The Effects of Border Controls on the Redirection of Irregular Migrants Flows

The Case of the Greece-Turkey Fence

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EU	European Union
IBC	Illegal Border Crossing
IOM	International Organization for Migration
NGO	Non-Governmental Organization
RMSPE	Root Mean Square Prediction Error
SAR	Search and Rescue
SCM	Synthetic Control Method

Abstract

Despite border controls are widely implemented in the European Union, irregular migration flows to Europe have remained significant. In this paper I study the effect of the construction of the Greece-Turkey fence in 2012 on the redirection of irregular migration flows to the Eastern Mediterranean Sea route. I find that after the construction of the fence, monthly border crossings detected on the Eastern Mediterranean Sea route increased on average by 832. These findings reveal that the imposition of border controls does not affect people's decision to migrate irregularly, but only changes the route migrants choose to take to reach Europe.

Relevance to Development Studies

The journeys made by irregular migrants to reach Europe are often dangerous and full of unforeseen events. On the other hand, the imposition of border controls is often driven by ideology, without regard to their implications over the lives of irregular migrants. In this context, it is important to understand the side effects of border controls on the journeys migrants decide to follow, as it helps to clarify to which extent these policies are effective or are just a waste of resources for the European Union or another bump in the road for irregular migrants.

Keywords

Irregular Migration, Border Crossings, Migratory Policies, Migratory Routes, Refugees, Border Controls, Greece-Turkey Fence, Synthetic Control Method

Chapter 1
Introduction

Since 1990, European countries have built more than 1000 km of walls and fences, the equivalent of 6 Berlin Walls (Akkerman, 2019). These events are part of broader migratory policies that European countries have extensively implemented, especially over the last two decades, to control irregular migration flows. However, despite these efforts, irregular migration has been on the rise, and more importantly, the number of fatalities recorded on the migratory routes to Europe has reached alarming figures: since 2014, at least 25,240 migrants have lost their lives trying to reach Europe (IOM, 2022).

In this context, the question arises: does the tightening of border controls effectively prevent irregular migratory flows? In this paper, I attempted to answer this question by analyzing whether the construction of the fence between Greece and Turkey in 2012 reduced the overall number of irregular border crossings or, conversely, caused irregular migrants to redirect towards alternative, less controlled but arguably riskier routes.

For that purpose, this paper relied on a panel from 2009 to 2022 provided by the European Border and Coast Guard Agency (Frontex) with monthly observations on detected border crossings of irregular migrants by migratory route. Based on this data, I undertook the case study by applying a Synthetic Control Method approach. The Eastern Mediterranean Sea route was considered the treated route to which irregular migrants redirected after the construction of the fence on the Eastern Mediterranean Land route and the synthetic control was built based on a combination of the other existent migratory routes in Europe.

By performing this analysis, I found that the construction of the fence caused the number of monthly border crossings on the Eastern Mediterranean Sea route to increase on average by 832. The mechanisms that explained these results were based on the fact that most migrants who used the Eastern Mediterranean routes during the period of analysis were refugees, and since the fence was built only on the Eastern Mediterranean Land route, this event did not change their decision to migrate (considering that their need to do so was high), but rather they decided to take less controlled, but riskier routes; among them, the Eastern Mediterranean Sea route. These results were robust to modifications of the donor pool and to in-time placebo tests.

With this paper, I aimed to contribute to a broader, but quantitively poor, literature on the effectiveness of migratory policies, in particular, border controls. Many authors researching on this topic have already claimed that border controls have limited effects on irregular migratory flows since they redirect migrants towards alternative routes (Lutterbeck, 2006; Fargues 2017; Üstübici and İçduygu, 2018; De Haas, 2021). However, such statements are either theoretical or, at most, based on a descriptive analysis of the data, which does not rule out the possibility of identifying a spurious correlation or claiming an effect larger than the real. In contrast, in this paper I was able to identify the existence of a causal effect of a type of border controls (fences) on the redirection of irregular migratory flows and to quantify the magnitude of the same.

The rest of this paper is structured as follows: the next chapter provides contextual information on the existent irregular migratory routes to Europe and the border controls implemented on them, with a particular focus on the construction of the fence between Turkey and Greece on the Eastern Mediterranean Land route. Chapter 3 provides a theoretical and conceptual framework and a brief literature review on the empirical evidence of the effects of border controls on irregular migratory flows. Chapter 4 describes the data used, Chapter 5 the methodology and Chapter 6 provides and discusses the results. Finally, Chapter 7 concludes.

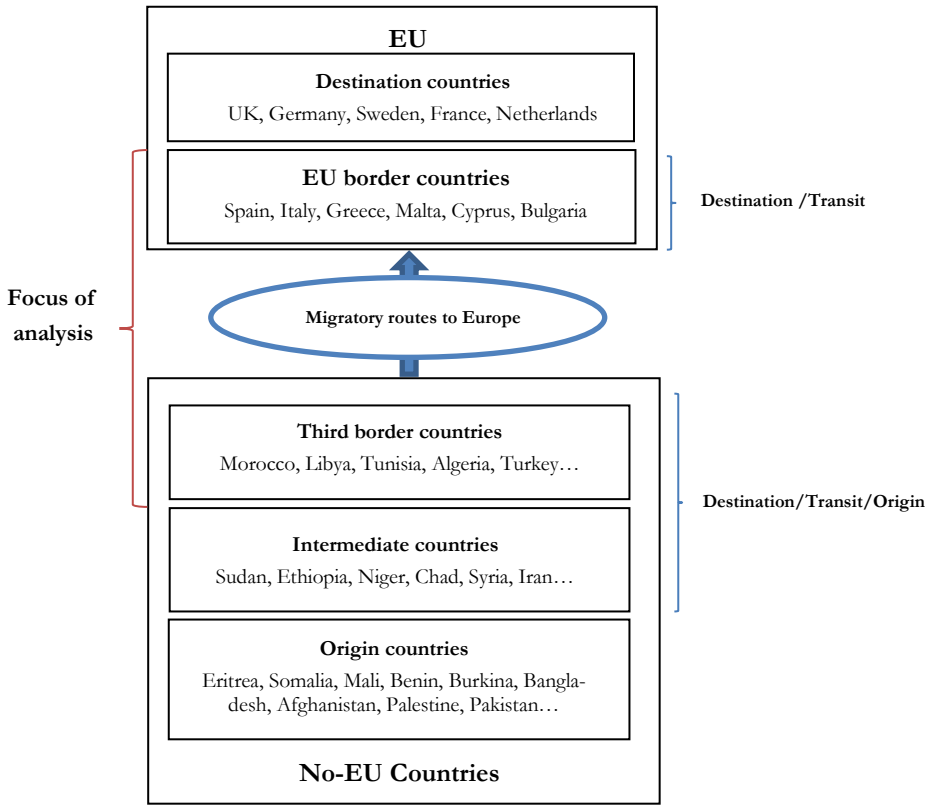
Chapter 2
Irregular Migration in the Mediterranean

2.1 Migrants' Journeys: Routes to Europe

Despite the causes of rising irregular migratory flows to Europe are diverse and complex in nature, the lack of access to official and regular means that would otherwise have guaranteed an orderly and safe migration, has pushed hundreds of thousands of migrants into travelling through irregular routes to reach Europe, sometimes risking their lives.

For migrants who travel irregularly, journeys are often convoluted, full of unforeseen events and long in time. From the moment they leave their country of origin, they often travel and stay in different countries before arriving to the country from which they leave for Europe. Similarly, the country through which they enter Europe is not usually their final destination, as they sometimes continue on to Western or Northern Europe, where they expect to find better prospects in terms of asylum and job opportunities (Fargues, 2017). Figure 1 illustrates this trajectory[1].

Figure 1. Simplified overview of migrants' journey to Europe



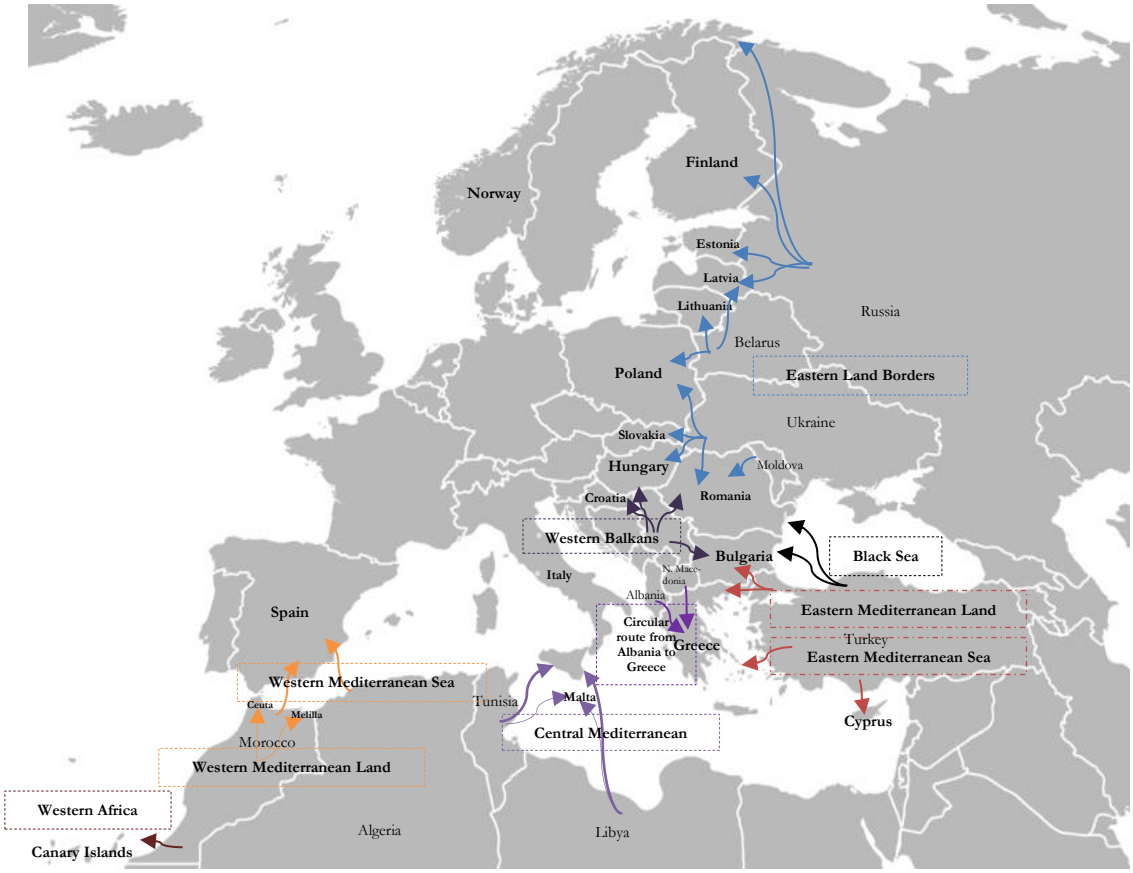
Source: Author's elaboration adapted from Altai consulting

[1] The focus of this paper is exclusively on migrants who enter Europe through irregular (sea or land) migratory routes. Other forms of irregular migration, such as overstaying visas, are not part of this research.

This analysis focuses one crucial part of migrants' journeys: the routes they take to cross European borders. These routes have been defined mostly by their point of departure and destination; however, it is important to keep in mind that these routes migrants take are not pre-defined but rather adapt depending on the context: within the same route, landing and embarkation sites have changed over time, mostly in response to border controls implemented along the route (Fargues and Bonfanti, 2014). Similarly, entirely new routes have emerged and others ceased to be used in reaction to them.

The European Border and Coast Guard Agency (Frontex), currently identifies up to eleven different migratory routes to Europe. Their approximate geographical location and the countries involved in each of them are depicted in Map 1 (countries in bold type are part of the EU). Among these routes, those that cross the Mediterranean have stand out by the number of crossings, and, unfortunately, by the number of missing lives recorded each year, which have made the Mediterranean Sea the deadliest border in the world (Fargues, 2017).

Map 1. Irregular migratory routes to Europe as identified by Frontex (2022)



Source: Author's elaboration

2.1.1 The Western Mediterranean Route

The Western Mediterranean Route departs from North Africa (mainly Morocco) to Spain. It can be undertaken by land, reaching the Spanish enclaves in North Africa of Ceuta and Melilla; or by sea, reaching the southern border of Spain.

The Western Mediterranean Sea route was relevant during the 1990s, especially for North African workers who used to migrate seasonally to work in the Spanish fields. However, a combination of stricter migratory policies from Spain and Morocco virtually closed the access to the Strait of Gibraltar (the shortest part of the route from the shore of Tangier) in 2005, which significantly reduced the number of border crossings along this route (Fargues 2017). However, new but more distant points of embarkation and disembarkation emerged shortly after, and even a new route opened: the Western Africa route (Fargues 2017).

Since then, irregular migratory flows through the Western Mediterranean Sea route remained relatively low in volume (on average 6,800 crossings per year between 2009 and 2015). In 2015, flows started to rise again as a consequence of the European Migration Crisis, and in 2017, more than 21,500 border crossings were recorded; however, this increase was in a much smaller volume than that recorded in Greece and Italy.

