



# FEM43-07

## FEMISE RESEARCH PAPERS

---

### ***The Effects of Syrian Refugees on the Labor Markets of Host Middle Eastern and European Countries***

***Directed by: Dr. Roby Nathanson  
(The Macro Center for Political Economics, Israel)***

*With Contributions by:*

*Roby Nathanson, The Macro Center for Political Economics, Israel*

*Prof. Khalid Sekkat, University of Brussels, Belgium*

*Mr. Itamar Gasala, The Macro Center for Political Economics*

*Ms. Ron Leyzer, The Macro Center for Political Economics*

*Mr. Jean Lacroix, Centre Emile Bernheim, Free University of Brussels*

***January 2019***

---



Ce rapport a été réalisé avec le soutien financier de l'Union Européenne dans le contexte du projet UE-FEMISE sur: "Support to economic research, studies and dialogue of the Euro-Mediterranean Partnership". Le contenu du rapport relève de la seule responsabilité des auteurs et ne peut en aucun cas être considéré comme reflétant l'opinion de l'Union Européenne.

This document has been produced with the financial assistance of the European Union within the context of the EU-FEMISE project "Support to economic research, studies and dialogue of the Euro-Mediterranean Partnership". The contents of this document are the sole responsibility of the authors and can under no circumstances be regarded as reflecting the position of the European Union.



# **The Effects of Syrian Refugees on the Labor Markets of Host Middle Eastern and European Countries**

**Dr. Roby Nathanson, MACRO Center**

**Prof. Khalid Sekkat, University of Brussels**

## Table of Contents

<b>Executive Summary .....</b>	<b>3</b>
<b>Literature Review .....</b>	<b>5</b>
General Review .....	5
Turkey .....	8
Lebanon.....	10
Jordan.....	11
The European Union .....	12
Theoretical Models and Empirical Results – Immigrants and Refugees .....	14
Possible implications on the Syrian Case .....	19
<b>Research Methodology .....</b>	<b>20</b>
The Model.....	20
Data and descriptive Analysis.....	23
<b>Bibliography .....</b>	<b>43</b>
<b>Appendix A.....</b>	<b>41</b>

### **Figures and Tables**

<b>Figure 1.a:</b> Number of Syrian refugees, 1999-2015 .....	24
<b>Figure 1.b:</b> Number of Syrian refugees, 1999-2011 .....	23
<b>Figure 2:</b> Destination of Syrian refugees .....	25
<b>Figure 3:</b> Number of Syrian refugees per 1 million inhabitants (Cumulative 2012-2015).....	26
<b>Figure 4.a:</b> Change in real earnings of employees (%), 2000-2015 .....	27
<b>Figure 4.b:</b> Change in real earnings of employees (%), 2001-2014 .....	28
<b>Figure 5.a:</b> Change in Unemployment rate.....	28
<b>Figure 5.b:</b> Change in Unemployment rate .....	29
<b>Table 1:</b> Wages equation.....	31
<b>Table 2:</b> Unemployment equation.....	33
<b>Table 3:</b> Jackknife analysis .....	36

## **Executive Summary**

Due to the ongoing Syrian civil war, between 2011 and 2016 about 5.1 million Syrian have been externally displaced. Most of the displaced Syrians initially arrived to Middle Eastern countries. Turkey hosts more Syrian refugees than any other country with an estimated 3.2 million refugees which comprising 3.5% of the country's population. Lebanon absorbed about 1 million refugees, which comprise 20% of the local population and Jordan absorbed 650,000 Syrian asylum seekers, which comprise 9% of its population. In Europe the main hosting countries are Germany and Sweden, however asylum seekers represent only slightly more than 1% of the total population in those countries (UNHCR, 2017)

The initial policy in most Middle Eastern hosting countries made it difficult for Syrian refugees to integrate (with Lebanon being the exception) into the local labor market. Contrary, the majority of European countries allowed Syrian refugees to receive working permits. Therefore, many refugees, seeking to improve employment opportunities began to make their way into Europe. As a result, the political discourse in Europe regarding Syrian asylum seekers has become significant. One of the main concerns raised by locals, both in Europe and in Middle Eastern absorbing countries, the impact of refugees on local labor markets, unemployment rate and wages. Other concerns included security, crime, terrorism welfare benefits, the cost of accommodating refugees, etc.

As the Syrian civil war refuses to end, the last couple of years marked a change in conception for many hosting countries. There is now a growing understanding that there's a need to take care for refugees' education, employment, health insurance and long-term shelter. The implementation of such policy stirs a significant political opposition due to feelings in the general public in many hosting countries.

The information that has been provided thus far about the implications of Syrian refugee arrival is rather insufficient, and there is little consensus on how they affect local labor markets. For example, in Turkey in some regions the arrival of refugees has been accompanied with resistance among the local population, and in other they were seen as cheap labor force that creates a relief on the burden imposed on them. Lebanon is the only Middle Eastern countries that from the very first stages of the Syrian conflict implemented a policy that allows participation of the Syrian refugees

in the labor market. On the other hand, Jordan is desperately in need to be seen as a country that supports the local population that might be affected from the refugee wave, and therefore impose a much more rigid policy regarding the integration of Syrian refugees into the local labor market. Research had been conducted concerning the impact of minimum wage on the labor market effects of immigration. It has been found that minimum wage plays an important role in mitigating any adverse labor effects of immigration (Edo, Rapoport, 2017). European countries suggested different plans such as temporary exceptions from the minimum wage, special training program and tax reductions for refugees in order to support their integration in the labor market.

This research seeks to contribute to the assessment of refugees within labor markets and differing countries' economies. Past studies about the impact of refugees on absorbing labor markets suggest that refugees have no significant impact while others argue that refugee influx causes a negative supply shock and is very likely to affect the lowest classes within a host country.

In this study we used the Borjas and Monras (2016) approach which allows a single empirical specification based on factor demand theory to measure the consequences of the refugee supply shock. This approach has recently been applied by Borjas and Morans (2016) to study the impact of the inflow of Cubans into Miami in 1980, the inflow of French repatriates and some Algerian nationals into France at the end of the Algerian Independence War in 1962, the inflow of Jewish immigrants into Israel after the collapse of the Soviet Union in the early 1990s and the exodus of refugees from former Yugoslavia during the long series of Balkan wars between 1991 and 2001.

Using this approach, we examined both the impact of Syrian refugees on wages and on unemployment rate. With accordance to Borjas and Monras main results, we uncovered that the Syrian refugee wave decreases the growth rate of real wages; however, have no effect on unemployment rate. However, it has been found that Jordan drives the negative relationship between the importance of the flows of Syrian refugees and the growth of real wages. This seems to make sense since the number of Syrian refugees is very large as compared to Jordan's population. One can reasonably expect a similar effect in Lebanon where Syrian refugees are even more numerous than in Jordan in comparison to the domestic population. However, we don't have

data on wages for Lebanon and our assertion can only be speculative. Finally, Syrian refugees are not numerous enough in the other countries (even Turkey) to affect domestic wages.

The country review and the empirical results lead us to four main policy recommendations. As for the majority of countries no connection between the Syrian refugees' inflow and unemployment or wages has been found, first, we recommend strengthening the existing trend of removing refugee-specific barriers in the labor market. In addition, in countries with high minimum wage, temporary exceptions should be permitted in order to promote the employment of refugees. Another important recommendation is to provide temporary migration opportunities in line with the labor market needs and address shortage of workers in some occupations, such as agriculture. A further investigation is needed based on each country's needs. Our last policy recommendation is to offer targeted temporary work opportunities and programs, as some European countries are already doing, both to local population that might be affected by the integration of refugees, and to the refugees themselves.

## **Literature Review**

### **General Review**

As of October 2017, the different United Nations agencies registered over 5.3 million Syrian refugees, 47.5% of them were kids up to the age of 17. 23.8% of the refugees were male at the working age (18-59), and 25.5% were female at the working age. Currently, above half of the refugees are registered in Middle Eastern countries. 3.2 million Syrian refugees are registered in Turkey, 1 million in Lebanon, 650,000 in Jordan, 250,000 in Iraq and 124,000 in Egypt.

According to the UN official data European Union countries are hosting about one million Syrian refugees. 64% of the Syrian refugees in Europe are hosted in Germany and Sweden. Other EU prominent countries that took in refugees are Austria, Hungary, Netherlands, Denmark and Bulgaria. It is also noted by the UN that the exact number of refugees in Europe might be even greater than the registered number (UN official site). This number of refugees has significant economic, political and social implications on the hosting countries.

The process of absorbing refugees among hosting Middle Eastern countries was uneven. While Turkey had agreed at first to absorb the refugees in camps, until recently, it was very difficult for Syrian refugees hosted in Turkey to receive a regular working permit in the country (Kirişci 2016). Contrary, in Lebanon the process of absorbing refugees was significantly easier. The Lebanese labor market is characterized with a high demand for low paid Syrian workers. Hence, it was easier for Syrian refugees to integrate into the Lebanese working force. Jordan on the other hand implemented a more rigid policy aimed to prevent the entry of Syrian refugees to the local Jordanian labor market (Turner, 2015).

Unlike the strict policy implemented in most Middle Eastern countries in the early years of the Syrian conflict, the majority of European Union allowed Syrian refugees to receive working permits. It might be possible that the policy gap between European countries and Middle Eastern countries led to the emigration of many high skill refugees with higher education level to Europe. The more integrative policy implemented in Europe has been found to be more attractive to refugees seeking to improve employment opportunities (Kizil, 2016). This is important due to the possible effect of the immigration on economic growth. Theoretical studies show that when the immigrant population is more educated and has a higher level of skills, in the short term, the negative effect on growth will be smaller. The theoretical result is corroborated with findings in empirical studies (Boubtane, Coulibaly and Rault, 2013).

As the Syrian civil war refuses to end, the last couple of years marked a change in conception for many hosting countries. There is now a growing understanding that there's a need to take care for refugees' education, employment, health insurance and long-term shelter. In order to ensure that social and economic long-term outcomes of the Syrian refugee crisis will be positive, countries should understand that the refugees would probably be staying in their countries for a long period of time. This means, among other, to implement an accommodating policy regarding the refugees and not only to absorb them into camps. The implementation of such policy is expected to stir a significant political opposition due to feelings in the general public in many hosting countries, that even by absorbing refugees in camps, they are already doing more than they are required to do (Kirişci 2016).

The conception that refugee camps are meant most and foremost to ensure humanitarian conditions to the refugees and to serve the security needs of the local population at the hosting country ignores the fact that one of the most important implications of creating the camps concerns the local labor market. In order to better understand under what circumstances countries choose to force refugees to live in camps and not to integrate them into society. It is important to bear in mind that one of the most significant reasons is the decision whether a country would like the refugees to join the labor market (Turner, 2015).

