importance due to the second intervention. Since a provisional duty is taken as signal for final duty, the importers reacted accordingly, and the impact of the final intervention is eroded. Contrary to seamless tubes and pipes, both in galvanized sheets and heavy plates investigations, final intervention imposing anti-dumping duty caused statistically significant results over import decisions.

CONCLUSION

International trade is one of the decisive factors for development through its impacts on innovation, productivity, and technology transfer. Export promotion and import substitution are two main pillars of international trade policy, owing mostly to their repercussions on industrial policy for development.

Turkey have implemented various combinations of these policies in different economic conjectures and applied considerable amount of trade measures thus far. While export promotion is the dominant approach in trade policy in post-1980 period, import substitution has maintained its importance in public policy sphere. Although import substitution favors domestic production, this implies efficiency losses and sacrifices in productivity to some extent. The timing, duration, and output of such policies, hence, need to be closely watched and analyzed.

We have recently witnessed a new wave of protectionist policies around the world, which makes it ever more imperative to take a closer look at Turkey's import policies. Turkey has multilateral and multidimensional trade agreements with different countries and economic blocs and implemented various trade policies in last few decades. These traits make Turkey almost a natural candidate for representative trade studies that might be carried out to extended spheres. As an important developing country with a sophisticated trade regime, findings about Turkish trade policy may provide significant implications and improve comparative research areas for other countries.

The main purpose of this thesis is to examine impacts of certain trade measures, specifically anti-dumping investigations, more closely by analyzing Turkish trade policy.

As one of the most frequent users of anti-dumping investigations in the world and like many other countries, rising global protectionism after 2012 stimulated the implementation of new measures in Turkey. ACD is among the most important instruments that have been applied and affected extensive volume of imports in this period but not have been studied yet. Although it is widely used and seems

to be an important substitute of anti-dumping policy, the study examines this policy tool for the first time in the literature among anti-dumping determinants.

The research questions of the Thesis are formulated under 3 interconnected categories and aimed to analyze the relevant policy instruments. Due to the clear need of a systematic reference, a general framework of anti-dumping practices both in the world and Turkey is given in the first section. Additionally, historical development of anti-dumping practices, theoretical background of the subject, institutional elements, stylized facts, and detailed statistics are also provided for better understanding of the conceptual framework.

The data improvements and completing the missing data points regarding Turkish anti-dumping investigations directly from original investigation documents in the first chapter provide a substantial logistics advantage for future analyses. Furthermore, detailed imports statistics both for ACD and AD are expected to stimulate prospective studies focusing on different aspects of the subject. Although Turkish ACD policy is a relatively new policy instrument, its intensive use and substantial impacts on imports and production decisions take the subject to the core of Turkish trade policy issues and require substantial research efforts in extended dimensions. The imports statistics are computed by this motivation for the first time for ACD coverage since they have been implemented.

The determinants of anti-dumping initiations are separately analyzed in the relevant section with different control variables. Since ACD policy shows an inconsistent implication frequency, 2 bunches of models are conducted with and without ACD intervention. In this set of regressions, various macroeconomic indicators, retaliation behavior and manufacturing sector's value added are controlled.

According to our findings, the most important factors that affect investigations are retaliation motives, deterioration in trade deficit and productivity of the manufacturing sector. Although it is statistically less significant compared to these factors, real GDP growth is also an important element in Turkish practices. A negative relationship between anti-dumping investigations and ACD is also

detected but since it is applied since 2011, more time is needed for further inference. The implementation nature and relatively short duration of the application of the policy sets the most important limitation for the study. Future studies are expected to eliminate these disadvantages by longer data sets and less ambiguous policy preferences.

Still our findings indicate more structural areas of the economy such as trade deficit, retaliating trade partners, changes in manufacturing value added, and GDP growth are dominant factors in Turkish anti-dumping policy. These factors are mostly related to protectionist motives, industrial productivity problems and overall macroeconomic stability. Thus, it seems more likely that the importance of ACD will substantially increase and it can be a serious alternative to AD investigations soon especially for certain countries. Recent fall in file petitions strengthen this expectation and ACD provide a more practical tool for Turkish authorities compared to anti-dumping investigations. Because imposing ACD does not require any additional administrative burden or rigid legislative requirements based on WTO Agreements contrary to anti-dumping investigations. In addition to its convenience for protection purposes, traditionally targeted countries via anti-dumping investigations can be subject to substantial additional tariffs with less administrative efforts and large import tax revenues.

However, ACD, is more distortive tool compared to AD based on its extensive coverage, less selective nature and transparency and there is no time limit on its duration of validity. In such a setting, lobbying power of different actors become more important than anti-dumping investigations and predictability of the application procedures disappear to a certain extent. AD and ACD have quite different policy implications especially in terms of allocation problem as well. Thus, comparison of similar protective measures in other developing countries with anti-dumping investigations offer productive research questions for future studies. In Turkish case, losses in consumer welfare, distortions in investment decisions across industries and rise in inflation via pass through of import prices due to ACD policy are most important aspects that could be examined as well.

The last section of the Thesis focuses on a different aspect of Turkish anti-dumping policy. The impacts of publicized interventions over firms' import decisions, are discussed for the first time for Turkey in the literature by using intervention analysis. As a major global actor in steel products, steel imports have always been among the most important targets of Turkish anti-dumping policy. The study investigates the impacts of different actions during anti-dumping investigations over firms' import decisions in this industry.

In Turkish anti-dumping practices, most critical interventions during the process are announced via Communiques published in the Official Gazette. Therefore, the study defines 3 important policy actions as interventions and attempts to estimate the effects of these actions over imports. Initiation decision, imposition of temporary measure and definitive measure are the interventions studied. Quantifying the overall effects of the investigation and impacts of different interventions separately over imports would be beneficial to all decision makers both from public sector and industry to measure the results of different anti-dumping actions.

The announcement of an investigation is found to be an important factor over import decisions. Although the immediate reaction to the initiation decision is ambiguous, the investigations caused significant changes in imports during the investigation process in every investigation analyzed. Additionally, provisional duty is found to be quite important factor over future import decisions.

In the investigations where provisional duty is applied, the final intervention is observed to lose its importance due to this intervention. Since a provisional duty is taken as signal for final duty, the importers reacted accordingly, and the impact of the final intervention is eroded. Lack of a provisional duty, on the other hand, is found to be an important factor that caused final intervention to be effective. Although a limited sector and number of investigations analyzed, the study still provides an objective comparison basis to measure the impact of any anti-dumping investigation that may be a useful resource for future economic evaluations.

