

# The Syrian Crisis Impact on Quality of Education in Jordan: A Quantitative and Qualitative Assessment

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## Abstract

This paper investigates the causal impact of the Syria crisis on quality of education in Jordan. We collected and analyzed primary quantitative and qualitative data for a sample of Jordanian public schools located in Qasabet-Irbid district (Northern Jordan), close to the Syrian border. Our empirical analysis assesses an overall negative impact of Syrian refugee enrollment in the Jordanian education system induced by both overcrowding and double-shift practices. This impact on students' performance is represented by a declining in their scores in four main subjects (Math, Science, Arabic, and English) relative to the counterfactual sample. This negative impact is confirmed by the qualitative analysis as well. This study provides the first empirical evidence on the impact of the Syrian crisis on education quality in the affected public schools in Jordan, with possible long-term effects on economic growth. Although it does not represent, by any means, an argument against hosting policies of refugees, it represents a quest for the international agencies and donors to refine their financial and technical support to schooling the refugees without affecting the education quality in public schools. This will also help to prevent tensions between the incoming and the host communities.

**Key Words:** Syria Crisis, Refugee Education, Education Quality, Overcrowding, Double-shift Schools, and Causal Impact

## 1. Introduction

The Syria crisis is one of the biggest humanitarian and refugee crisis of our time. In 2016, UN estimated that about 60 percent of the pre-war population of 22 million Syrians required humanitarian assistance, of which more than 6 million are internally displaced, and around 5.6 million are refugees outside of Syria (UNHCR, 2018a). By 2018, Syrian refugees in Jordan have grown up to more than 1.4 million, nearly 20 percent of the population (Dupire, 2018). Meanwhile, in the same year, UNHCR reported that only 661,859 of them are registered as refugees (UNHCR, 2018a)<sup>1</sup>. Those refugees who fled their country to Jordan at short notice made it difficult for a small country with limited resources to accommodate them and provide them with basic needs and services.

This study aims to assess, empirically, the impact of the Syria crisis (double-shift and overcrowding) on education quality in Jordan's public schools. To this end, we collected and analyzed primary quantitative and qualitative data for a sample of 30 double-shift public schools located in Qasabet-Irbid district (Northern Jordan), close to the Syrian border. The data was collected from the ministry of education (MOE) institutions and stakeholders<sup>2</sup> of education to assess the causal impact of the crisis on the quality of education in these schools. Specifically, we carried out a set of difference-in-difference (pre-and-post crisis comparisons) for students' scores in the sample's schools that are too much affected by refugee enrollment with respect to a control group of 30 unaffected schools to determine the causal impact of the crisis on education quality in the affected schools. Also, surveys and talks with the stakeholders of education in the sample's schools were carried out to complete the quantitative results.

After applying both quantitative and qualitative methodologies, our study shows an overall negative impact of the crisis on Jordanian students' performance, represented by a declining in their scores<sup>3</sup> in Math, Science, Arabic, and English relative to the counterfactual sample, particularly in Math and Science. This negative impact is confirmed by the qualitative analysis as well. The present study provides, to the best of our knowledge, the first empirical evidence on the impact of Syria crisis on the quality of education in the affected public schools in Jordan, with possible long-term effects on economic growth. Although it does not represent, by any means, an argument against policies of hosting the refugees or their education in Jordan. It represents only a quest for the international agencies and donors to refine their intervention approach to schooling the refugees without affecting the quality of education in public schools. This will help to prevent or reduce tensions between the incoming and the host communities.

This paper is organized as follows: section 2 has a literature review of the crisis impact on education quality, in turn, on economic growth in the long-run. Section 3 overviews the education system and quality in Jordan. Section 4 provides an overview of the Syrian refugee education in Jordan since the outset of the crisis. Section 5 presents the data and methodologies. Section 6 discusses the quantitative and qualitative results, and section 7 concludes.

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<sup>1</sup>Many of Syrians did not register as refugees in Jordan for the following reasons: many of them came to Jordan to use it as a transit-base (to move abroad, particularly to Europe or Canada), but a lot of them got stuck in the country. Many others have believed in an imminent return to Syria. Also, there were many Syrians who were working in Jordan prior to the crisis, so they could not go back to their country after the war. Some of them did not register as refugees, because they might have political problems back in Syria or criminal records. The numbers estimated from the government of Jordan are based on the national census that was accomplished by the end of 2016. Actually, having a huge number of refugee children who are not able to enroll in formal education due to lack of documents might confirm these estimates.

<sup>2</sup>National students, teachers, principals, students' parents; people from MOE, local and international agencies, and some educational and governmental institutions.

<sup>3</sup> The study analyzed the crisis impact on students' scores in these four main subjects only.

## 2. Literature Review

Syrians in Jordan accounted nearly 20 percent of the population, and the majority of them are living in host communities outside the camps, thus schooling them has impacted the education quality in public schools in different ways. According to RAND Corporation, the refugee influx is affecting the quality of education in the host countries, particularly in Jordan and Lebanon (Culbertson, Olikier and Baruch, 2016). A Human Rights Watch report states that running on double-shift has imposed a negative impact on the education quality in these schools due to time reduction (Van Esveld, 2016). In addition, a qualitative study that used a focus group work to discuss the Syria crisis impact on education quality revealed that the crisis has affected the education quality in Jordan, and its impact was more qualitative than quantitative (Bataineh and Momani, 2017). As per to a UNDP study, enrolling the Syrian refugees in schools will have a negative indirect impact by increasing dropouts, reducing school progression and the average number of years of schooling. This will lead to an indirect decrease in economic growth that will be translated into a monetary basis amounted on average to USD 384.2 million per year in the long run (MOPIC, 2017).

Overcrowded and double-shift schools are more likely to provide less education quality due to a higher teacher-student ratio and time-reduction, as in Bray (2008), Bandiera, Larcinese and Rasul (2010), and many others<sup>4</sup>. Overcrowding in the Jordanian public schools has exacerbated due to the huge influx of refugees to reach (47%) in 2014 (Whitman, 2015). Furthermore, there is a high concentration of Syrians in some schools, while others had very few (Culbertson, Olikier and Baruch, 2016). In many classrooms, the teacher-student ratio accounted 1:50, particularly in Irbid as the city has witnessed the highest enrollment rates for Syrian children in the public schools (Figure 1 in the appendix). Also, due to the increasing demand for education, the prices of private education have fueled, which forced 35,000 Jordanian students to move<sup>5</sup> from private to public schools at the beginning of the school year 2013/2014 (MOPIC, 2013). Conversely, some students left from public schools to the private ones due to the quality deterioration, but their numbers are less (MOE, 2017)<sup>6</sup>.

The large class-size reduces teacher-students engagement, and teachers' morale tends to erode as the class size grows (Bray, 2002). Teaching in an overcrowded classroom can be frustrating, overwhelming, and stressful. There is a trickle-down effect that has a tremendous negative impact on the quality of education that even the most effective teachers can provide their students (Meador, 2016). One study about the impact of overcrowding on education in Pakistan revealed that overcrowding can have a direct impact on learning (Shah, 2012). Students should be engaged in meaningful activities in order to apply an approach of active-learning, but overcrowding is in the way of applying this approach (Yew, Chng and Schmidt, 2010). Yet, there is robust evidence of a negative class-size effect on students' academic achievement when it is big. Larger classes reduce students' academic achievement as measured by test scores, and high ability students are more affected by larger class sizes (Bandiera, Larcinese and Rasul, 2010). Add to the aforementioned that overcrowding imposes pressure on libraries, laboratories, learning tools, and other school's facilities. On the other hand, small classes do not necessarily translate into improvement in quality as there are other factors that determine it like teacher quality and family income (Maligalig, Rodriguez and Martinez, 2010). Schooling the refugees increased overcrowding and caused mixing students with divergent skills and different educational backgrounds in the same classrooms (Syrians and Nationals). Jordanian students

<sup>4</sup> Meador (2016); Dessus (2001); Kintsch and Van Dijk (1978); Bransford and Johnson (1972).

<sup>5</sup> Overcrowding has exacerbated in the public school, as HM King Abdullah II statements oblige all the public schools in the country to enroll any Jordanian student who is moving from the private sector, even if the school is overcrowded.

<sup>6</sup> Data from some principals and people at MOE.

are better than their Syrian counterparts, and there is an educational gap between them (Table 2 in the appendix). This placed pressures on teachers to integrate the Syrians and help them access a different curriculum, in which it is slowing down the typical classroom learning. Many of the refugee children were out of school for a significant period or received education with a low quality due to the war consequences. Many of them have been through traumatic experiences as well, and a lot of Jordanian teachers lack the right training and experience to deal with them. Student engagement is more difficult when they have experienced neuro-developmental of trauma, as well as it has a direct result on learning and behavior in the classroom (Teaching Refugees, 2005). Furthermore, enrolling the refugees with nationals in the same schools has caused tensions between them, and increased bullying in schools. In Hungary for example, socio-cultural differences between the local and the foreign children created conflicts in the classroom, and the local communities prevented the foreign children from enrolling in the local schools, fearing that the quality of education would deteriorate (Huseynov, 2003).

In the first two years of the crisis, 97 public schools were forced to run on a double-shift to enroll more Syrians and reduce overcrowding, and their number increased to 200 by the school year 2016/2017. Double-shift schools means to operate in two shifts, Jordanians attend the morning shift, while the Syrians attend the afternoon one. Time reduction was necessary to keep classes short enough to operate the double-shift, but it has reduced the education quality in these schools, particularly in the second shift (Whitman, 2015). The need to compress a lot of activities into a short time makes the school day rather tense (Bray, 2008). Time reduction was really high during the first two years, as the class-time has been decreased from 45 to 30 minutes. Normally there is a 5-minute break between classes, so the teachers can change, plus a 20-minute lunch break. For the same period, there were no breaks and students eat in classrooms in the double-shift schools. Also, there are no much sports, arts, and fun classes and activities like in a regular school and those subjects have a high impact on students' recreation and ability to learn. Moreover, in the first year of introducing the double-shift, the same teachers were covering both shifts. This has reduced their productivity and motivation, in which it has a negative effect on students, particularly in the second shift (Sagyndykova, 2013). In addition, running the double-shift has increased the infrastructure-destruction ratio in these schools, and made a huge pressure on the facilities. Having a double use of the same infrastructure and facilities (wear and tear effect) has decreased their lifespan, and left most of the classrooms, bathrooms, and yards very dirty. Also, due to the time reduction, there is no enough time to do the exercises in the classes, and teachers skip many of the less important topics. In general, learning is a cumulative process where new learning builds upon knowledge acquired in a previous phase (Yew, Chng and Schmidt, 2010). Thereby, any dereliction caused at the previous stages might affect students' abilities to be prepared for harder topics at the higher grades. Accordingly, a gap might emerge between students who attend regular-shift schools and others who attend the double-shift ones.

