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European Centre for the Development
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Forecasting skill supply and demand in Europe: Evaluating the Projections

SKILLSNET TECHNICAL WORKSHOP
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Research Centre for Education
and the Labour Market

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Overview

- **Approach:**
 - Need for a detailed *Internal, Quantitative* evaluation of the results; and
 - An *External Qualitative* review of users opinions
- **General considerations**
- **Definitions of terms**
- **Taxonomies of errors**

General Considerations in Evaluating Labour Market Forecasts

- Previous evaluations of occupational employment projections
- Important considerations:
 - Accuracy, value and usefulness
- Focus and objectives
 - Understanding the Rationale for Employment Forecasting
 - Qualitative Assessment of Employment Forecasts

Definition of Terms

Variables and parameters

Time series

Dependent variable

Independent or explanatory variable

Endogenous and Exogenous:

Base year and Target year:

Systems of classification:

- **NACE**
- **ISCO**
- **ISCED**

Models:

- **Simultaneity**
- **Behavioural relationships**
- **Accounting relationships**

Trends & Trend extrapolation

- **Linear Trend**
- **Exponential Trend**
- **Logistic Trend**

Taxonomies of Errors

- General Taxonomies:
 - History and forecast
 - Losses and scores
 - Scale, sectoral & occupational effects
 - Quantitative and qualitative assessment
- Range of detailed quantitative analysis to be undertaken

Relative error

$$\text{Relative error} = (Z_i - \check{Z}_i) / Y_i \quad (1)$$

Z_i represents the outcome for some particular quantity being projected;

$\check{Z}_i$ represents the projected value.

Y_i indicates the level of employment in that category i .

Loss and Average Loss

Loss: $L_i = ((Z_i - \hat{Y}_i) / Y_i)^2$ (2)

Average loss: (AL) is determined by weighting the separate losses according to the size of the occupational or qualification category:

SCORE

Score: the ratio between the predictive quality of the forecast (loss or average loss) and the predictive quality of some reference forecast. This score is smaller than 1 if the forecast is better than the reference forecast and is more than 1 if the forecast is inferior to the reference:

SAB: (Same as Before) reference forecast which assumes no changes between the base year and the forecast year.

Qualitative evaluation:

Table 4.1: Qualitative evaluation of projections (illustrative)

Outcome/ Forecast	Fast decline	Low decline	Little change	Low growth	High growth	all
Fast decline	5	5	0	0	0	10
Slow decline	6	10	4	0	0	20
Little change	4	0	10	4	2	20
Slow growth	0	0	10	6	4	20
Fast growth	0	0	1	0	10	11
Total	15	15	25	10	16	81

Data errors

Historical data revisions:

- error in the measurement of the **dependent variable**
- errors in the **endogenous drivers**
- errors in the **assumptions** about **exogenous variables**

Forecast errors

errors of judgement about exogenous variables;

errors of specification reflected in the various **parameters** of the model.;

errors of judgement in running the models (econometric and other forecasting models are rarely used without some intervention by the operator to deal with perceived problems).

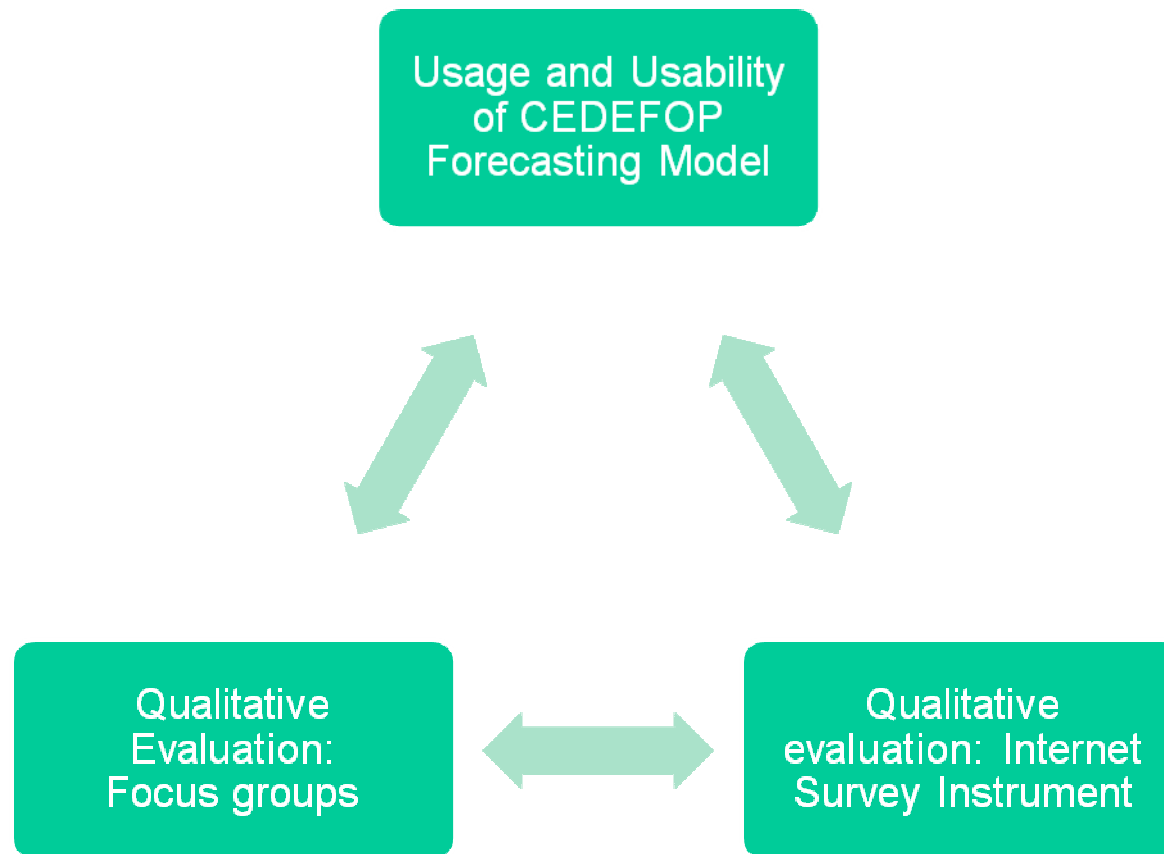
Summary of quantitative errors

- Errors due to data revision as opposed to forecast model errors;
- Distinctions due to scale, industry, occupation and other effects;
- relative (%) as opposed to absolute (000) differences (with variations to allow for direction of change);
- Qualitative indicators % getting it more or less right (direction and rough magnitude).

Specific considerations in the Cedefop approach

- **Role of E3ME**
- **Modular approach, need to focus on:**
 - **Sectors**
 - **Occupations**
 - **Qualifications**
- **Other aspects:**
 - **Supply;**
 - **Replacement demands, etc**

Qualitative evaluation



Qualitative Evaluation

I. Usability

- i. Workbook**
- ii. Actual usage**
- iii. Interactive**

II. Outcomes

- i. Sector**
- ii. Occupation**
- iii. Education**
- iv. Supply / Demand**
- v. Level of aggregation**

III. Methodology

- i. Sector model**
- ii. Scenarios**
- iii. Expansion demand**
- iv. Replacement demand**
- v. Supply (stock / flow)**

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