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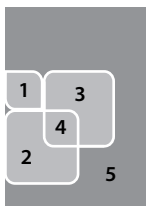
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Improving the capacity to anticipate EU-wide labour market and skills requirements

1. Introduction

The aim of the *EEO review: Autumn 2008* is to review the activities and instruments used to anticipate labour market and skills requirements in the countries covered by the EEO ⁽¹⁾ and identify activities and outcomes of the matching of labour market and skills needs.

This overview is based on national articles prepared by the System network of labour market and employment experts ⁽²⁾. Its purpose is to provide a summary of key trends and developments in the EEO countries and analyse their implications for improving the EU-wide capacity to anticipate labour market and skills requirements.

The full national articles on this topic are available separately on the EEO website. A summary of the main existing instruments for forecasting labour market and skills requirements, in each of the countries, is provided in the Annex to this publication.

2. Forecasting and anticipation of labour market and skills needs

In this section, the need and value of the activities designed to anticipate labour market and skills needs are described, as well as different perspectives on the advantages and disadvantages of such exercises. Following this, an overview is provided of the current political context and recent developments at the EU level related to developments of the EU-wide capacity to anticipate future labour market and skills needs.

2.1. Why forecast?

Forecasting and anticipatory activities are seen as essential in the context of imperfect labour markets, and given the lag between decisions about investment in skills and the availability of the skills in the labour market ⁽³⁾. Without the advance knowledge of future skills and labour market needs more and/or greater mismatches between labour supply and demand are likely to occur.

Knowledge about future skills needs in the labour market is thus seen as essential for policymakers to prevent mismatches between labour supply and demand. By considering future trends in the labour market, policymakers can propose required changes in the educational infrastructure, or underpin strategic management decisions on human resource policies. The results from forecasting and anticipatory activities are also perceived to help to inform other stakeholders in the private and public sectors to take appropriate decisions about investment in human capital. Information on vocational and career guidance can improve the functioning of the labour market, since individuals are more able to adjust their skills investment decisions and career planning to new skills needs. This is especially pertinent in a rapidly changing economic and social environment in the global world. Firms and labour market agencies may also use labour market and skills forecasts as 'early warnings' and adjust their human resources policies or re-design training programmes.

However, some experts tend to question the value and need for forecasting and anticipatory activities ⁽⁴⁾. They argue that forecasts of developments in the labour market (and economy) are associated with a certain degree of uncertainty. Labour demand, by industry sector, is often characterised by rapid changes, due to changing macroeconomic conditions, unforeseen political decisions and reforms. Medium and long-term demand projections are based on a set of assumptions concerning labour demand. These are essentially based on historical evidence, and their relevance for future trends may be questioned.

(3) See Commission staff working document accompanying the Communication 'New skills for new jobs — Anticipating and matching labour market and skills needs', SEC(2008) 3058/2 (<http://ec.europa.eu/social/main.jsp?catId=568&langId=enSafariHTML%5CShell%5COpen%5CCommand>).

(4) See, for instance, Martin Schlotter, 'Origins and consequences of changes in labour market skill needs considerations from a European perspective', analytical report for the European Commission prepared by the European Expert Network on Economics of Education (EENEE), 2008.

(1) 27 EU Member States, Croatia, Turkey (EU candidate countries) and Norway (EEA country).

(2) For more information on the System network of the EEO, see Internet (http://www.eu-employment-observatory.net/en/about/abt03_01.htm).

2.2. Trends in forecasting methods

There is a long tradition of forecasting and practices for anticipating future skills and matching activities in Europe and across the world.

Early work focused on ‘manpower planning’, using fixed and invariant links between the demand for goods and services and the demand for labour ⁽⁵⁾. This type of approach was expected to predict the major skills needed to ensure economic growth⁽⁶⁾. However, a critique of this approach revealed its main shortcomings: that it was static, disregarding any dynamic changes in the economy; that it neglected substitution possibilities between different kinds of skill, let alone substitution between capital and labour; and that it was affected by the lack of good data.

Since such early work, improvements have been made in forecasting activities both in terms of developing methodological approaches and acquiring good quality data. The focus switched from over detailed educational planning to the provision of more general strategic guidelines. Most models have also reduced the forecast periods from very long-term to more medium-term (5–10 years). In addition, where data permit, the interactions between supply and demand are now modelled and forecasting activities now generally allow for substitution possibilities and other economic links. Labour markets forecasts are aiming more to provide information on the type of changes likely to occur in the existing profiles of educational/occupational mix of the workforce. From these results, broad implications for employment, training and education policies can be ascertained.

As a research activity, forecasting has proliferated across the world. The vast range of tools and techniques can be classified as follows ⁽⁷⁾:

- (a) formal, national-level, quantitative, model-based projections, providing generally comprehensive, consistent and transparent projections;
- (b) sectoral or occupational studies (using a variety of quantitative and qualitative methods), providing good information on sector-specific dynamics;
- (c) surveys of employers or other stakeholders, allowing a direct involvement of employers (or other stakeholders) into the forecasting projections;

(5) One of the first examples of such an approach was the OECD Mediterranean planning project carried out in the early 1960s where the main objective was to forecast future employment totals classified by educational level and occupation.

(6) See Commission staff working document accompanying the Communication ‘New skills for new jobs — Anticipating and matching labour market and skills needs’, SEC(2008) 3058/2 (<http://ec.europa.eu/social/main.jsp?catId=568&langId=enSafariHTML%5CShell%5COpen%5CCommand>).

(7) A similar categorisation is contained in the Commission’s staff working document on new skills for new jobs, pp. 6–7 (<http://ec.europa.eu/social/main.jsp?catId=568&langId=enSafariHTML%5CShell%5COpen%5CCommand>).

- (d) foresight analysis using scenario development exercises (based on focus groups, round tables, Delphi-style methods, observatories), which can be a holistic exercise, incorporating inputs from highly-qualified experts.

2.3. The current political context

Early anticipation and identification of labour market and skills needs has become a key feature of EU-level employment and education policies. The importance of anticipating labour market requirements and skills needs has been reflected in a number of political developments at the EU level.

- (a) Better anticipation, matching, and relevant training policies are called for in the context of the Lisbon strategy for growth and jobs and the European employment strategy. The integrated guidelines No 20 ‘Improve matching of labour market needs’ and No 24 ‘Adapt education and training systems in response to new competence requirements’, adopted for the period 2008–10 (and identical in the 2005–08 period), highlight the issue of forecasting of skills needs and the importance of corresponding policy response ⁽⁸⁾.
- (b) The Commission strategic report and Community Lisbon programme adopted in December 2007 proposed to address the skills gap by improving the forecasting and monitoring of future skills requirements and strengthening capacity to anticipate EU-wide labour market trends and skills needs.
- (c) European Council Conclusions in December 2007 called on Member States and the Commission to give priority to the implementation of the ‘New skills for new jobs’ initiative. In March 2008, the European Council invited the Commission to present a comprehensive assessment of the future skills requirements in Europe up to 2020.

Based on these earlier steps, in December 2008, as part of the European economic recovery plan, the European Commission issued a communication ‘New skills for new jobs — Anticipating and matching labour market and skills needs’, calling for upgrading skills at all levels to ensure recovery from the global economic crisis and longer-term competitiveness, productivity and growth ⁽⁹⁾. The Communication also noted very different situations in Member States and regions in relation to the skills profile of their populations and the sector distribution of employment. As a consequence, the Commission called for improvements to monitoring, assessing and anticipating skills needs, as well as matching skills and demands, as ‘crucial to address both the employment impact of the crisis and the long-term job prospects of the EU workforce’.

(8) See Internet (http://ec.europa.eu/growthandjobs/pdf/european-dimension-200712-annual-progress-report/200712-annual-report-integrated-guidelines_en.pdf).

(9) COM(2008) 868 final.

The case for the need for pan-European capacity to anticipate future skills needs is made in the context of increasing workers' mobility within the EU and the growing interdependence of national labour markets. It is also seen that such assessment would:

- (a) aid the efficient functioning of labour markets and the mobility of labour within the EU;
- (b) facilitate a better match between labour supply and demand;
- (c) allow better planned and more efficient education and training systems sufficiently supporting a better development of human resources and increase in skills levels ⁽¹⁰⁾.

The first pan-European skills forecasting exercise has been started by Cedefop and its first results became available in 2008 ⁽¹¹⁾. The aim of such activity is to produce regular forecasts of skills needs in Europe over a 5–10 year horizon. With preliminary projections being published in 2008, the intention is that these will be updated biannually (e.g. 2009, 2011, 2013). The methodological approach employed by Cedefop was quantitative, based on the use of a Multi-sectoral macroeconomic model. Initial projections provided evidence about the future labour market demand for skills, as measured by occupation and qualification. In addition, the work will involve comparison between skill supply and demand to indicate possible imbalances in the labour market and an evaluation of projections against outcomes.

Cedefop research has highlighted several key trends.

- (a) The general shift that Europe has been experiencing away from the primary sector (especially agriculture) and traditional manufacturing industries towards services and the knowledge-intensive economy is likely to continue. Although employment in many new EU Member States still relies to a great extent on agriculture and manufacturing, there are clear signs that this is changing rapidly.
- (b) By the year 2020, the primary sector is expected to decline from almost 8 % in 1996 to less than 4 %, while almost three quarters of jobs in the EU-25 plus Norway and Switzerland will be in services.
- (c) The report predicts that over 20.3 million additional jobs are expected to be created between 2006 and 2020 in the EU-25 plus Norway and Switzerland.
- (d) The manufacturing and construction sectors are expected to experience only a slight fall in their shares.

(10) See Commission staff working document accompanying the Communication 'New skills for new jobs — Anticipating and matching labour market and skills needs', SEC(2008) 3058/2 (<http://ec.europa.eu/social/main.jsp?catId=568&langId=enSafariHTML%5CShell%5COpen%5CCommand>).

