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The impact of EU Refugee Crisis on International Trade: Evidence from Imports from China to 27 EU Member States

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Ai miei genitori,

per mille motivi e per uno solo.

Sebbene la presente tesi sia in inglese, ho scelto di esprimere i miei ringraziamenti in italiano, per rendere omaggio a questo paese dove ho vissuto uno degli anni più belli e indimenticabili della mia vita.

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Dulcis in fundo, desidero dedicare questo traguardo anche a me stesso. Affinché questa esperienza mi ricordi sempre che più è ardua la salita, più meravigliosa è la vista.

Abstract

This thesis focuses on the refugee crisis among EU member states since 2014 which had a negative impact on their imports from China. Given that the refugees were distributed unequally across countries, we employ a difference-in-difference method which allows for control of unobserved time-invariant confounders. The estimation indicates that the crisis decreased Chinese imports by approximately 20.94%. It has been revealed that such negative impact was attributed to decline in average salaries and loss of consumer confidence. As for types of products, processed goods such as machinery and leather bore the brunt, while primary goods such as mine and raw foods were unaffected. In light of this, we appeal for closer attention of EU authorities to refugee issues which had adverse influences on labour markets and consumer confidence. Chinese exporters should also be aware of the potential shock on bilateral trade and business risks.

Keywords: Refugee crisis, China-EU trade, difference-in-difference method

Table of Contents

1. Introduction and Background

1.1 Immigrants and International Trade

The European Union (EU) has long been a major destination for immigrants, who are believed to make contribution to the trade between destination countries and their home countries. Gould (1994) is one of the earliest researchers who pay attention to the link, preceding a large literature detailing the impact of immigration on trade across hosting countries. However, too little emphasis is placed on the classifications of immigrants. Given that the extent to which immigrants influence trade is heavily dependent on their personal traits, looking at the variation in such correlation across immigrant identities could provide us with valuable insights into its mechanism. Furthermore, the understanding of heterogeneity within the immigrant-trade link is conducive to formulation of economic and social policies for different countries, and there is no escaping the fact that appropriate solutions are critically urgent amidst ongoing debates over the EU immigration and trade policies. This thesis complements the previous literature by opening up further discussion on two distinct categories of immigrants and the way in which they affect international trade, namely refugees and non-refugee immigrants who resettle for work, education, or family reasons.

Two main mechanisms of the immigrant-trade link have been revealed and well discussed in preceding studies: First, immigrants arrive in the host country with invariable preferences for products made by their home countries though this may change after some time. Due to culture gaps and the difference in consumer habits, these products are usually unavailable in the host country, so they have to get it from their origins and thus increase imports, which is called ‘preference effect’ (White, 2007). Second, with more information and understanding of markets and business environments in their home country, immigrants are able to reduce transaction costs and thus facilitates bilateral trades. It has also been mentioned in some studies that their connection to social networks avoid potential business speculation or misconduct (Rauch, 2001; Rauch and Watson, 2004). These positive effects that their social

networks bring about are known as ‘network effects’ (Gould, 1994; Dunlevy, 2004; Greenaway, Mahabir and Milner, 2007).

However, some researchers argue that such theories are not applicable to forced immigrants, or refugees, because they are different from regular immigrants in two aspects: First, the roundabout fleeing routes to Europe are so tortuous that most refugees have to stay in a third country waiting for permission from authorities or even chances for smuggling. This could last for a few years during which they have already adapted their preferences to local tastes, which would hinder the preference effect. Non-refugee immigrants, on the contrary, usually arrive in the EU directly from their home countries because they are likely to be granted lawful permission. Another reason which could undermine the preference effect is that many refugees do not meet the employers’ needs as they usually come from less-developed countries where the education and skill training system does not align with demands in labor market in the host country. Some refugees cannot even get a legitimate job due to the EU regulations since their access to the labour market, though preserved by Article 26 of Directive 2011/95/EU, is guaranteed only after they acquire the legal status as a refugee but such procedure often delay for months. The employment rate of refugees, as a consequence of which, could be as low as 11% in the first two years since migration, and is substantially lower than that of non-refugee migrants, let alone natives. (Brell, Dustmann and Preston, 2020). Being at a precarious working and financial situation, refugees are unlikely to dissipate their savings on non-essential imported products, which would hinder the preference effect. Second, as White and Tadesse (2010) pointed out, refugees may have only a tenuous link with business and social networks of their original countries, and are thus less influential in promoting bilateral trade. The network effect, consequently, could not work in this case either.

Going back in history, the continental Europe was once positive about immigrants who would contribute to the reconstruction after World War II. Later on, ex-colonial countries like French and Netherlands had been accepting people of the colonies back to Europe. However, refugee issues were raised and basis for immigrant entry was

transformed since 1990s, featuring a series of international treaties such as *Maastricht Treaty* (1993), *the Treaty of Amsterdam* (1999) and *Tampere Convention* (1999) which were aimed at establishing a shared system for vetting the immigrants. Despite the joint efforts to link up board management and control illegal refugees, the issue has been escalating since the new millennium driven by regional wars, terrorism, and human trafficking. The brutal reality reaffirms the importance of our main idea to distinguish refugees from other immigrants and understand how they would affect international trade.

1.2 European Refugee Crisis in the 2010s

To meet the objective, we focus on the escalation of refugee issues since the early 2010s in Europe. During the period, the EU has witnessed a surge of refugees mainly as a result of regional conflicts and civil wars which swept through Middle East and North Africa, mainly in Syria, Iraq, and Afghanistan (Hatton and Williamson, 2006). Migratory pressures peaked in 2016 as the EU member states received more than 1.2 million asylum applications, almost six times the number at the beginning of that decade. The refugee wave exposed the weaknesses of the EU legal framework for refugee control (Yaseen et al., 2025), where the *Dublin Regulation* plays the most critical role. The regulation was amended for the third time in 2013 and entered into force later on, featuring allocation of responsibility for examining asylum applications based on the first crossing point of refugee entry, commonly known as 'polluter-pays' principle. The year 2013 also witnessed the new amendment of the *Directive of Recognition of Refugee Status* which grants refugees residence permits and legal protection from refoulement, and the *Reception Conditions Directive* which was aimed at establishing minimum standards for the reception of asylum seekers in EU member states. Albeit on humanitarian and righteous grounds, these regulations exacerbated fiscal and administrative pressures on EU governments. Getting overwhelmed with asylum applications, some countries tolerated the most superficial examination without even taking down basic information of refugees and acquiesced them to enter other countries to submit their asylum application.

Thanks to the refugee data provided by the Eurostat, the statistical office of the European Union, we visualize the number of all asylum applications although the dataset also provides subdivisions of age class, sex, citizenship and type (first-time application or subsequent application). As shown in **Figure 1**, some countries bore the brunt of the refugee influx. For example, Italy, the doorkeeper of EU Mediterranean border, was overwhelmed with refugee arrivals and had to sign an agreement with Libya to prevent refugees from starting their journeys there to Italian shores. Germany, though not a border country, took in 0.55 million of them within just three months because it has the most welcoming position towards refugees. Its accommodation centres were soon brought to a standstill in the following months. Although it was a long-lasting event, we regard the year of 2014 as the beginning of the refugee crisis in this thesis for two reasons. FIrst, that year saw a dramatic rise in asylum applications in many EU countries which is obvious in the figure. Second, it was the first year since the implementation of Dublin Regulation III, which, albeit in hopes of normalising procedures of refugee asylum application, in fact leads to free movement of refugees because it generated negative motivation for border countries to resettle refugees and prevent them from moving to wherever they wanted. The imbalance of refugee distribution among EU countries becomes the basis of our study.

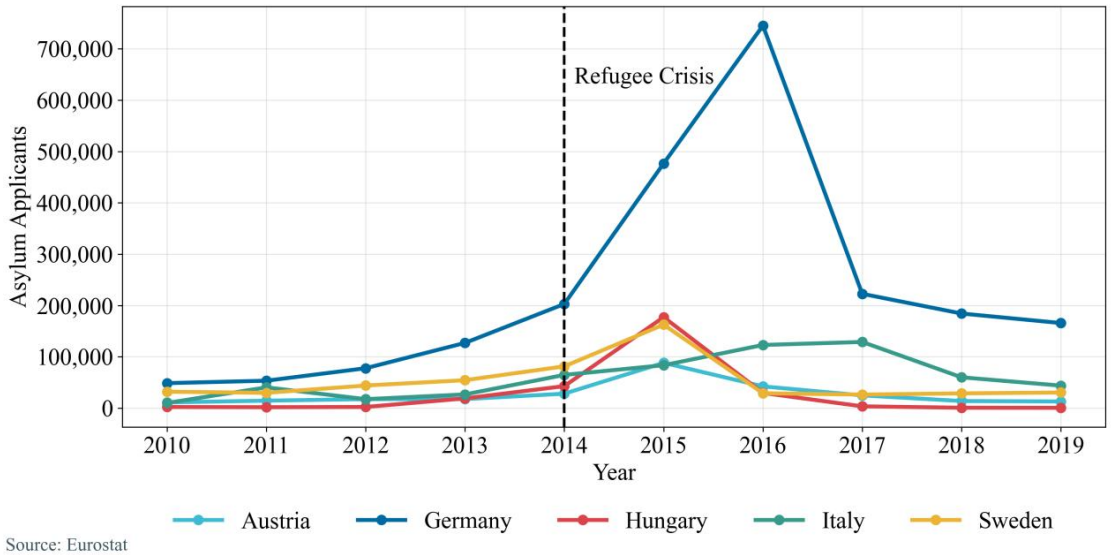


Figure 1: Asylum applications received by some EU member states

Given that most EU countries were economically superior to refugee origins, the deciding factor for asylum choice was mainly not the strength of economy, but the difficulties during exodus and the prospect of settling down. Therefore, it is rather important to take a look at the journey fleeing to Europe in order to know which countries are the top hosts. **Figure 2** shows some regular routes for refugees to enter the EU. The Western Balkans route is the major transit centre for migrants originated from Syria, Afghanistan and other Western Asian countries. Many of them flee to Turkey which has welcoming policies towards refugees, especially Islamic, because it desires to gain leadership in the Islamic world. On the west coast of Anatolia Peninsula, there is a mass of traffickers who help refugees make the illegal trip from İzmir to Athens by boat, a giant leap for them to enter the Schengen zone. Refugees will then cross the Balkans, either through the former Yugoslavian countries or through Bulgaria and Romania, to Eastern European countries, and finally make it to Germany, the largest refugee-hosting country in the EU.

Another major route for fleeing is the Mediterreanean route from North Africa by water. Refugees gather in Libya first where they take boat trips from Tripoli and Benghazi to Malta, a generous issuer of the EU visa which allows them to move and stay in Italy, or continue to Germany. Lastly, a less favoured route is the Russia route. Refugees make their ways first to Moscow where they are granted temporary asylum status, and then to the northwestern city of Murmansk which is close to the Norway-Russia border. After entering Norway, a Schengen member state, many of them finally settle down in Sweden, another country beside Germany which has cordial manner towards refugees.

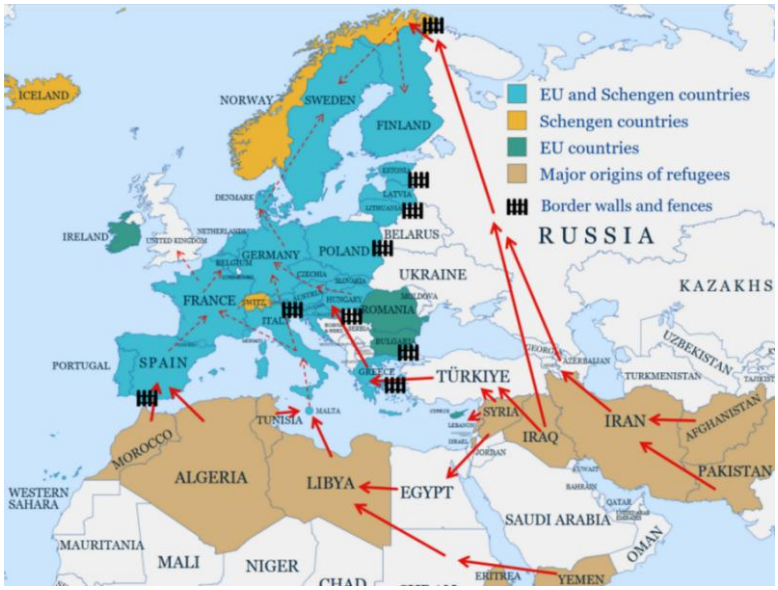


Figure 2: Regular routes for refugees to enter the EU

Taking into account the growth of asylum applications, regular fleeing routes and the attitude towards refugees, we are now able to divide all twenty seven EU member states into two categories: refugee-hosting countries as an experimental group and non refugee-hosting countries as a control group, which is visualized in **Figure 3**. It is apparent to see in **Figure 4** that the number of asylum applications received by refugee-hosting countries were remarkably higher than that of non refugee-hosting countries, with a sudden rise in around 2014.

