Refugees and the Education of Host Populations: Evidence from the Syrian Inflow to Jordan

Ragui Assaad  
University of Minnesota

Thomas Ginn  
Center for Global Development

Mohamed Saleh  
London School of Economics

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Introduction

- 82.4 million people displaced by conflict worldwide
  - 86% in developing countries, clustered in and around conflict

- Labor market effects of forced migration frequently studied. Other outcomes like education less so.
  - About 29% of the displaced between 5 and 17 years old

- Potential channels include:
  - Direct crowd out (or in)
  - Changes in the returns to education
  - Peer effects
Summary

- Did Syrian refugees affect education outcomes for Jordanians?
- Utilize school census and large household survey to examine quantity and quality of education
- Employ difference-in-differences across school cohorts and locations
- Find no evidence that greater exposure to Syrian refugees affected the attainment of Jordanians
- Expansion in high-Syrian areas (mostly donor-funded) appears sufficient to mitigate any over-crowding
Related Literature

- Impact of refugees and immigrants on native-born education
  - Rozo and Sviastchi (2019): same context and null result on enrollment at sub-district level, distance from camps IV
  - Tumen (2019): Syrians in Turkey increased native-born HS enrollment, since returns to education increased
  - Baez (2011): Rwandans in Tanzania decreased attainment and literacy of Tanzanians
  - Mixed results in large literature on high-income countries

- Impact of Syrians on Jordan’s labor market
Syrian Refugee Arrivals to Jordan

Source: https://data2.unhcr.org/en/situations/syria/location/36
Syrian Refugee Locations in Jordan in 2016

Overall prevalence $\approx 7\%$; 18\% of Syrians live in two camps
Setting

- Basic and secondary public schools free for Jordanians and Syrians
- 85% of 18-24 year-olds finished basic education
- 56% of 22-25 year-olds finished secondary education
- 12% of Jordanians in schools with two shifts, pre-dating Syrians
- Syrian students in Jordan account for:
  - 6.8% of total student population in 2016
  - 45% of increase in enrollment since 2010
- Barriers for Syrians include bans on students three or more years older than their grade level, low perceived returns, and lack of required documents
Exposure of Jordanians to Syrians Schoolmates

12% of Jordanians with $> 10\%$ Syrians in school
Data

► 2010-20 School Censuses
  ► Count of all basic & secondary schools, enrollment by nationality

► 2015 National Census
  ► Count of all residents, by nationality to the locality level (n = 958)
  ► 13.3% Syrian (higher than other data, \( \rho = 0.83 \) with sub-district level density from school data)

► Jordan Labor Market Panel Survey (JLMPS)
  ► 2016 nationally-representative survey (n = 7,229 households)
  ► Individual-level roster with education variables (n = 33,450)
Strategy: Difference-in-differences

Ex ante identification challenges:
► If refugees moved to areas with worse educational outcomes
► Syrian conflict slowed Jordan growth, which could affect education

Empirical strategy:
► School or locality of birth fixed effects
  ▶ Decompose by level of exposure: 0 − 2%, 2 − 5%, 5 − 10%, > 10%
► School cohorts: sample depends on the outcome variable
  ▶ Treated: “Young” cohorts potentially exposed from 2013
  ▶ Control: Cohorts too old for exposure

Identifying assumption:
► High- and low-Syrian schools or localities would have experienced similar educational trends in the absence of Syrian refugees
Results: Completed Basic Education