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APPENDIX 1. DETAILED STATISTICS ON TURKISH TRADE POLICY

Table 27: Dumping Investigations and Measures Across Countries

Country	Investigation	Share in Total (%)	Measure	Share in Total (%)
China	101	31.27	90	36.89
Taiwan	19	5.88	15	6.15
India	18	5.57	11	4.51
South Korea	16	4.95	12	4.92
Thailand	15	4.64	13	5.33
Russia	13	4.02	9	3.69
Indonesia	12	3.72	10	4.10
Romania	12	3.72	10	4.10
Vietnam	10	3.10	9	3.69
Malaysia	8	2.48	8	3.28
Bulgaria	6	1.86	5	2.05
Egypt	5	1.55	1	0.41
Germany	5	1.55	3	1.23
Hungary	5	1.55	4	1.64
Italy	5	1.55	3	1.23
Pakistan	5	1.55	3	1.23
Saudi Arabia	5	1.55	2	0.82
Ukraine	5	1.55	4	1.64
USA	5	1.55	4	1.64
HongKong	4	1.24	1	0.41
Israel	4	1.24	3	1.23
Brazil	3	0.93	2	0.82
Finland	3	0.93	3	1.23
Japan	3	0.93	0	0.00
Poland	3	0.93	2	0.82
Yugoslavia	3	0.93	1	0.41
Belgium	2	0.62	1	0.41
Croatia	2	0.62	0	0.00
Czechoslovakia	2	0.62	1	0.41
France	2	0.62	0	0.00
Greece	2	0.62	2	0.82
Iran	2	0.62	1	0.41
Netherlands	2	0.62	2	0.82
Serbia	2	0.62	2	0.82
Sri Lanka	2	0.62	2	0.82
Belarus	1	0.31	1	0.41
Canada	1	0.31	1	0.41
EastGermany	1	0.31	0	0.00
European Union	1	0.31	0	0.00
Georgia	1	0.31	0	0.00
Kuwait	1	0.31	1	0.41
Moldova	1	0.31	1	0.41
Slovakia	1	0.31	0	0.00
Soviet Union	1	0.31	0	0.00
Spain	1	0.31	0	0.00
Sweden	1	0.31	1	0.41
United Arab Emirates	1	0.31	0	0.00
Total	**323**	**100.00**	**244**	**100.00**

Turkey's Anti-Dumping Investigations (1989-2020), (*) Three investigations initiated in 2020 against Croatia, Vietnam and Saudi Arabia continue

Source: Author's update of Bown (2016)

Table 28: General View of Additional Customs Duty

Decree No	OG Date	Product Group	Tariff Lines	Imports (T_1) Million USD	Imports (T_1) Top 5 Exporters
2011/2203	2011-09-15	Textiles	1,319	5,429.84	China, Bangladesh, Italy, Pakistan, Indonesia
2014/6692	2014-08-02	Footwear	104	992.95	China, Vietnam, Italy, Indonesia, India
2014/6884	2014-10-18	Steelbars	1	4.60	Russia, Iran, China, Romania, Germany
2014/7252	2015-02-18	Rugs and Floor Coverings	18	98.76	India, Pakistan, China, Afghanistan, Iran
2015/7241	2015-02-06	Certain Hand Tools & Stationery	129	595.37	China, Germany, Taiwan, US, Italy
2015/7699	2015-05-23	Furniture & Mats	54	957.90	China, Italy, Germany, Poland, Romania
2015/7712	2015-06-07	Lighting Equipments	80	533.58	China, Germany, Italy, Poland, Spain
2015/7713	2015-06-07	Household Appliances	56	819.47	China, Germany, France, Spain, Romania
2015/7722	2015-06-20	Box,cases & bags	52	542.45	China, Italy, France, Vietnam, India
2015/7749	2015-07-05	Construction Materials	75	252.30	China, Russia, Germany, Italy, S.Korea
2016/9127	2016-09-07	Rubber Tires	21	818.57	Germany, Slovakia, Romania, Japan, China
2016/9391	2016-11-11	Kitchenware,Tableware	171	943.76	China, Italy, Germany, France, Bulgaria
2016/9422	2016-11-11	Stationery&Office Supplies	107	515.20	China, Germany, Italy, Switzerland, US
2016/9548	2016-12-08	Furnishings,knickknackery	175	304.98	China, India, Bosnia, UK, Belgium
2016/9640	2016-12-31	Garment	158	764.78	China, Bangladesh, India, Pakistan, Italy
2016/9647	2017-01-11	Personal Care Products	70	1,274.07	Germany, France, Poland, UK, Italy
2017/9750	2017-01-18	Pipes,Power Generator,Transmissons	44	1,174.48	Germany, UK, China, Italy, India
2017/10310	2017-06-01	Eyeglasses & equipments	12	194.41	China, Italy, Taiwan, France, Japan
2017/10476	2017-07-28	Bicycle-Motocycle Rubber Tires	29	488.72	China, India, Aegean Free Zone, France, Japan
2017/10561	2017-08-17	Steam-boilers, elevators etc	47	943.01	China, Germany, Italy, Slovakia, Finland
2017/10580	2017-08-17	Compressors & tower cranes	33	856.02	Germany, Italy, China, Finland, US
2018/11481	2018-03-28	Syringe, thermos, assorted machines	78	1,905.33	China, Italy, Germany, US, Russia
2018-416	2018-12-07	Various machines & equipments	42	462.60	China, Italy, Germany, US, France
2018-433	2018-12-10	Various construction equipments	161	1,974.63	China, Germany, S.Korea, US, Italy
2019-651	2019-01-16	Synthetic fibers	109	2,455.23	India, China, Indonesia, S.Korea, Vietnam
2019-1475	2019-08-22	Cotton yarns	44	85.12	Pakistan, India, Egypt, Uzbekistan, Italy
2019-1665	2019-10-18	Textiles	66	164.47	China, Italy, Romania, India, Germany
2019-1822	2019-12-12	Forklifts & similar vehicles	6	248.58	Germany, China, France, Italy, UK
2020-2424	2020-04-18	Various industrial products	194	2,978.38	China, Germany, Italy, Switzerland, US
2020-2429	2020-04-21	Various industrial products	886	3,924.88	China, India, Indonesia, Italy, S.Korea
2020-2430	2020-04-21	Various industrial products	2,112	12,268.56	China, Germany, Italy, France, Poland
2020-2514	2020-05-11	Various industrial products	414	4,139.13	India, China, Italy, Germany, UAE
2020-2565	2020-05-20	Various industrial products	859	5,117.22	China, Germany, Italy, Japan, US
2020-2682	2020-06-28	Various industrial products	445	3,198.89	Germany, China, Italy, India, Japan
2020-2819	2020-08-05	Various processed foods & industrial products	115	198.40	Belgium, Germany, Italy, Holland, India

Additional Customs Duty
Source: TUIK, Official Gazette

Table 29: Additional Customs Duty and Change in Physical Imports

	Physical Volume of Imports (Tons)					Period
DecreeNo	(t-1)	(t)	(t+1)	(t+2)	(t+3)	Change (%)
2011/2203	531,613	564,666	417,408	467,380	480,665	-9.58
2014/6692	41,777	39,871	36,492	32,230	30,528	-26.93
2014/6884	4,787	6,708	2,602	3,131	783	-83.64
2014/7252	2,194	1,218	574	383	430	-80.38
2015/7241	35,031	27,057	25,370	23,801	21,713	-38.02
2015/7699	157,328	141,181	113,644	88,353	80,552	-48.80
2015/7712	30,859	30,608	18,835	15,442	13,114	-57.50
2015/7713	73,500	71,405	60,634	69,811	52,530	-28.53
2015/7722	22,385	18,279	10,833	10,192	8,516	-61.96
2015/7749	207,900	161,420	105,965	98,799	102,590	-50.65
2016/9127	199,503	221,711	201,552	184,586	161,207	-19.20
2016/9391	337,241	297,325	230,352	217,660	182,685	-45.83
2016/9422	149,394	143,190	114,939	105,156	106,706	-28.57
2016/9548	46,417	46,437	35,651	29,218	25,860	-44.29
2016/9640	24,934	27,866	15,801	11,985	7,468	-70.05
2016/9647	380,454	386,452	354,160	344,036	366,655	-3.63
2017/9750	145,661	192,712	131,117	121,560	139,651	-4.13
2017/10310	2,188	2,004	1,750	1,271	958	-56.24
2017/10476	54,201	56,019	50,815	42,483	38,844	-28.33
2017/10561	153,989	104,594	81,081	71,367	91,141	-40.81
2017/10580	81,843	77,545	66,542	48,685	52,591	-35.74
2018/11481	277,168	178,097	104,754	133,354		
2018-416	38,972	37,531	32,206	37,815		
2018-433	728,325	657,511	501,610	569,780		
2019-651	1,055,200	1,177,193	996,401			
2019-1475	20,519	24,511	20,455			
2019-1665	17,420	21,910	11,555			
2019-1822	48,087	24,308	43,408			
2020-2424	552,570	534,038				
2020-2429	1,386,399	1,181,718				
2020-2430	2,226,288	2,485,101				
2020-2514	415,821	450,327				
2020-2565	1,670,006	1,698,390				
2020-2682	396,325	537,145				
2020-2819	86,475	92,203				