However, MOE policies were savvy enough to reduce those impacts to lower levels. They hired new teachers for the second shift, and they have increased the class-time continuously to be 35 minutes in 2013/14 and 40 minutes in 2016/17 by adding a school day for Syrians on Saturday. They also added some sports and art classes in the double-shift schools, and a brunch-break of ten minutes. However, MOE proposed a plan that is funded by donors to move from double-shift to integrated schools by 2019, but this plan is not in place according to the current funding practices. On the other hand, some studies in countries like South Korea and Brazil suggest that students in double-shift schools can perform as well as students in single-shift schools, but on the condition of having enough instructional time and equal resources (Culbertson, Oliner and Baruch, 2016).

Education has a leading role in economic growth and human capital formation. The risk is that lowering the education quality in Jordan's public schools due to time reduction and overcrowding (induced by schooling the refugees) will negatively impact economic growth in the long-run. According to a macro linear model introduced by M-R-W (1992), their estimations reveal that a higher student-teacher ratio inhibits growth (Mankiw, Romer and Weil, 1992). Also, having a more equal distribution of education quality is associated with a higher economic growth (Birdsall and Londono, 1997). The education quality has become more important for the economic growth, particularly in the developing countries (Hanushek and Wößmann, 2007). Add to the aforementioned, education has a lot of non-economic returns such as lower fertility and infant mortality rates, plus longer life expectancy (Hanushek and Kimko, 2000). In Jordan, many studies have confirmed that there is a positive relationship between education (quality) and economic growth such as (Kreishan and Al Hawarin, 2011), (Bader, 2012), and (Abdul-Khaliq, Soufan and Abu Shihab, 2013). Accordingly, sustaining the education quality is one of the highest priorities in Jordan.

In fact, there are many other indirect impacts of the crisis on education quality determinants in Jordan, such as the increase of poverty<sup>7</sup>, unemployment<sup>8</sup> and brain drain<sup>9</sup>. Teacher's quality matters a lot for education quality, but the socioeconomic characteristics of students are even stronger determinants (Maligalig, Rodriguez and Martinez, 2010). Also, GOJ has shifted some of the education budget in order to coop with the crisis<sup>10</sup>. Anyway, we will only assess the crisis impact on education quality through (double-shift, overcrowding and mixing Syrian with National students in the same classrooms)<sup>11</sup>.

### 3. Education in Jordan: the state of the art

Jordan's economy is among the smallest in the Middle East, and its government's budget relies heavily on foreign assistance. As a country with no oil and gas, and has limited natural resources; Jordan has early recognized the importance of investing in its education system and has accomplished significant results. Its education system has become the best one among Arab states (The World Bank, 2008). Jordan has achieved near universal primary education (Culbertson, Olikier and Baruch, 2016). According to the UNDP Report of 2002, Jordan is often mentioned among the better performers in terms of educational outcomes (EFT, 2005). Moreover, it has been the highest overall performing Arab state in the international assessments (PISA & TIMSS) since 2003 until 2015 (Tweissi and Abulibdeh, 2016). The good reputation of Jordan's education system always has been the main driver to attract foreign students to pursue their tertiary studies in the country. Jordan hosted the highest number of International students in the Arab World (HRK, 2013). The majority of Jordanians consider that children's education is the biggest investment for them and the country's future (PETRA | King Abdullah II, 2017).

<sup>7</sup> Poverty has increased in Jordan from 14.4% in 2010 to an estimated 20% in 2016 (JEGP "2018-2022").

<sup>8</sup> The unemployment has increased from 12.4 % in 2010 to 15.8 % in September 2016, because many Syrians have replaced Jordanians in the labor market, particularly in the informal market (PETRA, 2016).

<sup>9</sup> The brain drain of teachers in Jordan was declining in the last first five years before the crisis (2007-2011). While after the crisis (2012-2016), it has been rising up significantly due to the increase of poverty and hard economic conditions; raw data (MOE, 2017) - HR department.

<sup>10</sup> GOJ spent 12.2 percent of its GDP per capita on education in 2011, while this ratio was 11 percent in 2016; data from the Ministry of Planning and International Cooperation (MOPIIC). This budget reduction has mostly affected the quality improvements, as MOE has shifted its main focus to enroll more refugees and maintaining education quality for nationals in the affected areas instead of pursuing overall quality improvements.

<sup>11</sup> It is difficult to assess the indirect impacts of the crisis on education quality, as the whole sector and most of the public schools are affected. Therefore, it would be very difficult to design reliable control groups of schools to assess the whole causal impact of the crisis (directly and indirectly) on education quality in Jordan.

The structure of the educational system in Jordan consists of a two-year cycle of pre-school education, ten years of compulsory basic education, and two years of secondary academic or vocational education after which the students sit for a General Certificate of Secondary Education Exam (Tawjihi). See Figure 2 in the appendix for more details about the structure of Jordan's education system (UNESCO, 2011). Education is free for all primary and secondary school students, and compulsory for all Jordanian children up to the age of fifteen. Stakeholders have become more demanding, pushing schools to be more competitive to meet the needs of their children (Burns and Wilkoszewski, 2011). This implied a higher involvement of the private sector and created a multi-tier education system in most of Jordan's areas. Hence, the gaps in education quality in Jordan have enlarged, particularly between private and public education.

There are three main different school-systems that provide education to school-age children in Jordan, and each one of them is characterized by a different level of education quality. More than 60 percent of the students are enrolled in the public schools; around 30 percent are enrolled in the private education, whereas the rest are mostly enrolled in UNRWA (United Nations Relief and Works Agency for Palestine Refugees) schools (MOE, 2017)<sup>12</sup>. Overall, both private and UNRWA schools performance in international assessments (PISA & TIMSS) is better than public schools in Jordan (Tweissi and Abulibdeh, 2016). This is because the international organizations led by UNRWA have provided the UNRWA schools with better management, facilities and financial support compared with public schools (The World Bank, 2014). Prior to the Syria crisis, the National Center for Human Resources Development in Jordan (NCHRD) implemented a project for evaluating students' achievements for a random stratified sample of 245 schools for grades 4 and 8 to assess their performance in Arabic, Math, and Science; and the results were as follows (UNESCO, 2011):

- In all cases, the performance of students attending private schools was the best, then students in UNRWA schools followed by students in public schools.
- Overall, the girls' performance was better than that of boys.
- Overall, the performance of urban students was better than that of rural ones.
- Overall, the performance of students in North governorates was better than that in South governorates.

Due to schooling the Syrian refugees, there is a risk of creating sub-layers in public education, as well as enlarging the already existed gap with private education. This is because many public schools got overcrowded, and around 200 public schools are running on double-shift to accommodate the refugee children. See Figure 3 in the appendix for more details about the layers of education quality in Jordan.

#### **4. Education of Syrian Refugees in Jordan**

Education is a human right, and it has to be available in any situation, including crises. Refugee access to education is fundamental not only for the refugees themselves but also for the stability of their hosting countries. Education can enhance their resilient in exile, upon repatriation, upon resettlement, and in intervening times (Nicolai and Triplehorn, 2003; Tapscott, 1994). Since the outset of the Syrian civil war (March 2011), a huge influx of refugees fled to Jordan, particularly between the years 2012 and 2014. As per to UNHCR, more than 80 percent of the Syrian refugees in Jordan live below the poverty line, and around 51 percent of them are children under 18 (UNHCR, 2018b). Moreover, more than 80 percent of them are living in Jordanian host communities outside camps, mainly in the same cities that hosted most of the Palestinian and Iraqi refugees (Amman, Irbid, Mafraq, and Zarqa).

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<sup>12</sup> Data from MOE-Planning department.

Even though GOJ received immense efforts from the international donors to schooling the refugee children, but more than 118,840 of them have remained out of formal education after the school year 2016/2017 (MOPIC, 2017). MOE has defined three main categories of education for the refugees: formal (in public schools), non-formal (at home or in centers for students who have been out of school for three or more years), and informal (provided during formal education to help students re-enroll in schools after a prolonged absence), (ESWG, 2014). The formal education for refugees is divided into three main categories as well. For example, in the school year 2013/2014, 54 percent of Syrians were integrated with citizens in the same classrooms in regular or double-shift schools, 29 percent were in second shifts in public schools and the rest were in schools in their camps (Culbertson, Oliker and Baruch, 2016). By the end of 2018, around 210,600 Syrian refugee children were enrolled in formal education (MOPIC, 2017). But, only less than 23,000 of them are enrolled in schools at the three refugee camps (Za'atari, EJC, and Azraq), while the rest are heavily relying on public schools in the host communities (UNICEF, 2015). See Table 1 in the appendix for more details about Syrian children enrollment in Jordan.

As mentioned before, there is an educational gap between the Syrian and Jordanian students. According to a UNHCR global review on refugee education, in Syria even before the war, there was a 3 percent decrease in Gross Enrollment Ratio (GER) between the years 2007 and 2009 (Dryden-Peterson, 2011). Stave and Hillesund (2015) revealed that Syrian students perform much worse in school than Jordanians, and they have less educational experience. Furthermore, Jordan spent on education in 2011 almost two times and a half of what Syria has spent in 2009 (The World Bank, 2016).

In fact, Syrian children are facing many challenges in accessing the formal education in Jordan due to the lack of required documents to enroll in public schools, as well as the limited education system capacity (Christophersen, 2015). Also, MOE regulations prohibit school enrollment to all children who left school for three or more years (three years rule)<sup>13</sup>. The majorities of Syrian refugees in Jordan are very poor and live below the poverty line (European Parliament, 2017). Although GOJ has provided them free education at the public schools, UNICEF reported that around 15,400 Syrian children could not attend school in February 2016, due to financial hardships. Furthermore, due to diminishing assistance to refugees, dropout, child labor, and early marriage have been rising potentially (WFP-CFMSE, 2017). Overcrowded classrooms is another problem, the teacher-student ratio counted up to 1:85 in some schools in the camps (Whitman, 2015). In addition, the low quality of education provided in the second shifts has driven many refugees to drop out (Van Esveld, 2016). Moreover, around 1,600 Syrian children dropped out of school in 2016 due to bullying<sup>14</sup> (Valenza and Al-Fayez, 2016). As per to a UNHCR report, one of the key reasons why Syrian refugees want to flee to Europe is the lack of educational opportunities (Fleming, 2015).

In spite of all these challenges, Syrian children education situation in Jordan is the best among the top-refugee hosting countries in the region (UNHCR-3RP, 2015). It is also better than the global average for refugees in both stages of primary and secondary education (UNHCR, 2018). Furthermore, their educational outcomes in Jordan are as equal as or slightly better than the average in their own country before the crisis (Christophersen, 2015). Also, by the start of the 2015/2016 school year, there was a 50 percent decrease in the teacher-student ratio in Syrian refugee camps in order to improve the education quality (MOPIC, 2017). In fact, many international agencies have been working with GOJ to address

<sup>13</sup> This rule bars enrollment in formal education for children (Jordanians or Syrians) who are three years older than their age cohort.

<sup>14</sup> Syrian children reported that they face severe harassment and bullying by Jordanian children in school or while walking to and from school.

these challenges. See (Bataineh, 2019) for more information about the international response to the Syrian refugee education in Jordan.