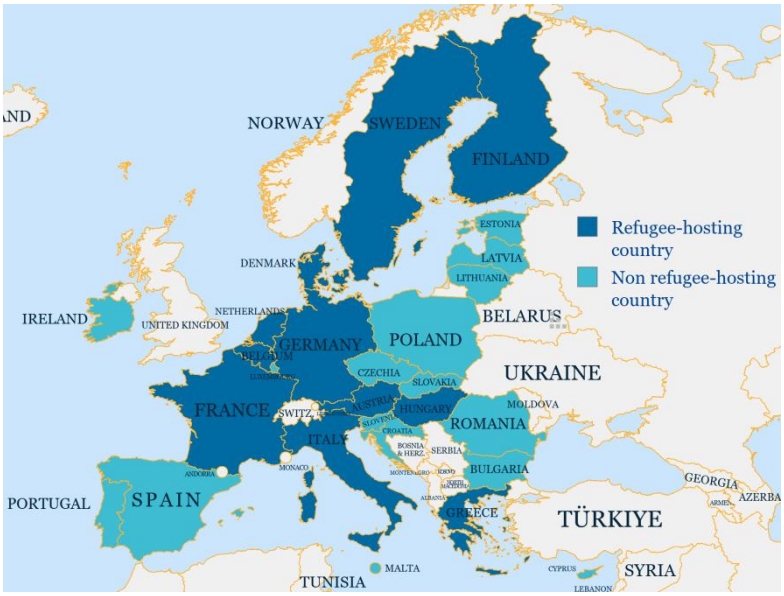


Figure 3: Refugee-hosting and non refugee-hosting countries in the EU

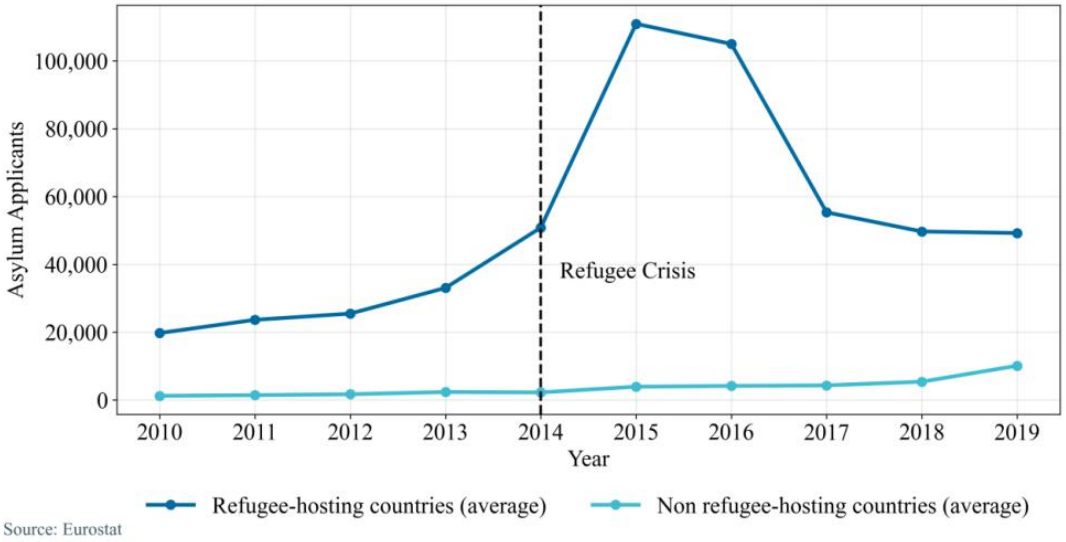
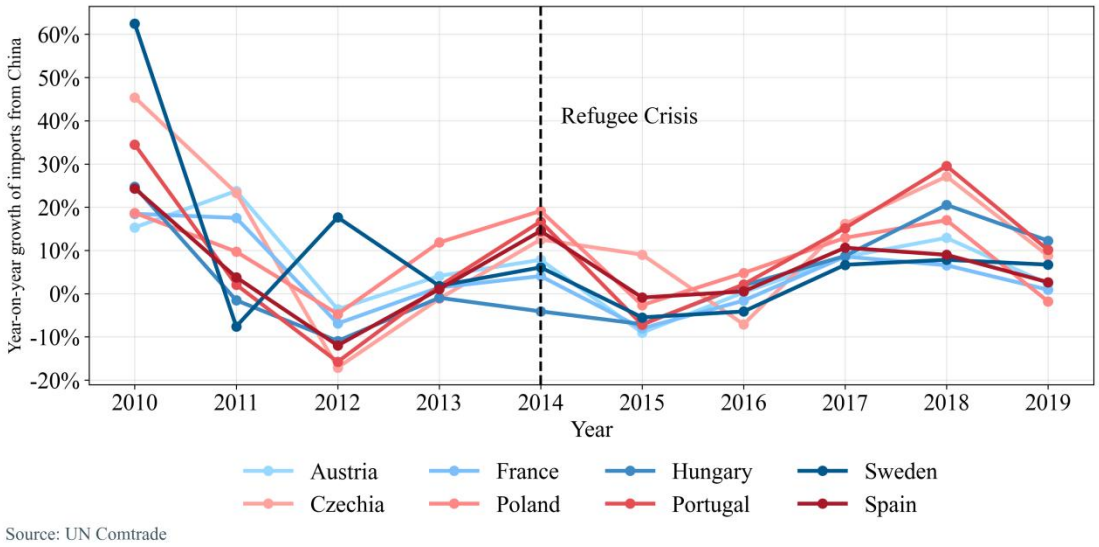


Figure 4: Asylum applications received by the EU countries

1.3 Main Structure and Contributions

Despite the great deal of effort in correlation between refugees and international trades, most of the studies look at the impact on trade between host countries and original countries, with relatively little attention given to that between host countries and a third-party country which both preference effect and network effect fail to explain. This paper seeks to address a part of the gap by considering one of the most important trading partnership between the EU and China, the largest manufacturer worldwide and traditionally not an origin of refugee waves. The shift of research focus is inspired by a structural change in the European imports from China. As shown in **Figure 5**, some European countries, such as Austria and France, had witnessed slower growth in imports from China in the years after 2014, while some countires reported relatively faster growth. This cannot be attributed entirely to factors such as foreign exchange rates, shipping costs or any systematic differences in the industrial structure because none of them could fully explain why such trend was not seen in the years before. A plausible guess is that this has something to do with the sudden influx of refugees into the EU in 2014.



Source: UN Comtrade

Figure 5: Year-on-year growth of imports from China to some EU countries

Although there are a number of factors interlinked with refugee waves, the 2014 European refugee crisis could be regarded as a natural experiment that helps us understand how and why forced immigrants may have an impact on trades between host countries and the third country. By using a difference-in-difference (DID) estimation method, this study investigates the impact that refugee waves to 27 EU countries have on their imports from China and contributes to the literature on three fronts: First, it provides insight into how the 2014 refugee crisis in Europe hit imports from their biggest trading partner by reshaping the job market. Second, it focuses on the impact on trade with a third-party country, which, to the best of my knowledge, is scarcely noticed and discussed in previous studies. Third, from a policy perspective, the finding has important implications for both Chinese and European traders that they should keep an eye on refugee-related events in Europe that may unbind their business.

The remaining part of paper is organized as follows. Section 2 is an illustrative overview of previous literature on migration and trade in an effort to provide a clear glimpse of the topic. In Section 3, we outline data sources and the identification methodology, that is, what kind of equation will be estimated and what variables are going to be included in the study. After that, a few hypotheses are put forward based

on our intuitive knowledge, and will then be verified in the empirical study. Section 4 presents the preliminary estimates with exhaustive validity tests to make sure that our method is statistically tenable, including time and space placebo tests and an event study that proves the pre-event parallel trend. In Section 5, we go one step further in addition to the baseline result by carrying out deeper investigation into channel and mechanism so as to understand how these variables are correlated. More specifically, we will delve into some broader factors such as wages and unemployment, consumer confidence and political landscapes which may differ from what they were before the inclusion of refugees. Finally, in Section 6, we come to a brief conclusion with the summary on previous findings, discussion of insights for refugee-related policies and business response and directions for future studies.

2. A Selective Literature Review

Over the past decades, there has been a heated debate among policymakers in the EU member states about whether or not more stringent policies and regulations should be formulated to control legal immigrants and to prevent illegal cross-border refugees from entering their territories both directly and indirectly. The importance of such policies could not be any clearer because they affect many economic factors and determine the welfare of the economy (Cobb-Clark, 1998; Shimada, 2005). However, related studies on the economic consequences of immigration in Europe have been a bit fragmented and less conclusive due to its essential complexity. In this section, we will briefly review the previous literature on the impact of refugees on not only international trade in the hosting country, but also various economic variables such as equilibrium wages, unemployment rate and commodity prices.

2.1 Impacts of Refugees on International Trades

There is a large literature on the impact that immigrants have on bilateral trades between sending countries and hosting countries based on their personal preference and knowledge of the business and legal system in their home countries. Evidence of a significant positive immigrant-trade link has been found for more than a few hosting countries. The pionnering study of Gould (1994) reveals a strong positive impact on exports and imports in the United States, with the greatest effects on consumer manufactured exports. Immigrant preference for home-country products is found playing the dominant role in the import sector. Hong and Santhapparaj (2006) aims to study the impact of skilled immigration from ASEAN and non-ASEAN countries on Malaysia's trade. Using the trade data from 1998 to 2004 with 16 trading partners, they find that a 10% increase in immigrants from ASEAN countries increases exports and imports of Malaysia by 5.3% and 8.8%. respectively, with scarcely any influence of immigrants from non-ASEAN countries. Their concluding remark suggests that preference effects dominate over business network effects as the magnitude of the import elasticity is larger than that of export elasticity.

Lots more literature, on the contrary, observe more contribution of business networks rather than individual preferences. Wagner, Head and Ries (2002) find that a new immigrant to Canada on average expands exports to his native country by $312, and imports from his native country by $944 thanks to his advantage in business networks. They assume that immigrants are able to exploit trade opportunities to which non-immigrants have no access. Blanes (2006) find that a 10% increase in immigrants increases Spanish exports by 2.8% to 3.8% and imports by 1.8% to 2.6%. Evidence for network effect is found but there is not any indication of the contribution of personal preferences. Combes, Lafourcade and Mayer (2005) quantify the trade and business network in 94 French regions (départements) and observe a surprisingly large effect that the average level of French immigrant stocks doubles trade flows than that without immigrants. The study concludes that migrant information channel mitigates the loss caused by transportation costs and administrative borders.

Imbalance between effects on imports and exports is also mentioned by Bratti, De Benedictis and Santoni (2014), who provide evidence for larger effects of immigrants on imports than exports using Italian panel data at the province level. Specifically, the elasticity of imports and exports with respect to immigrants is estimated to be 0.594, and 0.128 respectively. Piperakis, Milner and Wright (2003) carry out a case study on Greece which has invited a huge migration since the late 1980s due to political unrest in nearby Balkan countries. Their finding supports the assumption that immigrant links increase export opportunities as the coefficient on migration is significant only for exports, not for imports. White (2007), on the other hand, focuses on the difference among origin countries. Despite the fact that immigration exerts a positive influence on aggregate Danish imports from and exports to the origin countries, the link is less obvious when considering trade with low-income countries.

Link between legal or voluntary immigrants and trade has received widespread attention. On the contrary, only a few of these papers value making the distinction between refugees and non-refugee immigrants which are quite different by their nature. One of the major reasons, as we understand, is the lack of refugee-focused

database as the procedure of refugee recognition is complex and inconsistent among different countries. Nevertheless, a few researches manage to fill the gap with the help of their unique data, mainly focusing on refugees to the United States. Getting help from the Bureau of Population, Refugee and Migration at U.S. Department of State, Mayda, Parsons and Steingress (2017) utilizes the Worldwide Refugee Admissions Processing System dataset, which provides individual-level information on all refugees resettled in the U.S. from 1990 to 2015, with detail of social and economic characteristics. Their study suggests that refugees have a significant impact on exports from the state of resettlement to origin countries, while the influence of imports is hindered by the economic hardship there. They also mention the establishment of local business by refugees to meet their demand as an alternative for imports. Parsons and Vézina (2018) take the exodus of Vietnamese boat people in 1975 as a natural experiment, and then provides causal evidence in their paper of positive impacts of Vietnamese refugees on trades between Vietnam and different US states. Cohen, Gurun and Malloy (2017) consider the establishment of Japanese internment camps during World War II, which they believe could be an instrument variable for the size of the Japanese population in US communities. The study reveals that firms surrounding interment camps have 60% more imports from and 63% more exports to Japan than other firms for every one standard deviation increase in population. Such positive effect is more significant if the firm has board members with Japanese connection.

That notwithstanding, it has been revealed in some other studies that refugees are less influential than voluntary immigrants because of their economic struggles and social inferiority. Head and Ries (1998) investigate 5 classes of immigrants on Canada's trade with 159 partner countries, and find that refugees have the least influence on trade, less than family immigrants, independent immigrants and business immigrants. By employing data on US immigrants and trade with a large set of home countries from 1996 to 2001, White and Tadesse (2010) find scarcely any influence of refugees on bilateral trades when compared with that of voluntary immigrants. They mention

that most refugees finally settle down in developed countries after spending some period of time in a third country as transition where they may have already adapted their tastes and preferences to goods and services available in that country. Despite the presumption that refugees should have a positive impact on trade, Ghosh and Enami (2015) find that changes in Afghani refugees is not the cause of movements in trade between Afghanistan and Pakistan. An indirect effect on bilateral trade, however, is observed via the foreign financial aid given to Afghanistan.

2.2 Non-trade Effects of Refugees on the Hosting Country

Although this paper focuses primarily on the link between refugees and trade, it is still necessary to take several impact on non-trade variables into consideration, such as prices, wages and rents because they are also determinant factors of international trade, and could provide us with new insights into mediating effects and moderating effects which we will discuss in **Chapter 5**. The study of Chambers (1986) is one of the earliest and the most comprehensive discussion on neglect of host populations. The analysis covers the potential damage to them mainly in five dimensions, namely food, land, labour and wages, services and common property resources, and economic development. As a conclusion, he calls for more balanced approaches to refugee assistance to get rid of the adverse impact on poorer hosting countries.

Following him, one of the most discussed topics on non-trade consequences is the general price level. Alix-Garcia and Saah (2010) focuses on the massive influx of refugees from Burundi and Rwanda into Tanzania from 1993 to 1994. They find that the unexpected arrival of refugees led to huge increases in food prices in markets adjacent to refugee camps. The event is also noticed by Baez (2011) which puts emphasis on education and health. Incidence of infectious diseases and mortality rates for local children worsened in villages closer to the border, and there was also a long-run negative effect on height and literacy human which gradually undermined the country's human resource accumulation. Cortes (2008) highlights the potential consequence of not only wage changes but also price changes as a result of

immigration. By employing confidential CPI data of the US and the instrumental variable approach, they find that every 10% increase in the share of low-skilled immigrants in the labour force reduces the prices of immigrant-intensive services by 1.3%. Their further research based on consumption patterns from the Consumer Expenditure Survey (CEX) reveals that low-skilled immigration increased the purchasing power of high-skilled native workers by 0.65%, while the purchasing power of low-skilled native workers dropped by 2.66%. Zachariadis (2012) develops a theoretical paradigm to explore how immigration affects the price gap between developed countries and developing countries. Using microeconomic price data from the Economist Intelligence Unit (EIU) across 19 countries, he substantiates the negative impact of immigration on prices through both demand and supply channels. The former one suggests that immigrants, with a lower opportunity cost of time, are more willing to look for better deals and thus put pressure on sellers to lower prices. The latter one suggests that suppliers are able to curb production costs as immigrant workers are receptive to wages below industry standards. Tumen (2016) takes the forced immigration from northern Syria to southeastern Turkey as a natural experiment, and study three main sectors: labour markets, consumer prices and housing rents. The research reveals a slight decrease in local unemployment and overall consumer prices, especially when it comes to informal labour-intensive industries. Residential segregation is also observed as rents for high-quality houses increased by 11% as a result of demand for safer neighbourhoods among native people. Saiz (2003) investigates how immigration affects local rental prices by looking at Mariel boatlift in 1980, a large scale smuggling of approximately 125,000 Cubans into Miami, United States. Rental prices in Miami, as we could expected, increased significantly following the exodus and the impact was most pronounced for rental units occupied by low-income Hispanic residents.