Additional Customs Duty and Change in Imports

Source: TUIK, Official Gazette

[1] Decrees 2020-2429 and 2020-2430 update the ACDs in past 24 Decrees

Table 30: All Anti-Dumping Investigations in Steel Industry

Country	Product	Initiation Date	Status	Imports (t_1) (USD)
EU	Hot-rolled flat steel	2021-01-09	Continue	683,407,617
France	Hot-rolled coil steel	2015-01-28	No measure	502,401,705
Ukraine	Hot-rolled coil steel	2015-01-28	No measure	348,463,156
Russia	Hot-rolled coil steel	2015-01-28	No measure	340,864,786
China	Seamless tubes/pipes and hollow profiles of iron and steel	2015-05-15	In Force	182,603,661
Taiwan	Cold-rolled stainless steel flats	2015-08-22	No measure	117,993,558
S. Korea	Hot-rolled flat steel	2021-01-09	Continue	114,962,538
Japan	Hot-rolled coil steel	2015-01-28	No measure	105,492,557
Slovakia	Hot-rolled coil steel	2015-01-28	No measure	96,272,150
Romania	Hot-rolled coil steel	2015-01-28	No measure	87,869,190
China	Cold-rolled stainless steel flats	2015-08-22	No measure	84,707,303
China	Hot-rolled coil steel	2015-01-28	No measure	74,838,768
China	Painted galvanized sheet metal (Cold-rolled)	2015-07-23	In Force	35,452,687
China	Heavy plates	2016-12-21	In Force	24,962,478
Taiwan	Welded stainless steel tubes/pipes and profiles	2012-04-19	In Force	23,672,563
China	Welded stainless steel tubes/pipes and profiles	2012-04-19	In Force	22,735,454
China	Certain tube or pipe fittings of iron or steel	2009-04-18	In Force	7,107,291
Vietnam	Welded stainless steel tubes, pipes & profiles	2020-06-24	In Force	6,541,056
China	Articulated link chain and parts thereof	2009-07-25	In Force	5,859,974
India	Tubes and pipes of cast iron	2016-07-31	No measure	4,829,866
Thailand	Fittings	2005-04-27	In Force	1,882,662
Indonesia	Fittings	2005-04-27	In Force	1,471,716
Bulgaria	Fittings	2005-04-27	In Force	1,381,498
China	Tire chain	2004-08-12	Finish	1,275,186
Russia	Ropes and cables (including locked coil tapes)	2004-06-03	In Force	956,235
China	Ropes and cables (including locked coil tapes)	2004-06-03	In Force	676,133
China	Stud-Link of iron or steel welded link chain of iron or steel	2003-07-04	Finish	510,527
Serbia and Montenegro	Fittings	2005-04-27	Finish	441,830
India	Fittings	2005-04-27	In Force	266,139
UAE	Tubes and pipes of cast iron	2016-07-31	No measure	71,736

All Anti-Dumping Investigations Initiated for Steel Industry: 1989-2020
Source: Author's update of Bown (2016)

APPENDIX 2. REGRESSION PROCEDURES

B.1.Galvanized Sheet Metals

In determining the overall model, a four-step approach is adopted, and same procedures are applied for all the 3 investigations analyzed. In the first step, the ARIMA model of pre-intervention period is specified. In the second step, the interventions and their patterns are identified. In the third step, overall intervention model is set, and this model is checked with regard to its output and finally formal diagnostics are performed.

Figure 25 indicates monthly import volumes in thousand tons of investigated products from China and other 7 countries which has the biggest share for January 2009-June 2021. The interventions are illustrated with dotted lines in the same figure.

China pre-intervention import series does not seem to have trend but as the figure illustrates it does not seem to be stationary due to variance differences across the time. Although ACF-PACF plots in Figures 27 and 28 does not show that the series have a seasonality pattern, STL Decomposition in Figure 26 is a sign of clear seasonality.

For formal testing of stationarity of the original series, ADF test is used, and it shows the null hypothesis of non-stationary cannot be rejected with a p-value of 0.2661. However, after the log transformation of the differenced the series, it is stationary with a p-value less than 0.01. Thus, the candidate models are specified according to this nature of the data and log transformation of the differenced series is used.

For model specification, pre-intervention data (Jan 2009- June 2015) is used to fit an ARIMA model. The output of (auto.arima) function of R forecast package is used as a baseline model for further elaborations and the best fitted model is selected according to AIC for the intervention free series.

The best model is indicated as ARIMA(3,0,0) for log differenced series by the algorithm of the forecast package and several other alternatives are compared

with this model in Table 31. The model selected by automatic algorithm does not have seasonal part and has an AIC value of 301.077. However, based on the seasonal demand characteristics of the products concerned, more attention is attributed to seasonal alternatives.

The result of the comparison of seasonal models are given in Table 32. Among these models, third model in the table $(0,0,1)\ (1,0,1)_{12}$ has significant coefficients with minimum AIC value. Thus, third model in the Table is chosen as pre-intervention ARIMA model.

Following the specification of the ARIMA structure for the pre-intervention period, it is needed to check if the residuals of the model is white-noise or not. The residual plots and formal test of autocorrelation as Ljung-Box test are given in Figure 29 which shows that the chosen model is also suitable in terms of these concerns. There is no significant autocorrelation, and the model has a good fit.

In the second step the intervention type is specified. For this purpose, the identified ARIMA model for pre-intervention period is used to forecast the values for the period after intervention. The difference between the actual and forecasted values is calculated to fit a second ARIMA model. This model is used to determine the order model of the interventions and it is identified as (1, 0).

After the intervention type is specified, both models are combined, and overall intervention model is fitted. In Table 33, overall intervention regression results are given and all the models in the table have the same MA and seasonal part (i.e.,$(0,0,1)\ (1,0,1)_{12}$) due to pre-intervention model specified and transfer argument is followed by a list c (1,0) for both interventions.