(11) See Cedefop reports: Future skills needs in Europe — Synthesis report http://www.trainingvillage.gr/etv/Upload/Information_resources/Bookshop/485/4078_en.pdf Future skills needs in Europe — Focus on 2020 http://www.trainingvillage.gr/etv/Upload/Information_resources/Bookshop/498/5191_en.pdf

3. Looking forward to 2020

The national articles ⁽¹²⁾ of the *EEO review: Autumn 2008* have reviewed existing research and forecasting information, which foresees several divergent long-term trends across the EU in relation to the developments of the labour market and related skills requirements. Such key trends are summarised below. It must be noted, however, that none of the existing forecasts takes into account the impact of the current economic and financial crisis and its long-term implications for economic growth and jobs.

Across the European Union, the overall employment rate (for the 15–64 age group) is projected to rise from 65.5 % in 2007 to 69 % in 2020 ⁽¹³⁾. The projected increase is mainly due to higher female employment rates, which will rise from 58.4 % in 2007 to almost 63.4 % by 2020. The projected increase in the employment rate of older workers is even steeper, from 45 % in 2007 to 54.5 % in 2020. The youth employment rate has increased in a majority of countries and is expected to reach 40 % in 2020.

National articles for the *EEO review: Autumn 2008* highlighted that in some countries employment rates are expected to rise in the long-term (to 2020). Such countries include Austria, Finland, Lithuania, Netherlands, Portugal, Slovakia, and the UK. Other similar country-level trends observed include:

- (a) Estonia expects a slight increase in the employed by 2015;
- (b) France's working age population will increase by 2015 (compared with 2005), and there will still be under-utilised resources among the unemployed, women, young people and older workers;
- (c) German forecasts foresee an increase in employment of 1.7 million until 2020, without serious labour shortages;
- (d) In Malta, the activity rate is expected to grow in the long-term. To reach an activity rate of 70 % by 2020, at least 30 000 skilled people will need to be trained for new jobs created, while another 30 000 skilled people will be needed to replace retirees.

In contrast, employment rates are expected to fall in some countries, i.e. Latvia and Luxembourg.

Finally, as with the current situation, a stable employment rate is expected in some countries. These countries include Poland where even though the working age population is expected to fall by 2020, employment rates are expected to increase slightly and the total number of active people will remain close to 15 million throughout 2016–20. It is highly probable that the activity rate in the age group 15+ will remain constant.

(12) The national articles were prepared by System experts in autumn 2008.

(13) Commission staff working document accompanying the Communication 'New skills for new jobs — Anticipating and matching labour market and skills needs', SEC(2008) 3058/2, p.15 (<http://ec.europa.eu/social/main.jsp?catId=568&langId=enSafariHTML%5CShell%5COpen%5CCommand>).

Prospects for employment in different **sectors** at the pan-European level are defined, as follows, in the Cedefop publication *Future skill needs in Europe — Focus on 2020*. By the year 2020, almost three quarters of jobs in the EU will be in services. Distribution, transport, hotels and catering are together projected to see employment grow by more than 4.5 million over the next decade, while non-market services are expected to increase by slightly more (4.7 million). Business and miscellaneous services have the best prospects, with more than 13.6 million additional jobs being created between 2006 and 2020 in Cedefop's baseline scenario. Strong positive trends are expected in business services (such as IT, insurance or consultancy), health care and social work, distribution, personal services, hotels and catering, and to a lesser extent education.

Following prospects for employment in different sectors at the country level are identified in the national articles for the *EEO review: Autumn 2008*.

- (a) Employment in the primary sector: a reduction of employment in this sector is expected in Finland, Hungary, Luxembourg, and the UK. In the Netherlands, the demand for skills will increase in the manufacturing and maintenance sector, while the supply of skills will decline. An increase in the employment in this sector is expected in Slovakia.
- (b) In the agricultural sector, a decrease in employment is expected in Finland, Hungary, the Netherlands, and Slovakia.
- (c) Employment is forecast to be fairly constant in construction in the following countries: Cyprus, Slovakia, and the UK.
- (d) Services: a growth of jobs in the service sector is forecast in Austria, Cyprus (especially in tourism), France, Germany and Slovakia, the UK. Demand for workers in the ICT and private security and protection sectors and for jobs in the social care and cultural sectors is strongly positive in the Netherlands. Linked to the ageing of the Swedish society, there will be an increased need for workers in the healthcare and social service sector by 2020. Employment in the private service sector is expected to increase (by 160 000 people), although employment growth is expected to be slower than during the 1990s. The most rapid growth is forecast in business services, economic, legal and technical activities, as well as IT consultancy services.
- (e) Public sector: in Denmark, a deficit of around 35 000 public sector employees is expected to occur by 2015, due to the retirement of civil servants currently in post.

The following changes in **occupational structures** at the pan-European level are foreseen in the recent Cedefop forecasting exercises. As a result of technological change, globalisation and new forms of work organisation, education requirements are increasing in all occupational categories — including those at the lowest rung of the occupation ladder. Following this trend, an increase of almost 18.7 million jobs is expected at the highest education level (ISCED levels 5 and 6) and almost 13.3 million jobs at the medium level (ISCED levels 3 and 4). This would be offset by a sharp decline of almost 12.5 million jobs for those with no or low formal diploma qualifications (ISCED levels 0 to 2). As a consequence, higher education levels will be required overall from the working population across most jobs.

Prospects for changes in occupational structures at the country level are identified in the national articles for the *EEO review: Autumn 2008*.

- (a) Growth in managers and senior officials, professional occupations, and associate professional and technical occupations is forecast in Austria, Finland and the UK. Cyprus also expects the current shortage of highly qualified people to continue in the near future. Managerial occupations will rise in France.
- (b) Contraction in skilled trades, machine and transport operatives, and elementary occupations is forecast in the UK. Employment in this sector is forecast to remain unchanged in Finland. Looking at recent trends, employment in these occupations is expected to increase in Slovakia. In Slovenia, developments in the past (especially from 2006 onwards) also revealed increased demand for elementary occupations, craft and related workers, i.e. predominantly, less skilled workers or workers with very specific skills.
- (c) Cyprus anticipates a reduction in the demand for unskilled workers. Contraction in unskilled industry jobs is also forecast in France as well as a reduction in self-employment.
- (d) Growth in health and social services is forecast in Finland.

Following these sectoral and occupational changes, the **skills requirements** are expected to change.

- (a) A general tendency towards the need for highly qualified labour and lessening demand for people with only basic education is observed.
 - In Bulgaria, general skills requirements will increase significantly by 2020. The development of skills for medium and basic positions is expected to predominate in the medium term. Parallel to this development, the need for special skills and specialised knowledge will grow. The optimistic prediction is that, by 2020, the share of those in medium positions will be equal (or slightly higher) than that of people in basic positions, and the share of the highly qualified will be close to the EU average, although still slightly below it.
 - In the Czech Republic, an increase in the number of jobs held by highly skilled workers of over 400 000 is expected by 2016, combined with a similarly large drop in the number of jobs available for workers without qualifications and crafts workers.
 - In Denmark, there will be a clear tendency for the supply of unskilled workers to fall, but not sufficiently as to outnumber the fall in demand. At the same time, the supply of skilled workers and workers with higher education levels, will not be sufficient to meet expected labour demand.
 - In Germany, the skills structure of employment is expected to change towards university graduates and people trained at professional schools (*Fachschulen*), while the number of workers with dual training will decline. In particular, there will be a considerably lower share of workers without training by 2020.

- In the Netherlands, employer demand for highly-skilled workers will steadily increase and the skills of the labour force will also improve. The growth of employment is relatively low for the lower skilled, compared with medium- and higher-skilled workers.
 - In Spain, the shortage of highly qualified labour is anticipated to continue in the long term. Some estimates predict a shortfall of between 1.3 and 3.3 million workers in the knowledge economy by 2020 in Spain. The sectors that are most likely to suffer from these shortages of highly skilled workers are telecommunications, energy and health.
 - In Romania, by 2015, it is expected that while total employment may be marginally lower than today, there will be a slight oversupply of highly-qualified staff and a slight deficit of low-qualified labour. The greatest imbalances will concern medium level skills where a rather large pool of medium-qualified working age population will strongly compete for a slightly diminishing number of jobs.
 - In Norway, a balanced development between the supply and match of skills is expected up to 2020, except for people with only compulsory basic education who seem to have worsening job prospects, if educational trends do not change.
- (b) More emphasis will be placed and a growing need will emerge for generic skills such as ICT, teamworking, or communication. This has been highlighted, for example, in a number of countries.
- In Finland, more efficient use of ICT, communications and logistics is expected.
 - In Lithuania, practical training will be strengthened for skilled workers and professionals.
 - In Luxembourg, the government plans to initiate an in-depth reform of the primary and professional education systems. This change will lay the foundation for future skill needs.
 - In Malta, the need for generic skills has been highlighted by existing research.
 - In Slovakia, there is insufficient command of foreign languages, managerial competences, specific and general IT skills, and technical and practical skills at present. Greater demand for such skills is anticipated in the future.
 - In the UK it is considered that generic skills would underpin most jobs (if they do not do so already) and would be a prerequisite for acquiring more job-specific skills. This is, of course, consistent with developing employability of the workforce.
 - In Croatia, the education system is moving towards a system that fits the needs of a democracy with a globally integrated free market that requires problem-solving skills, creativity, communication skills and flexibility.

- (c) The need to integrate people into the system and culture of lifelong learning has been discussed, for example, in Austria where tackling the 'knowledge gap' between older workers, less educated and less qualified people is considered a critical issue, as such groups have high labour market risks.

4. The main instruments for labour market forecasting

4.1. Trends and approaches to forecasting activities

Many Member States have been carrying out forecasting activities to anticipate labour market needs and skills requirements. Recently, research has also been carried out at the pan-European level ⁽¹⁴⁾. National articles for the *EEO review: Autumn 2008* show a variety of situations across all countries in relation to forecasting activities to anticipate labour market and skills needs.

Several countries have a long tradition and/or comprehensive approaches to undertaking the forecasting of labour market and skills needs.

Denmark, Finland and Sweden have been developing approaches for the anticipation and the quantitative forecasting of the demand and supply for labour since the 1970s.

France also has long-standing, robust, tried and tested occupational forecasting tools which make it possible to identify key issues for the future and responses to them.