On the other hand, the Western Mediterranean Land route hasn't been as relevant as its maritime counterpart in the last decades: only 1 out of 10 migrants using the Western Mediterranean route did so via land between 2009 and 2021 (Frontex, 2022). This is the case because, in the early 1990s, Spain began building fences around the autonomous cities of Ceuta and Melilla, which have served to prevent migrants from crossing from these particular points.

Migrants using the Western Mediterranean routes mainly originate from North African countries, especially Algeria and Morocco, which jointly represented almost 50% of the total border crossings recorded on the Sea route during the 2009- May 2022 period (Table 1). People from these countries often migrate for economic reasons, although migrants from other nationalities also present in this route, such as Mali, migrate due to challenging environmental conditions and inter-community conflicts (Migrants-Refugees, 2020).

Table 1. Number of border crossings of the top four nationalities on the Western Mediterranean route (2009 – May 2022).

Nationality	Detected border crossings	Percentage over total border crossings
Land route		
Algeria	3,708	15.1%
Guinea	3,203	13%
Mali	1807	7.4%
Cameroon	1159	6.3%
Sea route		
Algeria	47,623	27%
Morocco	36,736	20.8%
Guinea	18,946	10.7%
Sub-Saharan nationals	14,893	8.4%

Source: Author's elaboration based on Frontex data

2.1.2 The Central Mediterranean Route

Migrants using the Central Mediterranean route depart from Libya and Tunisia to Italy. To a lesser extent, they depart from Egypt or Turkey and/or go to Malta.

Since 2010, due to conflicts affecting countries of origin, especially the Arab revolts and violent events in Libya, flows along this route have significantly increased. In 2014, 170,664 migrants crossed this route, the majority of them coming from Syria and Eritrea (Frontex, 2015). In 2016, more than 180,000 crossings were detected, the highest number ever recorded on this route. This time, flows were mainly composed of people from Nigeria, Eritrea and Guinea, who were also fleeing insecurity or conflict.

During the 2009- May 2022 period, Eritreans were the most common nationality on the Central Mediterranean route, closely followed by Nigerians and Tunisians (Table 2). Migrants from Eritrea are usually recognized as refugees, given the violent and repressive nature of their government, in addition to the appalling economic conditions of their country (Migrants-Refugees, 2021), while Nigerians and Tunisians migrate mostly for economic reasons.

Table 2. Number of border crossings of the top four nationalities on the Central Mediterranean route (2009 – May 2022).

Nationality	Detected border crossings	Percentage over total border crossings
Eritrea	122,323	13.22%
Nigeria	100,290	10.84%
Tunisia	82348	8.9%
Syria	67394	7.3%

Source: Author's elaboration based on Frontex data

Given the long distances between departure and disembarkation points and the challenging conditions of the Mediterranean Sea, this route is by far the deadliest of the three Mediterranean routes: since 2014, around 8 out of 10 missing migrants are recorded on this route (IOM, 2022). This holds true not only in absolute number, but also relative to the total number of crossings recorded: according to Steinhilper and Gruijters (2018) "The eastern route has consistently been the least dangerous [route], and the central route the most dangerous. In peak year 2015, the risk of dying on the central route was over 19 times higher than on the eastern route (15.4 vs. 0.83 out of 1,000 crossings)." (Steinhilper and Gruijters, 2018, p.522).

2.1.3 The Eastern Mediterranean Route

The Eastern Mediterranean Route runs from Turkey to Greece, either across the land border, most of it divided by the Evros river, or across the Aegean Sea to the Greek Islands. Alternative destinations, although in a much lesser extent, are Cyprus (by sea) or Bulgaria (by land).

Irregular migratory flows on this route began to increase in the early 2000s. This increase can be attributed to a combination of diverted flows from the Western and Central routes,

where border controls were getting stricter, in addition to conflicts in countries from Asia and the Middle East (Fargues and Bonfanti, 2014), which resulted in many people (at first from Afghanistan and later Iraq and Syria) fleeing their countries and seeking asylum in Europe.

The popularity of the Eastern Mediterranean Sea and Land route have been constantly shifting, mostly depending on where border controls are implemented. Before 2010, irregular border crossings from Turkey to Greece were detected mainly in the Aegean Sea. However, a combination of intensified patrols from the Greek Coast Guard and the removal of landmines along the land border at the end of 2009, shifted migratory flows to the shorter (and now safer) Eastern Mediterranean Land route. The majority of flows redirected again towards the Sea route when in 2012 the Greek authorities erected a fence in the part of the border with Turkey that was not naturally divided by the Evros river.

Of the three Mediterranean routes, the Eastern one was the most used during the 2015 European Migrant Crisis: 85% of the total number of detected border crossings was recorded on this route, mostly on the Sea part (Frontex, 2022). This high volume of flows is explained by Greece's neighboring position with Turkey, which was an important transit country for Middle Eastern refugees during this period, and the relatively low risk of using the Eastern Mediterranean route.

In reaction to this situation, in 2016 the EU signed a deal with Turkey (the EU-Turkey Deal) according to which Turkey would compromise to stop irregular migration to the Greek Islands in exchange of compensatory payments and special visa treatment for their citizens (European Council, 2016). As a consequence, arrivals of irregular migrants to Greece by sea dropped from around 850,000 in 2015 to 170,000 in 2016 (IOM DTM, 2022).

The Eastern Mediterranean route has long been the gate to Europe for many refugees from Asia and the Middle East: between 2009 and May 2022, about 85% of migrants using the maritime part of this route were refugees from Syria, Afghanistan and Iraq (Table 3).

Table 3. Number of border crossings of the top four nationalities on the Eastern Mediterranean route (2009 – May 2022).

Nationality	Detected border crossings	Percentage over total border crossings
Land route		
Afghanistan	59,006	21.5%
Syria	49,954	18.2%
Pakistan	29,354	10.7%
Turkey	24,924	9.1%
Sea route		
Syria	646,694	49.9%
Afghanistan	331,157	25.5%
Iraq	135,157	10.4%
Pakistan	36,708	2.8%

Source: Author's elaboration based on Frontex data

2.1.4 Other routes to Europe

In addition to the Mediterranean routes, Frontex identifies six other routes that migrants use to travel irregularly to Europe. In terms of volume, these are not as relevant as the Mediterranean routes (with the exception of the Western Balkans), however, outlining their main characteristics is important for the methodology used later in this paper.

2.1.4.1 The Western Balkans route

This route is delimited by the land borders between the Balkan countries (Albania, Bosnia, Kosovo, Montenegro, North Macedonia and Serbia) and the surrounding EU countries (mainly Croatia and Hungary). Although migrants from the Balkan countries themselves use this route, it is mostly used by migrants who have previously crossed the Eastern Mediterranean route and intent to reach Western European countries. In fact, the number of crossings detected on this route tends follows the trend of the Eastern Mediterranean, hence, it can be considered a continuation of this route.

The restrictive migratory policies implemented by the European bordering countries on this route since 2015, along with the implementation of the EU-Turkey Deal in 2016, significantly reduced the number of migrants using it: detected border crossings dropped from 764,033 in 2015 to 130,261 in 2016.

2.1.4.2 The Western Africa route

This route, which links Gambia, Mauritania, Morocco and Senegal with the Spanish Canary Islands, emerged around 2006, when 31,600 arrivals were recorded as a response to the stricter border controls implemented on the Western Mediterranean routes (Fargues, 2017). However, as a result of intensive border controls, which included push-backs at high sea and intensive controls at the countries of origin shores, the Western Africa route quickly became harder to transit. By 2009 arrivals had dropped almost 15 times as compared to 2006, and between 2010 and 2017, an average of 400 migrants were detected every year. As a result of the 2020 pandemic restrictions and enhanced smuggling tactics, flows increased again on this route, reaching a total of 22,500 in 2021 (Frontex, 2022).

2.1.4.3 The Circular route from Albania to Greece

95% of the border crossings on this route are made by Albanians themselves. It was mostly used during the early 2000s, but flows have remained low since 2010 (on average 423 crossings are detected per year) since visa liberalization was granted to Albanians in 2011.

2.1.4.4 The Black Sea route

As in the case of the Western Africa route, this route emerged as a response to the increasing border controls on the Eastern Mediterranean route. This route, which runs from Turkey to the maritime borders of Romania and Bulgaria, is used intermittently and in many years no crossings were recorded. However, in 2017, as a reaction to the blocking of the Eastern Mediterranean Sea route following the EU-Turkey Deal, more than 500 border crossings were detected on this route (Frontex, 2018).

2.1.4.5 The Eastern Borders route

This route connects Moldova, Ukraine, Belarus and Russia with their bordering European countries. Until 2020, flows on this route remained fairly low and stable, with around 100 border crossings recorded per month, mostly of migrants from Iraq and Afghanistan. A record number of more than 8,000 migrants was recorded in 2021, driven mainly by the growing number of Iraqi refugees.

2.1.4.6 The Baltic and North Sea route

Detections in these areas are rare, probably due to their challenging whether conditions and their distance from the countries of origin of most migrants. Between 2009 and 2021, only 3,120 crossings were detected.

2.2 Border controls in Europe: Who's on the Right Side?

When it comes to border controls, there seems to be a trade-off between what is perceived as the national security of European countries and the human rights of irregular migrants who risk their lives on their way to Europe[2]. As Topak (2014) puts it, border zones are characterized by a legal limbo between national sovereignty and human rights.

Within Europe, diametrically different stances have been adopted with respect to irregular migration, from the "open door" policy initiated by the German Chancellor Angela Merkel to the restrictive stance took by Hungary which, following the rising numbers of irregular migrants in 2015, fenced almost all its borders to prevent them from transiting the country. Moreover, many cases of push-backs, which are in violation of international law and human rights, have been reported along the Western Balkans borders (*The Guardian*, 2021). Similarly, maritime operations aimed at preventing irregular border crossings have coexisted with many humanitarian actions, such as the Search and Rescue (SAR) activities promoted by governments and NGOs (Steinhilper and Gruijters, 2018). Overall, European initiatives to handle irregular migration have been countless. Since 2004, these initiatives have been coordinated by Frontex as the European Border and Coast Guard Agency. Frontex participates in a wide range of activities, from border management and prevention of cross-border crimes to rescues at sea and cooperation with law enforcement.

In addition, border controls in Europe have also been externalized by reaching agreements with non-EU countries (particularly Morocco, Libya and Turkey). The idea of these agreements is to control irregular migration at the borders of the countries of origin themselves, so that the chances of migrants reaching European borders are reduced from the outset. One of the most recent examples of this practice was the implementation of the EU-Turkey Deal in 2016.

[2] Other approaches such as the human security approach to migration would state that there is not such trade-off, since the security of migrants and citizens of receiving countries cannot be addressed separately.

2.2.1 The Greece – Turkey Fence

The construction of the Greece – Turkey fence in 2012 is an example of the restrictive stance of Europe towards irregular migration. Negative perceptions towards migrants in Greece date back to the end of the Cold War, when the country saw an increase in the number of migrants originating from Eastern and Southern Europe. Prominent media-fueled discourses on the link between migration and crime and the spread of xenophobic sentiments, particularly towards Albanians, led to a widely established anti-migrant rhetoric in the country from this time onwards (Grigoriadis and Dilek, 2019; Triandafyllidou, 2009).

Concerns about irregular immigration and its threat to national security (this time not only for Greece, but for the EU as a whole), remerged in the late 2000s as a reaction to the increasing arrivals of migrants from North Africa and the Middle East. By 2010, 75% of irregular crossings to Europe were detected at Greek borders, most of them on the land border with Turkey (Frontex, 2010). At that time, the economic downturn following the 2008 economic crisis and the rise of far-right political parties heightened antimigratory feelings in Greece (Grigoriadis and Dilek, 2019). As a consequence, in late 2010, the Greek government announced the construction of a fence along the 12 km of the land border with Turkey that was not naturally divided by the Evros river (*BBC*, 2011). Map 2 depicts the land border between Greece and Turkey along with the position of the fence.