## 5. Data and Methodologies

Investigating the impact of the Syria crisis on education quality in Jordan is not an easy task. The quality of education has many determinants and most of the schools have different school resources and students' socioeconomic characteristics are heterogeneous. The impact of any deterioration in the educational outcomes takes time to be fully measured. Jordan has been carrying out many educational reforms before and after the Syria crisis, also GOJ and the international organizations have been providing ad-hoc interventions to reduce the crisis impact on education quality. Moreover, collecting all the required data to perform the empirical analysis is really hard due to both bureaucracy and data sensitivity.

Our sample includes 30 public schools<sup>15</sup> that are running on double-shift due to the increasing influx of Syrian refugees into their area. They are located in Qasabet Irbid district (Northern Jordan - close to the Syrian borders<sup>16</sup>). Table 3 in the appendix provides additional information about our sample of schools, while Figure 4 shows a map of Qasabet Irbid district. Qasabet Irbid has the highest number of public schools (201) among the directorates in the country (MOE, 2017)<sup>17</sup>. It also has the highest number of public schools in the country that are running on double-shift to cope with the crisis (30 double-shift schools). These schools have too many students in comparison with other public schools, and the majority of them have good educational outcomes<sup>18</sup>, as most of them are located in the city center and nearby urban areas. Also, many of these schools received intervention from international organizations (Bataineh and Momani, 2017). In addition, approximately one-third of the registered Syrian refugees in Irbid live in Qasabet Irbid district (NRC, 2014). Irbid also has the highest enrollment ratio for Syrian children in the country, and it has the highest rates of crowded and overcrowded schools (MOPIC, 2013); see Figures 1 and 5 in the appendix. Furthermore, in September 2013, Irbid hosted around 39 percent of the Syrian refugees in Jordan, while only 24 percent of them were in Amman (NRC, 2014).

This study used secondary and primary data. While the secondary data are ready to use, the collection of primary data has been very difficult. First, the information in the educational records can have political, social, demographic, and security implications (data sensitivity). Secondly, the required amount of data is huge and spread over many different entities and departments inside and outside MOE. Indeed, we succeeded in collecting a good share of the required primary data through surveys, interviews and computational techniques (using databases). Specifically, we computed the averages of students' scores at grade 6 for the period 2008-2015 in the sample's schools (26 affected by the crisis) and in another 26 schools that also located in Qasabet Irbid and not affected by the crisis (a control group<sup>19</sup>).

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<sup>15</sup> However the sample includes 30 schools, but only 26 are included in the quantitative analysis due to data unavailability for 4 schools, while all the 30 schools are included in the qualitative analysis.

<sup>16</sup> Irbid is very close to Dara'a governorate, it is the place where the Syrian revolution has started, and it is one of the most affected areas in Syria by the civil war. The majority of its population has been displaced either internally or externally.

<sup>17</sup> (MOE, 2017): available in Arabic on this link: <http://www.moe.gov.jo/schools.aspx>

<sup>18</sup> Data from the planning department at MOE-Irbid, the first Area.

<sup>19</sup> These schools are running on a regular shift only, and they are not affected by the crisis directly like the sample's schools. They have almost similar characteristics to those that are affected by the crisis (the sample's schools) in terms of location, students' achievements, number of students, and resources. So, for each school in the sample, it was selected a mirror school to be in the control group of schools; and this mirror school should be located close to the affected one and have similar students' outcomes. But, it should be mentioned that it is difficult to design a 100 percent reliable control group in this case, due to the spillover effects of the crisis (indirect impacts of the crisis).

We first divided the sample's schools into two main different groups based on the school's gender (16-F & 11-M). Then, we computed the first-difference (Dif) of students' scores in math, science, Arabic, and English in the sample's schools between the two periods (before the crisis implications<sup>20</sup> in 2008-2011 & after in 2012-2015). However, we acknowledge that this difference cannot be entirely attributed to the Syria crisis, that is why we applied a quasi-experimental technique to construct credible counterfactual (a control group of 26 unaffected schools), and we also computed the first-difference in scores in these schools for the same periods. Afterward, we computed the difference-in-difference (DID) between the two different groups of schools (treated and untreated)<sup>21</sup> to see if the declining is higher in the treated ones. The use of a difference-in-difference method allows us to get rid of unobservable confounders affecting the general declining trend of education quality in Jordan and isolate the causal impact of the Syria crisis on the quality of education. Finally, we divided the sample's schools into (6 sub-groups)<sup>22</sup> based on the school's gender and the year in which the school started the double-shift. Then we computed the difference-in-difference between these different groups of schools to see if the declining is higher in case of the schools that started the double-shift earlier<sup>23</sup>. This can provide deeper details about the impact of time-reduction, overcrowding and mixing Syrian students with nationals on the educational outcomes in the treated schools.

To increase the robustness, we added qualitative information to our quantitative analysis by interviewing stakeholders involved in the educational process in the country. The interviews were based on questionnaires (included true or false, multiple choices, and open discussion questions) to discuss the likely long-term effects of schooling the refugees on education quality in Jordan (see Table 4 in Appendix). Interviews were carried out with the entire sample's schools principals (19-F and 11-M). The questionnaire included 12 main questions and 5 sub-questions, and there were some open discussions depending on the situation and characteristic of the school; of whom 23 principals were interviewed in person, 5 by phone, and 2 preferred to fill the questionnaire by themselves. In some cases, vice principals or administrators were involved in the conversation. Interviews were also carried out with many teachers who teach math, science, Arabic, and English in the samples' schools (44-F and 51-M). They were based on a questionnaire that includes 5 main questions and 2 sub-questions, and there were some open discussions in some cases; of whom, 58 teachers were interviewed in person, 14 by phone, and 23 filled the questionnaire by themselves. Another set of interviews were carried out with many students' parents who study in the sample's schools (41-F and 47-M). They were based on a questionnaire that includes 5 main questions and 1 sub-question, and there were some open discussions depending on the student and his family status. The majority of parents were called by phone (84)<sup>24</sup>, and only 4 parents were interviewed in person. A final set of interviews were carried out with some people from MOE, MOPIC, QRCETI, NCHRD, RDFSC, and many international organizations that care of education in Jordan (34 interviewees). These interviews did not have a standard form of questions as they were mostly depending on open discussions about the problem and

<sup>20</sup> This means before running on double-shift and getting overcrowded due to schooling the refugees as in the period (2012-2015).

<sup>21</sup> The treated schools are the schools that got affected by the crisis due to the increase of overcrowding and being forced to run on double-shift (the sample's schools); while the untreated ones are the schools that run on a single-shift and are not affected by the Syria crisis (the control group).

<sup>22</sup> **G1** has all the female schools that started the double-shift in 2011/2012, in which their scores got affected in the year 2012; **G2** has all the female schools that started the double-shift in 2012/2013, in which their scores got affected in the year 2013; **G3** has all the female schools that started the double-shift in 2016/2017, in which their scores got affected in the year 2017; **G4** has all the male schools that started the double-shift in 2011/2012, in which their scores got affected in the year 2012; **G5** has all the male schools that started the double-shift in 2012/2013, in which their scores got affected in the year 2013; **G6** has all the male schools that started the double-shift in 2016/2017, in which their scores got affected in the year 2017.

<sup>23</sup> Since we only have students' scores until 2015, then only the schools that started the double-shift early in (2011 or 2012) have experienced time reduction. Meanwhile, the group of schools that started late (in 2016) have experienced more overcrowding and mixing students together longer (Syrians and Nationals); even though that many of the schools that started the double-shift early remained overcrowded after adding the second shift. But, overall, the schools that started the double-shift in 2016 have remained more overcrowded and had more Syrian students in the first-shift till the end of 2015.

<sup>24</sup> The students who participated in the surveys were asked optionally to provide their parents' phone numbers.

its impact on the education sector. Several of these interviews were formal and planned, while some others were carried out informally or without planning; i.e., they have happened during the processes of data collecting. Also, some of these interviews have been carried out by phone or over Skype, particularly with the staff of INGOs.

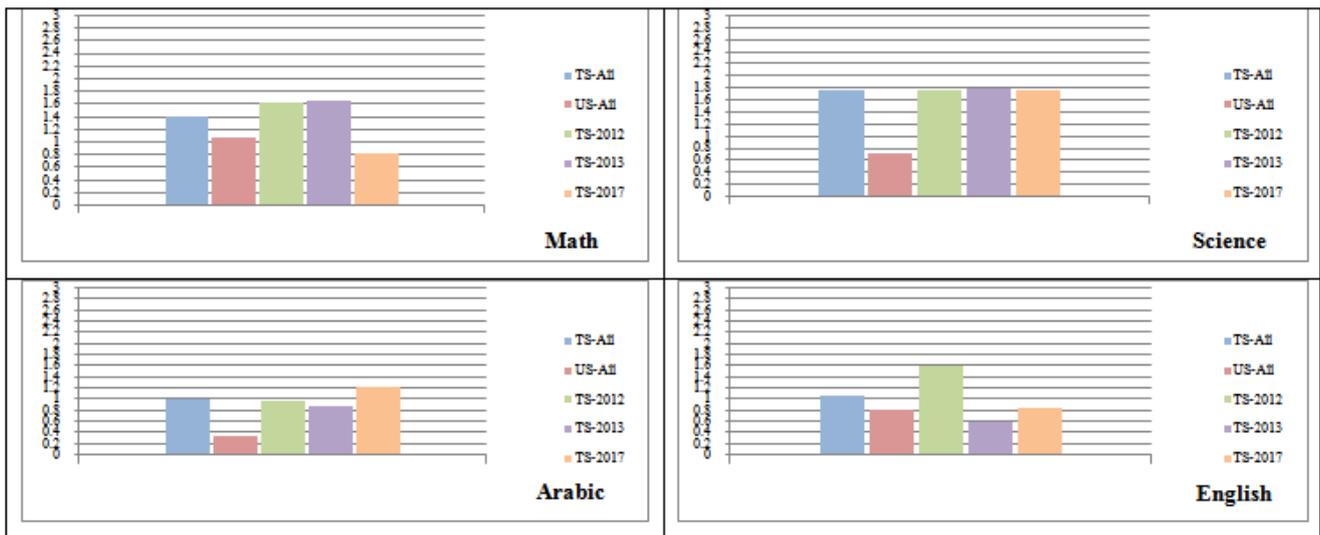
A survey was also carried out with a pool of students at grade 8 (14 years old) that are studying at the sample schools (207-F & 286-M). Although in some cases, it was provided to grade 6 in case if they are the oldest in the school. The survey is based on a questionnaire that includes 8 main questions and 1 sub-question. They included true or false, multiple choices, and WH questions; in addition to the last optional part for writing notes or comments. There were some cases where students did not really understand some questions or misunderstood them, particularly in the first two male schools as the surveys were distributed to all the students in each class. Thus, later on the surveys have been distributed only to the best 5 to 10 students in each classroom. Totally, 532 surveys were distributed to students (325 boys, and 207 girls). Out of this number, there were 39 semi-empty or invalid papers for the analysis (all of them belong to boys of the first two schools). Finally, we also benefited from some field visits that allow us to give a closer view on some on-going projects and interventions in the education sector, that particularly focus on maintaining and promoting education quality.

