

Three Essays on Trade and Economic Development

by

Jihad Abbadi

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Department of Economics
Faculty of Social Sciences
University of Ottawa

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Abstract

This thesis includes three essays on trade and economic development. In the second chapter, I analyzed the impact of public uprising and democratic transformation on economic favoritism in the context of Tunisia, referencing the Arab Spring, through stock market analysis. The study is set to a historical perspective. The data comes from financial statements of companies listed in the Tunisian Stock Market, and from Morgan Stanley Capital Indices (MSCI) for the world and Tunisian stock markets over the period of 2005 – 2011. The study used daily cumulative return of stock as a measurement of expected economic performance of each firm. In this vein, the study covers five main periods – for comparing the cumulative return during and after the Jasmine Revolution. The study implements the event-study method. The main finding of the study is that the street demonstrations against the former president of Tunisia, and democratic transformation favored the Islamic firms. This finding supports the evidence that the investors in the Tunisian Stock Market update their information and adjust their behavior toward investments in the stock market according to the current regime. The finding also suggests that the investors (or the firms) connected to the party in power were getting benefits from the current regime relative to non-connected firms.

The third chapter studies the impact of tariff rationalization on import prices and

volumes. We studied how the improved institutional set-up under National Tariff Policy (NTP) 2019 – 24 has increased the pace at which tariff rationalization is taking place in Pakistan, particularly in the case of raw materials and intermediate products. Since the approval of NTP 2019-24, the government has reduced tariffs on 6248 tariff lines including the introduction of a 0 percent slab for 2062 tariff lines. Our estimates based on the event study model show that the decline in tariffs of raw materials and the intermediate product has a near complete pass-through to import prices in the short term, which only decreased slightly in the long-term, and there was a delayed, but considerably large, increase in the quantity of imports. Moreover, following the tariffs rationalization, there was a substantial increase in the quantum index of large-scale manufacturing and export ratio of publicly listed firms indicating that the industrial output and exports were also increased after tariff rationalization.

The final chapter analyzes the impact of terrorist attacks on stock prices. I utilize data on terrorist incidents in Pakistan, and stock prices of Pakistani and Bangladeshi firms. Using propensity score matching and the event- study model, I estimate the causal impact of terrorist activities on stock prices. The analysis also includes propensity score matching method to match Bangladeshi firms in order to address the possible impact of confounding variables. The findings suggest that there is a negative impact of terrorist attacks on stock prices, and a positive impact on daily stock price volatility. The impact on both prices and volatility is short-lived, with a reversal of prices the day after an event indicating overreaction. Moreover, the results show that there are possible speculations after the reversal of stock prices, as there are positive impacts on stock prices following the reversal.

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Chapter 1

Introduction

This thesis consists of three essays on trade and economic development. The motivation for the dissertation stems from several events and policy changes across the world in the recent past. These events and policy changes include civic resistance in Tunisia, tariff rationalization policy, and terrorist attacks in Pakistan. This work examines these events and their implications for stock market outcomes, import prices, and volumes.

The key motivation for work in Chapter 2 comes from an epochal incident, the outbreak of the Arab Spring. The present study aims to reveal who benefited from revolution and democratic transformation in Tunisia during and after the Jasmine Revolution. Given the civic resistance and the democratic transformation of economic favoritism in Tunisia during the Arab Spring, to what extent did the uprising and democracy favor the winning party in Tunisia during and after the revolution?

To answer the above question, I use Tunisian Stock Market data from financial statements of companies listed in the Tunisian Stock Market and Morgan Stanley Capital Indices (MSCI) for the world and Tunisian stock markets for 2005 – 2011. The

study used the daily cumulative stock return to measure each firm's expected economic performance. In this vein, the study covers five main periods – for comparing the cumulative return during and after the Jasmine Revolution. The study implements the event-study method. The main finding of the study is that the street demonstrations against the former president of Tunisia, and democratic transformation, favored Islamic firms. This finding supports the evidence that the investors in the Tunisian Stock Market update their information and adjust their behavior toward investments in the stock market according to the current regime. The finding also suggests that the investors (or the firms) connected to the party in power benefited from the current regime relative to non-connected firms.

This chapter contributes to the literature by finding that the firms that are connected to incumbent political parties were able to capture the rent. The stock market participants invest in firms connected to the ruling parties because these firms were able to capture the rent.

Chapter 3 is co-authored with Dr. Mumtaz Ahmad and Dr. Imtiaz Ahmad. This chapter explores the impact of the tariff rationalization policy in Pakistan on import prices and volumes. The key motivation for this chapter is to understand how tariff rationalization has affected import prices, volumes, and consequently domestic production and export orientation in Pakistan, which is a small developing economy grappling with issues of large trade and budget deficits.

To answer the above question, we focus on the improved institutional set-up under the National Tariff Policy (NTP) 2019-24 that increased the pace at which tariff rationalization is taking place in Pakistan, particularly in the case of raw materials and intermediate products. Since the approval of NTP 2019-24, the government has reduced tariffs on 6248 tariff lines including the introduction of a 0 percent slab

for 2062 tariff lines. Our estimates based on the event study model show that the decline in tariffs of raw materials and the intermediate product has a near complete pass-through to import prices in the short term, which only decreased slightly in the long term, and there was delayed, but a considerably large, increase in the quantity of imports. Moreover, following the tariff rationalization, there was a substantial increase in the quantum index of the large-scale manufacturing and export ratio of publicly listed firms, indicating that the industrial output and exports were also improved following the tariff rationalization policy.

This study contributes to the literature on the impact of tariff rationalization on imports in the case of a small developing economy. In a context where an economy is highly reliant on tariffs for revenue generation and meeting revenue targets under the IMF program, and facing a huge trade deficit and low foreign reserves, the move to decrease tariffs for industrialization and competitiveness is an interesting case to analyze in at least three important ways. First, how import values and volumes respond to tariff rationalization in the short and long term. Second, if there is an increase in import volume due to tariff rationalization, it can offset the price effect and may offset the adverse impact on revenue generation. Third, if the tariff rationalization is mainly on raw materials and intermediate commodities, it can improve competitiveness and export orientation.

The motivation for the final chapter comes from the recent empirical studies that have analyzed the impact of terrorist attacks on stock markets in terms of how stock markets behave on the event date, and following the event. However, few studies have analyzed the impact of terrorist attacks on stock markets in the context of overreaction or underreaction hypotheses. In this chapter, I use data on terrorist incidents in Pakistan and stock prices of Pakistani and Bangladeshi firms. Using propensity score

matching and the event-study model, I estimate the causal impact of terrorist activities on stock prices. The analysis also includes a propensity score matching method to match Bangladeshi firms to address the possible impact of confounding variables. The findings suggest an adverse impact of terrorist attacks on stock prices and a positive impact on stock price volatility. The impact on both prices and volatility is short-lived, with the reversal of prices the day after an event indicating the presence of overreaction. Moreover, the results show there are possible speculations after the reversal of stock prices as there is a positive impact on stock prices following the reversal.

This paper contributes to the existing literature by utilizing the event study or two-way fixed effect model to estimate the causal impact of terrorist attacks on stock prices. In addition, I also use a propensity score matching technique to match the firms from a comparable economy. Using data on daily stock prices for Pakistani and Bangladeshi firms along with major terrorist attacks. I explore the dynamics shaping market behavior in the aftermath. Including Bangladeshi firms as a control group through propensity score matching adds depth to the analysis.

Chapter 2

The Impact of Uprising and Democracy on Economic Favoritism

2.1 Introduction

This paper reports on an event study apropos the relationship between civic resistance, political regimes and economy within the Tunisian context. The purpose is to measure the impact of public uprising and democratic transformation on economic favoritism in the country, concerning the Arab Spring. Previous research conducted on the Arab world (e.g., [Acemoglu et al. \(2018\)](#), [Dabashi \(2012\)](#); [Teti et al. \(2017\)](#); [Bayat \(2017\)](#); [Spierings \(2020\)](#) [Feltrin \(2019\)](#); [Debre \(2020\)](#)[Kilavuz and Sumaktoyo \(2020\)](#)) and elsewhere ([Walzer \(2015\)](#); [Osman \(2016\)](#); [Meller \(2020\)](#)) highlights the significant role that public protests and political regimes have on the nature and dynamics of economic favoritism within a country. To date, however, there is no study that has examined such a role in the case of Tunisia. By filling this gap, the present study contributes to a better understanding of factors (e.g., demographic, social, political,

ideological, and financial) that determine or inform a country’s economic dynamics, and the economic (and overall) development within that country.

The remainder of this section provides an overview of the study’s background, context, focus, and purpose. Section two provides an overview of the relevant literature. Section three provides the study perspective and the research methodology. Section four analyzes the data and discusses the findings. Lastly, section five concludes the work.

2.1.1 Background

Recent years have witnessed an epochal incident: the outbreak of the Arab Spring. The Arab Spring was a series of anti-government activities-protests, demonstrations, uprisings, and (sometimes) armed rebellions that spread across many Arab countries in the Middle East and North Africa (MENA) in late 2010 ([Dabashi \(2012\)](#); [Grinin et al. \(2018\)](#)). The incident began with protests in Tunisia, then the protests spread to five other countries: Libya, Egypt, Yemen, Syria, and Bahrain ([Shultziner and Kornblit \(2020\)](#)). Sustained street demonstrations took place in other countries including Morocco, Iraq, Lebanon, Jordan, Kuwait, Oman, and Sudan, and there were minor protests in Mauritania, Palestine, Saudi Arabia, and the Moroccan Western Sahara ([Debre \(2020\)](#)).

The Arab Spring has been a function of complex structural factors –economic, political, and demographic ([Charrad and Reith \(2019\)](#); [Elsayed and Yarovaya \(2019\)](#)). It is the interplay of these factors that has triggered public unrest along with desires for reformation of democratization – leading to political destabilization within the MENA region ([Debre \(2020\)](#)).

The economic factor relates to the low living standards prevalent in the MENA

region ([Debre \(2020\)](#)). Poor economic conditions in many Arab countries caused food insecurity triggered by bad weather conditions and exacerbated by corrupt local agricultural policies, rises in local farming costs, and thus rises in food prices ([Soffiantini \(2020\)](#)). Also, unrewarding fiscal returns have contributed to decreased investment in poor labor markets ([Campante and Chor \(2012\)](#)). This position has created a climate for sociopolitical unrest and destabilization, leading to an increased likelihood of political protests ([Basir and Datta \(2020\)](#)). Hence, it is plausible to consider the economic factor as a root cause of the Arab Spring ([Soffiantini \(2020\)](#)).

The political factor relates the oppressive regimes in the protesting Arab countries ([Azimov \(2019\)](#)). Entrenched in authoritarian ruling, the oppressive regimes triggered hopes and activities for democratization ([Debre \(2020\)](#)). In effect, the uprisings produced new forms of ideological struggle, essentially between representatives of secularists and Islamists ([Grinin et al. \(2018\)](#)). Likewise, the revolutions triggered counter-responses on the part of the political leaders, ranging from nonviolent to violent military works, to handle the anti-government demonstrators and protesters.

The demographic factor relates to the population's trends (including people's education, population growth, fertility rates, marriage rates, rapid urbanization, massive international migration, and forced displacement) that have shaped the Arab Spring ([LaGraffe \(2012\)](#)). For example, the population growth, the rapid urbanization, the changing age structure, the low labor participation, and the insufficient provision of food, housing, education, and medical care constituted major challenges for governments in the protesting countries in the MENA region ([Mirkin \(2013\)](#)).

However, the economic, political, and demographic conditions underlying the Arab Spring are strongly intertwined and their interplay should be seen as leading to the different forms of civil resistance ([Springborg \(2011\)](#); [Basir and Datta \(2020\)](#)).

For example, the demonstrations and uprisings were fueled by rampant economic corruption, unemployment, underemployment, inequality, high rates of inflation, and polarization of wealth, while demands for reformation, freedom, and democratization, especially with the youth (mostly the educated youth), were prevalent in the Arab World ([Hodler \(2018\)](#)). Likewise, economic and political powers in the Arab countries have strongly interacted with rulers, stakeholders, and businessmen, entertaining financial privileges and sharing personalized relationships and common interests ([Soffiantini \(2020\)](#)).

Briefly, the ultimate purpose of all the demonstrations and uprisings in the Arab World have been the public desire for the regime’s fall ([Alalawi \(2015\)](#)). For example, the slogan for the uprising movements in all the revolting Arab states has been Al-shab Yurid Isqat Annizam, or “The people want to bring down the regime” ([Sinha et al. \(2020\)](#)). Atop the underlying motive for Arab people to participate in revolutions in their countries have been the demand for equal economic opportunities and better living standards within the frame of reformation through democratization ([Azimov \(2019\)](#); [Debre \(2020\)](#); [Basir and Datta \(2020\)](#)). This uniquely applies to Tunisia — the context of this study.

2.1.2 Context

The present study takes Tunisia as its context. Tunisia constitutes an ideal study case through which to show how political, economic, and demographic circumstances interplay to shape economic dynamics while hopes for democratization in a region (the MENA region) are characterized by entrenched authoritarian ruling ([Debre \(2020\)](#)) for the following reasons: First, Tunisia was the initiator of the Arab Spring, as the first instance of the reformation-driven, pro-democracy protesting, and thus a

reference point for understanding the revolutions that followed it in the Arab World in North Africa and the Middle East. For example, just as Ben Ali (in January 2011) alarmed the authoritarian Arab leaders against protesting movements, further protests broke out against the Libyan government on February 17, 2011 (Debre (2020)). Second, Tunisia was among the most stable countries in the MENA region during the decade that preceded the Arab Spring, with the Tunisian government being the most successful in terms of the transition towards democratization Fraihat (2016). Third, unlike the case in other Arab countries (for example, Egypt, Libya, Yemen, and Syria), Tunisia witnessed three successful elections after the revolution (Kraft (2020)). Together, these three reasons make Tunisia an ideal case (an example of democratic transformation) through which to observe the impact of uprising and democracy on economic favoritism. The remainder is a synthesis of the Tunisian uprising.

The chain of anti-government activities (the Arab Spring) started in Tunisia, when a fruit-selling retailer (Mohamed Bouazizi) set himself on fire on December 17, 2010 (Masri (2017)), in dissatisfaction with the municipality officers who confiscated his merchandise and humiliated him in public. Bouazizi's expression against the frustrating conditions, resonated with many Tunisians (Masri (2017)). The incident stirred up the Tunisian uprising known as the Jasmine Revolution (El-Khawas (2012)). The Jasmine Revolution has been a significant point in Tunisian modern history: prominent national parties, like the secular (for example, Nidaa Tounes) and Islamic parties (for example, Ennahda), worked on advocacy for "a stronger Tunisian-Arab identity and closer affiliation with Arab and Muslim world" (Masri (2017)). The Jasmine Revolution is critical in another aspect – it mirrors the values of the international community as an effort to promote democracy within the MENA region countries that were once considered impervious to democratic change (Schraeder (2012)).

From Tunisia, the uprising spread to many Arab countries, including Egypt and Libya. The Tunisians’ protests became so intense, causing former President Zine El Abidine Ben Ali to officially resign after twenty-eight days of street demonstrations (Gottfredsson (2020)). Ben Ali was unseated and exiled to Saudi Arabia after having been in power for twenty-three years (Honwana (2013)). The unseating of Ben Ali marked the end of the dictatorship regime in Tunisia (Dihstelhoff (2020)). There were two provisional governments after the revolution that were followed by two elections (Kraft (2020)). The consecutive handover of two temporary presidencies and two elected presidents after the revolution featured infighting between domestic parties (essentially the Islamists and secularists) in the country (Gorman (2018)). A third election took place in 2019 after the death of President Essebsi, who played an important role in Tunisia’s peaceful transition to democracy but failed to deliver tangible programs to transform the country’s ailing economy. To date, the consolidation of the democratic institutions of Tunisia has remained a challenge for the current government (headed by Kais Saeed) amongst “economic crisis, rampant corruption, growing social and identity tensions, and widespread political estrangement” (Brumberg and Salem (2020)).

2.1.3 Study Focus

The present study engages the interplay of public uprising and political democratization in Tunisia, with a focus on (hence with relation to) economic favoritism during and after the Jasmine Revolution. The focus, therefore, is sociopolitical, but essentially economic.

The sociopolitical focus concerns coups d’état (the removal of an existing government from power, be it through violent or nonviolent means) and revolutions as critical

venues for the uprising and democratization, or democratic transformation ([Kraft \(2020\)](#)). Coups d'état and processes can have costs and benefits: they may lead to structuring away from an authoritarian regime and toward democratic transformation and consolidation ([Osuna \(2019\)](#)). The revolutions in Tunisia, Egypt, Libya, Yemen, Algeria, and Sudan succeeded in unseating rulers who abused their power to achieve personal benefits at the expense of public welfare. Unlike other countries, however, Tunisia has moved toward democracy. For example, the revolution in Egypt led to an elected president (Mohammad Mursi) one year later, but ended with unseating and detaining him by the army.

Inversely, coups d'état and revolutions have risks: they may pave the way for the rising and the fostering of a new dictatorship ([Wu and Ye \(2020\)](#)). An excellent example of this situation is also from Egypt. The coup d'état and the revolution in Egypt against Mursi (which ended with unseating and detaining him) brought a new president (Abdel Fattah Assisi) and an authoritarian regime. Still, revolutions can be a lengthy process and may lead to uncertainty. Some countries (like Syria and Sudan) have been under uncertain situations of political indetermination and unrest.

The focus of the present study is essentially economic because the economic conditions were the main drive for the Arab Spring Revolution, including of Tunisia ([Soffiantini \(2020\)](#)). Besides, (as we discussed in the background), the civic, political, and economic circumstances are interwind or networked in that democratization (as an aspect of political reformation), so the study of democratic transformation is unfeasible without reference to the economic conditions and corollaries of the revolution. Moreover, the economic focus is relevant here to understand economic favoritism and its correlated cronyism (the practice of partiality in awarding jobs and other advantages to friends or trusted colleagues without paying attention to their

qualification) and nepotism (the practice among those with power or influence of favoring relatives or friends, especially by giving them job) as cultures common in the economies of the Arab World ([Hertog \(2019\)](#)).

2.1.4 Study Purpose

The present study engages the role of coups d'état and revolution as critical venues for uprising and democratization. The present study aims to unfold who benefited from revolutions and democratic transformation in Tunisia during and after the Jasmine Revolution. The purpose is to measure the impact of the public uprising and the democratic transformation on economic favoritism in Tunisia during the time of the Arab Spring. The present study is guided by the following question: to what extent did the uprising and democracy favor the winning party in Tunisia during and after the revolution?

2.2 Literature Review

The present study is based on two types of existing literature: Literature that deals with political connection firms, and literature that deals with uprising and democracy. The literature uses variation in the stock market return as a measurement for the changes in politically connected firms such as [Roberts \(1990\)](#). It should be noted that the net profit of each firm cannot be used as a measurement to check the political connection. It may be the case that the firms spend much of their returns on rent-seeking activities. In this regard, [Fisman \(2001\)](#) used the changes in the stock price in Indonesia as an estimate for the investor evaluation of the politically connected firms during the rumors about the health of Indonesian president Suharto [Fisman \(2001\)](#).

[Fisman \(2001\)](#) showed that the revenue of connected firms in 1995 was \$ 60 billion, compared to the \$ 200 billion GDP and the investments were driven by connections rather than profitability. The perceived corruption ranking of Indonesia in 1998 was forty-five out of fifty-four countries included in the survey.

Another study about Malaysia by [Johnson and Mitton \(2003\)](#) conducted after the Malaysian crisis between July 1997 and August 1998, reported that the connected firms lost about \$60 billion of their market value due to the expected drop in government subsidies to politically connected firms. In September 1998, Prime Minister Mahathir fired his deputy. After that, the market value of firms connected to the prime minister gained around \$5 billion, where thirty-two percent of the increase was due to the connections.