Wages and unemployment rate, as we could expect, face the challenge of a flood of refugees. Angrist and Kugler (2003) address the issue of employment consequences of immigration in Europe. Based on a theoretical framework and IV estimation, they

observe job displacement for native workers in the short run, and warn the extension of negative impacts in the long run in countries with more restrictive labour standards which prevent the entry of new companies that may hire local workers. Friedberg (2001) has his sights set on the removal of emigration restrictions after the collapse of the Soviet Union in 1991 and Israel's welcoming policy towards Jews living there. The baseline result indicates a 3.8% decrease in the wages of native Israelis who involved in the industries that witnessed an influx of Russian immigrants. Foged and Peri (2016) consider a refugee dispersal policy in Denmark between 1986 and 1998 which featured a random allocation of eight refugee sending countries across Danish cities without regard to personal preferences. Their findings suppport a consistent positive wage effects on low-skilled native workers who underwent a phased transition to less manual-intensive occupations since the increase in refugee immigrants. D'Amuri and Peri (2014) goes a step further by constructing measures of task intensity using the O*NET data from the U.S. Department of Labor. Their finding indicates that the rise of share of immigrants would lead to an increase in natives' specialisation in complicated tasks, which is also associated with increase in wages. Glitz (2012) notices a quasi-experiment in Germany in which upcoming immigrants were exogenously allocated to specific regions as they crossed the border, with strict punishments on non compliance. He finds that for every 10 ethnic German immigrants who manage to find a job, about 3.1 resident workers lose theirs, which is interpreted as a short-run displacement effect. On the other hand, no systematic evidence for decrease in relative wages is found in this study. Dustmann, Schönberg and Stuhler (2016) make a comprehensive summary of studies on how immigration affects local job markets. They attribute contradictory results of some of these studies to variations in empirical specifications and assumptions. National skill-cell approach answers how wages of experienced and inexperienced workers in the same education group differ after refugee shocks. Pure spatial approach, on the contrary, answers how wages of people within a specific geographical unit differ after refugee shocks regardless of the level of education.

Apart from all that, there is a handful of research suggesting positive impacts of refugee influx. Dryden-Peterson and Hovil (2003) acknowledge that refugees ensure a stable enrolment and continuous functioning in Uganda schools, thereby improving the local education system. Aiyar et al. (2016) find that the proportion of Syrian refugees who hold a degree of higher education is only slightly less than that among local residents. Therefore, if given fair working opportunities, they are fully capable of boosting economic growth in the hosting countries. Another demographic advantage is their age. It is estimated that an impressive 81% of refugees seeking asylum in the EU in 2015 were younger than 35 years old, while more than a half of them were between 18 and 34 (Desilver, 2015). The European governments may hence regard them as a strategic asset which brings youth to an aging Europe and is crucial for its long run development.

As mentioned above, the existing literature either focuses the impact on trade of all immigrants, including both voluntary immigrants and refugees, or only looks at refugees from a certain country caused by some historical events. This paper instead focus on all refugees entering the EU, and investigate their impact on not bilateral trade, but the imports from China due to the large volume and influence of such trade.

3. Data and Empirical Methodology

To assess the effect of refugee crisis on the imports from China, we gather several economic data including the timing of refugee influx, foreign exchange rate, inflation rate and other country-level characteristics. This chapter introduces the database and describes the econometric methods.

3.1 Sample Period and Dataset

The sample used in this study comprises 27 EU member states over the time span of 10 years, from 2010 to 2019 (Croatia became the EU member state on 1 July 2013 but there should be little impact of such enlargement on the regression because it is an inconsequential customer of Chinese goods among the EU countries.). As in many other papers featuring the 'DID' method, we consider a nearly symmetric time period — 4 years before the crisis and 5 years after the crisis — which is sufficiently long in order to carry out a comprehensive and convincing analysis. We prefer not to expand it further in order to avoid being influenced by the financial crisis in the late 2000s and the COVID pandemic in the early 2020s. Obviously, these exogenous shocks are much stronger than the influx of refugee that we are going to discuss, and thus will definitely distort the outcome of the our empirical approach.

In this thesis we consider only the imported goods from Chinese traders while excluding services which only took up a small porportion of total exports from China. The data is publicly available on the website of UN Comtrade, a dataset compiled by the United Nations Statistics Division, providing detailed global trade data sorted by product, trading partner and many other categories. The approach to compiling the statistics, though we have no access to, remains consistent with a strict criterion and is hence more comparable than statistics released by each member state since they are likely to employ different and obscure methods to collect trade data.

We also take annual reports by Fraser Institute on economic freedom of the world into consideration, in an effort to control some of the most important factors that influence

bilateral trades. As a Canadian public policy think tank, the institute releases a group of indexes which are divided into five categories: government interference in business activities, legal system and property rights, stability of currency, freedom of international trade and communication, market competition and regulation, each with more detailed subdivisions.

Finally we incorporate inflation rates and foreign exchange rates as macro factors that should also be major concerns for international trade practitioners. Inflation rates are provided by the world bank based on harmonized consumer price index, while foreign exchange rates are obtained from the International Monetary Fund and the European Central Bank. We include it because not all EU member states were a part of the Eurozone and some of them used their own currencies.

3.2 Identification Strategy

A difference-in-difference (DID) approach is employed to assess the potential negative impact of 2014 refugee crisis on imports from China to EU countries, based on the following regression setup:

$$\ln y_{it} = \beta_0 + \beta_1 (R_i \times C_t) + \boldsymbol{x}_{it}^T \boldsymbol{\delta} + \xi_i + \eta_t + \varepsilon_{it} \quad (1)$$

In equation (1), y_{it} accounts for the imports from China (in million US dollar and in logarithm). R_i is a dummy variable that equals one for refugee-hosting countries as defined in **Chapter 1** and zero otherwise. C_t is a time dummy variable that equals one after the year of 2014 and zero before 2014. $\boldsymbol{x}_{it}$ refers to a series of time-varying country-level control variables which will be specified in the next paragraph. ξ_i and η_t account for fixed effects of country and time respectively. The former one includes geographical location, cultural gaps and other factors that do not change over time, while the latter one includes interest rates of US dollar, shipping costs, state of Chinese economy and other factors that remain the same across EU countries. ε_{it} is an error term. According to **Hypothesis 1**, a negative β_1 with statistical significance is expected to be confirmed.

Several control variables are introduced in equation (1) to deal with omitted variable bias: **ln_FX**, the exchange rate of local currencies to US dollars (in logarithm), considering that 7 out of 27 EU countries use their own currency instead of euro. **INFLATION**, the inflation rate measured by harmonized index of consumer price (HICP). **LEGAL**, an index that measures the health of legal system and protection of property rights. **BARRIER**, an index that measures non-tariff trade barriers as a useful addition to the Common Customs Tariff (CCT) applied by all EU countries. **BUSINESS**, an indicator of business regulations that may have consequences for international trade such as regulatory burden, bureaucracy costs and tax compliance. **FREE ENTRY**, an indicator of freedom to enter markets and adapt to local business environment. Inspired by Chen et al. (2020), we also include an interaction term **ln_IMPORT_BASIS*YEAR**, which is the product of the time dummy and the imports from China in 2010 (in logarithm). Such setting allows the post-crisis trend of each country to be reasonably related to its initial level of trade flows.

Table 10 includes some descriptive statistics of variables mentioned above. Imports from China are so unevenly distributed that it could be as high as 126.75 billion USD (Germany, 2018) and as low as 0.14 billion USD (Malta, 2017). So it is with the foreign exchange rate, ranging from 0.0034 USD (per Hungarian Forint, 2019) to 1.9716 USD (per Latvian Lats, 2011). By taking logarithm of these two variables we compress the range and make them more normalised.

Table 6: Descriptive Statistics

	Observations	Mean	Std.	Min	Max	Median
IMPORT (bn.)	270	14.09	23.55	0.14	126.75	4.98
ln_IMPORT (mn.)	270	8.40	1.63	4.97	11.75	8.51
FX	270	0.9133	0.5035	0.0034	1.9716	1.1197
ln_FX	270	-0.54	1.36	-5.67	0.68	0.11
INFLATION (%)	270	1.46	1.44	-2.10	6.09	1.41
LEGAL	270	7.32	0.97	5.29	9.13	7.25

BARRIER	270	7.40	0.73	6.04	9.18	7.17
BUSINESS	270	6.69	0.99	4.86	8.64	6.79
FREE ENTRY	270	7.58	0.81	5.66	9.31	7.63

3.3 Hypotheses

In light of the fact that both preference effect and network effect do not hold for refugee immigrants, it is necessary to put forward some theoretical foundations for their possible impact on trades with the third country, which will be verified later.

Hypothesis 1*: The 2014 European refugee crisis created a negative impact on imports from China to refugee hosting countries in the EU.*

This is our central focus. Given that they was not any obvious trade barriers between these countries and China, we assume that the refugee crisis during that time could be important reason why the annual growth of imports from China to refugee-hosting countries had been lower than that of non refugee-hosting countries after 2014.

In addition to **Hypothesis 1**, we come up with several assumptions that explain what could be the ultimate cause, and how it works.

Hypothesis 2a*: Such impact was the result of a decrease in equilibrium salaries.*

A potential mechanism of the negative impact on trade lies in its influence on the local labour market. Given that most of the refugees were less educated and thus could only be engaged in low-skilled occupations, the great exodus was always followed by an exogenous shock to labour supply which, according to basic economic principles, drove down the equilibrium salary. This would lead to a decrease in disposable income for certain groups of people who then had no choice but to depress their demand on imported products.

Hypothesis 2b*: Such impact was the result of an increase in the unemployment rate.*

As plausible as **Hypothesis 2a**, the hypothesis argues that the financial situation of natives deteriorated amid more fierce competition in labour markets. Due to possible

stickiness of wages or any regulation or common pratices that restricted employers from cutting down wages of native residents, the labour cost stayed consistent but could be lower if they decided to hire refugees who were acceptable to lower wages and other benefits. In this case, a great number of jobs might be replaced by illegal immigrants. Nevertheless, given that there is always a strong association between salaries and unemployment rates (Seputiene, 2011), **Hypothesis 2b** is essentially similar to **Hypothesis 2a**.

Hypothesis 3*: Such negative impact was the result of softer consumer sentiment.*

Beside economic uncertainty, the sudden influx of refugees might weaken consumer sentiment on social uncertainty, or more specifically healthcare issues, public security and pressure on the social welfare system, which finally led to growing concern about social unrest. When faced with perceived instability, consumers might reduce discretionary spending and retailers could revise whether it was a wise choice to have more products in stock. Therefore, weaker consumer confidence is expected to be a reason why refugee waves led to less imports from China.

Hypothesis 4*: Such negative impact was the result of the rise of right-wing parties.*

Recent years have seen a zeitgeist shift that lower-class and middle voters are turning to right-wing leaders which prioritise national interests and are opposed to the EU's globalisation policies, such as Giorgia Meloni from the Italian Brothers (Fratelli d'Italia) and Viktor Orbán from the Hungarian Civic Alliance (Magyar Polgári Szövetség). In addition, refugee-related crime and religious conflicts have been the major campaign issues of right-wing politicians, such as Marine Le Pen from the National Rally (Rassemblement national) and Alice Weidel from the Alternative for Germany (Alternative für Deutschland). Soon coming upon the political scene with massive supporters, right-wing populist parties tend to formulate policies against foreign imports which they believe put domestic workers at a disadvantage. This will affect particularly imports from China which is often regarded as an formidable political force from an opposing camp.

4. Preliminary Results

4.1 Effects of Refugee Crisis on Imports from China

Our empirical analysis relies on the basic assumption that the number of refugee applications received by EU member states was unaffected by their trade volume with Chinese suppliers. **Table 7** shows the result of stepwise regression of equation (1) with country-level clustering which allows for correlation in error terms over time within countries. The simplest regression with 'DID' term only — taking nothing else into account — reports a significant coefficient of -0.1673, which suggests a 16.73% drop in imports from China by refugee-hosting countries compared with those countries which were not one of the most popular transit destinations.

The 95% statistical significance remains as we include more control variables, but in this case the negative impact escalates since the new coefficient indicates a decrease in trade with China of 20.94% in average among refugee-hosting countries. Deduction could be made that the set of macro economic variables and initial levels of trade offset a small proportion of the negative effect caused by refugee waves. The result therefore confirms **Hypothesis 1** in section 3.3 that the 2014 refugee crisis indeed had a negative effect on trades between hosting countries and China in the years after as we assume.

Table 7: The effect of 2014 refugee crisis on imports from China

	(a)	**(b)**
	ln_IMPORT	**ln_IMPORT**
DID	-0.1673***	-0.2094***
	(0.0597)	(0.0663)
ln_FX	-	0.0921***
		(0.0320)
INFLATION	-	0.9949
		(1.8012)

LEGAL	-	-0.0628 (0.1000)
BARRIER	-	0.0243 (0.0340)
BUSINESS	-	0.0892 (0.1142)
FREE ENTRY	-	-0.1739 (0.1425)
ln_IMPORT_BASIS*YEAR	-	0.0012 (0.0187)
CONSTANT	8.4305*** (0.0119)	9.4694*** (1.3515)
Two-way fixed effects	Yes	Yes
Clustering of errors	Country-level	Country-level
Observations	270	270
R^2	0.0717	0.1760

Note: *** p<0.01 ** p<0.05 * p<0.1

4.2 Parallel Trend Test and Event Study

A pertinent question that may naturally arise is whether the estimators in **Table 7** fail to exclude unobserved confounding factors that already existed right before the crisis. For example, if those 'refugee-hosting countries' had been implementing a certain economic system that was beneficial to internation trade even before the crisis, the trend was likely to continue all the time. In this case, the parallel trends assumption which the 'DID' approach relies heavily on would be undermined and our regression would only produce a meaningless result.

