

The Economic Impacts of the Syrian Refugee Migration on Jordan

An Integration Perspective

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Abstract

The Syrian Civil War in 2011 led to a substantial influx of refugees into Jordan, with more than 660,000 Syrians arriving by 2015. More than half of these refugees were of working age. This study shows that Syrian refugees have less education than their Jordanian counterparts, and policies attempted to help them to assimilate into manufacturing. The study tests two hypotheses related to refugee assimilation. The first hypothesis examines the 2016 Jordan Compact with the European Union, which aimed to integrate Syrian refugees and improve Jordan's export profile with simplified rules of origin for certain industries. If the Jordan Compact was effective, a relative increase in exports to the European Union, compared to other regions, would be expected. The second hypothesis suggests that

the successful integration of Syrian workers into the manufacturing sector contributed to a boost in manufacturing exports to all destinations relative to other exports. The study conducts a gravity difference-in-differences analysis to evaluate these two hypotheses. The findings show little, if any, evidence supporting the first hypothesis but strong support for the second. These findings suggest that although the simplified rules of origin had limited impact on exports to the European Union, the Jordanian government effectively integrated Syrian workers into the manufacturing sector. Labor force surveys indicate that a skill mismatch impeded the integration of Syrian workers into the industries targeted by the Jordan Compact, but refugees were successfully assimilated into the manufacturing industry.

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The Economic Impacts of the Syrian Refugee Migration on Jordan: An Integration Perspective¹

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1. Introduction

As immigration and refugee flows increase, recipient nations are increasingly pressured to understand how immigrants generally, and refugees in particular, are “absorbed” into the labor force. How immigrants are absorbed into the labor force has implications for native support for immigrants/refugees, government resources dedicated to supporting unpaid migrants, and economic growth. The increase in labor supply can be absorbed successfully (with minimal domestic wage and employment impacts accompanied by economic growth) if the economy is sufficiently diversified.² Increasing exports is important because most recipient nations are too small to affect global prices and, by exporting, they can avoid the “Dutch Disease” effect of driving down domestic wages and employment through the increase in domestic production and labor-market competition. In other words, an increase in exports is often synonymous with an increase in labor demand.

In this paper, we focus on Jordan’s experience of receiving over 660,000 Syrian refugees between 2011 and 2015 following the Syrian Civil War. Recognizing the important potential of exports to increase labor demand and facilitate Jordan’s ability to absorb the influx of migrants, the European Union (EU) and the Hashemite Kingdom of Jordan entered into an agreement known as the Jordan Compact (JC) in 2016. The JC includes two measures to facilitate Jordan’s export growth during the influx of migrants. The first measure focused specifically on exports to the EU by simplifying “rules of origin” that define what products are considered “made in Jordan”. Relaxing these rules makes it easier for Jordan to expand exports by increasing access to foreign inputs and reducing trade costs (Abreha and Robertson 2023). The second measure focused on cooperation to help refugees assimilate and find jobs through better access to education, and attracting investment designed to enhance the resilience of both Jordanian host communities and Syrian refugees.

Evaluating the effects of these two measures is both important and straightforward. For the first measure, we evaluate the hypothesis that the EU-specific part of the JCC that relaxed rules of origin for Jordan’s exports to the EU would have shifted Jordan’s export basket towards the EU. In the second measure, the cooperation between Jordan and the EU to facilitate immigrant assimilation resulted in a higher share of migrants working in manufacturing than the share of natives working in manufacturing. Therefore, we evaluate the hypothesis that Jordan’s export basket would have shifted towards manufacturing following the Jordan compact relative to other sectors.

Our approach towards evaluating both hypotheses relies on a difference-in-differences gravity model approach. Our results provide little, if any support for the first hypothesis but strong and significant support for the second. The results suggest that the coordination between the EU and Jordan successfully supported migrant assimilation into the labor force generally, and

² Neoclassical trade theory shows that migration that does not move a country outside of its diversification cone will have no effect on wages of natives.

into manufacturing in particular, but relaxing the rules of origin had very little, if any, effect on expanding exports from Jordan to the EU.

This paper contributes to studies on the socio-economic impact of large-scale refugee movements on host countries. This includes literature on refugee crises, refugee integration, and the economic implications of forced migration (Betts and Collier, 2017; Dustmann et al., 2017; Brell et al., 2020). This study adds to the integration of minorities into local labor markets (Bertrand and Mullainathan, 2004; Charles and Guryan, 2008; Heath et al., 2013; Bartos et al., 2016; Hedegaard and Tyran, 2018), focusing for the first time on the integration of refugees into export-oriented industries. Expanding exports might also occur if policies are in place to help refugees overcome the universal problem of finding jobs that are appropriate for refugee skills.

2. Refugee Crisis and Refugee Assimilation

As of 2024, Jordan hosts approximately 1.3 million Syrians, with nearly 670,000 registered as refugees with the United Nations High Commissioner for Refugees (UNHCR). Most of these refugees live outside camps in urban and rural areas, while a smaller portion resides in refugee camps like Zaatari and Azraq. Over 80% of Syrian refugees in Jordan live in host communities, particularly in cities like Amman, Irbid, and Mafraq. Camps such as Zaatari, which has become one of the world's largest refugee camps, host tens of thousands of people but represent a fraction of the total Syrian refugee population in Jordan.

While the integration of refugees into the labor market has had positive economic effects, including increased consumer demand (Rozo and Sviatschi, 2018) and labor force participation (Fakih and Ibrahim, 2016), it has also placed additional pressure on public services and infrastructure (Alhawarin et al., 2021; Rozo and Sviatschi, 2021). Access to education has been a significant issue, with many Syrian children facing challenges in enrolling in Jordanian schools. The labor market has been affected, with some Jordanians perceiving refugees as competitors for jobs, especially in the informal sector. Employment opportunities for refugees are limited, with legal restrictions on work permits for certain sectors. In this context, the government of Jordan worked hard in the assimilation process of refugees, integrating them into the labor market through special work permits and initiatives.

The Jordanian government has implemented several policies and initiatives to assimilate Syrian refugees into the labor market, recognizing the economic and social challenges posed by the large refugee population. These efforts have been shaped by both domestic needs and international pressures, with the aim of balancing the needs of the refugees with the country's economic realities.

2.1. *The Jordan Compact*

The Jordan Compact was a landmark agreement between Jordan and the international community, particularly the European Union and donor countries. In exchange for significant financial aid, trade concessions, and investment opportunities, Jordan agreed to improve access

to its labor market for Syrian refugees. As part of the Compact, Jordan committed to issuing up to 200,000 work permits to Syrian refugees. This was a significant policy shift, as work for refugees was previously restricted. The permits allowed Syrians to work in specific sectors, including agriculture, construction, manufacturing, and services. The Compact also included the creation of special economic zones where companies could employ Syrian refugees, often in exchange for preferential access to European markets.

2.2. *Simplification of Work Permits Procedure*

The Jordanian government simplified the process for obtaining work permits, reducing fees and eliminating some bureaucratic hurdles. Mobile units were also deployed to refugee camps and urban areas to facilitate the issuance of permits. Jordan introduced flexible and sector-specific work permits, which allowed Syrian refugees to work in various jobs within certain sectors without the need for employer sponsorship. This made it easier for refugees to find and switch jobs. However, work permits are still largely restricted to low-wage, labor-intensive sectors, limiting opportunities for many skilled refugees. Moreover, despite the availability of work permits, about two-thirds of Syrian refugees continue to work informally, often due to the mismatch between their skills and the available jobs, or the perceived complexity of the work permit process.

2.3. *Sector-Specific Initiatives*

The agriculture sector has been one of the most accessible for Syrian refugees, with many permits issued for seasonal and regular agricultural work. The government worked with international organizations to promote the inclusion of refugees in this sector, where labor demand is high. The Government of Jordan made focal efforts to integrate Syrians into the construction and manufacturing sectors, which are important to Jordan's economy. This included vocational training programs designed to match refugees' skills with market needs.

To motivate our data section, it is essential to understand the UN Statistics Division's (ISIC – HS) concordances, which link the International Standard Industrial Classification of All Economic Activities (ISIC) with the Harmonized System (HS). ISIC is a global standard for categorizing economic activities, providing a hierarchical structure that organizes industries based on their primary activities, and is used for various statistical purposes. Meanwhile, the HS, developed by the World Customs Organization, offers a standardized nomenclature for classifying traded goods, facilitating customs, trade, and tariff processes. The ISIC – HS concordances bridge these two systems, enabling us to connect economic activities from Labor Force Survey (LFS) data (ISIC) to specific products in the UN COMTRADE data (HS), thereby enriching our analysis of economic activities and trade flows. Once the ISIC and HS codes are mapped, we can observe the employment allocation of workers across export-oriented industries and evaluate the employment implications of the JC.