Map 2. Turkey-Greece Land Border and Positioning of the Fence

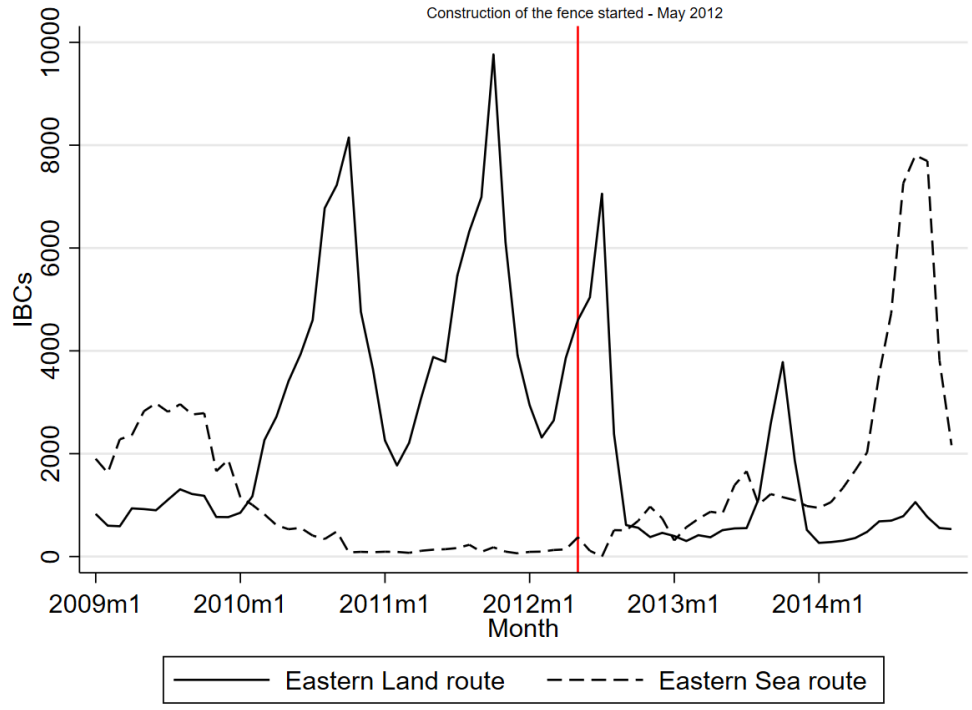
Source: Wikipedia.org

Since its announcement, the construction of the fence was fraught with controversy: on one hand, EU rejected funding the construction of the fence, as it would not solve the

structural issues affecting irregular migration to Greece, but it would rather redirect flows either to other parts of the land border, back to the Aegean Sea, or to the borders of other Member States (*The Guardian*, 2011; *Ekathimerini*, 2011; *EUbusiness*, 2012). Moreover, the public opinion on the construction of the fence was of discontent as it was planned during one of the most challenging economic recessions, along with political and social instability, that Greece had seen in recent years (Grigoriadis and Dilek, 2019). On the other hand, according to the then Minister of Citizen Protection, Nikos Dendias, the immigration issue was "perhaps even bigger than our financial one" (*The Guardian*, 2012).

Despite opposition, the construction of the fence started in May 2012 and finished in December. After its completion, border crossings on the Eastern Mediterranean Land route dropped from 55,558 in 2011 to 6,777 only three years later, a reduction of almost 90% (Frontex, 2015). However, border crossings on the Eastern Mediterranean Sea route began to increase simultaneously, spiked from 1,467 in 2011 to 44,057 in 2014. In this regard, in its 2014 Annual Risk Analysis, Frontex stated that "Compared to 2011 and 2012, the areas of detections [in 2013] also considerably changed, and detections in the Eastern Aegean Sea were the largest, followed by detections along the land border between Bulgaria and Turkey" (Frontex, 2014, p.35). Figure 2 plots the number of border crossings on the Eastern Mediterranean Sea and Land route during this period.

Figure 2. Detection of illegal border crossings (IBCs) on the Eastern Mediterranean Sea and Land route



Source: Author's elaboration based on Frontex data.

By the end of 2013, more than 8700 migrants had crossed the border into Bulgaria from Turkey (*The New Humanitarian*, 2013), representing more than 80% of the total number of border crossings recorded along the Eastern Mediterranean Land route in that year. This

redirection of migratory flows within the Eastern Mediterranean Land route from the Greek to the Bulgarian border explains the relatively high peak observed in Figure 2 at the end of 2013 on the Eastern Mediterranean Land route.

Overall, the construction of the fence was effective in reducing crossings through the Turkish-Greek land border, although as a long-term measure to reduce irregular migration flows its effectiveness is questionable. However, as Grigoriadis and Dilek (2019) argued, for the Greek government the construction of the fence was rather a symbolic move enabled by the perception of migration as a security threat and a statement by Greece to stop being perceived as an "open gate" to Europe, and reinforce its position as the "gatekeeper" of the European external borders.

Chapter 3
Theoretical and Conceptual Framework

3.1 Theoretical Framework

3.1.1 What Drives People to Migrate?

Early theories on the determinants of migration were based on the idea that people move from low-income to high-income countries motived by the difference in expected earnings. This basic approach to migration, initially developed in Ravenstein's Laws of Migration (1885), was expanded in the push-pull theory. According to this theory, there are factors that "push" migrants away from their country of origin (such as poverty) and factors that "pull" them to the receiving country (such as job opportunities). In this regard, migration is explained by a combination of "pull" and "push" factors.

From a neoclassical economics perspective, early models explaining migration were also limited to the expected income gap idea, sometimes adjusted by the cost of migrating. From a macroeconomics perspective, migration was driven either by labor supply and demand gaps between two countries, and from a microeconomics perspective, by the cost-benefit analysis of rational economic individuals. Later theories, such as the new economics of labor migration (NELM) theory (Stark and Bloom, 1985) enriched these neoclassical models by considering migration as a decision taken at the household level (in contrast with the usual individualistic approach) and as strategy to diversify income risks (in contrast with just maximizing income) in contexts marked by poverty and credit-related market failures.

Although these models are still used, their exclusive focus on the economic drivers of migration is a limited perspective from which to explain irregular migration flows in the European context, where other factors such as conflict, climate change and migratory policies play an important role. More importantly, these theories can only be applied in contexts where migrants *can* migrate and *are allowed* to migrate, ignoring cases of forced migration (refugees), which is predominant in the Eastern Mediterranean route.

Therefore, if we want to understand the determinants of (irregular) migration, it is necessary to go beyond the conception of the individual (or the family) as an optimizing agent and the isolated push and pull factors. Instead, it is important to take into account the social and political structures that, by interacting with people's desire to migrate, can enable or impede the realization of the movement. This is the approach proposed by De Haas (2021), who developed an aspirations-capabilities framework to explain migration. In his framework, De Haas integrates "all forms of migration as a function of aspirations and capabilities to migrate within given sets of perceived geographical opportunity structures" (De Haas, 2021, p.17).

In the aspirations-capabilities framework, aspirations respond to individuals' life ambitions and perceived opportunities, whereas capabilities respond to individuals' positive and negative freedom (De Haas, 2021). These freedoms materialize mainly through migrants' economic resources, skills and social networks (positive freedom) and through their freedom

from external constraints such as repressive policies, conflict or any other form of violence (negative freedom) (De Haas, 2021). Although aspirations and capabilities are separate concepts, they are not independent. For example, more education increases people's capability to migrate, but it might also reshape their aspirations as they get more aware of alternative lifestyles (De Haas, 2021).

In this framework, economic resources are just another element that facilitate migration, that interact with other capabilities such as those derived from education, social networks and freedom from oppression. Similarly, restrictive migratory policies are just another factor that reduce migrants' capabilities to move. However, the same might be outweighed by other capabilities and aspirations.

In this regard, the theoretical framework proposed by De Haas (2021) allows for a more nuanced understanding of migration. By going beyond economic factors, this framework conceives migration as a decision which is in constant interaction with the migrant's context, and as a decision that changes based on the migrant's capabilities and aspirations. From this perspective, it is possible to understand why even in contexts where strict border controls are in place, a combination of capabilities coupled with the need or desire to migrate ultimately gives rise to migratory movements.

3.1.2 Border Controls: Why, Where and How They Affect Migration.

One of the main justifications behind the implementation of restrictive migratory policies arises from the perception of (irregular) migrants as a threat to security, the functioning of welfare systems and the overall stability of nations, especially in cases where migration is associated with crime and terrorism. (Üstübici and İçduygu, 2018; Grigoriadis and Dilek, 2019). Some authors point out that the integration of European countries in the European Union has reallocated the perceived threat of irregular migration to the external (supra-national) borders (Grigoriadis and Dilek, 2019; Topak and Vives, 2018), which explains to a large extend why border controls, particularly physical ones such as fences and maritime operations, have been implemented at the external borders of the EU (mainly in Spain, Italy and Greece).

However, the question remains to which extent these type of border controls have an effect on (irregular) migratory movements. That is, we seek to understand how migration policies influence people's decision to migrate and what weight do they have in their decision, especially in relation to other determinants of migration.

De Haas et al. (2019) tried to outline such relationship by analyzing empirical evidence on the effectiveness of migration policies in relation to migratory movements. As a result, they identified four types of substitution effects that could potentially limit the effectiveness of migratory policies, and concluded that the effectiveness of this policies is theoretically ambiguous (De Haas et al., 2019). These substitution effects are: (1) spatial substitution, which refers to the redirection of migratory flows to alternative routes or destinations; (2) categorical substitution, which refers to the use of other legal or illegal means to migrate when restrictions are imposed on the means used before; (3) inter-temporal substitution, which refers to the fact that migration flows might increase when migrants expect or fear the tightening of migratory policies in the future; and (4) reverse flow substitution, which refers

to the fact that stricter migratory policies might discourage circular migration, encouraging migrants to settle permanently (De Haas et al., 2019). These substitution effects reveal a key aspect of the relationship between migratory policies and migrants' decision-making process. Namely, the fact that migration policies, although effective within a given time and space, could be easily circumvented. Therefore, these policies might not play a relevant role in migrants' decision on whether or not to migrate, but rather affect where, how, when and, in some cases, for how long to migrate.

3.2 Conceptual Framework

In the context of this research, the mechanisms through which the construction of the fence between Greece and Turkey is expected to affect the route choice of migrants will be conceptualized through a cost-benefit analysis framework. [3].

As described in Chapter 2, migrants travelling through the Eastern Mediterranean route are mostly refugees fleeing war and conflict in their countries of origin. In this case, beyond economic reasons, it is more relevant to consider the need for safety as part of the benefits of migrating (or rather moving forcibly). Therefore, the benefits of migrating are assumed to be high and mostly associated with the greater security obtained from claiming asylum in destination countries. Since staying put is also costly (staying means suffering the consequences of a country in conflict), part of the benefits of migrating will be to avoid these costs.

Migration costs are composed of the costs associated with being apprehended and the costs associated with the risks of the journey. Both costs depend on the chosen route. At the same time, the probability of being apprehended will positively depend on the enforcement of border controls, but could be diminished by hiring a smuggler; and the risk of the journey will depend on the conditions of the chosen route, namely its length, climate and geographical conditions[4].

Since the benefits of migrating are expected to be high and costs depend on the route chosen, migrants will choose the route that minimizes migration costs. In the case where there are no border controls (hence, the probability of being apprehended is zero), migrants will choose the route that minimizes the risk of their journey (routes with most favorable geographical and meteorological conditions). However, since this would be the route most migrants use, border controls are more likely to be implemented there. Therefore, there exists a trade-off between the risk of the route and the probability of being apprehended: when the risk associated with a particular route is lower, the route is more heavily used and, as response, border controls are more likely to be implemented and vice versa. Hence, whenever border controls are implemented in relatively safer routes, migrants are expected to switch

[3] From the previous section, we saw that a cost-benefit analysis could be a limited approach to explain the determinants of migration. However, for the purpose of this section (to conceptualize the expected relationship between border controls and the decision to migrate in the context of this research), and having acknowledge its limitations, it suffices to take this approach.

[4] Longer migratory routes are riskier because they increase the likelihood that migrants will have to survive extreme conditions, such as food shortages, adverse weather conditions or exhaustion. At the same time, challenging geographical conditions, such as having to cross the sea in a boat or to swim long distances, also increases the risk of the journey.

to more dangerous ones in order to minimize the probability of being apprehended. Overall, given this mechanism, border controls are not expected to have an effect on the decision to migrate, but only on the route selected to do so.

3.3 Empirical Evidence: How do Migrants React to Border Controls?

The conceptual framework presented above can be summarized in one hypothesis: whenever border controls are implemented on a particular route, migrants respond by stopping the usage of the specific route. However, the border controls do not cause migrants to stop migrating, instead they continue their journey to Europe by switching to alternative routes where the likelihood of being apprehended is lower.

Unfortunately, attempts to empirically test this hypothesis by means of quantitative methods are limited. One of the few examples is found in Gathmann (2008), who using an instrumental variable approach, finds that after the US increased the enforcement of border controls since 1986, migrants from Mexico were 7.9 percentage points more likely to switch to routes with lower enforcement of border controls. Within this context, Reyes, Johnson and Van Swearingen (2002), combining a quantitative and qualitative approach, find no evidence that the enforcement of border controls reduced overall migratory flows. Conversely, they find that Mexican migrants started to use alternative routes to cross the border and that the number of migrants who died en route increased, which was apparently linked to the change in crossing points (Reyes, Johnson and Van Swearingen, 2002).

In the European context, many researchers have analyzed changes in irregular migration patterns in relation to the tightening of border controls based on a descriptive analysis of the data. For example, in his analysis of migratory policies in the Mediterranean, Lutterbeck (2006) describes how the intensification of border controls in the Adriatic Sea diverted migrants going to Italy from the Straits of Otranto and the Apulian coast (where before the 2000s around the 90% of migrants going to Italy used to concentrate) to Sicily (where flows increased from less than 0.02% before 1998 to 98% between 1998 and 2004). A similar case is identified in Spain, where the Strait of Gibraltar was substituted by the Western African route to the Canary Islands when a combination of an upgraded surveillance system and stricter migration policies in Morocco virtually shut down the first route in 2003 (Fargues 2017). In their research, both Lutterbeck (2006) and Fargues (2017) explain how the routes migrants redirected to after tightening of border controls were longer and more dangerous. As a consequence, the authors observe, there were more deaths along these new routes compared to those that migrants used to employ before. However, Carling (2007) claims that the observed increase of fatalities along the Spanish-African border cannot be directly linked to the increased border controls but rather to the increased number of crossings.