Furthermore, it would be helpful if we figure out how long did the negative effect of the refugee shock last and how it changed by years. Both could be perfectly addressed by introducing an extended DID model, or a so-called dynamic estimation which

allows us to trace out how the effect of refugee crisis evolved over time. Inspired by the estimation setting as in Beck (2010), we then examine the dynamics of the relation between refugee waves and trade by employing the following specification:

$$\ln y_{it} = \beta_0 + \sum_{\substack{k=2010 \\ k \neq 2013}}^{2019} \beta_k (R_i \times C_{kt}) + \boldsymbol{x}_{it}^T \boldsymbol{\delta} + \xi_i + \eta_t + \varepsilon_{it} \tag{2}$$

Equation (2) has basically the same setting as equation (1). The difference is that the time dummy variable C_t has been replaced by a series of dummy variables C_{kt} which equals one if $t = k$ and zero otherwise. Following a regular paradigm, we drop $R_i \times C_{2013,t}$, an interaction term that stands for one period before crisis, so as to avoid perfect multicollinearity. In this setting, β_k therefore accounts for the net effect of refugee crisis in year k compared with that in the year of 2013. To make our identification more convincing, we expect statistical insignificance of β_k for every $k \leq 2012$ and statistical significance of β_k for every $k \geq 2014$, which means that there were no pre-trends before 2012 and observable trends after 2014.

Figure 8 presents the estimated parameters in the form of a time plot which is often called as an 'event study' plot. Each point in the figure represents the estimated impact of refugee crisis taking one year before the crisis as a benchmark. To make the axis labels more comprehensible, let $T = 2014$ and other time period denoted as $T-4$, $T-3$, $\cdots, T+5$. The shadows account for 95% confidence intervals of each estimate. The figure illustrates two points: First, the assumption of parallel trend is strongly supported by the finding that coefficients β_{T-4}, β_{T-3} and β_{T-2} are all insignificantly different from zero based on a 95% confidence level. Second, regression coefficients from T to $T+5$ are all statistically significant except β_T. They are commonly interpreted as the time varying treatment effect after the one-time shock, which consequently suggests that the negative impact of refugees on imports from China persisted in the years, instead of being a short term exogenous shock.

Some researchers point out that the null hypothesis that aligns with the parallel trend assumption should be a joint test rather than doing tests for a single coefficient repeatedly (Zhang and Huang, 2023). In this case, specifically, we are supposed to conduct a joint-F test for $\beta_{T-4} = \beta_{T-3} = \beta_{T-2} = 0$, which eliminates potential errors that individual t-tests may lead to. The p-value for such test is 0.3430, implying that there is no clear evidence that imports from China to refugee hosting countries were growing at a different speed from that to non-refugee hosting countries.

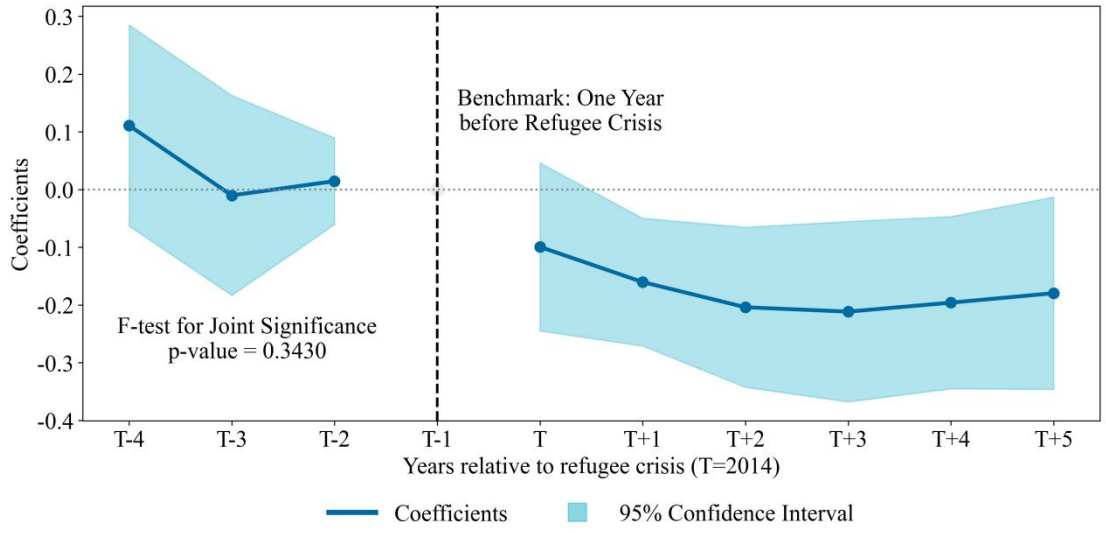


Figure 8: Event study for parallel trend test

Note: This figure shows the coefficients and 95% confidence intervals of β_k in equation (2). T represents the time of 2014 refugee crisis to make the plot more comprehensible. For example, the scatter with an x-coordinate of $T+1$ implies the net effect one year after the exogenous shock, that is, in year 2015, with that in year 2013 acting as a baseline. Country-level clustering of error terms is employed.

4.3 Placebo Test

In the previous chapter, we come up with some empirical evidence that the sudden influx of refugees into the EU in 2014 was a great cause of decline in imports from China. Even though we have also confirmed that there were no unparalleled trends in imports between refugee-hosting countries and non refugee-hosting countries before the crisis, such interpretation should be proceeded with caution that the negative impact on trade was caused by foreign immigrants. This is because the parallel trend test, by its very nature, is based on the logic that it would be hard to believe the

post-trends are parallel if the pre-trends are unparalleled, and that parallel pre-trends would boost our confidence on parallel post-trends. Therefore, such test will only provide indirect evidence for the parallel trends, which means that no assertion could be made about necessity or sufficiency (Kahn-Lang and Lang, 2020). In fact, it is impossible to tell whether post-trends are parallel because there is no way to get back to the world where the one-time shock had not happened.

To be more specific, in our case, the major threat to such statement resides in the fact that the mainland of Europe had witnessed a chaotic period of not only migrant crisis, but also wars and conflicts, terrorist and extremist attacks, controversial referendums, economic struggles and debt crisis. Therefore, it would be a legitimate concern that refugee waves were not the real culprit considering that refugee-hosting countries, for a certain reason, happened to be more susceptible to exogenous shocks during a tumultuous decade.

To delve deeper into these concerns, this chapter focuses on placebo tests which would prove (or prove false) that the treatment effects should not be attributed to unobservable confounding factors. Two types of test will be hereby discussed in this section. We use in-time placebo test to find out whether the year of 2014 was a crucial timing that leads to the structural change, and use in-place placebo test to review whether the division of 27 EU member states into refugee hosting countries and non-refugee hosting countries makes sense. They could also be a great complement to our estimation because they help reduce the error to some extent for a model with relatively few observations (Bertrand, Duflo and Mullainathan, 2004).

4.3.1 In-time Placebo Test

The in-time placebo test is based on the idea that it should be impossible to find the 'DID' term significant if we deliberately select a false treatment time before the real intervention. Specifically, following the setting as in Kroft and Pope (2014) and Huet-Vaughn (2019), we push back the ending year of our study to 2013 so that there would not be a mixed effect of placebo and the real treatment. On the other hand, we

find the year of 2002 an appropriate choice for the new starting year. Firstly, it was at the end of 2001 when China become a member of WTO, which was essential for the East Asia power to integrate itself into the global economy although the organisation is now ineffective at solving international trading conflicts at present. The substantial growth of China-EU trade since then, has been expected to be more than 10% per year because the involvement required China to make public commitment to international trade regulations that facilitated exports to the continent of Europe. Secondly, it was also the year when Euro coins and banknotes were launched and put into circulation after acting as 'book money' only for three years. Therefore, it is thus possible to keep the control variable of foreign exchange rate in our regression equation by simply altering the time period for data extraction. Nevertheless, since there should be a year before the starting year which serves as a control for the basis level, the sample period is supposed to begin in 2003.

It is also noteworthy that this time period saw the EU's eastward expansion with ten new member states in 2004 and two in 2007, culminating in Croatia's accession in 2013. Therefore, an another control variable that indicates whether the country is an EU member state is included in the regression, which has the following setups:

$$\begin{aligned}
\ln y_{it} &= \beta_0 + \beta_1 (R_i \times C_{2004,t}) + \boldsymbol{x}_{it}^T \boldsymbol{\delta} + \delta_1 \times EU + \xi_i + \eta_t + \varepsilon_{it} \\
\ln y_{it} &= \beta_0 + \beta_1 (R_i \times C_{2005,t}) + \boldsymbol{x}_{it}^T \boldsymbol{\delta} + \delta_1 \times EU + \xi_i + \eta_t + \varepsilon_{it} \\
&\vdots \\
\ln y_{it} &= \beta_0 + \beta_1 (R_i \times C_{2013,t}) + \boldsymbol{x}_{it}^T \boldsymbol{\delta} + \delta_1 \times EU + \xi_i + \eta_t + \varepsilon_{it}
\end{aligned} \tag{3}$$

In equation (3), the time subscript t ranges from 2003 to 2013. Time dummies C_{kt} equals one if $t = k$ and zero otherwise where k is from 2004 to 2013. **EU** indicates whether or not the country is a member state of the EU. These regressions are not only a test for potential confounding factors, but also allow us to carry out a review of 'expectation effects' — one would be more prudent to spend on imported products in advance if he had already expected the influx of refugees which might lead to social and economic unrest, given that there was an underlying trend of fleeing to

Europe. In that case, it should be considered whether to assign another year before 2014 that represents the refugee shock.

Figure 9 demonstrates the results of these regressions. Coefficients of the fake 'DID' term are all insignificantly different from zero regardless of the choice of fake treatment time. The result thus complements our event study in which the joint F-test for pre-trend coefficients are reasonably regarded as an in-time placebo test to some extent (Miller, 2023), and proves false the placebo treatment effects and expectation effects. This is quite a satisfying result as we have conducted a rigorous analysis which includes every single year as the fake treatment year. On the contrary, some other literature report them selectively. For example, they include in the paper only the fake treatment time that results in insignificant placebo treatment effect, and exclude those that will undermine the credibility of their regression.

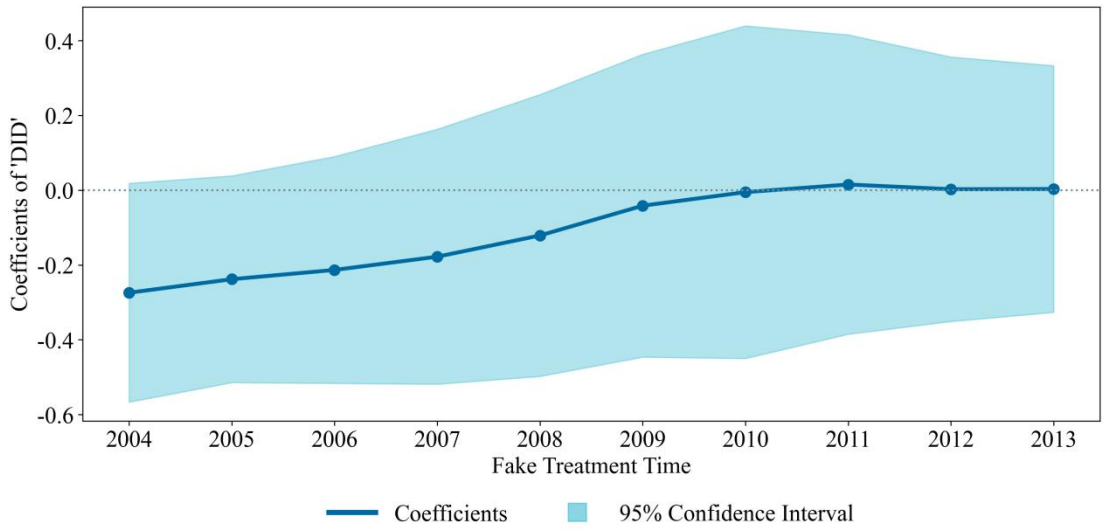


Figure 9: In-time placebo test

Note: This figure shows the coefficients and 95% confidence intervals of β_1 in equation (3). The x-axis stands for the fake treatment time and determines which dummy is incorporated in the equation. For example, if $x = 2004$, then the y-axis indicates the results of regression which includes $C_{2004,t}$. Country-level clustering of error terms is employed.

4.3.2 In-space Placebo Test

The in-space plabeco test, also known as entity placebo test, designates fake treatment entities either randomly or for specific purposes (e.g. to rule out a competitive theory that leads to different result from what the author expects). Since the selection is not based on a convincing idea, no treatment effect is expected to be observed under the new setting. Although non-random placebo treatment groups are used in some most well-known studies (Bloom et al., 2019; Cao and Chen, 2022), we prefer selecting them randomly so that the result would not be severly influenced by selection bias. Following the idea of Chen, Qi and Yan (2025), we conduct the random permutation by selecting random fake treatment groups for 1,000 times, each consisting of 11 countries. The new country dummy R_i^* equals one for these 11 countries and zero for others, and the regression equation is

$$\ln y_{it} = \beta_0 + \beta_{(j)}^* (R_i^* \times C_t) + \boldsymbol{x}_{it}^T \boldsymbol{\delta} + \xi_i + \eta_t + \varepsilon_{it} \tag{4}$$

where $\beta_{(j)}^*$ accounts for the placebo treatment effect in the j-th sampling. If the null hypothesis $\mathbf{H}_0: \beta_1 = 0$ is true, we naturally expect that the coefficient of 'DID' term in regression (1) should not be at an extreme end compared to the distribution of the in-place placebo effects $\left\{\hat{\beta}_{(1)}^*, \hat{\beta}_{(2)}^* \cdots \hat{\beta}_{(1000)}^*\right\}$. Since it is a non-parametric test, it would be difficult for us to derive a regular test statistic. However, Galiani and Quistorff (2017) introduce a two-tail p-value which is essentially the frequency with which the placebo effect is larger than the original treatment effect:

$$p = \frac{1}{1000} \sum_{j=1}^{1000} \mathbf{1}\left(\left|\hat{\beta}_{(j)}^*\right| \geq \left|\hat{\beta}_1\right|\right)$$

where $\mathbf{1}(\cdot)$ is an indicator function that equals one if the inequality in parentheses holds and zero if not. It is also advised that a one-tail p-value

$$p = \frac{1}{1000} \sum_{j=1}^{1000} \mathbf{1}\left(\hat{\beta}_{(j)}^* \leq \hat{\beta}_1\right)$$

would be more efficient in our case given that the real effect is significantly negative. Nevertheless, the result remains indifferent. **Figure 10** depicts the results of random sampling in a scatter plot, in which two dashed lines stand for the real treatment effect, which is 0.2094. The estimated in-space placebo effects for almost all samples, as we expect, fall into the range within ±0.2094, leading to a p-value of 0.0020. In consequence, our previous division of EU member states into refugee-hosting and non refugee-hosting is essentially a tenable setting instead of a random choice.