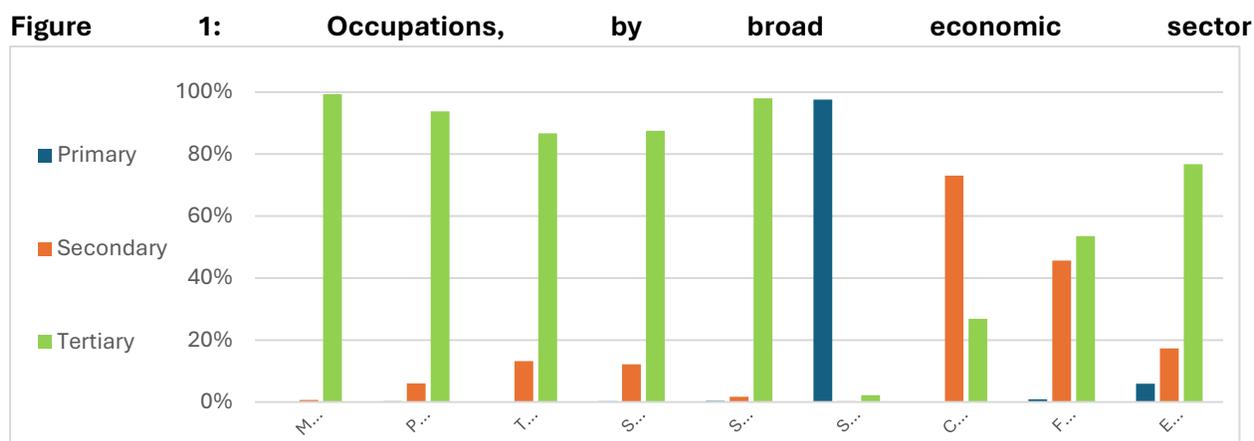
The Jordanian LFS is a survey implemented through four rounds on a yearly basis by the Jordanian Department of Statistics (DoS) and provides detailed information on various aspects of

the labor force in the country. The survey covers about 16,500 households distributed over all governorates. Since 2017, the survey collects data that are representative of Jordanians and non-Jordanians. As we cannot directly identify Syrians in the data, we proxy them as all non-Jordanians who arrived in Jordan after 2011 and have refugee status. Furthermore, we define as other immigrants as the rest of the non-Jordanians. In so doing, we follow the standard approach previously used for conducting analyses on Syrian refugees using Jordan LFS at the Poverty Practice (World Bank, 2016).

The LFS data cover a wide range of topics related to employment, unemployment, and labor force participation. It includes information about individuals' demographic characteristics, educational attainment, occupation, industry, employment status, and other relevant labor-related variables.

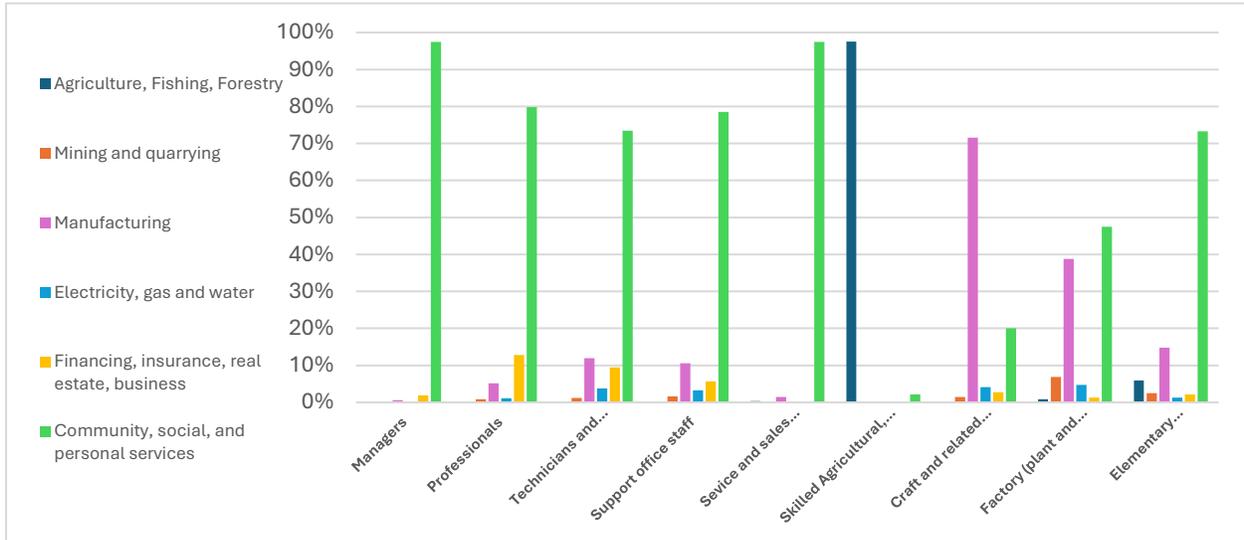
For this study, we built a repeated cross-sectional dataset between 2017 and 2019. We harmonized industry codes to ISIC Revision 2 classification. We refer to other data sources and harmonization used for this study in the Appendix.

A sectoral disaggregation of occupations (ISCO) across sectors shows the tertiary sector absorbs most laborers in Jordan's employment structure. Consistently, further disaggregating the occupational categories by main industry shows most workers are engaged in the *Community, Social, and Personal Services* sector (see Figures 1 and 2). This sector includes activities in Education Services, Health and Social Services, Public Administration and Defense, and Cultural and Recreational Activities, among others.



Source: Authors' elaboration using data from UNCOMTRADE and Jordan LFS 2017-2019.

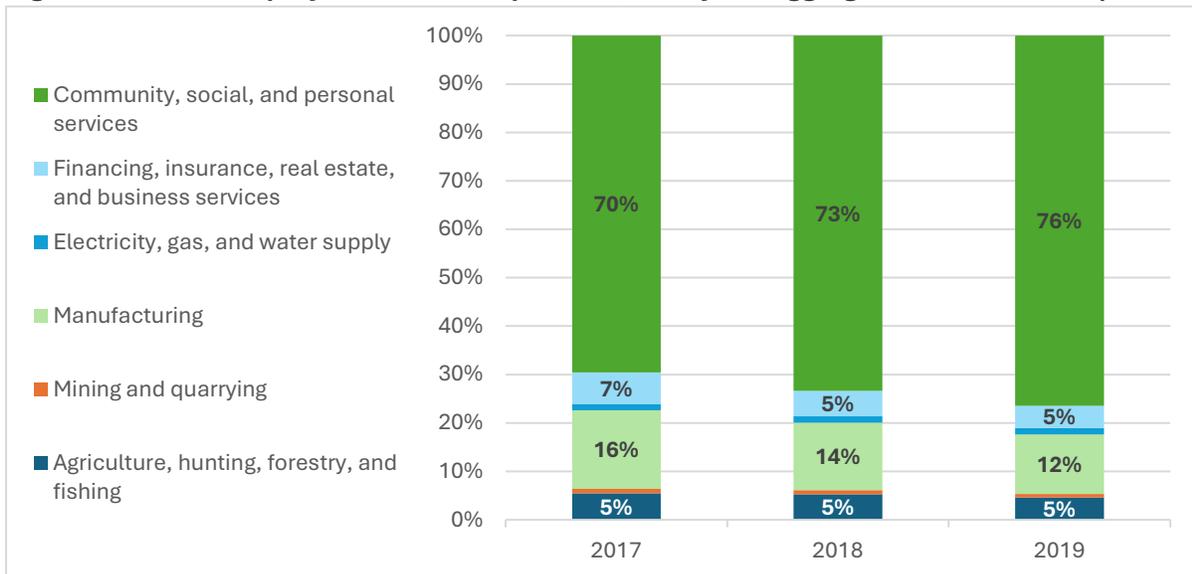
Figure 2: Occupations, by industry



Source: Authors' elaboration using data from UNCOMTRADE and Jordan LFS 2017-2019.

Jordan experienced a transformation in the allocation of employment across sectors between 2017 and 2019. Among those workers exposed to international trade, the shares of workers in “Community, Social, and Personal Services” increased year after year, reaching 76% in 2019, at the expense of employment in “Financing, Insurance, Real Estate, and Business Services”, as well as in “manufacturing” (see Figure 3).