## **6. The Causal Impact of the Crisis on Education Quality**

Before carrying out our empirical assessment, it is worth mentioning that overall, the quality of education in Jordan showed a declining trend even before the Syria crisis, particularly in public schools. The results of PISA and TIMMS revealed that education quality in the country is declining after the year 2008. The results of TIMSS sessions in 1999, 2003, and 2007 have shown good progress of Jordanian students, but in 2011 there was a noticeable decline in their progress. Also, in PISA 2012, there was a decline in students' performance in math, science, and reading compared with previous sessions (Tweissi and Abulibdeh, 2016). There is a widespread perception of education quality declining in Jordan after the year 2010, particularly in public schools (Bataineh and Momani, 2017). Hence, we cannot attribute any declining in the education quality in the affected schools to the Syria crisis only. So, to provide a proper assessment we designed a control group of untreated schools (unaffected) to compare their students' outcomes with those of students in the treated schools (affected). Then, by computing the difference-in-difference between them, it is possible to precisely gauge the impact of the crisis on education quality in the treated schools.

First, we computed the first-difference of average scores between the two periods [Avg. in (2012-2015) – Avg. in (2008-2011)] for each group of treated schools (10 Male & 16 Female schools). We found overall, a clear declining of male and female students' scores in the treated schools after the crisis (2012-2015). Then, by computing the difference-in-difference of averages between the two different groups [Dif. in Male schools – Dif. in Female schools], we detected that overall, male scores declined more than females except in English. See Figures 6 and 7, and Table 5 for more details. However, at this point, we still cannot refer all this declining in scores in the treated schools to the Syria crisis.

**Figure 6.** The first-difference (Dif) in male scores in the treated and untreated groups of schools



**TS-All:** stands for the 10 male treated schools.

**US-All:** stands for the 10 male untreated schools.

**TS-2012:** stands for the 4 male treated schools that started the double-shift in 2011/2012; in which their scores got affected in the year 2012.

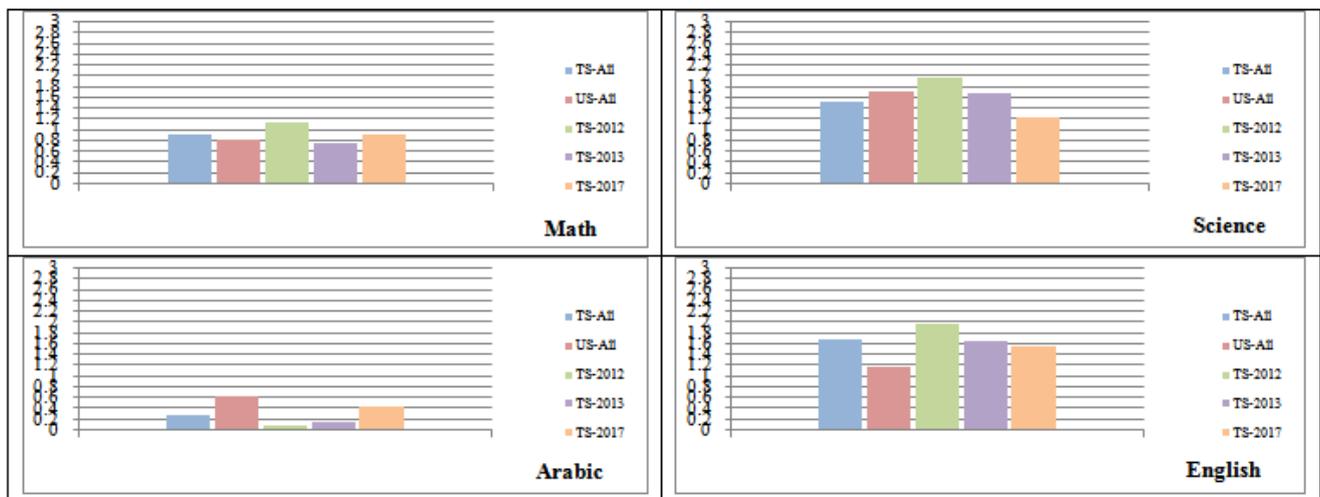
**TS-2013:** stands for the 3 male treated schools that started the double-shift in 2012/2013; in which their scores got affected in the year 2013.

**TS-2012/13:** stands for both TS-2012 & TS-2013.

**TS-2017:** stands for the 3 male treated schools that started the double-shift in 2016/2017; in which their scores got affected in the year 2017.

**Each column** (for each group of schools) represent the first-difference in the average of male scores between the two periods [Avg. in (2012-2015) – Avg. in (2008-2011)]. However, it represents the absolute value, because all the values of the first-difference are in minus (overall, students’ scores declined in the period 2012-2015).

**Figure 7.** The first-difference (Dif) in female scores in the treated and untreated groups of schools



**TS-All:** stands for the 16 female treated schools.

**US-All:** stands for the 16 untreated schools.

**TS-2012:** stands for the 4 female treated schools that started the double-shift in 2011/2012; in which their scores got affected in the year 2012.

**TS-2013:** stands for the 4 female treated schools that started the double-shift in 2012/2013; in which their scores got affected in the year 2013.

**TS-2012/13:** stands for both TS-2012 & TS-2013.

**TS-2017:** stands for the 8 female schools that started the double-shift in 2016/2017; in which their scores got affected in the year 2017.

Secondly, we computed the first-difference of average scores between the two periods [Avg. in (2012-2015) – Avg. in (2008-2011)] for each group of the untreated schools (10 male & 16 female untreated schools). However, it shows a declining in students' scores in the years (2012-2015) in the untreated schools as well. But, by computing the difference-in-difference between the treated and untreated schools [Dif. in treated schools – Dif. in the untreated schools]; we detected that overall, male and female scores in the treated schools have declined more than in the untreated schools. Hence, there is empirical evidence of a quantitative impact of the crisis on students' outcomes in the treated schools compared to the untreated ones. Note that these are conservative estimates of the overall impact of the crisis on education quality in Jordan since there is a possibility that also the untreated schools are affected by the crisis indirectly (spillovers effects)<sup>25</sup>. Moreover, GOJ and many international organizations have been providing ad-hoc interventions to reduce the crisis impact on education quality that benefited many affected schools. In addition, this quantitative impact was diversified among the different schools and subjects. It was significant in many cases (like in science and math for males & in English for females) and less or insignificant in some others (like in Arabic for females). See Table 5 below for more details.

To better understand the outcomes of Table 5, see the following example. Let us calculate the difference-in-difference in the averages of math scores between TS (10 treated male schools) and US (10 male untreated schools). The (DID) between [TS, US] = Dif. of TS [Avg. in (2012-2015) – Avg. in (2008-2011)] – Dif. of US [Avg. in (2012-2015) – Avg. in (2008-2011)] =  $-1.407 - (-1.066) = -0.341$ . This means that overall and after the crisis, male scores in math decreased in the treated schools by 0.341 more than in the untreated ones. This value ( $-0.341$ ) seems not really significant at this stage (grade 6), but in the long-run (at high school level), it will be very significant. Moreover, male scores in science and female scores in English are highly impacted by the crisis in the treated schools, see the (DID) values in Table 5. Anyway, the significance of the quantitative impact of the crisis on students' scores will be elaborated later on. Note that most of the (DID) values of the averages between the treated and untreated schools are in minus. This means that overall, students' scores declined more in the treated schools than in the untreated ones.

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<sup>25</sup> These are the indirect impacts of the crisis. For example, many students moved from private to public schools due to the increase in poverty and private education fees. Also, the hard economic conditions after the crisis that led to an increase in poverty and unemployment are also affecting education quality indirectly in the whole country. Plus, reducing the MOE budget is affecting the overall quality improvements. Moreover, brain drain of teachers out of MOE has increased significantly after the crisis, and most of the teachers who leave to teach abroad are very qualified.

**Table 5.** The first-difference (Dif) and difference-in-difference (DID) of averages in and between treated and untreated schools

	Male				vs.	Female			
Value for	Math	Science	Arabic	English		Math	Science	Arabic	English
Avg. in treated schools in (2008-2011)	71.202	72.961	76.215	71.898		74.541	76.388	81.186	74.733
Avg. in treated schools in (2012-2015)	69.795	71.195	75.199	70.825		73.615	74.862	80.910	73.066
<b>Dif.</b> in the treated schools = [Avg. in (2012-2015) – Avg. in (2008-2011)]	- 1.407	- 1.766	- 1.016	- 1.073		- 0.926	- 1.526	- 0.276	- 1.667
First-difference of declining ratio ( <b>Dif_R</b> ) in treated schools = <b>Dif.</b> in treated schools / Avg. in treated schools in (2008-2011).	-1.976%	-2.420%	-1.333%	-1.492%		- 01.242%	- 1.997%	-0.34%	- 2.230%
Avg. in untreated schools in (2008-2011)	70.819	73.066	75.647	70.765		74.337	77.329	81.589	74.493
Avg. in untreated schools in (2012-2015)	69.753	72.342	75.306	69.961		73.511	75.628	80.982	73.325
<b>Dif.</b> in untreated schools = [Avg. in (2012-2015) – Avg. in (2008-2011)]	- 1.066	- 0.724	- 0.341	- 0.804		- 0.826	- 1.701	- 0.607	- 1.168
First-difference of declining ratio ( <b>Dif_R</b> ) in untreated schools = <b>Dif.</b> in untreated schools / Avg. in untreated schools in (2008-2011).	-1.505%	- 0.990%	-0.450%	-1.136%		- 1.111%	- 2.199%	- 0.744%	- 1.567%
The difference-in-difference ( <b>DID</b> ) between treated & untreated schools = [ <b>Dif.</b> in treated – <b>Dif.</b> in untreated]	- 0.341	- 1.042	- 0.675	- 0.269		- 0.1	0.175	0.331	- 0.499
The difference-in-difference of declining ratio ( <b>DID_R</b> ) between [treated & untreated schools] = <b>Dif_R</b> in treated – <b>Dif_R</b> in untreated	-0.470%	-1.429%	-0.882%	-0.356%		-0.131%	+ 0.202%	+ 0.404%	-0.662%

**Dif.:** stands for the first-difference between the averages of the two periods: [Avg. in (2012-2015) – Avg. in (2008-2011)]; for the same group of schools.

**DID:** stands for the difference-in-difference between the averages of the two different groups of schools: [Dif. in Treated\_Schools] – [Dif. in Untreated\_Schools].

**Dif\_R:** stands for the first-difference in the declining ratio between the two periods [2012-2015 & 2008-2011]; for the same group of schools. This is important to refer the differences to the initial values they started at, as the different groups do not start at the same initial averages.

**DID\_R:** stands for the difference-in-difference in the declining ratio in the period after the crisis (2012-2015); between two different groups of schools.

However, the (DID) value of science (0.175) is positive in the case of females (Table 5), this means that female scores have declined less in the treated schools than in the untreated ones. But, (TS-All) group has two different sub-groups (TS-2012/13 & TS-2017), only the schools in the group (TS-2012/13) have experienced time reduction before the year 2015. Thus, when computing the (DID) between the two groups (TS-2012/13 & TS-2017), the value becomes negative again (-0.569) to match with the study hypothesis (Table 6). Moreover, the average of science in (2008-2011) for the untreated schools was higher than in the treated ones for the same period, which is not the case in math, Arabic and English (Table 6). Each school also has different resources (i.e., different teachers, science labs and facilities), as well as, not all the schools received support from international organizations, and if yes not to the same extent. Many schools got science labs and tools, while others no.