The possible implications of integrating the Syrian refugees in the local labor market had renewed the long political and economic discussion in the subject (Borjas, Monras, 2016). One of the biggest concerns hosting countries face is that migration waves would lead to a decrease in salaries and an increase in unemployment among local populations (Dustmann, Fabbri, Preston, 2005). In Europe, the main public discussion concerns the long-term implications of the 'Open Door' policy that German Chancellor, Angela Merkel, is implementing. While it might be hard to provide an exact estimation about the long-term implications of such policy, the implication of former migration waves could be examined in order to better understand the different potential outcomes of the current refugee wave (Alexe, 2015), as will be discussed later in this chapter. Among the influencing factors on the labor market in the hosting countries are the following – the number of migrants, the timing of the migration wave, the level of human capital of the migrant population and characteristics of the absorbing country (Borjas, Monras, 2016).

While this article focuses on the impacts refugees and immigrants on the local population labor market, it is also worth mentioning that also the foreign population experiences changes in wages and employment relative to the time before immigrating. More specifically, it is widely agreed today that immigrants suffer from a "downgrading" effect during the short-medium time period following the immigration. This means that their location among the wage distribution in hosting and absorbing countries is lower relative to their place of origin (Dustmann, Frattini and Glitz, 2011)



## Turkey

Turkey is one of the largest hosting countries of refugees, and hosts the largest amount of Syrian refugees. According to UN statistics, the number of Syrian refugees in Turkey is about 3.2 million as of October 2017. Until 2015 Turkey has established 22 refugee camps in which 220,000 people lived, most of them from Syria. Around half of the refugees are under the age of 18. Since 2014 the Turkish press has started to report about an increase in the number of Syrian refugees looking for permanent employment in the informal sectors, and that therefore they risk exploitation.

Furthermore, it is noticeable that in urban neighbourhoods that absorbed the largest number of Syrian refugees, whether in Istanbul or elsewhere, there's a noticeable economic activity that involves the refugees in bakeries, businesses, travel agencies and restaurants owned by Syrians. As of 2014, 75% of Syrian refugees living in Turkey outside the camps searched for a job at a certain point of time. However, until 2016, the Turkish labor laws made it difficult on those job seekers to receive a working permit, and therefore an employment in the formal Turkish economy was hard to achieve (Kirişci, 2016).

In order to receive working permits Syrian refugees were required to hold a valid passport and a residence permit. The employer also had to prove that there was no Turkish citizen able to fill the position. In practice, most Syrian refugees arrived without a passport, and obviously they could not extend its validity (Kirişci, 2016). At the beginning of 2016 the Turkish government changed the restrictions on employing Syrian refugees and started to issue more working permits. This move is expected to have meaningful implications on the local labor market such as changes in wages and employment rates (Kizil, 2016).

One of the noticeable problems of the severe restrictions imposed on the Syrian refugees regarding their participation in the local labor market was the creation of a black labor market, mainly in the construction, textile, and heavy manufacturing and agriculture sectors. Many Syrian refugees found seasonal job opportunities in agriculture. In Kilis, a city in the proximity of the Syrian border, the average daily salary decreased from 60 liras per day to 20 liras per day. The Syrian refugees had to compromise on lower salaries than their Turkish counterparts (Kirişci, 2016).

While in some regions that absorbed refugees it is being reported that the refugee wave has been accompanied with resistance among the local population, in other regions the local population sees the refugees as a cheap labor force that creates a relief on the burden imposed on them. In 2013, two of the Turkish regions close to the Syrian border, Kilis and Gaziantep, were among the only regions that reported a decrease in unemployment rates. The Syrian refugees might be working informally; however, those statistics might testify on the increasing need for Syrian working force in the area (Kirişci, 2016).

The importance of the cheap Syrian labor force was also demonstrated in the Gaziantep chamber of commerce recommendation back from 2013 to provide short term working permits for Syrians, as well as vocational education and to provide different social benefits. Following this recommendation, in 2014 the Turkish authorities created an accelerated process of issuing working permits in the region (Kirişci, 2016). In 2016 the Turkish government declared on a more comprehensive change in policy (Kizil, 2016).

Up until the policy change of 2016, the Turkish authorities issued only 7,351 working permits to Syrian refugees. Most permits were given for business owners and not for employees. The policy change is expected to assist many Syrian refugees in the country, although it is being implemented significantly late compared to Europe. In most of the European countries, according to the 1951 Geneva refugee convention, Syrian refugees were allowed to apply for a permanent residence permit. In addition, the policy in most European Union countries is to enable academic scholarships for suitable and bright Syrian refugees in order to enhance their integration process. It seems like the policy gap between Europe and Turkey led to the escape of most of the skilled and educated refugees from Turkey to Europe (Kizil, 2016).

The process of examining the broad economic consequences of the Syrian refugee wave on the Turkish economy is complicated, mostly because most of the Syrian refugees are employed illegally. Several studies have tried to capture the exact impact on the labor market. A 2015 research found that as a result of the refugee wave there has been an increase in housing prices, however it did not significantly affect the country's employment rate (Akgündüz, van den Berg, and Hassink, 2015). A different research from the same year compared regions in which the refugees settled in to

other regions, before and after the migration wave, and found that there's a significant decrease in the informal employment rates of local workers in regions that absorbed Syrian refugees. The influence on wages was insignificant. According to this research the main casualties were women, young people and less educated workers (Ceritoğlu et al. 2015). A different research reached the same conclusions, alongside an increase in the number of Turkish males employed legally in those regions (Del Carpio, Wagner, 2015).

Tumen (2015) found that by 2015 local unemployment in Turkish regions that absorbed Syrian refugees increased by 0.77 percentage points, but there was no statistically significant effect on wages. In addition, it was estimated that in accordance with the literature in the subject, consumer prices have declined. One of the most interesting findings was that while the increase in rental prices for lower-quality rental units was only 1.7%, the increase in rental prices for high quality rental units was about 11%. This could be explained by an increase in demand of locals to live in better and safer neighbourhoods (Tumen, 2015).

It is hard to attribute the changes in unemployment in different regions in Turkey to the presence of Syrian refugees. Many of the Syrian refugees have arrived to weak regions in the first place, which demonstrated negative economic outcomes in the years before the current refugee wave. However, in Gaziantep, which is normally characterized with a low unemployment rate, contrary to the 2013 statistics brought earlier, there was an increase of 1.9% in the unemployment rate in 2015. This data might be an evidence for the impact of the Syrian refugee wave on the local Turkish economy (Kizil, 2016).

As Turkey adopted a more comprehensive policy towards Syrian refugees only in 2016, it is important to gather information and provide an analysis of the impacts of this policy change in Turkey. However, the fact that many Syrian refugees were employed illegally doesn't mean that there was no impact on the legal labor market.

### Lebanon

Lebanon absorbed over 1 million Syrian refugees since the civil war broke. Beyond the geographic proximity, the large number of Syrian refugees in Lebanon could also be explained by the fact that from the early stages of the Syrian civil war, the Lebanese policy did not force Syrian refugees to live in camps, and they were allowed

to settle in permanent residence quickly. Furthermore, the Lebanese government has allowed most of the Syrian refugees to be employed in the informal labor market. The Lebanese labor market was depended in the past on the employment of Syrian workers at low wages. The integration policy of the government allowed the increase in the percentage of Syrian workers in the Lebanese labor market and compared it to the level which was customary in Lebanon before the retreat of the Syrian military from Lebanon back in 2005 (Turner, 2015).

The majority of the participation of the Syrian refugees in the Lebanese labor market is in the construction and agriculture sectors. 55% of the male Syrians in the working ages are employed and 6% of the female Syrians in the working ages are employed. 92% of the employed Syrians in Lebanon don't have a formal contract of employment, and 56% of them are employed on a seasonally, weekly or daily basis. The average monthly salary of Syrian refugees is about \$290, which is 65% of the Lebanese minimum wage. The participation of Syrian refugees led to a decrease in wages of low skilled employees, mainly in the Beqaa Valley. In certain sectors the salary of low skilled employees decreased in about 60% since the beginning of the Syrian crisis, mainly due to the fact that Syrians are willing to work longer hours for a smaller salary compared to their Lebanese counterparts. It is also worth noticing that many Lebanese are also willing to compromise on their salaries in order to avoid being replaced with the cheap Syrian labor force (Turner, 2015).

Lebanon is an example of a hosting country that its economic interests are in line with its economic elite. Therefore, among other, the country implements a policy that allows participation of the Syrian refugees in the labor market, even at the price of a decrease in local workers' salaries. That is, the Lebanese case teaches us that when the country's interests are similar to those of its economic elite, we are expected to witness the implementation of social and economic policies that further integrates the refugee into the labor market (Turner, 2015).

### Jordan

Jordan implemented a different policy regarding the Syrian refugees. In Jordan, as of 2015, around 80% of refugees were living outside the refugee camps, however, the Jordanian government opened several refugee camps; the biggest of them is Zaatar refugee camp. The population at the camp is estimated at around 80,000 refugees.

Due to the strict and limiting policy implemented in Jordan, most Syrians that reside in the camps are not allowed to leave them legally without being deported back to Syria. This means many of the refugees are being separated from the Jordanian labor market (Turner, 2015).

The main reason that the Jordanian government is implementing this policy is its desire to decrease its dependence on cheap foreign workers. This policy serves first and foremost the supporter of the Trans-Jordanian policy, which mainly live in the rural areas, characterized by relative high unemployment rates. The separation of the Syrian refugees from the rest of the population prevents any increase in competitiveness in the Jordanian labor market (Turner, 2015).

In 2015 only 22% of the male Syrian refugees in Jordan were employed and less of 1% of the female Syrian refugees at the working age were employed. Those statistics don't include the Syrians that reside inside the camps, that don't even have the possibility to integrate in the local labor market. Despite the concerns of many Jordanians that Syrian refugees would compete with them on jobs in the construction and retail sectors, in fact it seems like the refugees are competing other foreign employees in the country. The Jordanian official reports show that the percentage of Egyptians being employed in the country has decreased by 20% from 2010 to 2013 (Turner, 2013).

Jordan sets an example to a refugee hosting country that is desperately in need to be seen as a country that supports the local population that might be affected from the refugee wave. Absorbing refugees in camps supports the cause of the government to prevent decrease in wages and increase in unemployment. Namely, we expect to see that in countries where the population could get hurt by a migration wave has a strong political power, the policy would be to separate the refugee and migrates populations from the local population. The perception in the general public that an increase in the competitiveness in the job market would harm the local population will increase the political pressure on the authorities to create this separation (Turner, 2015).

### The European Union

During the first years of the Syrian Civil War, Middle Eastern countries, as well as the refugees themselves believed that they would be returning to Syria. As the war refuses to end, the notion among refugees changed and they realized that they would not be

returning to Syria in the near future. Many Syrians started looking for better job opportunities compared to those provided in Middle Eastern countries. Therefore, since 2013, the refugees' tendency to get clustered near the Syrian borders transformed into a willingness to move further west, especially to Europe (Tumen, 2015).