Similarly, [Khawaja and Mian \(2005\)](#) showed that the politically connected firms borrow forty-five percent more from government banks and their default rate was fifty percent more than non-connected firms, where private banks did not give any privilege to politically connected firms. Also, the study of [Ferguson and Voth \(2008\)](#) found significant returns for companies supporting the Nazi movement between January and March 1933.

The second set of literature in the present study includes studies that utilized the outcome of uprising and democracy, such as [Acemoglu and Robinson \(2000\)](#). They explained that the fall in inequality in Western Europe came after the democratization of the nineteenth century and the extension of voting rights due to the social unrest that took place in France and parts of Germany in 1848. In effect, democratic reforms were made in Belgium, Denmark, Luxembourg, and the Netherlands. [Aidt and Franck \(2015\)](#) showed that, throughout history, the threat of uprising triggered democratic reforms. They studied precisely the relationship between the swing riots in 1830 and

the number of voters who voted for pro-reform politicians.

Similarly, [Collins and Margo \(2007\)](#) examined the impact of race-related violence in many cities in the United States in the 1960s. They showed that the riots depressed the median value of the black-owned property.

The study of [Madestam et al. \(2013\)](#) explained how protests could affect policy-making – by changing the policy preference using the data collected about the Tea Party in the United States of America in 2009.

Along the same line, [Acemoglu et al. \(2018\)](#) studied the impact of street demonstrations that brought down the Mubarak regime in 2011. The street demonstrations lowered the stock prices of firms connected to the Mubarak regime, compared to non-connected firms.

2.3 Methodology

2.3.1 Research Method

The research method in the present work is based on the event study analysis, developed by Ball and Brown (1968). The event study analysis was used by [Acemoglu et al. \(2018\)](#) in their study of the Egyptian case within the Arab Spring incident. In the event study method, the changes in the stock prices are used as a measurement for the changes in the value of the firms during the event. Accordingly, in the present work, the firms were identified into groups: those connected and those non-connected to the political parties in Tunisia. Then, the market return of each stock based on efficient market hypotheses (EMH) was used to measure the changes in the value of the firms during the event. The abnormal changes in the value of each firm (or group of firms) were used to measure the rent captured by each firm (or group). Lastly,

the variations in stock price (connected to rivals) and the incumbents (compared to non-connected firms) were observed. In so doing, all other variables that affect the return of each stock during the event were controlled.

This method is adopted here to show us how political events favor each group of firms after the revolution and democratic transformation in Tunisia. It also helps us look in-depth into how the cronies benefited from the Tunisia president changing his cabinet, even though the government was elected in a legal process.

The present study covers three significant phases of the event. The first phase is *during the revolution*; the second phase is the transitional period – the forming of *provisional government* after the revolution; and the last (so primary) phase is the *democratic era*. Similarly, the firms are divided into *religious-affiliated firms (Islamic firms)* and *secular firms*. The *secular firms* are further divided into *non-connected firms* and *connected firms* – the firms that are connected to Ben Ali’s regime (*cronies*).

The cumulative daily return of each firm during the event is used as a dependent variable. The cumulative return $CR[n, m]_i = \sum_{t=n}^m R_{it}$, where R_{it} , is the log (ln) return of a firm i between its previous trading day and day t , during the period of each event from day n to day m . As mentioned, the firms are classified into three groups: non-connected, cronies, and Islamic. The D'_i is treated here as a vector of dummy variables and summaries of three groups of firms: $D_1 = 0$ for non-connected firms, $D_1 = 1$ for cronies, and $D_2 = 2$ for Islamic firms. The focus here is on the Islamic firms for two reasons: first, because the Islamic parties became one of the leading players in the political and legislative decisions after Ben Ali’s fall in 2011; and second, because the Islamists were cast away from the political life in Tunisia for decades. Accordingly, the focus is on the cumulative return to capture the rent. The rent represents investors’ beliefs during the event under study. That is their belief about

the firms' abilities to generate returns in the future. Furthermore, the study was meant to test if the rent captured by each group moved between groups under study or if the leading party obtained benefits without affecting other groups during the events under study between 2010 and 2018.

In the present study, the following is used as an empirical model:

$$CR[n, m]_i = D'_i \gamma + X'_i \nu + \eta_s + \varepsilon_i \quad (2.1)$$

where, D'_i is a vector of dummy variables, X_i is a vector of controls, η_s sector fixed effects (nine sectors), ε_i is the error term. Controls including constant term, size (total assets) and leverage (debt to asset ratio), and includes betas, β_i^{World} , $\beta_i^{Tunisia}$, β_i^{unrest} . We got $\beta_i^{World} \beta_i^{Tunisia}$, by regressing the daily stock return from January 31, 2005 to November 30, 2010 on the MSCI-Tunisia and MSCI-world indices, respectively. Where MSCI stands for Morgan Stanley Capital International, we obtain β_i^{unrest} , by regressing the daily stock return on unrest data collected from the Global Data on Events, Language and Tone [GDELT \(2018\)](#). The main focus will be on the vector of coefficients γ , as long as the dummy variable of secular firms is zero, so the coefficients of γ measure how the cumulative return (%) of cronies or Islamic firms will change relative to non-connected firms during the event.

2.3.2 Data Sets and Methods

The present study leverages financial and non-financial data. The financial data includes the daily stock prices, balance sheets, and income statements of the firms listed in the Tunisia Stock Exchange Market, MSCI Tunisia, and MSCI world. The non-financial data are [GDELT \(2018\)](#), and Tunisian authorities' list of confiscated

firms related to Ben Ali and his relatives . This listing helped to classify the firms into three categories: cronies, non-connected, and religious base firms (Islamic firms).¹

The daily stock prices, balance sheets, and income statements of listed firms in the Tunisia Stock Exchange and MSCI indices are downloaded from Bloomberg. The financial ratios (return to assets, return to equity, and debt to assets ratio) are calculated based on the financial statements. However, the daily stock returns for each stock are calculated by taking the difference between the closing and the open prices of the stocks.

β_i -Tunisia and β_i -World constitute the control variables for each firm. The value of β 's is estimated by regressing daily stock return of each firm on the daily MSCI-Tunisia (Morgan Stanley Capital International) index and MSCI-world index for five years before the Tunisian Revolution. Moreover, β_i -Unrest is used as another control variable for measuring the firms' return in response to general unrest events in Tunisia. Furthermore, the value is estimated by regressing daily stock returns for each firm on a dummy variable: one variable for unrest event happens on the trading day. The data for the unrest event is collected from Global Data of Event, Language, and Tone dataset [GDELT \(2018\)](#)², using *R* software.

¹The Tunisian authorities identified 112 people who are connected to former president Ben Ali and his wife on March 14, 2011. The Authorities confiscated any wealth earned after November 7, 1987, by Ben Ali, his wife, and the 112 relatives of Ben Ali and his extended family. In total, the Authorities confiscated 255 firms owned by the former president Zine El Abidine Ben Ali and his family.

²GDELT is an open database of human society that records the social event for more than 30 years, and includes more than 250 million observations. This dataset begins in 1979 and continues to today. It collects data using more than 100 languages including translated newspapers, magazines, and websites, such as AfricaNews, Agence France Presse, Associated Press, Associated Press Online, Associated Press Worldstream, BBC Monitoring, Christian Science Monitor, Facts on File, Foreign Broadcast Information Service, The New York Times, United Press International and The Washington Post [GDELT \(2018\)](#).

GDELT uses Conflict and Mediation Event Observations (CAMEO) to record the events. We use R (GDELT tools) to download data from [GDELT \(2018\)](#). Still, instead of downloading the entire dataset from [GDELT \(2018\)](#), we downloaded only the data that includes the action country code of Tunisia, and select the codes 14, 18, 19, and 20, which represents conflicts (unrest events such as

2.3.2.1 Cronies

Within economics, cronyism refers to the practice of partiality in awarding jobs and other advantages to friends or trusted colleagues, especially in politics and between politicians and their supportive individuals or groups ([Johnson and Mitton \(2003\)](#)). This practice is dominant within the Arab World and (for the purpose of the present study) in Tunisia ([Gherib \(2012\)](#)). The list of cronies is identified here using reports of the Ministry of Finance published on their website, including the confiscated properties of former president Ben Ali and his family members. There are 255 confiscated firms but only four of these firms are listed in the Tunisia Exchange Market. Therefore, my data sample is constrained by the availability of information on firms listed on the Tunisia Stock Exchange. So, the focus is only on the listed firms as long as we are assuming that the capital market will measure the real value of the firm and its' ability to generate profits based on EMH. The confiscated firms are known as having been connected with Zine El Abidine Ben Ali and benefited from his power. These firms evaded tax and tariffs in many ways, like importing goods and making false declaration for re-export, as the former regime imposed new complex regulations on the sectors dominated by connected firms. [Rijkers et al. \(2017\)](#) identified how politically connected firms used tax evasion by utilizing Tunisia's tax, social security, and customs records. They provided evidence about Ben Ali's practices to achieve private benefits, such as entry regulations, manipulating investment law, and imposing restrictions on foreign direct investments. Also, they showed that connected firms are 4.6 percent more likely not to submit a tax declaration, and 8.4 percent more likely to report lower sales when they submit a tax declaration.

riots, strikes, and boycotts). So if the action is verified at that date, then I use dummy variable 1, otherwise, zero. Then, I get a series of dummy variables for the last five years before the Tunisian revolution, which we call it later as unrest data.

2.3.2.2 Islamic Firms

There were many political parties during the regime of Ben Ali. However, The Democratic Constitutional Rally (DCR) was the ruling party in Tunisia since its independence in 1956 and until it was dissolved in January 2011. Before the Tunisian revolution, the Islamic parties were not officially recognized. This is because of strict policies imposed by the existing government on joining religious-based groups, like the Islamic party. Anyone entering the Islamic party before the revolution would be put in jail. So, there was no mechanism to identify the Islamic firms before the revolution, except for considering the firms that follow Sharia law (like the Islamic banks) as religious-based firms. Based on that, two banks followed Islamic Sharia law in Tunisia before the revolution. After the revolution, it is expected that the Islamic firms would benefit from democracy and have more customer base accordingly—this strategy will enable them to generate more profits compared to non-connected firms.

2.3.2.3 Non-connected firms

In the present study, a firm is considered non-connected if it does not follow Sharia law and is not connected to the Ben Ali regime. Therefore, the present study distinguishes three groups of firms: Islamic, cronies, and non-connected firms. In this paper, I compare the performance of cronies and Islamic firms to non-connected firms. Thus, there are fifty non-connected firms, listed in Tunisia Stock Market before and during the revolution.

Table 2.1 shows the firms' characteristics by networks. There were fifty-six companies listed in the Tunisian Stock Exchange Market by the end of 2010, out of which fifty are non-connected, four cronies, and two are Islamic firms. The capital share of non-connected firms, cronies, and Islamic firms is 91 percent, 8 percent, and 1

Table 2.1: Firm Characteristics by Network

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	<i>N</i>	Share Market Cap	Mean Size	Leverage	β^{World}	$\beta^{Tunisia}$	β^{Unrest}
All	56	1.00	725.7	0.24	0.0004	0.0026	0.0043
s.d			1329.7	0.24	0.0023	0.0034	0.0239
non-connected	50	0.91	739.4	0.23	0.0007	0.0027	0.0022
			1364.6	0.22	0.0017	0.0035	0.0157
Cronies	4	0.08	823.5	0.13	-0.0028	0.0017	0.0324
			1336.4	0.14	0.0059	0.0017	0.0724
Islamic	2	0.01	187.6	0.78	0.0002	0.0006	-0.00003
			113.0	0.33	0.00003	0.0001	.00001

Notes: The table shows the mean and standard deviation of firms by networks as of December 31st, 2010. The first panel shows the mean and standard deviation for all firms, while the second panel shows it for unconnected firms. The third and fourth panel show the mean and standard deviation for firms connected to Bin Ali and Islamic firms, respectively. The size is the firm book value in millions of US\$. The leverage ratio is the debt-to-assets ratio. β^{World} and $\beta^{Tunisia}$ is the regression of daily cumulative return of each firm on Morgan Stanley World and Tunisia indices, respectively from 2005 to 2010. β^{Unrest} measure each firm sensitivity for unrest events. β^{Unrest} calculated by regressing the daily cumulative return of each firm on two days of unrest events reported in Tunisia by [GDELT \(2018\)](#). Unrest events are strikes, boycotts, riots or any ethnic incident during the period between January 1st 2005 to November 30th 2010.

percent, respectively. The values reported in column 3 in millions of USD; the leverage ratio is debit to assets ratio as of December 2010. The leverage ratio for cronies is smaller than average; the leverage ratio for Islamic firms is more prominent and more significant. The leverage ratio for Islamic firms is high compared to the leverage ratio for the market because all Islamic firms are banks. Banks finance their assets using bonds and customer deposits, which increase the leverage ratio for banks compared to non-financial institutions. The last three columns of Table 2.1 show the average of slope coefficients of regressing the stock return on MSCI-Tunisia, MSCI-world in 2010, and unrest period between January 31, 2005, and November 30, 2010. The beta coefficient for MSCI-Tunisia and MSCI-world measures the sensitivity of a firm's return to changes in the performance indices of the Tunisia Stock Exchange Market and the performance of the rest of the world financial markets. On average, the magnitude of beta coefficients is small. The β -World measures the sensitivity of the

firm's return to general unrest in Tunisia. The Tunisian Stock Exchange Market is part of the world exchange market, and the listed firms are part of the Tunisia Stock Exchange Market. There are, on average, positive signs for beta Tunisia and beta world. The model used in this study follows [Acemoglu et al. \(2018\)](#), where they added betas to control for all factors that possibly affect the firm's stock returns.

2.3.2.4 Revolution and Rent

A culture of nepotism and cronyism in any regime will increase political instability after a certain point and may lead to revolution against the injustices of the ruler, and the Arab Spring was a reminder of this. Mohamed Bouazizi's incident was the ignition for the Arab spring, due to the frustrating economic conditions and unlawful practices of the rulers. The economic circumstances and political events fueled widespread street demonstrations engulfing the entire country in unrest. Consequently, the events made the political system fragile and less stable. Likewise, political instability would limit the future benefits of the cronies compared to other firms under the assumption of EMH. The earnings on the stock price of connected firms would be compared less to non-connected firms under the assumption of perfect competition. The stock price must reveal a firm's ability to generate future profits. In other words, the stock price is the discounted net present value of the expected cash flow. Thus, the value of connected firms will decrease compared to non-connected firms, under the risk of losing (or limiting) the political power of the ruling party. Sometimes, the foreign investors seek to capture the rent. However, if there is any risk of political changes inside the country, investors will transfer their investments to firms that are potentially connected to new rulers.

2.4 Historical Perspective

In this section, I present a brief political history of Tunisia before, during, and after the revolution. Notably, I focus on two groups: cronies and the Islamic movement. I apply an event study to analyze the impact of political events during and after the Arab Spring in Tunisia on stock market valuation for two connected groups compared to non-connected firms. It provides more understanding for shifting the rent between political groups in Tunisia, specifically for the uprising period and after moving to democracy once the Jasmine Revolution took place. Even though there was an election in some Arab countries, the same person was nominated and remained ruler over the country for over twenty years. Most of the previous elections that took place in Arab countries were manipulated except in a few cases, such as the elections in Tunisia after the Jasmine Revolution. Similarly, the first election after the revolution in Egypt was deemed to be fair. After the uprisings in Arab countries, the opposing media started speaking against the marriage between power and business. The ruling families and their friends captured all economic opportunities. The story begun clearly in the 1990s, when some Arab countries began privatization, the government began selling assets like Jordan and Egypt, and the shares were traded for the people who supported the regime.

Moreover, some countries confiscated the property of opposing party members before and after the revolution. This fueled public opposition to the rulers in Arab countries and lead to two waves of riots at the end of 2010 that unseated many presidents in Tunisia, Yemen, Libya, Egypt, Algeria, and Sudan. The corruption and nepotism fueled the uprising in Tunisia and many other countries. The Tunisian revolution lasted for twenty-eight days, but led to democratic transformation.

2.4.1 First President Habib Bourguiba

Since independence from France in 1956, Habib Bourguiba was the country's leader in Tunisia until 1987. He played an essential role in obtaining freedom from France, and was one of the founders of the New Constitutional Liberal Party in Arabic , also known as the "Neo-Destourian Party," during the French protectorate. The Tunisian king appointed him as a prime minister in 1957. The Constitutional Assembly of Tunisia, which was elected directly by Tunisian citizens, voted to change the political system in Tunisia from the kingdom-based system to the presidential system, and they designated Bourguiba as interim President for Tunisia. In 1964 Bourguiba renamed the ruling party the Socialist Destourian Party. Bourguiba proclaimed himself as the president of Tunisia for life using new amendments. Bourguiba was (as a liberal secular person) against Islamic or sharia order. He banned youth from early prayer in the morning, and prevented fasting for workers in 1962. He also banned the headcover for women in 1981 and legalized abortion. Briefly, Bourguiba's era was marked the rise of clientelism and anti-Islamic order. Bourguiba detained and executed many people for affiliating with opposition parties.

In 1987 Ben Ali, the prime minister of Tunisia, organized a military-based coup d'état against Bourguiba. Ben Ali announced Bourguiba as unfit and unseated him for his declining mental state. Bourguiba was confined in his house until his death in 2000.

The early era of the Ben Ali regime had fewer restrictions on the opposition parties. For example, he lessened restrictions on the newspapers published by opposition parties. He changed the name of the ruling party to the Democratic Constitutional Rally (DCR). However, in the 1989 election, none of the opposition parties' candidates could run for president. Each candidate needed a nomination certificate signed by 30

political figures, and all legislators belonged to DCR. Therefore, Ben Ali appeared alone in the elections. The people held DCR was the most dominant party and returned to the restrictions established during Bourguiba's era.

The most crucial active party from the opposition is the Islamic movement. The Islamic movement started in 1969 secretly; the activity began by students in 1971, who in the same year, started publishing their ideology indirectly. The first Islamic assembly was formed in 1972. The ruling party welcomed the Islamist ideology to add diversity to the extreme left opposition parties. In the same year, the Islamic movement held a preaching assembly, and they were arrested and released by the minister of justice. Again in 1980, the regime of Bourguiba arrested the leader of the Islamic movement. In 1981, the former president of Tunisia welcomed the diversity in the political parties, and later, the leaders of the Islamic movement applied officially to license their party. Their application was ignored by the Tunisian authorities. Around two months later, they held a conference to announce the Ennahda Party as an official party for the Islamic movement. However, two weeks later, the government arrested Ennahda's leaders. And, in 1984, the former president of Tunisia released all Islamic prisoners. Even though the Islamic leaders welcomed the coup d'état by Ben Ali in 1987, their party was not recognized officially until the Jasmine Revolution brought the Ben Ali regime down in 2011.

2.4.2 Second President Ben Ali

The first two years of Ben Ali's era were promising. He released prisoners from opposition parties, and when the first election took place in 1989, was supported by many opposition party members like Marzuki (who became the first elected president after the revolution) and Al-Ghanushi (the leader of Ennahda Islamic party).

However, no one from the opposition party won the parliamentary election. After the disappointing results of the 1989 elections, many of the opposition party's members left Tunisia. In the early decade of the 1990s, the Tunisian authorities rejected licensing the Islamic Party (Ennahda) while they approved the other political parties, which supported Ben Ali's regime. In the late 1990s, the influence of Leila Tarbelssi (the second wife of Ben Ali), her brothers, and Ben Ali's sons-in-law gained power and privileges in many sectors in Tunisia. In the 1999 election, Ben Ali won the election by 99%, despite the presence of another candidate. The millennium began with demonstrations and more uprisings against Ben Ali's regime. Moncef Marzouki established Congress for the Republican Party in 2001 as an opposition party. Ben Ali's family and his in-laws gained more control over the economic sectors after the 2002 referendum, which gave more judicial immunity to Ben Ali. In 2005 the opposition parties formed the October 18th Commission, demanding freedom and reforms to the regime, and in 2008, there was another revolution against Ben Ali's regime that demanded more freedom. Finally, the revolution that started in Tunisia in 2010, not only ended the era of Ben Ali forever, but also spread to other Arab countries while so far working to move Tunisia from authoritarian rule to a democratic one.