In Ireland, national forecast estimates of demand for labour, classified by sector, occupation and educational level, have been compiled on a regular basis since the early 1990s.

In Italy, the national system for the permanent observation of employment needs provides a comprehensive system, integrating several sources of forecasting information (such as periodic surveys conducted by the social partners; results of employer surveys on hiring forecasts in the short term (on a yearly basis); and estimates from econometric models from a research institute and the Ministry of the Economy.

In Luxembourg, a number of tools and mechanisms are in place to forecast the labour market and skills needs (e.g. employer surveys in specific sectors, existence of organisations charged with the monitoring of developments in the labour market).

(14) See Cedefop reports *Future skills needs in Europe — Synthesis report* and *Future skills needs in Europe — Focus on 2020*.

In the Netherlands, a number of forecasts on the match between supply and demand for skills exist, providing different types of information over differing time periods.

Studies of the match between supply and demand at the national level have a long tradition in Norway.

Other countries (e.g. Bulgaria, Estonia, Romania and Hungary) are **taking steps in developing systematic forecasting tools and methods.**

In the Czech Republic, several forecasting tools and methods are under development (such as quantitative forecasts based on the Labour Force Survey data; quantitative forecasts based on the methodology adopted from ROA in the Netherlands; ongoing work on an integrated system of typical working positions, employer surveys of skill demand and sectoral qualitative studies).

Following the transition from a planned to a market economy in Hungary, there have been attempts to create its own central forecasting system. Several institutions and organisations that contribute to the functionality of such a system are feeding data through the system of employment and education. These include the Public Employment Service (PES), the regional education and development councils (REDCs), the Ministry of Employment and Social Affairs and other government agencies involved in employment and education policy.

In Latvia, medium-term forecasts of labour force demand and supply started recently in 2008. Prior to these forecasts, annual estimates of short-term labour market trends were made.

In Lithuania, capacity to anticipate labour market and skills requirements requires development. The Ministry of Education and Science and the Lithuanian Labour Exchange are making progress in developing a system for the anticipation of labour market skills.

In Romania, in particular, the inherent difficulty in making forecasts in post-transition economies is noted, due to the lack of relevant historical data from recent years, and the lack of accompanying forecasting models.

In Slovakia, labour market institutions are in direct contact with businesses. This relationship is voluntary and conditioned by the interest of employers to use services provided by the offices. However, there is growing awareness among policy makers of the need to develop a comprehensive mapping and forecasting system. This includes the commitment to the development of a system of early identification and matching of labour market and skill needs.

In Slovenia, a systematic anticipation of skill needs at national level is not dominant as the existing skill needs analysis is performed in the framework of development of occupational standards, sectoral and regional analytical reviews.

In Germany and the UK, **a certain reluctance to undertake long-term forecasting of skills and labour market**

needs prevails among labour market policy makers and researchers, as the risk of misguiding students and employers appears considerable, as is the difficulty in predicting precise demand so far ahead. Many sectors are in very dynamic situations, where the skills needs for particular jobs change quickly under pressures such as technological development. Despite this, in Germany, the methods applied for anticipation range from macroeconomic models to trend extrapolations and survey techniques. Moreover, the German Federal Government decided recently to establish a continuous monthly skills survey to reflect short-term labour market needs and imbalances. The UK also has several sources of forecasting information, with much of the activity devolved to sectoral institutions and involving a combination of quantitative and qualitative information.

Finally, **some countries are lacking a comprehensive system for anticipation of labour market and skills requirements.**

In Austria, various different instruments are used to anticipate labour market and skill requirements. However, a systematic and integrated approach for discussing the matching of skill demand and skill supply has not yet been implemented. There is no coherent system of anticipation and matching of skills and labour market needs, which leads to a lack of concrete and, in terms of policy implementation, transferable results.

In the Czech Republic, to date there is no major regular and reliable system of forecasting in place and therefore very little application of forecasting in policy formulation.

The notion of skills gaps is generally absent from discussions of the labour market policy in Greece where there is no official method for medium and long-term forecasting of skill needs at the aggregate level.

In Portugal, forecasting tools and methods are not yet developed, and their results do not feed into the definition of the education and employment policies. However, some institutional changes have recently taken place to establish the foundations for a better match between the demand and supply of skills.

Similarly, in Slovakia there is no labour market forecasting system. Existing activities could be improved, methodologically, particularly with more expert inputs and improved co-ordination between different institutions and policies. At the same time, a number of attempts have been undertaken by several institutions to produce at least partial analysis and projections. Recent activities of public authorities indicate increased efforts to address the existing gaps due to a tightening labour market and policy initiatives put forward by European institutions.

Spanish labour market institutions have not developed sufficient analytical tools to determine the specific occupations and skills that will be required in the long run, in order to maintain competitiveness and growth. The main existing forecasting methodologies are based on the comparison of data on job vacancies and job applications from the public employment services.

In Croatia there is a need for a comprehensive system of information and data on the outcomes of the education system,

particularly at the tertiary level. This could assist the formulation of policies. As Croatia is a transitional country, raising skill levels is critical for economic competitiveness.

In Turkey, forecasting tools are virtually non-existent at the moment but a relevant study may be piloted in the near future.

As outlined above, there is considerable variation in the approaches adopted. The quality of the approaches is a function of the data available to drive the forecasts and countries' statistical infrastructure. Those countries with well established approaches are typically those with well developed statistical services. Among the countries with a long tradition of forecasting, steps are being taken to improve the methods and techniques being used to enable skills matching activities (e.g. Finland).

While there are countries where there is no tradition of forecasting, methods and techniques are being developed in some cases. That said, other methods to examine skills matching, such as surveys and qualitative, sectoral and regional studies are being conducted and which provide an understanding of labour market needs and skills shortages. These are discussed in turn below.

4.2. The main tools and approaches to forecasting at the country level

There is a vast range of different tools and techniques used across the countries for anticipating changing skills needs and labour market requirements. The main instruments used at the country level can be classified into the following main categories⁽¹⁵⁾:

- (a) formal, national-level, quantitative, model-based projections;
- (b) sectoral or occupational studies (using a variety of quantitative and qualitative methods);
- (c) surveys of employers or other stakeholders; and
- (d) foresight analysis using scenario development exercises (based on focus groups, round tables, Delphi-style methods, observatories).

Individual instruments are briefly described below and further details are provided in Annex to this publication.

4.2.1. Formal, national-level, quantitative, model-based projections

Short, medium and long-term model based projections are conducted in several countries. The following provides an illustration of the types of activity underway. Typically

projections take a medium- or longer-term perspective (five to 10 years respectively), though in some cases short term projections are conducted annually.

In Austria, short-term and medium-term model-based projections on national or regional levels are carried out by economic research institutes, providing quantitative data.

In Belgium, the macro-sectoral Hermes model is used to produce short and medium-term forecasts.

In Cyprus, the Human Resources Development Agency produces 10-year forecasts which are based on a model that involves forecasting linked variables in several stages, using historical data from 2000–06 to predict the values for variables for 2007–18.

In the Czech Republic, long-term forecasts by CERGE-EI/RILSA/NVF combine employment-age structure information from the Labour Force Survey with education-system production data and with information on the skills structure of the short-term unemployed.

In Denmark, a number of actors are involved in making national and regional quantitative forecasts, including the Ministry of Education, the Economic Council of the Labour Movement, the Danish Institute of Governmental Research, and the Ministry of Finance.

In Estonia, the development of aggregate level assessments started in 2003, when the Ministry of Economic Affairs and Communications (MoEC) prepared the first annual forecast on labour market needs. Today, the annual forecast by the Ministry of Economic Affairs and Communications is the main tool for anticipating skills needs in Estonia. The results are used by the Ministry of Education and Research for planning state-commissioned education in Estonia.

In Finland, the PT labour force model is used for forecasting long-term employment and skills requirements. Additionally, the Mitenna model developed by the Finnish National Board of Education forecasts the requirements for student places in comprehensive and vocational schools as well as in universities. Its data are used in the labour force model to forecast employment for a total of 20 sectors.

In France, quantitative projections are used in the regional and sectoral forecasts of labour market and skills requirements.

In Germany, several models are used. The IAB projections are based on the disaggregated Inforge macro model. It is linked with the rest of the world through the Ginfors model, which includes input–output and macro models for the OECD countries and other important trading partners of Germany. In the KMK projections, total employment is estimated using GDP and population as the two explanatory variables which both are exogenous. Estimates are based on long-term average rates of change.

In Greece, the Employment Observatory (PAEP) focuses on estimating labour demand and supply and aims to identify mismatches between labour supply and demand and between

(15) A similar categorisation is contained in the Commission's staff working document on new skills for new jobs, pp. 6–7 (<http://ec.europa.eu/social/main.jsp?catId=568&langId=enSafariHTML%5CShell%5COpen%5CCommand>).

educational supply and labour demand. Skills demand and supply mismatches are also examined. Based on LFS and other macroeconomic data, forecasts of labour demand and labour supply are being made using econometric models.

In Ireland, FAS/ESRI Manpower Forecasting studies use a macroeconomic model to produce regular medium-term forecasts.

In Italy, the main instrument for labour market forecasting is the National System for the Permanent Observation of Employment Needs, which includes several surveys that inform the forecasting activities:

- (a) periodic surveys conducted by the social partners by sector and profession;
- (b) results from the Excelsior survey of employers on hiring forecasts in the short term (yearly basis);
- (c) estimates from an econometric model, run by the ISFOL (National Institute for Vocational Training), on the forecasting of employment flows by sector and profession in the medium term (five years);
- (d) estimates of sectoral and regional economic trends in the medium term, resulting from the econometric model used by the Ministry of the Economy.

In Latvia, the dynamic optimisation model, uses existing data about the demographic and labour market situation and the estimated economic and demographic conditions, and defines medium term supply and demand developments in the labour market.

In Lithuania, several instruments are in use, including the development and application of a medium-term (five-year) forecasting methodology for skills and qualifications demand in the labour market.

In the Netherlands, the Research Centre for Education and the Labour Market (ROA) of Maastricht University has developed a forecasting model for the labour market situation of different types of education on the Dutch labour market. Forecasts are given for a five year period.