Figure 25: Imports from Top 8 Countries (Galvanized Sheet Metals)

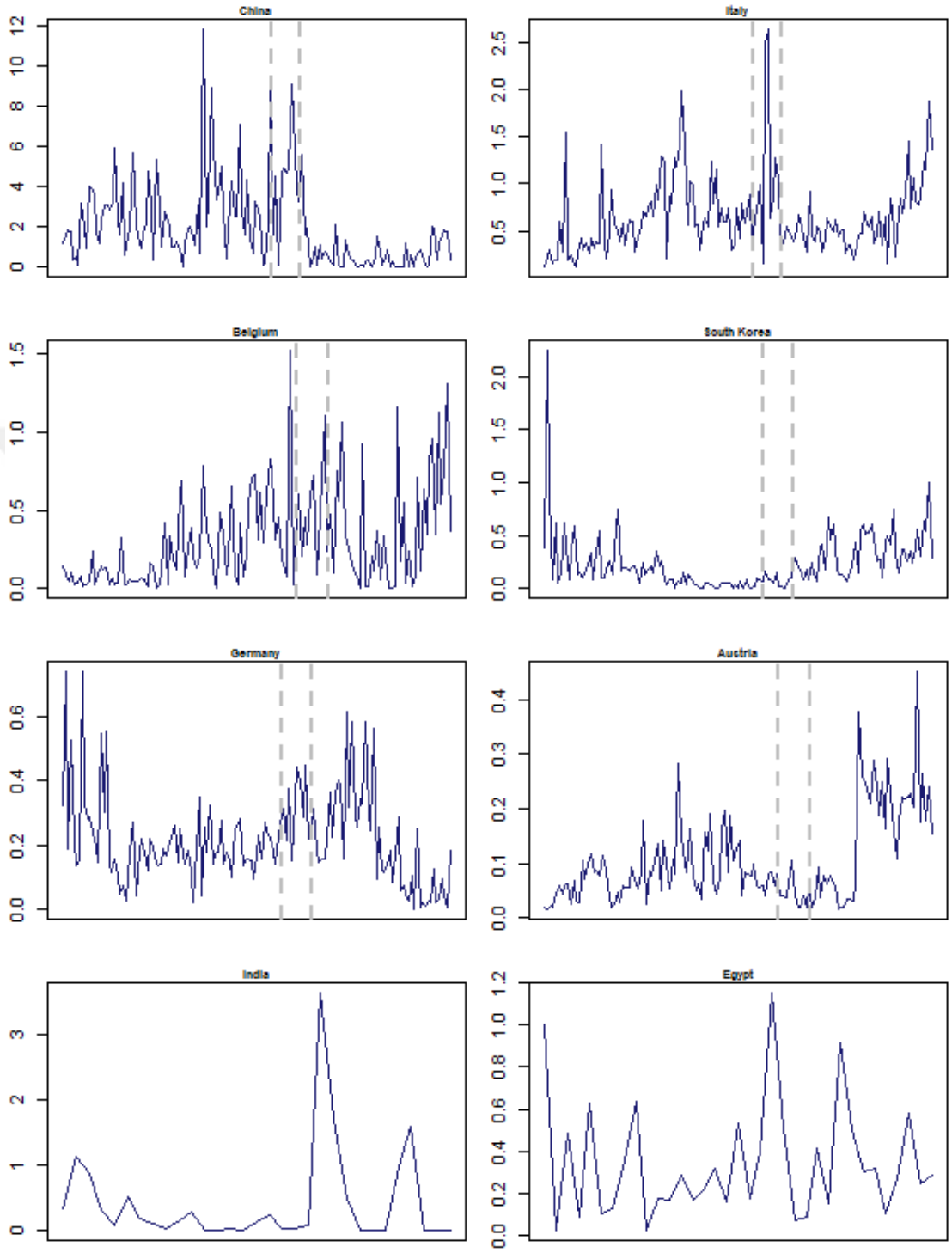


Figure 26: STL Decomposition (Galvanized Sheet Metals)

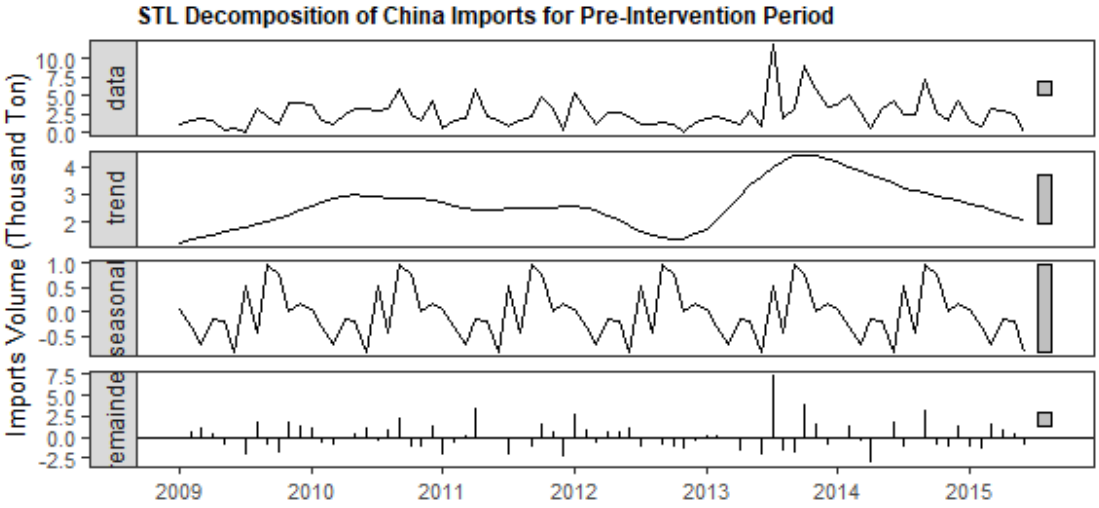


Figure 27: Gal. Sheet Metal Pre-Intervention ACF-PACF (Original Series)

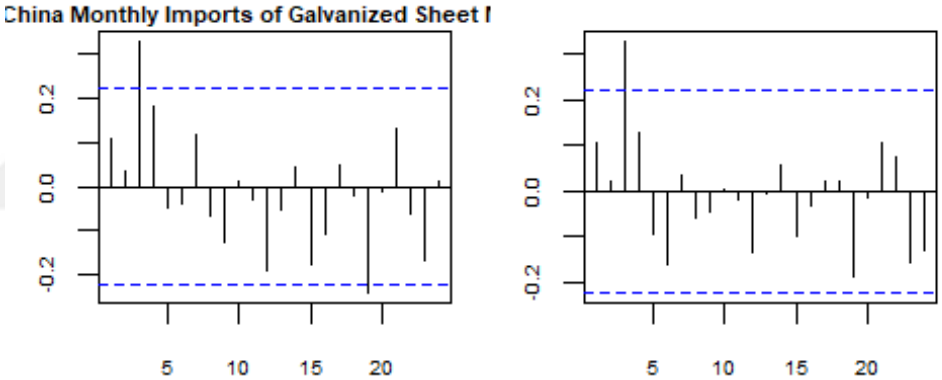


Figure 28: Gal. Sheet Metal Pre-Intervention ACF-PACF (Log Series)