The consequences of walls and fences on irregular migratory flows are consistent with the general findings of the consequences of border controls. Üstübici and İçduygu (2018) describe how after the construction of the fence between Bulgaria and Turkey in 2014, irregular migratory flows started to decrease along this border, while the flows through the Black Sea route to Bulgaria and Romania started to increase. Likewise, Melchionni (2018) points out how after the construction of the fences in the southern borders of Hungary, migratory

flows redirected towards Slovenia and Croatia. Similarly, in their analysis of the effectiveness of walls, Filipec and Macková (2019) revise how migratory patterns altered after the construction of walls and fences in five different scenarios (the Great Wall of China, the Berlin Wall, the Israel-Palestine fence, the Ceuta and Melilla fences and the Green Line in Cyprus); the authors conclude that, in all cases, these barriers were effective in reducing irregular migration along those specific points. However, they warn that "Complex defensive barriers may often lead to an adjustment of migration routes and result in more casualties. In other words, instead of preventing migration the walls may make migration more dangerous and lethal." (Filipec and Macková, 2019, p.83).

The observations and analyses provided by these authors help in drawing a comprehensive picture of the relationship between border controls and migration. However, the lack of quantitative causal evidence, especially in the European context, makes it difficult to identify the causal effect of border controls on irregular migration flows. Nonetheless, the fact that migratory flows seem to adjust in relation to border controls in differing circumstances, suggests that there is a correlation between the two. In this regard, this paper will complement the claims and observations made by the cited authors by providing quantitative causal evidence on the redirection of migratory flows after the construction of the Greece-Turkey fence in 2012.

Chapter 4
Description of the Data

4.1 Data Source and Outcome Variable

Starting 2009, Frontex provides a panel of monthly observations on Illegal Border Crossings (IBCs) disaggregated by nationality of the migrants and route taken. The data provides information on 149 different nationalities[5] and the 11 different routes specified in Chapter 2.

IBCs are defined as the "detections of illegal border-crossing on entry between BCPs [Border Crossing Points] of the external borders of the Member States of the EU and Schengen Associated Countries" (Frontex, 2022). As such, this dataset only registers irregular border crossings between non-EU and EU countries, which is precisely the focus of analysis of this paper as depicted in Figure 1. Therefore, the number of detected border crossings by route and month will be used as outcome variable.

Since border management efforts across the EU are coordinated by Frontex, it is possible to ensure that the differences in detections of irregular crossings across routes are the result of structural characteristics of the route, and not due to differences in border control efforts, administrative systems or definitions.

4.2 Descriptive Statistics

The data used in this paper covers the period from January 2009 to May 2022, resulting in a total of 1,771 observations. The unit of observation is set by route and month. Table 4 outlines the descriptive statistics.

In line with what was described in Chapter 2, the most important routes in terms of volume of flows are the Mediterranean ones (with the exception of the Western Land route), and the Western Balkan route. Among these, the Central Mediterranean, the Eastern Mediterranean Sea and the Western Balkan route stand out, recording an average of 5,749; 8,056 and 7,060 border crossings per month respectively. These last two routes recorded more than 1 million border crossings during the considered period, and the Central Mediterranean route over 925,000.

In 2015, the Western Balkans and the Eastern Mediterranean Sea reported the maximum number of border crossings detected in a month during this time period, more than 200,000 in both cases. This is the case since the Eastern Mediterranean Sea route, and, by extension, the Western Balkans, were the most used during the European Migrant Crisis.

Irregular migratory flows are characterized by their seasonality, with the flows being more intense in the summer months, when the weather is favorable, and less significant during the winter. This is especially true along the maritime routes, where the consequences of unfavorable weather conditions could be lethal. For this reason, only the Land routes (with

[5] Aside from the country of origin, there are four additional categories used as nationality of the migrant: Unknown, Third Country, Stateless and Unspecified sub-Saharan Nationals.

the exception of the Western Mediterranean Land route) present minimum values different from zero.

Table 4. Descriptive Statistics of Monthly Crossings of Irregular Migrants by Route (2009 – May 2022).

Route	Obs.	Mean	Std. Dev.	Min.	Max.	Total
Western Mediterranean Land	161	152.55	177.44	0	953	24,561
Western Mediterranean Sea	161	1,094.94	1,512.19	0	9,301	176,285
Central Mediterranean	161	5,748.75	6,927.94	0	27,390	925,549
Eastern Mediterranean Land	161	1,708.47	1,727.33	73	9,763	275,063
Eastern Mediterranean Sea	161	8,055.55	27,429.74	0	214,811	1,296,943
Western Balkans	161	7,060	25,327.28	90	205,703	1,136,660
Western Africa	161	398.29	1,028.96	0	8,175	64,125
Black Sea	161	7.14	32.99	0	335	1,150
Circular Route from Albania to Greece	161	829.91	1130.97	16	5,535	133,616
Eastern Land Borders	161	150.85	314.36	5	3,260	24,287
Baltic and North Sea	161	0.34	1.06	0	9	54

Source: Author's elaboration based on Frontex data.

Aside from being seasonal, the trend of border crossings has changed over time. During the time period covered in this dataset, there were years when migratory flows were less intense, as compared to others when detected crossings where large in volume. These changing trends over time respond to the fact that irregular migratory flows are susceptible to political, economic and social circumstances. For example, out of the more than 4 million border crossings that have been recorded by Frontex in this period, around 65% of them were recorded between 2014 and 2016, the peak years of the migratory crisis in Europe. The magnitude of the number of crossings detected during the crisis as compared to other years is appreciated in Figure 3, which plots the total number of border crossings detected by route and year. The seasonality and variation over the years of border crossings is also reflected by the high standard deviation of the variable.

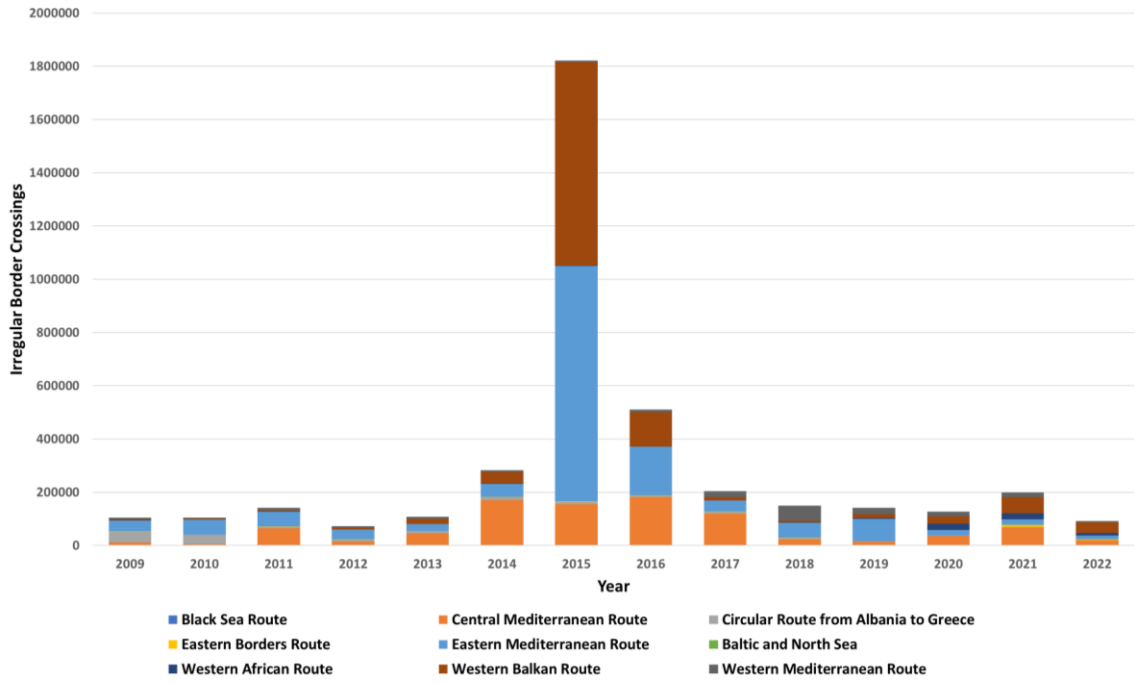
Aside from variating over time, routes present great variation among them. Whereas some of them have recorded large number of crossings in one month, other have been hardly used. For example, the Baltic and North Sea route only recorded 54 crossings in the considered period. The relatively lower volume of flows along these routes are explained by their danger and their distance with respect to the countries of origin.

4.3 Limitations of the Data

Given the clandestine nature of irregular migration, the available data presents important limitations. First, since irregular migration is considered illegal, migrants do their best to go unnoticed, at least during their journeys. Hence, the data presented above should be

considered a lower bound of the total number of crossings undertaken by irregular migrants in each of the routes. Therefore, the total number of undocumented migrants crossing European borders is expected to be higher (see Laczko and Arditis (2017) for a discussion on the challenges of collecting irregular migration data).

Figure 3. Detection of Irregular Border Crossings by route and year



Source: Author's elaboration based on Frontex data

Second, it could be argued that the increased number of detected crossings are a result of an improved detection capacity from the border authorities. If this would be the case, the variation in border crossings would reflect the variation in the detection capacity. In this context, it would be misleading to compare the number of detected crossings inter-temporally. However, the increasing number of border crossings recorded at different points in time are always explained by a particular event (conflict, wars, climate conditions…). Additionally, given that the period of analysis is relatively short, it is not expected that improvements in detection capacity (which take time to materialize) will explain most of the variation in the arrivals.

The last limitation this data presents is the lack of complementary information. Neither Frontex nor other sources provide further characteristics of the migrants who travel irregularly to Europe aside from their nationality. Nothing is recorded about their gender, age, skills, etc., which limits the possibilities of performing an in-depth analysis of irregular migration issues.

Chapter 5
Methodology: The Synthetic Control Method

5.1. Methodology Specification

The main motivation for selecting the Synthetic Control Method (SCM) as the estimation approach is the inability to find a single suitable comparison unit from the potential control routes. This is in fact what usually happens in comparative case studies in which the unit of observation are macro entities and small in number (Abadie, 2021). In this case, a combination of the potential controls makes a better counterfactual than any single control unit alone (Abadie, 2021).

In this analysis, the unit of observation is each of the migratory routes, k, observed at a time t. The group of observed k routes ($k = 1, 2, 3, \ldots, 11$) is composed of all the 11 sea and land routes migrants travelling irregularly use to reach to Europe presented in Chapter 2. It is assumed that the first route ($k = 1$) is the treated route, hence the remaining ten ($k = 2, \ldots, 11$) constitute what is usually referred in the literature as the donor pool. Moreover, for each of these routes, the monthly number of crossings at time t is observed in a total of T periods, with $T = 156$, from January 2009 to May 2022. From this time spam it is necessary to distinguish between pre-treatment (T_0 periods, with $1 < T_0 < T$) and post-treatment periods ($t > T_0$ periods, with $T_0 < t < T$).

Denoting Y_{1t} as the outcome of the treatment unit after the treatment, the aim of the synthetic control is to replicate the outcome that the treated unit would have had in the absence of the intervention, Y_{1t}^C – which is by definition unobserved –. Once the counterfactual is generated, it is possible to estimate the effect of the intervention in each post-intervention period t (with $t > T_0$), T_{1t} ,by differentiating the outcomes of the treated and synthetic control unit, that is

$$T_{1t} = Y_{1t} - Y_{1t}^C.$$

The synthetic control route will be generated from the weighted average of units in the donor pool, that is

$$Y_{1t}^C = \sum_{k=2}^{11} w_k^* Y_{kt},$$

where w_k^* are the optimal weights assigned to each control route k.

As in any case, the correct estimation of the treatment effect will depend on the quality of the counterfactual, i.e., how accurately the trajectory of the outcome of the counterfactual unit represents what would have happened in the absence of the intervention in the treatment

unit. This idea is at the core of the data-driven procedure behind the generation of the synthetic control, since, as Abadie, Diamond and Hainmueller (2010) describe, the weights each unit in the donor pool receive are assigned so that the generated synthetic control best resembles the outcome of the treated unit in the pre-intervention period. This is achieved by minimizing the distance of the predictors of the outcome, $X_{1k}, \ldots, X_{nk}$, between the treated and the synthetic unit in the pre-intervention period (Abadie, 2021). That is

$$\min_{W*} ||\boldsymbol{X_1} - \boldsymbol{X_0} W^*||,$$

where $\boldsymbol{X_1}$ is a $(n\ x\ 1)$ vector that contains the predictors of the outcome for the treated unit $k = 1$, $\boldsymbol{X_0}$ is a $(n\ x\ k-1)$ matrix that contains the predictors for the control units $k = 2, \ldots, 11$ and $W^* = (w_2^*, \ldots, w_{11}^*)$ are the weights that minimize the distance between the two. In this analysis, the predictors of the outcome only include the pre-intervention values of the same, i.e., the pre-intervention values of detected crossings.