Thirdly, we acknowledge that there are three different groups of treated schools in the sample: schools that started the double-shift earlier (TS-2012 & TS-2013) and schools that started later on (TS-2017). This means that only the first two groups of schools (TS-2012 & TS-2013) have experienced time-reduction before the year 2015 (last year of quantitative data availability). The study combines the first two groups together (TS-2012/13) in order to compare their scores with the third group (TS-2017). After computing the first-difference inside each group, we computed the difference-in-difference between the (TS-2012/13) and (TS-2017); [Dif. in TS-2012/13 – Dif. in TS-2017]. Consistently with our research hypothesis, female and male scores in the schools that started the double-shift earlier (TS-2012/13) were more quantitatively impacted by the crisis than in the schools that started the double-shift later (TS-2017). In all subjects except in Arabic, male and female scores in these schools (TS-2012 & TS-2013) have declined more than in the (TS-2017) schools. In other words, all the treated schools were impacted by the crisis, but the impact was higher in (TS-2012/13 schools)<sup>26</sup>. See Tables 6 for more details.

<sup>26</sup>It is worth to mention that the TS-2012/13 schools experienced not only time-reduction but also many of them were overcrowded and have few Syrians in the first-shift with nationals, even after adding the second shift. This made a sort of a double impact in these schools compared with TS-2017 schools, as they only experienced overcrowding and had some more Syrians mixed with nationals in the first-shift. But overall, it is important to mention that the TS-2017 schools were more overcrowded.

**Table 6.** The first-difference (Dif) and difference-in-difference (DID) of averages in and between (TS-2012/13) & (TS-2017)

Value for	Male				vs.	Female			
	Math	Science	Arabic	English		Math	Science	Arabic	English
Avg. in treated schools (TS-2012/13) in (2008-2011)	71.215	72.708	76.270	71.819		74.970	76.718	81.245	75.322
Avg. in treated schools (TS-2012/13) in (2012-2015)	69.563	70.942	75.348	70.647		74.024	74.908	81.133	73.518
<b>Dif.</b> in the treated schools (TS-2012/13) = [Avg. in (2012-2015) – Avg. in (2008-2011)]	- 1.652	- 1.766	- 0.922	- 1.172		- 0.94	- 1.81	- 0.112	- 1.804
First-difference of declining ratio ( <b>Dif_R</b> ) in treated schools (TS-2012/13) = <b>Dif.</b> in treated schools (TS-2012/13) / Avg. in treated schools (TS-2012/13) in (2008-2011).	- 2.319%	-2.428%	-1.208%	-1.631%		- 1.261%	- 2.359%	- 0.137%	- 2.395%
Avg. in the treated schools (TS-2017) in (2008-2011)	71.172	73.555	76.085	72.083		74.112	76.058	81.127	74.145
Avg. in the treated schools (TS-2017) in (2012-2015)	70.338	71.785	74.851	71.242		73.205	74.817	80.689	72.613
<b>Dif.</b> in the treated schools (TS-2017) = [Avg. in (2012-2015) – Avg. in (2008-2011)]	- 0.834	- 1.77	- 1.234	-0.841		- 0.907	- 1.241	-0.438	- 1.532
First-difference of declining ratio ( <b>Dif_R</b> ) in treated schools (TS-2017) = <b>Dif.</b> in treated schools (TS-2017) / Avg. in treated schools (TS-2017) in (2008-2011).	-1.171%	-2.406%	-1.621%	-1.166%		- 1.223%	- 1.631%	- 0.539%	- 2.066%
The difference-in-difference ( <b>DID</b> ) between (TS-2012/13) & (TS-2017) = [ <b>Dif.</b> in (TS-2012/13) – <b>Dif.</b> in (TS-2017)]	- 0.818	0.004	0.312	- 0.331		- 0.039	- 0.569	0.326	- 0.272
The difference-in-difference of declining ratio ( <b>DID_R</b> ) between [treated schools (TS-2012/13) & treated schools (TS-2017)] = <b>Dif_R</b> in (TS-2012/13) – <b>Dif_R</b> in (TS-2017)	-1.147%	-0.022%	+ 0.413%	-0.465%		-0.038%	-0.727%	+ 0.402%	-0.328%

Note that the positive values of the (DID) in Arabic between [TS-2012/13 & TS-2017] means that both male and female scores were impacted more in case of overcrowding (TS-2017) than in case of time reduction (TS-2012/13). Actually, the qualitative part has also confirmed that students' scores in Arabic got more impacted by overcrowding than by time reduction. Many Arabic teachers reported that it is very hard to follow up with all students in reading and writing exercises due to the high class-size.

To provide a more accurate measure of scores' differences, we thus also provide the difference-in-difference ratio (DID\_R) that is a weighted measure of the difference in averages between the two different periods (2008-2011 & 2012-2015) relative to the initial values of these averages (Avg. in 2008-2011). To fully understand this measure, it is sufficient to provide the following naive example: let us assume that group A of schools started with an initial value of average students' scores of 100 (first class mark) and that it later decreased to 99. In this case the first-difference is  $-1$  and the declining ratio is  $-1\%$  ( $-1 / 100$ ). Let us now assume that group B of schools started instead with an initial value of 50 and later decreased to 49. In this case, the first-difference is  $-1$  as well. However, this scores' reduction should be seen as more painful in terms of the quality of the students' overall education, also it is less than the passing grade (50/100). Hence, it should be characterized by a relative more weight in terms of grade downsizing. Consistently, the relative measure highlights in this case a declining ratio of  $-2\%$  ( $-1 / 50$ ), which is double than in case of group A. See Tables 5 and 6 for more details, and Example III<sup>27</sup> for a valid case about the importance of the above measure.

To better understand how the values of (DID\_R) have been computed. Let us compute the double-difference in the declining-ratios (DID\_R) in math scores between TS (10 treated male schools) and US (10 male untreated schools), note that they did not start with the same initial values of averages [Avg. in TS for (2008-2011)  $\neq$  Avg. in US for (2008-2011)]. The DID\_R between [TS&US] =  $\text{Dif}_R$  in treated -  $\text{Dif}_R$  in untreated =  $-0.01976 - (-0.01505) = -0.470$  percent. This means that the male average of math in the treated schools declined by 0.4708 percent more than in the untreated schools, for the period (2012-2015). Which considers a quite significant rate of change when talking about students' averages.

It is important to understand how significant are these quantitative differences in students' scores between the treated and untreated schools for the period (2012-2015), in turn, their impact on economic growth; because at some points, many of them might seem not really significant. In fact, there is no study discussed how matter is students' scores at grade 6 on economic growth or per capita income. But, in Jordan, each 0.1 percent of the GPA at the High School (Tawjihi) is matter, particularly for high performing students because it is so competitive to study medicine, dentistry, pharmacy or engineering. According to the Mena Development Report, higher numbers of degree holders in these majors are related to higher economic growth and annual earnings (The World Bank,

<sup>27</sup>Example III: even though the value of (DID = 0.004) is positive between the [TS-2012/13 & TS-2017], but the value of (DID\_R = -0.00022) is negative (Table 6). The DID\_R of male scores in science between [TS-2012/13 & TS-2017] =  $\text{Dif}_R$  in (TS-2012/13) -  $\text{Dif}_R$  in (TS-2017). The  $\text{Dif}_R$  in (TS-2012/13) =  $\text{Avg. of TS-2012/13 in (2012-2015)} - \text{Avg. of TS-2012/13 in (2008-2011)} / \text{Avg. of TS-2012/13 in (2008-2011)} = (-1.776) / (72.708) = -0.02428$ . The  $\text{Dif}_R$  in TS-2017 =  $\text{Avg. of TS-2017 in (2012-2015)} - \text{Avg. of TS-2017 in (2008-2011)} / \text{Avg. of TS-2017 in (2008-2011)} = (-1.770) / (73.555) = -0.02406$ . Finally, the DID\_R between [TS-2012/13 & TS-2017] =  $(-0.02428) - (-0.02406) = -0.022$  percent. This means that male scores in science in the TS-2012/13 declined by 0.022 percent more than in the TS-2017.

2008). In a recent U.S study, it is estimated that a one standard deviation<sup>28</sup> increase in math performance at the end of High School translates into around 15 percent higher annual earnings (Murnane, Willett and Duhaldeborde, 2000). Hanushek and Kimko (2000) used data from the international student achievement tests to build a measure of education quality. Their estimates suggest that a higher standard deviation<sup>29</sup> in test performance on a country-level would yield about one percentage point higher annual growth. Moreover, one standard deviation in math and science skills translates into more than one percent in the average of annual real growth.

In this study, the quantitative declining in scores at grade 6 in the treated schools is a cumulative process and its value will get bigger by moving with time to higher grades, particularly, in case of no remedy programs to address this dereliction in quality soon. In addition, the declining in math and science matters more for economic growth than in the other subjects. Male scores in science have declined significantly in the treated schools compared with the untreated (DID = - 1.042) for the period after the crisis (2012-2015). Also, there was a significant declining in male scores in Arabic (DID = - 0.675) and female scores in English (DID = - 0.499) in the treated schools compared with the untreated ones, see Table 5 for more details. Furthermore, in the treated schools that started the double-shift earlier (TS-2012/13), there was a significant declining in male scores in math (DID = - 1.652) and in female scores in science (DID = - 1.81), see Table 6 for more details. This confirms that students' scores in math and science were more impacted than in Arabic and English, particularly due to time reduction, which in turn has a more negative impact on economic growth in Jordan in the long-run.

Nevertheless, it was important to carry out qualitative methodologies to complete the quantitative results and to confirm or justify them. The data was collected from (11-M & 19-F) principals, (286-M & 207-F) students, (51-M & 44-F) teachers, (47-M & 41-F) parents, and 34 education experts.

The majority of participants in the surveys and interviews have confirmed that time reduction has impacted students' overall performance, particularly in the years 2012 and 2013, and males were more impacted than females due to some reasons that will be mentioned later on. However, this impact was not as high as what the hypothesis of this study supposed before carrying out the research. This could be due to the international intervention as well as the response from MOE and schools' body to the crisis. On the other hand, many students said that time reduction did not really impact their scores, as many of them were studying more at home or offset this gap by relying on family members or private tutoring. This also might justify why some students wrote that their scores increased after time reduction in some subjects. The time reduction, overcrowding, and mixing refugee children with nationals have impacted their performance more in the scientific subjects (math and science), as well as in English. Many teachers confirmed that Syrian children are a bit worse than nationals in math and science and much worse in English, as in Syria students start studying English in grade 5 (many of them started studying English for the first time in Jordan). But in Arabic, they said that Syrians are as good as nationals or even slightly better at some topics. In Arabic, overcrowding impact was higher than that of time-reduction for both male and female students. Many Arabic teachers said that it is very hard to follow up with all students in reading and writing exercises due to the high class-size, and for many parents, Arabic is not as important as math, science or English (many parents said they help their children in Arabic less than they do in the other subjects). Moreover, children in the (TS-2012/13)

<sup>28</sup> In this study, the standard deviation in case of all students is 7.33 and the mean is 14.11. They suggest that each standard deviation in the quality (7.33) is associated with a growth rate by 14.66 percent higher annual earnings.