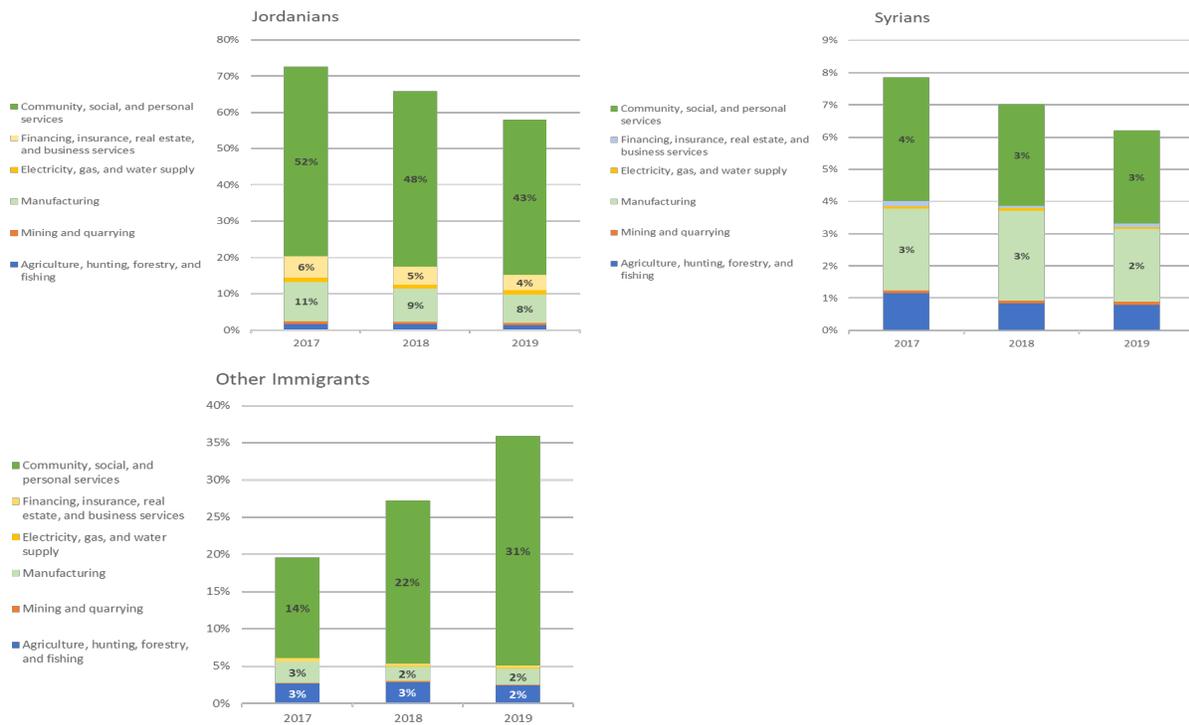
Figure 3: Employment Composition, by aggregate sector (2017-2019)



Source: Authors' calculations with data from Jordan LFS and UNCOMTRADE

Although the JC contributed to the insertion of Syrian refugee workers in export-oriented industries, native employment was replaced by other immigrants in all sectors year after year.³ More than 50% of employment in the “Community, Social, and Personal Services” is native, and it is almost equally shared with other non-Syrian immigrants. Syrian workers are underrepresented in all sectors, accounting for less than one in 20 workers, and most of them are in the “Community, Social, and Personal Services” and “Manufacturing”. On the other hand, other immigrants increased their participation, representing one in five workers in 2017 and one in three workers in the economy in 2019.

Figure 4: Employment composition for Jordanian/Syrian Refugees/Other Immigrants, by aggregate sector (2017-2019)



Source: Authors’ calculations with data from Jordan LFS and UNCOMTRADE

Syrian workers, although concentrated in the agriculture sector, also tend to specialize in manufacturing. This holds true for both genders, but more among men. Figure 5 shows the ratio between the proportion of Syrian workers out of total Syrian workers and the proportion of

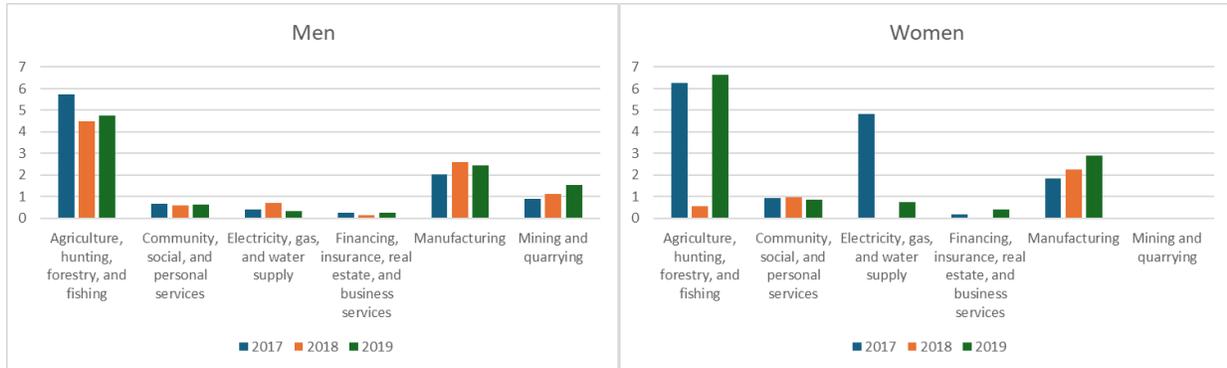
Jordanian workers out of the total Jordanian workers $\frac{\sum_i Syrian_i}{\sum_i Syrian_i} / \frac{\sum_i Jordanian_i}{\sum_i Jordanian_i}$ for each of the sectors

and genders. The trend even shows more specialization over time: this ratio for male workers in the primary sector decreased from 5.7 in 2017 to 4.7 in 2019 while in manufacturing this ratio

³ Due to data limitations, to identify Syrian refugees in the Jordan LFS, we had to narrow the period of analysis to 2017-2020. These other immigrants are all respondents identified as non-Jordanians in the data who do not belong to the group of Syrian refugees. Presumably, most of these immigrants are Egyptians and Iranians.

increased from 2.0 to 2.5. Similarly, for the case of women, the ratio in manufacturing increased from 1.8 to 2.9.

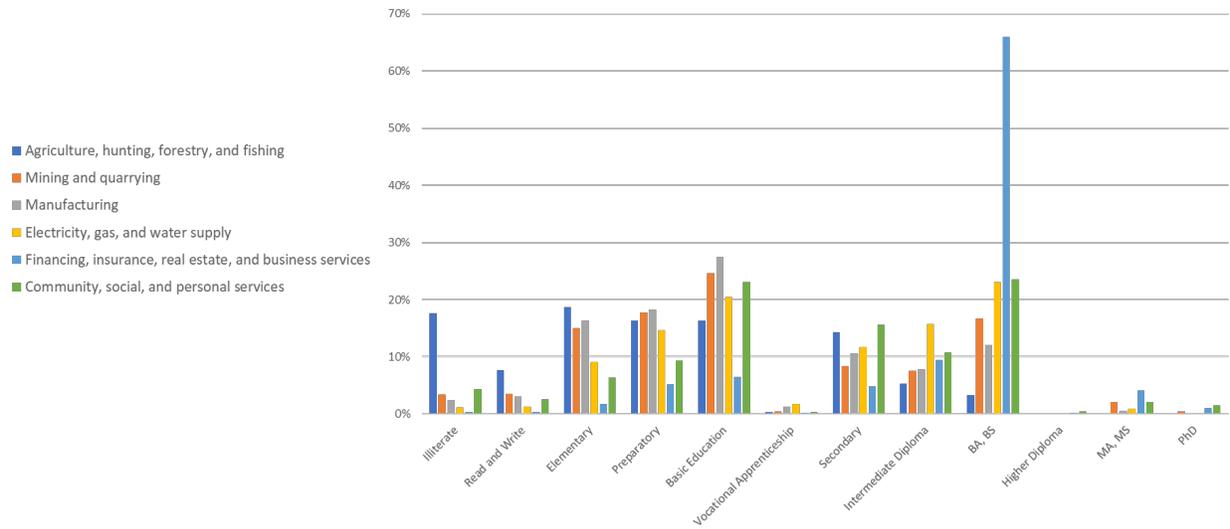
Figure 5: Relative Syrian Prevalence, by sector and gender (2017-2019)



