Annex

Summary of Overseas Case Studies of Manpower Forecasting
SUMMARY OF OVERSEAS CASE STUDIES OF MANPOWER FORECASTING

1.1 INTRODUCTION

In order to review the best overseas manpower forecasting practice, a number of case studies were undertaken in a broad range of countries plus the guidelines issued by the International Labour Organisation (ILO). These were:

- Australia
- The United Kingdom
- Belgium
- London
- Japan
- The United States
- the Netherlands
- New York
- Singapore
- ILO guidelines

The case studies were selected to provide a representative sample covering comparable economies, comparable cities and relevant regional competitors. A considerable amount of information was collected in the course of the case studies and detailed reports for each country have been presented in Annex B of the main report. However, a very brief summary of the results for each country case study are presented below. The aim of the summary is to briefly explain the approach adopted in each case study. The guidelines produced by the ILO have not been reported on as it transpired that they have been designed with developing countries in mind. They are therefore much less sophisticated than current practice in Hong Kong, and hence are of little use when attempting to improve upon existing forecasts in the SAR.

1.2 SUMMARY OF COUNTRY CASE STUDIES

1.2.1 Australia

Rationale for Selection

Australia was selected as a case study due to its open economy, high standards of governance and relatively high levels of migration. In addition, the Australian economy is service dominated, and heavily reliant upon the Asia Pacific region for exports.

Approach to Manpower Forecasting

Australia has a sophisticated approach to manpower forecasting. The models used in Australia are based on an econometric approach with two, the MONASH model and the MURPHY model, being the principal sources of manpower forecasts.
The MONASH model is funded by the Department of Employment, Education, Training and Youth Affairs (DEETYA) and produced by the Centre of Policy Studies at Monash University. The MONASH model itself is a detailed macro-economic model of the Australian economy that is used as the basis of the manpower forecasting process. A set of occupational and industry projections are produced every four years for DEETYA by the modelling team and cover employment (120 categories) and industry (112 categories).

The MURPHY model is the other leading macro-economic model in use in Australia. The model is developed and operated by a private sector consultancy (Econtech) and outputs are sold through subscription to private companies and federal and state governments. The MURPHY model produces employment forecast on a much more regular basis. For example, as part of its macro-economic forecasting service, Econtech produces employment estimates by industry (18 categories) and by state/territory (8) on a quarterly basis, and national forecast 8 times a year. In addition, twice a year Econtech produces national employment forecasts by detailed industry groups (158).

The Australian Bureau of Statistics also produces labour market forecasts detailing the size of the workforce broken down by gender and eight age groups. These are produced on a five yearly basis in order to take advantage of up to date census data. Other activities that are of relevance to manpower forecasting in Australia include:

- The TRYM model, used exclusively by commonwealth and state/territory treasury departments. TRYM is a macro-economic model of the Australian economy, and produces some high level outputs relating to the labour market, most notably total labour supply.

- The Department of Workplace Relations and Small Business Leading Indicator of employment. This indicator tracks six data series which, historically, have provided good indications of future (cyclical) employment patterns. The indicator tracks vehicle registrations, dwelling approvals, job advertisements, skilled vacancies, ABS reported vacancies and GDP.

Evaluation of Past Performance

Formal evaluations of past performance are not undertaken for either the MURPHY or MONASH models. However, past results have been found to be a good indicator of labour market trends. In addition, it is worth noting that:

- DEETYA has commissioned Monash University to provide manpower forecasts three times now, so is presumably satisfied with performance; and

- Econtech is a commercial organisation, and the continuing demand for its services would suggest satisfaction with model outputs by clients.
1.2.2 Belgium

Rationale for Selection

Belgium has a highly developed, free enterprise economy, with substantial cross border movements of goods and people. The country, with few raw materials on its own, requires substantial export revenues and is unusually reliant on trade performance for its economic well-being. Belgium is also dominated to an unusual extent by larger neighbouring economies (principally France and Germany).

Approach to Manpower Forecasting

Belgium is an interesting case study as the local approach to manpower forecasting focuses on short term vacancies, rather than medium to long term projections based on econometric models. The principal objective is to survey vacancies in order to highlight skills shortages and adjust training and educational provision accordingly. The surveys identify 20 “bottleneck” occupations and this data is then used to refocus training.

Longer term projections, such as those found for the majority of the case studies, do not seem to be produced at all on any regular basis. There is an econometric model of the Belgium economy that is operated by central Government. However, there appears to be very little use of this made for manpower forecasting. The only labour market data that are published relate to employment and unemployment, which are broken down by industry but not occupation.

Although this approach can certainly provide useful short-term data, one problem is that the majority of employment vacancies are not reported to state employment services (this is true across the industrialised world). There is therefore a question mark over whether the range of vacancies recorded, and the subsequent policy responses that are developed, are adequate.