An advantage of the SCM in front of other estimation methods, such as linear regressions, in which extrapolation is used in order to guarantee that the treated and control units have the best fit (even when they are quite different), is that the SCM avoids extrapolation by making the weights of the potential controls to have positive weights that sum to 1 (Abadie, 2021).

Finally, it is possible to assess the quality of the counterfactual generated by the SCM by evaluating how good the fit of the treated and counterfactual unit is before the treatment, i.e., it is transparent whether or not the synthetic control is a good counterfactual by looking at how similar the predictors of the outcome are in both units before the treatment (Abadie, Diamond and Hainmueller, 2010; Abadie, 2021). Additionally, since the SCM is a data-driven procedure, it is guaranteed that control units are not arbitrary selected; on the contrary, it is transparent why (similarly of characteristics) and to which extend (the weights assigned) each control unit contributes to the synthetic control.

5.2 Inference method

The inference method used in this analysis is based on Abadie, Diamond and Hainmueller (2010) who applied iterative placebo tests to all control units in the donor pool to perform a quantitative inference. The idea behind this kind of test is to assess whether the effect obtained from the real synthetic control (which is the one obtained when assigning the treatment to the real treated unit) is relatively large when compared to the effects obtained when randomly assigning the treatment to all units in the donor pool. When doing this exercise, a distribution of "in-place" placebo effects, as coined by Galiani and Quistorff (2017), will be obtained. Then, based on this distribution, it is possible to test whether the effects from the real treatment are relatively large by using the generated p-values, as described in Galiani and Quistorff (2017). These p-values have the standard interpretation of informing about the probability of the control unit to have an estimated effect at least as large as the treated unit (Galiani and Quistorff, 2017). If the p-values are small, the null hypothesis is rejected, therefore, it is possible to state that the effect of the treatment is significant.

However, this inference exercise could be misleading if the pre-treatment fit obtained in the placebo tests is not equally good for all units in the donor pool. If this is the case, we might obtain artificially large placebo effects, causing conservative p-values (Galiani and Quistorff, 2017). To adjust for this, Abadie, Diamond and Hainmueller (2010; 2015), use the distribution of the ratio between the post-treatment and pre-treatment root mean squared prediction error (RMSPE) to assess the significance of the treatment effect. The RMSPE is an indicator of the lack of fit between the unit assigned to the treatment and its synthetic counterpart. A high post-RMSPE could be indicative of a possible effect of the treatment, since it indicates a poor quality in the post-treatment fit between the synthetic and treated unit. However, obtaining a large post-RMSPE does not translate into a large effect if the pre-RMSPE is also large (Abadie, Diamond and Hainmueller, 2015). For this reason, the ratio between the post-RMSPE and pre-RMSPE is used to assess the quality of the post-treatment fit relative to the quality of the pre-treatment one (Abadie, 2021). By doing so, even if the quality of the fit is not perfect, the ratio will be large only when the post-treatment RMSPE (which will reflect the estimated effect of the treatment) is larger than the pre-treatment RMSPE. If the post-pre-RMSPE ratio of the treated unit is significantly larger than the ones obtained from the placebo tests in the distribution, the effect of the treatment is deemed significant. Following Abadie, Diamond and Hainmueller (2010) this will be assessed by calculating the share of the units with the highest ratio, and then by interpreting the share as a p-value.

5.3 Definition of the Treated and Control Units

To estimate the effect of the construction of the Greece-Turkey fence on the redirection of migratory flows towards an alternative route, first we need to determine which route will be considered as the substitutive route (the treated route), which routes will be considered part of the donor pool, and which other route(s) will have to be discarded due to potential spill-over effects.

First, we need to identify to which route migrants who used to take the Eastern Mediterranean Land route prior to the construction of the fence are most likely to redirect to, i.e., we need to identify the closest substitutive route for the Eastern Mediterranean Land route. In this regard, many authors have signaled how after construction of the fence, migrants were smuggled towards the Greek islands (see Fargues, 2017; Ulusoy, Baldwin-Edwards and Last, 2019; Üstübici and İçduygu, 2018), that is, they switched from the Eastern Land route to the Sea route. An analysis of the data leads us to this same conclusion: the recorded number of crossings in the Eastern Sea route were 8 times higher in 2013 as compared to 2011, while crossings along the Land route decreased by almost 80% during the same period (Frontex, 2022).

However, how can we be sure that the increasing number of detected crossings on the Eastern Sea route is explained by migrants that redirected their journey from the Land route and not, for example, the result of an exogenous inflow of migrants coming from a different place? To attempt to answer this question, we used the data provided by Frontex, which disaggregates migratory flows by route and nationality of the migrant. Based on this information, we analyzed which were the main nationalities present in the Eastern Mediterranean

Land route before the construction of the fence and how the migrants coming from those nationalities distributed across the different routes before and after its construction. If the same nationalities that were present before the construction of the fence on the Eastern Land route were present in a significant proportion on the Eastern Sea route after the start of the treatment, there will be reasons to believe that the increasing number of crossings on the latter is a result of the redirection of migrants and not due different exogenous shocks[6].

Table 5 shows the top nationalities with the higher number of detected crossings on the Eastern Mediterranean Land route during the January 2010 - February 2012 period[7]. Column 3 describes the percentage of the total migrants from each nationality that took the Eastern Mediterranean Land route during that period, whereas column 4 describes the weight of each nationality in the total flow of the route. For example, in the January 2010 – February 2012 period, 20287 Afghanis took the Eastern Mediterranean Land route, which represented around 33% of the total flow of that route. From the total number of Afghani migrants during this period, around 83% of them selected the Eastern Mediterranean Land route to go to Europe.

Table 5. Number of crossings, distribution of migrants and percentage represented over total crossings in the Eastern Mediterranean Land route for the January 2010 – February 2012 period by main nationalities.

Nationality	Total number of crossings	Distribution in the route	Proportion over total crossings
Afghanistan	20287	82.8%	33.4%
Pakistan	13688	85.3%	22.5%
Bangladesh	4444	76.2%	7.3%
Algeria	3961	56%	6.5%
Morocco	2183	52.8%	3.6%
Congo (Brazzaville)	1913	84.4%	3.1%
Syria	1609	79.2%	2.6%

Source: Author's elaboration based on Frontex data.

Overall, the 7 nationalities in Table 5 constituted almost 80% of the total detected crossings on the Eastern Mediterranean Land route before the construction of the fence. Moreover, in all cases, this is the route the majority of migrants from these nationalities selected for travelling to Europe (the distributions in column 3 are higher than 50%). In this regard, looking at how migrants coming from these countries changed their route selection after the construction of the fence, i.e., how their distribution across the different routes changed, is likely to be an indicative of the effect of the construction of the fence on the redirection of migratory flows.

[6] Ideally, one would like to observe the same group of migrants making repeated trips and assess how their route selection changed after the construction of the fence. However, in this context, there is virtually no circular migration, which means that it is not possible to determine how a group of migrants changed their route selection due to the construction of the fence, as they only choose the route they will use to reach Europe once. This is the reason why we are evaluating how migration patterns changed after the construction of the fence instead.

[7] The discussion on the selection of the time period will be addressed in the next section.

The distribution of the migrants coming from these nationalities on the Eastern Mediterranean Sea route before the treatment is outlined in Table 6. The same nationalities that composed the total flow of the Eastern Mediterranean Land route (with the exception of Congo), represented around 60% of the crossings detected on the Sea route. Additionally, on average less than 5% of the migrants coming from these countries selected this route before the construction of the fence. This is expected since, all other conditions being the same, the Land route is preferred as it is less dangerous.

Table 6. Number of crossings, distribution of migrants and percentage represented over total crossings on the Eastern Mediterranean Sea route for the January 2010 – February 2012 period by main nationalities.

Nationality	Total number of crossings	Distribution in the route	Proportion over total crossings
Afghanistan	339	1.4%	20.5%
Pakistan	211	1.3%	12.8%
Morocco	187	4.5%	11.3%
Algeria	141	2%	8.5%
Syria	92	4.5%	5.6%
Bangladesh	38	0.7%	2.3%

Source: Author's elaboration based on Frontex data.

Table 7 describes the variation of the same variables presented in the previous two tables between the pre-treatment and post-treatment period. After the construction of the fence, more than 20% of migrants coming from Afghanistan and Syria switched to the Eastern Mediterranean Sea route (see the shadowed rows in Table 7). Moreover, these two nationalities represented 77,8% of the total number of detected crossings on the route during the post-treatment period (figures not presented). These two facts support the selection of the Eastern Mediterranean Sea route as the treated route.

Having justified the selection of the treatment route, it remains to discuss about the composition of the donor pool. One key condition that the control routes in the donor pool should satisfy is that migratory flows in these routes shouldn't be affected by the construction of the fence. To assess this condition, we looked at how the distribution of migrants from the nationalities that were present in the Eastern Mediterranean Land route changed across routes after the construction of the fence (column 3 of Table 7). If we see a significant increase in the percentage of migrants that selected a route different from the Eastern Mediterranean Sea after the construction of the fence, it will be indicative of possible spillover effects of the treatment, because it would mean that migrants also switched to that route[8].

[8] Looking at how the percentage of migrants from a particular nationality selecting a particular route changed after the construction of the fence is more informative than the actual variation in terms of absolute flows. This is the case because the first measure, regardless of the total number of migrants, reflects the preference of a route over the other ones, which is precisely what we are looking at.

Table 7. Variation of number of crossings, distribution of migrants and percentage represented over total crossings of the route by the main nationalities on all routes between the pre-post treatment period

Route	Nationality	ΔTotal crossings	ΔDistribution in the route	ΔProportion over total crossings
Eastern Borders	Afghanistan	287	1.1%	2.3%
	Syria	125	0.2%	3.8%
	Algeria	-4	-0.1%	-1,5%
	Bangladesh	62	1.1%	1.5%
Central Mediterranean	Syria	21339	41.2%	17.2%
	Afghanistan	144	-0.1%	-1.8%
	Pakistan	2773	30.5%	1.2%
	Bangladesh	-43	-1.1%	-1%
	Algeria	-92	-1.7%	-0.3%
	Morocco	1101	24.7%	0.6%
Western Africa	Morocco	-107	-2.8%	-56.8%
Western Mediterranean Land	Algeria	914	10.1%	-3.38%
	Morocco	148	3.8%	1.7%
Western Mediterranean Sea	Algeria	536	5.1%	2.9%
	Morocco	-102	-3.4%	-5.1%
	Congo (Brazza-ville)	-83	8.9%	-2.28%
	Bangladesh	-8	-0.1%	-0.2%
Western Balkans	Afghanistan	4474	16.8%	-4.5%
	Algeria	966	11%	-8.2%
	Pakistan	3277	33%	-0.2%
	Morocco	573	12.6%	3.2%
	Syria	2533	3.2%	7.4%
	Bangladesh	753	12.7%	2%
	Congo (Brazza-ville)	207	25.7%	0.7%
Circular route from Albania to Greece	Pakistan	-44	-0.3%	-0.7%
	Afghanistan	20	0.1%	0.1%
Eastern Mediterranean Sea	**Afghanistan**	**7479**	**28.5%**	**8.9%**
	Pakistan	165	2.2%	-11.4%
	Morocco	-8	-0.4%	-10.6%
	Algeria	258	3%	-7%
	Syria	**12784**	**20.4%**	**42.8%**
	Bangladesh	35	0.5%	-2%
Black Sea	Afghanistan	125	0.5%	55.6%
	Syria	85	0.16%	37.8%

Source: Author's elaboration based on Frontex data.

Note: if a nationality is not present in the route it means that there were not migrants from that nationality in that route or that their presence was insignificant (less than 15 crossings). Similarly, the Baltic and North Sea route was not included here since there were no migrants from these nationalities in this route for any of the periods.

After the construction of the fence, only around 1% of the migrants from those nationalities that used to take the Eastern Mediterranean Land route switched to the Eastern Borders route, the Western Africa route and the Circular route from Albania to Greece (Table

7, column 3). Since there is no evidence of spillover effects, these routes will be included in the donor pool. The opposite seems to be true in the case of the Central Mediterranean, the Western Balkans and the Black Sea route, which presented significant changes in both the percentage of migrants switching to these routes (column 3) and in the proportion they represented in the total crossings (column 4). In addition, these three routes are geographically close to the Eastern Mediterranean Land route, which is a reason to expect spillover effects from the construction of the fence[9].

A relatively important percentage of migrants from Algeria and Congo seems to have switched to the Western Mediterranean Land and Sea route after the construction of the fence. Around 10% more Algerians selected the Western Mediterranean Land route to go to Europe compared to the pre-treatment period. Even though this might be considered a relevant increase, given the distance of the Western Mediterranean routes with respect to the Eastern Mediterranean Land route, it is unlikely that this change was (at least in its totality) explained by the construction of the fence. For this reason, both routes will be included as part of the donor pool. However, results excluding these routes will be presented as part of the robustness checks in the following chapter.

