Assessing Critical Occupations and Skills in Turkey

Migration: Experience, Best Practices and Lessons Learned from Receiving Countries

Mattia Makovec, Efsan Nas Ozen, Merve Demirel
World Bank, Social Protection and Jobs (ECA)

Jobs, Labor & Migration Course
The context

- Large inflows of Syrian refugees since 2013

- Vocational training provided by both government agencies and international organizations to improve employability for refugees and host communities

- Information missing on which occupations and skills matter more, both at the national level and in specific localities affected by the refugees’ influx

- Analytical capacity of government institutions not sufficient to come up with a comprehensive tool that provides such valuable information

- The project (financed by the EU “FRIT I”) aims to build a tool to identify and monitor occupations in high demand in local labor markets and the skills required to be productive in these occupations
  ✓ Useful also to address mismatch problems for young NEET (25.4%) and unemployed
Who can benefit from this tool?

**Public Employment Service (ISKUR) and gov. agencies**
- Use results for training design
- Use tool to build capacity for in-house analysis in the future
- Inform Min. of Education for the design of curricula and degrees
- In line with objectives set out in the 11th Development Plan

**Jobseekers**
- Target occupations in demand and identify missing skills requested by employers

**Education and training providers / career advisory centers**
- Training design and career advice
- Improve match between supply and demand

**Students and trainees**
- Identify fastest growing occupations
- Identify sectors with largest absorption capacity and careers with high returns
Identifying “critical” occupations and skills in demand

**Step 1: Top-down approach:**
- Analyze data from existing surveys/firms microdata to identify fastest growing occupations (based on indicators of employment growth & wage growth)
- Job vacancy data analysis (job postings or vacancy surveys)

**Step 2: Bottom-up validation**
- Conduct consultations and validation workshops with stakeholders
- *Conduct new data collection from firms in target localities, to fill gaps, if needed*

**Final consultations and dissemination of lists of critical occupations and skills to stakeholders**
Five data sources to ensure wide coverage and representativeness

**PES (ISKUR) vacancy dataset**
- Both aggregate and micro datasets ISKUR shared with the WB
- Reports demand for around 7 million vacancies between 2016-2018
- Dataset includes 6 digit ISCO codes

**ISKUR Labor market needs (IPA) Survey dataset**
- Dataset that ISKUR kindly shared with the WB
- Represents demand for around 1 million jobs Turkey-wide
- Dataset includes 6 digit ISCO codes

**Enterprise Information System (Firm registry data)**
- Administrative microdata on balance sheets and SSI records
- 3 million firms and 14 million formal employees in private sector
- ISCO codes available between 2014 – 2016 (in 4 digits)

**TUIK Household Labor Force Survey**
- Micro dataset includes a representative sample of workers
- Data for formal employees only (~100,000/year)
- Dataset includes ISCO codes in 2 digits

**Online vacancy inventory**
- 9 online job search portals (example: kariyer.net, yenibiris.com)
- Obtained around 102,994 unique vacancies
- Text analysis to identify occupations (ISCO codes) and skills
How we identify critical occupations

Identify “critical” occupations in demand from each Vacancy dataset (ISKUR Survey and Vacancy Data): “Critical” if “Critical” either in Survey or Vacancy Data (ISCO-4 digit)

Complement with analysis of “critical” occupations in other data sources (Firm Registry, LFS and Online job-search portals)

Text mining analysis on ISKUR Survey and Vacancy Data + On-line vacancy postings to identify which skills matter more for critical occupations
Critical occupations from ISKUR Survey and Vacancy data:
• at least 1% frequency in the last year,
• positive vacancy growth in both years
• higher than median two-year growth

➢ Critical in ISKUR: if it is critical in either ISKUR Survey or Vacancy Data

Critical occupations: Firms registry and LFS

Occupations chosen according to 6 Indicators:
I1: Occupations with >0 employment growth in each year
I2: Occupations with above median employment growth
I3: Occupations with >0 annual wage growth in each year
I4: Occupations with above median wage growth
I5: Occupations with >mean predicted wages in each year
I6: Occupations with above median predicted wage growth

Selection criteria:
Occupations are then selected as “critical” if:
a) at least 4 out of 6 indicator selects the occupation
b) out of 4 indicators, one is an employment indicator (Indicator 1, Indicator 2)
Identifying critical skills from ISKUR vacancy and On-line vacancies
Skills classification from vacancy data

Text mining analysis of job vacancies:
522 Unique skills requirements/keywords in all vacancies

