The Dutch Labour Market Forecasting Model

Prof.dr. Didier Fouarge
ROA, Maastricht University
d.fouarge@maastrichtuniversity.nl

INTERNATIONAL EXPERT WORKSHOP
Paris, March 28, 2017
The idea:

- Investors want to know about their (expected) returns
- Also true for human capital investments
- **ROA** forecasts since 1986
- Evidence that information improves allocation (Fouarge et al. 2016)
Plan of the talk

- Basic principles of the ROA forecasting model
- Data sources, classifications, level of disaggregation
- Uncertainties in employment projections
- Regional/local employment forecasts
- Conclusion
Basic principles of the ROA forecasting model
Basic principles

• Whole labour market taken into account: no partial analyses
• Independent estimation of expected labour demand and supply
  - Demand:
    o Expansion (job creation/destruction)
    o Replacement (occupational mobility, pensioning, ...)
    o Substitution (ex-ante) (interdependencies on the market)
  - Supply:
    o Inflow of graduates (new inflow)
    o Short-term unemployment
• (Explanatory) econometric models
• Estimate quantitative gap \( \rightarrow \) translate into qualitative indicator (5 levels: very good ... poor prospects)
• Forecasts by occupation, education and region
• Employers shape their demand in terms of occupations: demand by occupation derived from demand by occupation
Basic principles

• Forecast model based on quantities of labour (no wage information used) → interpretation of friction!
• Forecasts every 2 year → look 5 years ahead
• Make use of available authoritative forecasts of e.g. macroeconomic and sector developments and student outflows
• Output:
  - Reports, research papers...
  - Online tool with key indicators for current labour market and forecasts
• Forecasts are widely used:
  - Public information to prospective students
  - Unemployment office
  - Accreditation of new fields of study
  - Education policy
  - Press
Basic principles: Friction by type of education

Expansion demand by industry sector (+, - of 0)

Expansion demand by occupation (+, - of 0)

Expansion demand by education (+, - of 0)

Replacement demand by education (+ of 0)

Demand: job openings by education field (+, - of 0)

Friction by type of education

Supply by education field (+ of 0)

Substitution demand by education (+, - of 0)

If Demand > Supply, prospects are good

Short-term unemployed (+ of 0)

Inflow of young graduates (+ of 0)
Data sources, classifications, level of disaggregation
Data sources

• Main data input:
  - Only source with detailed occupation and education field

• Authoritative forecasts:
  - Economic growth forecasts (CPB, Netherlands Bureau for Economic Analysis)
  - (Inter)sectoral employment forecasts (Panteia)
  - Labour force participation forecasts, by age, gender and education level (CPB)
  - Forecasts for size of labour force (CBS, Statistics Netherlands)
  - Inflow forecasts of graduates (Ministry of Education)

• Other data input
  - Dutch school-leavers survey (streams through education system)
  - Administrative data of graduates by field of study
Definitions, classifications, disaggregation

• Employed (ILO):
  - Salaried or self-employed person, 15-74, works > 1 hour per week
• 21 industry sector of Statistics Netherlands (=NACE)
• 114 occupations:
  - Based on 4 digit ISCO2008
  - Classification developed by ROA in collaboration with Statistics Netherlands
  - ISCO fields grouped to match reality of Dutch labour market
• 97 types of education:
  - Based on ISCED1997
  - Classification developed by ROA to reflect Dutch educational structure
  - Clustering for homogeneous groups in terms of occupation
• We face a major trade-off:
  - increasing demand for details >> cell-size requirements
Uncertainties
Accommodate for uncertainties

Economic uncertainty
• Transfer quantitative gaps into qualitative statements:
  - 5 categories from ‘very good’ to ‘poor’
• Add risk indicators:
  - Sensitivity for cyclical fluctuations
  - Occupational flexibility potential of types of education
  - Wage risk by occupation/education
• Work with alternative growth scenarios
  - (but at the cost of having a less clear message)

Quality of the forecasts
• Evaluation studies
• Fundamental research
• Transparent documentation

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Regional forecasts
Regional forecasts

• Increasing demand for regional labour market information
• ROA regional forecasts since 2013, 35 regions
• Basic principles:
  - Derived from national forecasts!
  - By education only
  - Region = region of residence
  - Regions differ a lot in terms of industry composition: use region-specific industry growth forecasts for expansion demand
  - Use national outflow coefficients to estimate replacement demand using region-specific educational composition
• The big trade-off: details by region come at the cost of details by field of education
Some concluding remarks
• Success and relevance of ROA forecasts:
  - Good contacts with stakeholders
  - Good cooperation with statistical office
  - Combine data-work with evaluations and fundamental research

• Future developments:
  - Increase level of details (administrative data; Small Area Estimation techniques)
  - Skills and tasks forecasts
  - Improve data-visualisation for a larger circle of users
  - Field experiments for effect of information on study choice
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Interpretation of employment gaps
Demand and supply

Wage

\( S_t = D_t \)
Demand and supply

\[ L_t, L_{t+1} \]

\[ S_t = D_t, S_{t+1} = D_{t+1} \]
**Demand and supply**

Wage €

\[ S_t = D_t \]

\[ S_{t+1} = D_{t+1} \]

Additional supply

Additional demand

\[ L_t \]

\[ L_{t+1} \]
Demand and supply

Wage €

\[ D_t \]
\[ D_{t+1} \]
\[ S_t \]
\[ S_{t+1} \]

\[ L_t \]
\[ L_{t+1} \]

\[ S_t = D_t \]
\[ S_{t+1} = D_{t+1} \]

Employment gap ‘Shortage’?
Stimulate supply in case of `shortage’?

Employers = happy

$L_t = L_{t+1}$

$S_t = D_t$

$S_{t+1} = D_{t+1}$
Shortage?

- Too simplistic!
- Model is based on quantities and does not use information about price (wage)
- But results are good indication of adaptations (in price and/or quantity) that should take place (Borghans/Willems 1998)
- Size of adaptations depends on wage elasticity of demand and supply
- Real adaptation (in quantity) < ‘shortage’
Demand and supply

\[ S_t = D_t \]
\[ S_{t+1} = D_{t+1} \]

\[ S'_t \]
\[ S'_{t+1} \]

Wage €

\[ L'_t \]
\[ L_t \]
\[ L'_{t+1} \]
\[ L_{t+1} \]

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