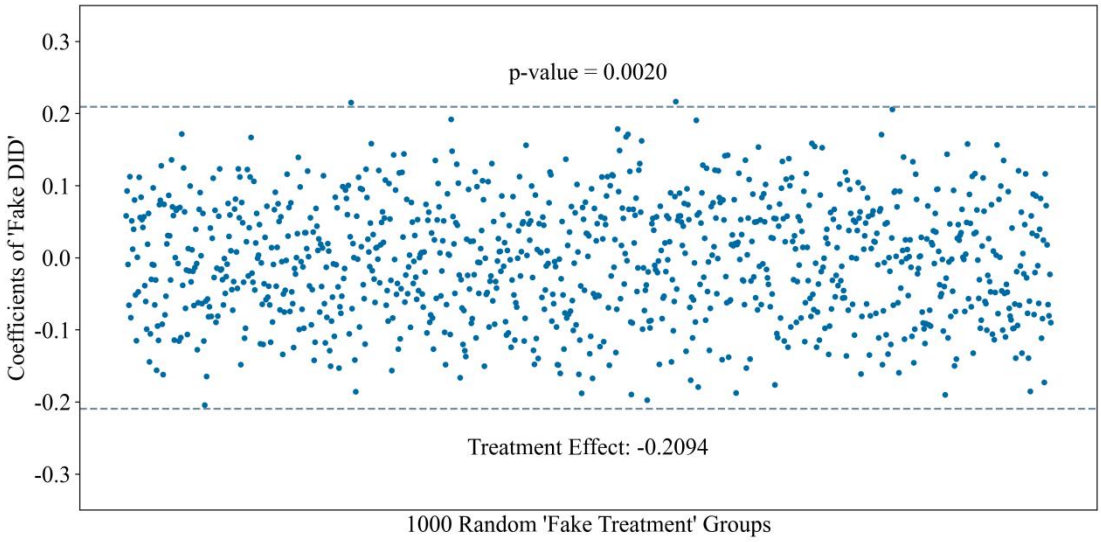


Figure 10: In-space placebo test

Note: Two dashed horizontal lines in the figure account for $\hat{\beta} = \pm 0.2094$, and 1000 scattered points represent the estimated placebo treatment effect based on each random sample. Since only 2 of them go beyond the bounds, the p-value is 2/1000 = 0.002.

5 Further analysis on the Refugee Shock

5.1 Channel and Mechanism

In light of the fact that both preference effect and network effect fail to explain why the influx of refugees would lead to the decline in imports from China which is an unintended consequence, we want to delve deeper into the mechanism by testing the hypotheses proposed in Chapter 2. To be more specific, we will conduct analyses on the mediating effect and the moderating effect. The former one focuses on how the indirect and unexpected negative effect on Chinese imports was transmitted through

one or more mediators. The latter one refers to how the effect varied from state to state, based on certain moderators.These analyses would allow us to understand the main effect at a deeper level, and also to come up with some measures that better coordinates the recovery of international trades and the humanitarian resettlement of refugees.

Due to the complexity of causal studies, there is not a widely accepted method for testing the mediating effect. Instead, scholars have been coming up with multiple theories that sometimes apply only to their own study. In general, the basic structural form of such test is composed of the following equations:

$$\begin{cases} Y = a_0 + a_1 X + \varepsilon_1 & \text{(i)} \\ Y = b_0 + b_1 X + b_2 M + \varepsilon_2 & \text{(ii)} \\ M = c_0 + c_1 X + \varepsilon_M & \text{(iii)} \end{cases}$$

where X and Y are the explanatory variable and dependent variable, and M is the potential mediator. Baron and Kenny (1986) are the pioneers in this field who developed 'causal steps approach': the mediating effect exists when $a_1 \neq 0$, $c_1 \neq 0$, $b_2 \neq 0$ in the statistical context, while $|b_1| < |a_1|$ which indicates that the effect of X on Y is either partially or entirely absorbed by M. However, these four criteria were proved unnecessary in later studies (Hayes, 2009). Moreover, oppositions were raised that that causal studies should not be supplanted by abused statistical analyses (Judd and Kenny, 2010; Bullock et al., 2010). After going through a lot of literature, Jiang (2022) points out that we should remain prudent when interpreting coefficients in equation (ii) since b_1 and b_2 are statistically consistent estimators only under some regularity conditions that are rarely met in practice. Consequently, he suggests that attention should be paid to equation (i) and (iii), with necessary theoretical analyses on why M has an effect on Y. Alesina and Zhuravskaya (2011) and Persico et al. (2004) acknowledge the shortcomings of this setup, but forcefully argue that the inclusion of M in equation (iii) could also provide us with a circumstantial evidence for mediating effect albeit the inherent endogeneity in the system. Their

suggestion is to check whether including M in the preliminary estimation leads to markedly change in the coefficient and significance of the core independent variables and the adjusted R^2 of the equation. In a more recent study, Di Giuli and Laux (2022) introduced a quasi-instrumental variable framework where X plays the role as an instrumental variable (IV) for M:

$$\begin{cases} M = c_0 + c_1 X + \varepsilon_M & \text{(i)} \\ Y = b_0 + b_2 M + \varepsilon_2 & \text{(ii)} \end{cases}$$

Intuitively, this decomposition, with a similar setting to the standard IV estimation, provides us with two standard errors on X and M respectively and allows us to discern whether the two-stage logical chain is tenable. In this case, we should find statistical significance of both c_1 and b_2. On the contrary, the mediation should be called into serious question if any of the links is found insignificant. However, this setup requires additional tests which check for its relevance (M is strongly correlated with X) and exogeneity (M is uncorrelated with ε_2).

The test for moderating effect is, on the contrary, less controversial than the discussion on mediating effect. It relies on the introduction of an interaction term:

$$Y = \beta_0 + \beta_1 X + \beta_2 M + \beta_3 (X \cdot M) + \varepsilon$$

where X and Y are the explanatory variable and dependent variable, and M is the potential moderator. Such setting allows the partial derivative of X with respect to Y to be dependent on M. Quantitatively we have

$$\frac{\partial \mathbb{E}(Y|M=m)}{\partial X} = \beta_1 + \beta_3 m$$

In consequence, the effect of X on Y gets larger as M increases if the estimation indicates that $\beta_3 > 0$, and vice versa.

5.1.1 Decline in Equilibrium Salaries

It has been well analysed in standard economic models that the number of workers in local job markets will increase as refugees entering the EU all have an immediate need to earn a living (Borjas, 2013). More intensified competition in the job market, consequently, put downward pressure in equilibrium salaries, and hence disposable household income which will inevitably lead to a downturn in Chinese imports as consumer purchasing power weakens. However, there is also a chance that labour productivity and labour demand will increase as immigration creates an incentive for capital to accumulate in the hosting country, thereby alleviating the negative impacts of supply shock on wages (Friedberg and Hunt, 1995).

To test whether the inflow of refugees led to a decrease in equilibrium salaries and thus imports from China, we obtain the average annual full-time adjusted salary for employees released by the Eurostat and consider the following equation:

$$\ln w = \alpha_1 + \beta_1 \cdot DID + \boldsymbol{x}^T \boldsymbol{\beta}_1 + \xi_1 + \eta_1 + \varepsilon_1 \tag{5}$$

where w is the average salary. The first column in **Table 11** shows the estimation of equation (5) in which the coefficient of DID is insignificantly different from zero. The assumption that salary is a mediator is therefore disproved.

However, there is a chance that salary acts as a moderator, which can be verified by the following equations:

$$\begin{cases} \ln y = \beta_0 + \beta_1 \cdot DID + \beta_2 \cdot \ln w + \boldsymbol{x}^T \boldsymbol{\beta}_2 + \xi_2 + \eta_2 + \varepsilon_2 \\ \ln y = \beta_0 + \beta_1 \cdot DID + \beta_2 \cdot \ln w + \beta_3 (DID \times \ln w) + \boldsymbol{x}^T \boldsymbol{\beta}_3 + \xi_3 + \eta_3 + \varepsilon_3 \end{cases} \tag{6}$$

where y refers to the imports from China. As shown in the second column in **Table 11**, the coefficient of DID remains statistically significant and only a small change is seen. The coefficient of salary is significantly positive, but we prefer not to focus on the figure itself to avoid being confused by potential endogeneities. The third column involves an interaction term between salary and DID, which is found significantly

positive with adjusted R^2 goes larger, thereby being a convincing proof that that our assumption for moderating effect is reasonable. In this case

$$\frac{\partial \mathbb{E}(\ln y | W = w)}{\partial DID} = -2.2194 + 0.1913 \cdot \ln w$$

The negative impact of refugee influx would be mitigated as salary grows higher, which corresponds with our basic understanding that low-paying industries would bear the brunt of shocks in the labour market. As a further study, we plot the partial effect and its 95% confidence interval in **Figure 12** so that we are ablt to understand how the effect varies with salaries. The x-axis accounts for salary instead of its logarithm form to make it more comprehensible. The y-axis stands for the partial effect on imports from China attributed to the 2014 refugee crisis. Impacts are estimated to be dramatic for low-income countries, for example Hungary and Greece, and ease off for high-income countries, such as Netherlands and Denmark. The shock to middle-income countries like France is as expected similar to the baseline effect which is given by equation (b) in **Table 11**.

Table 11: Test on salary as either a mediator or a moderator

	(a)	**(b)**	**(c)**
	ln_SALARY	**ln_IMPORT**	**ln_IMPORT**
DID	-0.0062	-0.2056***	-2.2194**
	(0.0353)	(0.0608)	(0.9665)
ln_SALARY	-	0.6089***	0.6061***
		(0.2041)	(0.1977)
DID×ln_SALARY	-	-	0.1913**
			(0.0926)
Control Variables	Yes	Yes	Yes
Two-way fixed effects	Yes	Yes	Yes
Clustering of errors	Country-level	Country-level	Country-level

Observations	270	270	270
R^2	0.2112	0.2599	0.2845

Note: *** p<0.01 ** p<0.05 * p<0.1

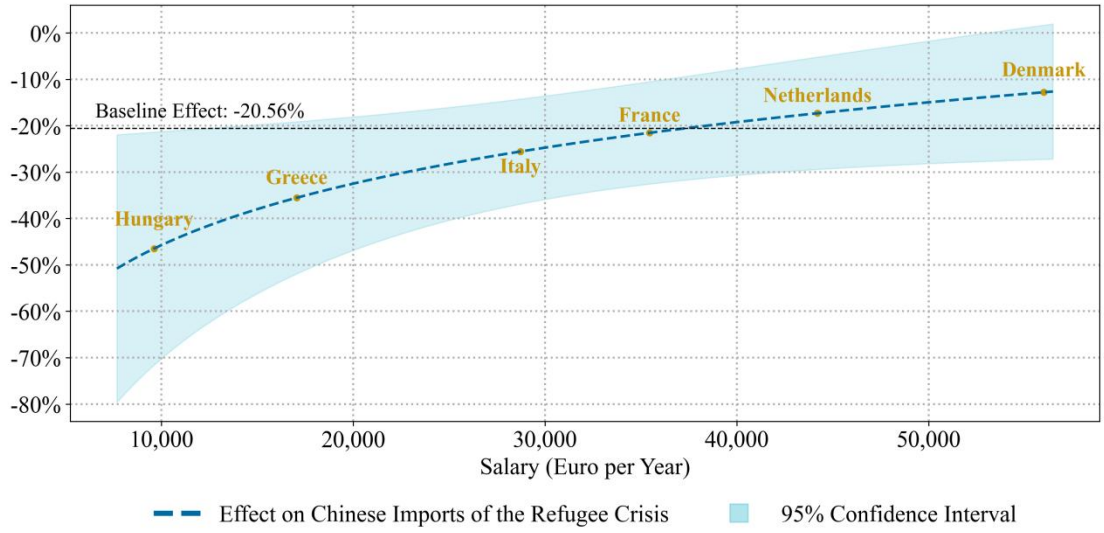


Figure 12: Moderating effect of salary

Note: The baseline effect refers to equation (2) in **Table 10** which includes salary but excludes the interaction term.

It is worth addressing the fact that the shock of immigration might differ across industries. For example, native workers similar to immigrant workers would bear the brunt, while complementary workers benifited from working with refugees since the aggregate productivity rose up (Edo, 2019). Given that this conceptual framework could possibly explain why no mediating effect is observed, a more comprehensive study should include the distribution of skills and occupations of refugees, which, to our best knowledge, is not publicly available at present.

Although we have had a detailed discussion on salary, it would also be beneficial to have a look at an another factor related to the labour market — unemployment rate. Our concern lies in the ratchet effect which implies that lowering wages is considered unacceptable even if the labour market is a buyer's market, especially in the EU where labour rights has long been a major concern of most parties. Anticipating inflexible demands for salaries, employers would be reluctant to scale up production and hire more. The potential increase of unemployment could also lead to decline in

demand for imported goods. However, it is clear in theory that the unemployment rate is highly correlated to salary because it usually goes higher as the latter one declines. The multicollinearity is also proved practically as shown in **Table 13**: incorporating unemployment into the equation leads to only little change in R^2, and the coefficient is not significant, implying that most of its effect on imports is absorbed by salary. Consequently, there is no need to include it in our study in addition to salary.

Table 13: Explanatory power of salary and unemployment

	(a)	(b)	(c)
	ln_IMPORT	**ln_IMPORT**	**ln_IMPORT**
DID	-0.2094***	-0.2056***	-0.1882***
	(0.0663)	(0.0608)	(0.0624)
ln_SALARY	-	0.6089***	0.5413**
		(0.2041)	(0.2456)
UNEMPLOYMENT	-	-	-0.8073
			(0.7736)
Control Variables	Yes	Yes	Yes
Two-way fixed effects	Yes	Yes	Yes
Clustering of errors	Country-level	Country-level	Country-level
Observations	270	270	270
R^2	0.1760	0.2599	0.2685

Note: *** p<0.01 ** p<0.05 * p<0.1

5.1.2 Loss of Consumer Confidence

Conclusions have been well revealed by our previous study that salary played a moderating role in the channel through which the refugee crisis affected Chinese imports. Although it provides us with better insights into the unexpected shock, it is essentially a lagging statistic that reflects economic performance in the past, and is released months or even more than a year later after the changes take place. The

downside of the labour market indicators prompt us to pay attention to some leading indicators that may also be mediators or moderators.