<sup>29</sup> In this study, the standard deviation in case of students' performance in the international assessment programs is 10.86 and the mean is 46.61 for 39 different participating countries or more at some tests. They suggest that each standard deviation in the quality (10.86) is associated with a higher annual growth rate by 1.4 percentages.

schools relayed more on private tutoring than their peers in the (TS-2017) schools for the period (2012-2015)<sup>30</sup>.

The double-shift has affected students' attitude toward learning in a way or another. Many students have complained that they do not get enough sleep as they have to be in school at 6:45 am. It is also a bigger problem in winter, as many of them should walk to school in the dark before sunrise, while it is very cold. A lot of them also complained that they cannot take breakfast because they wake up very early and usually in a hurry to get to school. In order to run the second shift, many fun and sports activities have been reduced, in which it has affected students' recreation. Moreover, there are no breaks between classes like before (5-minute break in case of the regular shift), which makes the school day really tense. There is no time to rest between classes, one teacher leaves the class and the other one walks in. Also, some teachers said that some students in the first two classes are not really involved, maybe they are sleepy or hungry. On the other hand, some students said that they prefer the double-shift, because the school day is shorter, and some said they are more energetic in the morning. The early shift in the morning forced many students to come late to school. However, this phenomenon already existed even when schools were running on a regular shift (school day starts at 8:00 am). But this ratio has increased significantly (sometimes more than 10-folds) after adding the second shift in the sample's schools. When students come late to class, it makes a distraction for their colleagues and put an onus on teachers to help them to catch up. Some principals punish the students who come late, while many others do not, as they understand students' problem in coming very early to school, particularly in winter. Hence, some principals have changed the classes' schedules not to have math or science in the first class. Many parents drive their children to school while they go to work, in which it makes their children arrive late.

The majority of teachers and principals have confirmed that to have a better education quality, both Syrian and Jordanian students should be enrolled in regular-shift schools only. It is also better to have the Syrians in Syrian-only schools to safeguard the education quality for nationals, as well as reduce bullying and tension at schools. They also said that refugee children are not keen on learning, as most of the boys are working and many girls welcome early marriage and drop out of school. On the other hand, some of them (mostly females) have said that ensuring the same level of education quality in double-shift schools like in the regular-shift ones is not impossible. But it needs a lot of efforts from students, teachers, principals, and parents, given that they have the same time and resources like in single-shift schools.

At the sample's schools, infrastructure destruction ratio has increased to a very high extent (more than 200 percent in some schools). The various ratios of infrastructure destruction are fairly related to the number of Syrians who attended the second-shift in these schools. The double-use of schools has caused an overuse of schools' assets (wear and tear effect), and this requires changing and fixing a lot of schools' resources and tools, as well as more frequent maintenance to schools' labs, sports facilities, and playgrounds ... etc. On the other hand, some of the principals said that the situation in their schools is way better than before due to international intervention. In addition, cleaning problems have arisen due to the double-shift, and the schools are way dirtier than before, plus there is huge pressure on bathrooms and sanitation facilities. More than 80 percent of the girls and around half of the boys complained about cleaning problems in their surveys. Many principals revealed that cleaning problems are not because of the Syrian children as most of the schools rely on the students to clean their

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<sup>30</sup> For the period (2012-2015): (13%) of students in the TS-2012/13 (schools that experienced time reduction) relayed on private tutoring; while this ratio was (7%) in the TS-2017 (schools that experienced more overcrowding).

classrooms. The fact of having not enough time to switch between the two shifts leaves less time for students to clean, and in many cases, they do not clean. Furthermore, many students eat in their classrooms because the lunch-break is very short.

Actually, cleaning problems and the noise which students of the second shift make (due to time overlapping between the two shifts) are the main reasons why many Jordanian students do not welcome the Syrians in their schools. Many principals complained that many Syrian students come too early to school, while their peers in the first-shift still have one or two classes to finish. They start to play and make noise in the yards, in which it distracts students' in the first-shift. It is not easy to prevent them from getting to school earlier, as they will stay in the streets and resort to bad practices. Also, many students in the first-shift have used this as an opportunity to play around or skip classes pretending that they are students of the second shift. Cleaning and time overlapping problems have fueled bullying and tension between national and refugee students. Principals and teachers said that during the switching time between the two shifts, there are a lot of fights and racial swears between national and refugee students, even in female schools. Students also exchange many racial words by writing it on the boards at the end of their shifts. In fact, there is a serious problem of social tension between national and refugee students that should be addressed.

The majority of parents are not happy with the double-shift, as they have to wake up earlier than before, and many of them need to walk or drive their children to schools, especially in winter. It is even a bigger problem if both parents are workers. Furthermore, they need to spend more time teaching their children at home or pay more out-of-pocket money for private tutoring. In addition, about half of the interviewed principals and administrators at MOE have confirmed that dropout and truancy increased a bit in the affected schools, due to the increase of poverty and time overlapping. Also, they said that the brain-drain of teachers has increased significantly in the years after the crisis, and they are less motivated than before.

In the first year of running the double-shift, same staff used to cover both shifts even teachers. Some of the teachers who used to cover both shifts revealed that their productivity and motivation reduced, particularly in the second shift. Thus, MOE hired new teachers to teach in the second shift, while the principals and some administrative staff remained covering both shifts. That might justify why the overall quantitative impact was higher in 2012 than in the other years. Many principles have complained that the school-day is way dense and they dislike to work on Saturdays. Despite they gain more money for covering both shifts, most of them said that the best solution for maintaining education quality is to remove the second shift, and have only regular shift schools for both national and Syrian students.

Overall and before the crisis, students' scores are higher in TS-2012 (schools started the double-shift earlier), it seems that MOE selected them first to be more resilient. This might give a higher impact for the double-shift on quality if they selected less performing schools. The girls are less affected by the crisis or more resilient than boys. Based on the field visits; overall, female schools are cleaner, more disciplined and organized than those of males. Female students are keener on learning, and their handwriting in the surveys is way better than that of boys. There is better management and the matter of schooling is taken more seriously than in male schools. Moreover, female teachers are more conscientious in their work than males, particularly in the case of young teachers. More than 80% of the girls study more than before to offset the time-reduction, compared with 55% in case of boys, and the percentage of girls who come late to school is less than half of that for boys. Generally, a lot of middle-class and some rich people tend to trust public schools for girls more than for boys. This means that female public schools have more students with better socioeconomic characteristics than

those of males, but this is not valid in every female school (i.e., depends on the school's reputation). In the surveys the level of income for female students was as follows (49% low income, 33% middle income, 18% high); while for males (52% low income, 33% middle income, 15% high). Furthermore, 39% of female students' parents have a BSc degree or higher, compared with 31% in the case of males. The results of this study also match with the results of NCHRD (2011) quality evaluation and PISA 2012, as both revealed that girls performance in Jordan is better than that of boys (UNESCO, 2011), (Tweissi and Abulibdeh, 2016).

## **7. Conclusion**

Since the outset of the Syria crisis, Jordan has received more than 1.4 million Syrian refugees. The crisis and the refugees' influx have been imposing heavy direct and indirect impacts on Jordan's resources and sectors. The education sector is too much affected by the crisis, and it has been struggling to accommodate the growing number of refugee children, as well as to maintain the education quality for the Nationals. Education is the foremost pillar of sustainable development and economic growth in Jordan. Hence, the risk is that the crisis and schooling the refugees will impose a negative long-term impact on education quality and the whole sector's progression. This, in turn, will impose a negative impact on economic growth in the long-run.

This study aims to assess, empirically, the Syria crisis impact on education quality in Jordan. The study collected and analyzed primary quantitative and qualitative data for a sample of (30 double-shift schools) located in Qasabet-Irbid (one of the top affected areas by the crisis). More specifically, the study carried out a set of pre-and-post crisis comparisons for students' scores in these schools that are affected by the crisis (through time-reduction, overcrowding and mixing refugee children with nationals in the same classrooms). Moreover, pre-and-post crisis comparisons were carried out between these treated schools and a control group of untreated schools (unaffected by the crisis) to determine the causal impact of the crisis on education quality in the treated schools by computing the difference-in-difference (DID) between the two groups. Surveys and talks with the stakeholders of education in the treated schools were also carried out to reinforce and complete the picture of the quantitative results.

Accordingly, there is an overall negative quantitative impact of the crisis on Jordanian students' performance in the treated schools, represented by a declining in their scores in math, science, Arabic, and English relative to the counterfactual sample. This study provides the first empirical evidence on the impact of the Syria crisis on education quality in the affected public schools in Jordan, with possible long-term effects on economic growth. This negative impact is confirmed and - possibly - reinforced by the qualitative analysis as well. The quantitative impact was more significant in math and science, then in English followed by Arabic, even though it was insignificant in some cases. This reduction of the extent of the crisis impact on education quality might be due to the international intervention, as well as the response from MOE staff and students to the crisis. On the other hand, this study does not represent, by any means, an argument against hosting policies of refugees or their enrollment in Jordan. It represents a quest for international organizations and donors to refine their financial and technical support to schooling the refugees without affecting the quality of education in public schools. Furthermore, they should support GOJ to remedy the damage that happened to quality in the affected public schools. This will help to prevent and reduce tensions between the incoming and the host communities.

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## References

- [1] A. Hanushek Eric and Ludger Wößmann; "Education Quality And Economic Growth". The World Bank- N.p., 2007.
- [2] Abdul-Khaliq Shatha, Thikraiat Soufan & Ruba Abu Shihab. "Intensive Economic Growth in Jordan during 1978-2010".
- [3] Bader Majed Farhan, 2012. The Effect of Education on Economic Growth in Jordan: An Econometric Study (1976 – 2007) "The Modified Version"; *Dirasat, Administrative Sciences*, Volume 39, No. 2, 2012.
- [4] Bandiera, Larcinese and Rasul: *The Economic Journal*; "HETEROGENEOUS CLASS SIZE EFFECTS: NEW EVIDENCE FROM A PANEL OF UNIVERSITY STUDENTS\*". N.p., 2010.
- [5] Bataineh Abdullah and Momani Fawwaz, "challenges of refugee education and conflicting priorities: case of Syrian refugees in Jordan", the second International conference for refugees in the Middle East; May, 2017.
- [6] Bataineh Abdullah, 2019. The International Role in Mitigating the Syria Crisis Impact on Education Quality in Jordan; *Journal of Social Sciences*, volume 8, July 2019.
- [7] Birdsall Nancy and J.L. Londono 1997. "Asset Inequality Matters: An Assessment of the World Bank's Approach to Poverty Reduction." *American Economic Review* 87 (2): 32–7.
- [8] Bransford J. D. and Johnson M. K. (1972). Contextual prerequisites for understanding: Some investigations of comprehension and recall. *Journal of Verbal Learning and Verbal Behaviour*, 11, pp. 717-726.
- [9] Bray Mark, "Double shift schooling: design and operation for cost-effectiveness" (PDF). UNESCO, 2008.