77 Aggregate skills requirements

15 aggregate skills categories

- Methodology: Keyword regular matching and fuzzy matching
## Skills classification from vacancy data

<table>
<thead>
<tr>
<th>Broad Skills categories</th>
<th>77 skill requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>Problem solving, analytical, research, critical thinking, math, statistics, creative, other cognitive.</td>
</tr>
<tr>
<td>Social</td>
<td>Social characteristics, team work, communication, negotiation, speech clarity, result orientation, adaptable</td>
</tr>
<tr>
<td>Character</td>
<td>Organized, detail-oriented, multitasking, disciplined, time management, meeting deadline, energetic, empathetic, open for improvement, confident.</td>
</tr>
<tr>
<td>Writing</td>
<td>Project writing, other writing.</td>
</tr>
<tr>
<td>Customer service</td>
<td>Customer dialogue, sales-oriented, service-oriented.</td>
</tr>
<tr>
<td>Project management</td>
<td>Project management</td>
</tr>
<tr>
<td>Personal hygiene</td>
<td>Hygiene, presentability, non-smoker, other personal hygiene.</td>
</tr>
<tr>
<td>Financial</td>
<td>Budgeting, accounting, finance, capital market, other financial.</td>
</tr>
<tr>
<td>Computer (general)</td>
<td>Computer, Microsoft Office, Internet.</td>
</tr>
<tr>
<td>Software (specific)</td>
<td>Accounting software, architecture and design software, programming software, technical software</td>
</tr>
<tr>
<td>Language</td>
<td>English, German, French, Italian, Spanish, Russian, Chinese, Arabic, Uzbek, Persian.</td>
</tr>
<tr>
<td>Technical Certificates</td>
<td>Machine operators, Ignition and boilers, CNC operating, Electric and Dangerous Jobs.</td>
</tr>
<tr>
<td>Service Certificates</td>
<td>Cooking and restaurant, Personal care services, Beauty services, Medical services, Security services, First aid services, Teacher and training, Occupational safety, Other service certificates.</td>
</tr>
<tr>
<td>Transportation Services</td>
<td>Transportation certificates, Drivers license.</td>
</tr>
<tr>
<td>Other</td>
<td>Other skills, other certificates.</td>
</tr>
</tbody>
</table>

Source: Based on Deming and Kahn (2018)
### Results, Turkey: Critical Occupations in ISKUR datasets

<table>
<thead>
<tr>
<th>Critical in ISKUR Vacancy</th>
<th>Critical in ISKUR Vacancy and LMNA</th>
<th>Critical in LMNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waiters</td>
<td>Weaving and knitting machine operators</td>
<td>Commercial sales representatives</td>
</tr>
<tr>
<td>Cleaning and housekeeping supervisors in offices, hotels and other establishments</td>
<td></td>
<td>Hairdressers</td>
</tr>
<tr>
<td>Cashiers and ticket clerks</td>
<td></td>
<td>Odd job persons</td>
</tr>
<tr>
<td>Sewing, embroidery and related workers</td>
<td></td>
<td>Contact centre information clerks</td>
</tr>
<tr>
<td>Sewing machine operators</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Non-routine, cognitive**
- **Non-routine, manual**
- **Routine**

4 digit isco codes are used in the analysis.
Results, Turkey: Critical Occupations in ISKUR datasets (ranked by frequency in IPA)

4 digit ISCO codes are used in the analysis.
Results, Turkey: frequency

Critical Occupations in ISKUR datasets (ranked by % frequency in ISKUR vacancy)

Critical Occupations in ISKUR datasets (ranked by % frequency in IPA)

Threshold: Top 25%

Vacancy share in ISKUR

Odd job persons
Waiters
Cleaning, embroidery and related occupations
Sewing, embroidery and related
Cashiers and ticket clerks
Wine dispensers
Contact centre information clerks
Commercial sales representatives
Product graders and testers
Motor vehicle mechanics and fitters
Hairdressers

Frequency in LMNA

Sewing machine operators
Cabinet-makers and related occupations
Weaving and knitting machine toolmakers
Commercial sales and service
Product graders and testers
Motor vehicle mechanics and fitters
Cashiers and ticket clerks
Cleaning and housekeeping

Non-routine, cognitive
Non-routine, manual
Routine

4 digit ISCO codes are used in the analysis.
Results, Turkey: growth

Critical Occupations in ISKUR datasets (ranked by % growth in ISKUR vacancy)