2.4.3 The Jasmine Revolution and Transitional Period

After the incident of Bouazizi, the demonstrations spread all over Tunisia. These demonstrations later turned into a massive revolution. As a result of this uprising, Ben Ali had to resign and flee to Saudi Arabia. The chairman (speaker) of the House of Representatives became a temporary president as per the constitution of the country. During the transitional period, many of the opposing party members, like Moncef Marzouki (who was in France before the Tunisian revolution), and Rashid Ghannouchi

(who was in London, UK before the Tunisian revolution) were able to register their parties in Tunisia as recognized parties to the Tunisian authorities. On January 17, 2011, the former ministers in the regime of Ben Ali led by Mohamed Ghannouchi tried to form a coalition government for national unity. Nevertheless, they resigned on February 27, 2011, due to widespread public resentment and a fear that the regime of Ben Ali might come into power again. Moreover, the court dissolved the Democratic Constitutional Rally in March 2011, headed by Ben Ali. The court also dissolved the House of Representatives and the Constitutional Council.

Table 2.2: Summary Statistics of CR [m,n] by Ruling Government

		Temporary Govt		El Marzouki		Essebsi	
		(1)	(2)	(3)	(4)	(5)	(6)
		1st Temp.	2nd Temp	First Govt	Second Govt	Third Govt	First Govt
All	Trading Days	19 Days	204 Days	306 Days	216 Days	254 Days	640 Days
	Mean	-0.288	1.631	-1.214	-1.988	-1.816	-3.494
	s.d	3.470	9.480	6.263	4.722	7.303	10.388
Unconnected	Mean	-0.286	1.793	-1.325	-2.175	-2.001	-3.896
	s.d	3.672	10.027	6.621	4.968	7.714	10.934
Bin Ali	Mean	-0.479	0.588	-0.006	-0.464	-0.389	-0.272
	s.d	0.592	0.704	0.791	0.312	0.634	0.780
Islamic	Mean	0.069	-0.348	-0.847	-0.369	-0.489	0.091
	s.d	0.134	0.891	0.635	0.437	0.089	0.395

Notes: Note: This table represents the mean and standard deviation of cumulative return for all firms, unconnected, connected and Islamic firms in Tunisia. The table covers the period after Bin Ali's fall. I have six periods included in this analysis. The first two periods cover temporary governments. The third, fourth and the fifth periods cover the period after the first elected president after the Arab spring. The last column covers only the first prime minister period after the second election

Table 2.2 shows nineteen trading days of the Tunisian Exchange Market during the first provisional government headed by Mohamed Ghannouchi. This period will be

used later in this paper to analyze the impact of uprising on democracy by comparing the connected firms to non-connected firms using an event study. The daily stock cumulative return during this period was negative for all firms except for Islamic banks. However, this should not indicate that the Islamic firms would do better in the future because I need to use the event model and control for all other factors that affect the cumulative return of each firm. Still, suppose the model shows that the cumulative return in the event study during any period is more for any group of firms. In that case, this means that these firms could generate more profit due to freedom and moving away from authoritarian regimes compared to other group of firms.

On February 27, 2011, the interim president of Tunisia assigned Beji Caid Essebsi as a prime minister to form a new government until for the election to take place on October 23, 2011. During Essebsi's government, 204 trading days took place, covering the period from the first day Essebsi headed the government until the results of the election. Table 2 shows that the average cumulative stock returns were positive during this period except for Islamic firms. It gives an indicator of the belief of investors about the ability of Islamic banks to generate profits in the future. This could be ascribed to Essebsi's affiliation with Constitutional Democratic Rally (Ben Ali regime). Thus, the investors could have held that as a return for Ben Ali regime members to rule the country again. However, I cannot jump to the results before I apply the event study during this period, because I need to control for all facts that might affect the cumulative return of stocks. Later, I will consider both periods as one event, as long as both prime ministers after the revolution belonged to the Ben Ali regime before the Tunisian revolution.

2.4.4 Democratic Era after revolution

The results of the 2011 election were surprising, and it was the first time in Arab countries, that the Islamic party's (Ennahda's) candidate won first place with 36 percent of the representation in the constituent assembly, without naming a candidate for the presidential position. However, the candidates had the most significant influence on selecting the next president of Tunisia.

The Islamic party reached an agreement with the other two parties; Congress for the Republic (headed by Moncef Marzouki) and Democratic Coalition for Labor Freedoms (headed by Mustafa bin Jaafar), and formed a coalition government. They elected Marzouki as interim president of Tunisia. The political alliance between these three parties is called Troika. This alliance and Marzouki as the country's president remained until the end of 2014. During this interim government, the most significant achievement was the law of transitional equality: they aimed to solve all violations against the former regimes from 1955 until 2013. Based on this law, there were more than sixty-five thousand violations against the Tunisia authorities during Bourguiba and Ben Ali regimes.

2.4.4.1 First Elected President

On December 13, 2011, Marzouki officially became the interim President of Tunisia, so the whole period from the first day Marzouki was announced as a President of Tunisia until the next president is considered here as the first era of democratic transformation in Tunisia. This era is divided into three events based on the person assigned as a prime minister during the first elected President in Tunisia.

Table [2.2](#) shows the number of trading days that will be considered under each government (prime minister). I consider the announcement day as the first day for

counting the days because the people and investors take their decisions based on the information once they know it. This paper examines the impact of democratic changes on the rent captured by different groups based on Table 2.2. The mean cumulative daily return during the Marzouk period was negative. The potential reason for these negative returns is the instability and unrest incidents prevalent in Tunisia then. There was such instability that three prime ministers were changed one after another. First, Jebali Cabinet was appointed prime minister from December 24, 2011, until March 13, 2013. He was a member of Ennahda. He resigned from the office two months after the assassination of Choukri Belaid. Belaid was a Tunisian politician and had been criticizing the performance of the Tunisian government. This increased the resentment among the public. As a result, Jebali had to resign after he failed to form a technocratic government to absorb the general resentment in Tunisia. There were 306 trading days in the Tunisian Exchange Market during Jebali time. Laarayedh was the second prime minister during the Marzouki era, and he was a political prisoner during the Ben Ali era. He spent fourteen years in prison, eleven of which were solitary confinement. He formed the technocrat government, was a member of the Ennahda party as well, and resigned on January 29, 2014. During his era, there were 216 trading days in the Tunisian Exchange Market.

The president appointed Mahdi Jomaa as the third prime minister in this era. He was given the responsibility to hold the Presidential elections in 2014. Jomaa had no affiliation with any political party at that time. There were 254 trading days in his period. Table 2.2 shows that during the era of Marzouki, the cumulative daily return was negative for all companies. However, the average drop in the cumulative daily return for Islamic firms was below the average of all companies listed in the Tunisia Exchange Market. This means the performance of Islamic companies was better than

other companies during Marzouki's presidency.

2.4.4.2 Second Elected President

The second election after the Tunisia revolution was in November 2014, Essebsi, who was the second prime minister after the revolution, won the election for the President. The transfer of power to Essebsi went smoothly in December 2014. He remained the President of the country until his death in July 2019. There were three prime ministers during his presidency. The first prime minister Mahdi Juma was appointed by former President Marzouki. The second prime minister Habib Essid and the third prime minister Youssef Al-Shahed were appointed by the late President Essebsi. When I consider the prime minister himself as a separate event, I cover only the era until the second prime minister, which ended on August 27, 2016. However, when I cover the era of the second elected President after the revolution, the event period will be from the first day of announcing the election results until the end of January 2018. The first appointed prime minister during the late President Essebsi, Prime Minister Habib Essid was independent. During his cabinet, Table 2.2 shows that the Islamic companies had positive average daily cumulative returns, and the average cumulative daily return of all other companies was negative.

2.4.4.3 Third Elected President

This election took place on September 15, 2019, instead of November 17, 2109 due to the death of late President Essebsi. The independent candidate Kais Saeed won the first and second rounds by 18.4 percent and 72.7 percent, respectively. The public participation rate in the election was 48.98 percent in the first round and 55.02 percent in the second round.

In October 2019, the Ennahda Party won the legislative election with the majority by fifty-two seats (19.63 percent) compared to sixty-nine seats in the previous elections. Rashed Ghannouchi (the leader of the Ennahda party) was elected as a leader for the Assembly of the Representative of People. When we look at the election post-Tunisian revolution, we can see how revolution moved Tunisia away from an authoritarian regime to the president and legislative assembly elected by the people, and the smooth handover between presidents of Tunisia reflects the democratic transformation in the political scenario in Tunisia after the revolution. In Tunisia, the Islamic party has remained in power since the first election after Ben Ali's fall, and it was not like the case of Egypt, where the Muslim Brotherhood party was banned after the coup d'état in 2013.

2.5 The Tunisian Revolution in Event Studies

This section uses the event study method to analyze the impact of each phase of democratic transformation in Tunisia from the first day of the Jasmine Revolution until the second elected president after the revolution. Since the first day of the revolution, the initial focus is on the period of the Tunisian revolution as one event; this event lasted for twenty-eight days. Then I look at a series of events post-Ben Ali's fall, beginning with two provisional governments and two elected presidents. Later, I look at the changing of prime minister after the Tunisian revolution as a separate event. Therefore, I will have five more events to consider after the Ben Ali fall; three prime ministers during the first elected president and two prime ministers during the second elected president. I also look at the election process itself while trying to see the impact on the rent captured by each group of firms. In this paper, I follow

the approach of [Acemoglu et al. \(2018\)](#); they analyzed the impact of political events during each of the four phases of Egypt’s Arab spring on the rent captured by different types of connected firms.

2.5.1 Ben Ali Fall

Wikileaks, the Guardian, and the New York Times published leaked files labelled as confidential, related to the corruption done by the Ben Ali regime a few weeks before the revolution. The incident of Bouazizi and these documents fueled the demonstration and spread not only inside Tunisia but also to other Arab countries. This era started in Tunisia on December 17, 2010, at city Sidi Bouzid (three-hundred kilometres south of Tunis), and ended on January 14, 2011. It is sometimes called the Sidi Bouzid Revolution, the Dignity Revolution (Thawrat al-Karamah), or the Jasmine Revolution. Former President Ben Ali was the first president to quit due to the Arab Spring, followed by Mubarak, the former President of Egypt. The focus here will be on twenty-eight days of the Tunisian Revolution. The financial data is taken from the Tunisian Exchange Market for twenty-one working days of the Tunisian Exchange Market. Therefore, I perform two regressions, using the event study. The first one is for 21 working days before and 21 working days during the Tunisian Revolution. The focus in this section is twofold: on measuring what happened to cronies and Islamic firms during the revolution compared to non-connected firms and on comparing the results before the revolution.

Table [2.3](#) represents the regression results of the previous model in section 3 during this period. I identified cronies using the list of confiscated properties of former

president Ben Ali and his inner circle.³ I have only 4 connected firms⁴ out of 56 listed firms in the Tunisia Stock Exchange as cronies. However, the other 251 confiscated firms are not listed, and (hence) cannot be used in the model.

Table 2.3: Regression Results (before and after revolution)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CR[m,n]							
	Before Revolution	During Revolution	Before Revolution	During Revolution	Before Revolution	During Revolution	Before Revolution	During Revolution
Bin Ali	-0.091 (0.749)	0.883 (0.027)	-0.187 (0.388)	0.434 (0.424)	-0.368 (0.310)	0.257 (0.669)	-0.422 (0.269)	0.200 (0.711)
Islamic	0.128 (0.602)	1.339 (0.00)	0.088 (0.852)	1.836 (0.000)	-1.254 (0.437)	1.449 (0.048)	-1.250 (0.444)	1.488 (0.051)
β^{Word}					-150 (0.440)	-436 (0.000)	-141.26 (0.060)	-434 (0.000)
$\beta^{Tunisia}$					-180 (0.0230)	-225 (0.001)	-188 (0.018)	-230 (0.001)
β^{Unrest}					-5.65 (0.504)	-42.54 (0.000)	-5.95 (0.469)	-43.60 (0.000)
Size					0.000 (0.857)	0.000 (872)	0.000 (0.894)	0.000 (0.870)
Leverage					0.015 (0.381)	-0.011 (0.358)	0.133 (0.534)	-0.0123 (0.294)
RTA							-0.030 (0.164)	-0.004 (0.870)
RTE					-0.015 (0.141)	-0.009 (0.548)		
Sector F.E.	no	no	yes	yes	yes	yes	yes	yes
R^2	0.0006	0.0281	0.009	0.234	0.3267	0.808	0.808	0.806
N	56	55	56	55	56	55	56	55
F	0.565	0.0003	0.009	0.000	0.000	0.000	0.000	0.000

Note: The values inside parenthesis are P-value.

Table 2.3 depicts the results of the regressions before versus. during the revolution, so each column covers twenty-one working days from December 17, 2010 to January 14th, 2011. The first two columns include only the dummy variables without a fixed effect, while in the third and fourth columns, the fixed effects of the regression are included. Similarly, columns 5 and 6 consist of betas and controls and using return to

³The report issued by the Ministry of Finance in Tunisia, the report can be accessed through the website

⁴One of these connected firms has small shares owned by the family of Ben Ali, even if we exclude it that did not change the results

equity ratio in controls. In Columns 7 and 8, when I replaced the ratio of return to equity (RTE) with the return to assets ratio (RTA). The results are close regardless of using RTA or RTE. In Table 2.3, the focus is on the interpretation of the coefficients of cronies and Islamic firms. Before the revolution, the coefficient of the dummy variable of both Islamic and cronies was not different from zero. The underlying reason behind these results is that there was no event that occurred during that period that could have affected the earnings of cronies and Islamic firms. This truly represents the phenomena that a firm's prices reflect all available information in the market. However, the coefficient of Islamic firms during the Tunisian revolution was positive and significant, while the coefficient of cronies was insignificant. These results can reflect the belief of the investors during the Tunisian Revolution, toward the future of Islamic firms and their ability to generate more profit compared to secular firms. On the other side, the coefficient of cronies was insignificant. The potential reason for this insignificance could be, as mentioned earlier, Ben Ali and his family owned a minimal share of these firms. Therefore, I do not expect any political changes in Tunisia to affect these firms. Ben Ali and his family focused on firms they owned and those not listed in the Tunisian exchange market. I can say that the uprising against Ben Ali's regime benefited the Islamic firms.

2.5.2 Post Ben Ali Regime

This section focuses on the uprising and transformation to democracy from different angles after Ben Ali's fall in early 2011, in addition to what has been mentioned previously. First, the period after Ben Ali's fall is segregated into three events based on the elected president. Then, to gain an in-depth look, this period is further subdivided into six periods, each one covering the prime minister's duration and examining

how changing the prime minister affected the rent captured by each group of firms. Moreover, it helps us find out how the prime minister changes the rent captured by each group of firms.

2.5.2.1 Democratic Transformation

There were two provisional governments following Ben Ali's fall in October 2011, which were followed by another two elections that are also covered by this paper. This democratic transformation was under pressure from the public. The first provisional government did not last a month, followed by another provisional government led by Essebsi (the second elected president after Ben Ali's fall and who was a minister during Ben Ali and former President Bourguiba). During the first two temporary governments, there was no election. Instead, based on the Tunisian constitution, the Speaker of Parliament became president pro tem of Tunisia, and in turn, he chose the provisional prime minister based on the Tunisian constitution. The Tunisian elected National Constituent Assembly was in October 2011. In turn, this assembly elected a president, and the main object of this assembly was to establish a new constitution that satisfied the democratic transformation in Tunisia and prepared for another election in 2014 under the new constitution. So, the uprising and street demonstration after Ben Ali's fall (and during the interim governments) helped Tunisia to move away from an authoritarian regime and thus established a new constitution that led to the new era of democracy in Tunisia. As an outcome of the elections of the National Constituent Assembly conducted in October 2011, Ennahda Movement, Congress for the Republic, and the Democratic Forum for Labour and Liberties established a coalition called Troika. These segments elected Marzouki as the President of Tunisia.

The remainder of this subsection presents an analysis of the impact of democratic

transformation that begins with the temporary government and covers the two elections following Ben Ali's fall. I divided the time after Ben Ali's fall into three periods. In each period, an event study is applied by using the previous model. Table 2.4 shows the number of active trading days of the Tunisian exchange market, and the results of the event study of three events starting from January 15, 2010, until January 31, 2018. The number of trading days and the regression results of the model given in section two. This covers the period from the first temporary president until January 31, 2018.

The first temporary president was the speaker of the parliament during Ben Ali's regime since 1997, and the provisional president was assigned as a minister during Ben Ali's regime many times as a minister of Sport and Youth, Minister of Health, and Minister of Cultural Affairs. He was also member of the ruling political party during Ben Ali's regime. In the meanwhile, both prime ministers of the provisional government were ministers during Ben Ali's era. Therefore, the Tunisian citizens and investors saw this era as a return for Ben Ali's regime. This was reflected in the behavior of investors in the Tunisia Exchange Market. During the provisional government, the cumulative return of Islamic firms was not different from zero. This is unlike the case during the Tunisian Revolution as shown in Table 2.3, which means that the investors lost confidence in the Islamic firms' abilities to generate more profits in the future, which was reflected on the cumulative return of Islamic firms, compared to non-connected firms.

The second and third columns of Table 2.4 show the regression results during Tunisia's first and second elected president. Noteworthy is that both presidents were elected democratically. This democratic transformation after the revolution has been seen as the most sustainable democratic transformation in Arab countries, due to the Arab Spring. The coefficients of Islamic firms were positive and significant. For

the investors, this means that the Islamic firms will be able to generate more profits compared to non-connected firms, controlling for all factors that could affect the profits of each firm. This can also be seen as a function of the democratic transformation and as an index that the Islamic parties in Tunisia became an important part of the government for the first time. Thus, the uprisings favors Islamic firms (as we saw in section 2.5.1). Likewise, democratic transformation favour Islamic firms once these firms become part of the regime. However, during the provisional government, it was seen as a return of the Ben Ali's regime or as an uprising against democratic transformation. The model shows the Islamic firms were impartial or neutral.

Table 2.4: Post Bin Ali Fall

	(1)	(2)	(3)
	Provisional Govt	First Elected President	Second Elected President
	223 Trading Days	776 Trading Days	749 Trading Days
Bin Ali	-2.825 (0.504)	2.503 (0.490)	-0.853 (0.712)
Islamic	-2.772 (0.404)	4.897 (0.053)	4.263 (0.025)
β^{Word}	2615 (0.151)	-4444 (0.006)	-4049 (0.000)
$\beta^{Tunisia}$	-1464 (0.161)	1049 (0.186)	507 (0.323)
β^{Unrest}	312 (0.060)	-468 (0.002)	-367 (0.000)
Controls	Yes	Yes	Yes
Sector F.E.	Yes	Yes	Yes
R^2	0.585	0.807	0.880
N	56	56	56

Note: The values inside parenthesis are P-value.