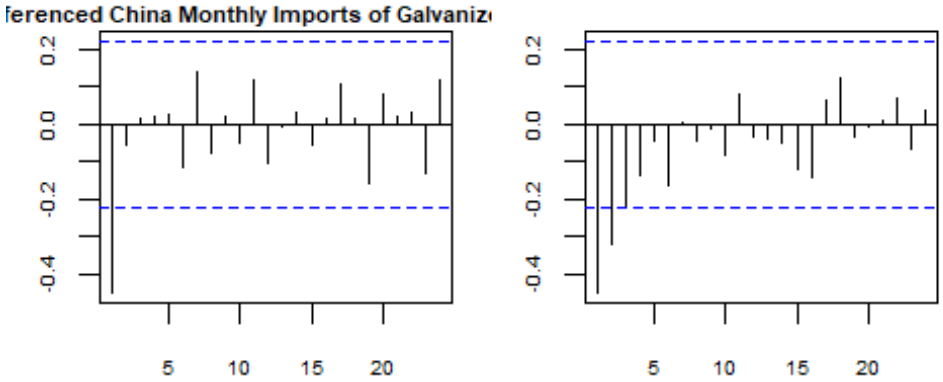


Table 31: Non-Seasonal Regression Results: Galvanized Sheet Metals

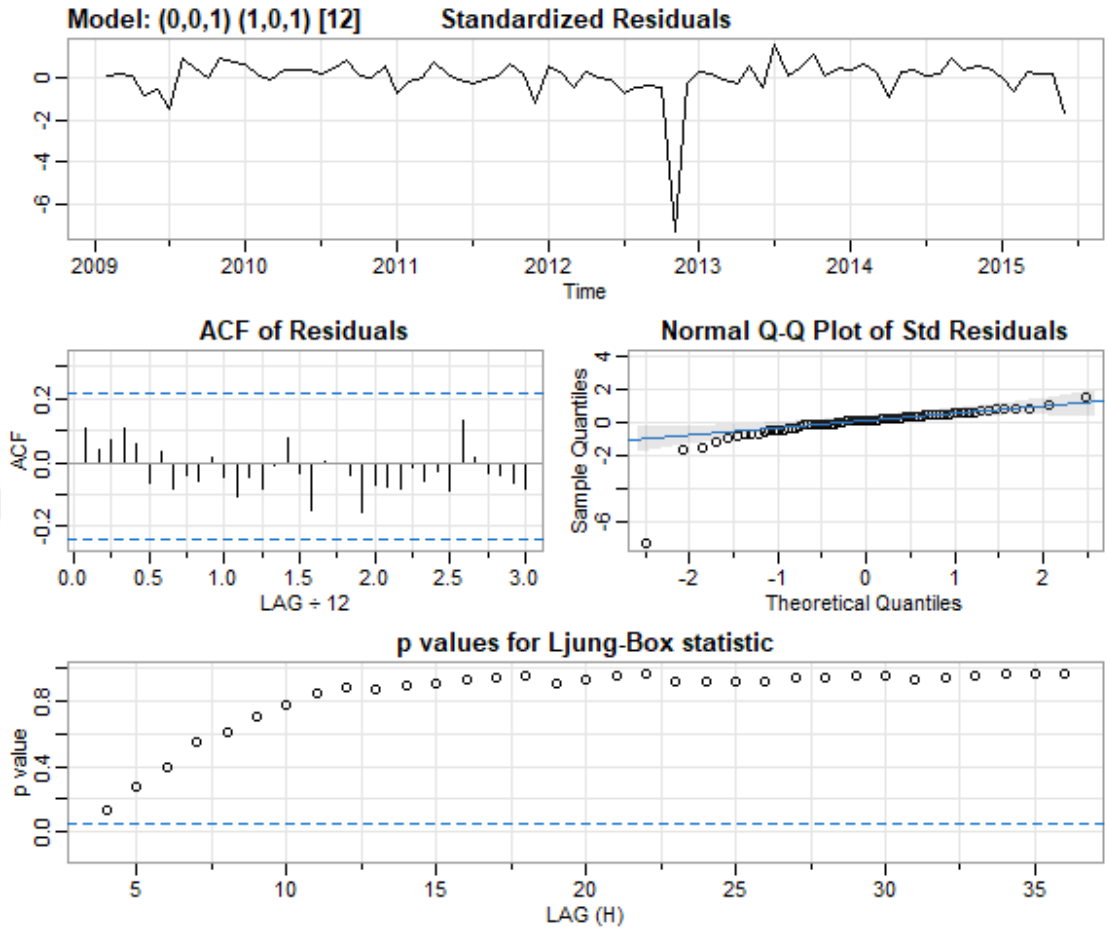
	Dependent variable: Log Difference of Imports Volume (Thousand Tons)						
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
ar1		0.119		0.726	−0.706***	−0.617***	−0.458***
		(0.116)		(0.402)	(0.112)	(0.109)	(0.102)
ar2				0.002	−0.496***	−0.337**	
				(0.138)	(0.125)	(0.107)	
ma1	−0.999***	−0.999***	−0.890***	−1.618***			
	(0.046)	(0.041)	(0.119)	(0.385)			
ma2			−0.110	0.618			
			(0.112)	(0.383)			
ar3					−0.250*		
					(0.110)		
intercept	0.003	0.003	0.003	0.003	−0.008	−0.011	−0.017
	(0.007)	(0.008)	(0.008)	(0.010)	(0.075)	(0.097)	(0.138)
Observations	77	77	77	77	77	77	77
Log Likelihood	−142.019	−141.496	−141.536	−141.167	−145.539	−148.009	−152.607
σ^2	2.213	2.190	2.191	2.182	2.543	2.719	3.074
Akaike Inf. Crit.	290.039	290.991	291.072	294.334	301.077	304.019	311.214

Note: *p<0.05; **p<0.01; ***p<0.001

Table 32: Seasonal Regression Results: Galvanized Sheet Metals

	Dependent variable: Log Difference of Imports Volume (Thousand Tons)						
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
ar1					0.122	0.116	−0.705***
					(0.116)	(0.116)	(0.111)
ar2						0.040	−0.501***
						(0.116)	(0.124)
ma1	−1.000***	−1.000***	−0.999***	−1.000***	−1.000***	−1.000***	
	(0.049)	(0.049)	(0.049)	(0.049)	(0.043)	(0.042)	
ar3							−0.272*
							(0.110)
sar1	−0.144		−0.977***		−0.992***	−0.997***	−0.998***
	(0.112)		(0.113)		(0.151)	(0.051)	(0.030)
sma1		−0.142	0.922***	−0.142	0.953*	0.974***	0.976***
		(0.113)	(0.204)	(0.114)	(0.431)	(0.255)	(0.192)
sma2				0.013			
				(0.111)			
intercept	0.003	0.003	0.004	0.003	0.004	0.004	−0.007
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.069)
Observations	77	77	77	77	77	77	77
Log Likelihood	−141.212	−141.231	−141.035	−141.224	−140.482	−140.418	−144.307
σ^2	2.154	2.154	2.076	2.154	2.012	1.982	2.264
Akaike Inf. Crit.	290.424	290.463	292.069	292.448	292.965	294.836	302.615
Note:							*p<0.05; **p<0.01; ***p<0.001

Figure 29: Galvanized Sheet Metal Pre-Intervention Model Inspection



B.2.Heavy Plates

In determining the overall model, a four-step approach is adopted, and same procedures are applied for all of the 3 investigations analyzed. In the first step, the ARIMA model of pre-intervention period is specified. In the second step, the interventions and their patterns are identified. In the third step, overall intervention model is set, and this model is checked with regard to its output and finally formal diagnostics are performed.

Figure 26 indicates monthly import volumes in thousand tons of investigated products from China and other 7 countries which has the biggest share for January 2009-December 2021. The interventions are illustrated with dotted lines in the same figure.