Critical Occupations in ISKUR datasets (ranked by % growth in IPA)

Threshold: Top 25%

Non-routine, cognitive  Non-routine, manual  Routine

4 digit ISCO codes are used in the analysis.
### Results, Turkey: Final list of ISKUR critical occupations (ranked according to frequency in Vacancy Survey)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Frequency in LMNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewing machine operators</td>
<td>10%</td>
</tr>
<tr>
<td>Waiters</td>
<td>8%</td>
</tr>
<tr>
<td>Odd job persons</td>
<td>6%</td>
</tr>
<tr>
<td>Contact centre information clerks</td>
<td>4%</td>
</tr>
<tr>
<td>Weaving and knitting machine operators</td>
<td>2%</td>
</tr>
<tr>
<td>Product graders and testers (excluding foods and beverages)</td>
<td>1%</td>
</tr>
<tr>
<td>Cleaning and housekeeping supervisors in offices, hotels and other</td>
<td>0%</td>
</tr>
<tr>
<td>Establishments</td>
<td></td>
</tr>
</tbody>
</table>

4 digit ISCO codes are used in the analysis.
Results, Gaziantep: Final list of ISKUR critical occupations (ranked according to frequency in Vacancy Survey)

- Cleaners and helpers in...
- Sewing, embroidery and...
- Fibre preparing, spinning...
- Hand packers
- Weaving and knitting...
- Nursing professionals
- Textile, fur and leather...
- Handicraft workers in...
- Sales demonstrators

4 digit ISCO codes are used in the analysis.
Results, Hatay: Final list of ISKUR critical occupations (ranked according to frequency in Vacancy Survey)

- Welders and flamecutters: 4%
- Electrical mechanics and fitters: 4%
- Concrete placers, concrete...: 4%
- Accounting and bookkeeping clerks: 3%
- Metal working, machine tool...: 3%
- Agricultural and industrial...: 3%
- Sales demonstrators: 2%
- Shop sales assistants: 2%
- Sheet-metal workers: 2%
- Blacksmiths, hammersmiths and...: 1%
- Hand packers: 1%
- Freight handlers: 1%
- Security guards: 1%

4 digit ISCO codes are used in the analysis.
### Results, Sanliurfa: Critical occupations according to ISKUR datasets and Online vacancy

<table>
<thead>
<tr>
<th>Critical in ISKUR</th>
<th>Critical in ISKUR and Online Vacancy</th>
<th>Critical in Online Vacancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tailors, dressmakers, furriers and hatters</td>
<td>Clerical support workers not elsewhere classified</td>
<td>Human resource managers</td>
</tr>
<tr>
<td>Garment and related pattern-makers and cutters</td>
<td></td>
<td>Policy and planning managers</td>
</tr>
<tr>
<td>Weaving and knitting machine operators</td>
<td></td>
<td>Sales and marketing managers</td>
</tr>
<tr>
<td>Sewing machine operators</td>
<td></td>
<td>Retail and wholesale trade managers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Farming, forestry and fisheries advisers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Secondary education teachers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Primary school teachers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other language teachers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teaching professionals not elsewhere classified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Psychologists</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social work and counselling professionals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electrical engineering technicians</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Commercial sales representatives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Administrative and executive secretaries</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shop supervisors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shop sales assistants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sales demonstrators</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Security guards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cleaners and helpers in offices, hotels and other establishments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kitchen helpers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contact centre information clerks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accounting and bookkeeping clerks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stock clerks</td>
</tr>
</tbody>
</table>

4 digit isco codes are used in the analysis.
Comparison of ISKUR-Vacancy vs. Online vacancy - Turkey

Skills requirements from vacancies (%)

- Computer software
- Personal hygiene
- Social services
- Character
- Financial
- General computer
- Language
- Service Certificates
- Cognitive
- Other
- Customer Services
- Technical Certificates
- Project management
- Writing

- ISKUR Vacancy
- Online Vacancy
Turkey - skills requirements in focus: social skills

- Teamwork
- Communication
- Speech clarity
- Social characteristics
- Adaptable
- Result orientation
- Negotiation

- ISKUR Vacancy
- Online Vacancy
Next steps

➢ Bottom-up validation of results with employers and employers’ associations

➢ Final consultations

➢ Creating the final lists of Critical Occupations and Skills

➢ Delivering lists to training providers, government and non-government agencies and other users

➢ Complete a “skills inventory” list for ISKUR & Min. of Labor

➢ Create visualization dashboards