Source: Authors' calculations with data from Jordan LFS and UNCOMTRADE

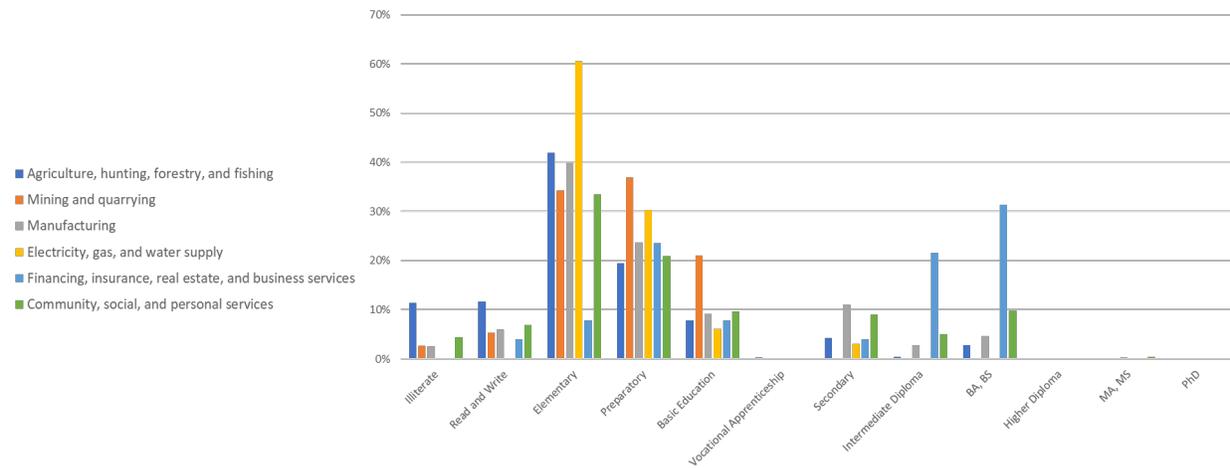
The limitations for Syrians entering the job market to a larger extent may stem from a skill mismatch, as highlighted in Visintin et al. (2015) and McGowan and Andrews (2015). Although working-age Syrians are less educated than their Jordanian counterparts (see Figure 8), this mismatch can manifest in highly educated Syrians performing low-skilled jobs and less educated Syrians struggling to compete. To analyze this, we can compare the distribution of Jordanians and Syrians across sectors for a given educational level. The distribution of native Jordanians can serve as a benchmark, reflecting the structural characteristics of the labor market. Significant differences in the allocation of Syrian workers, compared to Jordanians with the same educational background, would suggest a skill migration mismatch. Figures 6 and 7 support this hypothesis: 66% of Jordanians in manufacturing, less than 8% in FIRE (Finance, Insurance, and Real Estate), and 25% in EGW (Electricity, Gas, and Water) have not completed secondary education. In contrast, 81% of Syrians in manufacturing, 36% in FIRE, and 91% in EGW have not completed secondary education, indicating a significant deviation from the structural benchmark.

Figure 6: Education background of Jordanians, by sector (2017-2019)



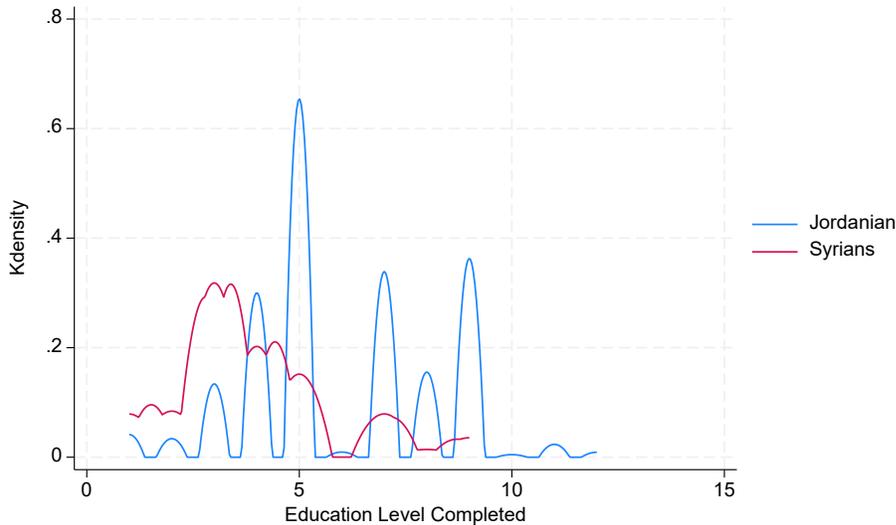
Source: Authors' calculations with data from Jordan LFS and UNCOMTRADE

Figure 7: Education background of Syrian Refugees, by aggregate sector (2017-2019)



Source: Authors' calculations with data from Jordan LFS and UNCOMTRADE

Figure 8: Completed Education Levels for Syrians and Jordanians in Working Age (2017-2019)



Notes: Authors' calculations with data from Jordan LFS. Education levels increase by one from Illiterate to PhD as shown in Figures 6 and 7.

The Elasticity of Substitution (EoS) is a measure that quantifies how easily one input can be substituted for another in the production process. In this specific context, the EoS is calculated as the percentage change in Syrian employment divided by the percentage change in Jordanian employment ($EoS = \frac{\% \text{ change in Syrian employment}}{\% \text{ change in Jordanian employment}}$). Therefore, a positive EoS implies complements, but a negative EoS implies substitutes. If employment increases (decreases) for both groups, they are complements ($EoS > 0$), but if employment increases (declines) for one but declines (increases) for the other, Syrians and Jordanians are substitutes ($EoS < 0$). Table 1 shows estimates of the EoS of Jordanians and Syrians across sectors and for the economy as a whole. Although the aggregate EoS suggests Syrians and Jordanians are substitutes, this is not the case for workers engaged in the primary and manufacturing sectors.

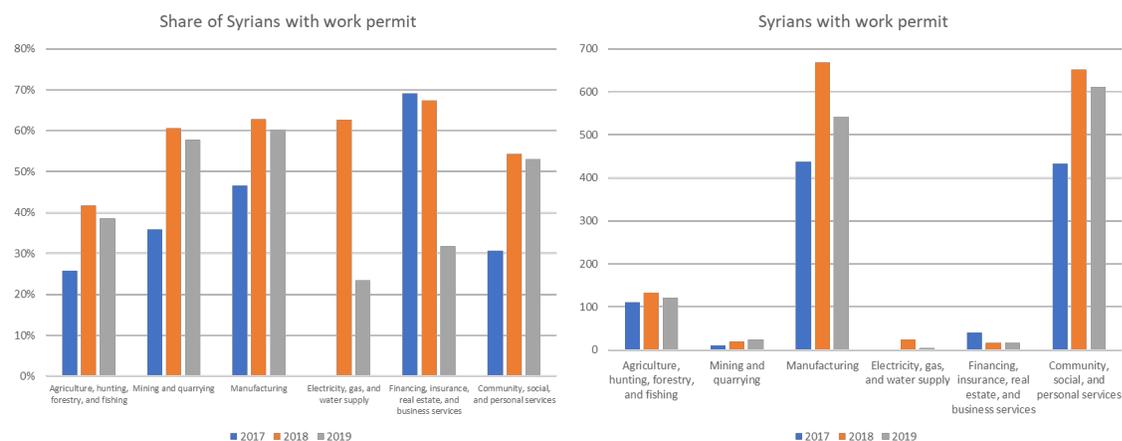
Table 1: Elasticity of Substitution

Sector	Sectoral Elasticity of Substitution	Elasticity of Substitution
Agriculture, hunting, forestry, and fishing	11.23	-2.33
Mining and quarrying	-0.72	
Manufacturing	2.80	
Electricity, gas, and water supply	-38.82	
Financing, insurance, real estate, and business services	-0.40	
Community, social, and personal services	2.88	

Notes: Elasticity of Substitution (EoS) = (% change Syrian employment) / (% change Jordanian employment). $EoS > 0 \Rightarrow$ Inputs are Complements; $EoS < 0 \Rightarrow$ Inputs are Substitutes. Authors' calculations with data from Jordan LFS and UNCOMTRADE 2017-2019.

There is a marked increase in the share of Syrian refugee workers in Jordanian export-oriented industries holding work permits. While the 2017 data reveal that less than half of Syrian workers in each sector held a work permit, except for those working in *FIRE*, most of them held a work permit in 2018 and 2019. This result is in line with a better knowledge of the existence of the JC among Jordanians and the Syrian refugee population. Unsurprisingly, the primary sector, with the largest Syrian refugee prevalence, has low rates of Syrian workers with work permits in 2018 and 2019 in comparison to other sectors.