2.5.2.2 Political Tussle

It was uncertain who would be the leading player in the political scenario of Tunisia under the pressure of widespread demonstrations and the spreading of the Arab Spring from Tunisia to other countries like Libya and Egypt. Now, I look in-depth at the situation after the fall of Ben Ali and consider the impact of government formation on economic favoritism. Mohamed Ghannouchi was the First Minister (Prime Minister) during Ben Ali's regime. After Ben Ali's fall, the first attempt to form a government headed by Ghannouchi failed as he could not earn the trust of the Tunisian citizens. During this attempt, there were 19 working days of the Tunisian Stock Market. Table 2.5 shows the results of applying model 2.1. The results show that the cumulative return of Islamic firms is not significantly different from 0 compared to non-connected firms. It is again not as the case during the revolution when the cumulative return of the Islamic firms was positive and significant, compared to non-connected firms. The second Prime Minister after Ben Ali's fall was Essebsi, who was a minister twice during the former President, Bourguiba. The temporary President of Tunisia assigned Essebsi as a prime minister until December 13, 2011. Essebsi was elected as the fifth President of Tunisia later in 2014. Column 2 of Table 2.5 shows that the cumulative return is not different from 0 compared to non-connected firms during the second temporary prime minister after Ben Ali's fall (which were during this period, 204 working days and included in the regression). On December 12, 2011, the constituent assembly elected Moncef Marzouki as the fourth president of the Tunisian Republic. He assigned Hammadi Al-Jabali as a prime minister for 14 months and 17 days. Jabali was Secretary-General of Ennahda Movement, spent 10 years in prison during Ben Ali's regime. He resigned after the parliament members of his party rejected his initiative to form a new technocrat government after the assassination of Shukri

Belaid, who was the secretary-general for one of the radical parties in Tunisia. Table 2.5 shows 306 days of the Tunisian Stock Market during the Jabali government. The results of the event model show that there is no difference between the cumulative return of cronies or the Islamic firms and the non-connected firms, regardless of the affiliation of the prime minister with Ennahda Movement. This can be ascribed to political instability at the time and to the lack of strikes in many cities against Jabali government. According to former President Marzouki, the radical groups were behind the strikes and fueled resentment against Jabali to cause the failure of the democratic transformation in Tunisia. The instability of Jabali's government may discourage investors and prevent them from investing in Islamic firms.

The Ennahdha Movement nominated Ali Al-Areed as a prime minister to succeed the resigned Prime Minister Al-Jabali. Al-Areed was a member of the Ennahdha Movement, he got the required number of votes from the National Constituent Assembly, and became the prime minister, Al-Areed spent fourteen years in prison during Ben Ali regime for his affiliation with Ennahdha Movement. During the Al-Areed government, Islamic firms earned positive cumulative returns compared to non-connected firms. In less than one year, Al-Areed resigned and handed over his position to Mehdi Juma, who elected as a prime minister by the National Constituent Assembly. The Prime Minister Juma was independent and the third and last prime minister during the era of President Marzouki. Table 2.5 shows that even though the prime minister is independent, the Islamic firms still had positive cumulative returns compared to the non-connected firms.

The Tunisian presidential election in 2014 was the end of the democratic transition in Tunisia. The election was held on November 23, 2014, and the participation rate was 64.5 percent; it was the first election under the new constitution of 2014. Essebsi

Table 2.5: Post Bin Ali Falls

	(1)	(2)	(3)	(4)	(5)	(6)
	Temporary Govt.		First Elected First President			Second Elected President
	1st Temp. Govt 19 Days	2nd Temp. Govt 204 Days	First Prime Minister 306 Days	Second Prime Minister 216 Days	Third Prime Minister 254 Days	First Prime Minister 412 Days
Bin Ali	-1.109 (0.324)	-1.715 (0.587)	2.191 (0.252)	0.220 (0.819)	0.509 (0.737)	0.620 (0.659)
Islamic	-1.461 (0.117)	-1.312 (0.633)	0.271 (0.878)	2.725 (0.010)	2.859 (0.013)	3.330 (0.023)
β^{Word}	514 (0.287)	2102 (0.119)	-1370 (0.091)	-1098 (0.000)	-2000 (0.001)	-2191 (0.000)
$\beta^{Tunisia}$	-785 (0.004)	-679 (0.396)	485 (0.314)	179 (0.272)	483 (0.108)	232 (0.423)
β^{Unrest}	72 (0.094)	241 (0.053)	-168 (0.025)	-112 (0.000)	-212 (0.000)	-198 (0.000)
Controls	yes	yes	yes	yes	yes	yes
Sector F.E.	yes	yes	yes	yes	yes	yes
R^2	0.588	0.600	0.586	0.820	0.835	0.874
N	56	56	56	56	56	56

Note: The values inside parenthesis are P-values.

won the election in the second round on December 21, 2014. Essebsi assigned the position of prime minister to Habib Essid, who was independent and the Tunisian Interior Minister during the provisional government. The last column of Table 2.5 includes the result of the event study, and covers the government of the first Prime Minister, Essid, that ended by August 27, 2016. During the second elected president, the Ennahdha Movement still had power in the Tunisian Parliament (69 members out of 217). During this event, the results show that the cumulative return of Islamic firms compared to non-connected firms is positive and even higher than the 2 previous prime ministers during former President Marzouki.

There is no significant difference found between the cumulative return of Islamic and cronies compared to non-connected firms during the two prime ministers of the

first provisional government. There were three prime ministers during the period of Marzuki, for the period covering the first prime minister, the Islamic firms did not get any benefit from their power. However, it seems that the second and the third prime minister eras were more promising for Islamic firms. Table 2.5 shows that as democracy is strengthened, Islamic firms benefit more from democratization. Since the second prime minister, after the first election, I noticed that Islamic firms are always performing better compared to non-connected firms. The existence of the Islamic party in the regime favors Islamic firms. However, during the temporary government and first prime minister during the first election, these periods were in the transition period for democracy. So, there is no advantage for Islamic firms over other firms.

Table 2.6: Political Tussle

	(1)	(2)	(3)	(4)	(5)	(6)
	First Elected President				Second Elected President	
	First Prime Minister Resignation 5 Days Before	Resignation 5 Days After	Second Prime Minister Resignation 5 Days Before	Resignation 5 Days After	First Prime Minister Resignation 5 Days Before	Resignation 5 Days After
Bin Ali	0.258 (0.383)	1.636 (0.270)	0.194 (0.319)	-0.252 (0.512)	0.004 (0.951)	-0.042 (0.603)
Islamic	-0.243 (0.358)	3.067 (0.038)	-0.121 (0.512)	-0.154 (0.620)	0.018 (0.850)	0.047 (0.559)
β^{Word}	-111 (0.459)	-2281 (0.161)	347 (0.000)	277 (0.127)	-59 (0.020)	41 (0.028)
$\beta^{Tunisia}$	116 (0.139)	516 (0.407)	77 (0.046)	-83 (0.407)	14 (0.635)	-17 (0.223)
β^{Unrest}	-18 (0.234)	-251 (0.142)	28 (0.001)	33 (0.052)	-5 (0.001)	4 (0.007)
Controls	yes	yes	yes	yes	yes	yes
Sector F.E.	yes	yes	yes	yes	yes	yes
R^2	0.542	0.414	0.516	0.651	0.469	0.556
N	56	56	56	56	56	56

Note: The values inside parenthesis are P-value.

It is apparent from table 2.5 that when the country moves to political stability, the firms connected to the party in power will benefit from this stability. The results exhibit *J*-curve effect because the returns of Islamic firms initially decline after the revolution and then show positive trend (Ethier 1979). I will investigate to see who benefited more during the short term of the transitional period. In other words, if

we consider changing the prime minister as a shock, I need to know who benefited from these shocks. Table 2.6 shows the results of the event study for five days before, and five days after changing the prime minister, the essential changes took place when the first prime minister resigned due to failure in forming a government. The regression results show that the coefficient of Islamic firms was positive after forming a new government by the second prime minister, so an uprising during any time did not disadvantage any group. However, political stability favored Islamic firms when the government tended to be more stable and succeeds in forming a new cabinet. Moreover, the other two changes were not due to uprising. So, I do not expect and hence do not see any changes in the value of any firms due to political changes.

2.5.2.3 Political Stability

This subsection focuses on the election and its effects on the firms listed in the Tunisian Stock Market. The peaceful transfer of power from one president to another is a rare phenomenon in the developing, or “third-world” countries, especially in the Arab World. Therefore, we saw the Tunisian elections as the most successful elections that took place in Tunisia since the Arab Spring, hearkening to a democratic transformation. For example, the first elected president handed over the power to the winning president smoothly in 2014. That political stability has an impact on economic stability and the financial market, as well. I used the same model to look at the five-day period before, and after the election, for the first two elections in Tunisia that were held after Ben Ali’s fall. Table 2.7 shows the results of the coefficients of betas and controls, as we are interested in the coefficients of Islamic firms and cronies-based firms.

The first Tunisian election was held on October 23, 2011, the same year that Ben Ali’s regime fell. After two temporary governments (and during the provisional

Table 2.7: Elections and favoritism

	(1)	(2)	(3)	(4)
	Before First Elections	After First Elections	Before Second Elections	After Second Elections
Bin Ali	-0.198 (0.473)	1.81 (0.253)	0.137 (0.337)	0.078 (0.640)
Islamic	-0.436 (0.554)	3.568 (0.019)	0.083 (0.418)	0.432 (0.185)
Controls	yes	yes	yes	yes
Sector F.E.	yes	yes	yes	yes
R^2	0.504	0.360	0.584	0.556
N	56	56	56	56

Note: The values inside parenthesis are P-value.

governments), the Tunisians perceived no improvement because the change in power only replaced the person at the top. Therefore, when observing five days before the election, I noticed that no firms benefited during these periods. However, five days after the announcement of the result, the democratic transformation in Tunisia favored Islamic firms. This means that the Islamic firms benefited from the democratic transformation when the Ennahda Movement won and dominated the legislative house by Marzouki becoming the first president and leader of the Troika collision. On the other hand, when the second election took place in Tunisia, there was no single benefit from this election. This is for two reasons: First, there was no democratic transformation, which links to the Islamic members still influencing the parliament. Second, the Islamic party did not name any candidate for the president of Tunisia. In other words, the result (that there is no benefit obtained from the election) was contingent to the political power of the party, in our case here, the Islamic party.

2.6 Pre-Revolution

We have shown so far that the Islamic firms captured the rent and accumulated earnings in the financial market during the revolution. However, right after the revolution, there was resentment among the masses and political parties. The regression results show that no party received benefits during these temporary periods, which lasted for ten months. That is, when the person in power (at the top) had been changed, and only the temporary president and provisional governments belonging to the former Ben Ali and Bourguiba regimes remained. This was not the case when the results of the democratic election were announced; the Troika coalition won the election, and the Islamic party (Ennahda) was part of the coalition. Thus, the Islamic firms yielded positive cumulative returns compared to the non-connected firms. On this note, the democratic transformation period from 2011 to 2014 was beneficial for the Islamic firms. During the period after the second election in 2014 until the last day (considered in this paper as January 31, 2018), the results showed that the Islamic firm had positive cumulative returns compared to non-connected firms.

By looking more profoundly into what was happening before the revolution. Table 2.8 depicts the results for twenty-one days before the revolution and (further) when I added more days before the revolution. The results indicated no difference between the cumulative return of Islamic firms and cronies, that is, before the revolution and as compared to non-connected firms. Moreover, I applied the same model using different periods before the revolution (the noncumulative index). Still, we had the same results, as shown in Table 2.8. This means that model 2.1 (as long as no event happened during this period and while I control for everything that affects the financial market) is relevant: it points to no difference between firms. In other words, the financial market is efficient and reflects all information available in the market. Nevertheless,

Table 2.8: Before Bin Ali's Fall using cumulative returns

	(1)	(2)	(3)	(4)	(5)
	105 Days Before Rev.	84 Days Before Rev.	63 Days Before Rev.	42 Days Before Rev.	21 Days Before Rev.
Bin Ali	-0.957 (0.412)	-1.225 (0.340)	-0.698 (0.390)	-0.530 (0.139)	-0.422 (0.269)
Islamic	-1.543 (0.334)	-0.917 (0.618)	0.162 (0.937)	-0.513 (0.775)	-1.250 (0.444)
Controls	yes	yes	yes	yes	yes
Sector F.E.	yes	yes	yes	yes	yes
R^2	0.587	0.620	0.413	0.535	0.321
N	56	56	56	56	56

The values inside parenthesis are P-value.

after the revolution, as long as the investors believed that the Islamic firms would be able to capture the rent due to democratic transformation, we have positive cumulation for the Islamic firms compared to non-connected firms.

2.7 Conclusion

This paper has looked at who benefited most from the uprising and democratic transformation in Tunisia, using the event study. In this perspective, the paper utilized the series of political events from the first day of the Tunisian revolution until 2018, to investigate whom the uprising and democratic events favor economically. It was found that the firms connected to incumbent political parties could capture the rent. The stock market participants invest in firms connected to the rolling parties because these firms were able to capture the rent.

The analysis covered four main political events in Tunisia, based on the transitional

period. The first event is the uprising against the former President Ben Ali. The event study showed that Islamic firms were able to generate more cumulative returns compared to non-connected firms. The second event was the provisional government that extended from Ben Ali's fall until the first election held in 2011. This period is considered as not suitable for democratic transformation. Moreover, the Islamic firms did not yield any significant cumulative return in the stock market, compared to non-connected firms during this period. The third major event was suitable for the democratic transformation from 2011 to 2014. Lastly, the fourth democratic era, from 2014 until 2018, showed that Islamic firms started building more and significantly positive cumulative returns compared to non-connected firms. From this, it may be inferred that democracy favors the Islamic firms when they are in power.

Finally, the analysis applied the event study to each government. The results showed that when there is a stable government and the Islamic parties are in power, the Islamic firms could benefit from political stability. Furthermore, the Islamic firms benefited from the election process when the Islamic party obtained power for the first time, as was unexpected. However, when the Islamic party won in the second election, as was expected, the Islamic firms did not yield any exceptional cumulative returns right after the election results. Thus, uprising and democratic transformation favor Islamic firms in Tunisia, and the Islamic banks got traction as the Islamic party was in power.

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Chapter 3

Impact of Tariff Rationalization on Imports: An Event Study Analysis

3.1 Introduction

Tariffs primarily generate revenue, protect domestic industry from international competition, and remedy trade distortions. Traditionally, in Pakistan, revenue generation has overshadowed other functions, which is also evident because the tariff-setting role has been controlled by the Federal Board of Revenue (FBR) instead of the Ministry of Commerce. The imposition of tariffs from the point of view of generating revenue, has adversely affected the competitiveness of domestic industries, especially their export orientation. The excessive protection from increasing tariffs has increased the margins in domestic industry and made exports less profitable relative to the domestic market.

Persistently higher tariffs have created inefficiencies over the years, increased the cost of imported inputs, and incentivized smuggling, under-invoicing, and misinvoicing (Qureshi and Mahmood 2016). Notably, in the wake of the economic upheaval every

four to five years, the protectionist policies rebound in Pakistan. Since 1958, Pakistan has gone to the International Monetary Fund (IMF) twenty-two times for bailout packages. The revenue targets by IMF have compelled the government to use tariff policy more often to increase revenue collection and meet the IMF targets. In the long term, such a tariff policy adversely affects industrial growth and competitiveness, making the economy structurally recession-prone ([Yeo and Deng 2019](#)).

The manufacturing sector in Pakistan is characterized by low competitiveness, decreased value added, and substandard products due to low innovation and technology adoption ([Nasir 2020](#)). National Tariff Policy (NTP) 2019-2024 aims to improve competitiveness, increase employment, and exports through tariff rationalization, i.e., gradually reducing customs duty, additional customs duty, and regulatory duty. It also aims to provide time-bound tariff protection to strategic and import substitution industries, and simplify tariff structures and procedures. The policy points out that the wider the gap between the average bound and applied tariff rates, the lower the consistency and predictability of the tariff regime of a country ([Qadir 2020](#)). The NTP 2019-2024 is based on five key principles: Tariff policy will be employed as an instrument of trade policy instead of a revenue generation tool, Exemptions and concession will be reduced to simplify tariff structure, The cascading principles will be retained whereby tariff is higher with stages of processing of a product, but steepness in an escalation of tariffs will be reduced, Only time-bound protection will be provided to infant industries, The size of the domestic market will be leveraged for the development of competitive import substitution industry.

Under NTP 2019-2024, the government has reduced the tariffs on various items. The average tariff has been reduced from 11.3 in 2018 to 8.7 percent in 2021. Most of the products on which tariff is reduced are raw materials and intermediate products.

Whether or not tariff rationalization has an intended impact on the economy? it is mainly the price effects of tariff rationalization that give rise to static and dynamic benefits. The standard theory of tariffs says that a decrease in tariff translates to reduced domestic price of the imported good, and an equal fall in prices for a complete pass-through. For developing countries, removing their trade barriers has larger total gains than the gains they project to receive from barriers reduced in advanced industrialized countries ([Weisbrot and Baker 2003](#)).

Most literature suggests that reducing tariffs is associated with higher productivity ([Fernandes 2007](#); [Holmes and Schmitz 2001](#); [Melitz 2003](#)), since productive firms are relatively large in size and are more likely to export. Trade liberalization could not only increase productivity, but also help in the reallocation of resources from relatively less productive firms to more productive firms. Also, Empirical studies conducted for Pakistan report a negative correlation between the effective rate of protection and industry-level characteristics such as labor intensity, and export orientation, revealing comparative advantage and industrial productivity. For many years manufacturing sectors have enjoyed a high rate of protection ([Ul Haque and Siddique 2017](#)). [Ahmed et al. \(2017\)](#) show that, during 1981-2006, effective protection had a large and negative effect on manufacturing productivity. Therefore, considering that the tariff reduction under the recent NTP 2019-24 is a step in the right direction, it is important to understand how it has affected import prices, volumes, and consequently, domestic production and export orientation.

It has now become a stylized fact that trade liberalization leads to higher productivity and exports via increased competition in the domestic market. However, the empirical literature on tariff rationalization and its impact on prices, imports, and production mainly focuses on changing tariffs without any differentiation to the

type of products, such as final, intermediate, or raw-material products. How firms and consumers respond to tariff rationalization depends on the type of products on which the tariff is being rationalized. For instance, in the case of raw materials, tariff rationalization can have implications for domestic production and exports.

Another factor that determines how an economy responds to tariff rationalization is the size of the economy. In the case of a large country, the tariff reduction affects the domestic and foreign price of the imported product. In other words, the pass-through elasticity of the domestic price is lower than one for a large economy. A large economy has the major share in global demand for the product, and tariff cuts increase the demand for that product, which positively impacts import prices. In the case of a small country, trade liberalization generates terms-of-trade changes because foreign suppliers find it profitable to use their market power to counteract the domestic price effect of the tariff cut. As a result, the tariff pass-through is generally lower than one, in analogy with what is observed for the exchange rate pass-through ([Feenstra 1995](#)).

This study documents Pakistan's recent move towards unilateral tariff rationalization. We explore both extent and character of tariff rationalization during 2018-2022. In addition, we analyze the impact of tariff rationalization on import prices and the volume of imports. Since most of the products on which the tariff declined are raw materials and intermediate goods, the extent of tariff pass-through will indicate access to cheaper or higher quality inputs.

Pakistan's case of tariff rationalization is relevant for small developing economies grappling with issues of large trade and budget deficits. It contributes to the literature on the impact of tariff rationalization on imports in the case of a small developing economy. In a context where an economy is both highly reliant on tariffs for revenue generation and meeting revenue targets under the IMF program, and also facing a huge

trade deficit and low foreign reserves, the move to decrease tariffs for industrialization and competitiveness is an interesting case to analyze in at least three important ways: first, how import values and volumes respond to tariff rationalization in the short and long term; second, if there is an increase in import volume due to tariff rationalization, it can offset the price effect and may offset the adverse impact on revenue generation; third, if the tariff rationalization is mainly on raw materials and intermediate commodities, it can improve competitiveness and export orientation.

Using highly disaggregated destination-wise import data at an 8-digit product level provides interesting findings on the impact of tariff rationalization in the context of a small developing economy. First, an increase in the volume of raw materials and intermediate input imports indicates that the volume effect could have offset the revenue loss because of the price effect. More importantly, a higher volume of imports of raw-material and intermediate inputs indicates that the domestic industry has used higher levels of inputs or higher quality of inputs, which can also increase export orientation. In this study, in addition to tariff pass-through to prices and imports, we also explore this channel that can affect domestic production and exports.