In Poland, a national forecasting system was launched in 2004, but was discontinued in 2006 and its future is currently uncertain.

In Romania, the forecasting method used integrates an enterprise survey, the use of classic production functions (Cobb–Douglas) and trend equations, all consolidated by the partial use of the Macbeth model.

In Slovakia, macroeconomic forecasts provide short-term and medium-term forecasts, including those concerning the main labour market indicators.

In Sweden, Statistics Sweden produce 'Trends and forecasts' reports, which focus on the long-term developments and make demographic, educational and labour market forecasts for the coming 15–20 years. These forecasts are based mainly on cohort analysis and econometric estimation.

In the UK, the multi-sectoral dynamic model of the UK economy provides the basis for the 'Working Futures' data, which provide forecasts of labour market and skills requirements over the medium-term.

In Norway, forecasting studies based on multi-sectoral growth models for the economy have been carried out since the late 1970s. In the 1990s, a model with substitution possibilities in each sector and market clearing by wage adjustments by type of labour force was developed at Econ Analysis. In autumn 2007, Statistics Norway started working with an updated picture of the future supply and demand of labour by type of education, which led to the latest study of the future match between supply and demand of labour by types of education at the national level, published in August 2008.

A variety of models is used to forecast different aspects of labour supply, labour demand and the match or mismatch between supply and demand. In some cases models have been used regularly on a long-term basis, though in other cases models have been introduced recently. Some of these more recently introduced models have been introduced and used for relatively short periods only.

4.2.2. Sectoral or occupational studies (using a variety of quantitative and qualitative methods)

In many cases sectoral or occupational studies complement projections and/or employer surveys, although in some cases they are stand-alone research. Various stakeholders are responsible for this type of study, although the public employment services are key partners in many cases, as the outputs are often used to inform their service offer. The focused nature of these studies provides rich information and an in-depth understanding about the current position for sectors or occupations and about expected trends. Studies draw on statistical information to show trends and can be informed by employer opinion, through surveys and others similar means for collecting their views.

Examples of such activities in the countries are provided below.

In Austria ad hoc sectoral or occupational studies refer to general skill requirements and expected changes.

In France, regional-level forecasting studies are carried out through 'Forward studies contracts' (*Contrats d'études prospectives* — CEPs) and the forecasting needs for the next five years are agreed between the state and the social partners.

In Ireland, the work has been undertaken by the expert group on future skills needs (EGFSN) to determine the future requirements for high-level skills in the ICT industry and in the international financial services sector (as well as other sectors).

In Lithuania, forecasting changes in the number of employees and training needs for separate economic sectors, by the Centre for Vocational Training Methodology, is being developed.

In Luxembourg, the 'Qualifications of tomorrow' survey is undertaken in the industrial and ICT sectors. The survey aims to guide young people to a profession that fits labour market needs and supplies information to public authorities and professionals in the education field.

In Malta, the forecasting of labour needs in particular sectors is often based on one-off, ad hoc studies, sometimes forming part of new policy and strategy about a specific sector (for example, studies have been carried out in the ICT, construction and environment sectors).

In Portugal, the 'Information and management system of the education and training offer' (*Sistema de Informação e Gestão da Oferta Educativa e Formativa — SIGO*) is a key instrument for managing and monitoring demand, processes and results, fundamental for directing and guiding young people and adults to training offers that enable them to develop their certified skills, thus allowing the decentralised management of the training offer.

In Slovenia, skill needs analysis is performed in the framework of development of occupational standards, including some sectoral analyses.

In Spain, existing methodologies to identify prospective skills needs in the labour market are mainly for short- and medium-term forecasts. They are mostly based on the study of recent trends in the evolution of contracts and job demands, complemented by the views of employers and other relevant stakeholders (such as experts, and local administrations) in order to identify imminent needs. The main studies, undertaken by the Observatory for Occupations belonging to the National Institute of Employment, are based on a comparative analysis of the official data on signed contracts and job demands from the regional employment services, identifying the most dynamic branches.

In Sweden, the Labour Market Authority presents a global overview of the labour market in the 'Labour market outlook' reports, published at six-monthly intervals and providing a view on the following year. They focus on trends, developments and forecasts for different industries and sectors and comprise detailed information about the reasons behind recent trends, the current situation, its consequences, and responses in terms of labour market programmes.

4.2.3. Surveys of employers

Well constructed surveys are a key tool used to inform future skills needs. However, it also needs to be considered that employers are not always very good at anticipating their future skill needs (see Wilson et al, 2004) ⁽¹⁶⁾. Employer surveys highlight current trends and provide the base data to inform projections.

Surveys typically focus on labour demand, current and future skills needs and the associated training needs. The scale and scope of

employer surveys vary enormously: two of the larger surveys are the 'Excelsior survey' in Italy and the UK's 'National employer skills survey', while others have much smaller samples.

Surveys of employers in Austria provide information about short-term skill demand and training activities of employers.

In Belgium, there is a 'Skills for future' employer survey in the technology industry.

In Bulgaria, anticipated skills needs have been identified through two enterprise surveys at the national level that took place in 2004 and 2007.

In Greece, the Employment Observatory (PAEP) undertook surveys, in 2003 and 2007, of enterprises of all sizes, regions and sectors of economic activity on anticipated occupational and skill demand.

In Hungary, an annual survey is distributed to 7 000 business executives, focusing on expected labour demand for the next year, including details about the structure of labour demand.

In Italy, the Excelsior survey is undertaken with a large number of firms (around 100 000 in 2007) for short-term employment forecasting.

In Latvia, the annual employer's survey focuses on current and anticipated vacancies in the enterprises surveyed, and on accompanying skill requirements.

In Luxembourg, the 'Qualifications of tomorrow' survey is undertaken by employer organisations to explore skills needed in the industrial sector.

In Malta, surveys of employers about short-term employment skills needs are undertaken by the Central Bank of Malta and the Malta Federation of Industry.

In the Netherlands, every two years, the OSA (Institute for Labour Studies) carries out a survey on labour supply and demand.

In Romania, two employer surveys are key components of the forecasting method being used.

In Slovakia, the 'Business Tendency Survey' is an employer survey on trends in the four branches of the economy with short-term predictions of expected trends, including employment. Additionally, in Slovakia, a survey of 260 enterprises focused on the qualification structure of demand and the mismatch between employers' requirements and available labour supply.

The Employment Service of Slovenia undertakes the 'Employment forecast' research once a year (at the end of the year), based on a legal requirement for all employers to report their anticipated needs for workers and possible redundant workers for the whole year.

(16) Wilson, R. A., I. Woolard and D. Lee, *Developing a national skills forecasting tool for South Africa*, South African Department of Labour, Pretoria, 2004.

In Sweden, surveys of employers are undertaken by several institutions.

- (a) Statistics Sweden undertakes the 'Labour market tendency survey', published every year since 1959. It presents short-term forecasts based on questionnaires sent to a sample of firms whose employees represent those educational groups that are considered most relevant and interesting.
- (b) Regional and local labour market authorities undertake regular surveys on short-term skill needs, which are based on annual interviews with around 12 500 employers, carried out at the regional level. This entails special questionnaires to all firms in the region with more than 100 employees. These surveys form the basis of regular forecasting reports, available at the national and regional levels.
- (c) The National Institute of Economic Research (NIER) undertakes a monthly and quarterly 'Business tendency survey' of a large number of firms in the private sector and asks for their assessment of the development of the economy. Firms are questioned concerning their output, new orders, employment, labour shortage, etc. The situation on labour demand and skill needs (in particular, the share of firms reporting labour shortages) is mainly reported in the quarterly report.

In the UK, the 'National employer skills survey' interviews a large number of employers (79 000 in the last survey round) on skills shortages and gaps, and workforce development needs.

In Norway an enterprise survey is undertaken by the Norwegian Labour and Welfare Organisation to explore recruitment needs over the next year.

4.2.4. Foresight analysis using scenario development exercises

There is some evidence of scenario development exercises being undertaken to inform future skills needs. Such exercises include focus groups, round tables, Delphi-style methods, and Observatories. They all employ qualitative data collection methods that use employers' and stakeholders' opinions to explore how sectors and occupations might change in the future. Occupational observatories and qualifications catalogues are being developed to provide information about competencies and the dynamics of how occupations are evolving.

In Austria regional round tables and 'Delphi-style' methods aim to identify future skill demand through qualitative interviews with local employers and experts.

In Luxembourg, the Permanent Committee of Labour and Employment (PCLE) examines the employment and unemployment situation, working conditions, security as well as workers' health. In addition, the Competitiveness Observatory collects national and international data on competitiveness and carries out studies or adds contributions to international research on competitiveness.

In Portugal, the Observatório do Emprego e Formação Profissional (Employment and Vocational Training Observatory

— OEFPP) is a tri-partite body which monitors the labour market and evaluates employment policies. Also in Portugal, the Gabinete de Planeamento, Estratégia, Avaliação e Relações Internacionais (Cabinet of Strategy, Evaluation and International Relations — Gpeari) collects information relevant to the definition of policies in the area of tertiary education.

In Romania, the National Employment and Vocational Training Observatory, recently established in the Ministry of Labour, jointly with the National Labour Research Institute, is currently working on the development of scenario-based approaches on forecasting future skills needs. Some such elements have already been incorporated as additional modules into the two enterprise surveys undertaken so far by the Institute.

In Spain, the Observatory for Occupations (belonging to the National Institute of Employment) publishes, on a regular basis, different studies that analyse the main trends of the labour market at the regional level.

In the UK, such foresight analysis is carried out using a more structured method, as part of the UK's 'Foresight programme' in the Government Office for Science within the Department for Innovation, Universities and Skills (DIUS).

In Croatia, activities for short- and medium-term anticipation of future labour force needs and skills include the work undertaken by political parties and youth associations. Some are leading to a better match of demand and supply in the labour market and an identification of future labour market needs. For example, the Forum mladih (Youth Forum) is developing an employment registry. It will contain a register for employers' needs and EU standard learning outcomes, occupations, accredited informal educational programmes and a list of trainers and lecturers in informal programmes.