As a result of the refugee wave to Europe, European hosting countries, mainly Germany, Sweden and Austria, experienced an increase in the aggregate demand as a result from a fiscal expansion aimed to support refugees in housing, food, health, etc. In 2015 the European Union decided to boost resources devoted to refugee surge from 1.7 billion Euros (0.01% of the European Union GDP) to 9.2 billion Euros (0.07% of the European Union GDP). It is expected that following the increase in demand, the labor supply effects will develop gradually. In the medium and long term, the impact of the refugees on employment and GDP in hosting European countries is dependent on their integration to the labor market. Assuming the integration process is successful, and that the initial employment gap between the local and the refugees would gradually narrow, it is expected that by 2020 the economic growth in Germany, Sweden and Austria would be higher compared to other European countries. However, if the labor integration is less successful it is suggested that unemployment and government debt would rise (Aiyar, etc. 2016).

One of the concerns in Europe is that many European economies are still struggling to recover from the global financial crisis and the sovereign debt crisis. Therefore, the integration process of the refugees would take longer and they will experience high unemployment rates and low wages for a long period. Another challenge that many European countries face is that past data shows that immigrants from the Middle East have had harder time to integrate into the European labor market compared to immigrants from other regions, chiefly because they are twice as likely to have only a lower secondary education or less. The positive side is that although there is a lack of accurate data about the education level of current refugees, the available statistics testify that the current wave of asylum seekers from Syria are more educated than past immigrants from that region (Aiyar, etc. 2016).

In addition, empirical evidence suggests the migrants' employment rate and their job quality are higher in countries with low entry level salaries and less employment

protection. Meaning, high entry level position wages might be a significant barrier to immigrant integration. Therefore, it has been suggested that in European countries in which employees enjoy high level of protection, temporary exceptions should be permitted. For example, it was suggested that in countries, such as Germany, employers should be allowed to exempt asylum seekers from the minimum wage for the first six months of employment (Aiyar, etc. 2016).

In addition, it was recommended to implement tailored introductory programs for migrants, to help them overcome different kinds of disadvantages in the local labor market. Such programs already take place in many European countries. Other recommendations include reducing taxes and social security to low-wage workers and lower barriers on entrepreneurship (Aiyar, etc. 2016). The quick integration of refugees would not only benefit the refugees themselves but also the local European population. It is expected that in the long run, as competition on lower paid job would increase, the incentive of many locals to gain higher education and to specialize in more complex tasks would also grow (Aiyar, etc. 2016).

#### Theoretical Models and Empirical Results – Immigrants and Refugees

The findings of past researches on economic implications of migrations are diverse and don't always testify a meaningful influence (Clement, Hunt 2017) (Dustmann, Schonberg, Stuhler, 2016). Most findings testify that at most the negative implications of migration on wages and employment is limited in hosting countries (Dustmann, Fabbri and Preston, 2005). From examining how exogenous shocks, such as migration, influence the labor market, it seems like there's a negative influence on job finding opportunities for the local population that compete them. However, immigration has, not once, positive impact on wages for the complementary skill level population (Borjas, Monras, 2016). Other research found that while younger natives experience larger wage effects, employment responses are particularly pronounced for older natives (Dustmann, Shonberg, Stuhler, 2016).

It is also worth mentioning that today many researches consider immigration waves not to be completely exogenous. Migrants take into consideration the possible job opportunities as well as other economic conditions of the hosting countries, before they choose where to migrate. Low unemployment rate and high growth rates would be appealing for many migrants (Boubtane, Coulibaly, Rault, 2013). However, while

economic migrants choose their destination to maximize employment opportunities, refugees' primary goal is to secure personal safety. From examining the Syrian case, it is noticeable that many Syrians have a strong preference for hosting countries with high employment rates in Europe (Aiyar, etc. 2016).

Therefore, the Syrian case might be considered as an example to the blurring border between refugees and immigrants. As being a displaced becomes a long-term reality for many refugees they are expected to seek livelihood employment opportunities in different destinations. Based on past evidence it is suggested that allowing greater mobility for refugees would in the long run help to reduce their dependence on international aid, and increase their ability to earn a living and achieve access to other long-term solutions (Long, 2015).

Despite the fact that the existing findings regarding the implications of migration waves on the local population are diverse and do not testify on significant economic implications in one direction, the public opinion in many countries is influenced by increasing concerns that the 'open door' policy alongside an easement in the working permits application process would harm the local population. The concern from negative potential implications to wages and employment level, at least in the short term, provides a vocal and meaningful opposition for the implementation of policies that are considered more liberal (Dustmann, Frattini and Glitz, 2008). It is true that the strongest concerns in the Syrian case are especially strong among people with low skills and without higher education, as they expect to compete with the refugees.

Dustmann, Frattini and Glitz used a theoretical model in order to examine the possible implications of migration waves on the local labor market. The conclusion they reached was that the two most influential factors on the performance of the local labor market following migration waves are the skill level of the migrants compared to the skill level of the local population and the elasticity in capital supply. When the skill level of the migrants is similar to those of the local population, and the capital supply is perfectly elastic, then the job market would simply absorb the migration workforce without further implications. In any other condition the model predicts wage implication on the local market – some might earn from the arrival of the refugees while other should expect losses. The aggregate implications depend on the level of elasticity of the capital supply (Dustmann, Frattini and Glitz). In other words, it might



be suggested that the impact of immigration on the labor market in host countries depends on whether the migrants and the local populations are substituted or complements in the market (Boubtane, Coulibaly and Rault, 2013).

In another research, Dustmann, Frattini and Glitz, focusing on foreign-born population in the UK between 1997 and 2005, examined the effects of immigration along the distribution wages. As in many other cases, they concluded that immigrants have an adjustment period in which many of them work in jobs and occupations that do not correspond to their skills on former profession. Mostly, it has been found, that during that time, that might be considered as the short-medium term period, immigrants are "downgraded" supply (Dustmann, Frattini and Glitz, 2011).

Regarding local population, it has been found that immigration waves leads to a decrease in wages among competing population. Meaning, immigrants cause a decrease in salaries at those part of the distribution where the relative density of immigrants is higher than the relative density of the local population. On general it has been found that the impact of immigrants on local population's wages is slightly positive (Dustmann, Frattini and Glitz, 2011). Another big concern that many hosting countries share is the fiscal burden of absorbing Syrian refugees. Researchers, mainly in the 1990's evaluated the fiscal impacts and concluded that the economic impact and the burden on the country's social welfare system were relatively small (Boubtane, Coulibaly and Rault).

The professional literature in the field includes references to four main case studies – the Cuban migration wave to Miami in 1980; the Algerian refugee arriving to France during the Algerian War of Independence, a migration wave that included both French civilians and local Algerians; the migration wave to Israel from former USSR countries following the collapse of the Soviet Union in the early 1990's; and the refugees arriving to European countries from former Yugoslavian countries, due to the Yugoslavian wars during the 1990's. Each migration wave was characterized in different size, timing and level of human capital (Borjas, Monras, 2016). It has been concluded, that even if there have been short term implications for the local population, in the long term, even the natives who should be the closest substitutes with the immigrant population have not suffered significantly (Friedberg and Hunt, 1995).

The Cuban migration included about 120,000 migrants with a low level of human capital. In contrast, the migration wave to Israel from the former Soviet Union included around 500,000 migrants characterized with a relatively high level of human capital. Most of them had at least a basic academic education. The arrival of refugees to France from Algeria included 1.5 million refugees with diverse levels of human capital. From analysing those migration waves, it seems that in the short term they had mainly a negative influence on populations with similar level of human capital as the migrants, meaning on the substitute population to the immigrants. The negative influence is chiefly expressed with lower salaries, decrease in employment level and sometimes both. However, it seems like the migration waves has in the short term a positive influence on populations with different level of human capital from that of the migrants' population (Borjas, Monras, 2016).

Cuba-USA - The former Cuban President, Fidel Castro, allowed in 1980, for the first time, to Cuban citizens to migrate through Mariel port. Due to this change in policy around 125,000 Cubans migrated to Miami, Florida. The migration wave caused an increase of about 8% in the cities workforce. About 60% of the migrants had no secondary education and therefore increased the competition for workers from low socio-economic background. The percentage of male without secondary education increased in about 32% (Clemens, Hunt, 2017).

It was indeed visible that the average salary for workers who did not complete secondary education was significantly lower in Miami in those years compared to other cities in the area. Similarly, the average salary for workers who completed secondary education increased faster in Miami compared to other cities in the area. However, there was no significant change in the level of employment in the city (Borjas, Monras, 2016). More recent results show that the decrease in salaries observed in Miami during those years was a result of a sudden change in the racial composition of population survey participants in the city in 1980 that had nothing to do with the migration wave itself (Clemens, Hunt, 2017).

Algeria-France – Another important case study was the migration wave that followed the Algerian independence War. The end of the war in 1962 marked the beginning of a refugee wave into France. In the summer of 1962 alone 750,000 refugees fled Algeria to France. The wave consisted of two different populations – the French

colonial and the local Algerians. That wave had negative and meaningful impact on competing employees in the local French labor market. That is, the migration wave caused a decrease in the employment rate among local French that was now competing with the migrants in the short term. As most of the migrants had a low skill level, this population was affected the most. However, also populations with higher education showed a relative decrease in employment, but in lower percentages (Borjas, Monras, 2016).

Former Soviet Union-Israel – As mentioned, one of the most important cases that could imply on the long term consequences of the Syrian refugee wave is the migration wave of former Soviet Union citizens to Israel at the beginning of the 1990's. Due to a change in policy in those countries, and due to the relative easy immigration policy posed by Israel to people with Jewish origins, during the years 1989-1995, more than 600,000 immigrants from the former Soviet Union moved to Israel. This migration wave caused an increase of 13.6% in the size of the Israeli population. Unlike the Cuban migration wave to the United States, the Soviet Union migrants enjoyed a relatively high level of skills. Only 11% of them arrived to Israel without secondary education, while in Israel 33% of the population had no secondary education at the time. Around 43% of the migrants had academic education, while only 18% of the local Israelis had a similar education level. However, 14% of migrants with an academic education were employed in jobs suitable for low skilled employees and 50% of the migrants were employed as skilled employees in the industry and construction sectors (Borjas, Monras, 2016).

The data shows that in the short term the population that was mostly harmed by this migration wave was the more educated population in Israel, which experienced a decrease in incomes during those years. It is also shown that the level of education and skills of the migrants could not provide a strong indication regarding the job they found in Israel and that the skill level they possessed was not fully translated to the Israeli market. This could be explained by the language barrier many migrants had. It is indeed shown that income shocks were weaker in professions that required fluency in Hebrew (Borjas, Monras, 2016).

In addition, as expected, immigrants suffered from a downgrading period in which they had to work in occupations that do not correspond with their previous set of

skills. This is considered in the professional literature as "downgrading". Pre-allocation of immigrants according to their measured skills before immigrating, placed them at different locations following the immigration (Dustmann, Frattini and Glitz, 2011).

