Introduction

In this short statement I will present some indicators of labour market conditions, educational behaviour, and demographic trends, which may be relevant for the motivation to invest in forecasting of skill and labour market needs. Political decision makers might have less incentive to pay for a forecast identifying shortages of labour market supply if unemployment grows, high immigration and rising labour force participation add to labour supply, and both trends are expected to continue at least for the next few years.

In the second part I will mention some activities in forecasting skill and labour market needs undertaken by different institutions in Austria. This will lead me to the conclusion that one major shortcoming regarding the transferability of the Finnish approach is a lack in coordination and co-operation between labour market and educational policy and the institutions involved.

In the third part I will mention one forecasting approach which is quite similar to that applied in Finland, although it may be less sophisticated, at least in its utilisation for planning educational provision.

I will conclude by assessing next steps that could improve the strategies to meet skill and labour market needs in Austria and what can be learned from the strategy in Finland.

1. Some economic and demographic trends

Austria is among the European countries with the lowest rate of unemployment. In spite of that, unemployment grew considerably during the last decades and especially since 2000, from 3.6% reaching a maximum of 5.2% in 2005 according to Eurostat (from 5.8% to 7.2% according to the ‘national Definition’). One of the groups with the sharpest increase in unemployment is that of young workers below the age of 25 years (see figure 1). Young labour market entrants in general have experienced decreasing job stability and increasing risk of getting unemployed during the last two decades in Austria (Mahringer, 2005).
The main reasons for growing unemployment are the weak growth of the economy and employment and an unexpectedly high increase in labour supply. The latter is mainly caused by strong immigration flows (see figure 2), due above all to family reunification (see Biffl 2005), but also by slightly higher participation rates of women and older workers.

As the host country government paper (Saijets, Tiainen, Kangaspunta, Mäenpää, Kimari, Hanhijoki, 2006) points out for Finland, the forecasted population developments were too low during the last years, because immigration was higher than expected. For the same reason, also in Austria the turn from a growing to a shrinking population in the employment age (15 to 64 years) has steadily been shifted to the farther future and is now expected to take place around 2018 (see figure 4).\(^1\)

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\(^1\) The working age population between 15 and 59, which is actually more relevant given the low employment rates of older workers in Austria, is expected to shrink from 2014 onwards.
Labour force participation of older workers is extremely low in Austria (around 30 percent in the age group 55 to 64, see figure 3), following labour supply reducing policies of early retirement. Now there are first steps undertaken on the legal level to increase incentives for staying employed until the regular retirement age of 65 for men and 60 for women.

Figure 3: Labour force participation by age-groups in Austria 1990 - 2005

Due to growing and from the Austrian perspective high rates of unemployment combined with the perspective of a growing labour supply, the topic of labour shortages is not very burning in the Austrian political discussion. But low rates of population with tertiary education (see figure 5), low educational levels of most immigrants in Austria and low activation potential among people with high education would justify more attention to the development of supply and demand relations on the labour market. Even more so, since there are significant problems integrating young workers who prefer to follow a dual educational path into the apprenticeship system rather than a pure school education. In spite of rising subsidies many firms are reluctant to provide places for apprentices, especially in the more dynamic segments of the labour market.
Figure 4: Population development and population forecasts for Austria 1980 - 2025

Source: Statistic Austria

Figure 5: Population of the age group 25 to 64 years that has attained tertiary education in 2003

2. Anticipation approaches in Austria

In Austria there is no system of anticipation of skill needs and long term employment forecasts at government level comparable to the Finnish approach. One important reason for that might be the lower level of cooperation between the Ministry of Economics and Labour and the Ministry for Education, Science and Culture in this field. The establishment of a stable cooperation between these institutions seems to be one of the major achievements of Finland. As could be expected, educational policy-makers use anticipation methods for their planning activity (e.g. Landler, Dell'Mour, 2002). For instance, in order to receive accreditation the advanced technical colleges have to present evidence of sufficient demand for their graduates. However, there is no systematic link to forecasting models for labour market needs. Although methods for anticipation of labour skill needs are increasingly discussed within the Ministry for Education, Science and Culture (e.g. BMBWK, 2001) no concrete steps are undertaken to build up forecasting tools comparable to those in Finland.

Activities in anticipation of skill and labour market needs in Austria stem rather from the information requirements of active labour market policy and career guidance than from educational planning. Consequently the public employment service (AMS) and social partner institutions commission most of the forecasting projects carried out.

Following the typology presented by Wilson (2005) at the CEDEFOP ‘Feasibility workshop on European skill need forecasting’, I find quite recent examples for every type of anticipation method in Austria.