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) School-Level</th>
<th>(2) School-Level</th>
<th>(3) Locality-Level</th>
<th>(4) Locality-Level</th>
<th>(5) Locality-Level</th>
<th>(6) Locality-Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prop. Syrians ∈ [0.02, 0.05) × Young</td>
<td>0.098**</td>
<td>0.025</td>
<td>-0.031</td>
<td>-0.009</td>
<td>-0.045</td>
<td>-0.009</td>
</tr>
<tr>
<td></td>
<td>(0.045)</td>
<td>(0.067)</td>
<td>(0.044)</td>
<td>(0.043)</td>
<td>(0.034)</td>
<td>(0.034)</td>
</tr>
<tr>
<td>Prop. Syrians ∈ [0.05, 0.1) × Young</td>
<td>0.103*</td>
<td>0.024</td>
<td>-0.009</td>
<td>-0.045</td>
<td>-0.184</td>
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</tr>
<tr>
<td></td>
<td>(0.054)</td>
<td>(0.045)</td>
<td>(0.043)</td>
<td>(0.034)</td>
<td>(0.276)</td>
<td>(0.276)</td>
</tr>
<tr>
<td>Prop. Syrians ≥ 0.1 × Young</td>
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<tr>
<td>Prop. Syrians ≥ 0.05 × Young</td>
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<tr>
<td>Proportion Syrians in 2016 × Young</td>
<td></td>
<td></td>
<td></td>
<td>0.292</td>
<td>-0.184</td>
<td></td>
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<td></td>
<td></td>
<td>(0.187)</td>
<td>(0.276)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>2,333</td>
<td>2,333</td>
<td>2,333</td>
<td>2,714</td>
<td>2,714</td>
<td>2,714</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.516</td>
<td>0.513</td>
<td>0.513</td>
<td>0.338</td>
<td>0.337</td>
<td>0.337</td>
</tr>
<tr>
<td>School Cohort FEs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>School or Locality of Birth FEs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Number of Schools or Localities</td>
<td>615</td>
<td>615</td>
<td>615</td>
<td>212</td>
<td>212</td>
<td>212</td>
</tr>
<tr>
<td>Dep. Var. Mean (Young, Schools &lt; 2%)</td>
<td>0.71</td>
<td>0.71</td>
<td>0.71</td>
<td>0.74</td>
<td>0.74</td>
<td>0.74</td>
</tr>
<tr>
<td>Dep. Var. Mean (Old, Schools &lt; 2%)</td>
<td>0.96</td>
<td>0.96</td>
<td>0.96</td>
<td>0.96</td>
<td>0.96</td>
<td>0.96</td>
</tr>
</tbody>
</table>

Reject an effect of $<-1.4$ percentage points for schools with higher than median exposure
### Grade-Level Exposure

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Completed Basic</th>
<th>(2) Completed Grade 8</th>
<th>(3) Completed Grade 6</th>
<th>(4) Completed Grade 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prop. Syrians ∈ [0.02, 0.05) × Young</td>
<td>0.027 (0.061)</td>
<td>-0.037 (0.059)</td>
<td>0.034 (0.040)</td>
<td>0.015 (0.031)</td>
</tr>
<tr>
<td>Prop. Syrians ∈ [0.05, 0.1) × Young</td>
<td>0.020 (0.070)</td>
<td>0.092* (0.047)</td>
<td>-0.058 (0.073)</td>
<td>-0.005 (0.035)</td>
</tr>
<tr>
<td>Prop. Syrians ≥ 0.1 × Young</td>
<td>0.062 (0.074)</td>
<td>0.122*** (0.040)</td>
<td>-0.025 (0.059)</td>
<td>0.012 (0.025)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,608</td>
<td>1,685</td>
<td>1,539</td>
<td>2,115</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.537</td>
<td>0.443</td>
<td>0.460</td>
<td>0.459</td>
</tr>
<tr>
<td>School Cohort FEs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>School FEs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Number of Schools</td>
<td>420</td>
<td>461</td>
<td>423</td>
<td>559</td>
</tr>
<tr>
<td>Dep. Var. Mean (Young, Schools &lt; 2%)</td>
<td>0.74</td>
<td>0.84</td>
<td>0.88</td>
<td>0.96</td>
</tr>
<tr>
<td>Dep. Var. Mean (Old, Schools &lt; 2%)</td>
<td>0.96</td>
<td>0.96</td>
<td>0.99</td>
<td>0.99</td>
</tr>
</tbody>
</table>
### Additional Outcomes from Exposure During Basic Education