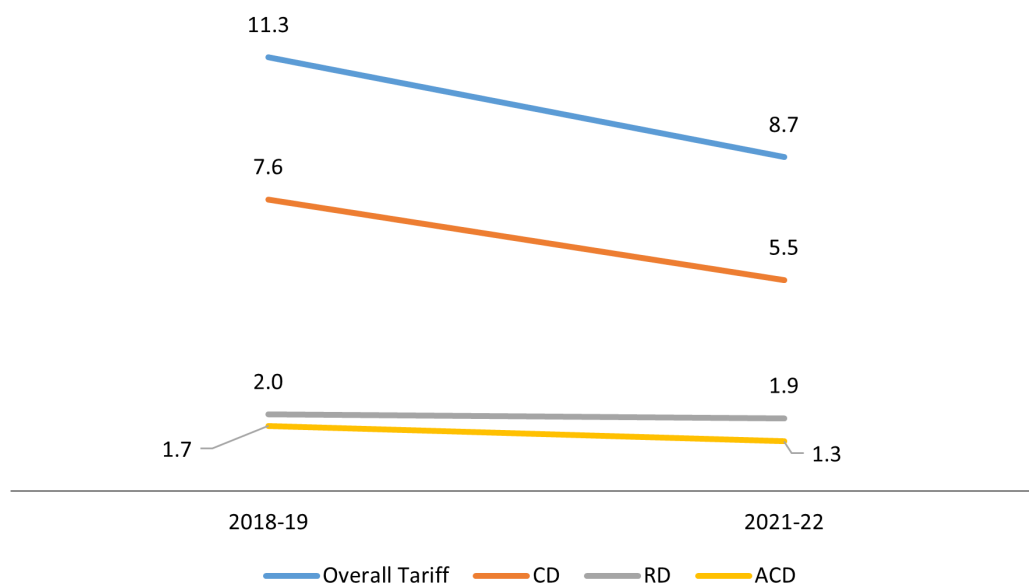
The next section provides an overview of tariff rationalization during FY 2018-19 to FY 2021-22. The third section gives a theoretical framework. The fourth and fifth sections provide methodology details, results and discussions, followed by conclusions.

3.2 Tariff Rationalization During 2018-2022

After NTP 2019-24, the institutional setup has improved by the tariff-setting mandate exercised by the National Tariff Commission and Ministry of Commerce. Also, tariff rationalization is taking place at an increased pace, and as this rationalization is

unilateral and on a self-interest basis, it is likely to impact competitiveness and industrialization (Flatters 2001) positively. This section provides an overview of the extent of the decline in overall tariffs at the sector level. The change in tariffs is further calculated separately for Customs Duty (CD), Additional Customs Duty (ACD), and Regulatory Duty (RD).

Figure 3.1: Manufacturing Sector Import Weighted MFN Tariffs*



Note: *Tariffs exclude the Energy, Food, and Auto Sector, and only Most Favoured Nation (MFN) Tariffs are included. This is because the auto and food sectors are highly protected sectors with considerably higher tariffs, and the government is a major importer in the energy sector—therefore, these sectors are excluded

Overall, the import-weighted tariff has declined from 11.3 percent in 2018-19 to 8.7 percent in 2021- 22. The largest decline during the same period is in Customs Duty (CD) of the manufacturing sector (excluding energy, food, and auto sector) which has declined from 7.6 in 2018-19 to 5.5 percent in 2021-22 (See Figure 3.1). At the same time, Additional Customs Duty (ACD) and Regulatory Duty (RD) have also

decreased slightly. Out of the overall decline in import-weighted tariff of 23 percent, 82 percent happened in raw materials and intermediate inputs.

Table 3.1: Pakistan’s Tariff Structure FY 2018-19 to FY 2020-21

Slabs	Number of Tariff Lines		Value of Imports (\$ Millions)	
	2018-19	2021-22	2018-19	2020-21
0	0	2062	0	15258
3	2768	993	29886	10811
11	1058	1093	9453	14309
16	573	497	2425	1844
20	2452	2214	6653	4956
Others	501	513	5167	5828
Total	7352	7369	53584	53006

Source: Federal Board of Revenue, Pakistan

First, a 0 percent tariff slab is introduced that comprises 2062 tariff lines—almost 30 percent of the total tariff lines and 29 percent of imports — and tariffs on these lines are reduced straight away from 3 to 0 percent. This reduction also includes nearly 50 percent of the total imports of inputs that now have a 0 percent tariff. There is a significant tariff reduction in the textile value chain, inputs of pharma, footwear, poultry, dairy, and chemicals. Table 3.1 presents slab-wise tariff lines, and import values.

Figure 3.2 compares the average customs duty on different sectors in FY 2021-22 compared to FY 2018-19. This comparison also illustrates the change in tariffs in all the sectors covering Pakistan’s total imports during the given period. The custom duty during this period declined in virtually all sectors except the mineral sector. The largest decline is in the machinery sector.

Figure 3.2: Sector Wise Import Weighted Average Tariffs

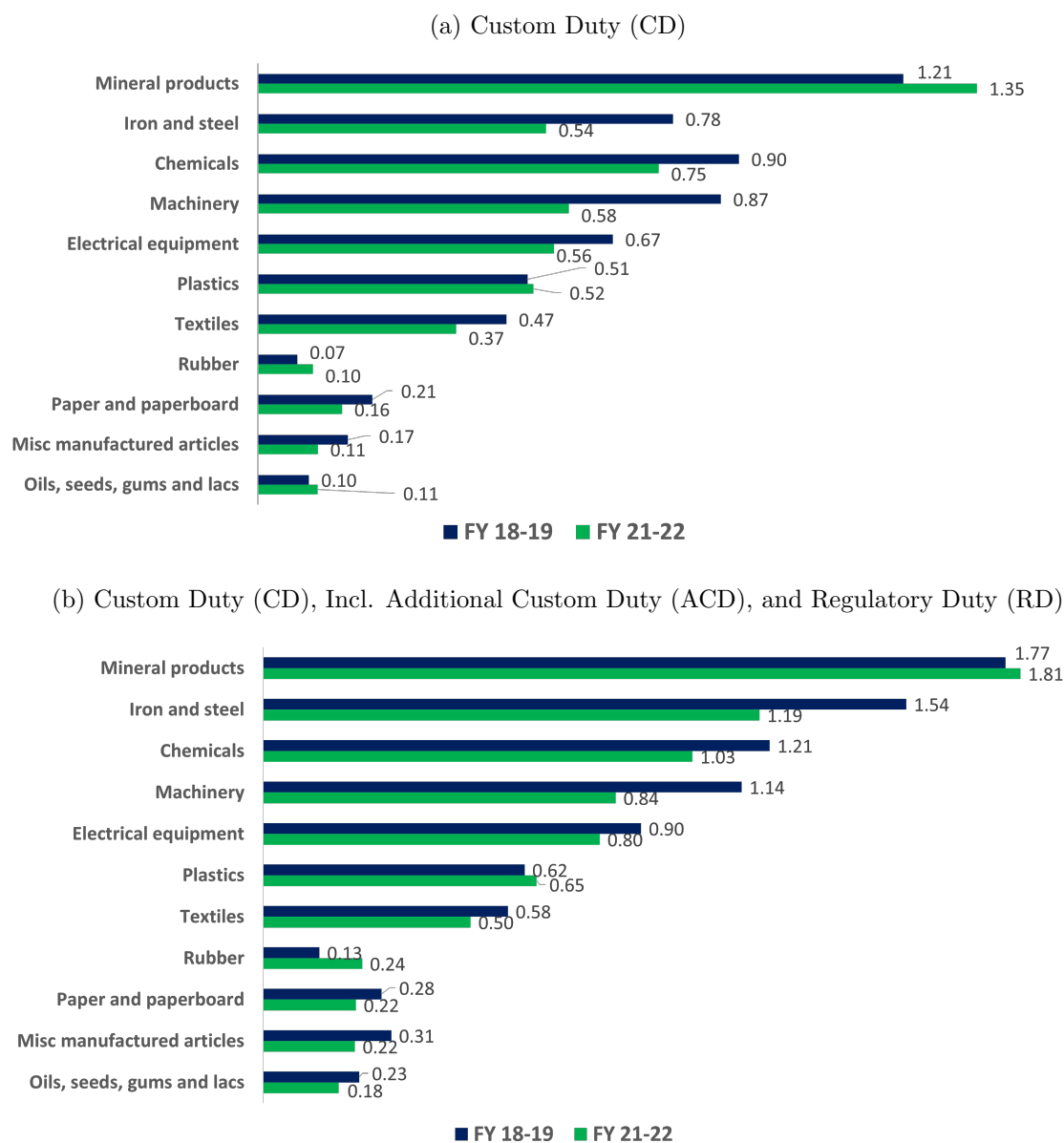
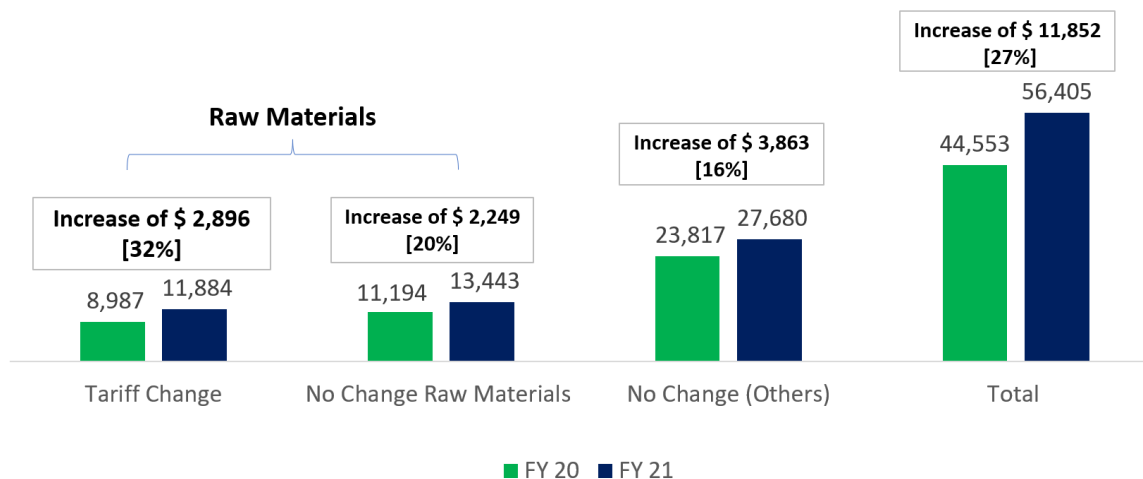


Figure 3.3 shows that the import of raw material products, on which the tariff was reduced, increased by thirty-two percent in FY 2021. For the same period, the raw materials on which the tariff was not reduced increased less than the raw-material products on which the tariff was reduced. While the present government has started

moving in the right direction by reducing customs duties on raw materials and key inputs, there is still room for reducing regulatory and additional customs duties to support industrialization.

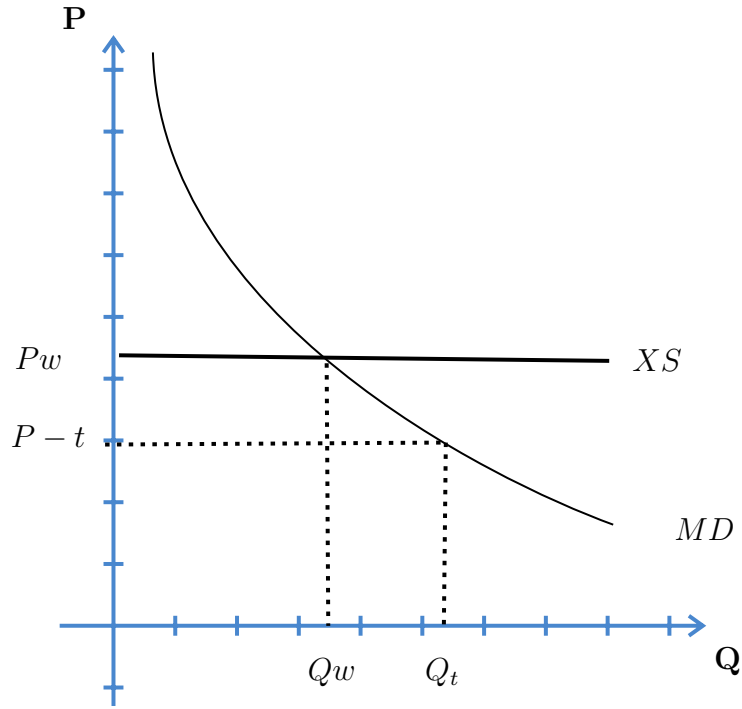
Figure 3.3: Imports of Rationalized Tariff Lines (\$ Millions)



3.3 Theoretical Framework

In the case of a small country, the imports are a very small share of the world market, so even a large increase or decrease in the country's imports has negligible impact on the world price. Therefore, even if a change in tariffs has a sizeable effect on the country's imports, it does not affect world prices. Thus, a small country takes the world prices as exogenous and faces a horizontal supply curve, as shown in Figure 3.4. As a result, an importer can import based on its import demand (MD) at the world price. If the government decreases tariffs on a particular product, the imports will increase because of the decline in tariffs as lower domestic prices increase import demand. However, the increase in imports has different implications on the domestic

Figure 3.4: Impact of Tariff Rationalization on Prices and Imports of Inputs and Raw-Materials



economy depending on the product type, i.e., whether the product is the intermediate or final good.

In case of a tariff decline on intermediate goods imports, the cost of production of firms that use those products in the production process declines. Therefore, in addition to an increase in imports of an intermediate product, it is bound to impact production. In Figure 3.5(a), a decrease in unit prices of imported inputs increases home firms' profit margins. Considering this just like a production subsidy, the price increases from P_w to $P_w + s$. This price rise leads to increase home quantity supplied from Q_{S1} to Q_{S2} . The consumer price at home is not affected, assuming that firms do not distinguish between items sold at home or exported (firms continue to charge the world price at home), so the quantity demanded stays at Q_D . In panel (b), exports

rise due to a decrease in the cost of production from Q_{X1} to Q_{X2} , though the increase in exports is less than for the export subsidy because, for the decrease in cost of production, quantity demanded does not change at home.

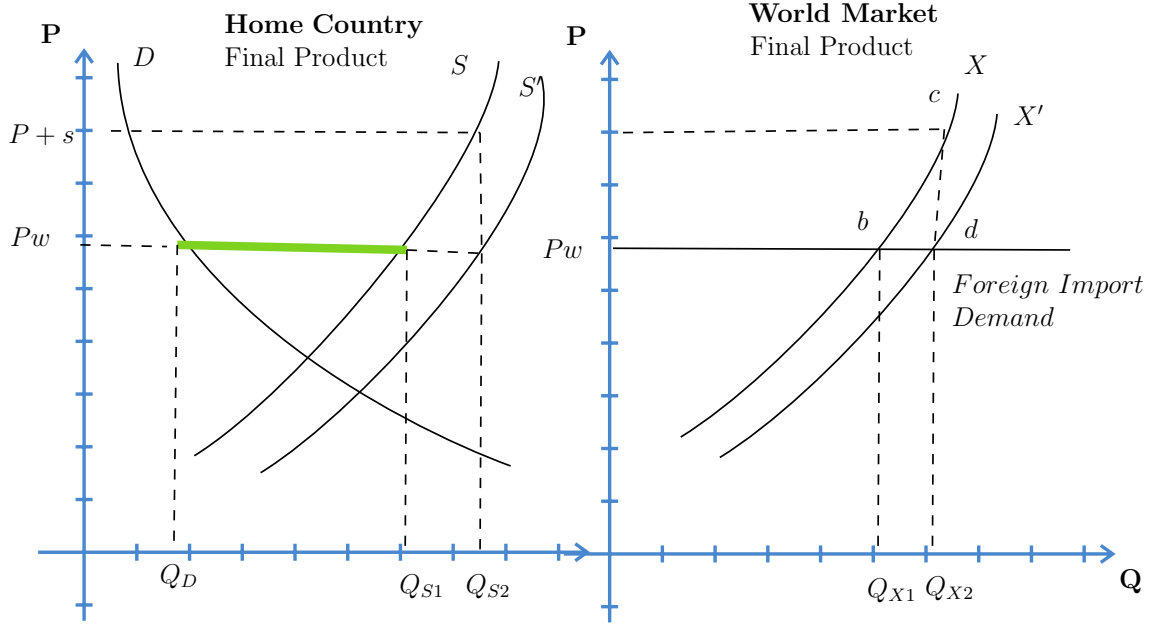
The final product that the firm's exports would increase due to a decline in tariffs on its intermediate inputs assumes that the firm does not distinguish between domestic and export supply. Alternatively, firms can pass on the impact of a decrease in tariffs to domestic consumers resulting in increased demand for the final product in the domestic market. In this case, the impact on exports will be less than on domestic sales. Whether firms supply additional production in the domestic market or export is a matter of empirical investigation.

In this study, we focus on the impact of decreased tariffs on import prices and the quantity of intermediate products. It is likely a change in the composition and quality of products as a decrease in tariffs also increases the access to better quality inputs or supply chain adjustments, causing less than complete pass-through of tariffs, and therefore, we estimate the short-term and long-term impact of a decrease in tariffs on import or intermediate inputs. Moreover, we also analyze how domestic production and exports relative to domestic sales have behaved following the decline in tariffs.

3.4 Data and Methodology

We utilize monthly data on import values and volumes at HS 8-digit product and country level for FY 2018-21. The data is obtained from the Ministry of Commerce, Government of Pakistan and covers the entire period's imports. The period covered is the same as when the Government of Pakistan started the process of tariff rationalization under NTP. To analyze the impact of tariff rationalization, we utilize the

Figure 3.5: Impact of Tariff Rationalization on Final Products



methodology proposed by [Clarke and Tapia-Schythe \(2021\)](#), which is an event study regression model to estimate the response to a quasi-experimental policy. The event study model specification is as follows:

$$\ln(m_{ijt}) = \eta_{ij} + \sum_{s=-T}^T \beta_s \left(I_{ijs} \times \ln \left(\frac{1 + \tau_{ijs}}{1 + \tau_{ij0}} \right) \right) + \delta_j + \mu_{it} + u_{ijt} \quad (3.1)$$

Where,

$\ln(m_{ijt})$ = log unit prices (tariff inclusive) or Import volumes by product country month

I_{ijs} = Indicator Variable for treated month

$\ln((1 + \tau_{ijs}) / (1 + \tau_{ij0}))$ = log change in tariffs between month s and the last untreated month treatment month indicator variables.

η_{ij} = product country effects

δ_j = country effects

μ_{it} = production time effects

Since both the dependent and right-hand-side tariff variables are measured in logs, the coefficients, s , are elasticities estimated over different time horizons, s . The final month also consists of observations for periods longer than twelve months, therefore, it captures the long-term impact of change in tariffs. The treatment month indicator variables indicate that a particular product is a given number of periods away from the imposition of tariff in the respective month. Each coefficient (s) is a difference-in-differences estimator based on the period before and after implementing the tariffs. (it) and (jt) are country-time fixed effects and product-time fixed effects to control for country-specific time-varying and other factors such as exchange rate affecting imports and unit prices. The country product fixed-effect controls for quality or comparative advantage across countries in untreated months. We estimate the regression for all steel products combined and each end-use category of steel products.

There is a strand of literature that estimates the impact of expectations on international trade ([Khan and Khederlarian 2021](#); [Alessandria and Mix 2021](#)). However, most of this literature is developed around the free trade agreements and their impact on trade mainly because there is a lag between negotiations and the implementation of bilateral or multilateral FTAs. In our case, the tariff rationalization is unilateral, and there are no announcements indicating the sectors or products on which the government is planning to reduce tariffs; therefore, we can rule out the possibility of impact of expectation on imports.

3.5 Results and Discussion

Figure 3.6(a) shows the estimated elasticities of import prices (tariff-inclusive) for the first twelve months before and after the change in tariffs. After the tariffs are changed, we see that tariff pass-through is a little below one in the first month after the tariff change, indicating that, initially, approximately one-hundred percent of the declined import tariffs have been passed on to Pakistani importers in terms of lower unit prices of imports. However, the impact on prices is less than complete in the long-term from the tenth month onwards, although it becomes insignificant in the long term. The less than complete pass-through indicates the supply chain adjustments and quality of imports following the decline in import tariffs.