Finally, none of the main nationalities present in the Eastern Mediterranean Land route before the construction of the fence were present in the Baltic and North Sea route. Thus, this route will be also included in the donor pool.

Table 8 provides a summary of the classification of the routes in the affected, treated, control and excluded groups.

Table 8. Summary of the classification of the routes for the construction of the synthetic control.

Group	Route
Affected	Eastern Mediterranean Land
Treated	Eastern Mediterranean Sea
Control	Eastern Borders, Western Africa, Western Mediterranean Land and Sea, Circular route from Albania to Greece and Baltic and North Sea route
Excluded	Central Mediterranean, Western Balkans and Black Sea

Source: Author's elaboration

5.4 Selection of the Time Period

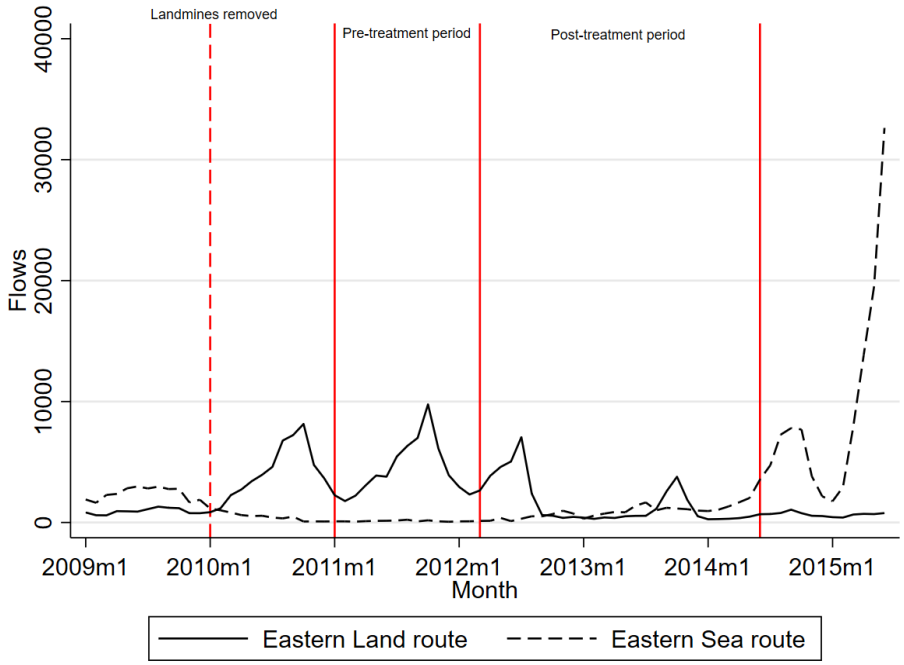
Even though in the context of the SCM using long pre-treatment periods is preferred, the possibility of structural breaks in the data might harm the accuracy of the estimations obtained from the synthetic control (Abadie, 2021). Since migration flows are quite susceptible

[9] Although the percentage of migrants from Afghanistan and Syria that switched to the Black Sea route after the treatment was less than 1%, both nationalities jointly represented almost the totality of the number of crossings detected in the route in the post-treatment period, which means that migration flows in the Black Sea route were highly explained by the migratory patterns of Afghanis and Syrians in the post-treatment period. As it was mentioned in Chapter 2, some authors signaled that these increasing flows were a response to the construction of the fence.

to shocks and these shocks affect routes unevenly, even though there is data available from January 2009, the time period needs to be restricted to avoid any confusion in the resulting estimated effect as a consequence of structural breaks or any other exogenous shock.

For example, the removal of landmines located on the Greek side of the Evros river by the end of 2009 supposed an important shift in migratory patterns. This was reflected by the fact that throughout 2010, migratory flows on the Land route started to consistently increase, while flows on the Sea route were decreasing (Ulusoy, Baldwin-Edwards and Last, 2019). In 2011 flows on the Sea route started to stabilize (see Figure 4). For this reason, the pre-treatment period was set to start in January 2011.

Figure 4. Migratory flows on the Eastern Mediterranean routes



Source: Author's elaboration based on Frontex data.

Similarly, the start of the treatment period has some nuances. Since the fence did not appear overnight, it is quite likely that migrants started to adapt their behavior even before it was completely built. This is known as anticipation effects, which means that the treatment starts having an impact before its actual implementation. In this kind of situations, Abadie (2010) suggests assigning the start of the treatment to the first period in which the intervention might have started to affect the outcome. Following this approach, the treatment will be assigned to the month when the government stated the fence will start its construction, in March 2012 (the second solid line in Figure 4), although the construction actually started two months later.

Finally, as for the post-treatment period, its length will be capped in June 2014, mainly because from this period onwards, Syrian refugees flows on the Eastern routes skyrocketed (see Figure 4), giving rise to the so-called 2015 European Migrant Crisis.

Overall, in order to analyze the effects of the construction of the Turkey-Greece fence on the redirection of migratory flows by means of the SCM, we will count with 14 pre-treatment periods, 27 post-treatment periods and 6 control units in the donor pool.

5.5 Other Considerations

5.5.1 About potential biases derived from not including control variables as predictors (aside from the pre-treatment outcomes).

In an ideal scenario, some control variables that are deemed as important to predict the outcome would be considered when generating the synthetic control. By taking into account such controls, it is more transparent and easier to assess whether the fit between the synthetic and treated unit is genuine and not a result of overfitted values (when the fit is good only as a result of a combination of several idiosyncratic shocks) or interpolation biases (when units of the donor pool with very different characteristics are used to build the synthetic control), both of which would eventually translate into biased results.

Despite it is acknowledge that not including control variables presents a limitation in terms of clarity and, to some degree, the transparency of the fit, obtaining biased results due to overfitting is considered unlikely given the size of the donor pool and the length of the pre-treatment period. As outlined by Abadie (2021), the risk of overfitting decreases with the size of the donor pool, as a smaller pool makes it more difficult to fit the pre-treatment outcomes if there are great discrepancies between the treatment and the units in the donor pool. Moreover, having a long pre-treatment period also reduces this potential source of bias since the impact of idiosyncratic shocks for any given time period is reduced and the number of pre-treatment values of the outcome variable (predictors) is larger (compared to a case with a short pre-treatment period), which reduces the importance of single predictors in the selection of the units from the donor pool (McClelland and Mucciolo, 2022). Unfortunately, there is no clarity in the literature about what is considered a small pool or a long pre-treatment period. However, in his analyses, Abadie[10] has used at least 16 units in the donor pool and a minimum of 5 pre-treatment periods. Taking these references, the size of the donor pool used in this analysis (6 units) is considered small and the number of pretreatment periods (14 periods) considered large.

Regarding the interpolation bias, as described in Abadie, Diamond and Hainmueller (2010), this increases with the number of unobserved factors. In this case, not including any potential observable covariate as predictor for the synthetic control implies that all covariates are unobserved, which, by definition, potentially increases the bias. However, it is not always possible to observe or include in the data important covariates. When this occurs, Abadie, Diamond and Hainmueller (2010), suggest restricting the donor pool to those units that are likely to be more similar to the treated one. In our case, it could be argued that the routes used in this analysis are similar to the extent that all of them are used with the intent to reach Europe and all of them are subject to the same European policies enforced by Frontex. Of course, there are differences in terms of the characteristics of the route; for example, some

[10] See Abadie and Gardeazabal (2003) and Abadie, Diamond and Hainmueller (2010; 2015)

of them go by sea and others by land, and some of them are longer than others. However, especially given the small sample of the donor pool, it is not expected that obtaining a good fit between the synthetic control and treated unit could be a result of this interpolation bias.

5.5.2 About issues derived from having a small donor pool for inference

Even though for the estimation of the synthetic control few control units are required – and even advised, as it was just described - the same cannot be say if we wish to perform a solid inference to assess the significance of the effect of the treatment. In particular, having a small donor pool increases the maximum possible p-value that can be obtained from the distribution of the effects from the placebo tests. In this case, since there are only seven units in the donor pool, the maximum p-value that can be obtained is 0.17 (1/6) – which is above the usual values used to claim significant effects of 0.10 or 0.05.

Despite this is an important limitation, in this case obtaining a p-value of 0.17 does not necessarily imply that the effect is not significant -especially if the effects obtained from the treatment unit differ greatly from the placebo tests-, but rather that there is not enough information available to claim that there is an effect with a smaller confidence level[11].

5.5.3 About the volatility of the outcome variables

As it was seen in the descriptive statistics of the previous chapter, irregular migratory flows are highly volatile. Irregular migratory flows vary significantly depending on the season of the year, and also on shocks that can come from the country of origin (e.g., a new conflict), the country of destination (e.g., a new policy), the route itself (e.g., border controls) or a combination of all of the above. In this context, Abadie (2021) states that "As a result, the impact of "small" interventions with effects of a magnitude similar to the volatility of the outcome are difficult to detect. Even a large effect may be difficult to detect if the volatility of the outcome is also large." (Abadie, 2021, p.409). Therefore, the difficulty in disentangling different effects and the fact that the magnitude of the same may go unnoticed withing the volatility of the variable, could suppose a major limitation to identify the effect of construction of the fence on the redirection of migratory flows. This a limitation that would be considered when analyzing the results in the next chapter.

[11] This is something that could be easily improved in future research when data for the disaggregated parts of the routes become available.

Chapter 6
Results and Robustness Checks

6.1 Results

The synthetic Eastern Mediterranean Sea route was built from a weighted average of the routes included in the donor pool. This weighted combination of routes in the donor pool provides a better counterfactual than the simple average of all control units, as outlined in Table 9. During the pre-treatment period, the synthetic and the real Eastern Mediterranean Sea route presented on average virtually the same number of crossings, 118, which is much lower than the average from all control routes, 688. A simple average of the routes in the donor pool presents better results in terms of similarity to the Eastern Mediterranean Sea route, although not as good as the synthetic route formed from the weighted averages.

Table 9. Number of average detected border crossings by route and period.

	Eastern Sea Route		All control routes	Donor pool
	Real	Synthetic		
Pre-treatment	118.14	118.2	688.2	194.6
Post-treatment	949.89	134.95	764.27	218.54

Source: Author's estimations
Note: "all control routes" include all routes but the Eastern Mediterranean Sea and Land routes.

Table 10 presents the weights assigned to each of the routes to build the synthetic Eastern Mediterranean Sea route. All routes in the donor pool received positive weights (which is expected given the small size of the pool), although the weights assigned to the Western Mediterranean Sea route and the Circular route from Albania to Greece are fairly small. This was expected since these were the routes that presented the highest flows in the donor pool, whereas flows on the Eastern Mediterranean Sea route were at the lower end.

According to the weights in Table 10, the Eastern Mediterranean Sea route is best approximated by a combination of the Baltic and North Sea route, the Western Africa route, the Eastern Borders and the Western Mediterranean Land route. The first two routes combined obtained more than 0.5 of the weights assigned. On one hand, this is positive, since these routes share an important characteristic with the Eastern Sea route, namely both of them are maritime routes. Additionally, as it is the case for the Eastern Mediterranean Sea route, the destiny of the Western Africa route are also islands (the Canary Islands). However, as we saw in Chapter 4, crossings in the Baltic and North Sea are few and scattered in time. This should not be a problem, since this is not due an issue with the data itself, but a characteristic of the route (it is barely used). Nonetheless, to ensure that the estimated effects are not magnified by the fact that the Baltic and North Sea route would pull down the average of the estimated synthetic crossings (considering that it received the highest weight), an

analysis of the results excluding this route will be provided at the end of this chapter as a robustness check.

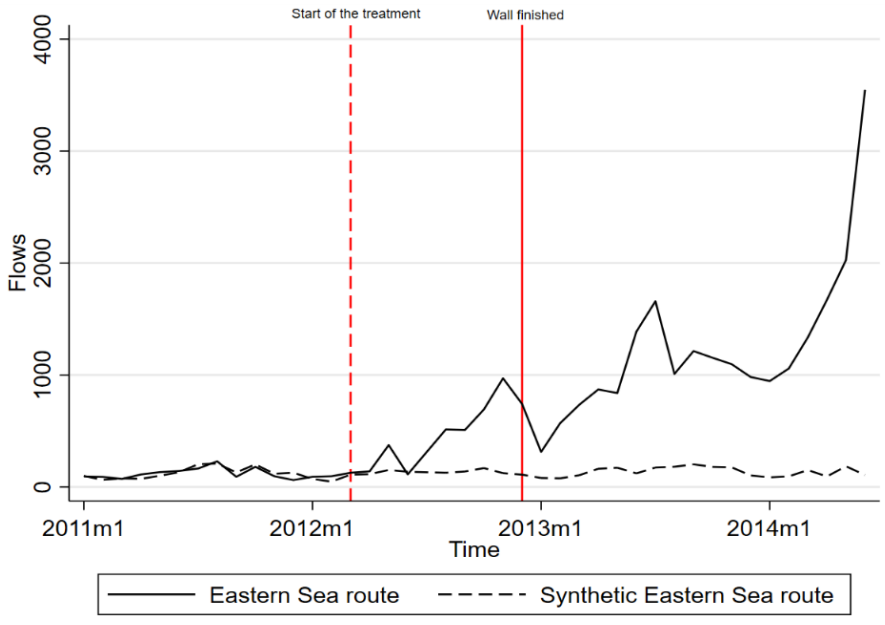
Table 10. Routes' weights on the synthetic Eastern Mediterranean Sea route

Route	Weight
Eastern Borders	0.183
Western Africa	0.228
Western Mediterranean Land	0.118
Western Mediterranean Sea	0.088
Circular route from Albania to Greece	0.08
Baltic and North Sea	0.303

Source: Author's estimations

Figure 5 plots the number of detected crossings on both, the Eastern Mediterranean Sea route and the synthetic Eastern Mediterranean Sea route for the January 2011 – June 2014 period.