Table 33: Intervention Regression Results: Galvanized Sheet Metals

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ma1	−0.999***	−1.000***	−1.000***	−0.905***	−0.857***	−0.842***
	(0.018)	(0.018)	(0.020)	(0.058)	(0.047)	(0.048)
sar1	0.075	0.023	−0.891***	0.383	0.279	0.327
	(5.189)		(0.073)	(0.722)	(0.641)	(0.516)
sma1	−0.030	0.022	1.000***	−0.318	−0.191	−0.241
	(5.203)		(0.119)	(0.736)	(0.654)	(0.527)
gInt1Step.1.Tg.-AR1	1.000***	0.991***				
	(0.013)	(0.015)				
gInt1Step.1.Tg.-MA0	0.120	0.123*				
	(0.073)	(0.057)				
gInt3Step.1.Tg.-AR1	0.948***			0.903***		
	(0.020)			(0.045)		
gInt3Step.1.Tg.-MA0	−0.495**			−0.314*		
	(0.182)			(0.140)		
gInt3mix.1.Tg.-AR1		0.943***	0.770***			
		(0.022)	(0.152)			
gInt3mix.1.Tg.-MA0		−0.468***	−0.500			
		(0.129)	(0.336)			
gInt1mix.1.Tg.-AR1			0.899***		0.836***	
			(0.064)		(0.130)	
gInt1mix.1.Tg.-MA0			0.203		0.356	
			(0.104)		(0.211)	
gInt1Pulse.1.Tg.-AR1				0.034		−0.038
				(0.440)		(0.447)
gInt1Pulse.1.Tg.-MA0				−2.526		−2.154
				(1.528)		(1.517)
gInt3Pulse.1.Tg.-AR1					0.698	0.665**
					(0.456)	(0.255)
gInt3Pulse.1.Tg.-MA0					1.028	1.977
					(1.450)	(1.362)
Log Likelihood	−273.401	−273.920	−275.180	−278.536	−279.838	−280.804
σ^2	2.225	2.240	2.180	2.433	2.481	2.515
AIC	562.8	563.8	566.4	573.1	575.7	577.6
RMSE	1.49	1.49	1.47	1.55	1.57	1.58

China pre-intervention import series seem to have trend and as the figure illustrates it does not seem to be stationary due to variance differences across the time. ACF-PACF plots in Figures 32 and 33 show that the series are not stationary and STL Decomposition in Figure 31 is a sign of clear seasonality.

For formal testing of stationarity of the original series, ADF test is used and it shows the null hypothesis of non-stationary can not be rejected with a p-value of 0.4912. After the log transformation, the null hypothesis still can not be rejected (p-value:0,037). The log transformation of the differenced the series is stationary with a p-value less than 0.01. Thus, the candidate models are specified according to this nature of the data and log transformation of the differenced series is used.

For model specification, pre-intervention data (Jan 2009- November 2016) is used to fit an ARIMA model. The output of (auto.arima) function of R forecast package is used as a baseline model for further elaborations and the best fitted model is selected according to AIC for the intervention free series.

The best model is indicated as ARIMA(1,0,2) for log differenced series by the algorithm of the forecast package and several other alternatives are compared with this model in Table 34. The model selected by automatic algorithm does not have seasonal part. However, based on the seasonal demand characteristics of the products concerned, more attention is attributed to seasonal alternatives.

The result of the comparison of seasonal models are given in Table 35. Among these models, first model in the table $(1,0,2)\ (0,1,1)_{12}$ has significant coefficients with minimum AIC value. Thus first model in the Table is chosen as pre-intervention ARIMA model.

Following the specification of the ARIMA structure for the pre-intervention period, it is needed to check if the residuals of the model is white-noise or not. The residual plots and formal test of autocorrelation as Ljung-Box test are given in Figure 34 which shows that the chosen model is also suitable in terms of these concerns. There is no significant autocorrelation and the model has a good fit.

In the second step the intervention type is specified. For this purpose, the identified ARIMA model for pre-intervention period is used to forecast the values

for the period after intervention. The difference between the actual and forecasted values is calculated to fit a second ARIMA model. This model is used to determine the order model of the interventions and it is identified as (1, 0).

After the intervention type is specified, both models are combined and overall intervention model is fitted. In Table 36, overall intervention regression results are given and all the models in the table have the same ARMA and seasonal part (i.e.,$(1,0,2)\ (0,1,1)_{12}$) due to pre-intervention model specified and transfer argument is followed by a list c(1,0) for both interventions.

Figure 30: Imports from Top 8 Countries (Heavy Plates)

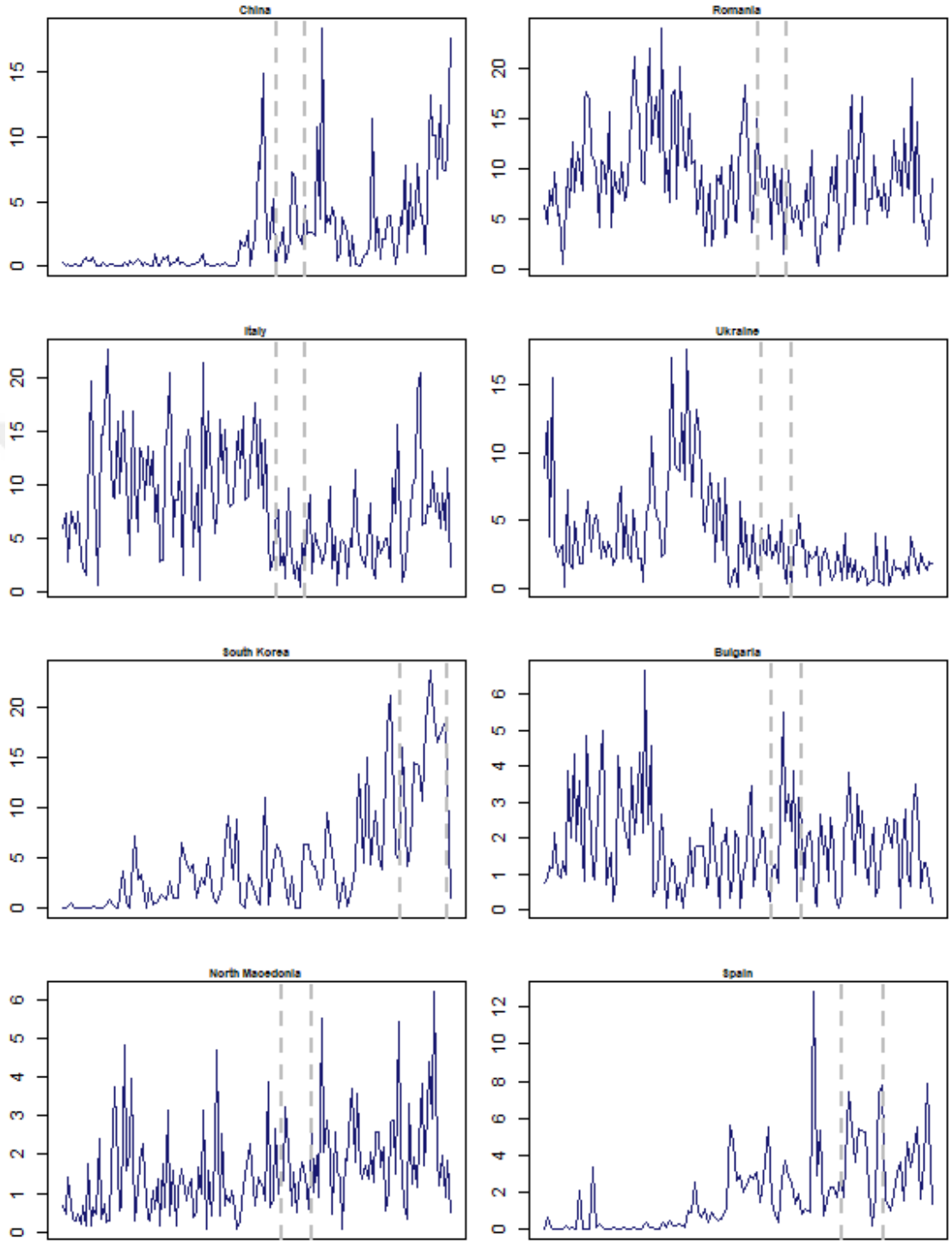


Figure 31: STL Decomposition (Heavy Plates)