Among a large number of available statistics, we take the European Union Consumer Confidence Indicator (EUCCI) into consideration because it is a representative and comprehensive indicator that adequately reflects the general opinion of EU consumers on economic conditions for the next 12 months. The indicator is calculated and seasonally adjusted according to the survey respondents' attitude towards specific questions regarding financial situation, general economic situation, unemployment expectations and savings expectations. **Figure 14** illustrates how this index varied over time. The sad part of the story is that consumers in most of the EU countries were not confident with economic conditions through out the decade 2010-2019, while such pessimistic idea was dispelled as they cleared a hopeful path back to their lost position from the massive financial and debt crisis. It is also noticeable that refugee-hosting countries witnessed a slower recovery after the 2014 refugee crisis even though their confidence before 2014 was apparently stronger than that among non refugee-hosting countries. One rational inference from the unsatisfying cross of these two lines in 2014 is that the unprecedented influx of refugees shook their confidence and expectations of social security.

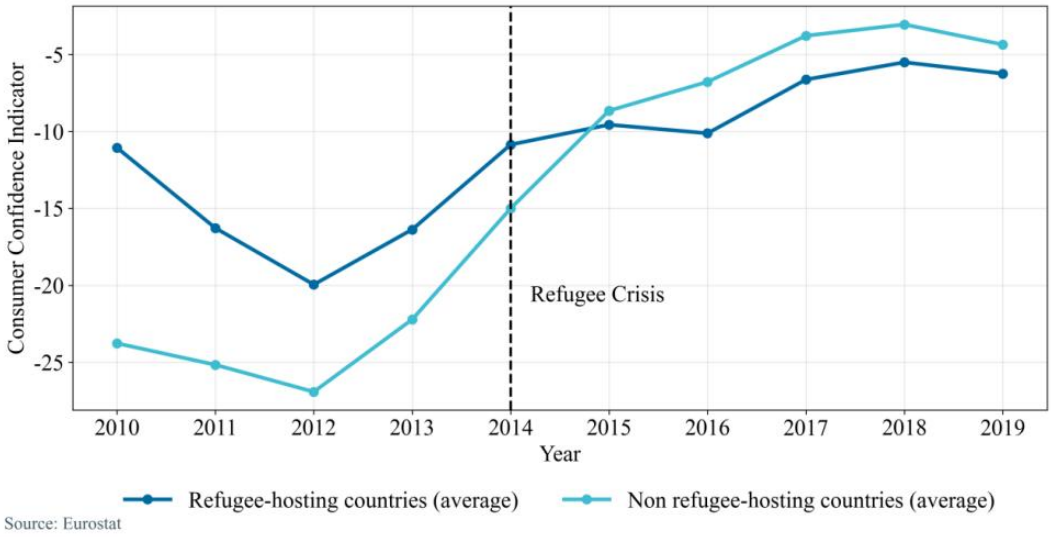


Figure 14: Consumer Confidence Indicators of the EU countries

At least in theory, lower consumer confidence, in general, leads to more precautionary savings and less spending on unnecessary goods, and thus less imports from China. In this case, consumer confidence serves as a mediator that explains why the refugee crisis would cause decline in imported goods. There is also empirical evidence to back this up. Carroll, Fuhrer and Wilcox (1994) points out that consumer sentiment index helps predict future changes in household spending, including imported products. Kucuk (2005) emphasises the importance of consumer confidence in developed economies to predicting household consumptions in the future, especially for durable and specialty goods which make up a large proportion of Chinese imports. Dées and Brinca (2013) finds a significant correlation coefficient of 0.28 between the logarithm change in real consumption and the absolute consumer confidence in the Eurozone, which proves that consumer confidence is strongly indicative of future spending on foreign imports.

Based on the suggestion by Jiang (2022), what we have to do now is to verify the association between the change in consumer confidence index and the refugee crisis in 2014. As in most studies of its kind, we have to assume that confidence index serves as a good proxy of public perceptions about economic outlook although the sentiment survey contains too many ambiguous questions for the respondent and acts better as a qualitative variable than a quantitative one (Dominitz and Manski, 2004). As an empirical analysis, we consider an equation in which the consumer confidence index is the dependent variable, and DID is the explanatory variable. The result is shown in **Table 15**. Negative significance is found in the coefficient of DID, which corresponds well with our previous assumption that consumer confidence declined as refugees entered the EU. Though more like a circumstantial evidence, we are now able to conclude that the consumer confidence index in EU countries, acts as a mediator through which the refugee waves influence imports from China.

Table 15: The 2014 refugee crisis influenced consumer confidence in the EU

	CONFIDENCE
DID	-10.9560***
	(3.7362)
Control Variables	Yes
Two-way fixed effects	Yes
Clustering of errors	Country-level
Observations	270
R^2	0.1911

5.1.3 Rise of Right-wing Political Parties

International trade is always dependent on political factors that determine tariffs and other trade policies. What we establish earlier in this paper, however, focuses only one economic factors. Therefore, it would be a good complement to our argument to take political issues into consideration, which we refer particularly to the fierce opposition of unrestricted imports, or in a broader sense, globalisation. Before falling back in recent years, economic globalisation had been expanding at an increasing rate due to massive improvements in transportation across continents, telecommunications services and internet infrastructures, featuring awareness of comparative advantages and global industrial specialisation (Feenstra and Weinstein, 2017). Such economic landscapes allows EU countries to focus on high-tech and high-end manufacturing while enjoying imported energies and primary industrial products at lower costs. Despite the economic growth and poverty reduction it has brought, globalisation also leads to unwanted regional and industrial redistribution as imported products hit local markets hard and thus cause unemployment (Bussman and Schneider, 2007). The huge political backlash against globalisation is then provoked among losers in EU countries who call for goverment compensation. As a consequence of that, right-wing parties enter the EU political stage, taking a firm position of protectionism.

Tracing back to the beginning of this century, opposition to excessive international trade was in fact a left wing political logic which was mainly concerned with the labour dispute since the disorderly expansion of multinational conglomerates had a serious detrimental impact on labour rights (Milner and Judkins, 2004). Refugees from different ethnic groups at that time were deemed also as victims of capitalist exploitation, and natural allies with which the left-wing could work together against globalists. However, opposition to international trade and globalisation is now closely intertwined with the resistance to refugees amidst recent right-wing political thought which puts identity ahead of social class as both are believed to take away social resources from the dominant ethnic group and make them de facto marginalized ones.

Whether or not such political propaganda is ultimately correct, recent elections in the EU countries were indeed dominated by public concerns about the refugee crisis and economic instability which greatly reshaped political landscapes. Exposure to the refugee influx increased extreme-right rhetoric (Sakib and Ishraque Osman, 2020) and fuelled support for right-wing parties (Inglehart and Norris, 2016; Dinas et al., 2019). Apart from the refugee crisis, there was also widespread discontent at the longlasting stagnation and industrial recesssion. Voters would then blame mainstream politicians for unfavoured globalisation policies (Costa-Perez et al., 2012) and turn in favour of the right-wing populists (Rodrik, 2011). **Table 16** shows how the nearest election year after 2014 witnessed the dramatic rise of right-wing parties in many refugee-hosting countries. Increasing share of votes gave them a favoured position in the joint government to act on their radical claims. With a tough stance on immigration-related issues, politicians tightened rules for people to seek asylum and bolstered the enforcement of repatriation laws. When it comes to international trade, it is a broad consensus for right-wing supporters that import bans should be applied. Particularly, they regard China as the biggest rival given its large production capacity and for fear that it would take its advantage in labour costs to keep ‘dumping’ which is damaging for local industries. This dramatic shift in the EU politics inspires us to include election-related statistics as a mediator into our regression.

Table 16: Popularity and political claims of some right-wing parties in the EU

Party	Country	Vote share in the nearest election year after (before) 2014	Policy related to refugees	Policy related to trade with China
La République En Marche (*)	France	28.21% (-)	to reduce net legal immigration from 182,000 to 10,000 per year	prioritise French producers which its leader called 'economic patriotism'
Alternative für Deutschland	Germany	12.60% (4.70%)	end mass immigration except skilled immigrants who speak German	be against communism and compare Angela Merkel to East German 'Stasi'
Νέα Δημοκρατία	Greece	39.85% (29.70%)	accused of misusing 'administrative detention' against refugees	invited China to invest in its port if Piraeus with important strategic status
Lega Nord	Italy	17.39% (4.10%)	take a tough stance on immigration from Muslim countries to protect the 'Christian Identity'	restrict imports and is opposed to globalisation because they threaten the cultural identity of Northern Italy

Note: ① Election data are obtained from CHES as clarified in the following paragraph. Claims of parties come from their official sites and Wikipedia. ② Since it is not a paper on political science, we conclude in the table only generic ideas with potential bias which, nevertheless, are sufficient to support our argument that the rise of right-wing parties may play a mediating role. (*) La République En Marche was renamed Rassemblement national (RN) in 2018.

Although the electoral database is publicly available, it is a complex undertaking to define a party's tendency to move to the right. In this study, we employ the political database provided by Timbro, a Stockholm-based leading think tank which has been tracking the major ideological trends in European politics for decades. The database covers nearly 300 parties from all the EU countries since 1946 and records share of votes in the national elections. These parties are categorised into a handful of party families, such as liberals, conservatives and populists, which allows us to define an election-related variable included in the estimation: **RIGHTVOTE**. It refers to the total share of votes received by all the parties categorised as 'radical right populist'. We then apply a logarithm transformation to reduce potential heteroskedasticity and make the result less affected by extremes. For non-election years, the index is calculated based on linear interpolation.

Since the classification of parties is a little bit generic in the Timbro data, we consider another database called the Chapel Hill expert surveys (CHES), which is managed and released by The University of North Carolina at Chapel Hill's Center for European Studies. The survey contains questions on immigration, decentralization, and other EU-related policies that reflect the general position of the same parties as mentioned above. Quantitatively, they classify the general ideological view of a party on a certain question as a number from 0 (extreme left) to 10 (extreme right). We further define **RIGHTINDEX** as an index that measures how 'right' a country has gone by summing up answers to our concerned questions only. To be more specific, the right index of a party is obtained by taking into account their position on market regulation, immigration policy, integration of immigrants, and minority rights, each ascribed a particular weight. The right index of a country is then calculated as the weighted average of that of all parties in that country, where share of votes are the weights. Similarly, for non-election years, the index is calculated based on linear interpolation.

Table 17: Index measuring a party's right-wing tendency

Issue	Left (0)	Right (10)	Weight
Market Regulation	strongly favors deregulation	strongly favors regulation	30%
Immigration Policy	strongly favors a liberal policy	strongly favors a restrictive policy	40%
Integration of Immigrants	strongly favors multiculturalism	strongly favors assimilation	20%
Minority Rights	strongly favors more rights	strongly favors equal or less rights	10%

Table 18 shows the result of regressing **RIGHTVOTE** and **RIGHTINDEX** on *DID* respectively. In contrast with the findings of Sun and Feng (2023), both coefficients are insignificantly different from zero, indicating that our previous assumption about the mediating effect of right-wing politics is not tenable. The insignificance remains even if the dependent variable is replaced with the share votes of conservative parties and regionalist parties which are also likely to impose ban on Chinese imports.

Table 18: Test on right wing power as either a mediator or a moderator

	(a)	(b)
	ln_RIGHTVOTE	**RIGHTINDEX**
DID	0.0564	0.0111
	(0.1307)	(0.2662)
Control Variables	Yes	Yes
Two-way fixed effects	Yes	Yes
Clustering of errors	Country-level	Country-level
Observations	270	270
R^2	0.1563	0.0961

Note: *** p<0.01 ** p<0.05 * p<0.1

The reason behind it, as we understand, could be more than a few. Most importantly, we are not able to deal with the most fundamental weakness in this setup that the data are only available in the election years which usually take place every four years in most of the EU countries. The method of linear interpolation which we employ as a remedy implies that approval ratings of parties varied in a basically flat way during the period which is in reality unrealistic. The most critical change in political dynamics in 2014, consequently, might be obscured by such estimation. Meanwhile, election polls are not good substitutes for indermediate periods because the voters tend to 'vote with their foots' instead of showing populist and conservative ideas in a mobile phone survey which are believed to be less socially acceptable than liberal stances. Even if we manage to get access to some unbiased and representative polls, it would also be difficult to make these database comparable across EU countries in sampling and designing questions. Another reason is that we fail to consider the information overflow from refugee transit countries to those temporarily unaffected countries, that is to say, voters there might call for tougher parties and stricter rules and checks for immigrants for fear that refugees would overwhelm the administrative system in the future even if it had not happened yet. Actually, such cases of illegal attempts to cross the borders within Schengen areas are not new in the last decades. Furthermore, the EU Common Commercial Policy (CCP) limits a single member state to implement trade bans on other countries even if its ruling party desires to do so, that is, any restriction would be imposed both in refugee-hosting and non refugee-hosting countries as a result of negotiation and compromise, making the coefficient of DID insignificant. Finally, as we have already established, the rise of right-wing governments was possibly driven primarily by long-standing anger against the political elite triggered by economic collapse in 2008 since they could no longer tolerate these elites to make policies for their own gains and political advantages at the expense of the overall well-being of local people. Refugee crisis during the 2010s, however, is just another example of how unscrupulous these politicians could be to grab reputations without thinking about possible negative consequences.

5.2 Industry heterogeneity

In this chapter, we try to understand the structural reasons for shocks on Chinese imports by looking at the heterogeneity of different categories of products. In general, trade between developed and developing countries features division of labour, that is, developed economies produce high value-added goods while purchasing labour-intensive goods from developing economies. However, the past decade has seen China's absolute determination to accelerate industrial upgrading, shifting from traditional manufacturing to high-end production. While the EU countries are enjoying the cheapness of small consumer goods made in China, they feel threatened by the strengthening of its trading position in more advanced industries, such as mechanical appliances and electronic devices (Li, Dunford and Yeung, 2012), which is believed to be associated with the decline of domestic industrial sectors (Flückiger and Ludwig, 2015). In the face of this, we presume that the EU member states had a strong motivation to reclaim their global marketplace in the aftermath of refugee crisis by restricting Chinese imports and encouraging local manufacturing. Agricultural products and energy sources, nevertheless, were possibly not affected since they are basic necessity for living regardless of the decline in individual income and usually rely on specific natural conditions with only a few trading partners. Therefore, if we break down the dependent variable into primary goods and processed goods, and regress them respectively on DID, we will find statistical significance only in the latter equation.