Figure 5. Trend of the treated and synthetic unit over the period of analysis (January 2011 – June 2014)



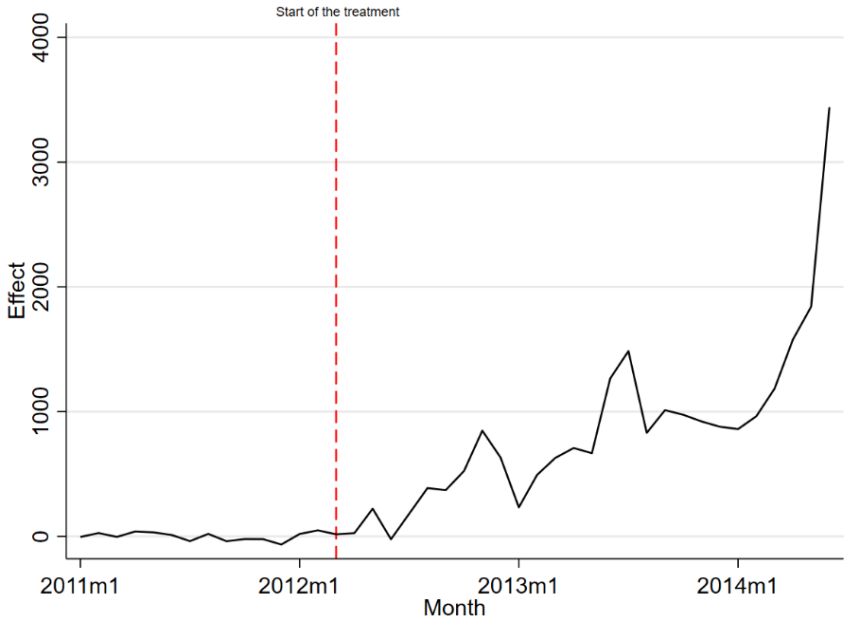
Source: Author's estimations

During the pre-treatment period (before the vertical dashed line in Figure 5), the number of detected crossings on the synthetic Eastern Sea route closely matched those detected on the actual Eastern Sea route, confirming the fact that the counterfactual generated by the

SCM is an appropriate approximation of the treated route. Shortly after the start of the treatment, the number of crossings detected on the Eastern Mediterranean Sea route started to increase, supporting our belief that migrants adapted their behavior even before the construction of the fence began. Once the construction of the fence was completed (in December 2012, represented by the solid vertical line in Figure 5) and after the seasonal decline corresponding to the winter months, crossings on the Eastern Mediterranean Sea route started to noticeably increase. Meanwhile, the synthetic route maintained the stable trend it had during the pre-treatment period.

The size of the effect of the construction of the fence on the number of crossings detected on the Eastern Sea route is obtained by differencing the number of crossings on this route with the number of crossings on the synthetic route after the start of the treatment. Figure 6 plots these monthly estimated effects. Before the treatment, the difference between the number of border crossings on the Eastern Mediterranean Sea route and its synthetic counterpart converged around 0, which is consistent with the good fit obtained between the units. After the treatment, the size of the effect starts to increase and it gets higher over time. The fact that the effect increases over time might respond to two phenomena: first, while some migrants adapted their behavior even before the construction of the fence, others may have taken longer to do so. This is related to the fact that some migrants might obtain information about existing border controls more quickly than others. Second, during the post-treatment period, migration flows to Europe increased in general terms. This latter event and its effect on the estimations will be discussed further in the next section.

Figure 6. Estimated effects of the construction of the Turkey-Greece fence

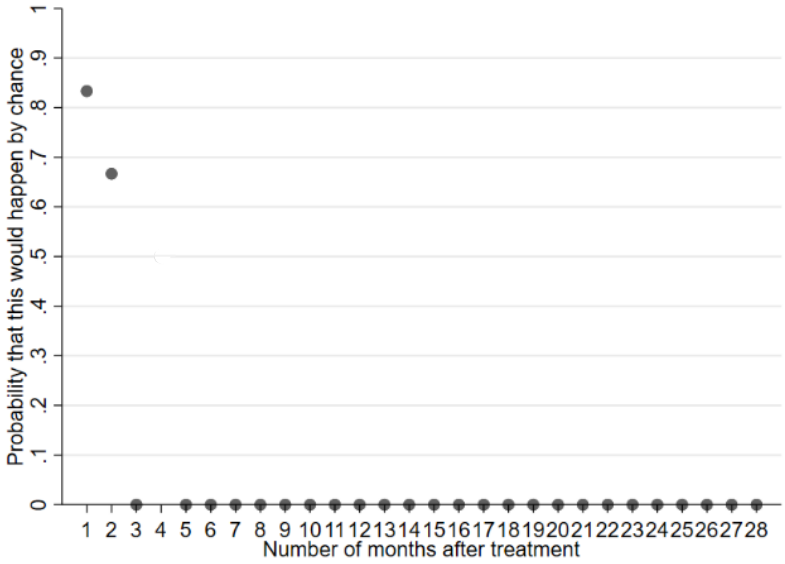


Source: Author's estimations

The results suggest that for the March 2012 – June 2014 period, detected crossings on the Eastern Mediterranean Sea route increased by 7 times compared to the case where the

fence would not have been built, spiking from an average of 118 detections in the pre-treatment period to 950 during the post-treatment (Table 9). To determine the significance of these results, we assessed the adjusted p-values obtained from the placebo tests (Figure 7). These p-values suggest that, after the 3rd post-treatment month, the probability of obtaining these results by chance is 0, therefore, we can claim that the obtained effects are statistically significant.

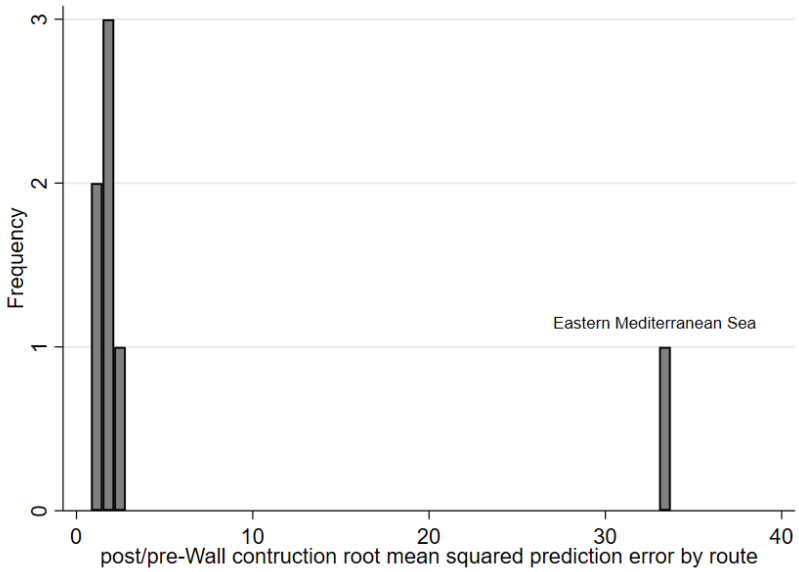
Figure 7. Adjusted p-values for the effect of the construction of the Greece-Turkey fence



Source: Author's estimations
Note: The p-value for the 4th month after the treatment (July 2012) is excluded since flows for this month were missing in the data.

Comparing the post-pre RMSPE ratio yields a similar interpretation of the results. As depicted in Figure 8, the post-pre RMSPE ratio of the Eastern Mediterranean Sea route is considerably higher than those obtained from the placebo tests on the other routes, which is indicative that the estimated effect is significant. Following the interpretation made by Abadie, Diamond and Hainmueller (2010), if we were to assign the treatment to a random route in our data, the probability of obtaining a RMSPE as large as the one we obtained for the Eastern Mediterranean Sea route would be 0.14 (1/7). This value is higher than the usual p-values accepted for claiming a significant effect. However, this relatively large p-value is driven by the small size of the donor pool. Hence, it should not be interpreted as an indicative of an insignificant effect, but rather as a lack of more information to claim a significant effect with the usual confidence levels.

Figure 8. Distribution of the post/pre-Turkey-Greece fence construction RMSPE by route



Source: Author's estimations

6.2 Discussion

The results presented above can be analyzed in light of the conceptual framework described in Chapter 3. Before the construction of the fence, the Eastern Mediterranean Sea route was more costly to cross than the Land route, since it is more dangerous to cross the Greek border by sea. However, the construction of the fence increased the costs of crossing the border through the Eastern Mediterranean Land route. Given that the benefits of migrating for the migrants taking the Eastern Mediterranean route were high (considering that 75% of them were refugees), the construction of the fence didn't prevent them from migrating, and they responded to it by switching to the Eastern Sea route. As it was described in the conceptual framework section, border controls and the risk of the route suppose a trade-off in the decision of the migrant for the selection of the route. In this context, the fact that migrants switched to the Eastern Mediterranean Sea route, supports the hypothesis that migrants took a riskier but less controlled route as a response to the construction of the fence.

Moreover, the results obtained align with one of the substitution effects described by De Haas (2019) when explaining why migratory policies can result ineffective: the spatial substitution. According to De Haas (2019), the spatial substitution effect refers to the fact that migrants use alternative routes or redirect towards alternative destinations as a response to stricter migratory policies.

It is important to highlight that this spatial substitution effect is not constrained to alternative routes. Spatial substitution can also occur when flows redirect to a different area within the same route or towards new routes that were previously unused. We find evidence of both of these cases for the construction of the Greece-Turkey fence. First, despite the construction of the fence, migrants kept crossing the Eastern Mediterranean Land route

through the more than 200 remaining unfenced kilometers where the Evros river delimited the border between the two countries, which were harder to control, but also riskier to cross (Ulusoy, Baldwin-Edwards and Last, 2019; Topak, 2014). Similarly, instead of crossing from Turkey to Greece, migrants started to cross the Bulgarian border (Frontex, 2014), which is also part of the Eastern Mediterranean Land route. In this case, the spatial substitution effect takes place within the same route, as flows are redirected towards more remote areas. Second, the construction of the fence was also followed by the opening of new routes that were previously unused. After the construction of the fence, migratory flows from the Eastern Mediterranean Land route shifted to the Bulgarian and Romanian Sea border via the Black Sea route, which until then had not been used (Üstübici and İçduygu, 2018). These events provide empirical evidence for the theoretical explanation given by De Haas (2019) that border controls do represent an impediment for migrants to cross from a particular point, but that they can be circumvented with relative ease by crossing from a different area or with the help of smugglers, which reduces the overall effectiveness of the policy.

More importantly, these substitution effects in different areas/routes provide a sound explanation on why the reduction on average crossings in the Eastern Mediterranean Land route during the post-treatment period was not completely absorbed by its Sea counterpart. After the construction of the fence, detected crossings on the Land route dropped from an average of 4344 in the pre-treatment period to 1534 during the post-treatment. However, this reduction in flows on the Eastern Land route (on average a monthly reduction of 2810 crossings), was not fully corresponded by the increase in flows on the Sea route, where on average, monthly crossings increased by 832 in the post-treatment period. Hence, it could be understood that, although flows from the Land route redirected to some extent to the Sea route, overall migratory flows were reduced. However, this interpretation is misleading, as it does not consider that flows redirected to other routes as well, as it was just described.

The redirection of flows towards alternative areas different from the Eastern Mediterranean Sea route, means that estimating the effect of the redistribution of flows after the construction of the fence by only using the Eastern Mediterranean Sea route as the treated route is limited. This is the case as the estimated effect on the increased number of crossings on the Eastern Mediterranean Sea route does not fully reflect the extent to which migrants redirected from the Land route to alternative routes.

On the other hand, the results presented can be also explained in light of the intertemporal substitution effect described by De Haas (2019). According to this substitution effect, migrant flows are likely to increase when migrants fear that migratory policies will be tightened in the future (De Haas, 2019). In this regard, the Eastern Mediterranean Sea route the Central Mediterranean, the Western Balkans and the Black Sea route recorded an increasing number of border crossings of migrants from the same nationalities previously present in the Eastern Mediterranean Land route. Hence, it could be that the increasing trend of border crossings observed on the Eastern Mediterranean Sea route is part of a general trend of increasing migratory flows, as migrants started to fear the implementation of more border controls after the construction of the fence.