Additionally, and from a broader perspective, the approach offers no insights into important longer term issues such as future occupational profiles and skills needs.

Evaluation of Past Performance

There appears to have been no evaluation of past forecasting performance in Belgium.

1.2.3 Japan

Rationale for Selection

Japan has the leading economy within the Asia Pacific region, with highly developed finance, technology and manufacturing sectors. Although often considered to have a stable population structure, Japan actually experiences high levels of out-migration. In terms of Government, Japan has a history of
economic planning and intervention, although the ownership of business and industry has always been very much with private sector.

Approach to Manpower Forecasting

Government manpower forecasts in Japan are the responsibility of the Ministry of Labour (MoL). Manpower forecasting activity actually appears to be quite limited. However, the MoL does undertake two types of forecasts:

- short-term forecasts, produced annually and for Government consumption only; and
- long-term forecasts, typically produced every five to six years.

Short-term forecasts are based primarily on survey results but also include views from the MoL’s expert “think tank” group. Their principal purpose is to help the Economic Planning Agency prepare annual economic forecasts for the economy as a whole.

The longer term forecasts are based primarily on expert opinion, with account taken of short-term survey results and statistical forecasts based on past trends. The current forecasts cover the period 1999 to 2010.

In addition, an annual summary of the state of the labour market is prepared by the MoL and, whilst this has no explicit forecasting element, current trends are highlighted and discussed. There is also a monthly survey of labour market demand but, once again, there is no forecasting element to this.

Evaluation of past Performance

No evaluations of the past performance of manpower forecasting have been undertaken in Japan. However, if the MoL considers that longer term forecast have failed to adequately anticipate changes in the labour market it can prepare new forecasts before the scheduled time. The current plan (1999 to 2010) actually superseded the 1995 to 2001 plan, indicating that problems were found with the 1995 to 2001 forecasts.

1.2.4 The Netherlands

Rationale for Selection

The Netherlands has a highly developed, affluent economy. Like Hong Kong, services dominate the economy, but port and other transport functions are also important and the Netherlands is something of a hub in northern Europe, particularly for shipping, but also for air and land transport. Economic relations with larger neighbours, and in particular Germany, are also crucial to economic prospects. With regard to Government, the Netherlands has a strong reputation for well run and innovative public services, including in the field of manpower planning.
Approach to Manpower Forecasting

As noted above, the Dutch are widely recognised as being at the leading edge of manpower forecasting practice, and the government devotes considerable resources to its forecasts. The Dutch approach is based on an econometric model which is supported by short-term survey research. The manpower forecasting is undertaken by a specialist group at the University of Limburg, although this centre uses central government macro-economic and employment level forecasts as inputs.

Particular strengths of the Dutch approach include a strong focus on flows of workers into and out of the work force by skills, as opposed to just forecasting the total numbers of workers by skill. This can be very important as it takes account of not just overall growth, but also turnover and replacements needs as workers leave the workforce. Forecasts are made for 93 occupational classes and 79 types of education, covering the full spectrum of the labour market (earlier forecasts covered 49 types of education but it was perceived that significant differences between the technical, commercial and administrative types of education and so these are now desegregated).

The Dutch approach also takes account of mismatches between the labour market and educational provision and qualifications. The unemployed represent “visible” discrepancies, but work is also undertaken to identify the extent to which workers are overeducated, leading to calculations of under-utilisation by type of education. This is obviously of great benefit when seeking to plan for training and educational needs.

The Dutch also undertake well regarded surveys of vacancies on a quarterly basis, in order to provide information on short-term skills needs, and also have a good system for disseminating results to business and other end-users.

The outcome is that the Dutch approach is thorough and takes account of every influence on the structure of the labour market. This is in a part a reflection of the desire of Government to have forecasts that are of use to all participants in the labour market, including employers and job seekers.

Evaluation of Past Performance

The consultants have identified no formal evaluation of past performance. However, as reported above, the Dutch approach is highly regarded internationally. It should be noted that resources are deployed to constantly improve upon current practice. For example, work to improve the monitoring of school leavers is currently being planned, as is work on matching the supply of and demand for university graduates.
1.2.5 **Singapore**

**Rationale for Selection**

Singapore was selected due to its obvious similarities to Hong Kong in terms of economic structure, regional role and territorial extent. Like Hong Kong, Singapore also has a reputation as a well administered, free market economy.

**Manpower Forecasting in Singapore**

Manpower forecasts in Singapore are the responsibility of the Ministry of Manpower and the Council on Professional and Technical Education. However, these organisations elected not to participate in this study and reported that both the methodologies used and outputs are kept confidential and not distributed outside Government.