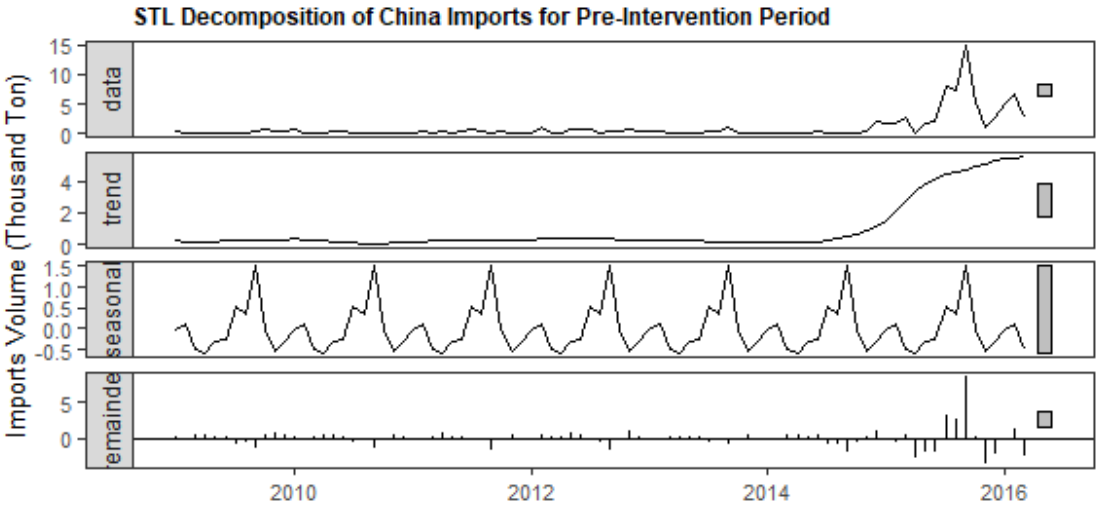


Figure 32: Heavy Plates Pre-Intervention ACF-PACF (Original Series)

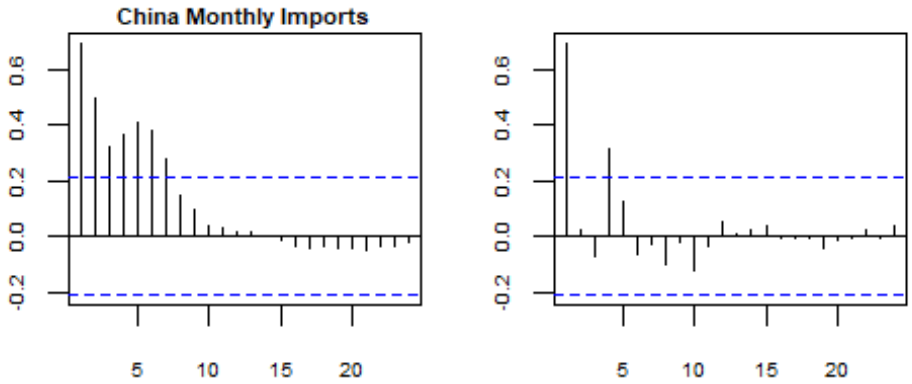


Figure 33: Heavy Plates Pre-Intervention ACF-PACF (Differenced Series)

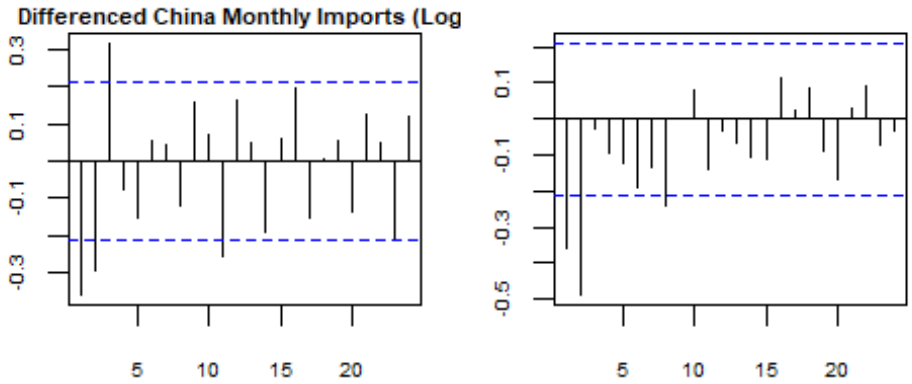


Table 34: Non-Seasonal Regression Results: Heavy Plates

	Dependent variable: Log Difference of Imports Volume (Thousand Tons)						
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
ar1	−0.495*		0.238*	−0.501*	−0.454		−0.532***
	(0.201)		(0.106)	(0.204)	(0.296)		(0.094)
ar2				−0.051			−0.479***
				(0.166)			(0.092)
ma1	−0.163	−0.688***	−1.000***	−0.164	−0.207	−0.856***	
	(0.184)	(0.140)	(0.051)	(0.181)	(0.291)	(0.083)	
ma2	−0.697***	−0.312*		−0.655***	−0.671***		
	(0.131)	(0.132)		(0.191)	(0.185)		
ma3					0.032		
					(0.158)		
intercept	0.049	0.038	0.039	0.053	0.051	0.056	0.037
	(0.052)	(0.024)	(0.024)	(0.061)	(0.057)	(0.073)	(0.238)
Observations	86	86	86	86	86	86	86
Log Likelihood	−246.625	−248.056	−248.560	−246.582	−246.606	−250.085	−249.940
σ^2	17.761	17.885	18.106	17.776	17.773	19.350	19.434
Akaike Inf. Crit.	503.249	504.111	505.119	505.163	505.212	506.170	507.881

Note: *p<0.05; **p<0.01; ***p<0.001

Table 35: Seasonal Regression Results: Heavy Plates

	Dependent variable: Log Difference of Imports Volume (Thousand Tons)						
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
ar1	−0.537**		−0.492*	0.263*			
	(0.195)		(0.204)	(0.107)			
ma1	−0.068	−0.802***	−0.148	−1.000***	−0.852***	−0.837***	−0.845***
	(0.165)	(0.091)	(0.182)	(0.044)	(0.086)	(0.086)	(0.087)
ma2	−0.672***		−0.695***				
	(0.121)		(0.128)				
sar1			0.601	0.545	0.056		0.657
			(0.484)	(0.475)	(0.108)		(0.557)
sma1	−0.868**	−1.000*	−0.504	−0.437		0.014	−0.581
	(0.330)	(0.413)	(0.516)	(0.502)		(0.109)	(0.589)
sma2						0.194	
						(0.161)	
intercept			0.054	0.040	0.057	0.068	0.060
			(0.064)	(0.026)	(0.079)	(0.094)	(0.089)
Observations	74	74	86	86	86	86	86
Log Likelihood	−222.706	−225.511	−246.047	−247.895	−249.948	−249.225	−249.677
σ^2	19.220	18.584	17.515	17.854	19.289	18.791	19.147
Akaike Inf. Crit.	455.411	457.022	506.093	507.790	507.896	508.449	509.353
Note:							*p<0.05; **p<0.01; ***p<0.001