- Formal, quantitative, model based projections
- Ad hoc sectoral or occupational studies
- Surveys of employers or other groups
- Focus groups, round tables and other ‘Delphi style’ methods

Since the Finnish approach belongs to the model based type of forecasts, I will focus on similar approaches in Austria. Since there are other important methods in use, I will also mention some of these, not least because they could be complements to quantitative model based forecasting methods.

2.1 Quantitative, model based longer term projections

The public employment service commissioned a number of labour demand forecasting projects over the years: Based on a sectoral macroeconomic model and a shift share analysis of employment by occupation using industry-occupation matrixes Biffl and Kratena (2001) or Lassnigg, Prenner and Steiner (1997) presented employment forecasts by industries, occupations and educational levels.

This approach was followed by a regional forecasting model commissioned by the Chamber of Labour in ‘Upper Austria’ (one of the 9 Austrian federal regions). Based on a national and a regional macroeconomic model sectoral employment was forecasted. In addition, the occupational structure within the sectors was modelled using a combination of regression analysis, estimations of further restrictions to the employment in occupations, and statistical balancing methods to receive consistent results (see Huemer, Mahringer and Streicher, 2002). This method went further than the earlier approaches in modelling occupational change. In addition, the forecast of the demand side was recently supplemented by a forecast of labour supply (Bock-Schappelwein, Huemer, Mahringer, Steiner, 2006).

This forecasting method, which is currently probably the most similar to the Finnish approach in Austria, will be sketched in the next chapter. This approach is also being applied at the national level, on commission of the
public employment service Austria (AMS). The first run of the demand-side forecast has already been published (Huber, Huemer, Kratena, Mahringer, 2006).

2.2 Other types of anticipation methods

The public employment service (AMS) also uses other types of anticipation methods: A mixed but mainly qualitative anticipation approach called ‘prospect’ was carried out for some Austrian regions, one for instance as ESF Objective-3 project for further development of preventive labour market policy. A mix of different methods including expert and employer interviews, and the collection of quantitative evidence about the relevant region is used for a qualitative assessment of labour market needs. The regional focus and the cooperation with institutions directly involved in the implementation of training programs are further features of this approach (see e.g. Hausegger, Weber, 2003).

The public employment service also runs an information source called ‘qualification barometer’ that makes use of a detailed collection and classification of vacancy advertisements, vacancies registered at the public employment service, expert judgements and results of relevant studies. Results are available on the internet for use as occupational guidance (e.g. Archan, Kargl, Markowitsch (2004, 2005) or Hofstätter, Sturm (2005)).

Walterskirchen (2002) uses a more ‘ad hoc’ approach for an assessment of shortages of skilled labour based on quantitative evidence of regional and national labour market conditions, occupational and educational structures of employment and unemployment, and demographic change.

A kind of identification strategy of skill needs at firm level is also the combination of subsidies for training for certain groups of employees with the duty to provide a formal ‘qualification plan’ for the personnel. This type of active labour market measures is offered by the public employment service and is co-financed by the ESF. Information from the qualification plans may provide insight into needs for further vocational training.

Of course there are a number of other studies in that field which examine specific industries or occupations or which carry out sectoral or occupational employment projections, both at the regional and at the national level (e.g. Alteneder, Städtner, Wagner-Pinter, 2006 or Kurzmann, Streicher, Zakarias, 2005).

3. Forecasting methods for skill and labour market needs: an example from Austria

The example of a longer term anticipation strategy for skill and labour market needs which I will sketch in the following chapter is the result of collaboration between three Austrian research institutes and the Chamber of Labour in Upper Austria, who initiated and commissioned this work. In 1999 a first feasibility study was carried out.

3.1 Demand-side forecast

In 2002 a first demand-side forecast for roughly 30 industries and 60 occupations was presented (Fritz et al., 2002). The sectoral forecast was based on a regional econometric input-output model, which was built up for

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2 http://bis.ams.or.at/qualibarometer/berufsbereiche.php
3 The Austrian Institute of Economic Research (WIFO), the research group ‘equi’ within the Institute of Advanced Studies and the Institute of Technology and Regional Policy at Joanneum Research.
that purpose. This ‘top-down’ modelling strategy needed inputs from the national level, which came from a sectoral model for Austria (see Kratena, Zakarias, 2001). The industries were classified using combinations of 2-digit NACE codes. The forecast was also presented in a gender-specific scenario. Data requirements were high; some information had even to be gathered through firm interviews (e.g. inter-regional trade with production inputs).