Former Yugoslavia-Europe – Following the dissolution of Yugoslavia, Europe faced a number of refugee waves from former Yugoslavian countries. The first wave took place in 1991 and 1992 when Slovenia, Croatia and Bosnia declared independence. Another wave took place as the Kosovo crisis erupted. Unlike other migration waves brought here, many of the Yugoslavian refugees returned to their countries when the fighting ended. During the 1990's 260,000 people who were born in Yugoslavia found their way to Austria, Greece, Ireland, Portugal, Romania, Spain and Swiss. Even though it's only an increase of 0.3% in the population of the absorbing countries, the refugees chose focused areas to reside in. The city that absorbed the biggest number of refugees was Vienna. Data shows that this migration wave had a non-significant but negative influence on the local population. However, during those years Europe faced several other migration waves and it is difficult to isolate the influence of the Yugoslavian refugees on local labor markets (Morjas, Monras, 2016).

In the first two examples of Miami and Israel the migrants from Cuba and the former Soviet Union probably chose the destination country while taking economic opportunities under consideration, which means the country of origin, is not completely exogenous. On the other hand, it seems like refugees from the last two examples of Algeria and former Yugoslavia, escaped to the easiest or closest destinations, and therefore the shocks might be referred to as more exogenous. When comparing those cases to the Syrian refugees, it seems like that in the first stages of the Syrian war the refugees believed that they would return to Syria, and therefore chose close destination to stay in – Turkey, Lebanon and Jordan. Once they realized they are going to be displaced for a long period of time they started to act like immigrants, searching for better employment opportunities within the European Union in countries such as Germany, Sweden and Austria.

#### Possible implications on the Syrian Case

As the above cases indicate, absorbing immigrants into local labor markets had only small wage and employment implications in the long term. Meaning, that despite the

popular belief of local population that the immigrants have an adverse effect on wages and employment opportunities, past cases as well as the literature does not support this conclusion in the long term (Friedberg and Hunt, 1995).

Thus, it is recommended to strengthen the existing trend in most countries to remove refugee-specific barriers and to provide at least temporary migration opportunities in line with the labor market needs in hosting countries. This task might have strong opposition and might be difficult to achieve politically. One of the ways to overcome sometimes hostile public opinion would be to offer targeted temporary work opportunities and programs that address shortage of workers in some occupations, such as agriculture, as well as technical and language skills. Other recommended programs could be aimed to the local population who might experience decrease in wages or even unemployment in the short term (Lang, 2015)

In addition, as it's been mentioned, the increase in supply of workers with low skills could increase the demand of local population for higher education and advanced training. Therefore, they might be hurt in the short run, but as long as there's a government support for helping those who might be affected, in the long run they will benefit (Aiyar, etc. 2016).

## **Research Methodology**

### The Model

Following Borjas and Monras (2016), we assume a CES production function,

$$Q_t = [\alpha_{kt} K_t^\delta + \alpha_{lt} L_t^\delta]^{\frac{1}{\delta}} \quad (1)$$

the quantity of capital ( $K$ ) is given in the short run. Profit maximization and full employment imply the following expression of the log of the wage paid to workers at the pre-refugee's shock:

$$P_t \alpha_{lt} Q_t^{1-\delta} L_t^{-(1-\delta)} = W_t \quad (2)$$

where  $P$  is the price of the final good assumed to be given,  $Q$  is the output,  $L$  is the labor supply,  $W$  is the equilibrium nominal wage and  $t$  is the year. Equation 2 can be rewritten as:

$$\log (W_t) = \log (P_t) + \log (\alpha_{lt}) + (1 - \delta)\log Q_t - (1 - \delta) \log (L_t) \quad (3)$$

The disturbance occurring in period  $t + 1$  is an inflow of new refugees,  $M_{t+1}$ , the post-shock marginal productivity condition implies:

$$\log(W_{t+1}) = \log(P_{t+1}) + \log(\alpha_{lt+1}) + (1 - \delta) \log(Q_{t+1}) - (1 - \delta) \log(L_{t+1} + M_{t+1}) \quad (4)$$

To compute the wage change observed as a result of the refugee supply shock, we assume  $M_{it} = 0$  and take the difference between Equations (3) and (4). Rearranging gives:

$$\Delta \log(W_{t+1}) = \Delta \log(\alpha_{lt+1}) + \Delta \log(P_{t+1}) + (1 - \delta) \Delta \log(Q_{t+1}) - (1 - \delta) [\log(L_{t+1} + M_{t+1}) - \log(L_t)] \quad (5)$$

Setting  $\Delta \log(\alpha_{lt+1}) = \eta_{t+1}$ ,  $m_{t+1} = M_{t+1} / L_{t+1}$  and using the approximation  $\log(m_{t+1} + 1) = m_{t+1}$ , gives:

$$\begin{aligned}
\Delta \log(W_{t+1}) &= \eta_{t+1} + \Delta \log(P_{t+1}) + (1 - \delta)\Delta \log(Q_{t+1}) \\
&\quad - (1 - \delta) \left[ \log \left( \frac{L_{t+1} * (1 + m_{t+1})}{L_t} \right) \right] \\
&= \eta_{t+1} + \Delta \log(P_{t+1}) + (1 - \delta)\Delta \log(Q_{t+1}) - \\
&\quad (1 - \delta) \log \left( \frac{L_{t+1}}{L_t} \right) - (1 - \delta) m_{t+1} \quad (6)
\end{aligned}$$

The empirical counterpart of equation (6) controlling for the effects of non-Syrian refugees is the following: <sup>1</sup>

$$\begin{aligned}
\Delta \log(w_{t+1}) &= \\
\eta_t + \eta_1 \Delta \log(Q_{t+1}) - \eta_2 \Delta \log \left( \frac{L_{t+1}}{L_t} \right) - \eta_3 Sm_{t+1} - \\
&\quad \eta_4 NSm_{t+1} + \varepsilon_t \quad (7)
\end{aligned}$$

where  $w_{t+1}$  is the real wage;  $W_{t+1} / P_{t+1}$ ,  $\eta_t$  is time fixed effect,  $Sm$  and  $NSm$  refer respectively to Syrian and non-Syrian refugees and  $\eta_1, \eta_2, \eta_3$  and  $\eta_4$  are expected to be positive.

The error term,  $\varepsilon_s$ , is independent both from the size of the refugee shock and from the size of the native. Under such condition, Equation (7) can consistently be estimated by OLS. However, in many real-world situations the location of refugees in a given country can be endogenous. If, as suggested by Card (2001), migrants choose their location this can also be the case for refugees. Hence, locations of refugees become endogenous and  $\varepsilon_s$  and  $M_{t+1}$  will be correlated. One should, therefore, find instruments to get unbiased estimates. Inspired by the observation that new immigrants locate, in general, in the same country where the earlier immigrants from the same country of origin have located, the idea is to use information about the location of past immigrants. We will use this approach. The next section deals the data requirements for estimation.

Other estimation issues has been raised that should be taken into account. Most of them are related to skills and will be left aside because available data don't allow distinguishing refugees by skills. In the robusness test section, however, we will use an aleternative specification to control for skills.

---

<sup>1</sup> Similar equation to (5) can be derived for the unemployment rate (Botjas and Monras, 2016).

### Data and descriptive Analysis

The analysis is conducted for real wages growth and unemployment rate changes as dependent variables. The data for these variables are available from ILO but only for the period 1999-2015 in the case of the five main receivers in the region which we consider in our analysis: Lebanon, Egypt, Iraq, Jordan, Lebanon and Turkey. However, we do not have data on wages for Iraq and Lebanon. Among European countries, we select those which are the most exposed to the flows of Syrian refugees: Austria, Belgium, France, Denmark, Germany, Greece, Italy, Netherlands, Norway, Spain, Sweden, Switzerland and United Kingdom. The ILO data for these countries are available for a longer period but we limit our analysis to 1999-2015.

The main explanatory variable of interest is the number of Syrian refugees. The data are drawn from the UNHCR and provide the number of refugees by country of destination and country of origin. This allows distinguishing the impacts of Syrian and non-Syrian refugees. Other data are collected either as control variables or as instruments and come from the World Development Indicators. Information on bilateral migration stocks will be used to construct instruments and come from the site of Frédéric Docquier<sup>2</sup>.

Figure 1.a presents the flows of Syrian refugees between 1999 and 2015. It shows a dramatic increase since 2012. The increase is so important that it might hide past trends. Hence, Figure 1.b zooms on the period before 2012. Not only the scale is much more modest but there is almost no trend. This further highlights the extent of the post 2011 shock.