However, we have learnt that the Singapore government has recently commissioned a MURPHY style econometric model from Econtech, developers and operators of the MURPHY model in Australia. The purpose of this model is to replace the existing approach to forecasting which, as far as we were able to ascertain, does not use macro models. The old practice in Singapore appears to have some similarities with current practice in Hong Kong, in that it makes use of survey data rather than macro models, is aimed at the short- to medium-term and is intended primarily for planning for educational and training provision.

**Evaluation of Past Performance**

Based on the fact that Singapore is investing in a new approach to manpower forecasting, it can safely be assumed that it was no longer satisfied with the outputs of the old approach. Clearly, no data are available on the performance of the new approach at this stage, although reference to the Australian case study (and also the Dutch, UK and US ones which are also based on an econometric model) should provide a general indication of future reliability.

1.2.6 **United Kingdom (National Forecasts)**

**Rationale for Selection**

The UK has a well developed economy, with an unusually high reliance on service industries, and in particular financial and business services. There is currently a great deal of interest in skills forecasting and the knowledge economy in the UK, and this has led to some interesting and innovative work which is likely to be of interest in Hong Kong.

**Approach to Manpower Forecasting**

The UK has a well developed approach to manpower forecasting, with work being undertaken by consultancies and academic research groups on behalf of Government, which sponsors the research. The approach is based on detailed
macro-economic models of the UK economy, supplemented by a range of census and survey data.

Forecasts are produced on a regional basis, although the Department for Education and Employment only sponsors the national forecasts. Forecasts are produced annually and cover a ten year time frame, although they could be extended further. The econometric model is dominated by demand factors in the short term, but long forecasts that take account of long term economic factors such as productivity growth are also used to influence shorter term projections.

The forecasts cover employment by occupation and industry for men and women, employees and the self employed, and part time and full time. As a part of the same project, the occupational forecasts are also used to generate forecasts for the demand for highly qualified people, divided up into sub-degree level qualifications, first degrees and higher degrees, and into subject groups. The supply of qualified people is also forecast so that mismatches can be identified and addressed.

Annual surveys of skills needs are also undertaken by the Department for Education and Employment (DfEE). Although there is no central forecasting of skills needs in the central government work, regional governments have commissioned their own research in this area. For example, in 1998 the Welsh Office funded forecasts of future skills needs in Wales. These forecasts used data on the relative importance of skills by occupation and on the expected changes in the importance of these skills, and then used sector output forecasts to generate forecasts of skills demand by sector.

New work that is now being undertaken includes a greatly enhanced annual survey of skills. One focus of this work is to gain more insights into how skills requirements are likely to change as companies increasingly focus on higher value added activities. The objective is to understand how differing development paths for the UK economy might affect skills requirements.

In addition to cross-sectoral work, the UK also has a number of industry specific training organisations who have done interesting work on skills surveys and forecasts. One of the most advance is the Land Based Training Organisation (Lantra), which covers activities such as agriculture, forestry, fisheries, horticulture, landscaping and machinery production, operation and maintenance. Lantra has undertaken a major data warehousing exercise, and the type of model it has developed could be of interest to Hong Kong should data warehousing be pursued in the future.

Evaluation of Past Performance

A review of the accuracy of employment forecasts has been undertaken by the University of Warwick (who used to carry out the forecasts under contract to the DfEE prior to the contract being awarded to a consultancy, Business Strategies). The findings were that the forecasts proved accurate at predicting the nature of key changes in the labour market, even if the
magnitude of those changes was not always predicted precisely. In particular, the Warwick team pointed out that sometimes it is beneficial for forecasts to be wrong in the sense that undesirable outcomes can, with adequate warning, sometimes be averted through effective intervention by Government. The Warwick team concluded that occupational forecasts do provide useful information. The identification of broad trends does allow policy makers to formulate responses, which in themselves tend to be rather broad (for example, to promote information technology rather than a particular sector within IT), but which never the less can prove effective if well designed.

1.2.7 London

Rationale for Selection

London was selected as a case study due to obvious similarities with Hong Kong in terms of economic structure and role, namely high reliance on financial and business services, with a leading role in its region.

Approach to Manpower Forecasting

Until very recently, London’s government has been fragmented and poorly co-ordinated, with responsibility for a range of functions (including manpower forecasting) divided between central government, local boroughs, quangos and publicly sponsored research groups. However, interesting work of relevance to Hong Kong has been undertaken in the field of skills forecasting, much of which has been sponsored by the Corporation of the City of London (the local authority for the financial district) and Training and Enterprise Councils (TECs, which are focused on specific districts within in the capital). TECs are also supporters of the London Skills Forecasting Unit (LFSU), which sponsors a range of work of interest to groups across the capital. The Unit has also proved successful at packaging existing information into more accessible sources.