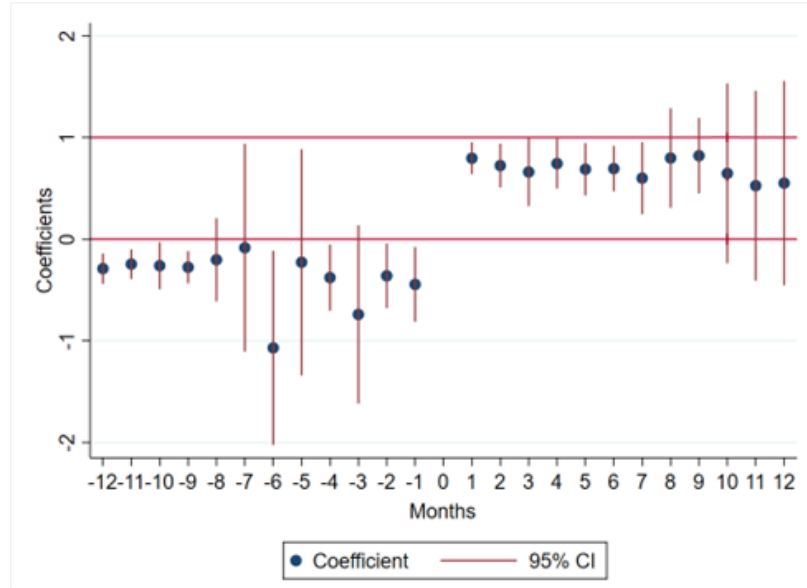
In the case of the quantity of imports, Figure 3.6(b) shows that the decline in tariffs has a negligible impact on the quantity of imports in the short-term but a substantial impact after the ninth month. The literature has also reported a delayed impact of tariffs on imports and cited that it takes time to enter into a new contract and deliver goods. Also, the medium to long-term impact of tariffs on imports is different because of changes in the quality of products and adjustments in supply chains.

The government started rationalizing tariffs on intermediate inputs in FY 2019; however, before this decline in tariffs impacted intermediate products, the COVID-19 restrictions started to affect Pakistan's economy and large-scale manufacturing industry (See Figure 3.7). However, after the relaxation in restrictions and opening up of the economy, the large-scale manufacturing sector recovered and reached an all-time high level.

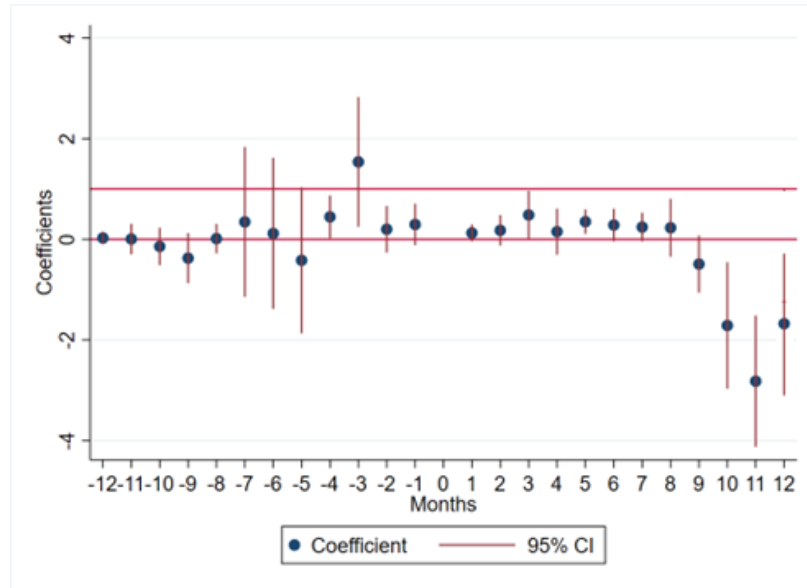
During the same period, the export-to-import ratio of firms declining in the pre-COVID-19 period recovered and increased more than in the pre-Covid period (See

Figure 3.6: Impact of Tariffs on Import Prices and Volumes

(a) Import Prices



(b) Import Volumes



Note: This figure provides elasticities for different time horizons along with 95% confidence intervals. The 12th lead(lag) month also consists of observations for the period longer(earlier) than 12 months—therefore, it captures the long-term impact. The estimations for 6 and 9 month window are give in Appendix Figure 3.9 and 4.1, respectively.

Figure 3.7: Cumulative Quantum Index of Large Scale Manufacturing(\$ Millions)

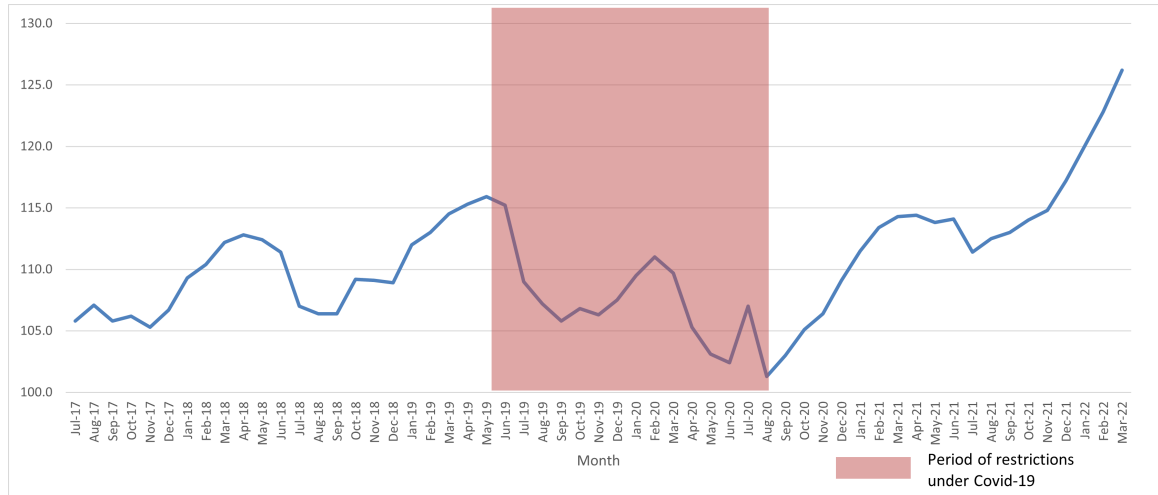
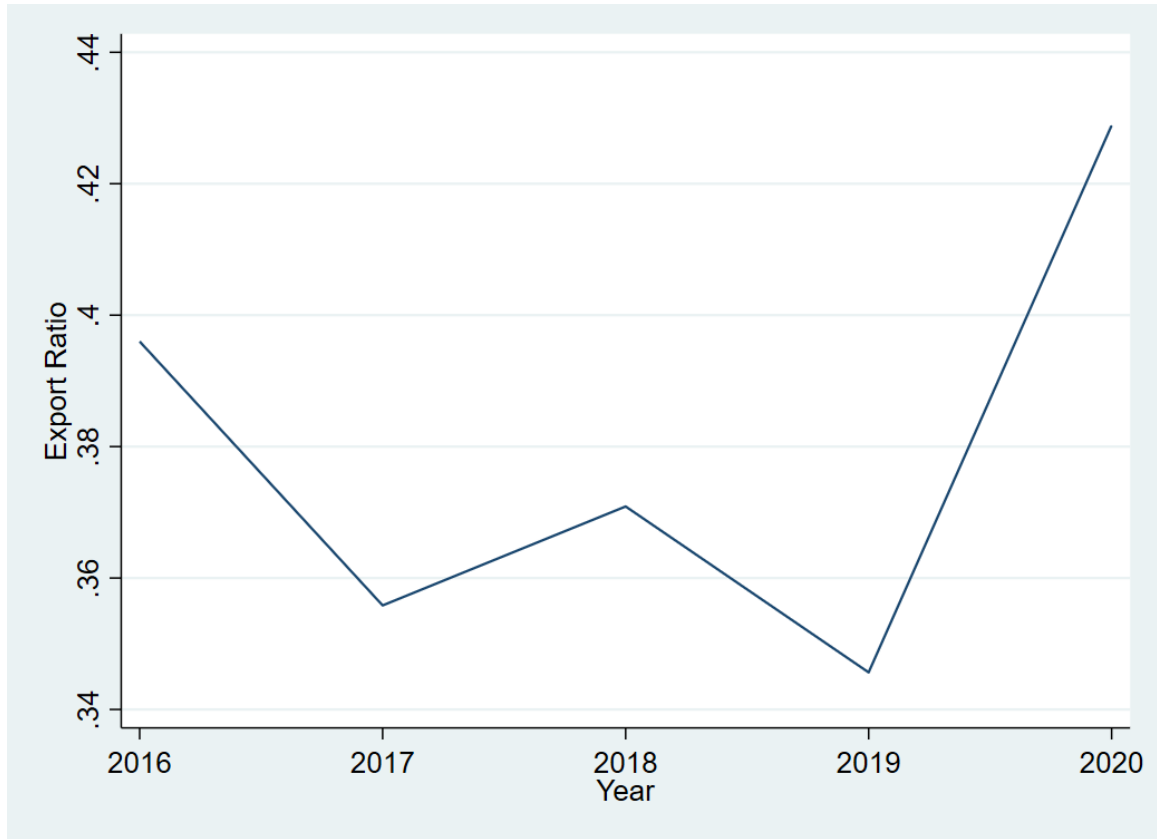


Figure 3.8) . This finding also indicates that tariff rationalization not only increased the domestic production as depicted in the theoretical section but also improved the export orientation of the firms which are simultaneously supplying in the domestic market and export market.

3.6 Conclusions

During 2018-2021, the government of Pakistan, under NTP reduced tariffs on various raw materials and intermediate products. This study analyzed whether the tariff rationalization had an intended impact on the economy. Based on the standard theory of tariffs in the case of a small country, the decrease in tariffs translates to reduced domestic prices of the imported good and increased imports of rationalized products. As most of the products were raw materials and intermediate products, they also positively impacted domestic production and exports of final products. The results based on event study models show that the tariffs pass-through to prices is near complete in the short term but less than complete in the long term. Although

Figure 3.8: Export to Import Ratio (\$ Millions)



Note: The export-to-import ratio is computed based on publicly listed firms' data from the State Bank of Pakistan, only those exporting firms are included, which are also selling in the domestic market. The ratio is aggregated using sectoral weights.

there is a delayed impact on the quantity of imports, i.e., after nine months of tariff rationalization, the impact is substantial. This impact also indicates that tariff rationalization under NTP has had its intended impact in terms of decreased prices of raw-material and intermediate products and improved access. Also, the increased quantity of imports of raw-material and intermediate products indicates that domestic products have increased following the decrease in tariffs.

The overall increase in the quantum index of large-scale manufacturing shows that the overall production has increased following tariff rationalization. Assuming that

the decline in the cost of production does not affect the domestic demand for the final product, the additional production increases exports. Contrary to this, if firms pass on the increased profit margins to domestic consumers in the form of lower prices, the domestic demand for final products may increase domestic sales more than exports. However, our results indicate that the export-to-import ratio has increased following the tariff rationalization.

However, it is important to acknowledge a limitation of this study. While we have analyzed the impact of tariff rationalization on imports of raw-materials and intermediate goods, the assessment of its effect on exports remains unexplored. This gap arises from the lack of available data on disaggregated exports that could be matched with raw-material and inputs for which tariffs is rationalized. Without this crucial data, we're unable to fully analyze the the intended impact of tariff adjustments and on export.

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3.7 Appendix

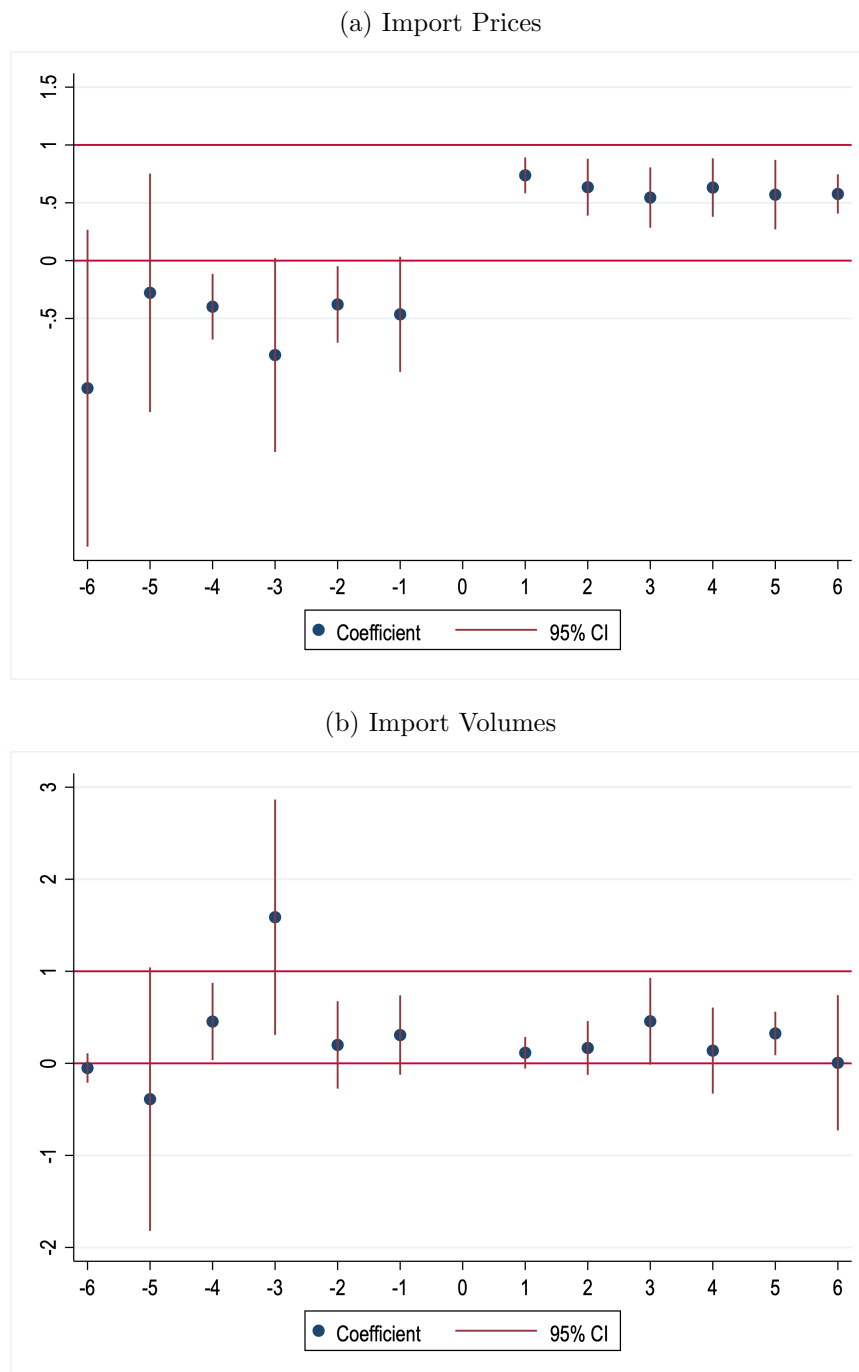
Table 3.2: Estimates of Event Study Model: 12-Months Window

Variables	Coef	Unit Values			Coef	Import Volumes		
		Stderr	CI_lower	CI_upper		Stderr	CI_lower	CI_upper
L.tariff_hc_pre1	-0.45	0.19	-0.81	-0.08	0.29	0.21	-0.12	0.71
L.tariff_hc_pre2	-0.36	0.16	-0.68	-0.04	0.20	0.24	-0.26	0.66
L.tariff_hc_pre3	-0.74	0.45	-1.62	0.14	1.54	0.66	0.25	2.83
L.tariff_hc_pre4	-0.38	0.17	-0.70	-0.05	0.45	0.22	0.02	0.87
L.tariff_hc_pre5	-0.23	0.57	-1.34	0.89	-0.42	0.74	-1.87	1.03
L.tariff_hc_pre6	-1.07	0.49	-2.02	-0.12	0.12	0.77	-1.38	1.62
L.tariff_hc_pre7	-0.08	0.52	-1.11	0.94	0.35	0.76	-1.14	1.83
L.tariff_hc_pre8	-0.20	0.21	-0.61	0.21	0.01	0.15	-0.28	0.31
L.tariff_hc_pre9	-0.28	0.08	-0.44	-0.12	-0.37	0.25	-0.87	0.12
L.tariff_hc_pre10	-0.26	0.12	-0.49	-0.03	-0.14	0.19	-0.51	0.23
L.tariff_hc_pre11	-0.25	0.07	-0.39	-0.10	0.01	0.15	-0.30	0.31
L.tariff_hc_pre12	-0.29	0.08	-0.44	-0.14	0.03	0.06	-0.10	0.15
L.tariff_hc_post1	0.80	0.08	0.64	0.95	0.13	0.09	-0.04	0.29
L.tariff_hc_post2	0.72	0.11	0.51	0.94	0.18	0.15	-0.13	0.48
L.tariff_hc_post3	0.66	0.17	0.32	1.00	0.48	0.24	0.01	0.96
L.tariff_hc_post4	0.74	0.13	0.50	0.99	0.15	0.23	-0.31	0.61
L.tariff_hc_post5	0.69	0.13	0.43	0.95	0.35	0.12	0.11	0.59
L.tariff_hc_post6	0.69	0.11	0.47	0.92	0.28	0.17	-0.04	0.61
L.tariff_hc_post7	0.60	0.18	0.25	0.95	0.24	0.15	-0.04	0.53
L.tariff_hc_post8	0.80	0.25	0.31	1.29	0.23	0.29	-0.35	0.80
L.tariff_hc_post9	0.82	0.19	0.45	1.19	-0.49	0.29	-1.06	0.08
L.tariff_hc_post10	0.06	0.45	-0.82	0.94	-1.71	0.64	-2.97	-0.46
L.tariff_hc_post11	0.53	0.48	-0.41	1.46	-2.82	0.67	-4.12	-1.51
L.tariff_hc_post12	0.55	0.51	-0.45	1.56	-0.43	0.73	-1.86	0.99
_cons	2.74	0.00	2.74	2.74	6.06	0.00	6.06	6.06
N	671260				602033			
r2	0.76				0.87			