---

<sup>2</sup> <http://perso.uclouvain.be/frederic.docquier/oxlight.htm>



Figure 1.a: Number of Syrian refugees, 1999-2015

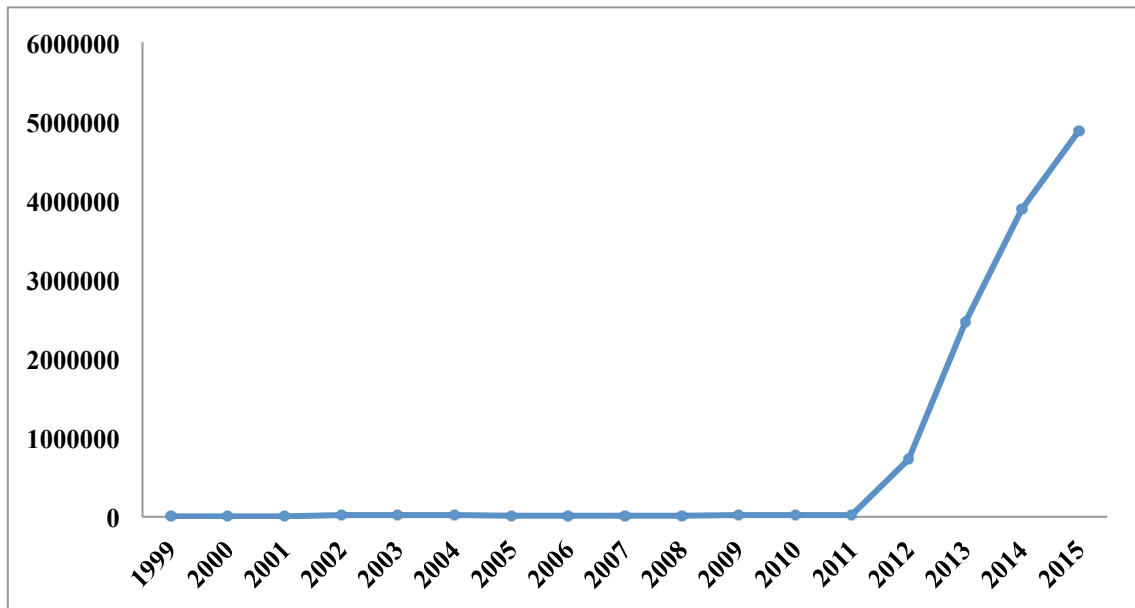


Figure 1.b: Number of Syrian refugees, 1999-2011

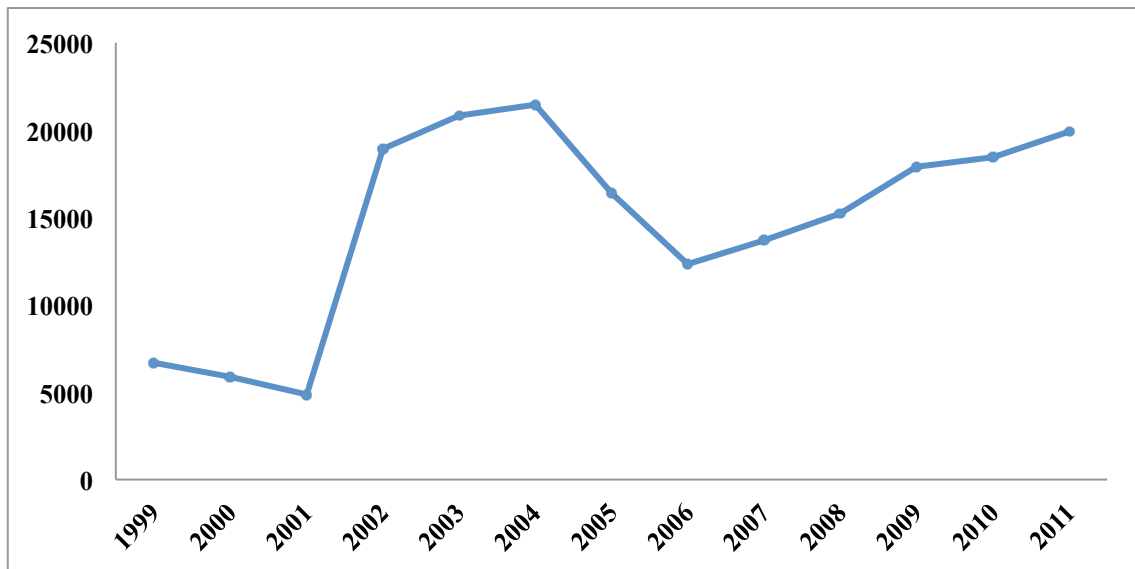
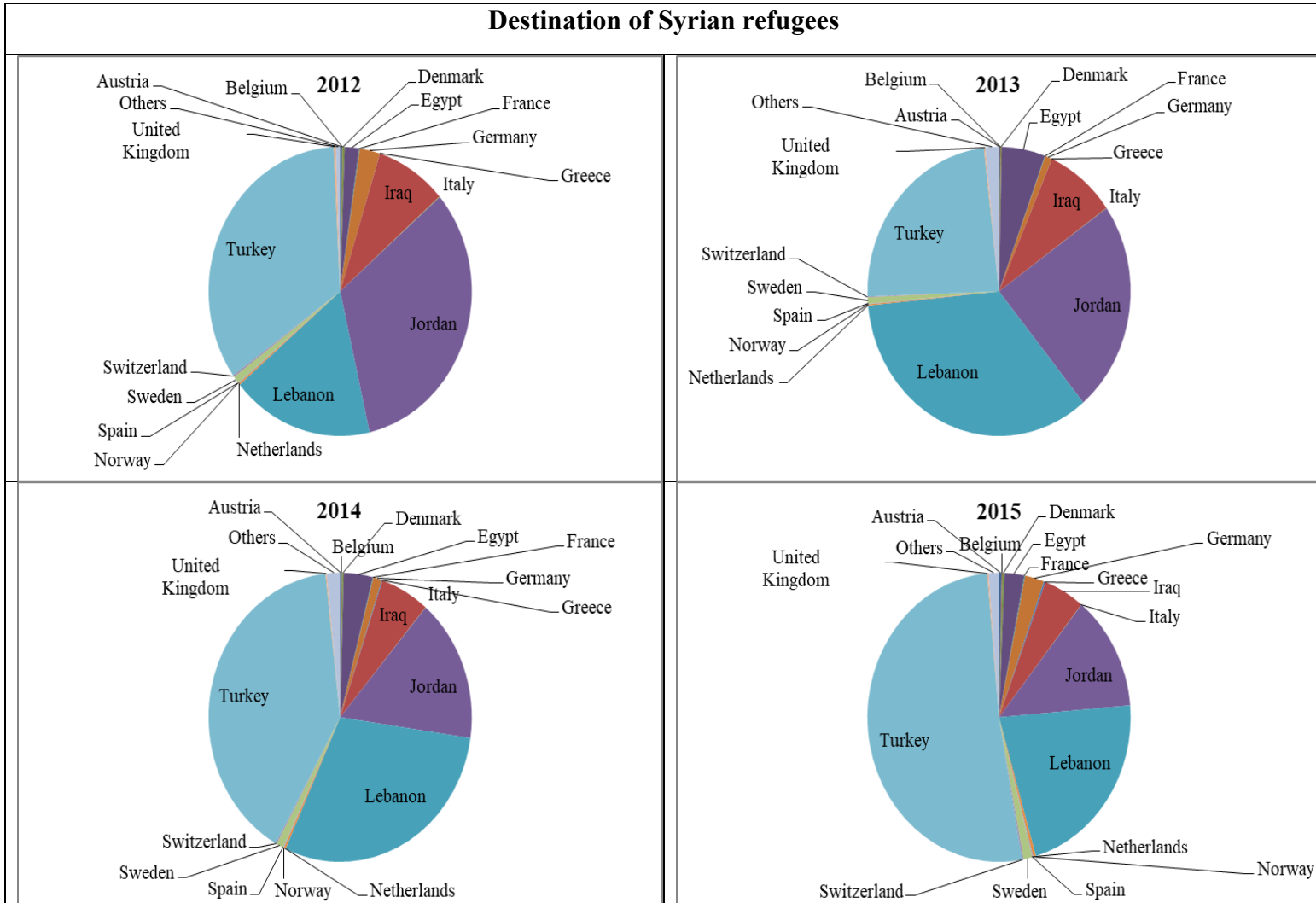


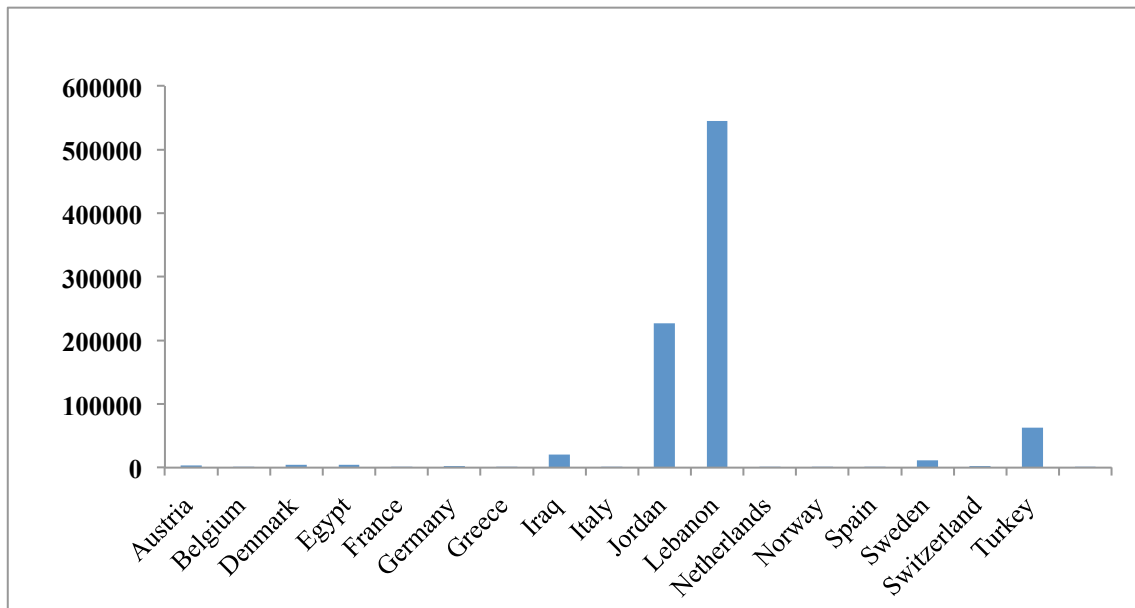
Figure 2: Destination of Syrian refugees



Figures 2 exhibit the distribution of Syrian refugees across the main receivers for each year between 2012 and 2015. The main receivers are the same across the whole period. These are Jordan, Lebanon and Turkey. The ranking of these countries as first, second and third receiver changes over the years. Egypt and Iraq follow in the ranking but are receiving a much lower share of Syrian refugees. The selected European countries altogether receive a very modest share of Syrian refugees as compared to any single country from the top three.

In line with the analysis of Figures 2, Figure 3 further highlights the high asymmetry in terms of hosting Syrian refugees. The figure presents the ratios of the total number of refugees received by the different countries between 2012 and 2015 to their respective population. Among all the considered countries, Lebanon and Jordan show ratios by far higher than any other country. Far behind, Turkey and Iraq follow. European countries are almost not affected.

Figure 3: Number of Syrian refugees per 1 million inhabitants (Cumulative 2012-2015)



### A first look and the dependent and explanatory variables

As explained above, we analyze the effects of the flows of Syrian refugees on real wage growth and on unemployment rate change. Before tackling the econometric analysis, Figures 4 and 5 offer descriptive analyses of the dependent variables. Figures 4 present the change in real wages over the period 2000-2014 in the selected Middle Eastern (Figure 4.a) and European countries (Figure 4.b). While a downward tendency seems to start after 2012 in Middle Eastern countries, no noticeable trend can be observed in European countries. Figures 5 are similar to Figures 4 except that they focus on the change in unemployment rate. No noticeable movement can be observed after 2012 in Middle Eastern countries. In Europe a slight downward tendency appears after 2012 but, in our opinion, this reflects the beginning of the recovery from the global financial and economic crises rather than any “Syrian” effect.