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4) Entered Secondary (Who Completed Basic)</th>
<th>(5) Vocational Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prop. Syrians $\in [0.02, 0.05) \times Young$</td>
<td>0.020</td>
<td>-0.077</td>
<td>0.080</td>
<td>0.026</td>
<td>-0.096</td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td>(0.162)</td>
<td>(0.067)</td>
<td>(0.071)</td>
<td>(0.077)</td>
</tr>
<tr>
<td>Prop. Syrians $\in [0.05, 0.1) \times Young$</td>
<td>-0.020</td>
<td>-0.141</td>
<td>-0.064</td>
<td>-0.062</td>
<td>0.026</td>
</tr>
<tr>
<td></td>
<td>(0.020)</td>
<td>(0.162)</td>
<td>(0.095)</td>
<td>(0.097)</td>
<td>(0.069)</td>
</tr>
<tr>
<td>Prop. Syrians $\geq 0.1 \times Young$</td>
<td>0.012</td>
<td>-0.159</td>
<td>0.165**</td>
<td>0.110</td>
<td>-0.027</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.156)</td>
<td>(0.072)</td>
<td>(0.068)</td>
<td>(0.081)</td>
</tr>
</tbody>
</table>

- **Observations**: 2,310, 1,784, 2,333, 1,867, 1,430
- **R-squared**: 0.338, 0.495, 0.514, 0.509, 0.423
- **School Cohort FEs**: Yes, Yes, Yes, Yes, Yes
- **School FEs**: Yes, Yes, Yes, Yes, Yes
- **Number of Schools**: 613, 500, 615, 518, 435
- **Dep. Var. Mean (Young, Schools < 2%)**: 0.02, -0.05, 0.56, 0.78, 0.14
- **Dep. Var. Mean (Old, Schools < 2%)**: 0.02, -0.10, 0.75, 0.78, 0.18
### Outcomes from Exposure During Secondary Education

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Repeated Secondary</th>
<th>(2) Completed Secondary (Who Entered)</th>
<th>(3) Secondary Final Grade</th>
<th>(4) Entered Tertiary (Who Completed Secondary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prop. Syrians ∈ [0.02, 0.05) × Young</td>
<td>-0.141**</td>
<td>0.021</td>
<td>0.332</td>
<td>0.160*</td>
</tr>
<tr>
<td></td>
<td>(0.064)</td>
<td>(0.088)</td>
<td>(0.308)</td>
<td>(0.086)</td>
</tr>
<tr>
<td>Prop. Syrians ∈ [0.05, 0.1) × Young</td>
<td>-0.035</td>
<td>0.247*</td>
<td>-0.262</td>
<td>0.224**</td>
</tr>
<tr>
<td></td>
<td>(0.083)</td>
<td>(0.142)</td>
<td>(0.256)</td>
<td>(0.093)</td>
</tr>
<tr>
<td>Prop. Syrians ≥ 0.1 × Young</td>
<td>-0.264*</td>
<td>0.140</td>
<td>-0.041</td>
<td>-0.206</td>
</tr>
<tr>
<td></td>
<td>(0.148)</td>
<td>(0.106)</td>
<td>(0.648)</td>
<td>(0.272)</td>
</tr>
</tbody>
</table>

- **Observations**: 1,754, 1,754, 313, 806
- **R-squared**: 0.432, 0.490, 0.507, 0.540
- **School Cohort FE{s}**: Yes, Yes, Yes, Yes
- **School FE{s}**: Yes, Yes, Yes, Yes
- **Number of Schools**: 432, 432, 432, 248
- **Dep. Var. Mean (Young, Schools < 2%)**: 0.32, 0.33, 0.01, 0.68
- **Dep. Var. Mean (Old, Schools < 2%)**: 0.23, 0.60, -0.02, 0.85
Robustness

- **Specifications:**
  - Levels: School, Locality, Sub-district
  - Cuts: Median, Quartiles, Continuous, High vs. Low
  - Placebo: Old vs. Older cohort