Skills forecasts by the LSFU have focused on requirements for eight sectors, namely the financial services, business services, the public sector, hotels and catering, retail, transport, manufacturing and construction (which is having to respond to rapid changes in the skills that are required for modern office developments). Other organisations have examined sectors such as the creative industries (which are typically high value added). On-going research is looking at the impact of new technology, and on organisational restructuring (such as management “delayering”). The approach adopted is therefore quite sector specific, and is very much focused upon the needs of employers.

A final group undertaking labour market research is the London Labour Market Forecasting Consortium, which is headed by a consultancy, Business Strategies. This work is seeking to understand patterns of commuting and migration into London. Factors that are being examined include house prices, the impact of competition from Frankfurt, the capacity of transport networks and the impact of major development projects such as the Channel Tunnel.
Evaluation of Past Performance

Many of the initiatives in London have been established relatively recently in response to a growing need for London specific data. Some of the work is also innovative, and it is too early to comment on the performance at this stage.

1.2.8 United States (National Forecasts)

Rationale for Selection

The US was selected for two main reasons. Firstly, the US has the most advanced economy in the world, and has to address issues such as skills development for leading industries at an earlier stage than other countries. Secondly, the US devotes considerable resources to manpower forecasting and is recognised as a leader in the filed of disseminating results.

Approach to Manpower Forecasting

The USA has a well developed approach to manpower forecasting. A specialist agency, the Bureau of Labor Market Statistics (BLS), produces employment forecast by industry, occupation and state which are all prepared using a detailed macro-economic model of the US economy. The BLS projections for employment are based upon a productivity calculations and a matrix showing occupational employment patterns. This matrix includes 260 detailed industries and 513 detailed occupations.

These forecasts are used by a wide range of local government, research and consultancy organisations, who adapt and tailor the results in order to produce more detailed sector, occupational or state level analyses. Also, BLS forecasts are widely used by private businesses, careers services and consultancies, as well as federal and state governments. The US is particularly well known for very active dissemination of forecasts and, for example, publishes extensive data on its web site.

Evaluation of Past Performance

The BLS is rare in that is has undertaken a detailed evaluation of past forecasts and reports that, overall, their projections provided a good indication of future labour market trends. Although fully accurate predictions are, in practice, impossible due to the inherent uncertainties surrounding many of the key variables, BLS reported that they were able to predict key trends in the majority of cases. Where projections turned out to be inaccurate by a wide margin, it was generally due to unforeseen circumstances such as the rapid advance in information technologies, or the drastic cut back in US defence spending (which accounts for a major proportion of research and development activity and manufacturing output).
1.2.9 New York

Rationale for Selection

New York was selected as a case study for much the same reason as London, namely that it is a major financial and business services centre, and is pre-eminent in its region in these activities.

Approach to Manpower Forecasting

The New York State Department of Labor (DoL) is primarily concerned with generating projections by occupational groups for New York. The DoL interacts with a number of other organisations when preparing its forecasts, including the Department of Budget (DoB, which forecasts employment and output by sector for tax revenue estimation purposes) and the joint state/ Federal Occupational Employment Survey.

DoB forecasts make use of sectoral employment and output forecast from a private consulting firm, DRI McGraw Hill. The DRI model is an econometric model of the economy of the US as a whole (run under a contract from the Federal government), and is regarded as highly complex. It is the model on which the BLS national forecasts are based. Upon receiving the DRI model outputs, adjustments are made by the DoB to increase the level of detail for key factors in New York, such as migration and age structure (which in New York are obviously very different to the national averages), and to remove irrelevant factors (such as agricultural production or industries not represented in the city). The result is that the 1,000 or so equations of the national model are simplified to just 150 for the local New York model.

Evaluation of Past Performance

Because the New York economy is much less diverse than that of the US as a whole, there have been problems associated with failing to predict economic shocks, such as booms and busts in the financial industry. However, this is more of a problem with the underlying macro-model than the manpower forecasting element, and is an issue with every macro-economic model. Because of this, expert opinion or actual knowledge of future changes (such as the run down of major manufacturing facilities) are used to interpret results.

1.3 Summary of Scope of Overseas Manpower Forecasts

A simple summary of the coverage of manpower forecasts overseas has been presented earlier as Table 1 of the Executive Summary. The table summarised a checklist of requirements suggested for Hong Kong against overseas practice.

With regard to the Singapore case study, as noted above the consultants have been unable to undertake a detailed examination of current or future practices. This is because the responsible organisations in Singapore chose not to participate in the study. However, as Singapore is reportedly
developing a MURPHY style macro-economic model, the match of capabilities against suggested requirements for Hong Kong can be assumed to be reasonably similar to the match for the Australian case study.