The forecast of demand by occupation models the change of the occupational composition of employment in each industry. Thus, a 30x60 matrix has to be forecasted. This is done in a first step by outlier-consistent trend regressions. In a second step restrictions of the employment development for each occupation are constructed. These can be taken from other studies, if available, from trend regressions for employment in each occupation, or from estimations of other determinants of occupational employment (e.g. of the number of pupils for the demand for teachers). Each cell estimate and each restriction is weighted by its standard error and consistency is achieved by a statistical balancing method. The resulting matrix of forecasted shares of occupations within each industry is multiplied by the vector of employment demand by industry to receive forecasts by occupation. Occupations are classified as combinations of ISCO 3-digits, which can still be aggregated to 2-digits or the underlying skill levels. The most important data-source is the quarterly Microcensus (which includes the LFS). For different reasons this data source has severe problems and incompatibilities with other data sources. Even after allowing for the best possible corrections, these data problems have to be kept in mind when it comes to interpreting the results.

3.2 Supply-side forecast

While the demand-side forecasts are classified by industry, occupation and gender, the supply side forecasts are classified by education, age and gender. Using a very broad concept of supply the forecast looks at the working-age population not in education. Start point for the forecast is the year of the most recent National Census, 2001. The extrapolation of the population has to take into account the natural movements from and to the working age (15-64), death, as well as migration.

The labour supply loss is determined by the population leaving the working age, dying or emigrating, and can be classified by education, 4 age-groups and gender. Aging can be extrapolated from the census-data, while migration scenarios are taken with slight adaptations from the statistical office (Statistik Austria).

The inflow of new labour supply is determined on the one hand by immigrants (and their educational levels), and on the other hand by school leavers (and others completing an educational path). The inflow of people completing their education is estimated in an own forecasting module based on school and university data (also by education, 4 age-groups and gender).

Educational attainments are classified in 60 groups with respect to the Austrian educational system.

3.3 Comparison between supply and demand side forecasts

Since the supply-side forecast focuses on educational levels and the demand-side forecasts on occupations, a relation between occupations and educational attainments has to be established in order to compare them. The Austrian educational system strongly relies on vocational forms of education (apprenticeship, vocational oriented schools). But in spite of that the relation between education and occupation is weak. On the one hand this shows that there is a range of employment possibilities accessible with certain educational attainments,

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4 People in education are only those not working in parallel.
but on the other hand this weak relation has to be taken into account when trying to interpret over- or under-supply.

- Therefore, the comparison starts from the empirical relation between education and occupation as it was in the year 2001 (‘translation matrix’ between educational attainments and occupations).
- Modifications are made for changes in this relation over time and generations.
- The interpretation is restricted to an ordinal scale of reduction or rise in supply compared to the development of demand.

The comparison is made on the one hand looking at the educational perspective, where the need for a rise or reduction in the employment rates by educational attainment necessary for the correspondence of supply and demand is made for each of the 60 educational groups (see figure 6). On the other hand an occupational view is presented, which compares the demand and supply of employment by occupations given a plausible trend in employment rates (see figure 7). In both views corrections for systematic differences between the underlying data-sources (Census and Micro census) have to be made.

The forecasting period is currently six years (2004 to 2010) but it could be extended up to 10 to 15 years using the same model infrastructure.

Figure 6: Comparison of supply-side and demand-side forecasts – Educational view

Source: WIFO.

5 Plausible employment rates are estimated separately for age-groups and by gender.
Results present a detailed picture of changes in labour market supply-demand proportions over a period long enough for policy reaction. Given the data restrictions and the expected inexactness of the estimates, results of the comparison of supply and demand are not published as numbers but as categories.

4. Conclusions on transferability

From the methodical point of view the Finnish system of forecasting skill and labour market needs is quite similar to the Austrian one, although it goes clearly beyond it with regard to completeness and comprehensiveness. However, in Austria no implementation structures similar to the Finnish ones are currently in sight. Therefore, it is probably more promising to further enhance and integrate the existing useful tools which are more focused on labour market policy and occupational guidance than on the anticipation of educational needs.

At the same time a co-operation of the involved institutions (e.g. the public employment service (AMS), the social partners, the Ministry of Economics and Labour) could be built in order to avoid redundancies, overcome the institutional fragmentation and to bundle resources (see also Lassnigg, 2001). There is also scope for further enhancement of the existing quantitative anticipation methods, e.g.:

- consistent regional forecasts,
- integration of a supply side forecast at the national level,
- additional or better sources of accessible data (e.g. working time and education of employed population),
- integration of quantitative forecasting results in the policy planning processes and in (more qualitative oriented but more user-friendly designed) information sources. Here the results in Finland show clearly that quantitative results are relevant and of direct use to policy planning; a circumstance that is often called into question in Austria (see Markovitsch, 2001)
A more elaborated anticipation of educational needs can only be established in accordance with educational planning requirements. Here Finland and countries like the Netherlands provide examples of an extensive and direct utilisation of quantitative forecasts for educational planning.
References


