

**Investigating the Use of
Regional Economic
Forecasting Models in
Wales**

London Economics

**Executive Summary of
Report Prepared**

for

**the Future Skills Wales
(FSW) Partnership**

The Future Skills Wales Partnership

In 1998, the Future Skills Wales (FSW) research project was undertaken in order to establish the current and future skills needs throughout Wales. A strategic partnership, representing a wide cross-section of public and private sector organisations, was created to guide and support the research activity.

The Partnership currently includes the National Assembly for Wales, the Welsh Development Agency, ELWa, the Welsh Local Government Association, Careers Wales, the Secondary Heads Association, ACCAC, Cyngor NTO Cymru, the Local Government Data Unit, Fforwm, ESTYN, Wales Council for Voluntary Action, CBI Wales, the Employment Service, the Federation of Small Businesses, DYSG, and Wales TUC.

The Future Skills Wales (FSW) Partnership provides a national infrastructure through which truly collaborative research can be undertaken in support of skills development in Wales.

<http://www.futureskillswales.com>



Executive Summary

The Future Skills Wales (FSW) Partnership commissioned London Economics to examine their use of regional forecasts and regional forecasting models, and make recommendations on how they could individually and collectively derive greater benefits from their forecasting related activities. In addition, London Economics was asked to assess how the forecasts produced or used by the Partners could be used in a skills needs projection exercise by the Future Skills Wales Partners.

In response to the terms of reference of the assignment, we first surveyed the current literature by academics and practitioners on the issue of occupational and skills forecasting. We then examined the issue of the quality of the regional data used in regional economic forecasts available for Wales.

Next, we focused on the structure and properties of the regional models and the forecasting performance of the three regional forecasting services producing regular economic forecasts for Wales and the other major regions of the UK, namely, in alphabetical order, Business Strategies Limited (BSL), Cambridge Econometrics (CE) and Oxford Economic Forecasting/Northern Ireland Economic Research Centre (OEF).

We interviewed a number of representatives from the FSW Partners and other institutions. These interviews focused mainly on the issues of regional economic forecasting and skills projections.

Finally, on the basis of the observations and conclusions drawn from the various research blocks described above, we offer a number of recommendations on how FSW Partners could derive greater benefits from their current forecast-related activities, and highlight a number of key issues to consider in preparing for the next skills assessment in Wales.

Chapters Summary

London Economics is submitting this report to the FSW Partners which includes the following chapters:

Skills Forecasting: Theory and Practice

The review of the literature and actual practice of skills forecasting shows that one needs to be mindful of a number key issues and pitfalls:

First, the underlying labour market projections need to be based firmly on sound macro-economic projections, concerning how the economy as a whole is evolving, both cyclically and structurally.

Second, skills forecasts are typically proxied by occupational projections. These forecasts perform reasonably well in capturing occupational change, and can be usefully extended into forecasts of qualifications and of job opportunities. The real issue is whether occupational forecasts are successful at picking up changing skill requirements.

- In the past, the distinction between occupations and skills has been less clear, and there is some evidence that roughly only half of all changes in skill requirements are associated with occupational change. This is due to the fact that the skills content of many occupations changes rapidly.
- Recent trends reveal that aggregate changes in skills requirements are due more to changes in skills demanded within occupations than to new, highly skilled occupations, driving out old, less skilled occupations.

Third, net changes in occupational employment are only one indicator of future demand for skills. Another measure, which is equally important for assessing education and training needs, is the replacement demand needed to offset outflows due to retirements, occupational mobility, etc.

- In particular, a robust skills forecast needs to take account not only of the skills needed in growth industries, but must also consider the needs of stagnant and declining industries where high employee turnover may result in substantial re-training requirements.
- The bottom line is that a robust skills forecast must focus on the issue of gross employment changes by occupation rather than net changes in employment.

Fourth, on the labour supply side, at a minimum, demographic changes such as death and migration need to be taken into account, in addition to changes in activity rates (such as retirement and other exits from the workforce).

- New entrants, migration, re-entrants to the workforce, as well as inter-occupational mobility constitute other flows in the supply of skilled workers.
- In addition, skills projections should take account of the likely responses of the labour force to various skill scarcity signals. If the long-term projections were to ignore the spontaneous take up of specific skills (through schooling, adult education or training) and were to project the current skill mix into the future, the supply of skills will likely be grossly miscalculated and could lead to seriously misleading conclusions about likely future skill imbalances.

Fifth, knowledge of the changing demand for qualifications can be very useful within an educational planning context. However, it is less clear whether qualifications are a better measure of skills than occupations.

- In this regard, some models have been developed to generate projections of demand for and supply of qualifications taking into consideration the existing level of qualifications and skills.
- In particular, efforts have been made to identify generic and specific skills. Generic skills are a set of skills that are not precisely defined and often merge into personal attributes. Undoubtedly some generic skills, such as those associated with IT, have become increasingly important in recent years. Using a methodology similar to the one adopted to link the demand for qualifications to occupations, it is

possible to generate projections of generic skill needs from the basic occupational projections. The key additional input requirement is an estimate of the importance of the various generic skills within a given occupation.

