Quantitative occupational forecasting model: A mini–guide

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1   Major steps

2   Sources of key indicators

3   Methodology

4   Equations

5   Goals

6   Annex: Classifications

Major steps

    — Collect data

    — Visualise data

    — Validate and process data

    — Create a model (estimate a set of equations)

    — Run the model (produce a forecast)

    — Cross–check and discuss the forecast

    — Report on the results

    — Communicate on new findings

Sources of key indicators

Lebanon Central Administration of Statistics (CAS)

   — National Account Statistics

   — Other economic indicators

International Labour Organisation, Department of Statistics (ILOSTAT)

   — Demographic trends

   — Employment by industrial sector

   — Occupations by industrial sector

   — Qualifications by occupation (limited availability!)

International Monetary Fund (IMF)

   — World economic developments and outlook

Labour market surveys conducted by our project partners
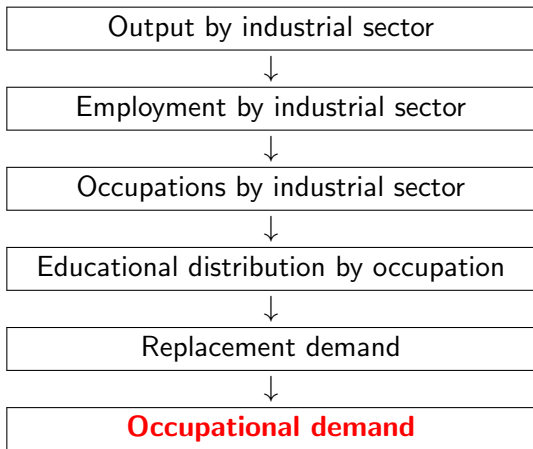
Methodology

Forecasting techniques using **R**:

— Extrapolation of past trends;

— more complex time series methods;
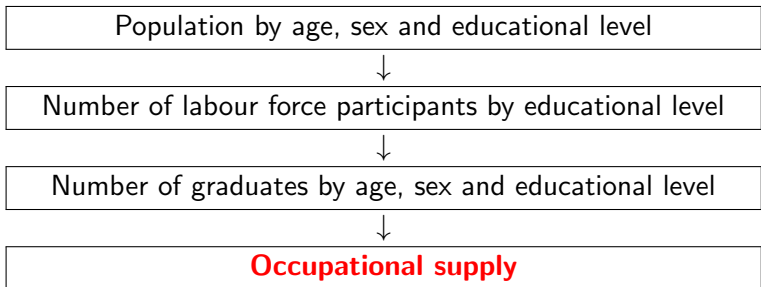
— introducing behavioural content.

Model design is based on previous research of the European Training Foundation (ETF), European Centre for the Development of Vocational Training (Cedefop) and the International Labour Office (ILO). Publications on the topic:

— *ETF, Cedefop, ILO (2016)* **Developing skills foresights, scenarios and forecasts**. *Guide to anticipating and matching skills and jobs. Volume 2.* `https://www.ilo.org/wcmsp5/groups/public/---ed_emp/ ---ifp_skills/documents/publication/wcms_534328.pdf`

— *ILO (2015)* **Anticipating and matching skills and jobs**, *a guidence note.* `https://www.ilo.org/ wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_534307.pdf`.

— *Souleima El Achkar (2010)* **A companion guide to analysing and projecting occupational trends**, *August 2010, CSLS Research Report 2010–07.* `http://www.csls.ca/reports/csls2010-07.pdf`.

Modelling labour demand

Output by industrial sector

↓

Employment by industrial sector

↓

Occupations by industrial sector

↓

Educational distribution by occupation

↓

Replacement demand

↓

Occupational demand

Modelling labour supply

Population by age, sex and educational level
↓
| Number of labour force participants by educational level |

↓

| Number of graduates by age, sex and educational level |

↓

| **Occupational supply** |

Equilibrium condition

$$\boxed{\textbf{Occupational demand} = \textbf{Occupational supply}}$$

↓

$$\boxed{\text{Identifying imbalances}}$$

↓

$$\boxed{\text{Determining occupational outlook}}$$

↓

$$\boxed{\text{Feedback on national income and education policy}}$$

Equations labour demand model

Economic development by industrial sector
f (domestic and foreign demand, technological progress, policies)

Employment by industrial sector
f (Demand by industrial sector, retirement of employed persons)

Occupations by industrial sector
f (Employment by industrial sector, occupational trends)

Educational distribution by occupation
f (Employment by occupation, educational trends within occupations)

Equations labour supply model

Population by age, sex and educational level
Assumption

Number of labour force participants by educational level
Assumption

Number of graduates by educational level
f (Enrolment and graduates in secondary education, expectations)

Goals regarding model development

- A quantitative model for the Lebanese labour market,

- showing past and future trends in labour supply and demand,

- identifying imbalances on the labour market.