Figure 4.a. Change in real earnings of employees (%), 2000-2015

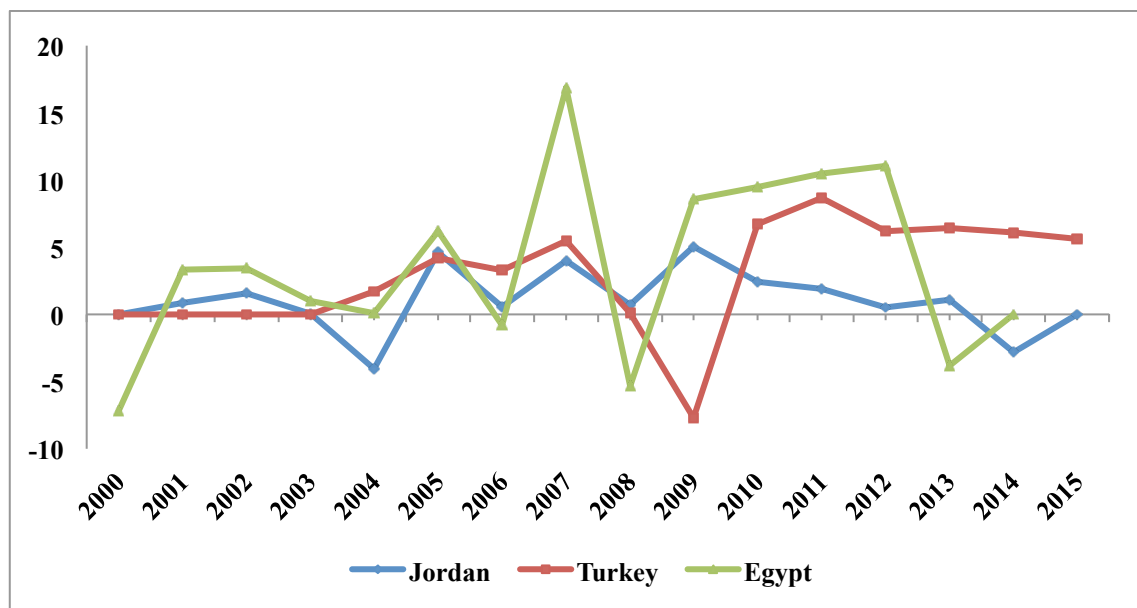


Figure 4.b. Change in real earnings of employees (%), 2001-2014

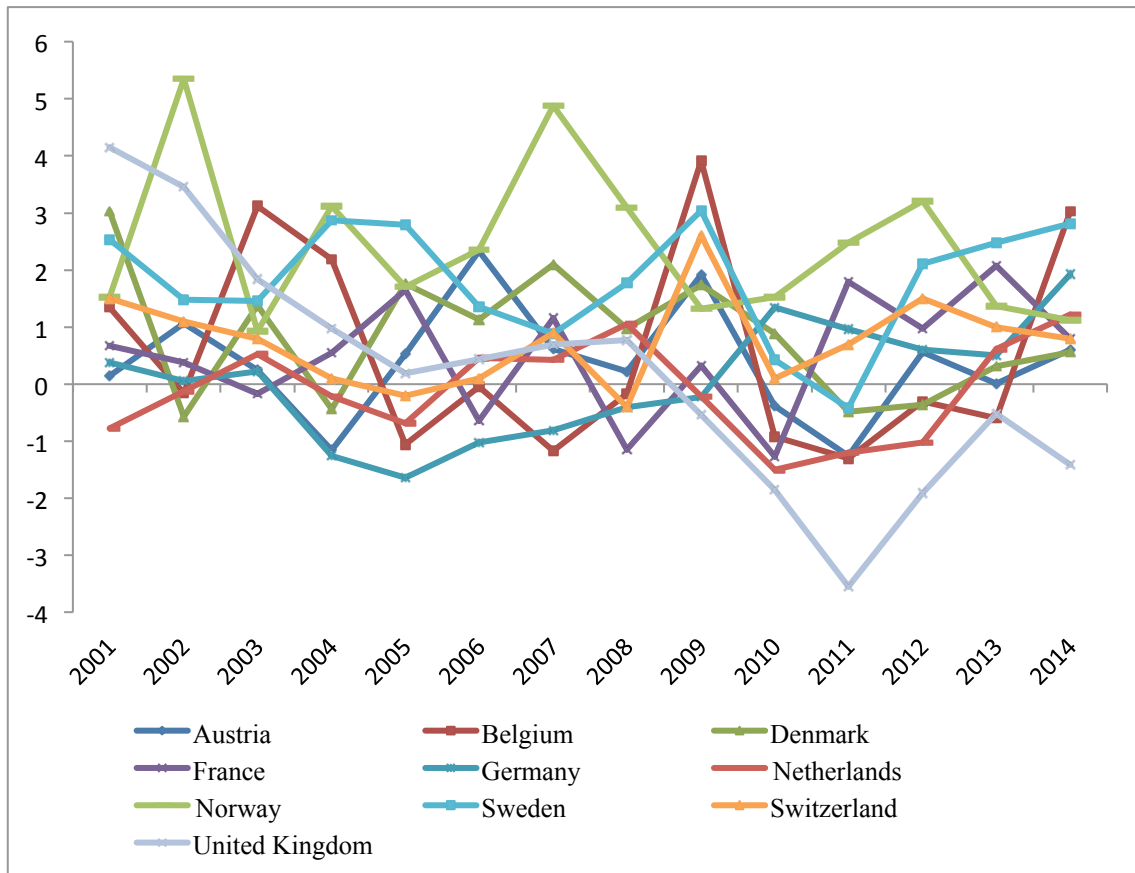


Figure 5.a. Change in Unemployment rate

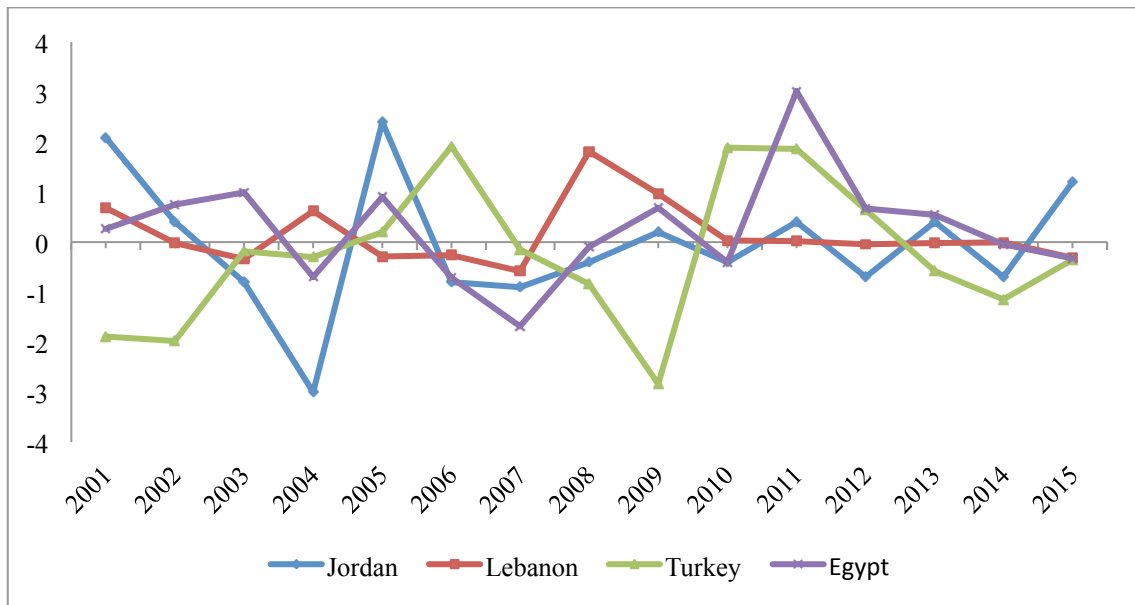
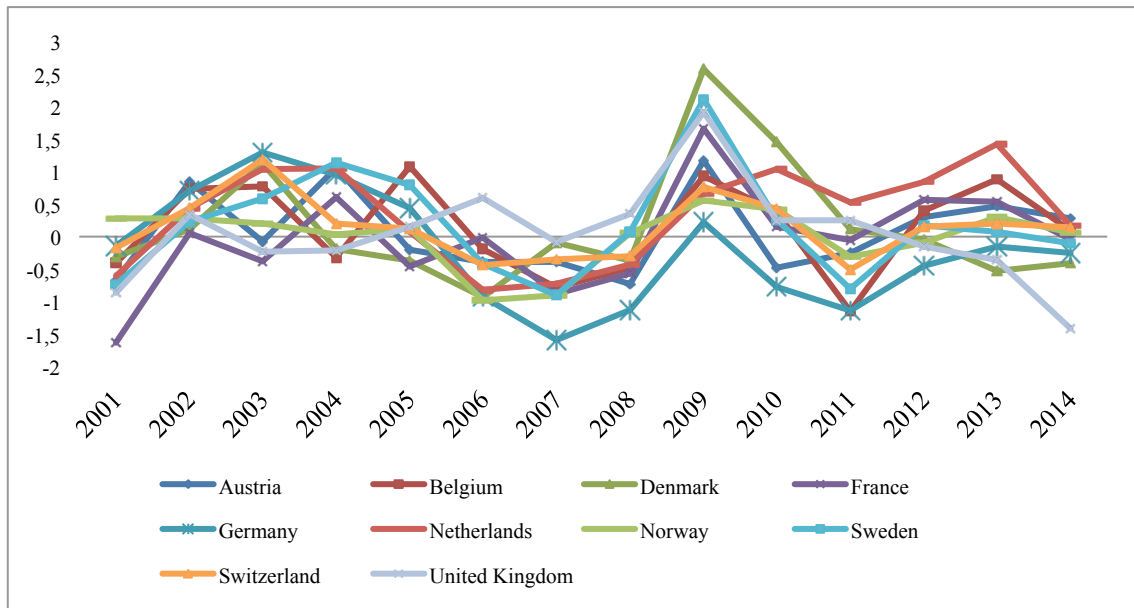


Figure 5.b. Change in Unemployment rate



Baseline results

Table 1 presents the estimation results (Equation 7) distinguishing between the effect of Syrian and non-Syrian refugees. As implied by Equation 7, all specifications include time fixed effects. However, their coefficients are not reported to save on space. Two sets of columns are presented and differ with respect to the dependent variable. The first set concerns the change in real wages while the second set pertains to the change in unemployment rate. Within each set we estimate two variants. One variant uses the contemporary levels of the explanatory variables of interest (Syrian and non-Syrian refugees) while the second uses the levels of these variables lagged once. The latter allows the effect of refugees on wages and unemployment to take some times. Note that all explanatory variables relates to the host country and are in log.

All estimates show a good quality of fit. The estimated values of the coefficients do not depend on whether the contemporary or the lagged levels of the refugees' variables are introduced. The coefficient of the real output growth rate is always significant and has the expected positive sign in the wage equation and the expected negative sign in the employment equation. The coefficient of the labor supply growth rate is never significant.