Table 3.3: Estimates of Event Study Model: 6-Months Window

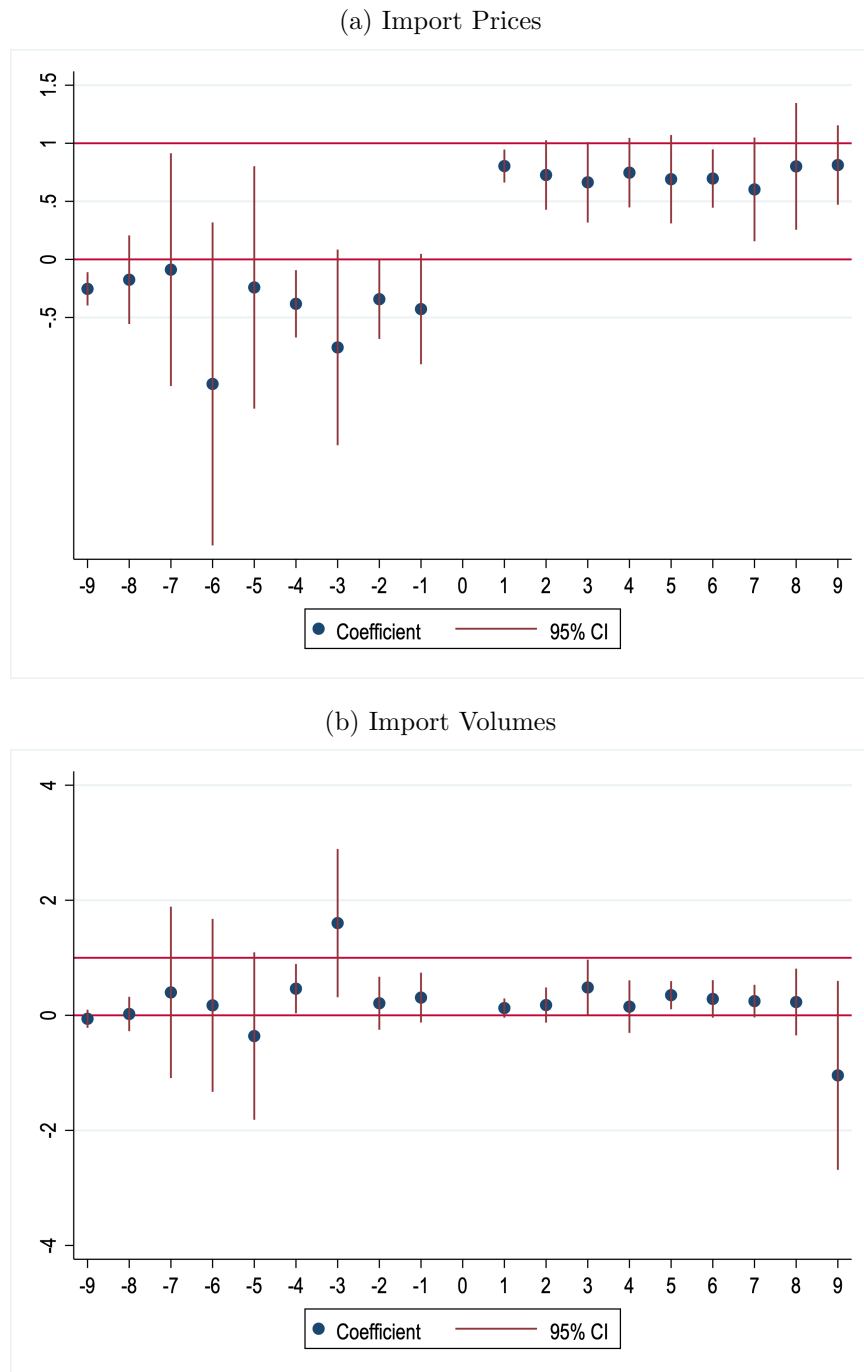
Variables	Unit Values				Import Volumes			
	Coef	Stderr	CI_lower	CI_upper	Coef	Stderr	CI_lower	CI_upper
L.tariff_hc_pre1	-0.46	0.21	-0.87	-0.06	0.31	0.22	-0.12	0.74
L.tariff_hc_pre2	-0.38	0.16	-0.69	-0.07	0.20	0.24	-0.27	0.67
L.tariff_hc_pre3	-0.82	0.44	-1.68	0.05	1.59	0.65	0.31	2.87
L.tariff_hc_pre4	-0.40	0.17	-0.72	-0.07	0.45	0.21	0.03	0.87
L.tariff_hc_pre5	-0.28	0.57	-1.39	0.83	-0.39	0.73	-1.82	1.04
L.tariff_hc_pre6	-1.10	0.48	-2.05	-0.15	-0.05	0.08	-0.21	0.11
L.tariff_hc_post1	0.74	0.09	0.56	0.91	0.11	0.09	-0.06	0.29
L.tariff_hc_post2	0.64	0.12	0.40	0.87	0.17	0.15	-0.12	0.46
L.tariff_hc_post3	0.55	0.17	0.21	0.88	0.46	0.24	-0.01	0.93
L.tariff_hc_post4	0.63	0.15	0.34	0.92	0.14	0.24	-0.33	0.61
L.tariff_hc_post5	0.57	0.13	0.32	0.82	0.32	0.12	0.09	0.56
L.tariff_hc_post6	0.58	0.14	0.31	0.85	0.01	0.37	-0.73	0.74
_cons	2.74	0.00	2.74	2.74	6.06	0.00	6.06	6.06
N	671260				602033			
r2	0.76				0.87			

Figure 3.9: Impact of Tariffs on Import Prices and Volumes in 6-Months Window



Note: This figure provides elasticities for different time horizons along with 95% confidence intervals. The 6th lead(lag) month also consists of observations for the period longer(earlier) than 6 months—therefore, it captures the long term impact.

Figure 3.10: Impact of Tariffs on Import Prices and Volumes in 9-Months Window



Note: This figure provides elasticities for different time horizons along with 95% confidence intervals. The 9th lead(lag) month also consists of observations for the period longer(earlier) than 9 months—therefore, it captures the long term impact.

Table 3.4: Estimates of Event Study Model: 9-Months Window

Variables	Unit Values				Import Volumes			
	Coef	Stderr	CI_lower	CI_upper	Coef	Stderr	CI_lower	CI_upper
I.tariff_hc_pre1	-0.43	0.19	-0.80	-0.05	0.31	0.22	-0.13	0.74
I.tariff_hc_pre2	-0.34	0.16	-0.66	-0.02	0.21	0.24	-0.25	0.67
I.tariff_hc_pre3	-0.76	0.44	-1.63	0.11	1.60	0.66	0.31	2.89
I.tariff_hc_pre4	-0.38	0.17	-0.71	-0.06	0.46	0.22	0.03	0.89
I.tariff_hc_pre5	-0.24	0.57	-1.36	0.87	-0.36	0.74	-1.82	1.09
I.tariff_hc_pre6	-1.07	0.49	-2.03	-0.12	0.17	0.77	-1.33	1.68
I.tariff_hc_pre7	-0.09	0.52	-1.11	0.93	0.40	0.76	-1.09	1.89
I.tariff_hc_pre8	-0.18	0.20	-0.57	0.22	0.02	0.15	-0.28	0.32
I.tariff_hc_pre9	-0.25	0.07	-0.40	-0.11	-0.06	0.08	-0.22	0.10
I.tariff_hc_post1	0.80	0.08	0.65	0.96	0.13	0.09	-0.04	0.29
I.tariff_hc_post2	0.73	0.11	0.52	0.94	0.18	0.16	-0.13	0.48
I.tariff_hc_post3	0.66	0.17	0.33	0.99	0.48	0.25	0.00	0.97
I.tariff_hc_post4	0.75	0.13	0.50	0.99	0.15	0.23	-0.31	0.61
I.tariff_hc_post5	0.69	0.13	0.44	0.94	0.35	0.12	0.11	0.60
I.tariff_hc_post6	0.70	0.11	0.48	0.92	0.29	0.17	-0.04	0.61
I.tariff_hc_post7	0.60	0.18	0.25	0.95	0.25	0.14	-0.04	0.53
I.tariff_hc_post8	0.80	0.25	0.32	1.28	0.23	0.30	-0.35	0.81
I.tariff_hc_post9	0.81	0.19	0.45	1.18	-1.04	0.84	-2.69	0.60
_cons	2.74	0.00	2.74	2.74	6.06	0.00	6.06	6.06
N	671260				602033			
r2	0.76				0.87			

Chapter 4

Impact of Terrorism on Stock Market: The Case of Pakistan

4.1 Introduction

The impacts of terrorist attacks extend well beyond their immediate physical effects. One area where these repercussions are particularly pronounced is the financial markets. The relationship between terrorism and the financial sector has captured the attention of researchers and policymakers, especially after September 11, 2001, when the core of the world's financial epicenter was targeted, leading to the closure of the New York Stock Exchange (NYSE) and the NASDAQ for four trading days, and a sharp and significant decline of 684 point drop in the Dow Jones Industrial Average (DJIA). Terrorism incidents in the twenty-first century have far-reaching economic consequences in terms of loss of earnings and jobs ([Brodeur 2018](#)). Terrorism disrupts societies and economies by instilling fear and causing violence. It creates uncertainty, impacting consumer sentiment, investor confidence, and economic stability. Financial markets

are vulnerable to shockwaves, leading to volatility, price fluctuations, and altered investor behavior ([Drakos 2010](#)).

Rising uncertainty has been studied to impact macroeconomic outcomes, such as GDP ([Bloom 2009](#); [Engle and Rangel 2008](#)), consumer spending on durable goods ([Romer 1990](#)). Romer (1990) found a negative correlation between stock market volatility and purchases of durable goods during the pre-war period. [Handley and Limão \(2012\)](#) also model the role of uncertainty in firms' investment decisions, particularly in export markets. While adverse impact of volatility are generally found to have adverse impacts on macro and micro levels. It is believed that markets recover rapidly ([Mill 1848](#); [Becker and Murphy 2001](#)) particularly when impact on key infrastructure is negligible. Most of the literature has reported negative impacts of terrorist attacks on stock prices and returns ([Karolyi and Martell 2010](#); [Brounen and Derwall 2018](#); [Nikkinen and Vähämaa 2010](#)), but the impacts vary depending on types or severity of terrorist attacks or the development status of a market or economy.

In recent years, many empirical studies have analyzed the impact of terrorist attacks on stock markets in terms of how stock markets behave on the event date and following the event . In some cases, it is found that terrorist incidents have permanent effects on stock markets ([Eldor and Melnick 2004](#)), but the effects are likely to differ with respect to the types of firms, whether the firms are located in rich or poor, or democratic or non-democratic countries ([Karolyi and Martell 2010](#)). Literature also shows that stock markets of large economies and economies that have stable financial sector are relatively more resilient ([Chen and Siems 2004](#)). Therefore, the overall impact of terrorist attacks and how stock markets react in terms of recovery depends on various factors.

One strand of literature analyzes the overreaction and underreaction of stock

market following some extreme news. In general, there are three cases, and a main hypothesis related to investor behavior in face of extreme event. First, the Efficient Market Hypothesis suggests that shock information is incorporated immediately in equity prices without reversal. Second, the Overreaction Hypothesis suggests that market participants overreact to new information and correct their behavior later. The Underreaction hypothesis suggests that participants underreact and correct their behavior later. Most the literature on over-reaction and under-reaction is related to information asymmetry, political events, and other extreme news and events ([Zainudin and Hussin 2015](#); [George and Hwang 2007](#); [Piccoli et. al. 2017](#)). There are few studies that have also analyzed over-reaction or underreaction in case of terrorist attacks. According to [Boubaker et. al. \(2001\)](#) there is short-term overreaction to terrorist attacks for three days post event followed by price reversals, and the price reversals tend to be greater for small firms compared to large firms. Similarly, [Park \(2018\)](#), [Cummins and Lewis \(2003\)](#), and [Doherty et al. \(2003\)](#) examine the stock price reactions of insurance companies in case of 9/11 attacks and found presence of overreaction.

This paper contributes to the existing literature by utilizing the event study model or two-way fixed effect model, to estimate the causal impact of terrorist attacks on stock prices. In addition, I also use propensity score matching technique to match the firms from a comparable economy. Using data on daily stock prices for Pakistani and Bangladeshi firms along with major terrorist attacks. I explore the dynamics shaping market behavior in the aftermath. The inclusion of Bangladeshi firms as a control group through propensity score matching adds depth to the analysis. The next section provides details on data and methodology, followed by results and discussion.

4.2 Data sources and Descriptive Analysis

Table 4.1 provides key characteristics of for sample of firms from Bangladesh and Pakistan. In total, 133 firms are included, with 44 from Bangladesh and 89 from Pakistan. The assets of Bangladeshi firms on avearge amount to \$28.011 million, significantly lower than the \$104.623 million in case of Pakistani firms. However, when considering liabilities, Bangladesh presents a lighter burden with on average \$16.040 million compared to Pakistan’s \$40.430 million. Interestingly, despite Pakistan’s larger asset base, Bangladeshi firms exhibit a higher shareholders’ equity at \$11.677 million versus \$51.412 million. In terms of gross profit, Bangladeshi firms also outperform their Pakistani counterparts, generating \$6.624 million compared to \$3.904 million on avearage. These differences can be attributed to the distinct financial landscapes of the two countries and therefore using matching techniques becomes necessary for causal analysis.

Table 4.1: Key Firm Characteristics

	(1)	(2)	(3)	(4)	(5)
	N	Assets	Liabilities	Shareholders Equity	Gross Profit
Bangladeshi	44 (33.1%)	28.011 (38.441)	16.040 (25.505)	11.677 (16.731)	6.624 (16.700)
Pakistani	89 (66.9%)	104.623 (262.918)	40.430 (91.050)	51.412 (148.960)	3.904 (10.350)
Total	133 (100.0%)	79.277 (218.802)	32.361 (76.624)	38.266 (123.435)	4.804 (12.803)

Table 4.2 provides an overview of the distribution of terrorist attacks, shedding light on the impact of these attacks in terms of casualties. During the sample period (2018 - 2021) there were a total of 1,137 terrorist incidents. Notably, a significant proportion of the recorded incidents (47.67 percent) resulted in no casualties, suggesting that a substantial portion of these attacks may have aimed at instilling fear, causing disruption, or targeting property rather than causing harm to individuals. Furthermore, around 30.17 percent of the attacks resulted in a single casualty, underlining the prevalence of incidents with relatively limited human harm. Attacks with casualty counts ranging from 2 to 5 were observed in 15.92 percent of the total cases, indicating a higher level of violence compared to single-casualty incidents. While attacks leading to 6 to 9 casualties (2.55 percent), 10 to 15 casualties (0.79 percent), and 16 to 35 casualties (0.53 percent) were relatively less frequent, it is noteworthy that there was one extremely deadly attack causing 36 or more casualties (0.09 percent) within the dataset.

Table 4.2: Distribution of Terrorist Attacks

Categories	Frequency	Percent
No casualties	542	47.67
1 casualty	343	30.17
Between 2-5	181	15.92
Between 6-9	29	2.55
Between 10-15	9	0.79
Between 16-35	6	0.53
36 and above	1	0.09
unknown	26	2.29
Total	1,137	100

Source: GTA

Table 4.3 presents a breakdown of terrorist attacks by attack type, along with incidents and casualties. Firstly, bombing/explosion stands out as the most frequent type of attack, comprising 50.4 percent of total incidents. Remarkably, despite its high frequency, it accounts for an almost equivalent percentage of total casualties, indicating the severe human toll associated with these attacks. Armed assault is the second most common type of attack, representing 30.17 percent of incidents. Interestingly, it results in a relatively higher percentage of casualties, at 34.19 percent, underscoring the higher lethality of such incidents. Assassination is the third most frequent type of attack, with 12.49 percent of incidents, but it has a lower casualty percentage of 9.82 percent, suggesting that these attacks tend to be less deadly on average. Furthermore, hostage taking and kidnapping account for 3.69 percent of incidents and 2.51 percent of casualties, indicating their relatively lower frequency, but still significant impact. Other categories, including facility/infrastructure attacks, unarmed assault and hostage taking (barricade incidents have lower incident and casualty percentages).

Table 4.3: Terrorist Attacks by Attack Type

Attack Type	No. of Incidents	Percent	Causalities	Percent
Armed Assault	343	30.17	491	34.19
Assassination	142	12.49	141	9.82
Bombing/Explosion	573	50.4	724	50.42
Facility/Infrastructure Attack	19	1.67	16	1.11
Hostage Taking (Barricade Incident)	1	0.09	0	0
Hostage Taking (Kidnapping)	42	3.69	36	2.51
Unarmed Assault	1	0.09	0	0
Unknown	16	1.41	28	1.95
Total	1,137	100	1,436	100

Source: GTA

Table 4.4 provides a breakdown of terrorist attacks categorized by the type of weapon used, with a particular focus on key notable numbers related to incidents and casualties. Explosives are the predominant choice of weaponry, accounting for a substantial 55.85 percent of total incidents. Notably, these explosive-related attacks are associated with the highest percentage of casualties, at 58.22 percent. This suggests that while they are the most frequent, they also tend to be deadliest, causing a disproportionately high number of casualties in comparison to other weapon types. Firearms come in as the second most common weapon type, representing 39.75 percent of incidents. However, their relative deadliness is somewhat lower, with 38.3 percent of total casualties attributed to firearms. This indicates that while firearm-related attacks are relatively frequent, they tend to result in fewer casualties on average compared to explosive-based attacks.

Table 4.4: Terrorist Attacks by Weapon type

Weapon type	Number of Incidents	Percent	Casualties	Percent
Explosives	635	55.85	836	58.22
Firearms	452	39.75	550	38.3
Incendiary	17	1.49	16	1.11
Melee	6	0.53	2	0.14
Unknown	27	2.37	32	2.23
Total	1,137	100	1,436	100

Source: GTA

Table 4.5 gives a breakdown of terrorist attacks categorized by their target type, incidents and casualties. Notably, attacks on private citizens and property stand out as the most frequent, comprising 23.48 percent of total incidents. These incidents also result in a significant percentage of casualties, representing 31.75 percent of the total. This highlights that attacks on private citizens and property are not only common but also have a substantial impact, causing a significant number of casualties. Similarly, attacks on military entities account for 23.31 percent of incidents and 26.95 percent of casualties, indicating their significance in both frequency and the severity of consequences. Additionally, police are a notable target, constituting 17.41 percent of incidents and resulting in 19.57 percent of total casualties, underscoring the risks faced by law enforcement officers during these incidents.

Table 4.5: Terrorist Attacks and Target type

Target Type	Number of Incidents	Percent	Causalities	Percent
Private Citizens & Property	267	23.48	456	31.75
Military	265	23.31	387	26.95
Police	198	17.41	281	19.57
Unknown	81	7.12	13	0.91
Government (General)	70	6.16	46	3.2
Business	59	5.19	85	5.92
Educational Institution	43	3.78	23	1.6
Religious Figures/Institutions	38	3.34	59	4.11
Violent Political Party	36	3.17	18	1.25
Transportation	26	2.29	20	1.39
Journalists & Media	18	1.58	10	0.7
Terrorists/Non-State Militia	11	0.97	12	0.84
Utilities	10	0.88	4	0.28
Government (Diplomatic)	6	0.53	10	0.7
Telecommunication	5	0.44	12	0.84
NGO	4	0.35	0	0
Total	1,137	100	1,436	100

Source: GTA

4.3 Methodology

I use an event study model to analyze the impact of terrorist incidents on stock prices and volatility. The daily stock price data of Pakistani and Bangladeshi firms is acquired from the DataStream International Database. Where Bangladeshi firms are

used as control group. I also use matching technique to match the similar firms from Bangladesh. The period for the analysis is January 2018 to December 2021, and for the same period data on terrorist attacks is taken from Global Terrorism Database. During this period there were 423 terrorist attacks. As there were many events that occurred in distance places, and some events that were not severe, I focused on major terrorism events that took place in major cities, and where the number of casualties were two or more. The event study model specification is as follows:

$$\ln p_{it} = \delta_i + \mu_t + \sum_{s=-T}^{\bar{T}} \beta_s (I_{it}) + u_{it} \quad (4.1)$$

Where,

$\ln p_{it}$ = log stock prices or volatility in prices

I_{it} = Indicator Variable for day on which terrorist attack happened

δ_i = firm effects

μ_t = time effects

Since the dependent variables are measured in logs, the coefficients are elasticities estimated over different time horizons, s . The final day also consists of observations for periods longer than five days, therefore, it captures relatively long-term impact of terrorist attacks. The treatment day indicator variables indicate that a particular firm's stock price is a given number of periods away from the day of event. Each coefficient (β_s) is a difference-in-differences estimator based on the period before and after terrorist attacks. δ_i and μ_t are firm and time fixed effects, respectively.