- It will allow simulation analyses.

- Hence, it will contribute to a better understanding of labour market needs and skills matching.

- Quantitative results can inform qualitative research and vice versa.

- Policy makers will learn how to identify, to understand, to cope with, to control regarding imbalances.

Goals regarding labour market policies

Anticipation and matching approaches that help to develop a skilled workforce with the right mix of skills in response to labour market needs, particularly in the field of higher education and digitalisation.

These will help to reduce unemployment, particularly among young people, leading to a better life for individuals by improving employability, social mobility and inclusion.

Annex: Classifications

Classifications of **industrial sectors, occupations and qualifications** are important in running quantitative forecasting models.

These classifications allow combining different data sources and set the level to which forecasts can generally be made.

If existing classifications do not reflect the level of detail to which a forecast is to be done, alternative classifications would need to be determined.

Employment by industrial activity (ISIC)

The International Standard Industrial Classification of all Economic Activities (ISIC) is the international reference classification of productive economic activities.

Its main purpose is to provide a set of activity categories that can be utilized for the production of statistics according to such activities.

The major aims are:

− fostering international comparability of data,

− providing guidance for the development of national classifications

− and for promoting the development of sound national statistical systems.

Major groups of ISIC Rev. 4.

A   Agriculture; forestry and fishing
B   Mining and quarrying
C   Manufacturing
D   Electricity; gas, steam and air conditioning supply
E   Water supply; sewerage, waste management and remediation activities
F   Construction
G   Wholesale and retail trade; repair of motor vehicles and motorcycles
H   Transportation and storage
I   Accommodation and food service activities
J   Information and communication
K   Financial and insurance activities
L   Real estate activities
M   Professional, scientific and technical activities
N   Administrative and support service activities
O   Public administration and defence; compulsory social security
P   Education
Q   Human health and social work activities
R   Arts, entertainment and recreation
S   Other service activities
T   Activities of households as employers; undifferentiated goods- and
     services-producing activities of households for own use
U   Activities of extraterritorial organizations and bodies
X   Not elsewhere classified

https://ilostat.ilo.org/resources/concepts-and-definitions/classification-economic-activities/

Occupations (ISCO)

The International Standard Classification of Occupations (ISCO) is a tool for organizing jobs into a clearly defined set of groups according to the tasks and duties undertaken in the job. Its main aims are to provide:

- a basis for the international reporting, comparison and exchange of statistical and administrative data about occupations;
- a model for the development of national and regional classifications of occupations; and
- a system that can be used directly in countries that have not developed their own national classifications.

Major groups of ISCO-08

1 Managers
2 Professionals
3 Technicians and associate professionals
4 Clerical support workers
5 Services and sales workers
6 Skilled agricultural, forestry and fishery workers
7 Craft and related trades workers
8 Plant and machine operators and assemblers
9 Elementary occupations
x Armed forces occupations

`https://www.ilo.org/public/english/bureau/stat/isco/`

Qualifications (ISCED)

Qualifications are the formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards.

The International Standard Classification of Education (ISCED) links every single qualification to several standard classification codes.

In labour market research, correlates of fields of education as well as (mis–)match between fields of education and occupation or industry are important topics.

Major groups of ISCED

0000	Generic programmes and qualifications
0100	Education
0200	Arts and humanities
0300	Social sciences, journalism and information
0400	Business, administration and law
0500	Natural sciences, mathematics and statistics
0600	Information and communication technologies (ICTs)
0700	Engineering, manufacturing and construction
0800	Agriculture, forestry, fisheries and veterinary
0900	Health and welfare
1000	Services

https://www.surveycodings.org/education/
classification-educational-qualifications/