5. Roles of the labour market institutions

The roles played by the labour market institutions in anticipating future skills needs vary significantly from country to country. Different countries have very diverse approaches to utilising existing intelligence about future labour market and skills needs.

Roles and responsibilities for forecasting activities vary between countries, with responsibilities often shared. Ministries of Employment (Finland, France, Poland), ministries of education (Denmark, Finland, France, Lithuania, Romania), public employment services (Austria, Cyprus, Ireland, Lithuania) and training institutes (Italy), are typically involved, along with national statistical services and research institutes (Cyprus, Romania, Sweden, Norway) and independent research institutes, including think-tanks and research councils (Austria, Czech Republic, Denmark, Finland, France, Ireland, Lithuania, Netherlands, Poland, UK). Other parties involved include ministries of finance and/or economic affairs (Cyprus, Estonia, and Latvia), regional councils or regional representative bodies (Germany, Finland), social partners and NGOs (France, Romania) and expert groups (Ireland).

In countries where more than one forecasting activity has been identified, either one institution commissions the activities, e.g. the PES, and works with various research institutions (Austria), or different ministries work with different stakeholders to conduct forecasting activities. In France, for example, the Ministry of Employment works with social partners on the 'Prospective management of jobs and skills' (*Gestion prévisionnelle des emplois et des compétences*, GPEC), while the Ministry of Education has worked with a research institute on forecasting job and training needs up to 2015.

In several countries, the data on future skills needs play a significant role in policymaking at the national level.

In Belgium, the matching of skills with the labour market is well integrated with national migration policy. The use of labour market forecasting information in policymaking is also apparent in Finland and Luxembourg.

In Denmark, a number of different practices are being developed in order to facilitate the practical use of skills forecasting. One example is the development of a national accreditation system, while another example is the national strategy for monitoring labour market developments. The aim of this is to provide a uniform knowledge base for both the national and the regional employment strategies, including the knowledge needed for prioritising the use of the different instruments of labour market policy, including labour market education and training. The significant element of the strategy is not the monitoring activities themselves, but the fact that an institutional framework has been created, which allows the flows of information to be created in a uniform manner and to move between national, regional and local levels.

In Italy, the production, dissemination and use of data on the identification of employment and training needs often follows a dual pathway. On the one hand, data are produced at both national and regional levels, whereas, on the other hand, their exploitation occurs primarily at the local level. In addition, in Italy key stakeholders form a technical committee (Cabina di Regia), which is responsible for addressing, co-ordinating and assessing all the initiatives aimed at identifying future skills needs, as well as defining the methodology for the national system.

In Latvia, the State Employment Agency (SEA) uses data from the annual employers' survey to identify employer recruitment needs and those professions most in demand. Survey results are taken into account when organising SEA employment activities and professional training for unemployed people, to facilitate the match between labour supply and demand.

In Luxembourg, the employment agency (ADEM) has used the results of the 'Qualifications of tomorrow' survey (one of the surveys available in Luxembourg) to organise training for employers, since 2000.

The Maltese government has recently started to formulate and implement policies based on forecasts of future needs and challenges. This pro-active approach, supported by the Lisbon strategy targets, is now being accompanied by the

government's 'Vision 2015', which outlines Malta's strategic medium-term goals across various policy domains, including the labour market. Skills forecasts are thus increasingly used.

In the Netherlands, the government is using specific results from the forecasting exercises in the policymaking process. For example, existing forecasts anticipate a shortage of technical workers at all education levels. As a consequence, an action plan was developed in 2003 to decrease the shortage of people with technical schooling at all levels, from vocational training to a university degree in sciences. Action is also taken at the local level where it appeared that many employers did not have a clear view of future labour demands. In some municipalities research on the future demand in particular sectors has started.

In Slovenia, forecasting data are being used to inform and prepare short-term (one year) and medium-term (5–6 years) planning documents for training activities and vocational and career guidance.

In Spain, the 'National catalogue of professional qualifications' is the main instrument of the National Institute of Qualifications and is used to gather information on and classify professional competences and skills suitable for recognition and accreditation. The catalogue of professional qualifications highlights the demand for skills, in accordance with sectoral needs, and classifies them into professional branches and levels. The catalogue provides the basis upon which the vocational, occupational and continuous training offer is developed, including the development of curricula, obtaining the relevant qualifications and recognition of skills acquired in the workplace.

In Sweden, the forecasts of skills needs are one source of information for policymakers which influences the content of labour market training initiatives. The main features of vocational training are its strong vocational focus, its direct link to the PES and its flexibility. In contrast to the general education system, the task of labour market training is primarily to qualify workers to match current or short-term labour market needs. The short-term forecasting tools are regarded as efficient mechanisms for the planning and provision of labour market training, in the framework of Swedish active labour market policies. The forecasts, based on their econometric model, with a 15–20 year time horizon, are useful for individuals planning their careers, as well as a means of making a long-term assessment of the supply and orientation of education and the future demand for skills and occupations.

In Norway, information on labour market needs is a key source of information in the process of matching applicants with study places in post-compulsory education. Forecasting information has also been used by the Ministry of Education and Research to plan for the future demand for teachers and health personnel by specifying the required intake capacity for the relevant education.

In some countries, other groups and stakeholders are producing and conducting forecasts (and making use of such data) on future skills needs.

In Austria, the new AMS skills barometer is based on vacancies published in daily and weekly newspapers, on vacancies reported to the AMS and on expert interviews. Information is available nationwide as well as at a regional level.

In Belgium, social partners have agreed several branch covenants ('sector covenants') to mobilise specific branches to take action to improve the skills of workers and jobseekers. The covenants are negotiated every two years.

Every four years in Finland, the regional governments draw up a special regional programme based on the results of the PT and Mitenna models. At the regional level, special regional committees have been established to fine-tune the forecasts for vocational structures and educational requirements generated by the models.

In Hungary, the Ministry of Employment and Social Affairs is initiating the development of a system of forecasting for medium and long term labour market trends. The system is planned to yield occupation-specific forecasts of both supply and demand at the national and regional level. It will be accompanied by a freely accessible website targeted at potential students and jobseekers as well as government officials. The project will be carried out as a part of the 'Social renewal operative programme'.

In Lithuania, the Lithuanian Labour Exchange is very active in this area, although its forecasts are of a departmental character and therefore more adapted to the needs of employment services. Additionally, the Lithuanian Labour Market Training Authority has formed focus groups to anticipate future qualification needs.

In Portugal, the *Conselhos Sectoriais* (Advisory Councils for Qualifications) are being created and will be tasked with compiling the *Catálogo nacional de qualificações* (national qualifications catalogue — CNQ) and updating data on skills needs.

In the UK, the principal users of the 'Working futures' forecasts of future skills needs are the 26 Sector Skills Councils and the UK Commission for Skills and Employment.

In Croatia, the Employment Service (CES) conducted a large-scale survey that examined trends in employers' short term skills needs, both retrospectively and into the future. It assesses requirements in relation to occupation, knowledge and skills required by recruits. The survey aims to propose measures for a better match between the demand and supply of labour in the labour market.

6. The role of ESF funding

As a funding source, the European Social Fund (ESF) plays an important and diverse role across the EU in improving the capacity to anticipate labour market and skills requirements.

In several countries, ESF is used as a (co-financing) source to fund research on future skills needs and related topics.

This is the case, for example, in Finland, Hungary, Latvia, Slovakia and Croatia. In some cases, ESF monies have funded the development and use of forecasting models and approaches that help deepen the understanding about labour demand and skills needs. It is also notable that ESF funds have allowed skills forecasting to become an ongoing activity.

Examples of such activities are provided below.

In Denmark, most of the work on skills forecasting is financed by national and regional authorities. However, ESF has supported a few of the activities aimed at developing new approaches to forecasting and cooperation between different actors.

In Greece ESF funding has supported most of the Employment Observatory's (PAEP) research activities in the field of employment projections and forecasting.

In Finland, ESF projects have raised the profile of forecasting labour and education needs. Forecasting activities have generated new forms of cooperation and practices, of which the publicly available Ensti electronic information system is a good example.

In Hungary, ESF has played a significant role in funding a system of labour market forecasts. ESF was a major contributor and a critical resource in the development of a continuous forecasting system.

In Latvia, ESF funding has played a significant role in the development of labour market forecasting models. The dynamic optimisation model, developed by the Ministry of Economics for medium-term forecasting, was the result of an ESF-funded research programme in 2006–07.

In Italy, the identification of employment and training needs represented one of the main areas of intervention in the 2000–06 period, which provided useful inputs to design training and employment strategies, and to improve both matching in the labour market and the national system for anticipating skills and jobs. The most important ESF funded initiatives are characterised by the attempt to make the identification and anticipation of employment and training needs a systemic activity.

In Malta, the government is making considerable use of ESF funds in order to anticipate labour market and future skills needs. Indeed, addressing skills mismatches is one of the focus areas of intervention under the priority 'Invest in human capital to raise the employment rate' of operational programme (OP) No 2, for 2007–13, co-financed by the ESF. Several relevant projects are in progress.

In Poland, a number of ESF-funded projects focus on promoting forecasting tools and methods. An example is the recently launched project 'Diagnosis of demand on qualifications and skills in regional and local labour markets — cooperation of labour offices with employers and other partners on the labour market'. This project analyses the methods used by the PES for the diagnosis of labour demand. The project also involves the preparation of a manual describing the methods, tools

and procedures used to forecast the demand for skills and qualifications in the regional and local labour markets. Project outcomes will be available in 2009.

In Romania, ESF supports a project aimed at anticipating labour and skills needs for the capital region of Bucharest and the surrounding county of Ilfov. The project is co-funded under the priority axis aimed at enhancing the capacity of the Public Employment Services, in the 'Sector operational programme — Human resources development' (SOP HRD).

In Slovakia, ESF funding was used to support the early identification of skills and labour market needs.

In Spain, ESF contributes to the funding of studies on training needs in specific sectors and for specific target groups, transversal sector studies and the activity of the permanent Observatory of Occupations. The relative importance of ESF as a funding source for anticipating labour market and future skills needs is unknown, however, as such activities are usually embedded in more general actions and budget items.