[10] Bray Mark, 2002. *The Costs and Financing of Educations: Trends and Policy Implications. Education in Developing Asia. Volume 3.* Asian Development Bank, Manila.

[11] Burns and Wilkoszewski, *GOVERNING COMPLEX EDUCATION SYSTEMS*, OECD, 2011.

[12] ChristophersenMona, "Securing Education for Syrian Refugees in Jordan," New York: International Peace Institute, May 2015.

[13] Culbertson Shelly, Olga Olikier, BenBaruch, Ilana Blum. "Rethinking Coordination Of Services To Refugees In Urban Areas: Managing The Crisis In Jordan And Lebanon | RAND". Rand.org. N.p., 2016.

[14] Dalisay S. Maligalig, Rhona B. Caoli-Rodriguez, Arturo Martinez Jr., and Sining Cuevas. "Education Outcomes in the Philippines"; Asian Development Bank, 2010.

[15] DessusSébastien, 2001. "Human Capital and Growth: the Recovered Role of Educational Systems." Middle East and North Africa Working Paper 22, World Bank, Washington, DC.

[16] Dryden-Petersson Sarah. "Refugee Education -A Global Review". UNHCR. N.p., 2011.

[17] Dupire Camille: 'Syrian refugees will greatly benefit from regularising situation'; The Jordan Times, 5th March 2018.

[18] EFT, 2005; "AN OVERVIEW OF EDUCATIONAL SYSTEMSAND LABOUR MARKETS IN THE MEDITERRANEAN"

[19] ESWG, 2014; "Glossary of Education Services," Jordan, Education Sector Working Group, May 29, 2014.

[20] European Parliament, 2017. "Syrian Crisis: Impact On Jordan - Think Tank". Europarl.europa.eu. N.p., 2017.

[21] GaliyaSagyndykova, 2013. "Academic Performance in Double-Shift Schooling". Department of Economics, University of Arizona, Tucson, 85721.

[22] Gregory Mankiw, DavidWeil and N. Romer: A CONTRIBUTION TO THE EMPIRICS OF ECONOMIC GROWTH\*, The Quarterly Journal of Economics, May 1992.

[23] Hanushek E. A. and Kimko D. D. (2000): Schooling, labor force quality, and the growth of nations. American Economic Review 90(5), 1184–1208.

[24] HRK, Hochschulrektorenkonferenz"German Rectors' Conference", [Available at] [https://www.hrk.de/uploads/media/Hochschulbildung\\_in\\_JordanienKurz.pdf](https://www.hrk.de/uploads/media/Hochschulbildung_in_JordanienKurz.pdf)

- [25] JEGP "2018-2022", Jordan Economic Growth Plan 2018 - 2022; The Economic Policy Council. Jordan News Agency Petra, 2016. "Unemployment rate increases in the 3rd quarter of 2016".
- [26] Kintsch W. and Van Dijk T. A. (1978): Toward a model of text comprehension and production. *Psychological Review*, 85 (5), pp. 363-394.
- [27] KreishanFuad and I.M. Al Hawarin, "Education And Economic Growth In Jordan: Causality Test". N.p., 2011.
- [28] Meador Derrick. "What Teachers Can Do To Combat An Overcrowded Classroom". ThoughtCo. N.p., 2016.
- [29] Melissa Fleming (UNHCR), "Six reasons why Syrians are fleeing to Europe in increasing numbers," *The Guardian*, October 25, 2015.
- [30] MOPIC, February 2017. "The Jordanian Response Plan for the Syria Crisis, JRP 2017-2019". MOPIC, Host Community Support Platform, November 2013. "Needs Assessment Review of the Impact of the Syrian Crisis on Jordan".
- [31] Murnane Richard, John B. Willett, Yves Duhaldeborde, and John H. Tyler. 2000. "How Important Are the Cognitive Skills of Teenagers in Predicting Subsequent Earnings?" *Journal of Policy Analysis and Management* 19 (4): 547–68.
- [32] Nicolai, S.andTriplehorn, C. (2003). "The role of education in protecting children in conflict". London: Humanitarian Practice Institute.
- [32] NRC, 2014. "Shared Resilience for Syrian Refugees and Host Communities in Jordan". Petra, "Jordan News Agency (Petra) |King Issues 7Th Discussion Paper." Petra.gov.jo. N.p., 2017.
- [33] Rafael Huseynov, Azerbaijan, Liberal, Democratic and Reformers' Group. Parliamentary Assembly, 2003. "Education of refugees and internally displaced persons Report".
- [34] ShahJehangir. "THE IMPACT OF OVERCROWDED CLASSROOM ON THE ACADEMI". N.p., 2012.
- [35] Stave Svein Erik andHillesundSolveig (ILO and Fafo), "Impact of Syrian Refugees on the Jordanian Labour Market: Findings from the governorates of Amman, Irbid, and Mafrq," December 2015), pp. 105-106.
- [36] Tapscott C. (1994); *A Tale of Two Homecomings: Influences of theEconomy and the State on Reintegration of Repatriated*
- [38] Teaching Refugees, "Classroom Supports | Teaching Refugees With Limited Formal Schooling". Teaching Refugees.com. 2005.

[39] The World Bank, 2008, "MENA DEVELOPMENT REPORT-The Road Not Traveled Education Reform In The Middle East And North Africa".

[40] The World Bank, 2014. "UN Asks For Help In Responding To Syrian Refugee Crisis".

[41] The World Bank, March 2016, "Government expenditure on education as % of GDP per capita," Available for Jordan, Syria, Lebanon, Turkey, USA and UK.

[42] TweissiAhmad, and KhattabAbulibdeh. "TIMSS And PISA Impact – The Case Of Jordan: Research Papers In Education: Vol 31, No 5". Tandfonline.com. N.p., 2016.

[43] UNESCO, WDE, 2011. "World Data on Education Donnéesmondiales de l'éducationDatosMundiales de Educación"- 7th edition, Updated version, August 2011.

[44] UNHCR, 2018a. "UNHCR Syria Regional Refugee Response." N.p., 2018. [Available at] <http://data.unhcr.org/syrianrefugees/regional.php>

[45] UNHCR, 2018b; The UN Refugee Agency, Jordan February 2018; Fact Sheet, [Available at] [https://reliefweb.int/sites/reliefweb.int/files/resources/FactSheetJordanFebruary2018-FINAL\\_0.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/FactSheetJordanFebruary2018-FINAL_0.pdf)

[46] UNHCR, 3RP, 2015: Regional Refugee and Resilience Plan, 3RP Regional Progress Report, June 2015. [Available at] <http://www.3rpsyriacrisis.org/wp-content/uploads/2015/06/3RP-Progress-Report.pdf>

[47] UNICEF, 2015, Jordan Situation Overview & Humanitarian Needs; Situation Report covering January-December 2014; [Available at] [https://www.unicef.org/jordan/Jordan\\_Sitrep\\_covering\\_2014.pdf](https://www.unicef.org/jordan/Jordan_Sitrep_covering_2014.pdf)

[48] Valenza and AlFayez (UNICEF), "Running on Empty,"2016, p. 16.

[49] Van Esveld Bill, "'We'Re Afraid For Their Future'". Human Rights Watch; Barriers to Education for Syrian Refugee Children in JordanN.p., 2016.

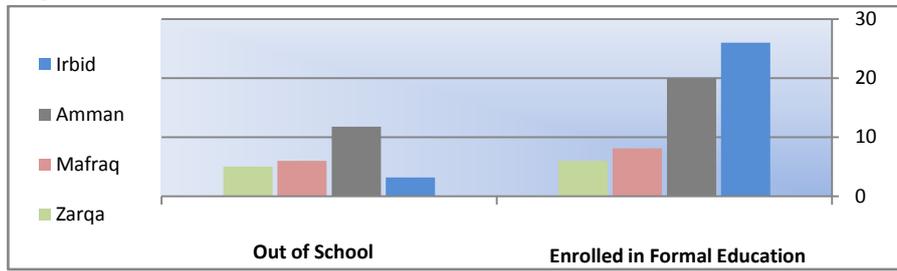
[50] WFP–CFMSE, MOPIC, February 2017. "The Jordanian Response Plan for the Syria Crisis, 2017-2019".

[51] WHITMAN ELIZABETH. "Refugee Crisis 2015: In Jordan, More Than 100,000 Syrian Students Means Double Shifts For Some Schools". International Business Times.

[52] Yew, Elaine H. J., Esther Chng, and Henk G. Schmidt. "Is Learning In Problem-Based Learning Cumulative?". N.p., 2010.

Appendix (Online)

Figure 1A. Actual enrollments and estimated number of out of school Syrian children.



Source: (4.2) MOE, data provided to UNICEF by the end of September 2013; NB: the out of school children those are the eligible to enroll in formal education.

Figure 2A. The structure of education system in Jordan



Source: Ministry of Education (MOE, 2008).

Figure 3A. The Education Quality Trend and Percentages of Students in Jordanian Schools



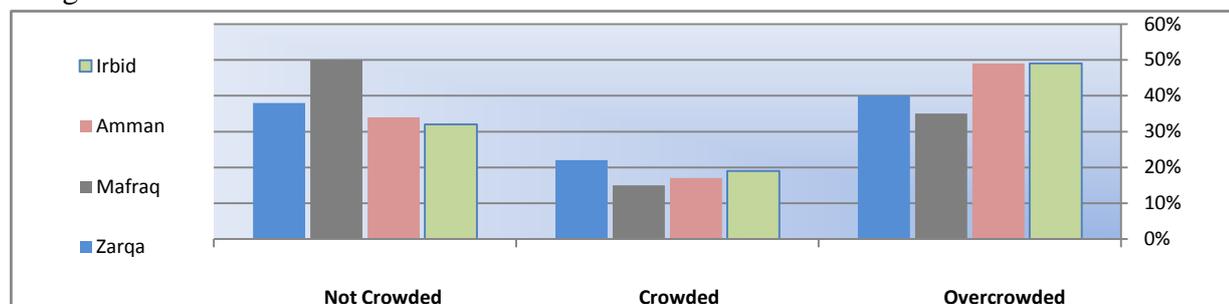
Sources: MOE (2017) & NCHRD (2017).

Figure 4A. Shows a map of Qasabet Irbid (Qasabah District)



**NB:** This area which is bordered in red and looks like a butterfly is the so-called Qasabet Irbid, and it is the biggest area in the city in terms of population density. It is clear on the map that's very close to the Syrian south borders. That's why it host around one-third of the registered Syrian refugees in Irbid (NRC, 2014).