Figure 9: Share of Syrian refugee workers with work permits, by aggregate sector (2017-2019)



Source: Authors' calculations with data from Jordan LFS and UNCOMTRADE

3. Trade Patterns

UN COMTRADE

The UN Comtrade dataset, officially known as the United Nations Commodity Trade Statistics Database, is a comprehensive international trade database maintained by the United

Nations Statistics Division (UNSD). This dataset provides detailed information on global merchandise trade, encompassing the import and export of goods and services between countries and regions. In this study, we limit the analysis to trade in merchandise only, since data on trade in services are very limited. Moreover, following the standard convention in empirical trade studies, we use the value of imports reported by Jordan’s trade partners to capture the value of Jordan’s exports to its partners.

Trade trends provide insights into Jordan's economic health and growth prospects. Analyzing trade data helps understand how Jordan is integrating into the global economy and which sectors are driving export growth. Moreover, understanding trade patterns helps Jordan identify opportunities to diversify its economy. Over-reliance on a few key exports or trading partners can make the economy vulnerable to external shocks. By analyzing trade trends, Jordan can strategize to broaden its export base and reduce dependency on specific markets.

Jordan has pursued a policy of trade liberalization in the past few decades. Between 1997 and 2024, Jordan signed eight trade agreements (see Table 2). The most important is the Pan-Arab Free Trade Area, signed in 1997 with the Middle East and North Africa (MENA) countries. In 2021, it accounts for a third of Jordan’s total exports.

Table 2. Jordan’s Trade Agreements

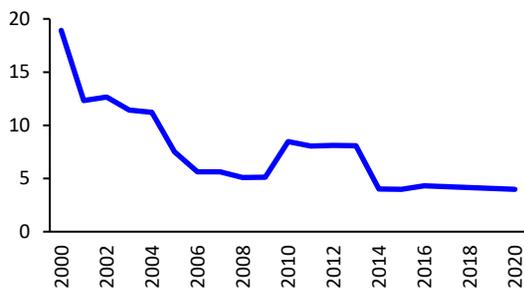
Agreement Name	Signature	Entry into force	Partners
Pan-Arab Free Trade Area (PAFTA)	01/19/1997	01/01/1998	MENA
EU - Jordan	11/24/1997	05/01/2002	EU, Jordan
United States - Jordan	10/25/2000	12/17/2001	Jordan, United States
EFTA Agreement	06/21/2001	09/01/2001	Iceland, Liechtenstein, Norway, Switzerland, Jordan
Agadir Agreement	02/25/2004	03/27/2007	Arab Republic of Egypt, Jordan, Morocco, Tunisia
Jordan - Singapore	05/16/2004	08/22/2005	Jordan, Singapore
Canada - Jordan	06/28/2009	10/01/2012	Canada, Jordan
United Kingdom - Jordan	11/05/2019	05/01/2021	Jordan, United Kingdom

Source: World Trade Organization (WTO). [WTO | Regional trade agreements](#)

As a result of these agreements, Jordan’s tariff rates have dropped sharply, from 18.9 percent in 2000 to 4.0 in 2020 (Figure 10). Even though trade openness (measured as the sum of exports and imports as a percentage of GDP) has historically been above 100 percent (110.3 percent in 2000), it has been decreasing, hitting a low of 65.3 percent in 2020 (due to the pandemic) and reaching 81.4 percent in 2021 (Figure 11) toward pre-pandemic values.

Figure 10. Tariff rates considerably decreased

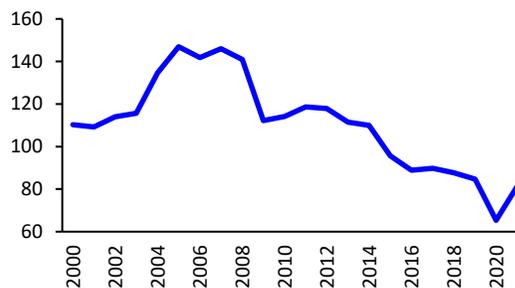
Tariff rate of all products in percentage



Source: Authors' elaboration using data from Our World in Data (<https://ourworldindata.org/>)

Figure 11. Trade openness also decreased

Total trade as percentage of GDP

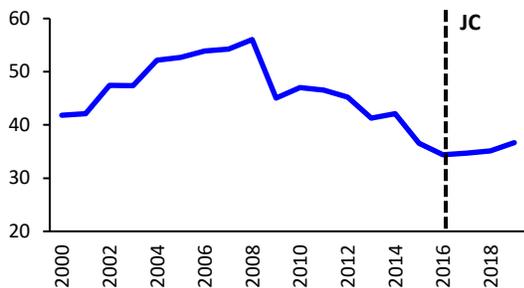


Source: Authors' elaboration using data from Our World in Data (<https://ourworldindata.org/>)

Unlike other developing economies that promoted trade liberalization, Jordan's export sector did not grow as expected. Total exports as a percentage of GDP dropped from 41.8 percent in 2000 to 36.7 percent in 2019 after peaking at 56 percent in 2008 (Figure 12). At the same time, imports have increased more than exports and the total trade balance has become even more negative (Figure 13).

Figure 12. Exports decreased after 2008

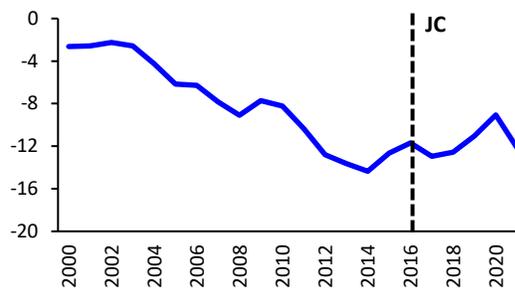
Exports as percentage of GDP



Source: Authors' elaboration using data from the World Integrated Trade Solutions (<https://wits.worldbank.org/>). Black dotted line in the year of implementation of the JC.

Figure 13. Trade balance has remained negative

Total balance, billions US\$

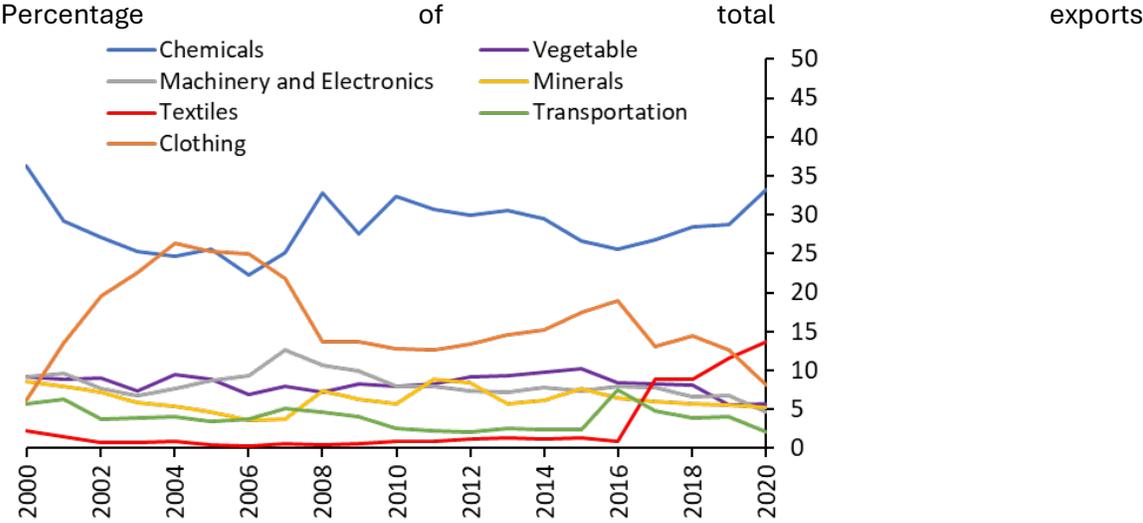


Source: Authors' elaboration using data from the World Integrated Trade Solutions (<https://wits.worldbank.org/>). Black dotted line in the year of implementation of the JC.

Export patterns remained relatively stable in terms of products exported as a share of total exports. Even though the export of chemicals (fertilizers and pharmaceutical) has held the largest share of exports for most of the time, in the period 2004-2006 textiles and clothing became the largest and then experienced a decline and slow recovery from 2008. Surprisingly, the number of products exported by Jordan has decreased nearly 22 percent, from 2,606 products in 2000 to 2,021 products in 2021. Within manufacturing, the main winner was the labor-intensive clothing sector, which increased from 6 percent of total exports in 2000 to 25 in 2007 and 9 percent in

2020 (Figure 14), while capital intensive textiles experienced a sharp increase after 2016, from less than 1 percent to 14 percent in 2020.