Lastly, it could be argued that the explosive magnitude of the estimated effect from 2014 onwards is mostly driven by the increasing inflows of refugees from Syria, which could be wrongly interpreted as artificially large effects. However, the inflow of migrants from Syria

would have had occurred regardless of the construction of the fence. In the hypothetical case where the fence wasn't built, Syrians would most likely have chosen the Eastern Mediterranean Land route to cross to Europe, as reflected in their previous patterns prior to treatment (almost 80% of them used to select the Eastern Mediterranean Land route to go to Europe before the construction of the fence, see Table 5). The fact that the increase of inflows from Syrians is partly absorbed by the Eastern Mediterranean Sea route (after the treatment, 25% of Syrians selected the Sea route, a 20% increase with respect to the pre-treatment period, see Table 7), only confirms the fact that some Syrian migrants switched to the Eastern Mediterranean Sea route as a consequence of the construction of the fence.

Regardless of the magnitude of the specific effect, the results presented provided evidence in favor of the hypothesis tested in this analysis. In general terms, migrants did not stop migrating after the construction of the fence, instead they redirected to alternative routes (particularly, towards the Eastern Mediterranean Sea route).

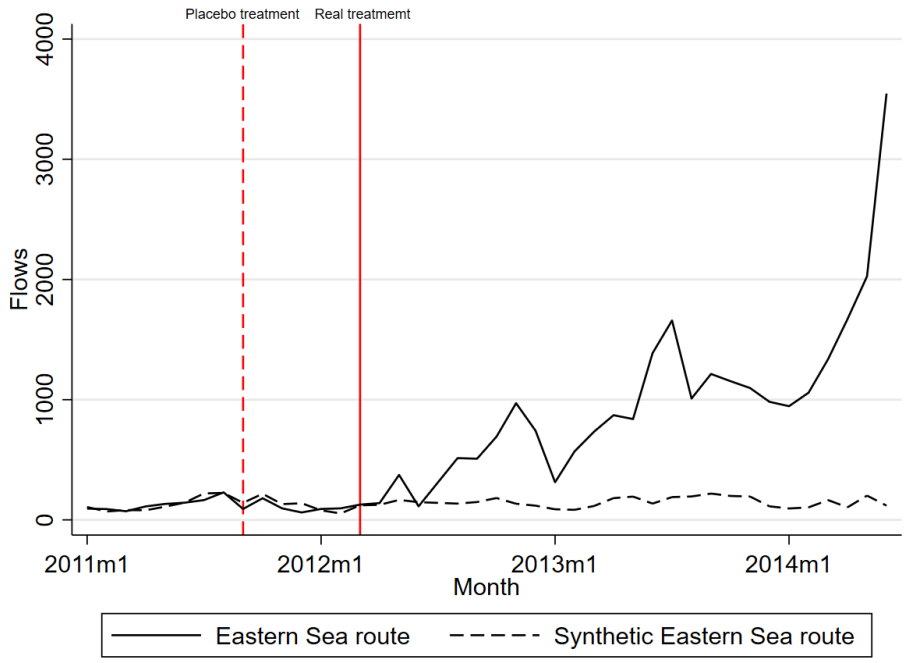
6.2 Robustness Checks

To assess the credibility of the obtained results, different robustness checks were conducted. First, following Abadie, Diamond and Hainmueller (2015), we did an in-time placebo treatment test. Second, due to the suspicion of potential spillover effects, we removed the Western Mediterranean routes from the donor pool and checked if the obtained results were robust to it. Finally, we removed the Baltic and North Sea route from the donor pool to ensure that the results were robust to the exclusion of this route. This test was performed since the Baltic and North Sea route was the one that received the highest weight to build the synthetic Eastern Mediterranean Sea route and also presented the lowest number and variation of detected crossings.

For the in-time placebo test, we assigned the start of the treatment to an earlier date during the pre-treatment period and then proceed with the SCM as we did before. Obtaining a large effect from this in-time placebo test would suggest that the results obtained from our analysis might reflect a lack of predictive power (Abadie, Diamond and Hainmueller, 2015). The placebo treatment was assigned to September 2011, 6 months earlier than the actual treatment. Figure 9 shows the results.

Before the placebo treatment, the synthetic Eastern Mediterranean Sea route closely reproduces the migratory flows of the actual Eastern Sea route. Most importantly, this remains the case during the September 2011 – March 2012 period (after the placebo treatment), as both trends only start to diverge after the start of the actual treatment, in March 2012. Hence, unlike the actual treatment, the in-time placebo treatment did not have any effect on the redirection of migratory flows towards the Eastern Mediterranean Sea route. Therefore, we can be sure that the results obtained in Figure 5 and 6 reflect the actual effect of the construction of the fence on the redirection of migratory flows towards the Eastern Sea route and are not a result of lack of predictive power of the synthetic Eastern Sea route.

Figure 9. In-time placebo treatment: Trend of the treated and synthetic control units

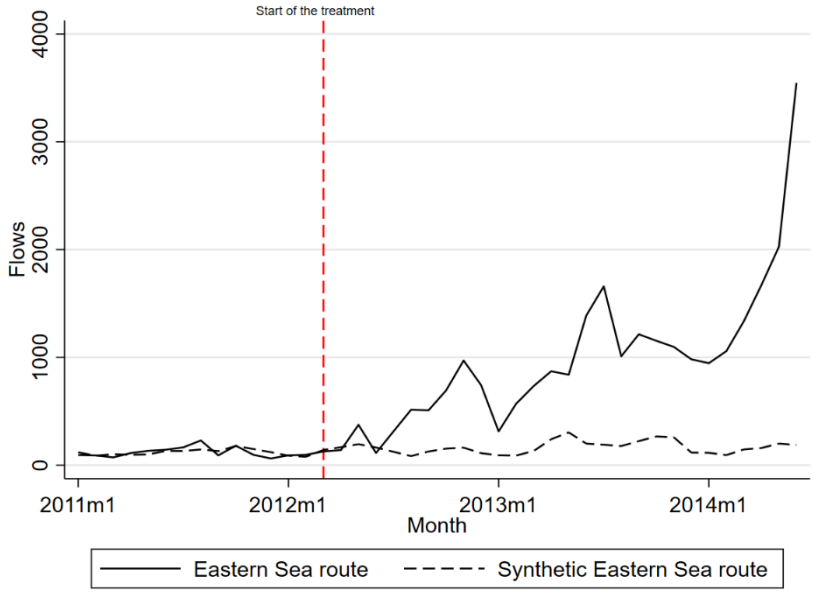


Source: Author's estimations

In the second robustness test, the synthetic control was obtained by leaving out the Western Mediterranean Sea and Land routes from the donor pool due to possible spillover effects of the construction of the Greece-Turkey fence on the redirection of flows toward these routes. The synthetic route formed by excluding the Western Mediterranean routes from the donor pool still closely reproduces the migratory flows of the Eastern Mediterranean Sea route before the treatment (Figure 10), although the fit is not as good as the one presented in Figure 5.

If there were significant spillover effects from the treatment in any of the Western Mediterranean routes, we would expect the effects presented in Figure 6 to be underestimated. Since the redistribution of migrants to routes included in the donor pool would have caused the synthetic control to better match the treated route after the treatment, this would have resulted in lower estimated effects. Therefore, if there was any spillover effect, we would expect that the synthetic control built from a donor pool without the Western Mediterranean routes would present a lower number of detected crossings in the post-treatment period. However, as shown in Table 11, the opposite is true. The synthetic Eastern Mediterranean Sea route built from the restricted pool detected 30 more crossings in the post-treatment period than the synthetic route built from the full donor pool (column 3, Table 11). Hence, we can rule out the presence of significant spillover effects in the Western Mediterranean routes.

Figure 10. Trend of the treated and synthetic control units after leaving out the Western Mediterranean routes



Source: Author's estimations

Table 11. Second robustness check: Number of average detected crossings by route and period

	Eastern Sea Route		
	Real	**Synthetic**	**Synthetic (restricted)**
Pre-treatment	118.14	118.2	118.17
Post-treatment	949.89	134.95	165.05

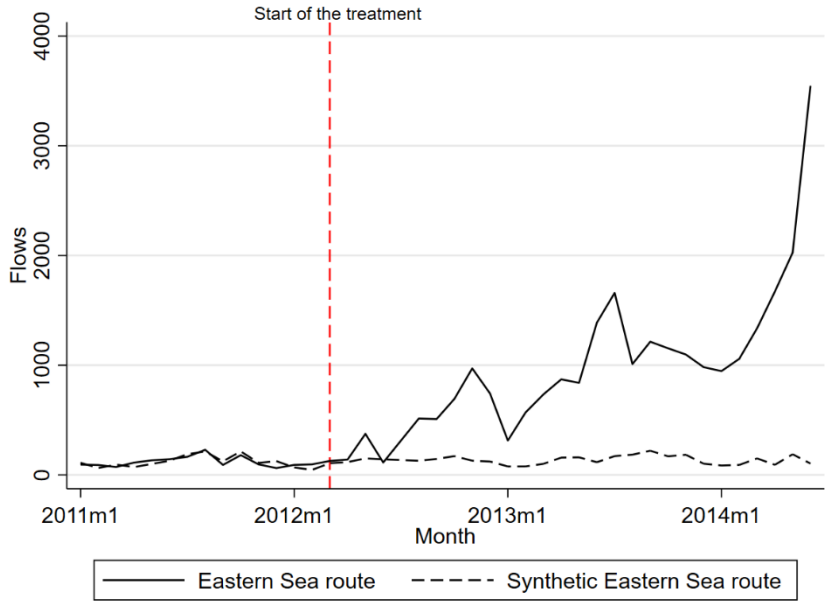
Source: Author's estimations.
Note: the synthetic restricted route is built based on a donor pool without the Western Mediterranean routes.

Finally, if the lower relative number of crossings and their lower variability presented in the Baltic and North Sea route is really a problem, we would expect that excluding it from the donor pool would create a new synthetic control that would present higher number of crossings in all periods (since the Baltic and North Sea route wouldn't be pulling down the estimates). Conversely, if the estimated effects are robust to the exclusion of this route, we can state that the presence of the Baltic and North Sea route in the donor pool does not artificially lower the estimated number of crossings in the synthetic route and that the estimated effects were not artificially magnified.

Figure 11 plots the trend of the real Eastern Mediterranean Sea route and its synthetic counterpart obtained from excluding the Baltic and North Sea from the donor pool. As in the previous case, leaving out the Baltic and North Sea route from the donor pool does not significantly affect the quality of the pre-treatment fit. Moreover, the average of the estimated

number of crossings in the synthetic route without the Baltic and Sea North during the post-treatment period is virtually the same as the one obtained from the synthetic route with the full donor pool (Table 12). Hence, based on these results, we can state that the estimated effects are robust to the exclusion of the Baltic and North Sea route from the donor pool.

Figure 11. Trend of the treated and synthetic control units after leaving out the Baltic and North Sea route



Source: Author's estimations

Table 12. Third robustness check: Number of average detected crossings by route and period

	Eastern Sea Route		
	Real	**Synthetic**	**Synthetic (restricted)**
Pre-treatment	118.14	118.2	118.36
Post-treatment	949.89	134.95	134.84

Source: Author's estimations.
Note: the synthetic restricted route is built based on a donor pool without the Baltic and North Sea route.

Overall, our estimated effects remained consistent across the different robustness tests applied, therefore, we can claim that the identified effect of the Greece-Turkey fence on the redirection of migratory flows towards the Eastern Mediterranean Sea route are credible.

Chapter 7
Conclusion

The intent of this paper was to provide a deeper understanding of the effectiveness of stricter migratory policies on irregular migration flows. For this purpose, I undertook a case study to analyze whether, and to which extent, the construction of a fence between Greece and Turkey in 2012 provoked the redirection of irregular migrants from the Eastern Mediterranean Land route towards the Eastern Mediterranean Sea route to enter Europe.

Based on monthly data of irregular border crossings provided by Frontex, I applied a Synthetic Control Method which revealed that monthly crossings on the Eastern Mediterranean Sea route increased on average by 832 after the fence was built, a seven-fold increase compared to the counterfactual case. These results supported my hypothesis that stricter border controls do not deter irregular migration, but rather redirect migrants towards alternative, sometimes riskier, routes. This is the case as irregular migrants who utilized the Eastern Mediterranean routes to Europe were mostly composed of refugees who benefited greatly from migrating and the increased costs derived from the construction of the fence could be avoided by selecting another route. Thus, the construction of the fence held little weight in the decision to migrate.

This research provided quantitative causal empirical evidence on a sensitive issue which is often driven exclusively by ideology. It is hoped that this evidence on the effectiveness of border controls could be used to objectively assess the consequences of such policies and, hopefully, motivate the implementation of more secure and inclusive migratory policies in the future.

While it can be argued that the results of this research cannot be generalized considering that it is a case study, the evidence provided by a multitude of other researchers suggests that our findings do not represent an isolated event but a rather common side effect of tightened border controls on irregular migration flows.

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