- Projecting the demand for specific skills is much more complex as occupational change may be an unreliable predictor of required specific skills due to the changing skill content of various occupations.

Sixth, surveys of households' and employers' views and perceptions can provide additional information that can be used to either provide additional information and data for the projections and/or test the outputs of model-based skills forecasts.

- To the extent possible, in addition to targeted surveys aimed at generating additional data required for the skills projections, more comprehensive surveys seeking labour market participants' views of likely developments with regards to future skill requirements and availability should be undertaken in parallel with the model-based projection exercise to provide an independent source of information and validation to the users of skills-forecasts.
- That being said, while such surveys can provide valuable information, it is important to remember that responses in such surveys tend to be heavily influenced by current circumstances or those that are expected to prevail in the very near future. Therefore, some degree of caution is always advisable in using such surveys over longer time horizons.

Finally, it is important to stress that uncertainty prevails at each of the many steps involved in a skills forecasting exercise, namely economic activity forecasting, employment forecasting, occupational projections taking into account the dynamics of the labour market, skill requirement projections, labour supply and skill supply projections.

It is interesting to note here that the U.S. Bureau of Labor Statistics is of the view that any occupational forecast percentage error falling within the range of plus or minus 10% the actual outcome is reasonable and acceptable.

Some steps -- such as complementary surveys and the use of alternative scenarios -- can be taken to reduce somewhat the uncertainty, but cannot totally eliminate it.

Moreover, as the forecast error tends to increase with the level of spatial, industrial and occupational disaggregation, it is preferable to maintain the focus of any skills projection at a relatively high level of aggregation.

Regional Data Issues

- The quality of the regional data used in regional forecasts is often less than desirable. Frequent revisions and substantial publication lags mean that the true values of key economic variables at the starting point of the forecast are often uncertain. This can have a significant impact on the quality of the economic forecasts as the true state of the regional economy at the starting point of the forecast is known only very imperfectly.

- The uncertainty increases as one moves down from national, highly aggregated data to disaggregated regional and sub-regional data. Moreover, the degree of uncertainty is not eliminated entirely with successive releases of a given year's data.
- The data improvement process launched by the National Assembly for Wales should eventually contribute to alleviate some of the problems faced by regional forecasters. However, the reality is that over the foreseeable future these gains will most likely be limited. Over the short to medium-term future, the starting point of any forecast of the Welsh economy is likely to continue to be clouded by considerable uncertainty about the precise state of the economy.

Regional Economic Forecasting Models

Next, we examined the structure of the regional models used by the three forecasting services, focusing in particular on the interaction between the regional model and the national model, the determinants of the long-run equilibrium in the model and the availability of detailed employment and occupational data at the regional and sub-regional level.

None of the forecasting models provide for a full and effective bottom up approach to the regional forecasting exercise and each have different characteristics and different strengths and weaknesses. The OEF macro-economic model is well known in the UK and internationally for its embedded theoretical properties, but is based on a regional top-down approach. A richer regional texture is captured in the regional models of both BSL and CE but this comes at a cost of increased complexity and, especially in the latter case, very large data requirements.

- The model responses to standard economic shocks reported in this study do differ across models. But, they all fall within a plausible range and do not provide strong evidence in favour of one or the other model. The main conclusion one should draw from such a comparative model property exercise is that any precise model-based estimate of the response of the economy to a particular policy shock should always be viewed with some caution. As a protection against putting too much emphasis on a specific model result, it may be preferable to focus on scenarios rather than single projections or simulations.

In assessing any forecasting performance one should always remember the saying that the only certain thing about the future is that it is highly uncertain. Forecasts will be wrong almost by definition, as it is impossible for forecasters to capture all the unknowns that may impinge on the actual performance of the economy in the years ahead. The special regional data quality problems that confront regional forecasters in the UK only compound the forecast error risk.

Limited data availability prevents the completion of a thorough statistical assessment of the errors of the forecasts for the Welsh economy produced by the forecasting services. Nevertheless, a few general observations can be drawn from our analysis.

- First, the forecast errors tend to be larger at the Welsh level than at the national level.
 - Second, the forecast errors of employment growth tend to be larger than those for GDP growth.
 - Third, while the forecasting errors appear to be relatively large, ranging from 0.6% to 1.7% in the case of Welsh GDP growth, they are very similar to the forecasting errors of GDP growth for the G-7 countries by the IMF and the OECD.
- Does it mean that forecasts are useless? In our view, the answer is that they can have a value as an input to a coherent framework for organising one's thinking about the future. However, less attention should be paid to the precise point estimates shown in the forecasts for the various economic indicators and more attention should be given to the intuition behind the forecast. This would be particularly the case when the forecast changes substantially from one projection to the next. In-depth discussions with forecast providers would be most useful in that regard.