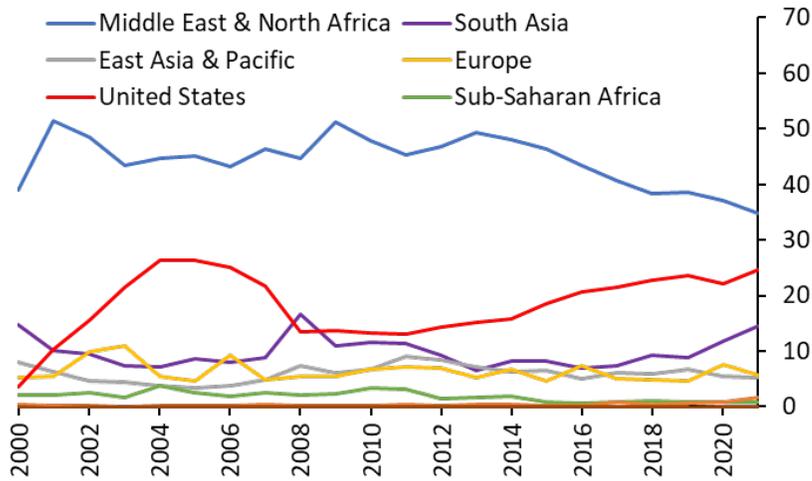
Figure 14: Share in total exports shifted from labor-intensive to capital-intensive industries



Source: Authors’ elaboration using data from the World Integrated Trade Solutions (WITS). Product groups appear as reported by WITS.

In terms of trading partners, the largest share of total exports continues to flow to countries within MENA. Regardless, the share of exports to the United States has surged from 3.5 percent in 2000 to 24.7 percent in 2021. Even though this share peaked in 2004 (26.2 percent), in recent years it has shown an upward trend increasing from 18.4 in 2015 to the previously mentioned 24.7 percent in 2021 (Figure 15). Export share to other regions such as Europe has remained relatively stable over time, accounting for 5.7 percent of total exports in 2021.

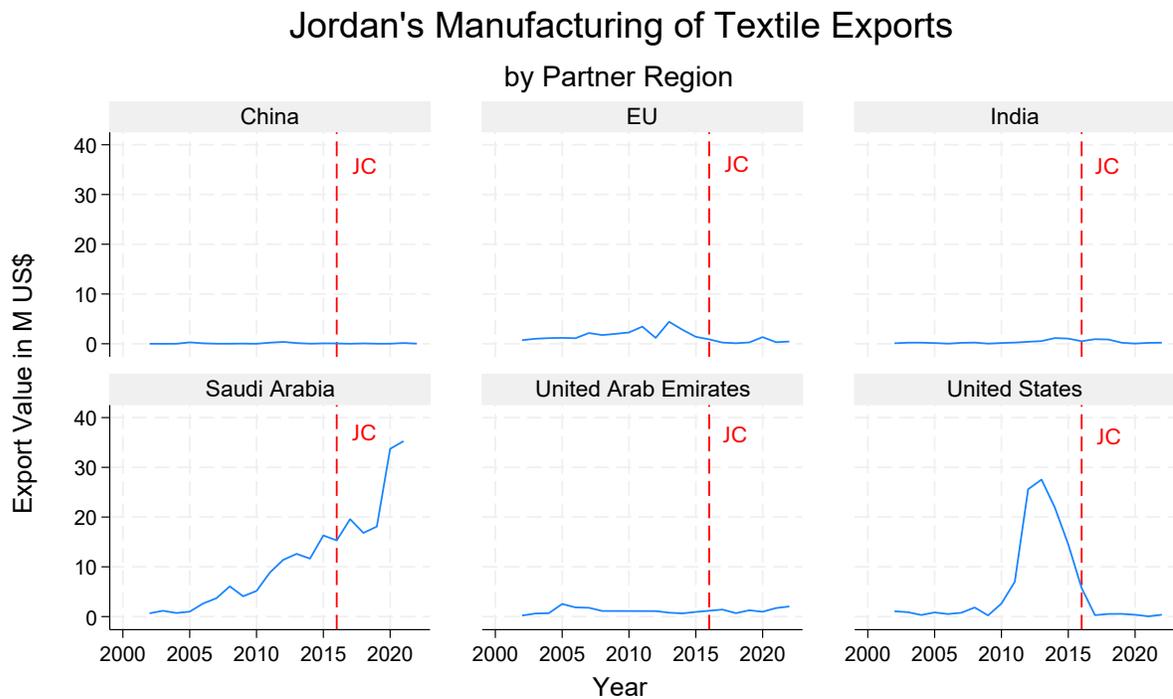
Figure 15: Share in total exports increased for the United States
Percentage of total exports



Source: Authors' elaboration using data from the World Integrated Trade Solutions (WITS).
 Note: Product groups appear as reported by WITS.

To disentangle whether the sharp increase in textile exports after 2016 can be related to the implementation of the JC, Figure 16 plots trade trends by main trade partner. There is no evidence of an increase of textile exports to EU and these results suggest Saudi Arabia drives the overall increase in Jordan's textile exports.

Figure 16: Jordan's Manufacturing of Textile Exports



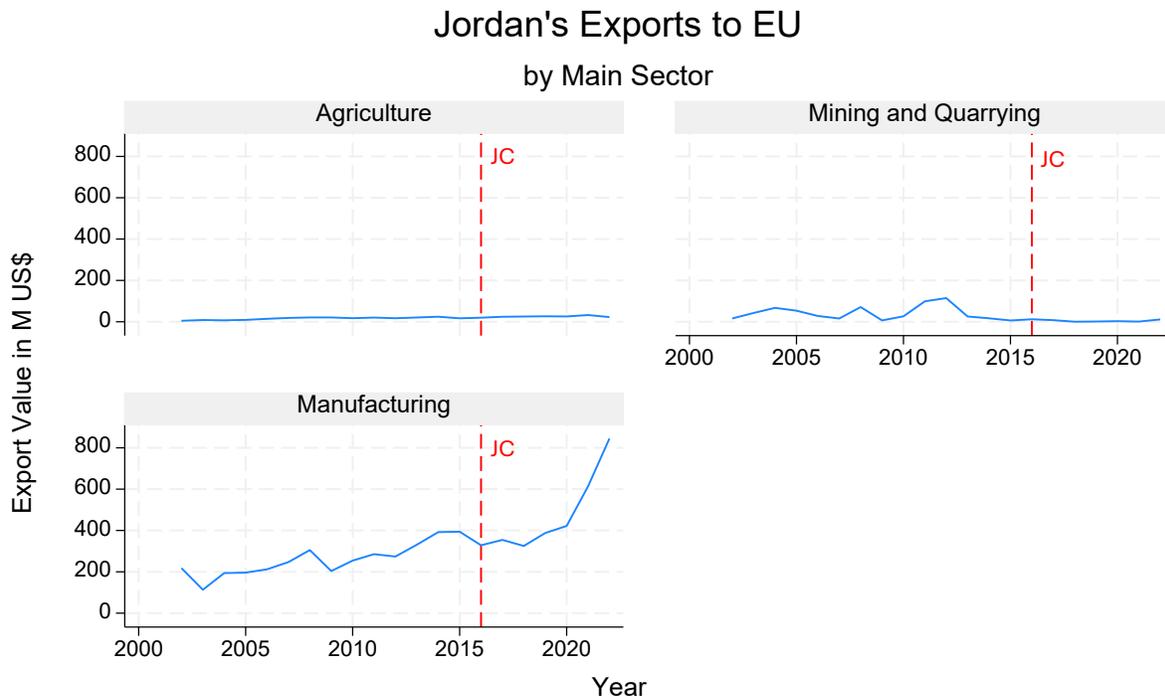
Source: Authors' elaboration using data from the World Integrated Trade Solutions (WITS).
 Note: Product groups appear as reported by WITS. The vertical red dotted line splits the periods before and after the implementation of the JC.

Because of the US-Jordan FTA in the year 2000, the largest share of exports to the United States are textiles and clothing, but other sectors such as chemicals have surged in the past few years. There are interesting patterns when zooming in on the share of products exported from Jordan to the United States since 2015. While the textiles and clothing sector remains the highest exporting sector, accounting for 66.8 percent of total exports in 2021 (86.6 percent in 2015), the chemicals sector has gained relative importance, growing from 1.9 percent in 2015 to 16.4 percent in 2021. In terms of US\$, this means an increase from US\$28 million to US\$425 million in 2021 (textiles increased from US\$1,251 million to US\$1,544 million).