**Figure 5A.** Ratios of crowded and overcrowded schools in the main Jordanian cities that host Syrian refugees.



**Source:** (4.3) MOE EMIS data provided to UNICEF, September 2013.

**Table 1A.** Syrian children enrollment rates in Jordan since the school year 2011/2012 until 2019

Year	Number of Syrian Children Enrolled in Formal Education	Facts About the Enrollment of Syrian Refugee Children
2011/2012	16,713 in public schools in host communities only.	Only 12% of school-aged refugee children were enrolled in formal education.
2012/2013	84,831 in host communities and camps.	By Nov 2013, 34% were out of school.
2013/2014	120,000 in host communities and camps.	65,000 mixed into Jordanian schools, 35,000 in Syrian-only second shifts, and 20,000 in the camps.
2014/2015	129,354 in host communities and camps.	60,066 mixed into Jordanian schools, 46,049 in Syrian-only second shifts, and 23,227 in the camps; By the end of 2014, there were 35,000 students enrolled in non-formal and informal education.
2015/2016	145,458 in host communities and camps.	35% of Syrian children were out of formal education.
2016/2017	170,000 in host communities and camps.	Around 90,846 Syrian children registered with UNHCR remain out of formal education; a figure that substantially increases to 118,840 children when calculations are based on the 2015 Census data.
End of 2017	Estimated: 195,000 students enrolled in formal education.	By the end of 2017, 25,000 children will be enrolled in a “catch-up” program, which will teach two grades of material in a single year, after which they will be eligible to re-enroll in formal education.
End of 2018	Estimated: 210,600 students enrolled in formal education.	–
End of 2019	Estimated: 227,448 students enrolled in formal education.	–

Sources of data: MOE September 2016, DOS 2015 census – MOPIC, THE JORDAN RESPONSE PLAN FOR THE SYRIA CRISIS 2017-2019, UPDATED FEBRUARY 23, 2017; MOE and UNESCO (2012) – The Fiscal Impact Of The Syrian Refugee Crisis on Jordan (USAID); MOE 2014 – Education of Syrian Refugee Children –Managing the Crisis in Turkey, Lebanon, and Jordan – Shelly

Culbertson, Louay Constant – Rand Corporation; UNICEF – Evaluation for Emergency Education Response for Syrian Refugee Children and Host Communities in Jordan, in Early 2015.

**Table 2A.** The differences in the education systems between Jordan and Syria according to some indicators

The Indicator	Year	Jordan	Syria
Literacy rate, among the population aged 15 years and above.	2000	90 %	75 %
Average years of schooling for population aged 15 years and above.	2000	6.91	5.77
Standard deviation from the average years of schooling of the population aged 15 and above.	2000	5.41	4.77
Survival Rate to Grade 5.	2000	97.7	92.4
Primary Completion Rate.	2001	91.8	90.2
Dropout Rate in Primary Education.	2002	0.2	11.7
Dropout Rate in Secondary Education.	2004	0.7	7.8
Pupil-Teacher Ratio in Primary Education.	2002	19.9	23.2
Pupil-Teacher Ratio in Secondary Education.	2002	16.9	15.5
Repetition Rate in Primary Education.	2002	0.5	6.8
Repetition Rate in Secondary Education.	2002	0.9	7
Access to Primary School Education: Net Enrollment Rate.	2003	101.1	98.1
Gross Enrollment Rates in Secondary Education.	2003	87.4	63.2
Illiteracy Rates of the Population Aged 15 and over by Gender.	2003	9.7	20.4
Private Enrollment Share in Primary Education.	2003	29.9	4.2
Private Enrollment Share in Secondary Education.	2003	16.6	4.1
Adult Literacy Rate (Aged 15 and Older).	2003	90.3	79.6
Gender Parity Index of Gross Enrollment Rate in Secondary and Tertiary Education (female as a proportion of male).	2003	1.02	0.93
Average of Public Expenditure in Education as a Percentage of GDP	2003	6.4	3.2
The proportion of students failing to achieve even the low benchmark in math and science in 2003, Trends in International Mathematics and Science Study (TIMSS).	2003	40 %	71 %
School enrollment, secondary (% gross).	2010	89.9	72.4
School enrollment, tertiary (% gross).	2010	40.4	25.7
Literacy rate, adult total (% of people ages 15 and above).	2012	97.9	85.1
Average of Public Expenditure in Education as a Percentage of GDP.	—	In 2011 = 12.2	In 2009 = 5.1
NER in pre-primary stage (KG).	2015	59 %	—
NER in the basic education (Grade 1–10).	2015	99 %	—
NER in the secondary education (Grade 11–12).	2015	77.4 %	—

**Sources of data:** The World Bank – MENA Development Report, 2008; European Parliament – EFT – AN OVERVIEW OF EDUCATIONAL SYSTEMS AND LABOUR MARKETS IN THE MEDITERRANEAN REGION; The World Bank Database, WBD – 2013.

**Table 3A.** The 30 public schools that located in Qasabet Irbid area and running on double-shift

School ID	School Name	School Code	Year	Gender
113944	Al Qadisiyah Secondary School for Girls	FS1	2011/2012	Female
113128	Khadija umm Al Momineen Basic School for Girls	FS2	2011/2012	Female
111145	Hakama Basic School for Girls	FS3	2012/2013	Female
113945	Rufaidah Al Asslamia School for Girls	FS4	2011/2012	Female
113971	Al Qasila Secondary-mixed School for Girls	FS5	2011/2012	Female
114037	Hunaina Basic-mixed School	FS6	2012/2013	Female
113967	Nusaiba Al Mazinia Basic School for Girls	FS7	2012/2013	Female
114195	Dahiyat Al Hussein Secondary-mixed School	FS8	2016/2017	Female
114199	Bushra Secondary-mixed School for Girls	FS9	2016/2017	Female
114196	Umm Salama Basic-mixed School	FS10	2016/2017	Female
114197	Huwara Secondary-mixed School	FS11	2016/2017	Female
111058	BaytRas Secondary School for Girls	FS12	2016/2017	Female
114235	Al Mughair Secondary-mixed School	FS13	2016/2017	Female
114236	Duoqara Secondary-mixed School	FS14	2016/2017	Female
111150	That Al Nitaqain Basic School for Girls	FS15	2016/2017	Female
114035	Ajnadin Secondary for Girls	FS16	2013/2014	Female
114164	Al Bahrainia Basic School for Girls	N/A	2016/2017	Female
113948	Jumana Basic-mixed School	N/A	2011/2012	Female
114104	Fatima Bint Al Yamaan Basic-mixed School	N/A	2012/2013	Female
113947	Al MuthannaIbnHaritha Secondary School for Boys	MS1	2011/2012	Male
114034	Abdulrahman Al Halhouli Secondary School for Boys	MS2	2011/2012	Male
111025	Omar Bin Abdulaziz Secondary School for Boys	MS3	2012/2013	Male
113968	Abu Bakr Al Siddiq Secondary School for Boys	MS4	2012/2013	Male
114200	Dahiyat Al Hussein Secondary School for Boys	MS5	2016/2017	Male
114201	Bushra Secondary School for Boys	MS6	2016/2017	Male
114202	BaytRas Secondary School for Boys	MS7	2016/2017	Male
114038	Al HasanIbn Al Haytham Secondary School for Boys	MS8	2012/2013	Male
114040	Muath Bin Jabal Secondary School for Boys	MS9	2013/2014	Male
114036	Kafr-Yuba Basic School for Boys	MS10	2012/2013	Male
113970	IbnZaidoon Secondary School for Boys	N/A	2012/2013	Male

**Source:** (MOE, 2017); available in Arabic on this link: <http://www.moe.gov.jo/schools.aspx>

**NB:** Some of the schools for females have mixed students (girls and boys), but only for the first three grades (G1-G3, in some cases students are mixed until G4). That's why the schools that assigned to girls are more than those for boys because some of them have also boys for the earliest grades. Also, the Syrian girls' enrolment in the country's schools is higher than that for boys, due to the increase ratio of child labor. However, this study will focus on grades six and eight; and all of them have only either girls or boys in the same classroom. Thus, from now on, it will be considered that there are 19 schools for girls and 11 schools for boys in this sample. Four schools (3F, 1M) are not included in the quantitative analysis due to the unavailability of their students' scores (N/A).

**Table 4A. List of questionnaires and surveys**

<p><b>The questionnaire with the managers of the 30 double-shift schools in Qasabat Irbid</b></p> <p>1) When did you start to run on a double-shift working manner?</p> <p>2) How many Syrian students are in the first-shift? Percent!</p> <p>3) Did the International Organizations help you to reduce the impact of the refugee crisis in your school? Not at all, a little bit, fair enough, very good or excellent!</p> <p>4) Overcrowding ratio (average) in the school? For grade 6, 7 and 8!</p> <p>5) One of the problems caused by the double-shift system is (students come late in the first-shift)? Did your school get affected by this phenomenon? Would you tell me more about it?</p> <p>6) Have you noticed any declining in students' scores after being on the first-shift? Not at all, Yes but not significant, Yes and significant, Yes and very significant.</p> <p>7) Many problems caused by the double-shift system are (Bullying, Social problems and Truancy ...etc)? Did your school get affected by these phenomenons? Would you tell me more about them?</p> <p>8) One of the problems caused by the double-shift system is (Infrastructure Destruction)? Did your school get affected by this phenomenon? Would you tell me more about it?</p> <p>9) Do you have a sort of overlapping between the two shifts (Would you explain it in more details)?</p> <p>10) One of the problems caused by the double-shift system is (pressure on the school facilities such as W.C, Libraries, play grounds ...etc)? Would you tell me more about it?</p> <p>11) Do you think it is hard for you to manage both shifts? Any kind of problems related to be managing both shifts!</p> <p>12) Is it possible to have the same education quality like in the case before (single-shift)? Explain your answer, please.</p> <p>Notes &amp; Comments .....</p>
<p><b>The questionnaire with the teachers who teach Math, Science, Arabic &amp; English in the sample's schools</b></p> <p>1) What kind of material do you teach (Scientific or Theoretical)?</p> <p>2) Did you feel any difference in your student's level of education after being on a double-shift?</p> <p>3) Do you think that the regular shift is better for students to get a better education's outcome?</p> <p>4) Do you think that the time reduction has impacted the students' education outcome they get in the class? Not at all, a little bit, significant, very significant!</p> <p>5) For you as a teacher, which is better to be teaching a regular shift or the first-shift? Did it affect your motivation?</p> <p>Notes &amp; Comments .....</p>
<p><b>The questionnaire with the parents of students who study in the sample's schools</b></p> <p>1) Did you notice any difference in your son/daughter level of education (after following the double-shift)?</p> <p>2) Did you have any problems because of the double- shift?</p> <p>3) Do you spend more time with your sons after having them follow the 1st shift (due to time reduction)?</p> <p>4) Did you feel that their attitude to schooling is lower than before, just because they have to wake up earlier?</p> <p>5) Do you think it is better for your Son/Daughter to be in an overcrowded regular shift school, or</p>

to be in a double-shift school (less overcrowded)?

Notes & Comments .....

**The survey with the students who study in the sample's schools**

1) Which grade you're enrolled in?

2) Your family income ( $x < 500$ ,  $500 < x < 1000$ ,  $x > 1000$ ).

3) Your father's highest level of education (Basic Education, Secondary Education, BSc, MSc, PhD).

4) Your mother's highest level of education (Basic Education, Secondary Education, BSc, MSc, PhD).

5) Do you think that your education's outcome (grades & knowledge) you get at school has decreased because of the double-shift (time reduction)? The same or increased!

6) Do you like school less than before because of the double-shift? Same or More!

7) Do you like to study in an overcrowded regular shift school or a double-shift one, but less overcrowded?

Notes & Comments .....