Results of Interviews

We conducted a number of interviews with a number of officers from the FSW Partners, and from other institutions in Wales or outside Wales that focus on regional economic development or skills forecasting.

The key issues raised during the interviews were the problems with the quality of the data, the limited scope for regional information to be incorporated into the regional forecasts, and the need for a good skills assessment.

Officers of the FSW Partners noted as well that they wished to obtain greater value from their current forecasting-related activities.

Representatives of the forecasting services were very happy to contribute to the project and noted that they i) are also concerned about the quality of the regional data, ii) strive to take account of region-specific information within the constraints imposed by the modelling structure adopted and iii) would be pleased to meet regularly key Welsh clients to discuss the forecast and articulate the intuition behind the projection. All indicated that such meetings would also be a valuable opportunity for them to gain additional insights into regional economic developments.

Potential Use of Existing Forecasts for Skills Projection

All the off-the-shelf forecasts could be used as a building block for a skills projection, but significantly more work would be required as they provide only an occupational or an employment forecast. The latter would have to be mapped into a skills projection and complemented by a comprehensive projection of the likely labour supply response.

Key Conclusion and Recommendations

The key conclusion from our report on the use of regional economic forecasting models is that any point estimates of expected GDP or employment growth are affected by a high degree of uncertainty. This is not specific to the forecasts for Wales but is a general characteristic of any economic forecast. However, what is particular to Wales, and the other regions of the United Kingdom, are the problems with the quality of the regional data which tends to be lower than that of the national data and which add to the forecast uncertainty by seriously clouding the starting point of the regional forecast. Unfortunately, the data quality problems worsen at the sub-regional level.

These factors lead one to conclude that:

1. In the context of the skills assessment that the FSW Partnership plans to undertake in 2003, analysts and policy-makers would be well advised to avoid the temptation of putting too much weight on specific forecast values of key variables of interest such as employment, occupations, etc., at the regional or sub-regional level;
2. Moreover, maintaining the skills assessment at a relatively aggregated level, in terms of occupations, skills and geographical space, will likely result in much more robust conclusions that will stand the test of time better than a very large and detailed assessment.

The key issue raised a number of times during the interviews is how the subscribers to the off-the-shelf forecasts could get more value from their investments. In particular, many expressed a strong desire to be able to go behind the published numbers and better understand the dynamics driving the forecast. In our view, the following two actions could go a long way towards meeting this objective:

- Regular inter-institution meetings between the partners could be held to review and assess forecasts; and,
- Forecast services could be invited to meet regularly (once or twice a year) with key forecast subscribers in Wales to review and explain the forecasts, and engage in an exchange on potential region-specific factors that would have to be taken into account in the regional forecast.

Some interviewees noted that it would be worthwhile to develop some local capacity, housed either in one of the Partner institutions or in an outside, possibly newly-created, body to produce regional forecasts that would allow for greater use of local knowledge. In our view,

- An assessment of potential benefits and costs (financial, human resources, etc.) of creating and maintaining a local modelling and forecasting capacity should be undertaken to inform the decision makers likely to be involved in this decision. In the general conclusions of this report we provide some tentative cost estimates of moving to an in-house forecasting capacity.

Many noted in the interviews that the next FSW exercise should be carefully prepared. In this regard we offer the following recommendations:

- There should be a clear understanding of the purpose of the skills assessment at the beginning of the exercise. Is the focus on the demand for skills or is it on skills gaps, i.e., the difference between the supply of and the demand for skills? The latter is a much more demanding objective as it requires projections of both the demand for skills and the supply of skills.
- Despite all the pitfalls associated with forecasting, consideration should be given to use again a regional employment and occupational forecast as one of the inputs into the next FSW exercise.
- However, as noted before, such a forecasting exercise should involve a number of scenarios to reflect the key uncertainties underlying the projections. For example, scenarios could be run for different economic growth and productivity assumptions - two key determinants of future employment.
- Moreover, to ensure that they provide useful information, such scenarios would need to be defined in close co-operation between the FSW Partners and the forecasting service.
- Given the uncertainty about precise occupational skill requirements for specific employment groups, it would be preferable to focus the projection exercise on generic skills or skills that are used in a number of occupations.
- While recognizing that there exists a need for sub-regional information on future skills demands and supplies, we would argue against using very detailed employment and occupational projections at a sub-regional level as they may not be very reliable.
- Careful consideration should be given to how occupations, skills and labour supply responses are modelled and projected by either the forecasting service or the in-house projection team.
- Consideration will need to be given to how optimally combine local-survey based information with the broader forecasting exercise. Such surveys can be used to generate data that are not otherwise available for the skills projections or as an external reality check of the model-based projections.