Projecting demand and supply of labour by education
Experiences from Norway

BJORN DAPI, HEGE MARIE GJEFSEN AND NILS MARTIN STØLEN
Main modules

• Demographic projections
  ◦ Annual cohort-component model

• Macroeconomic projections by main industries
  ◦ Quarterly/annual model based on National Accounts and econometric connections

• Change in composition of employment in each industry

• Projections of labour supply by qualification/education
  ◦ Annual dynamic microsimulation model, but sufficient with a cohort-component model

• Further information: Reports 2016/31
Other main information

• Long traditions for projections at Research Department of Statistics Norway
  ◦ Macroeconomic projections since the early 1980s
  ◦ Projections of labour supply by education since the 1970s
  ◦ Projections of demand and supply of labour by education since the early 1990s

• Labour market projections with a scope of about 15 years

• Prepared every third or second year on demand from relevant Ministries
Labour classification

- Dependent on available statistics
- Classification by occupation common for analyses of demand for labour
- Skills or education more relevant for analyses of supply
- Your occupation may change when you start in a new job
- Skills and education more fixed
- More distinct borderlines between different educations than occupations
- In Norway level and fields of education from administrative registers
How many detailed groups?

It depends on:

• Available statistics
• More details demand more resources, and results are more uncertain
• Possible with more details when discussing the present situation
• Small benefits from separating groups with large possibilities of substitution
• Technical limits for the number of groups in a general approach
• No technical limits when dividing into subgroups and for partial analyses
Classification used for the Norwegian projections 10-15 years ahead

• General approach
  ◦ 5 levels of education
    - Primary education
    - Secondary education, university preparatory
    - Secondary education, vocational
    - Education at bachelor level
    - Education at master level
  ◦ Distributed over 28 educational groups
Classification used (cont.)

• Partial projections for specific groups
  ◦ Educations towards health and care
  ◦ Different kinds of teachers

• Common characteristics for these projections
  ◦ Borderlines between different groups
  ◦ Demographic development important for demand
  ◦ Demand mainly regulated by local and central government
Macroeconomic projections of employment by industry

• Time-series from the National Accounts and econometric connections

• 15 main industries in the model

• Level of production determined from demand except from resource based industries

• Most important exogenous factors
  ◦ Demographic development
  ◦ Prices and activity in resource based industries
  ◦ International economic development, prices and rate of interest
  ◦ Economic policy including use of labour in the public sector
Employment by main industries (2017 = 1)
Projections by level and field of education

Two main components

- Change in employment between industries
- Change in composition within each industry
  - Includes change in composition caused by technical progress
Composition by level and field of education

• Based on observation of recent changes for each industry
• Look at changes in composition between levels first
• Thereafter look at changes in composition between fields within each level
Change in composition by level of education
Share of total employment

![Graph showing the change in composition by level of education from 2005 to 2035. The x-axis represents years from 2005 to 2035, and the y-axis represents the share of total employment. The graph includes lines for Primary and unknown, Bachelor, Master, Secondary general, and Secondary vocational. The lines show trends over time.](image)
Projecting the labour force

• Labour force = Employed + Unemployed
• Population in working age from official projections 2018
• Labour market participation by age, gender and education
• Know the level and field of education for those in work
• Projection of education for natives and immigrants
Composition of labour force

- Dependent on those entering and those leaving
- Educational level among new entrants is much higher than for those who entered some decades ago
- Large changes over time in level and field of education
Labour force by level of education

- Unknown
- Primary education
- Secondary general
- Secondary vocational
- Bachelor
- Master
Inflow versus replacement demand
Economics and administration, bachelor level

- The number of new entrants is much higher than the number of those who leave
Nursing and caregiving, bachelor level

- Only a few more entering than leaving
- The number of persons in the labour force is almost constant
How do we compare projected demand and supply?

• Aggregate labour force and employment simultaneously projected in the macro model
• Demand and supply for different educational groups projected independently
• Comparisons indicate possible imbalances
• In the real world imbalances will be moderated
  ◦ Educational and labour market policy
  ◦ Educational choice
  ◦ Demand for close substitutes is affected
  ◦ Relative wages
Projections by level of education. 1000 persons

- Primary and unknown, supply
- Upper secondary, vocational, supply
- Master, supply
- Upper secondary general, supply
- Bachelor, supply
- Primary and unknown, demand
- Upper secondary, vocational, demand
- Bachelor, demand
- Master, demand
Secondary vocational education towards manufacturing, building and construction and crafts
Share of total labour force (17%)
Engineering and tertiary education in science
Share of total labour force (8%)

- Relatively strong growth in labour force because several youths choose these educations.
- Demand is rather stable because reduced activity in the petroleum industry and production of equipment and services towards this industry outweigh increased demand in most other industries.

Graph showing supply and demand over the years 2015 to 2035.
Nursing and caregiving, bachelor
Share of total labour force (3%)

- Demographic development causes more old persons and increases demand
- Labour force almost constant because the number of those entering corresponds to those retiring
Tertiary education in economics and administration
Share of total labour force 6%

- A relatively strong growth in demand compared to most other groups
- A large expansion of capacity in education during last decades causes a high number of new entrants compared to the number of retirees
Funding of Statistics Norway’s skills projections

- The Ministry of Education and Research
- The Ministry of Labour and Social Affairs
- The Ministry of Trade, Industry and Fisheries
- The Ministry of Health and Care Services
- The Norwegian Directorate of Health
- The Norwegian Labour and Welfare Administration
Government Committee on Skill Needs established 2017

• Provide the best professional assessments of Norway’s future skill needs
  ◦ Basis for national and regional planning
  ◦ Strategic decision making of both employers and individuals

• Annual report on skill needs

• Representatives from social partners, researchers/analysts and civil servants from the Ministries

• Statistics, analyses and projections from Statistics Norway part of the knowledge base
Thank you