UN Comtrade database offers an option to aggregate total imports according to the Harmonized System (HS) code, which is maintained and released by the World Customs Organisation in an effort to classify goods crossing the border for import tariffs. The HS code includes 97 categories and some more sub-categories of products but does not define primary goods and processed goods strictly. Even so, its detailed descriptions allow us to allocate them based on our broad understanding of all the imported goods, as shown in **Table 19**.

Table 19: Definition of primary goods and processed goods

In Harmonized System (HS)		In our study	
Code	**Products**	**Variable name**	**Category**
01-15	Live animals; Meat; Fish and crustaceans; Dairy, eggs and honey; Trees; Vegetables; Fruit and nuts; Coffee, tea and mates; Cereals; Vegetable oils	**ANIVEG**	Primary Goods
16-24	Preserved meat and sausages; Sugars; Cocoa products; Pasta; Preparations of vegetables; Beverages, spirits and vinegar; Animal fodder	**FOOD**	Processed Goods
25-27	Salt; Sulphur; Ores, slag and ash; Mineral fuels, mineral oils and products	**MINE**	Primary Goods
28-38	Inorganic chemicals; Organic chemicals; Pharmaceutical products; Fertilizers; Tanning and dyeing extracts; Essential oils, perfumery and cosmetics; Soap, washing and lubricating preparations; Explosives; Photographic and cinematographic goods	**CHEM**	Processed Goods
39-40	Polymers of ethylene, propylene, styrene, vinyl chloride and vinyl acetate; Plastic articles; Rubber tyres; Vulcanised rubber gloves; Hard rubber products	**PLAS**	Processed Goods
41	Raw hides, skins and leather	**SKIN**	Primary Goods
42-43	Leather articles; Saddlery and harness; Travel goods, handbags and similar containers; Furskin manufactures	**LEAT**	Processed Goods

44-45	Wood articles; Cork articles	**WOOD**	Primary Goods
46-49	Straw, esparto and other plaiting materials; Pulp of wood and other fibrous cellulosic material; Paper and paperboard; Printed books, newspapers and other printed products	**PAPR**	Processed Goods
50-67	Silk, yarn; Wool, fine and coarse animal hair; Cotton and woven fabrics; Flax, jute and other vegetable textile fibres; Man-made filaments and staple fibres; Carpets; Knitted and crocheted fabrics; Apparel and clothing accessories; Furnishing articles	**TEXT**	Processed Goods
68-70	Stone, plaster, cement, asbestos, mica and similar materials; Ceramic products; Glass	**STON**	Processed Goods
71-83	Iron and steel articles; Copper articles; Nickle articles; Aluminium articles; Lead articles; Zinc articles; Tin articles; Metal tools and implements	**METL**	Processed Goods
84-89	Mechanical appliances; Electrical machinery equipment; Railway locomotives; Vehicles; Aircrafts and spacecrafts; Ship, boats and floating structures	**MACH**	Processed Goods
90-97	Clocks and watches; Musical instruments; Arms and ammunition; Furniture; Toys, games and sports requisites; Works of art and antiques; Miscellaneous manufactured articles	**MISC**	Processed Goods

Such classification allows us to do the following estimation:

$$\begin{cases} \ln y_1 = \alpha_1 + \beta_1 \times DID + \boldsymbol{x}^T \boldsymbol{\delta}_1 + \xi_1 + \eta_1 + \varepsilon_1 \\ \ln y_2 = \alpha_2 + \beta_2 \times DID + \boldsymbol{x}^T \boldsymbol{\delta}_2 + \xi_2 + \eta_2 + \varepsilon_2 \end{cases} \quad (8)$$

where y_1 and y_2 account for primary imported goods and processed imported goods as define in **Table 19**. The result demonstrated in **Table 20** proves our previous idea really well as the 2014 refugee crisis had no impact on primary goods, but affected processed goods significantly, with the coefficient of DID very similar to that in our preliminary regression.

Table 20: Heterogeneity within primary goods and processed goods

	(a)	**(b)**	**(c)**
	ln_IMPORT	**ln_PRIMARY**	**ln_PROCESSED**
DID	-0.2094***	-0.0397	-0.2081***
	(0.0663)	(0.0726)	(0.0687)
Control Variables	Yes	Yes	Yes
Two-way fixed effects	Yes	Yes	Yes
Clustering of errors	Country-level	Country-level	Country-level
Observations	270	270	270
R^2	0.1760	0.0332	0.1768

Note: *** p<0.01 ** p<0.05 * p<0.1

For in-depth discussion, further division of processed goods by sectors is conducted, followed by the same regression setup. **Figure 21** displays how these sectors differ from each other. Only three of them, namely miscellaneous products, machineries and plastics, produce significant results. It is estimated that the refugee wave led to a 22.27% decline in miscellaneous products such as clocks, furniture and toys, while the total import of machineries and plastics dropped by 21.21% and 17.80%. Not suprisingly, these worse-hit industries had been the EU's leading industries until recently as China began to catch up by taking its advantages of lower labour costs,

larger population base and more serious attention to 'STEM' subjects. Luckily, the decrease in equilibrium salaries after 2014 opened up an opportunity for EU member states to regain its position in these industries, and for right-wing leaders to respond to their voters with hostile attitudes towards China — the imagined barbarians.

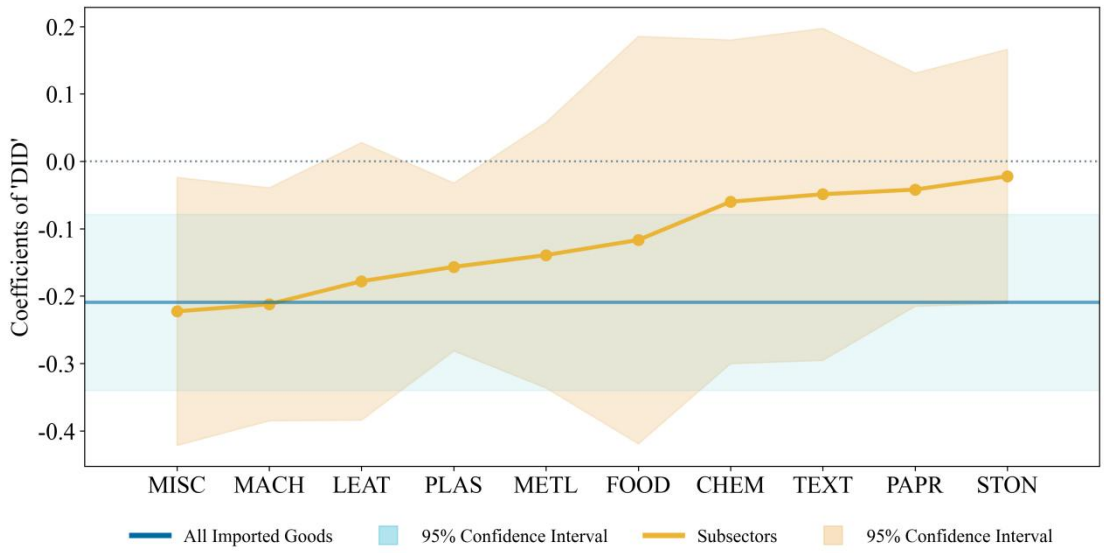


Figure 21: Heterogeneity analysis

6 Conclusions and Policy Implications

6.1 Brief Summary of our Key Findings

An enormous body of literature presents us with important evidence that immigrants boost trade between transit countries and their home countries, while only a small subset of them takes notice of the fundamental difference between refugees and voluntary immigrants that prevents the widely acknowledged channels through personal preference and via social network from working. In an effort to fill in the gaps, this thesis features a comprehensive review of the existing literature that paints us a rich picture, from the bottom up, of impacts of both refugees and non-refugee immigrants on both trade and non-trade economic factors based on data from different countries and historic events. The central focus has been on a mass exodus from war-ridden countries to the EU territories culminating in 2014 as a result of endless fighting in Middle East and North Africa, typically in Syria, Iraq and Afghanistan.

Taking the unexpected event as a quasi-natural experiment, we carry out an in-depth research to understand to what extent these refugees influenced to international trade from China to their hosting countries, which saw a strange and significant downturn after the mass migration compared to that of non refugee-hosting countries. By employing a difference in difference estimation model, our investigation leads us all the way to an impressive result that the refugee crisis in 2014 was expected to decrease imports from China by approximately 20.94%. A subsequent event study indicates that the negative impact aggravated in the first few years since crisis and faded gradually thereafter. Our estimation is confirmed robust through placebo tests that randomly reassign the time period and treatment group as if the exogenous shock had happened in another year and on different EU countries.

Another positive contribution of this thesis lies on the detailed analysis of channels through which the refugee wave made impact on Chinese imports. To be more specific, we display the importance of changes in the local labour market where the equilibrium salary is found acting as a moderator. The negative impact of the refugee crisis on imports was mitigated in high-wage countries, probably because they enjoy greater resilience in labour markets and larger fiscal capacity and availability that helped absorb the shock in the short run. We then consider the consumer confidence index as a leading mediator which influences household consumption on imported goods. Our empirical study indicates that the influx of refugee in 2014 damaged the consumer confidence in overall economic conditions, such as financial stability, expected job numbers and possibility for running down their household savings. Pessimistic thoughts, as a consequence, depressed consumption on unnecessary goods in the following years so as to keep a more precautionary savings account. The last channel that we set our sights on is the change in EU political landscapes. Following previous studies, we are preconditioned to think that the refugee crisis helped some right-wing populist parties' rise to power across EU countries even though they were believed to be extremely radical and unacceptable decades before. These parties have repeatedly displayed protectionist instincts and are more in favour of trade policies

that restrict unlimited imports from China which they believe belongs to a different alignment against the western world. Our empirical study, however, does not find any evidence for such association after employing two influential politic databases. The insignificance is mainly attributed to the essential limitation of our data which are not available in non-election years. The unavailability forces us to interpolate between two votes in election years which naturally leads to a biased result.

In addition to the preliminary regression, imported goods from China are sorted into clusters to help us understand the heterogeneity of refugee impacts. By breaking them down into more than a dozen of categories and doing regression respectively, we find that the impact of refugee waves was only significant for three types, namely plastics, machineries and miscellaneous products. To be more general, the crisis affected only imported processed goods significantly while having no impact on primary goods. We interpret this result as an effort of affected countries to boost local manufacturing and reclaim their global marketplace by taking the advantage of lower labour costs caused by the increase in labour supply as a crowd of refugees were trying to make a living. Primary products such as animals, vegetables and ore, on the contrary, are dependent on certain natural conditions and hence could not be replaced easily.

6.2 Policy Implications

Over the past decades, China has been growing as a heavyweight on the international stage and the largest trading partner for EU imports of goods (around 21.3% in 2024). The partnership features an incredible growth of exports from China to EU which almost tripled in size from 2014 to 2024. On the other hand, we should be aware of the fact that a sustainable trading partnership with the EU, in turn, also matters to China which has been committed to advancing a structural upgrading and building an innovation-driven economy. The EU could be supportive of China’s economic reform with large sum of direct investments and its ideas and experience throughout the development. However, as we establish before, the continent has recently fallen on hard times as the influx of refugees continues battering local job markets and sways

consumers' confidence in the long run, which leads to an unwanted decrease in Chinese imports, and of course other household spendings. This poses an explicit threat to Chinese exporters especially when the United States could no longer be a reliable trading partner. Multiple measures should be adopted immediately to reduce their vulnerability and hold tight to the promising EU markets.

Their first and most important response to the status quo should be to pay closer attention to the trend of refugees and immigration related policies of the EU countries. By establishing a regular monitoring system to track important economic indicators such as average salaries, unemployment rate and consumer confidence index, Chinese exporters will be able to spot early warning signs of demand shifts and adapt their manufacturing tactics accordingly. Second, appropriate adjustments should be made to the product categories in order to align with the structural change in consumption across EU customers amidst the refugee crisis. As stated in **Chapter 5**, the negative shock on Chinese goods was especially severe in some low-income countries where both household disposable income and consumer confidence decreased. Therfore, shifting focus from plastics and machineries to some essential primary products would help maintain export volumes. Great efforts should also be made to promote cooperation with more economically resilient countries such as Denmark and Netherlands which feature much political and economic toughness and adequate fiscal resources that allow them to rebound from short term shocks.

Another big part of rebranding effort for Chinese exporters is to set up closer and more effective partnerships with local distributors. By offering extra job opportunities to local people and engaging in social responsibilities, they are able to create a more positive brand image and eliminate hostility and distrust amid fierce geopolitical confrontation. Localised marketing strategies could also be important to introduce their products and address cultural misunderstanding.

On the other hand, measures must be taken immediately for the EU countries to handle the refugee crisis effectively so as to prevent the downturn in not only Chinese

imports, but also other imported products and domestic consumption. Being caught in a real dilemma of refugee resettlement, the EU member states should seek mutual interests and not beholden to the political dogma of human rights. Given that more than a few countries, especially those near the southern and eastern border of EU, are already struggling financially, it will no longer be a sustainable strategy to welcome too many refugees. Instead, it is high time that they tighten up on asylum applications and cushion the blow of illegal immigrants who are traveling across EU territories disorderly.

As for refugee integration, it is an urgent need to provide them with training on native languages and job-related skills. With deep involvement in the local community, they are able to introduce personal preferences and build up social and business networks which, considering the effects of preference and network as we discuss in the opening paragraph, would help boost local demand and imports. However, special attention should still be paid on the uneven distribution between young and old refugees who are not equally adaptable to new ways of life and thus have different career prospects.

At bottom, refugee eradication requires active engagements of the EU in regional security and stability, which entails a strategic shift from resttlement of refugees to prevention of conflicts. The growing regional tension in the Middle East, for example, is often blamed on military intervention of the United States and their attempts to spread western values without regard to local religious traditions and beliefs. EU countries, though on the same side, should be well aware that they are the one to bear the brunt of the US aim to maintain offshore balance there. The fundamental solution to refugee crises is to stop any unnecessary interference in regional affairs.