- **Decompositions:** Gender, Household Wealth

- **Outcomes (Basic and Secondary):** Ever Attended, Repeated or Needed Tutoring, Graduated, Passed Final, Final Grade, Private School, Vocational School; Attended Tertiary
Few Jordanians in High-Density Schools

![Graph showing the number of Jordanians and Syrians in high-density schools over academic years 2012 to 2019. The x-axis represents the academic year, and the y-axis represents the number of students. The graph shows an increase in the number of students in each year, with a notable increase in 2013. The percentage of Syrian students in school is also shown, with different colors representing different percentage ranges.](image-url)

- Syrian students in school < 2%
- Syrian students in school ≥ 2% & < 5%
- Syrian students in school ≥ 5% & < 10%
- Syrian students in school ≥ 10% & < 50%
- Syrian students in school ≥ 50% & < 90%
- Syrian students in school ≥ 90%
Fewer Jordanians in High-Density Shifts

- High-density areas much more likely to open shifts
Student-Teacher Ratio for Jordanians Unchanged

Jordanians

Academic Year

Number of Students

0 300,000 600,000 900,000 1,200,000


Student-teacher ratio in shift < 15
Student-teacher ratio in shift ≥ 15 & < 20
Student-teacher ratio in shift ≥ 20 & < 25
Student-teacher ratio in shift ≥ 25 & < 30
Student-teacher ratio in shift ≥ 30 & < 40
Student-teacher ratio in shift ≥ 40

Syrians

Academic Year

Number of Students

0 30,000 60,000 90,000 120,000


Student-teacher ratio in shift < 15
Student-teacher ratio in shift ≥ 15 & < 20
Student-teacher ratio in shift ≥ 20 & < 25
Student-teacher ratio in shift ≥ 25 & < 30
Student-teacher ratio in shift ≥ 30 & < 40
Student-teacher ratio in shift ≥ 40
Classroom Density for Jordanians Unchanged

Jordanians

Syrians

Academic Year

Academic Year

Number of Students

Classroom density in shift < 15
Classroom density in shift ≥ 15 & < 20
Classroom density in shift ≥ 20 & < 25
Classroom density in shift ≥ 25 & < 30
Classroom density in shift ≥ 30 & < 40
Classroom density in shift ≥ 40
## Impact of Syrian Students on Jordanian School Supply

<table>
<thead>
<tr>
<th>Locality-Level Regressions (1)–(4)</th>
<th>School-Level Regressions (5)–(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Schools</td>
<td>No. Double-Shift Schools</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Prop. Syrians ∈ [0.02, 0.05) × Post-2012</td>
<td>0.064</td>
</tr>
<tr>
<td></td>
<td>(0.349)</td>
</tr>
<tr>
<td>Prop. Syrians ∈ [0.05, 0.1) × Post-2012</td>
<td>1.408***</td>
</tr>
<tr>
<td></td>
<td>(0.509)</td>
</tr>
<tr>
<td>Prop. Syrians ≥ 0.1 × Post-2012</td>
<td>1.711***</td>
</tr>
<tr>
<td></td>
<td>(0.534)</td>
</tr>
</tbody>
</table>

| Observations | 7,024 | 7,024 | 7,024 | 7,024 | 31,107 | 31,057 | 31,057 |
| R-squared | 0.999 | 0.975 | 0.899 | 0.730 | 0.791 | 0.700 | 0.494 |
| Year FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Locality or School FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Number of Localities or Schools | 707 | 707 | 707 | 707 | 3,111 | 3,106 | 3,106 |
| Dep. Var. Mean (2012) | 32.10 | 4.76 | 0.51 | 0.03 | 0.11 | 0.52 | 0.03 |
What if Shifts in High-Density Areas Had Not Opened?

- <2% Syrian Localities
- ≥2% and <5% Syrian Localities
- ≥5% and <10% Syrian Localities
- ≥10% Syrian Localities

Classroom Density

Kernel Density

- Actual
- Simulation 1: Within School
- Simulation 2: Within Locality
What if Shifts in High-Density Areas Had Not Opened?