In Croatia, ESF funding is used for human resources development. Under the ESF operational programme, the Ministry of the Economy, Labour and Entrepreneurship is responsible for the management of one of the components on the development of human potential. Some experts predict that significant resources will be allocated to anticipating labour market and skill needs.

In other countries, ESF plays a more indirect role in the process of anticipating future skills needs.

This is the case, for example, in Austria, Belgium, Lithuania, Luxembourg and the UK.

In Austria, the focus of ESF co-financed measures is mainly on a reduction of the qualification gap and on the improvement of the quality of adult training.

In Belgium, ESF funding is used in numerous training activities. It is unclear whether these will help avoid future labour market shortages.

In Cyprus, there appears to be no direct involvement of ESF in forecasting efforts. However, ESF is used to co-sponsor a number of schemes that aim to achieve a better balance between the demand and supply of labour (e.g. schemes to modernise the district employment offices and to promote the training and employability of women, young and older people).

In the Czech Republic, there are various small regional projects co-funded by the EU, which help make qualitative and quantitative information about local labour market conditions available on the Internet or through district labour offices. However, these projects provide information on the current situation or on past trends and they do not employ reliable prediction methodologies.

In Lithuania, ESF funding has been assigned to the single programming document, priority 2 'Human resource development'. Although the associated measures do not specifically aim to anticipate labour market and future skills needs, some of the forecasting measures have been supported using ESF funding. This includes the systematic assessment of the match between supply and demand of highly skilled experts.

In Luxembourg, one of the ESF funding priority axes is aimed at reducing the inadequacy between job demand and supply, by increasing the investment in human capital through a quality based education training system and the promotion of a lifelong learning culture.

In the Netherlands, ESF funds are used to design and implement programmes that activate target groups and not necessarily to monitor future skill needs.

In Portugal, ESF funding was critical in making educational improvements although it is unclear how ESF funding will be used, in this regard, in the future. This will depend on the system developed to anticipate the future needs of skills and some experts consider ESF funding will play a role in this field.

In Slovenia, ESF funding plays an important role in co-funding many activities related to the Slovenian labour market, including the field of matching labour market demand and skills supply. One such activity is the comprehensive curriculum reform, which is being carried out to develop new occupational standards in all fields.

While Swedish ESF does not provide direct assessment or forecasting on skill and occupational needs, it finances various projects at the regional level that may improve the matching process in the labour market.

In the UK, the ESF funding has an indirect role in reacting to the forecasts in so far as the development and implementation of active labour market policy may be (part) funded by ESF.

7. Comparisons with the capacity to anticipate the labour market and skills requirements in the United States of America

The United States (USA) has been one of the pioneers in the area of forecasting labour market and skills needs. The US Bureau of Labor Statistics (BLS) has been producing such projections since the 1950s ⁽¹⁷⁾. Key features of these projections, and comparison with the forecasting activities in Europe, are described in Table 1 below.

Table 1: Comparison of forecasting activities in the United States and Europe

	US Bureau of Labor Statistics projections	Forecasting activities in Europe (as a whole and by specific countries)
Aims	The aim of the projections is to produce useful labour market information to guide decision-making by labour market participants. The results are not intended for mechanistic planning purposes.	Different forecasting activities have different purposes in European countries, but the main aim of providing useful information is shared by many of them. The recent work commissioned by Cedefop is the first attempt at a pan-European forecast and represents an attempt to improve transparency on the European labour markets, increase the skill levels of populations and prevent skill mismatches and make information about the future development of skills and competences available.
Methodology	Projections are based on a detailed multi-sectoral macroeconomic model, complemented by other activities (such as the Occupational Employment Statistics Survey and the O*NET system for monitoring changing skills needs within the occupations)	Different forecasting activities in different European countries have different methodological approaches and models. Countries use various macroeconomic models, employer surveys, occupational studies and foresight analysis (and combinations of these) for forecasting activities. The approach adopted by the Cedefop study is a modular approach comprising four modules: <ul style="list-style-type: none"> • Module 1 — a set of multisectoral macroeconomic forecasts, based on the preferred macroeconomic model (E3ME); • Module 2 — an occupational expansion demand model, (EDMOD), based on LFS data; • Module 3 — a qualifications expansion demand module (QMOD), based on similar data sources; • Module 4 — a replacement demand module, (RDMOD).
Detail of forecasts	The forecasts produce very detailed quantitative projections of employment by industry and occupation	The detail of forecasting projections varies significantly between forecasting activities in different European countries. 'Future skill needs in Europe' currently covers broad sectors and occupations.
Geographical coverage	The forecasts are produced for the whole of the United States and other geographical sub-areas	Forecasts undertaken in different European countries provide a varied geographical breakdown. Only recent Cedefop work ⁽¹⁸⁾ provides pan-European forecasts comparable to those of the US.
Time period covered	Forecasts are produced over the medium and long terms	National forecasting activities have different time horizons. Most countries produce short-term forecasts. Some countries produce also medium-term and long-term forecasts. Recent Cedefop work provides medium- and long-term forecasts.
Resource allocation	Forecasts are regular and well-resourced (USD 6 million in 2005)	Some forecasting activities are regular and well resourced (although not on the scale comparable to the US). Other forecasting activities are irregular ad hoc exercises. Recent pan-European Cedefop work was based on resources of EUR 400 000.

(17) See <http://www.bls.gov>

(18) See footnote 11.

Table 1 shows that the USA has a coherent and comprehensive forecasting system, based on a single forecasting model, which integrates a range of information sources. The forecasting activities are conducted on a regular basis and are detailed and well resourced. In contrast, national-level forecasting activities in European countries (in some cases) appear to lack coordination and an agreed common methodological approach, as methods have developed over time to suit national circumstances. The regularity of forecasting exercises varies significantly between the European countries, and none of the European activities are resourced to the extent of the US projections. In general, the landscape of forecasting activities in Europe appears to be so varied from country to country that it is difficult to describe a common 'European' model, with the exception of the work undertaken recently by Cedefop ⁽¹⁹⁾. Cedefop is developing a system for regular, medium-term forecasts of skill needs (demand and supply) in Europe based on available comparative data. The forecasts will be carried out every two years (2009, 2011 ...). Levels of detail will depend on data availability but will be at least the same as in the forecasts produced by Cedefop in 2007–08 and cover the time period until 2020. At least two alternative scenarios will be introduced to envisage the impact of the recent financial crisis and current recession.

8. Improving the capacity to anticipate labour market and skills needs

The description of the current forecasting activities across European countries in the previous sections (and comparison with the situation in the United States) shows that there is considerable room for improvement in developing and maintaining an EU-wide capacity to anticipate labour market and skills requirements in the future.

The evidence demonstrates a wide range of approaches and techniques being adopted and already used. The key issue at the country level is that, while there are common base principles, how these have been applied varies, as does the periodicity, and level of detail (spatial, sectors and occupations) of the forecasting methods. There is considerable variation in how forecasting methods have been applied. Successful forecasting appears to feature as part of a holistic approach where the forecast sits alongside other complementary surveys and / or qualitative research. Where forecasts are criticised, these tend to be linked to traditional methods orientated towards the early manpower planning approaches, which simply use the past to forecast the future. Indeed, as the outcomes from traditional approaches are unlikely to reflect the future, then it is pertinent to consider whether the mindset on forecasting needs to change: forecasting does not (and cannot) predict the future; it is simply an illustration of the future that informs policy making and planning.

Different European countries are at different stages in relation to developing their own forecasting capacity and making use of such intelligence. Some countries have comprehensive and long-established forecasting systems; others are starting to develop such capacity and some countries have neither developed methods and tools nor a current policy imperative to develop these. The recommendations highlighted in the national articles for the *EEO review: Autumn 2008* would therefore be largely country-specific and applicable in particular national contexts. However, some general observations can be made.

Overall, there is a need to bring together, in a co-ordinated manner, existing forecasting activities undertaken by different institutions in the countries, in order to produce timely and reliable information and strengthen the effectiveness of existing instruments. It tends to be the case that individual institutions lack sufficient resources to undertake comprehensive regular forecasting. The systematisation of forecasting activities could address this issue and ensure the optimal complementarity of activities.

Such co-ordination could involve better and more targeted resources spent on forecasting, extension of forecasting (if not already existing) to all sectors of the labour market and involvement of all relevant stakeholders in the forecasting system (such as social partners, public employment services, national statistical institutes, research organisations, and educational institutions). Involving a range of stakeholders could also ensure greater cooperation between employers, education providers and national governments in matching the labour demand and supply. It should be recognised that such an approach would require considerable investment and time.

It is also crucial that more effort is made to make use of existing intelligence in the formulation of employment and education policies at the national, regional and local levels. Successful examples of such use exist in several European countries, and this needs to be recognised and built upon so that forecasting information plays a more regular and integrated part in the policy formulation process.

A strategy for dissemination and communication of the results of forecasting activities to citizens and employers also needs to be considered and developed.

There are also a number of methodological issues that need to be considered in the development of EU-wide capacity to anticipate labour market and skills requirements:

- (a) a greater cross-linkage and integration of quantitative and qualitative approaches to forecasting could be developed;
- (b) several countries face the problem of inadequacy of existing data and data collection methods required for substantive forecasting activities;
- (c) countries where there is currently little forecasting activity should build upon existing experience and consider the appropriate forecasting tools and long-term modelling.

(19) See footnote 11.

Country-specific methodological recommendations are detailed below.

In Bulgaria, anticipating skills needs has to be planned together with the improvement of labour productivity, business competitiveness and labour market innovation. Skills forecasts also have to be linked to sectoral strategies, while the dynamic relationship between skills, competences and professions has to influence vocational training and its reforms more decisively.

In Cyprus, considering the available data on which forecasts are based, a medium-term (three to five years) forecasting horizon seems most likely to be accurate and useful. The HRDA (Public Employment Service) has been assessing its own procedures and monitoring the match between its own forecasts and other economic data. However, these exercises are not publicised and it is suggested that they be made public, with a view to leading to improvements in the procedures.

In the Czech Republic, the existing methodological approaches need to be enriched to take account of a number of specific factors related to the Czech economy, education, and data availability. The existing models could be usefully combined into a joint methodology. For instance, quantitative forecasts should be regularly supported by qualitative sectoral studies.