In the unemployment equation, the coefficient Syrians as well as those of Non-Syrians are never significant. This is in line with *the main result of Borjas and Monras (2016) that inflows of refugees have no effect on unemployment rate.*

In the wage equation, the coefficient of Non-Syrians is significantly negative when the contemporary level of the explanatory variable is considered and non significant when the lagged level of Non-Syrians is considered. More importantly, the coefficients of Syrian refugees are negative and significant for both the contemporary and the lagged levels. This implies that an increase in the Syrian refugees flow reduce real wages. The magnitude of the coefficient is higher in absolute term with the lagged than with the contemporary variable. These coefficients are, however, much lower than those found by Borjas and Monras (2016) regarding the impact of the Cuban supply shock on US workers. This may be due to the composition of our sample which mixes countries facing high and low inflows of Syrian refugees. We will be back to this issue when performing a Jackknife robustness tests. *In any cases, we uncover their main result that inflows of refugees decrease the growth rate of real wages.*

Table 1: OLS estimation

Variable	Change in real wage		Change in employment rate	
Constant	0.004 (0.936)	0.004 (0.923)	0.002 (0.713)	0.001 (0.603)
Real output growth rate	0.676 (4.372) ***	0.664 (4.089) ***	-0.231 (5.016) ***	-0.233 (4.911) ***
Labor supply growth rate	0.328 (1.477)	0.329 (1.362)	0.127 (1.553)	0.125 (1.543)
Ratio of Syrian refugees to labor supply	-0.127 (1.722) *		-0.009 (0.849)	
Ratio of Non-Syrian refugees to labor supply	-0.094 (1.706) *		-0.006 (0.409)	
Lagged ratio of Syrian refugees to labor supply		-0.193 (2.959) *		-0.001 (0.132)
Lagged Ratio of Non-Syrian refugees to labor supply		-0.084 (1.410)		-0.016 (0.914)
Number of observations	158	157	186	184
Adjusted R <sup>2</sup>	0.31	0.31	0.29	0.30
P-value F-test (Slopes jointly = 0)	0.00	0.00	0.00	0.00

t-statistics (in parentheses) are heteroskedastic-consistent, \*\*\* = Significant at 1%, \*\* = Significant at 5% and

\* = Significant at 10%

### Dealing with endogeneity of location choice

As explained above, there is a risk of correlation between the error term and the explanatory variables which can bias the OLS estimates. This section presents, therefore, the results based on the 2SLS which avoids such a risk. The instruments for this estimation are the lagged values of all the explanatory variables as well as the stocks of Syrian and non-Syrian *immigrants* in the receiving countries in 2000. As before, we consider two variants of the equation. One variant uses the contemporary levels of the explanatory variables of interest (Syrian and non-Syrian refugees) while the second uses the level of these variables lagged once.

Starting with the wage equation, the first stage's F-test and the P-Value of the test of over-identifying restriction show respectively that the estimates are strong and valid. Hence, the results have a causal implication and can be analyzed with confidence. Again, the coefficients of the labor supply growth are no more significant. The real output growth rate has a significant and expected positive sign. The coefficients of the ratio of non-Syrian refugees to labor supply are never significant while those of the



ratio of Syrian refugees to labor supply are always significant and show the expected negative signs. Their magnitude is, however, higher in absolute term with the lagged than with the contemporary variable. The difference is much higher than with the OLS estimation. These coefficients are, however, still much lower than those found by Borjas and Monras (2016) regarding the impact of the Cuban supply shock on US workers. This may be due to the composition of our sample which mixes countries facing high and low inflows of Syrian refugees. As said above, we will be back to this issue later in the paper.

Focusing on the unemployment equation, the first stage's F-test and the P-Value of the test of over-identifying restriction show respectively that the estimates are strong and valid. Hence, the results have a causal implication and can be analyzed with confidence. Except for the coefficient of the real output growth rate, which is significant and show the expected negative signs, all other coefficients are never significant. In particular, the ratio of Syrian refugees to labor supply are insignificant irrespective of the specification. No evidence of an effect of the inflow of Syrian refugees on unemployment rate is found.

***To sum up, with different estimation methods and different specifications we uncover the main results of Borjas and Monras (2016) that inflows of refugees decrease the growth rate of real wages but have no effect on unemployment rate.***

Table 2: 2 Stages Least Squares

Variable	Change in real wage		Change in employment rate	
Constant	-0.005 (0.756)	-0.002 (0.407)	0.011 (1.171)	0.020 (0.945)
Real output growth rate	1.203 (4.397) ***	0.966 (3.773) ***	-0.968 (1.464)	-1.937 (1.023)
Labor supply growth rate	-0.381 (1.264)	0.352 (0.538)	1.017 (1.283)	2.799 (0.851)
Ratio of Syrian refugees to labor supply	-0.103 (2.353) **		-0.083 (1.129)	
Ratio of Non-Syrian refugees to labor supply	-0.050 (0.649)		-0.034 (0.662)	
Lagged ratio of Syrian refugees to labor supply		-0.230 (2.412) **		-0.245 (0.791)
Lagged Ratio of Non-Syrian refugees to labor supply		-0.146 (1.435)		-0.196 (0.539)
Number of observations	157	156	184	182
F-test (Slopes jointly = 0)	0.00	0.00	0.00	0.00
F-test first stage of 2SLS	18.50	18.50	18.50	18.50
P-Value test of over-identifying restriction	0.22	0.93	0.09	0.98

t-statistics (in parentheses) are heteroskedastic-consistent, \*\*\* = Significant at 1%, \*\* = Significant at 5% and \* = Significant at 10%

### Robustness check: Additional control variables

So far we have used a parsimonious specification where the explanatory variables are limited to those derived from the theoretical model. In reality, however, the observed effects may depend on some structural features of the labor market and the economy in general. Hence, to gauge the robustness of our results we should confront them with those derived from the estimation of equations which accounts for some economic specificities that are likely to influence the refugees/wage (unemployment) linkages. Among these specificities, there is the skill composition of labor forces; which we have discussed above. Therefore, we test whether our results are robust to the inclusion of indicators of these skill composition. We use the difference in skills between the receiving and the sending (Syria) countries. Specifically, we consider for each partner the log of the ratio of unskilled to total workers.

Other structural characteristics of the labor force of the host country that can differentiate the impact of Syrian refugees on the unemployment and wages include

the share of self-employed workers, the share of vulnerable employment and the share of paid employment. These variables are drawn from the World Development Indicators where they are defined as follows. They are taken in percentage of total employment and in log. Self-employed workers are those who, working on their own account or with one or a few partners or in cooperative, hold the type of jobs defined as a "self-employment jobs", that is jobs where the remuneration is directly dependent upon the profits derived from the goods and services produced. Vulnerable employment is contributing family and own-account workers. Wage and salaried workers (employees) are those workers who hold the type of jobs defined as "paid employment jobs". They hold explicit (written or oral) or implicit employment contracts that give them a basic remuneration that is not directly dependent upon the revenue of the unit for which they work.

Finally, we consider a variable which pertains to cyclical phases of the host economy and two variables which reflect the structure of this economy. Cycles are proxied using inflation rates; that is the growth rate of the Consumer Price Index. The structure of the economy is reflected in the shares of agricultural and industrial value added in GDP.

All the additional explanatory variables are first introduced separately in the equation and then a final regression considers all of them in the same equation. Given their better quality of fit, only the equations with the lagged Syrian and Non-Syrian refugees are discussed.

The results for the change in real wages are presented in Table 3. The overall quality of the fit is good and comparable to the one in Table 1 except when the structure of the economy is introduced. The adjusted  $R^2$  becomes 0.39 instead of 0.31 suggesting that the structure of the economy is very important in explaining the change in real wages.

As in Table 1, the coefficient of labor supply growth rate and of lagged Ratio of Non-Syrian refugees to labor supply are never significant. Irrespective of the specification, none of the additional control variables is significantly different from zero except for the share of industry in GDP. The coefficient of the share of industry is positive suggesting that the aggregate real wage increases more in an economy with a large industrial sector as compared to agriculture or services.

The coefficients of real output growth rate and of lagged ratio of Syrian refugees to labor supply are significant and respectively positive and negative. The level of both

coefficients remains similar to Table1 suggesting that potential omission of some explanatory variables does not change the main finding. *In other words, our main result regarding wages is robust to the introduction of other explanatory variables.*

Table 3: Wages equation: Additional control variables (OLS estimates)

Variable	Estimate						
Constant	0.002 (0.158)	-0.007 (0.419)	0.006 (0.477)	0.035 (0.306)	0.011 (0.143)	0.093 (3.268)***	0.067 (1.097)
Real output growth rate	0.663 (3.884)***	0.666 (4.085)***	0.666 (4.040)***	0.665 (4.061)***	0.663 (4.044)***	0.507 (3.139)***	0.489 (2.759)***
Labor supply growth rate	0.327 (1.348)	0.334 (1.355)	0.314 (1.289)	0.326 (1.334)	0.282 (1.159)	0.021 (0.093)	0.006 (0.027)
Lagged ratio of Syrian refugees to labor supply	-0.186 (2.648)***	-0.174 (2.327)**	-0.187 (2.837)***	-0.189 (2.805)***	0.182 (2.868)***	-0.192 (3.476)***	-0.203 (3.534)***
Lagged Ratio of Non-Syrian refugees to labor supply	-0.082 (1.286)	-0.075 (1.313)	-0.081 (1.448)	-0.084 (1.476)	0.071 (1.287)	-0.055 (1.02)	-0.067 (1.144)
Inflation	-0.014 (0.181)						-0.052 (0.787)
The share of unskilled		-0.004 (0.717)					0.004 (0.504)
The share of self-employed			0.001 (0.146)				0.012 (0.457)
The share of vulnerable employment				0.000 (0.036)			-0.022 (0.847)
The share of paid employment					0.014 (0.509)		-0.032 (0.327)
The share of agriculture in GDP						0.006 (1.381)	0.007 (1.542)
The share of industry in GDP						0.043 (3.782)***	0.041 (3.012)***
Number of observations	157	157	157	157	157	157	157
Adjusted R <sup>2</sup>	0.31	0.31	0.30	0.30	0.31	0.39	0.38
F-test (Slopes jointly = 0)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

t-statistics (in parentheses) are heteroskedastic-consistent, \*\*\* = Significant at 1%, \*\* = Significant at 5% and \* = Significant at 10%

The results for the change in unemployment rate are presented in Table 4. The overall quality of fit is good and comparable to the one in Table 2 except when the structure of the economy is considered. The adjusted  $R^2$  increases from 0.30 to 0.32 confirming the findings in Table 3 that the structure of the economy is important for understanding the labor market outcomes.