4. The Impact of the JC

The JC had a clear objective of boosting Jordan’s exports to the EU. Figure 17 shows the evolution of Jordan’s export value by main commodity sector. As it can be noted, only for manufacturing the country experienced a sharp change in export values flowing to the EU zone after 2016. The observed change in trend was not immediately after the JC was implemented but it rather took off in 2020-2021. Later in this study, we suggest that a skill mismatch of Syrian workers may explain the weak integration of Syrian refugees in the labor market early after the implementation of the JC, therefore affecting the effectiveness of the agreement in boosting targeted exports.

Figure 17: Jordan’s total export value to EU in Agriculture, Mining and Quarrying, and Manufacturing



Source: Authors’ elaboration using data from the World Integrated Trade Solutions (WITS). The vertical red dotted line splits the periods before and after the implementation of the JC.

5. Hypothesis Evaluation

5.1. The Jordan Compact

The JC was signed in February 2016 between the country of Jordan and countries in the EU as a response to the Syrian crisis.⁴ The JC includes measures to stimulate economic growth and create job opportunities in Jordan, particularly in sectors that can absorb both Jordanian workers and Syrian refugees, facilitating Jordan's access to European markets, through the relaxation of ROO for Jordanian exports (Abreha and Robertson, 2023). To achieve these goals, the JC focused in boosting the agriculture, construction, and manufacturing industries in Jordan by integrating Syrian refugees into 18 EU-focused Special Economic Zones (SEZs) to stimulate exports. In this study we focus on manufacturing industries, whose production in SEZs has tariff-free access into the EU market if: i) these industries have at least 15% Syrian employment, and ii) 200,000 work permits for Syrians in SEZs are issued.

The JC faced several challenges to implementation. The first problem is that targeted sectors are typically informal sectors, affecting the issuance of work permits. In 2017, only two manufacturing companies in SEZs were exporting to the EU and only 60,000 permits have been issued. The number of exporting companies increased to eleven by 2021. Second, commuting constraints impede integration. SEZs are far away from urban centers where the Syrian refugee population lives. The Jordanian government is aware of the commuting challenges faced by workers and is actively working on improving infrastructure to better connect urban centers and SEZs. Efforts to formalize sectors are also ongoing to facilitate better integration.

5.2. Approach

To assess the true impact of the JC in boosting Jordan's manufacturing exports to the EU we conduct a difference-in-differences regression analysis. Figure 19 suggests China is a natural control to use. Formally, we estimate the following regression equation

$$Export_t = \beta_0 + \beta_1 * Post_{2016} + \beta_3 EU_t + \gamma Post_{2016} * EU_t + \lambda X_t + \varepsilon_{it}$$

where $Export_t$ is the value of Jordan's exports in manufacturing at year t , $Post_{2016}$ is a dummy equal to one for year t in 2016 and onwards, EU is a dummy variable equal to one if destination of exports is EU and zero if destination of exports is China in year t , and $Post_{2016} * EU_t$ is a dummy equal to one if exports flow to EU as of 2016. γ is the parameter of interest. X_t is the set of pre-trends controls. Robust standard errors at the country level. For the analysis, we exploit all data available in WITS disaggregated by sector and destination country, ranging between 2002-2022.

⁴ Signed in February 2016 at the London Conference, which was hosted by the UK, Germany, Kuwait, Norway, and the United Nations.

5.3. Hypothesis 1: EU exports relative to other countries

To study whether the JC was followed by an increase in exports relative to a comparison group of countries we overcame the identification challenge of heterogeneous impacts of rising exports. The empirical approach we implement is a gravity model. A gravity model is a framework used in economics and geography to predict and describe the flow of goods, people, or information between two locations. In this paper we use it to describe the flow of goods. Larger economies are assumed to have greater capacity to generate and attract flows. Physical distance is commonly used, but economic distance (e.g., trade barriers, cultural differences) can also be considered. In this paper, we use gravity to conduct a difference-in-differences analysis to move towards identifying impact. The model helps to understand trade patterns and the impact of trade policies.

Table 3 reports the regression results. The second column reports estimation results with pre-trends controls. Although manufacturing exports to EU are larger than those to China, and that exports significantly increased to both destinations after 2016, the causal effect of implementing the JC is not statistically different from zero in any of the specifications. When controlling for pre-trends the estimated coefficient of interest estimates a positive but insignificant impact.

Table 3: Difference-in-differences estimation results

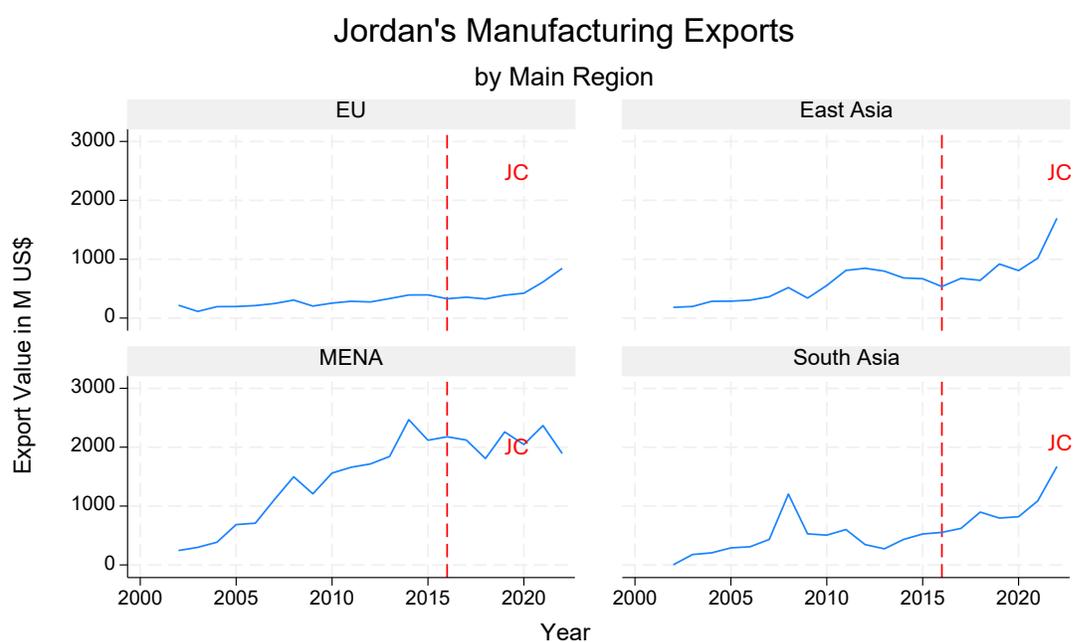
	Value of Exports (M US\$)	Value of Exports (M US\$)
Post 2016	240.76*** (72.03)	240.76** (88.80)
EU	109.94*** (32.62)	47.49 (29.30)
Post 2016 * EU	-31.41 (103.48)	31.03 (124.84)
Observations	42	42
R-squared	0.484	0.552
Controls	No	Yes

Notes: Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1
Post 2016 accounts for a dummy variable equal to one for all years from 2016 onwards and zero otherwise; EU is a dummy variable equal to one if destination of exports is EU and zero if China; Post 2016 * EU is the interaction term and variable of interest.

5.4. Hypothesis 2: MFG exports relative to other sectors

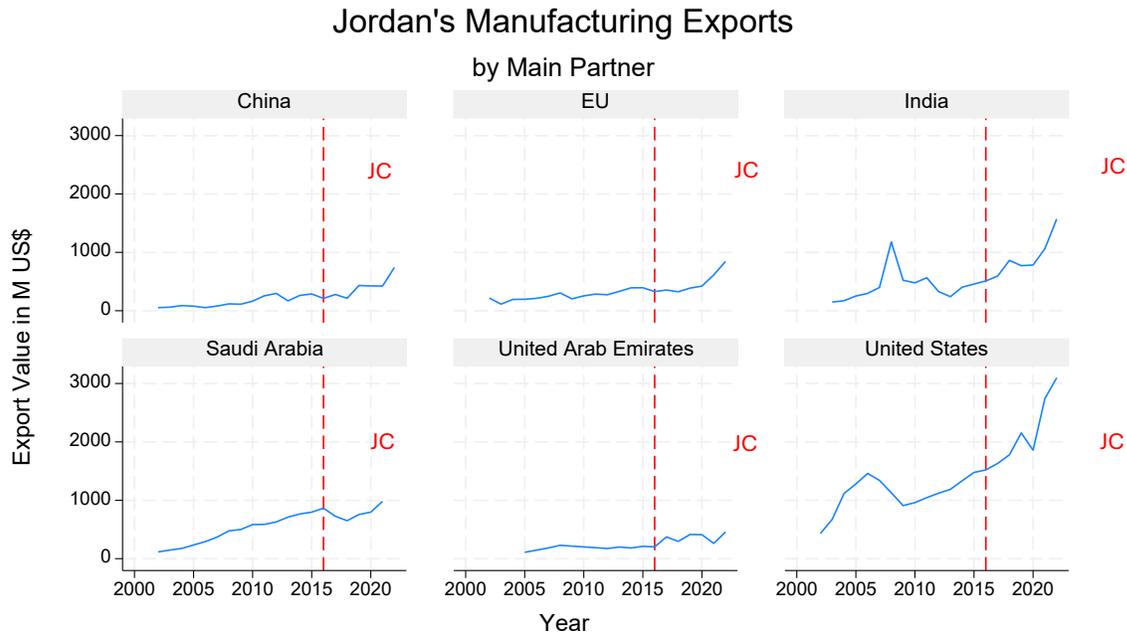
As suggested by the descriptive evidence in section 2.3., the Jordanian government was successful in integrating Syrian refugees into manufacturing. Therefore, manufacturing exports should rise everywhere relative to other sectors. Figures 18 and 19 reveal manufacturing exports increased to other main destinations after 2016, even to those destinations unaffected by the JC.