In Denmark, there is the potential to improve the knowledge base through more qualitative analysis about the future role of personal and social skills and the importance of tacit knowledge required for different job functions. Current understanding is either rather general or based only on observations from a few job types or sectors.

In Estonia, where the system for forecasting labour market needs and matching them with training provision is still in the early phases of development, tighter cooperation between the relevant ministries and research institutions will be essential. It will be particularly useful to find ways to introduce a skills component into forecasts, so that they can feed into the mapping of skills and qualifications which is also currently underway.

In France, it is recommended that 'Forward studies contracts' ('CEPs') become mandatory for each sector, to ensure a full coverage of anticipated skills needs throughout the economy.

In Germany, it is recommended that the econometric approach should not be extended, as this appears to be overly deterministic. In contrast, a strategic approach is required which regards education and training as the infrastructure upon which economic growth will be built. A flexible education and training system is required, with a key role for lifelong learning that helps adjust the match of skills to the short-term requirements of the economy.

As regards methods of skills need forecasting, the Greek experience shows that precise information cannot be obtained by purely quantitative measurements at the macro level and that the use of enterprise surveys is indispensable.

In Poland, the reintroduction of the previous forecasting system, and its subsequent improvement, should be a priority activity to improve the capacity to anticipate labour market and skills needs in the country. In each Polish region, a regional team for labour demand forecasting should be established. Its role would be to enrich the national quantitative forecasts by qualitative data and expert knowledge, taking into consideration the characteristics of the region.

In Romania, it is recommended that the Ministry of Labour (under whose responsibility the management authority for the SOP HRD operates) is more involved in the forecasting exercises. The Ministry should strive to forge a partnership between its agencies so as to unleash and use the funds available under the SOP HRD and develop the much-needed forecasting tools.

In Sweden, some improvement in the reliability of long-term forecasting could be achieved by taking account of external factors when forecasting labour supply. Business surveys conducted exhibit the usual shortcomings associated with employer surveys, in particular, the risk of myopic behaviour, with employers having a tendency to ground their assessment in the current situation and not on future skill needs. Other potential drawbacks is that terms such as 'shortages' and 'mismatches' are subject to varying interpretation. In addition, a short-term forecast generally does not take into account demographic developments, flows within and from the education system, and macroeconomic trends.

In the UK, there is scope for enhancing the depth and output of forecasting activity, so that more detailed sector forecasts can be made (to three-digit SIC at least), offering a closer fit with the sector coverage of many SSCs.

For Turkey, a good starting point would be to produce a pilot occupational outlook study by ISKUR (the Public Employment Service), based on methodologies used in other countries. Such a study could eventually become a regular output of ISKUR, while particular emphasis would need to be made on identifying future skills needs for highly skilled people.

In Norway, the main challenge is to develop better forecasting methods for the demand side of the labour market, including substitution possibilities between different types of labour and different types of education in different sectors and types of job.

Annex: The main existing instruments for forecasting labour market and skills requirements

Country	Title of instrument	Timing and periodicity	Base data collection	Sample size (for surveys)	Detail of forecast method
Belgium	Hermes model used by the Federal Planning Bureau	Medium-term forecasts	Macro-sectoral Hermes model	n/a	
Belgium	Employer survey 'Skills for the future'	Forecasts for 2015	Survey among employers in the technology industry	Technology industry at national level	Survey of skills shortages
Bulgaria	Enterprise survey	Medium term horizon	Survey of employers	2 000 enterprises, nationally representative sample	16 economic sectors, 5 occupational groups
Czech Republic	Forecasts of the Institute of Education Policy (SVP)	10-year forecasts	The approach uses LFS data and compares the evolution of industry and occupational structure of employment in EU/US to that in the Czech Republic and takes the age structure and qualification requirements into account to generate forecasts.	n/a	The detailed methodology used by SVP is yet to be published
Czech Republic	Forecasts by CERGE-EI/RILSA/NVF	Long-term	The approach combines employment-age structure information from the LFS with education-system production data and with information on the skills structure of the short-term unemployed	n/a	This quantitative approach draws on the 'Dutch methodology' developed by the ROA Institute
Denmark	Forecasts of the Economic Council of the Labour Movement	10-year horizon	Thus, they are dependent on assessments of flows through the educational system and on the demand for labour by skills, which in turn reflects estimates of the skills demand by different economic sectors	n/a	Method is based on coupling quantitative models for the supply and demand for labour. Assumptions are made about the kind of substitution that will take place in case of imbalances.
Denmark	Forecasts of the Danish Institute of Governmental Research	10-year horizon, not regularly updated		n/a	Forecasts are by educational attainment and by regions
Denmark	Forecasts of the Ministry of Education (UNI-C Statistics and Analysis)	Both short-term (used for planning of public budgets over the next two to three years), but also with a longer time horizon (10 years or more)	A set of statistical databases for the educational system as a whole; quantitative forecasts related to education and the labour market	n/a	The forecasts are focused on the supply side of the labour market, but some modelling exercises also include forecasting future imbalances between the supply and demand for different kinds of labour
Denmark	Forecasts of the National Labour Market Authority and the Regional Labour Market Boards	Short-term horizon (six months to one year). The forecasting exercise is carried out twice a year.	Sources include a nationwide employer survey and unemployment statistics	n/a	Detailed assessments of labour demand divided by sectors and occupations (skills) and of imbalances between supply and demand. Labour market balances are distinguished between five degrees of imbalance for 1 500 types of occupations.

Country	Title of instrument	Timing and periodicity	Base data collection	Sample size (for surveys)	Detail of forecast method
Germany	IAB projections	Long-term	Based on the disaggregated macro model called Inforge which was developed by the Gesellschaft für wirtschaftliche Strukturforchung (GWS) at the University of Oldenburg. It is linked with the 'rest of the world' through the Ginfois model, which includes input-output and macro models for the OECD countries and other important trading partners of Germany.	n/a	This is a 'bottom-up' model with 59 sectors, which are linked through input-output matrices, and numerous behavioural equations. In addition to sectoral links, the model reflects all economic areas of consumption, investment, government expenditure etc.
Germany	KMK projections	Long-term	Total employment is estimated by an equation which uses GDP and population as the two explaining variables which both are exogenous. Estimates are based on long-term average rates of change. International dependencies and feedbacks from wages or unfilled vacancies are not considered. Variations of working time are also not included.	n/a	Based on trend extrapolation and applied to a range of skills-related variables, like occupations, formal training, field of study etc. Starts with the estimate of employment at the macro level and differentiates this on the basis of available statistics by sectors, occupations etc.
Germany	FreQueNz skills anticipation. FreQueNz is a network of research institutions		Data are collected in a databank and analysed in order to identify trends and develop recommendations	n/a	Qualitative method. Results are available for several branches e.g. logistics, facility management, retail trade etc.
Germany	Job vacancy surveys (by IAB in cooperation with Economix Research and Consulting)	The survey exists since 1989 and thus provides a long time-series for the indicators observed.	The main survey in the fourth quarter of every year provides a broad view on recruitment practices, labour shortages, and general business expectations. Moreover, the use of active labour market policy measures is surveyed.	8 000 to 15 000 local business and public administration units are surveyed quarterly. Based on two stratified samples for Western and Eastern Germany, representing all sectors and groups of the German economy.	The survey provides data for the total number of vacancies on the German labour market and their composition by branches, occupations and regions. Special projection methods were developed to estimate the total amount of vacancies.
Estonia	Forecasts of the Ministry of Economic Affairs and Communications	Long term forecasts carried out every year	Inputs from the Estonian macroeconomic model (Hermin) with data from the LFS, Estonian Tax and Customs board and employer organisations		Forecasts broken down by 34 sectors, five occupational groups and three educational levels.
Ireland	FAS/ESRI Manpower Forecasting Studies	Medium-term; updated regularly	Macroeconomic model	n/a	The forecasts usually involve some 20 sectoral categories, over 40 occupational groups and five broad educational levels. The occupational classification contains a fairly comprehensive range of high, medium and low skill activities.
Ireland	EGFSN forecasts of labour supply	Long-term; one-off exercise		n/a	Involves compiling forecast estimates, for different educational levels, of the flows from the educational system, and estimates of labour supply due to immigration and re-entries to the labour force.
Greece	Employment Observatory (PAEP) econometric forecasts	Annual	LFS data, national accounts, demographic and macroeconomic data	n/a	Estimations of labour demand and supply by occupation, sector of economic activity and educational level at the national level and at the level of the regions (13 in total)
Greece	Employment Observatory (PAEP) survey of enterprises	2003, repeated in 2007 (on smaller scale)	Survey of enterprises of all sizes, regions and sectors of economic activity	Survey of 7 336 private companies; 80 in-depth interviews	Estimations of labour force needs are done by occupation, region, size of firm and sector of economic activity