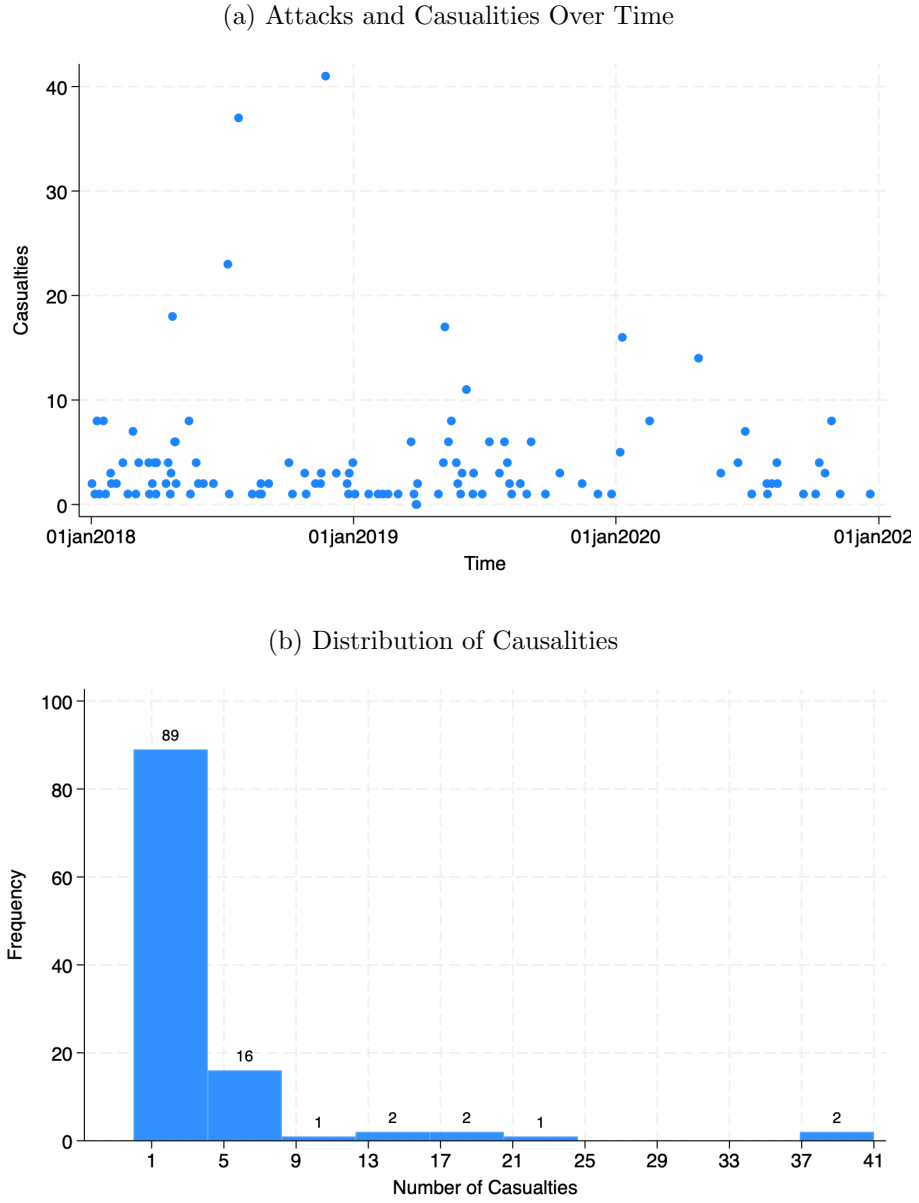
To estimate a causal impact of terrorist attacks on stock prices, I first match the Pakistani firms with Bangladeshi firms using the Propensity Score Matching (PSM) method that is based on a probit model. The PSM model solved the problem of

selection bias as simple comparisons of outcome variables across such dissimilar groups would be invalid and biased. For example, using a group of potential confounders, such as firm size, capital, and sector, a propensity score represents the predicted likelihood that a specific firm belongs to the Pakistani market. The propensity score is an estimated probability that is then assigned to the treatment (firms which were affected by the terrorist attacks) and the control group (firms which were not exposed to the impact of terrorist attacks) based on a probit model. Successful matching requires both variability in the propensity scores within each group and overlap of propensity scores across groups (i.e., common support region). The probit model gives the predicted probability that firm belongs to Pakistani market based on the selected predictors, where $D=1$ for firms that belong to Pakistan and $D=0$ otherwise.

$$p(x) = \text{prob}(D = 1|x) = E(D|x) \quad (4.2)$$

The propensity score matching method assigns propensity scores to each household, to help match them based on similar characteristics, dividing them into treated and control groups. The two groups (treated and control) are then matched using four matching characteristics based on their propensity scores. There was total 89 firms that are matched with Bangladeshi firms using propensity scores matching model that had average total assets, liabilities, shareholders equity and gross profit as key factors on which firms were matched. Figure 4.1 provides the selected events of terrorist attacks that took place in major cities i.e., provincial capitals and there were casualties involved. During the sample period there were total 113 event days and 464 casualties. Most the selected events caused casualties below 4 and there were two events that caused more than 35 casualties.

Figure 4.1: Terrorist Attacks: Causalities and Frequency Distribution



4.4 Results and Discussion

The key purpose of the propensity score matching approach is to reduce selection bias or any imbalance between treatment and control groups. If the treated and

untreated groups are similar in terms of observables, then it is reasonable to assume that there will not be any sizeable differences in unobservables. Table 4.6 shows that after matching the treated and untreated groups, they have similar characteristics in terms of total assets, liabilities, equities, and gross profits. In terms of standard deviation in these key characters, the untreated group has higher variation but the difference with respect to treated groups is negligible. The key purpose of using propensity score matching is to avoid the risk of confounding variables affecting the results. As discussed in literature the impact of terrorist attacks on stock market varies with respect to the firm level characteristics.

Table 4.6: Differences in Matched Firms' Characteristics

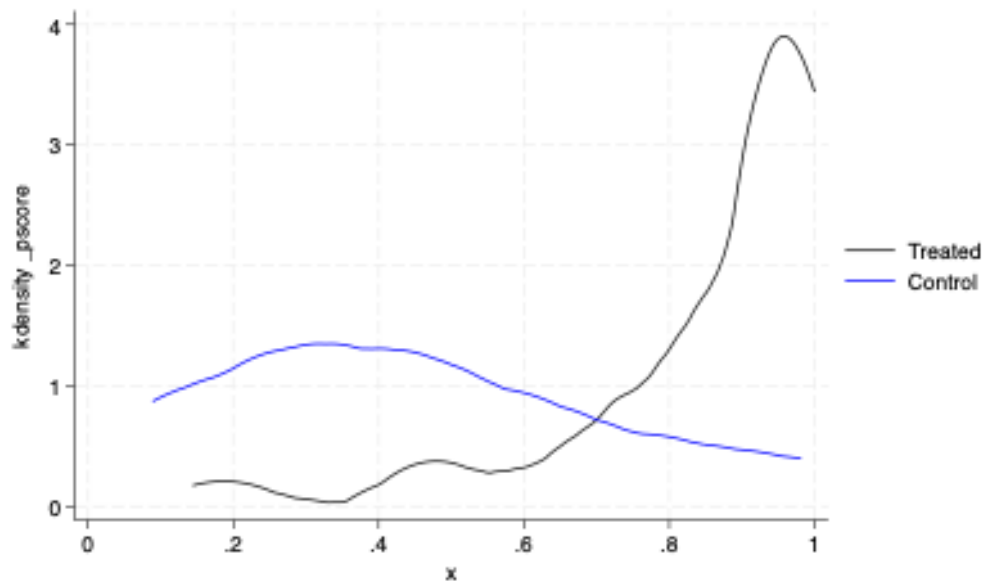
Variables	Untreated	Treated	Total
Total Assets	16.609 (1.362)	17.559 (1.237)	17.353 (1.318)
Total Liabilities	15.764 (1.654)	16.616 (1.301)	16.431 (1.421)
Equity	15.769 (1.336)	16.647 (1.357)	16.456 (1.394)
Gross Profit	14.050 (1.623)	14.182 (1.406)	14.154 (1.449)

The treated firms have relatively higher propensity scores compared to control firms. However, the density function of propensity scores of treated and control firms given in Figure 4.2 shows that there is significant overlapping of treated and untreated firms that have similar propensity scores.

First, I estimate the event study model without matching Pakistani firms with Bangladeshi firms. The estimated results of event study model given in Figure 4.3 indicate that the instantaneous effects of the terrorist attacks on the stock prices is negative, but that prices recover immediately. The short-lived impact of terrorist

attacks can be attributed to the perception of the investors that the terrorist attack is a one-time event with limited lasting economic impacts. These results are also in line with the efficient market hypothesis that suggests that stock prices instantly reflect all available information. If the attack's impact is accurately and fully assessed within the first day of trading, the efficient market hypothesis would imply that the effects of the attack on stock prices should be relatively short-lived.

Figure 4.2: Distribution of Propensity Scores of Treated and Control Firms



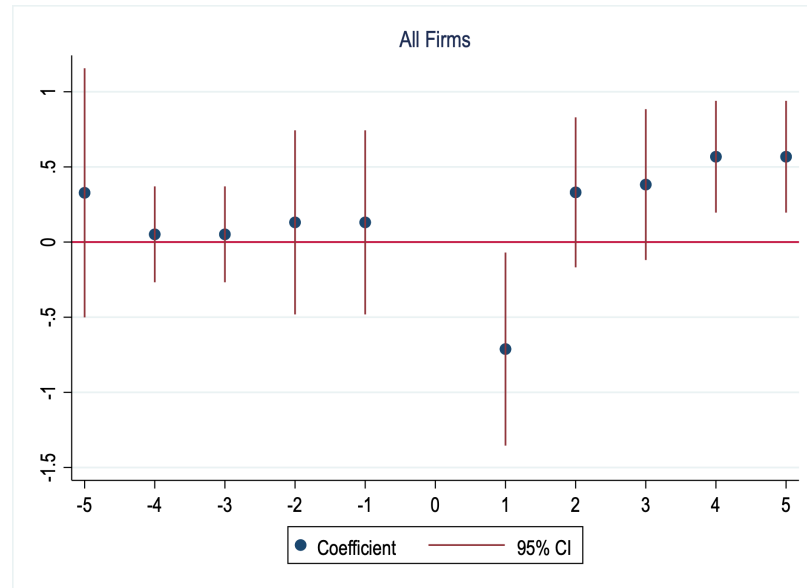
More interestingly, following the recovery there is positive impact on stock prices, although lower than the instantaneous negative impact of terrorist attack. This hints towards overreactions or underreactions in the face of uncertainty. While the immediate adverse impact is short-lived, the positive impact on prices remain for relatively longer term. The impact on volatility in stock prices also short lived but positive.

When the propensity score matching method is used to match Pakistani firms,

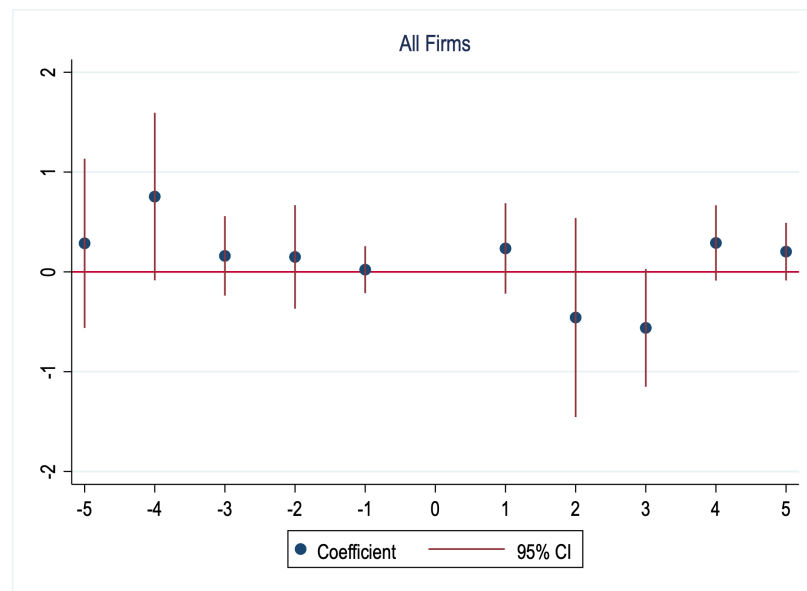
with Bangladeshi firms the results do not change much. However, there is a more pronounced impact on volatility in stock prices compared to the case where I am not using propensity score matching (Figure 4.4). The significance of the findings is also notably influenced by the specific locations of terrorist attacks and the magnitude of casualties involved. As depicted in Appendix Figure 4.5, when considering all types of attacks across various locations, including those outside major cities and instances with fewer than two casualties, the discernible impact on stock market prices becomes less apparent.

Figure 4.3: Event Study Model Estimations Without Matching

(a) Prices

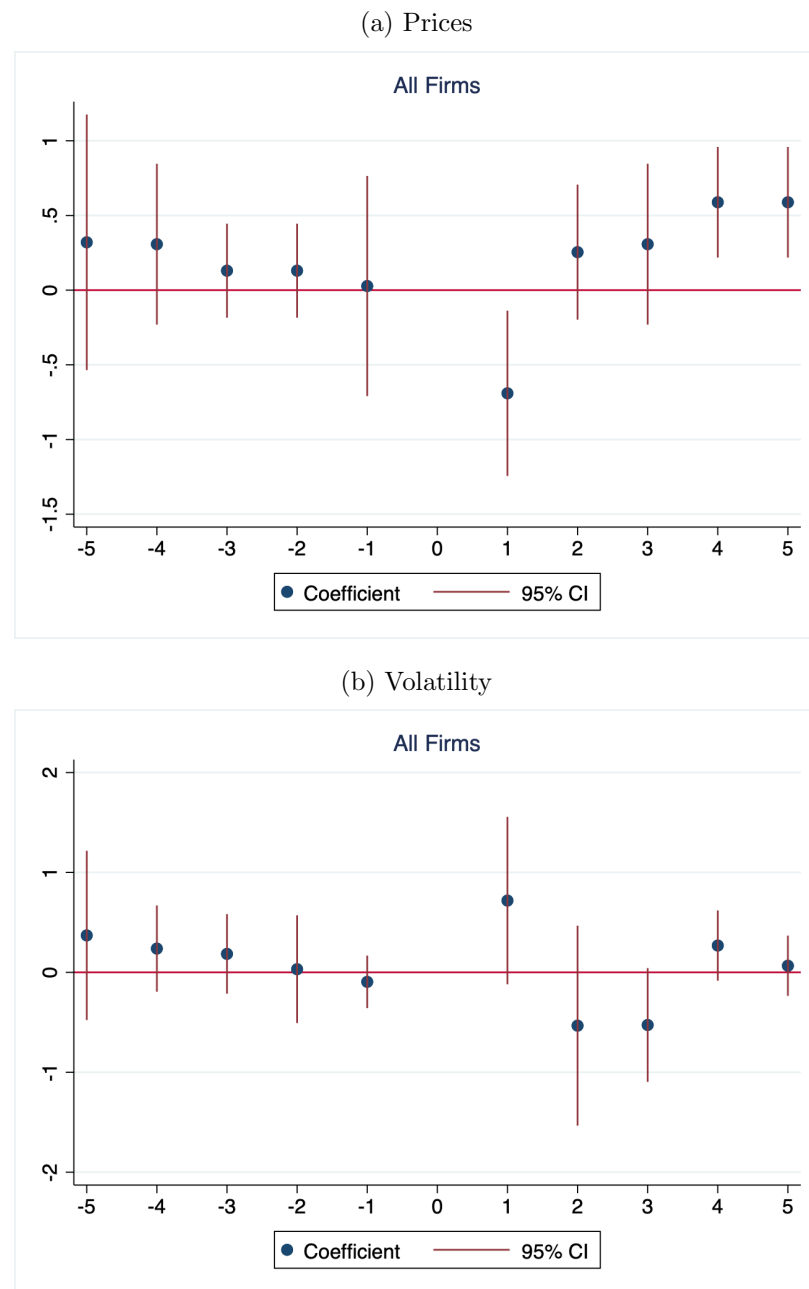


(b) Volatility



Note: This figure provides difference-in-differences estimate for different time horizons along with 95% confidence intervals.

Figure 4.4: Event Study Model Estimations With Matching



Note: This figure provides difference-in-differences estimate for different time horizons along with 95% confidence intervals.

4.5 Conclusions

In this paper, I utilize the propensity score matching approach to avoid the risk of confounding variables influencing the results. In addition, I use the event study model to estimate the impact of terrorist attacks on stock market prices and track the evolution of prices following the terrorist attacks. The analyzing of the event study model revealed that there are immediate negative impacts of terrorist attacks on stock market prices followed by swift recovery. Subsequent reversals in stock prices suggest potential market overreactions to uncertainty caused by terrorist incidents. Moreover, there is also an increase in volatility on the day of a terrorist attack, but the volatility also decrease the next day.

Interestingly, the stock prices, after recovering the following day, show positive impacts and persist indicating the short-term speculation to capitalize on initial decline in prices and subsequent recovery. The speculative activity following the terrorist attack gains momentum in the second day.

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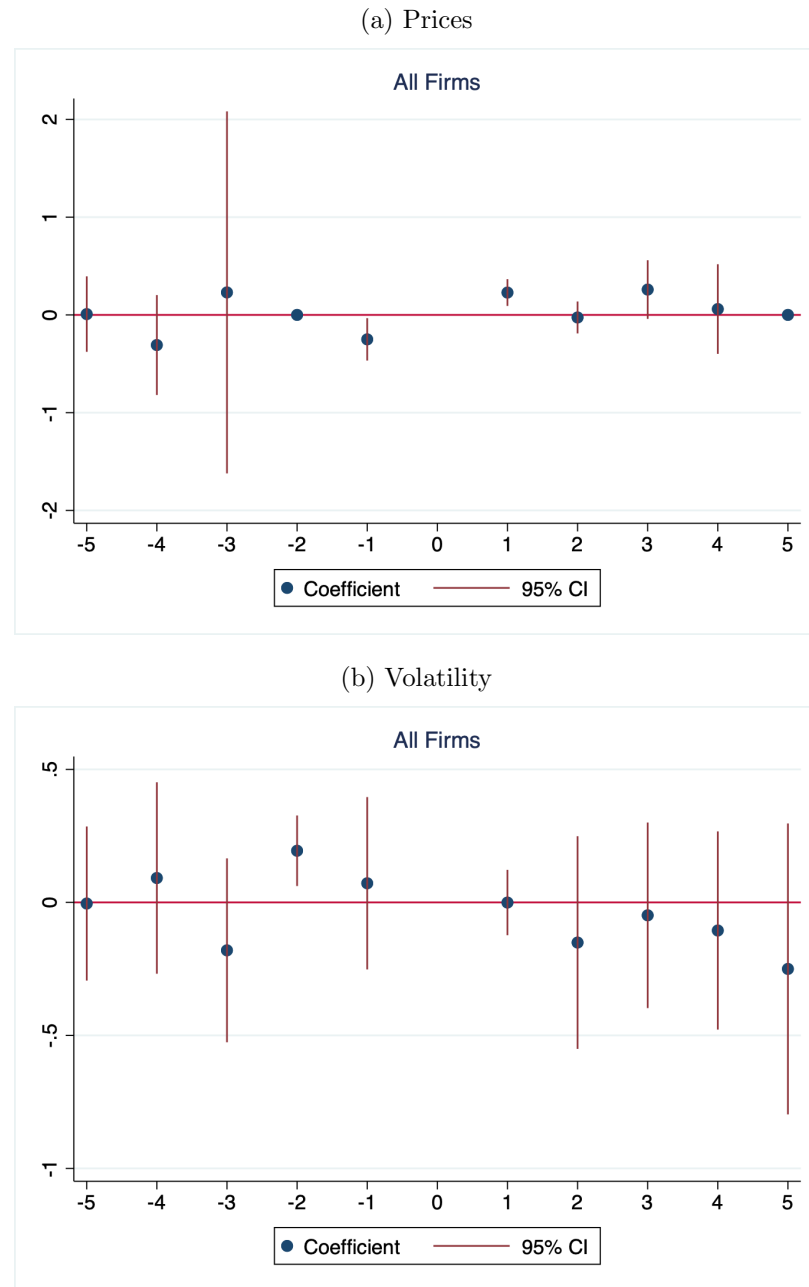
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4.6 Appendix

Figure 4.5: Event Study Model Estimations Without Matching



Note: This figure provides difference-in-differences estimate for different time horizons along with 95% confidence intervals. These estimates includes all terrorist attacks that had any number casualties.