Figure 34: Pre-Intervention Model Inspection: Heavy Plates

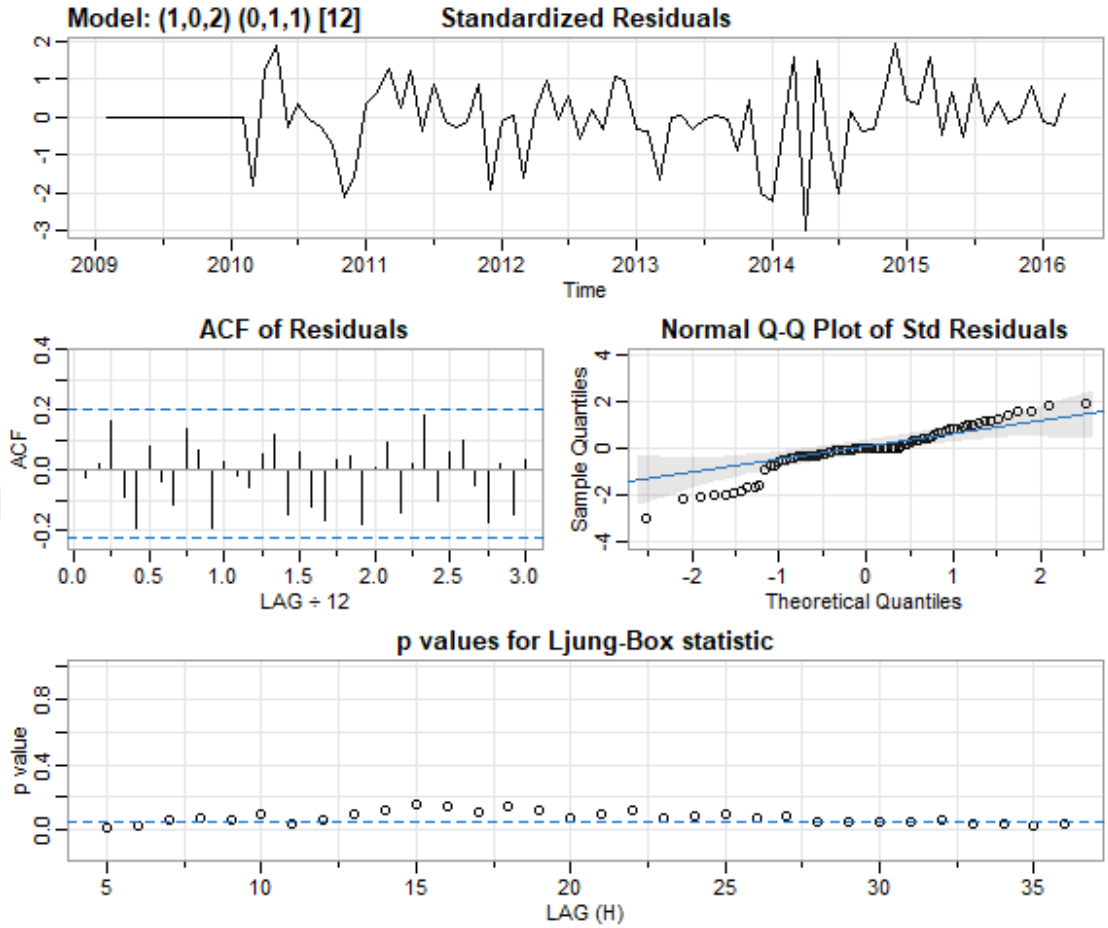


Table 36: Intervention Regression Results:Heavy Plates

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ar1	−0.508**	−0.514**	−0.454*	−0.453*	−0.461*	−0.475*
	(0.175)	(0.179)	(0.183)	(0.185)	(0.191)	(0.186)
ma1	−0.159	−0.141	−0.230	−0.234	−0.222	−0.196
	(0.149)	(0.156)	(0.159)	(0.163)	(0.174)	(0.165)
ma2	−0.666***	−0.650***	−0.619***	−0.624***	−0.618***	−0.614***
	(0.117)	(0.117)	(0.129)	(0.130)	(0.129)	(0.125)
sma1	−0.912***	−0.950***	−0.842***	−0.842***	−0.863***	−0.859***
	(0.146)	(0.259)	(0.098)	(0.098)	(0.104)	(0.102)
hInt1mix.1.Hg.-AR1	−0.975***	−0.975***				
	(0.021)	(0.021)				
hInt1mix.1.Hg.-MA0	−1.126*	−1.097				
	(0.680)	(0.692)				
hInt3mix.1.Hg.-AR1	0.838***					
	(0.161)					
hInt3mix.1.Hg.-MA0	−0.532					
	(0.543)					
hInt3Pulse.1.Hg.-AR1		0.709*			0.708*	0.689*
		(0.454)			(0.327)	(0.391)
hInt3Pulse.1.Hg.-MA0		1.101			2.031	1.750
		(2.890)			(2.916)	(2.934)
hInt1Pulse.1.Hg.-AR1			−0.153		0.835***	
			(1.280)		(0.209)	
hInt1Pulse.1.Hg.-MA0			1.877		2.451	
			(3.176)		(2.613)	
hInt3Step.1.Hg.-AR1			0.846***	0.833***		
			(0.153)	(0.160)		
hInt3Step.1.Hg.-MA0			−0.492	−0.546		
			(0.501)	(0.533)		
hInt1Step.1.Hg.-AR1				−0.564		−0.533
				(0.840)		(1.436)
hInt1Step.1.Hg.-MA0				1.202		0.676
				(2.296)		(2.503)
Log Likelihood	−387.123	−387.930	−388.585	−388.653	−389.036	−389.451
AIC	792.2	793.9	795.2	795.3	796.1	796.9

APPENDIX 3. ETHICS COMMISSION FORM

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
TEZ ÇALIŞMASI ETİK KOMİSYON MUAFİYETİ FORMU

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İKTİSAT ANABİLİM DALI BAŞKANLIĞI'NA

Tarih: 16/05/2022

Tez Başlığı: **Turkey's Anti-Dumping Policy and Its Impacts on Firms Behaviors**

Yukarıda başlığı gösterilen tez çalışmam:

1. İnsan ve hayvan üzerinde deney niteliği taşımamaktadır,
2. Biyolojik materyal (kan, idrar vb. biyolojik sıvılar ve numuneler) kullanılmasını gerektirmemektedir.
3. Beden bütünlüğüne müdahale içermemektedir.
4. Gözlemsel ve betimsel araştırma (anket, mülakat, ölçek/skala çalışmaları, dosya taramaları, veri kaynakları taraması, sistem-model geliştirme çalışmaları) niteliğinde değildir.

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.

Gereğini saygılarımla arz ederim.

16.05.2022

Tarih ve İmza

Adı Soyadı:	SERDAR AKBAŞ
Öğrenci No:	N15245996
Anabilim Dalı:	İKTİSAT
Programı:	İNGİLİZCE İKTİSAT
Statüsü:	☐ Yüksek Lisans ☒ Doktora ☐ Bütünleşik Doktora

DANIŞMAN GÖRÜŞÜ VE ONAYI

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

HACETTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
ECONOMICS DEPARTMENT

Date: 16/05/2022

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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.

16.05.2022
Date and Signature

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Program:	ECONOMICS
Status:	☐ MA ☒ Ph.D. ☐ Combined MA/ Ph.D.

ADVISER COMMENTS AND APPROVAL

Doç. Dr. BAHAR BAYRAKTAR SAĞLAM
(Title, Name Surname, Signature)

APPENDIX 4. ORIGINALITY REPORT

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
DOKTORA TEZ ÇALIŞMASI ORİJİNALLİK RAPORU

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İKTİSAT ANABİLİM DALI BAŞKANLIĞI'NA

Tarih: 16/05/2022

Tez Başlığı : **Turkey's Anti-Dumping Policy and Its Impacts on Firms Behaviors**

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