As in Table 2, the results are consistent across specification. Only the coefficients of the real output growth rate and of the structure of the economy are significant. The coefficients of the real output growth rate have the expected negative sign and their magnitude is comparable to Table 2. The coefficient of the share of agriculture is positive suggesting that aggregate unemployment grows faster in economy with a large agricultural sector as compared to industry or services. No other coefficient is significant. In particular, the coefficients of the lagged ratio of Syrian refugees to labor supply are non-significant. ***This implies that our main result regarding the non-responsiveness of unemployment rate to the flow of Syrian refugees is robust to the introduction of additional explanatory variables.***

Table 4: Unemployment equation: Additional control variables

Variable	Estimate						
Constant	0.003 (0.936)	0.003 (0.413)	0.007 (1.117)	0.006 (0.952)	0.000 (0.041)	0.006 (0.554)	0.061 (1.724)*
Real output growth rate	-0.233 (4.934)***	-0.235 (4.858)***	-0.240 (5.027)***	-0.24 (4.950)***	-0.24 (4.753)***	-0.235 (4.611)***	-0.227 (3.908)***
Labor supply growth rate	0.122 (1.457)	0.12 (1.601)	0.092 (1.118)	0.098 (1.198)	0.098 (1.163)	0.095 (1.117)	0.129 (1.435)
Lagged ratio of Syrian refugees to labor supply	-0.006 (0.513)	-0.001 (0.100)	-0.005 (0.042)	-0.000 (0.699)	-0.000 (0.242)	-0.006 (0.47)	-0.011 (0.718)
Lagged Ratio of Non-Syrian refugees to labor supply	-0.018 (1.033)	-0.018 (0.953)	-0.008 (0.402)	-0.008 (0.387)	-0.009 (0.419)	-0.011 (0.595)	-0.026 (0.952)
Inflation	0.014 (0.751)						0.016 (0.675)
The share of unskilled		0.001 (0.248)					-0.002 (0.518)
The share of self-employed			0.003 (1.065)				0.01 (0.941)
The share of vulnerable employment				0.002 (0.862)			0.005 (0.701)
The share of paid employment					-0.007 (0.629)		0.069 (1.338)
The share of agriculture in GDP						0.003 (2.087)**	0.005 (2.297)**
The share of industry in GDP						-0.005 (0.982)	-0.308 (0.553)
Number of observations	184	184	184	184	184	184	184
Adjusted R <sup>2</sup>	0.30	0.29	0.30	0.30	0.30	0.32	0.32
F-test (Slopes jointly = 0)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

t-statistics (in parentheses) are heteroskedastic-consistent, \*\*\* = Significant at 1%, \*\* = Significant at 5% and \* = Significant at 10%

#### Robustness check: Jackknife analysis

As the sample consists of only 18 countries, a single country could have a substantial influence on the estimates. To assess the sensitivity of our results to a specific country, we run a country Jackknife. In other words, we drop one individual country in turn, and estimate the same specification on a sample consisting of the remaining 17 countries. Given the similarity of the results noticed above, we use the OLS

method with lagged variables. Table 5 reports the outcome of the two regressions that resulted in the largest and smallest absolute values of the coefficient of interest; that is the coefficient of ratio of Syrian refugees to labor supply. As far as the unemployment equation is concerned, the table shows that our results do not depend on the inclusion of any single country in the sample. We obtain the largest absolute value of the coefficient when Iraq is dropped, and the smallest absolute value of the coefficient when Germany is dropped. However, none of the coefficients is significant. Regarding the wage growth rate, it appears that the results depend on the inclusion of a single country in the sample. We obtain the largest absolute value of the coefficient of interest when Italy is dropped, and the smallest absolute value when Jordan is dropped. When Italy is dropped the coefficient is significantly negative like in the whole sample. In contrast, when Jordan is dropped the coefficient becomes insignificant. Actually, except for Jordan the removal of any country does not affect the significance of the coefficients of the variable of interest. In other words, Jordan seems to drive the negative relationship between the importance of the flows of Syrian refugees and the growth of real wages. This seems to make sense since the number of Syrian refugees is very large as compared to Jordan's population. One can reasonably expect a similar effect in Lebanon where Syrian refugees are even more numerous than in Jordan in comparison to the domestic population. As explained above, however, we don't have data on wages for Lebanon and our assertion can only be speculative. Finally, the Jackknife analysis combined with Figure 3 suggests that Syrian refugees are not numerous enough in the other countries (even Turkey) to affect domestic wages.



Table 5: Jackknife analysis

	Wages		Unemployment	
	Highest absolute value of the coefficient	Lowest absolute value of the coefficient	Highest absolute value of the coefficient	Lowest absolute value of the coefficient
Coefficient	-0.209	0.204	-0.007	0.002
<i>t-Stat</i>	(3.002) ***	(0.719)	(0.662)	(0.165)
Excluded country	Italy	Jordan	Iraq	Germany
Number of observations	146	147	173	173
Adjusted R <sup>2</sup>	0.30	0.31	0.40	0.31
F-test (Slopes jointly = 0)	0.00	0.00	0.00	0.00

t-statistics (in parentheses) are heteroskedastic-consistent, \*\*\* = Significant at 1%.

## **Bibliography**

- Aiyar, S, et al. (2016). The Refugee Surge in Europe; Economic Challenges. No. 16/2. International Monetary Fund
- Angrist, J. D., & Kugler, A. D. (2003). Protective or Counter-Productive? European Labor Market Institutions and the Effect of Immigrants on EU Natives. *The Economic Journal*, 113(488), F302–F331.
- Beerli, A., Peri, G. (2015). The Labor Market Effects of Opening the Border: Evidence from Switzerland. NBER Working Paper No. 21319
- Borjas, G. J., & Monras, J. (2016). The Labor Market Consequences of Refugee Supply Shocks. NBER Working Paper Series, 76
- Boubtane, E., Coulibaly, D., & Rault, C. (2013). Immigration, Unemployment and GDP in the host country : Bootstrap panel Granger causality analysis on OECD countries. Documents de Travail de Centre d’Economie de La Sorbone.
- Card, D. (2001). Immigrant inflows, native outflows, and the local labor market impacts of higher immigration. *Journal of Labor Economics*, 19(1), 22-64.
- Clemens, M. A., & Hunt, J. (2017). The Labor Market Effects of Refugee Waves: Reconciling Conflicting Results. National Bureau of Economic Research Working Paper Series, No. 23433(1491).
- Clemens, Michael A., Ethan G. Lewis, and Hannah M. Postel. 2018. "Immigration Restrictions as Active Labor Market Policy: Evidence from the Mexican Bracero Exclusion.
- Del-Carpio, X., Wagner, M. (2015), The Impact of Syrians Refugees on the Turkish Labor Market.
- Dustmann, C., Fabbri, F., & Preston, I. (2005). The Impact of Immigration on the British Labour Market. *Economic Journal*, 115(507), 324–341.
- Dustmann, C., Fabbri, F., & Preston, I. (2011). The Effect of Immigration Along the Distribution of Wages. *Review of Economic Studies* 80, 145-173.

Dustmann, C., Frattini, T., & Glitz, A. (2008). The Labour Market Impact of Immigration. *Oxford Review of Economic Policy*, 24(3), 477–494.

Dustmann, C. Hatton, T. Preston, I. (2005). The Labour Market Effects of Immigration. *The Economic Journal*, 115, F297–F299.

Dustmann, C., Schönberg, U., Stuhler, J. 2017. Labor Supply Shocks, Native Wages, and the Adjustment of Local Employment, *The Quarterly Journal of Economics*, Volume 132, Issue 1, Pages 435–483

Dustmann, Christian, Uta Schönberg, and Jan Stuhler. 2016. "The Impact of Immigration: Why Do Studies Reach Such Different Results?" *Journal of Economic Perspectives*, 30 (4): 31-56.

Edo, A., Hillel, R. (2017). Minimum Wages and the Labor Market Effects of Immigration. Working Paper

Hansen, R., & Randeria, S. (2016). Tensions of refugee politics in Europe. *Science*, 353(6303), 994-995

Friedberg, R. M., & Hunt, J. (1995). Employment and Growth. *The Journal of Economic Perspectives*, 9(2), 23–44.

Kirişçi, Kemal. (2014). Syrian Refugees and Turkey's Challenges: Going beyond Hospitality. The Brookings Institute, Washington, D.C.

Kizil, C. (2016). Turkey's Policy on Employment of Syrian Refugees and its Impact on the Turkish Labour Market. In I. Eroglu, Deniz; Cohen, H. Jeffrey; Sirkeci (Ed.), *Turkish Migration 2016 Selected Papers* (pp. 164–170). Transnational Press London.

Long, K. (2015). From Refugee to Migrant? Labor Mobility's Protection Potential. Migration Policy Institute, 1–25.

Peri, G. 2016. "Immigrants, Productivity, and Labor Markets." *Journal of Economic Perspectives*, 30 (4): 3-30.

Peri, G., Yasenov, V. 2015. The Labor Market Effects of a Refugee Wave: Applying the Synthetic Control Method to the Mariel Boatlift. NBER Working Paper No. 21801.

Taylor, J. E., Filipski, M. J., Alloush, M., Gupta, A., Valdes, R. I. R., & Gonzalez-Estrada, E. (2016). Economic impact of refugees. *Proceedings of the National Academy of Sciences*, 201604566

Tumen, B. S. (2016). The Economic Impact of Syrian Refugees on Host Countries ;, 106(5), 456–460.

Turner, L. (2015). Explaining the ( Non-) Encampment of Syrian Refugees: Security , Class and the Labour Market. *Mediterranean Politics*, 20(3), 386–404.

UNHCR (2017), Regional Strategic Overview: Regional Refugee & Resilience Plan 2017-2018. <http://data.unhcr.org/syrianrefugees/regional.php>.

## Appendix A

### Descriptive statistics

	Mean	Std. Dev.	Minimum	Maximum
Change in real earnings of employees	0.008	0.033	-0.093	0.169
Change in unemployment rate	0.002	0.013	-0.024	0.066
Real output growth rate	0.016	0.031	-0.096	0.105
Labor supply growth rate	0.012	0.015	-0.019	0.081
Ratio of Syrian refugees to labor supply	0.003	0.024	0.000	0.273
Ratio of Non-Syrian refugees to labor supply	0.018	0.052	0.000	0.324
Inflation	0.013	0.077	-0.242	0.173
The share of unskilled	-2.446	0.416	-3.353	-1.657
The share of self-employed	-1.783	0.478	-2.665	-0.881
The share of vulnerable employment	-2.160	0.534	-2.965	-1.036
The share of paid employment	-0.219	0.135	-0.535	-0.072
The share of agriculture in GDP	-3.938	0.828	-5.108	-1.905
The share of industry in GDP	-1.330	0.226	-1.860	-0.810

### Correlation Matrix<sup>+</sup>

	Earnings	Unemployment	Output growth	Labor supply	Syrian refugees	Non-Syrian refugees	Inflation	Unskilled	Self-employee	Vulnerable employee	Paid employee	Agriculture	Industry
Earnings	1.00												
Unemployment	-0.26	1.00											
Output growth	0.48	-0.63	1.00										
Labor supply	0.32	-0.13	0.52	1.00									
Syrian refugees	-0.04	-0.04	0.08	0.22	1.00								

FEM43-07 “The Effects of Syrian Refugees on the Labor Markets of Host Middle Eastern and European Countries”

Non-Syrian refugees	0.11	-0.10	0.21	0.54	0.02	1.00						
Inflation	-0.01	-0.10	0.19	0.15	0.02	0.14	1.00					
Unskilled	-0.01	0.05	0.11	0.30	0.21	0.31	0.00	1.00				
Self-employed	0.06	0.16	0.08	0.15	0.02	-0.10	0.09	0.23	1.00			
Vulnerable employment	0.03	0.17	0.04	0.09	0.00	-0.16	0.04	0.23	0.98	1.00		
Paid employment	-0.12	-0.14	-0.10	-0.15	0.00	0.14	-0.08	-0.10	-0.97	-0.96	1.00	
Agriculture	0.29	0.09	0.26	0.35	0.12	0.05	0.12	0.21	0.74	0.71	-0.82	1.
Industry	0.48	-0.22	0.46	0.48	0.08	0.20	0.16	-0.18	-0.13	-0.18	0.02	0.

+ See the previous table for the exact name of the variables