6.3 Limitations and Future Research

We acknowledge that there are a few limitations in this study. First, according to the prerequisite for our estimation method, there should be a significant difference between number of refugees received by hosting countries and non-hosting countries. Official figures, though comparable and credible enough, would not reflect the actual

trend of refugee influx since some EU member states carried out loose management of inbound immigrants, thus indulging without formal registration in the legal asylum system. As a result, our classification of refugee-hosting and non refugee-hosting countries could be misled by such hidden population. As for the DID setup, we regard the year when Dublin Regulation was amended as the beginning of refugee shock, which is pratically tenable. Nevertheless, the assumption of one-time shock remains slightly ambiguous and a better way could be employing a staggered DID model that is more applicable when treatments are introduced at different times. There is, as well, a lack of research into refugee heterogeneity which we refer to their regious belief, level of education, career before fleeing from home nations, etc. and we would like to call for following research to collect more detailed personal data and carry out such investigation.

References

[1] Aiyar, M.S., Barkbu, M.B.B., Batini, N., Berger, M.H., Detragiache, M.E., Dizioli, A., Ebeke, M.C.H., Lin, M.H.H., Kaltani, M.L., Sosa, M.S. and Spilimbergo, M.A. The refugee surge in Europe: Economic challenges[R]. International Monetary Fund, 2016

[2] Alesina, A. and Zhuravskaya, E. Segregation and the quality of government in a cross section of countries[J]. American Economic Review, 2011, 101(5): 1872-1911.

[3] Alix-Garcia, J. and Saah, D. The effect of refugee inflows on host communities: Evidence from Tanzania[J]. The World Bank Economic Review, 2010, 24(1): 148-170

[4] Angrist, J.D. and Kugler, A.D. Protective Or Counterproductive?: European Labour Market Institutions and the Effect of Immigrants on EU Natives[M]. Centre for Economic Policy Research, 2002

[5] Baez, J.E., 2011. Civil wars beyond their borders: The human capital and health consequences of hosting refugees. Journal of development economics, 96(2), pp.391-408

[6] Baron, R.M. and Kenny, D.A. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations[J]. Journal of personality and social psychology, 1986, 51(6):1173

[7] Beck, T., Levine, R. and Levkov, A. Big bad banks? The winners and losers from bank deregulation in the United States[J]. The journal of finance, 2010, 65(5): 1637-1667.

[8] Bertrand, M., Duflo, E. and Mullainathan, S. How much should we trust differences-in-differences estimates?. The Quarterly journal of economics[J], 2004, 119(1): 249-275.

[9] Blanes, J.V. Immigrant's Characteristics and their different effects on bilateral trade[R]. Evidence from Spain, 2006

[10] Bloom, N., Brynjolfsson, E., Foster, L., Jarmin, R., Patnaik, M., Saporta-Eksten, I. and Van Reenen, J. What drives differences in management practices?[J]. American Economic Review, 2019, 109(5): 1648-1683

[11] Borjas, G.J. The analytics of the wage effect of immigration[J]. IZA Journal of Migration 2, 2013, 1-25

[12] Bratti, M., De Benedictis, L. and Santoni, G. On the pro-trade effects of immigrants[J]. Review of World Economics, 2014, 150: 557-594

[13] Brell, C., Dustmann, C. and Preston, I. The labor market integration of refugee migrants in high-income countries[J]. Journal of Economic Perspectives, 2020, 34(1): 94-121

[14] Bullock, J.G., Green, D.P. and Ha, S.E. Yes, but what's the mechanism? (don't expect an easy answer)[J]. Journal of personality and social psychology, 2012, 98(4): 550

[15] Bussmann, M. and Schneider, G. When globalization discontent turns violent: Foreign economic liberalization and internal war[J]. International Studies Quarterly, 2007, 51(1): 79-97

[16] Cao, Y. and Chen, S. Rebel on the canal: Disrupted trade access and social conflict in China, 1650-1911[J]. American Economic Review, 2022, 112(5): 1555-1590.

[17] Carroll, C.D., Fuhrer, J.C. and Wilcox, D.W. Does consumer sentiment forecast household spending? If so, why?[J]. The American Economic Review, 1994, 84(5): 1397-1408.

[18] Chambers, R. Hidden losers? The impact of rural refugees and refugee programs on poorer hosts[J]. International migration review, 1986, 20(2): 245-263

[19] Chen, Y., Fan, Z., Gu, X. and Zhou, L.A. Arrival of young talent: The send-down movement and rural education in China[J]. American Economic Review, 2020, 110(11): 3393-3430

[20] Chen, Q., Qi, J. and Yan, G. Placebo tests for difference-in-differences: A practical guide[J]. Management World, 2025, 2: 181-203 (The original text is in Chinese)

[21] Cobb-Clark, D.A. Incorporating US Policy into a Model of the Immigration Decision[J]. Journal of Policy Modeling, 1998, 20(5): 621-630

[22] Cohen, L., Gurun, U.G. and Malloy, C. Resident networks and corporate connections: Evidence from World War II internment camps[J]. The Journal of Finance, 2017, 72(1): 207-248

[23] Combes, P.P., Lafourcade, M. and Mayer, T. The trade-creating effects of business and social networks: evidence from France[J]. Journal of international Economics, 2005, 66(1): 1-29

[24] Cortes, P. The effect of low-skilled immigration on US prices: evidence from CPI data[J]. Journal of political Economy, 2008, 116(3): 381-422

[25] Costas-Pérez, E., Solé-Ollé, A. and Sorribas-Navarro, P. Corruption scandals, voter information, and accountability[J]. European journal of political economy, 2012, 28(4): 469-484

[26] D'Amuri, F. and Peri, G. Immigration, jobs, and employment protection: evidence from Europe before and during the great recession[J]. Journal of the European Economic Association, 2014, 12(2): 432-464

[27] Dées, S. and Brinca, P.S. Consumer confidence as a predictor of consumption spending: Evidence for the United States and the Euro area[J]. International Economics, 2013, 134: 1-14

[28] Desilver, D. Refugee surge brings youth to an aging Europe[EB/OL]. Pew Reseasrch Center, 8 October 2015

[29] Di Giuli, A. and Laux, P.A. The effect of media-linked directors on financing and external governance[J]. Journal of Financial Economics, 2022, 145(2): 103-131

[30] Dinas, E., Matakos, K., Xefteris, D. and Hangartner, D. Waking up the golden dawn: does exposure to the refugee crisis increase support for extreme-right parties?[J]. Political analysis, 2019, 27(2): 244-254

[31] Dominitz, J. and Manski, C.F. How should we measure consumer confidence?[J]. Journal of Economic Perspectives, 2004, 18(2): 51-66

[32] Dryden-Peterson, S. and Hovil, L. Local integration as a durable solution: refugees, host populations and education in Uganda[R]. 2003

[33] Dunlevy, J. A. Interpersonal networks in international trade: Evidence on the role of immigrants in promoting exports from the American states. Review of Economics and Statistics, 2004

[34] Dustmann, C., Schönberg, U. and Stuhler, J. The impact of immigration: Why do studies reach such different results?[J]. Journal of Economic Perspectives, 2016, 30(4): 31-56

[35] Edo, A. The impact of immigration on the labor market[J]. Journal of Economic Surveys, 2019, 33(3): 922-948

[36] Feenstra, R.C. and Weinstein, D.E. Globalization, markups, and US welfare[J]. Journal of Political Economy, 2017, 125(4): 1040-1074

[37] Flückiger, M. and Ludwig, M. Chinese export competition, declining exports and adjustments at the industry and regional level in Europe[J]. Canadian Journal of Economics/Revue canadienne d'économique, 2015, 48(3): 1120-1151

[38] Foged, M. and Peri, G. Immigrants' effect on native workers: New analysis on longitudinal data[J]. American Economic Journal: Applied Economics, 2016, 8(2): 1-34

[39] Friedberg, R.M. The impact of mass migration on the Israeli labor market[J]. The Quarterly Journal of Economics, 2001, 116(4): 1373-1408

[40] Friedberg, R.M. and Hunt, J. The impact of immigrants on host country wages, employment and growth[J]. Journal of economic perspectives, 1995, 9(2): 23-44

[41] Galiani, S. and Quistorff, B. The synth_runner package: Utilities to automate synthetic control estimation using synth[J]. The Stata Journal, 2017, 17(4): 834-849.

[42] Ghosh, S. and Enami, A. Do refugee-immigrants affect international trade? Evidence from the world's largest refugee case[J]. Journal of Policy Modeling, 2015, 37(2): 291-307

[43] Glitz, A. The labor market impact of immigration: A quasi-experiment exploiting immigrant location rules in Germany[J]. Journal of Labor Economics, 2012, 30(1): 175-213

[44] Gould, D. M. Immigrant links to the home country: Empirical implications for US bilateral trade flows[J]. The Review of Economics and Statistics, 1994, 76(2): 302-316

[45] Greenaway, D., Mahabir, P.A. and Milner, C. Does the presence of ethnic Chinese in trading partner countries influence bilateral trade flows with China?[R]. Leverhulme Centre for Research in Globalisation and Economic Policy, University of Nottingham Working Paper, 2007

[46] Hatton, T. J. and Williamson, J.G. Refugees, asylum seekers, and policy in Europe[C]. Labor mobility and the world economy. Berlin, Heidelberg: Springer Berlin Heidelberg, 2006, 249-284

[47] Hayes, A.F. Beyond Baron and Kenny: Statistical mediation analysis in the new millennium[J]. Communication monographs, 2009, 76(4): 408-420

[48] Head, K. and Ries, J. Immigration and trade creation: econometric evidence from Canada[J]. Canadian journal of economics, 1998, 47-62

[49] Hong, T.C. and Santhapparaj, A.S. Skilled labor immigration and external trade in Malaysia: A pooled data analysis[J]. Perspectives on Global Development and Technology, 2006, 5(4): 351-366

[50] Huet-Vaughn, E. Stimulating the vote: ARRA road spending and vote share[J]. American Economic Journal: Economic Policy, 2019, 11(1): 292-316

[51] Inglehart, R.F. and Norris, P. Trump, Brexit, and the rise of populism: Economic have-nots and cultural backlash[R]. Harvard Kennedy School, 2016

[52] Jiang, T. Mediating effects and moderating effects in causal inference[J]. China Industrial Economics, 2022, 100-119 (The original text is in Chinese)

[53] Judd, C.M. and Kenny, D.A. Data Analysis in Social Psychology: Recent and recurring issues[M]. Handbook of Social Psychology, Volume 1, 2010, 115

[54] Kahn-Lang, A. and Lang, K. The promise and pitfalls of differences in differences: Reflections on 16 and pregnant and other applications[J]. Journal of Business & Economic Statistics, 2020, 38(3): 613-620

[55] Kroft, K. and Pope, D.G. Does online search crowd out traditional search and improve matching efficiency? Evidence from Craigslist[J]. Journal of Labor Economics, 2014, 32(2): 259-303

[56] Kucuk, S.U. Impact of consumer confidence on purchase behavior in an emerging market[J]. Journal of International Consumer Marketing, 2005, 18(1-2): 73-92

[57] Li, L., Dunford, M. and Yeung, G. International trade and industrial dynamics: Geographical and structural dimensions of Chinese and Sino-EU merchandise trade[J]. Applied Geography, 2012, 32(1): 130-142.

[58] Mayda, A.M., Parsons, C. and Steingress, W. Refugee resettlement: The impact on international trade flows[R]. US Department of State Office of the Chief Economist (OCE) Working Paper 3, 2017

[59] Milner, H.V. and Judkins, B. Partisanship, trade policy, and globalization: Is there a left–right divide on trade policy?[J]. International studies quarterly, 2004, 48(1): 95-119

[60] Parsons, C. and Vézina, P.L. Migrant networks and trade: The Vietnamese boat people as a natural experiment[J]. The Economic Journal, 2018, 128(612): 210-234

[61] Persico, N., Postlewaite, A. and Silverman, D. The effect of adolescent experience on labor market outcomes: The case of height[J]. Journal of political Economy, 2004, 112(5): 1019-1053

[62] Piperakis, A.S., Milner, C. and Wright, P.W. Immigration, trade costs, and trade: gravity evidence for Greece[J]. Journal of Economic Integration, 2003, 750-762

[63] Rauch, J.E. Business and social networks in international trade[J]. Journal of economic literature, 2001, 39(4): 1177-1203

[64] Rauch, J.E. and Watson, J. Network intermediaries in international trade[J]. Journal of Economics & Management Strategy, 2004, 13(1): 69-93

[65] Rodrik, D. The globalization paradox: why global markets, states, and democracy can't coexist[M]. Oxford University Press, 2011: 180

[66] Saiz, A. Room in the kitchen for the melting pot: Immigration and rental prices[J]. Review of Economics and Statistics, 2003, 85(3): 502-521

[67] Sakib, N. and Ishraque Osman, S.M. Syrian refugee influx and the rise of far-right rhetoric: A quasi-experimental investigation[J]. European Politics and Society, 2020, 21(4): 371-383

[68] Seputiene, J. The estimation of the relationship between wages and unemployment in the European Union[J]. International Journal of Social Sciences and Humanity Studies, 2011, 3(2): 277-285

[69] Shimada, A. Foreign worker participation in labor markets and the economy's welfare[J]. Journal of Policy Modeling, 2005, 27(3): 355-362

[70] Sun, R. and Feng, G. How Refugee Shock Affects Europe's Imports from China: Evidence from European Refugee Crisis[R]. 2023

[71] Tumen, S. The economic impact of Syrian refugees on host countries: Quasi-experimental evidence from Turkey[J]. American Economic Review, 2016, 106(5): 456-460

[72] Wagner, D., Head, K. and Ries, J. Immigration and the trade of provinces[J]. Scottish Journal of Political Economy, 2002, 49(5): 507-525.

[73] White, R. An examination of the Danish immigrant - trade link[J]. International Migration, 2007, 45(5): 61-86

[74] White, R. and Tadesse, B. The effects of refugee and non-refugee immigrants on US trade with their home countries[J]. The Journal of International Trade & Economic Development, 2010, 19(2): 289-317

[75] Yaseen, M., Ghayoor, S., Hassan, M.S. and Jabeen, F. The Political Dynamics of Refugee Migration in Europe: Analyzing the Impact of Nationalism, EU Solidarity, and the Dublin Regulation Post-2015 Migrant Crisis[J]. The Critical Review of Social Sciences Studies, 2025, 3(1): 486-510

[76] Zachariadis, M. Immigration and international prices[J]. Journal of International Economics, 2012, 87(2): 298-311

[77] Zhang, Z. and Huang W. Questions, applications and extensions in event study approach[J]. The Journal of Quantitative & Technical Economics, 2023, 9: 71-92 (The original text is in Chinese)