Figure 18: Jordan's total export value in manufacturing



Source: Authors' elaboration using data from the World Integrated Trade Solutions (WITS). The vertical red dotted line splits the periods before and after the implementation of the JC.

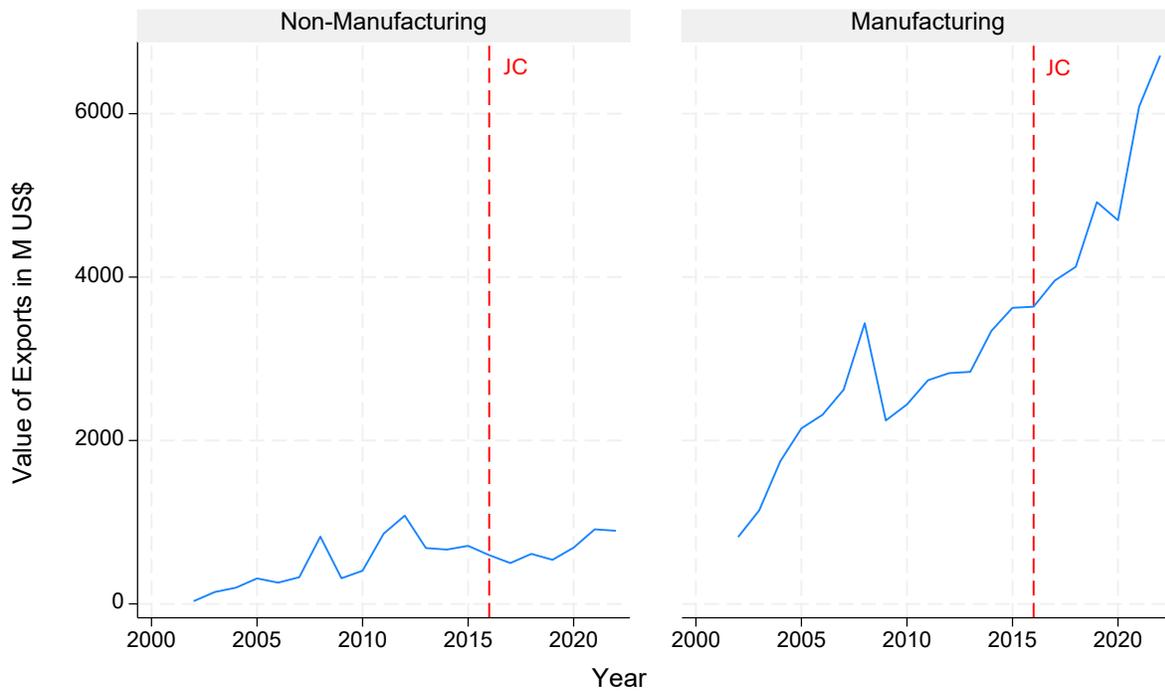
Figure 19: Jordan’s total export value in Manufacturing, by main trade partner



Source: Authors’ elaboration using data from the World Integrated Trade Solutions (WITS). The vertical red dotted line splits the periods before and after the implementation of the JC.

We assess the relative importance of the increase in manufacturing exports to Jordan’s main trade partners relative to other sectors. We consider total manufacturing and non-manufacturing exports to EU and countries in Figure 19, the main group of Jordanian manufacturing importers. Figure 20 reports Jordan’s total manufacturing and non-manufacturing exports to Eu and countries in Figure 19.

Figure 20: Jordan’s total export value in non-manufacturing and manufacturing to main trade partners.



Source: Authors' elaboration using data from the World Integrated Trade Solutions (WITS). The vertical red dotted line splits the periods before and after the implementation of the JC.

We conduct a difference-in-differences regression analysis and formally test the following regression equation:

$$Export_t = \beta_0 + \beta_1 * Post_{2016} + \beta_3 Manu_t + \gamma Post_{2016} * Manu_t + \lambda X_t + \varepsilon_{it}$$

where $Export_t$ is the value of Jordan's exports at year t , $Post_{2016}$ is a dummy equal to one for year t in 2016 and onwards, $Manu_t$ is a dummy variable equal to one if export category is manufacturing in year t and zero otherwise, and $Post_{2016} * Manu_t$ is a dummy equal to one if exports flow is manufacturing exports as of 2016. γ is the parameter of interest. X_t is the set of pre-trends controls. Robust standard errors at the country level. For the analysis, we exploit all data available in WITS disaggregated by sector and destination country, ranging between 2002-2022.

Table 4: Difference-in-differences estimation results

	Value of Exports (M US\$)	Value of Exports (M US\$)
Post 2016	190.83* (104.35)	190.83 (128.65)
Manu	1961.92*** (235.55)	1661.47*** (104.52)
Post 2016 * Manu	2236.23*** (485.06)	2536.69*** (533.12)

Observations	42	42
R-squared	0.85	0.92
Controls	No	Yes

Notes: Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1
Post 2016 accounts for a dummy variable equal to one for all years from 2016 onwards and zero otherwise; Manu is a dummy variable equal to one if exports are manufacturing exports and zero otherwise; Post 2016 * Manu is the interaction term and variable of interest.

There are positive and significant effects of rising manufacturing exports after 2016 relative to other sectors, in both specifications without and with pre-trends, of more than US\$2,000 million.

6. Conclusion

In conclusion, the experience of Jordan in absorbing a significant influx of Syrian refugees highlights the complex interplay between labor market integration and export-oriented economic strategies. The Jordan Compact serves as a critical case study demonstrating that targeted cooperation between a host country and external partners, such as the EU, can effectively facilitate refugee integration into the labor force, particularly in manufacturing sectors. This successful integration supports the broader economic stability of the host nation, as evidenced by the increased participation of refugees in manufacturing jobs, a sector that is crucial for economic growth and labor demand.

However, while the Compact's first set of measures—focused on enhancing refugee employment through education, investment, and community resilience—showed positive outcomes, the second set of measures, which aimed to boost Jordan’s exports to the EU by relaxing rules of origin, did not yield the expected shift in Jordan's export basket towards the EU. This suggests that while domestic labor market integration can be effectively supported by international cooperation, translating this into broader export growth requires more than just regulatory easing; it may necessitate deeper structural reforms or additional supportive measures.

Overall, this study contributes valuable insights to the literature on refugee integration and the economic impact of forced migration, particularly in the context of export-oriented economies. It underscores the importance of comprehensive, multi-faceted approaches to managing large-scale refugee movements, emphasizing that successful economic integration of refugees requires both domestic labor market strategies and international trade policies that are well-aligned with the host country's economic capacities and challenges.

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Appendix

UN Statistics Division (ISIC-HS Concordances)

The UN Statistics Division (ISIC – HS) concordances refer to a set of tables or mapping systems that establish a link between two international classification systems: the International Standard Industrial Classification of All Economic Activities (ISIC) and the Harmonized System (HS).

ISIC is a global standard for classifying economic activities. It provides a hierarchical structure that categorizes industries based on their primary economic activities. ISIC codes are used for various statistical and analytical purposes to group economic activities into meaningful categories. ISIC codes exist under four different classifications and levels of disaggregation. In this study, we use the nine-sector classification consistent with Revision 2.

The HS is an international nomenclature developed by the World Customs Organization (WCO) for classifying traded goods. It provides a standardized way of categorizing products for customs, trade, and tariff purposes.

The ISIC – HS concordances serve as a bridge between these two classification systems, allowing us to link economic activities (ISIC) from the LFS data to specific products or goods (HS) in the UN COMTRADE data.