Country	Title of instrument	Timing and periodicity	Base data collection	Sample size (for surveys)	Detail of forecast method
Spain	Studies of the Observatory for Occupations (belonging to the National Institute of Employment)	Regular studies, short and medium term	Comparative analysis of the official data on signed contracts and job demands from the regional employment services	n/a	Regional level analysis, ISCO four-digit breakdown, the information is disaggregated by type of contract, gender, age, nationality and disability
France	GPEC 'Prospective management of jobs and skills' (Gestion prévisionnelle des emplois et des compétences)	Short term	Territorial and sectoral scope	n/a	GPEC is an object of social dialogue and negotiation, and its core is the forecasting based on an in-depth analysis of the external economic environment and the enterprise strategy
France	CEPs — 'Forward studies contracts' (Contrats d'études prospectives)	Five year horizon	Territorial and sectoral scope	n/a	Allows regions or companies or occupational groups to receive state financial support to anticipate skills needs and implement measures to meet them
France	Regional Observatories of Employment and Training (OREF) and Sectoral Observatories (OPMQ)	Depends on each study	The observatories lead forecasting studies in order to foresee the needs in skills and vocational training of enterprises, at regional level (OREF) or sectoral level (OPMQ)	n/a	Regional and sectoral forecasts are made
Italy	National System for the Permanent Observation of Employment Needs. The system consists of several forecasting activities, each described below.				
Italy	Periodic surveys conducted by the social partners	Periodic	Survey of employers		Data is available by sector and profession
Italy	Excelsior survey	Yearly since 1997	Survey of employers through computer-assisted telephone interviewing (CATI) (for firms with fewer than 250 employees) and direct interviews (for firms with more than 250 employees)	100 000 firms in 2007	Information on labour demand is provided following ISCO-88 (at three-digit level) and ISTAT 2001 (at four-digit level) classifications
Italy	ISFOL econometric method	Medium-term (five years)	Econometric method	n/a	Forecasting of employment flows by sector and profession in the medium term (five years)
Italy	Ministry of Economy econometric method	Medium-term	Estimates of sectoral and regional economic trends in the medium term	n/a	Sectoral and regional trends
Cyprus	HRDA annual forecasts	Annual forecasts	Qualitative information provided by survey respondents	Social partners, district labour offices and the Cyprus Tourism Organisation are surveyed	Skills needs required for particular professions by district
Cyprus	HRDA long-term forecasts	10-year forecasts are conducted regularly while studies for specific sectors or occupations are conducted on an ad hoc basis	Method involves forecasting linked variables in several stages, using historical data from 2000–06 to predict values of variables for 2007–18	n/a	Sectoral breakdown in three broad areas, then 17 main sectors and 32 second-level sectors, from which 43 finer sectors are selected. Occupational categories involve three broad areas, 10 main occupational categories, 25 second-level categories of occupations, 85 occupations at the third level of analysis and 147 occupations at the fourth level of analysis.
Latvia	Dynamic Optimisation Model	Began in 2008	To identify problems in the labour market in the medium run and develop solutions by adjusting education and social policies	n/a	Uses existing data about the demographic and labour market situation as well as the estimated economic and demographic conditions

Country	Title of instrument	Timing and periodicity	Base data collection	Sample size (for surveys)	Detail of forecast method
Latvia	Employer survey	Every year	Employer responses to survey on their short-term needs		Employers' demand for labour and early identification of skills required
Lithuania	Medium-term forecasting model	Currently under development	Methodology for skills requirements on the labour market	n/a	National breakdown of skills and qualification demand on the labour market
Lithuania	Forecasting changes by economic sector	Currently under development	Inform of changes and developments in economic sectors	n/a	Sectoral breakdown of economic changes and skill requirements
Luxembourg	'Qualifications of tomorrow' survey	Updated every two years since 1997	To guide young people to professions that meet labour market needs and to supply information to public authorities	Industrial and ICT sectors (members of FEDIL, CLC and ABBL)	Sectoral information on skill requirements; information to professionals and public authorities to ensure adequacy between education and labour market needs
Luxembourg	Permanent committee of labour and employment (PCLÉ)	Began in 2007	Examines the employment and unemployment situation, working conditions, security as well as workers' health	n/a	Could formulate recommendations in order to bring closer the job supply and demand as well as to reduce inadequacies on the labour market
Luxembourg	Competitiveness observatory	Established in 2003	National and international data on competitiveness	n/a	Collection of national and international data on economic competitiveness; undertakes and adds information on international research on competitiveness
Hungary	Employer survey	Annually (since 2006)	Inform developments of the labour market	7 000 business executives	Labour market demands over the next year, details on composition of labour required; translated into actual numbers
Malta	National Statistical Office (labour market statistics)	Short-term	Labour market statistics and employment-related administrative information	Various, dependent on a survey. For example, the 'Labour force survey' is based on a random sample of 3 200 private households	Various, depending on a particular study
Malta	Surveys of employers	Quarterly and monthly	Survey of employers about short-term employment needs	Selected sample of employers	Sectoral trends
Netherlands	CWI labour market forecasts	Annual, short-term forecasts	Labour market statistics	n/a	Focuses on national developments and particular sectors, regions, education levels and branches
Netherlands	ROA forecasts	Bi-annual publication, forecasts for next five years	The forecasts encompass expansion demand as well as replacement demand. An indication of future labour market prospects for newcomers to the labour market is calculated, for each type of education, by comparing the expected flows of demand and supply, and surplus as well as identifying 'shortage' education categories.	n/a	The labour market developments are differentiated by about 127 groups of occupations and 102 types of education
Netherlands	OSA Labour supply and demand panel	Every two years	Survey		
Austria	Short and medium term model-based projections commissioned by the PES	Regular intervals	Model-based projections	National and regional level	Quantitative short-term and medium-term model-based projections on national or regional level

Country	Title of instrument	Timing and periodicity	Base data collection	Sample size (for surveys)	Detail of forecast method
Austria	Employer surveys by the PES	Ad hoc	Employer survey	Varies. Recent survey covered 7 200 employers	Breakdown by sector and occupation
Austria	Skills barometer of the PES	Updated every six months; forecasts for four years	Skill demand is observed through monitoring vacancies published in the media, reported to the PES, complemented by expert opinions; studies and scientific literature	n/a	Information on short and medium term trends on the labour market and information on developments in skill requirements
Poland	'Labour demand forecasting system' (System Prognozowania Popytu na Pracę — SPPP)	SPPP was launched in November 2004, and was updated regularly and used for labour demand forecasting up to March 2006. When the Government Centre for Strategic Studies was liquidated, the SPPP website closed down and its future is uncertain.	The system was based on a data bank supplied with data from CSO, the OECD, and a macroeconomic 'W' series models data bank developed at the University of Lodz	n/a	SPPP was meant to be an IT system generating labour demand forecasts based on a database updated systematically. The method allowed forecasting, quarterly, by various sections (vocational groups, gender, education, sectors, provinces, etc.), using various statistical methods.
Portugal	Employment and Vocational Training Observatory	n/a	Monitoring of labour market and employment policies	n/a	Monitoring of labour market and employment policies; contribution to framework of anticipation of labour market and skill needs
Portugal	Cabinet of Strategy — Evaluation and International Relations	n/a	Collection of data and information related to tertiary education	n/a	Definition of policies in tertiary education, twice yearly report on unemployment by scientific sector
Romania	National Labour Research Institute	Carried out on an ad hoc basis	Information on job generation provided by survey respondents and statistical data series provided by the National Statistics Institute	Representative sample of 2 400 companies (10+ employees), selected from seven out of the country's eight development regions. Complemented by non-representative survey of 244 enterprises with fewer than 10 employees. The capital region of Bucharest is excluded.	The method is an amalgamation between a statistical field investigation conducted among enterprises, the use of classic production functions (Cobb-Douglas) and trend equations; all consolidated by the partial use of the Macbeth model. Three forecasting scenarios are explored.
Slovenia	'Employment forecast' report	Annual	Reports by employers on their anticipated needs for workers and possible redundant workers for the whole year	n/a	
Slovenia	'Forecast of economic trends' by the Institute of Macroeconomic Analysis and Development	Twice a year, short-term predictions	Macroeconomic and labour market statistics	n/a	
Slovakia	Macroeconomic forecasts		Includes forecasts of main labour market indicators (employment, unemployment rate, and wages)	n/a	Short-term and medium-term forecasts of macroeconomic developments with the use of an own model

Country	Title of instrument	Timing and periodicity	Base data collection	Sample size (for surveys)	Detail of forecast method
Slovakia	Business tendency survey	Short-term (three months) prediction of expected trends, including employment.	Short-term skill demand of employers in four branches of the Slovakian economy	Employers in all four branches of the economy (industry, construction, retail trade and selected services)	Economy is divided into 12 sectors and a total of 48 sub-sectors
Finland	PT model	Updated every three to four years	Population forecasts and target employment	n/a	Detailed projections of labour market supply, demand and the mismatch between them. The employed are divided into 40 industry sectors for which assumptions are made regarding the distribution among 100 educational groups.
Sweden	Statistics Sweden 'Trends and forecasts' reports	Published since 1970s, focus on long-term forecasting	Cohort analysis and econometric model	n/a	Assessment about the potential mismatches between the supply and demand for education by educational groups
Sweden	Statistics Sweden 'Education and work' reports	Medium-term forecasting	Cohort analysis and econometric model	n/a	The survey covers around 70 different educational and training categories of which 56 are higher education programmes
Sweden	Statistics Sweden — 'Labour market tendency survey'	Short-term forecasts	Employer survey	Sample of firms whose employees represent those educational groups that are considered most relevant and interesting.	The annual report presents the expected change in the number of employed by occupation/branch as well as a shortage index
Sweden	Labour Market Authority reports 'Where are the jobs?'	Short-term forecasts	Questionnaires sent to a sample of firms	12 500 employers, carried out at the regional level	Focus on discussions about trends, developments and forecasts for different industries and sectors
Sweden	Labour Market Authority 'Labour market outlook' report	Short-term forecasts	Employer surveys; internal studies and statistics	n/a	Firms are questioned concerning their output, new orders, employment, labour shortage, the situation on labour demand and skill needs
Sweden	The National Institute of Economic Research — 'Business tendency survey'	Short-term forecasts	Employer surveys on monthly and quarterly basis	Firm survey (at least 3 000 firms)	Sectoral and geographical breakdown (UK and home country overviews, 67 sectors, 47 LSC operational areas, counties and regions); occupational requirements for new and replacement demand
UK	'Working futures' data	10-year horizon, updated every two years since 2006	Multi-sectoral dynamic model of the UK economy	n/a	Register of employer needs, accredited informal education courses
Croatia	'Youth forum' (Forum mladih)	Under development	Employment register of employer needs and standard EU learning outcomes	n/a	Various, depending on study
Norway	Forecasting studies	Starting in late 1970s	Multi-sectoral growth model	n/a	Sectoral breakdown
Norway	ECON Analysis model	Developed in 1990s	A model with substitution possibilities in each sector and market clearing by means of wage adjustments by type of labour force		Future supply and demand of labour by level of education
Norway	Statistics Norway forecasting	Started in 1990s, discontinued in 2001, renewed in 2007 (trends to 2020)	Based on a Mosart model on the supply side and on the demand side, assumption of contemporary trends in the educational structure in most of the sectors	n/a	

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