

## Annex A

### Medium-term forecast of occupational skill needs in Europe: methodology used<sup>1</sup>

This annex provides an introduction into a systematic approach for analysing the future skill needs (demand side) of all EU Member States, using common models and data sources. It establishes a general *Framework* that can act as a starting point for further development.

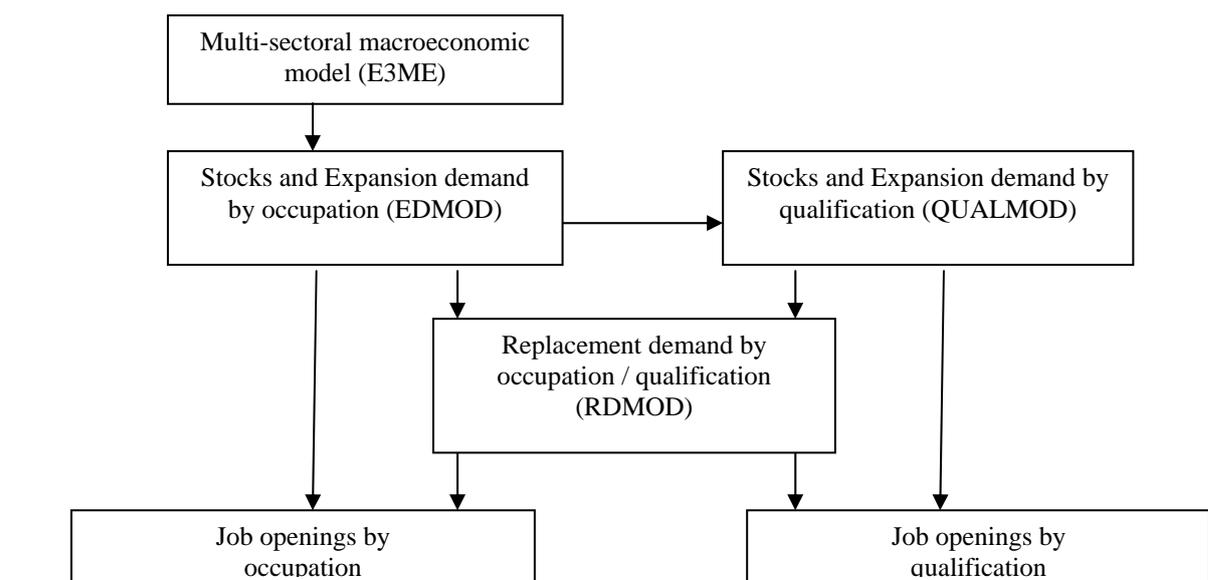
The project aims to deliver the following main objectives:

1. To **develop a robust and consistent occupational database and related projection models** which will enable the production of benchmark projections by occupation, sector and qualifications across EU-25 (i.e. before the accession of Bulgaria, Romania) plus Norway and Switzerland.<sup>2</sup> These are referred to as the EU25+2.
2. To **develop a full set of projections** using these models and data. This will look up to 10 years ahead but also focus on the shorter-term profile. It will also include some alternative scenarios using the database and tools established.
3. To present these results in such a way as to initiate and facilitate a **process of systematic dialogue** with other individual country experts (ICEs).

The project adopts a modular approach which is intended to facilitate ongoing development and improvement. The overall *Framework* comprising the forecasting tools and the associated database consists of four key elements, as follows:

- **Module 1:** a set of multi-sectoral macroeconomic forecasts, based on the macroeconomic model (E3ME);
- **Module 2:** an occupational expansion demand model (EDMOD);
- **Module 3:** a qualifications module (QUALMOD), based on similar data sources;
- **Module 4:** a replacement demand module (RDMOD).

*Figure 1.1: Modular Approach to Skills Forecasting - Overview of the Framework*



<sup>1</sup> Extract from Wilson R. A.: The Skillsnet project on Medium-term forecasts of occupational skill needs in Europe: an overview. Paper presented at the Workshop on *Medium-term forecast of occupational skill needs in Europe: Interim results* in May 2007.

<sup>2</sup> It is hoped that the models can be extended to include the most recent accession countries shortly.

**Module 1 (E3ME)** is based around the existing and well established Pan-European multi-sectoral macroeconomic model (E3ME), developed by Cambridge Econometrics (CE) in collaboration with others. The model delivers a set of consistent sectoral employment projections. The underlying assumptions made about the main external influences on the economy and the labour market are described. In addition two alternative scenarios are considered to demonstrate the sensitivity of the outcomes to different assumptions.

E3ME combines the features of an annual short- and medium-term sectoral model estimated by formal econometric methods with the detail and some of the methods of the Computable General Equilibrium (CGE) models. It is essentially a dynamic simulation model estimated by econometric methods.

The main endogenous variables in E3ME are determined from functions estimated on historical data about the economy. The econometric techniques used to specify the functional form of the equations are the concepts of co-integration and error-correction.

Compared to other models targeted at achieving the same goals, the advantage of the E3ME model lies in three areas:

- Model disaggregation: The detailed nature of the model allows it to represent fairly complex scenarios, in particular scenarios which are differentiated according to sector and to country. Similarly, the impact of any measure can be represented in a detailed way;
- Econometric pedigree: The econometric grounding of the models gives it a better capability in representing and forecasting performance in the short to medium run. It therefore provides information which is closer to the time horizon of many policy makers than pure CGE models;
- E3 linkages: An interaction (two-way feedback) between the economy, energy demand/supply and environmental emissions is an undoubted advantage over other models which may either ignore the interaction completely or only assume a one-way causation.

**Module 2 (EDMOD)** builds upon previous work in individual countries. It focuses on the factors influencing occupational structure within sectors. It delivers a comprehensive and consistent set of *Expansion Demand* estimates, based on Labour Force Survey (LFS) data from Eurostat (although these data have some limitations). A key part of the project will be concerned with trying to reconcile inconsistencies between the LFS and National Accounts estimates.

**Module 3 (QUALMOD)** focuses upon the implications for formal qualifications. Progress on this to date is limited. A review of the data available suggests that there are many gaps and problems with the existing data. Problems of consistency in classification across countries are more severe here than in any other area. Nevertheless it is felt that the data are sufficiently robust to enable the production of useful benchmark projections of trends in qualifications intensities. At present the focus is purely upon the demand side, with no attempt being made to model or project the supply of qualifications.

**Module 4 (RDMOD)** is again based on building on previous research efforts. It delivers a set of *Replacement Demand* estimates. Without estimates of replacement needs, projections of expansion demands are of little value. However, data on various aspects of replacement demands are in many respects weaker than those on occupational employment structure. Nevertheless, the review of available data suggests that sufficient information exists to provide at least a broad indication of the likely scale of replacement demands, as opposed to the projections of expansion or contraction in employment levels.

In combination, the 4 modules deliver a comprehensive and consistent detailed picture of job openings across Europe. Job openings are defined as the sum of expansion and replacement demands.

Figure 1.2: Modular Approach to Skills Forecasting - Details

