Al Manar Project

The Outlook for Employment by Occupation for Jordan

Prepared by

Bashir (Bill) Ahamad

Working group

Dr. Nader Mryyan (Almanar project director) **Mamdouh Al-Salamat** (Economic Researcher-Almanar)

Majdi Abu Sa'an (Ministry of labor)   **Batoul Obaid** (Department of Statistics)

2010

Acknowledgements

Foreword

What are the economy's future requirements of jobs and occupations? Who studies what, and where? These are frequent questions raised by high government officials, business people, human resources managers and planners, academics and citizens. These queries capture the paramount attention and interest of the people of Jordan, a country where human resources make its most precious asset; 70% of its population is under 30 years, and the female participation rate is among the lowest.

Deciding the future career path has never been easy; it has always involved difficult choices. Preferences and aptitudes must be matched with education and training choices. As we move ahead, we also want to keep the future job market in mind.

The Al Manar project has done its utmost to assemble and integrate the labor supply and demand data; it compiled statistics and developed simulation models to forecast the economy's future requirements for skills and occupations by gender and by level of education. The model developed to generate the job forecasts was a revolving one, which can be upgraded and expanded to reflect any changes in the model's basic assumptions and /or the availability of new data. Continuous updates and periodical run of the model, together with sharing and discussing its results with chief economists and key representatives from the economic sectors are necessary and sufficient conditions for having credible and quality results from the model.

Al Manar is committed to keep producing jobs' forecast for the Jordanian economy by utilizing new releases of data and information; it is planned that the next version of the job forecast model will incorporate the new input-output model developed by the Department of Statistics.

Dr. Nader Mryyan

Al Manar Project Director

TABLE OF CONTENTS

Executive Summary

Objective of this Study

The initial objective of this Study was to assess an occupational projections model for Jordan constructed in 2006. It was anticipated that the assessment could be conducted by comparing the occupation projections generated by the 2006 Model, with data on employment by occupation for the projection year.

It turned out that this objective could not be met. The occupation data used in the 2006 Model were based in part on the Employment Survey (ES) for the years 2000-02. These data were coded using the International Standard Classification of Occupations (ISCO). However, since 2004 occupation data in the ES has been coded using the Jordan Standard Classification for Occupation (JSCO). The 4-digit occupations in the two classifications are quite different, so that projections generated by the Model cannot be compared with actual estimates of employment by occupation.

As a result, the primary objective of this study was changed after the work got underway. The primary objective became the development of a model that could be regularly updated to provide projections of employment by occupation for Jordan.

More specifically, the Study was designed to:

- Develop a model that can be used on a regular basis to provide projections of employment by occupation for Jordan; and
- Explore the development of a model for making projections of labour supply over the short-run.

This Report addresses questions such as the following:

- What is the projected increase in jobs in Jordan between 2006 (the base year) and 2011?
- How large is the projected increase in employment in economic activities and occupations?
- Which occupations are projected to increase the most over the period?
- Which relatively large occupations are projected to add the least new jobs over the period?
- Could the projected increase in jobs be met by the anticipated increase in the labour supply?

Outline of the Occupation Projections Model

The Occupation Projections Model used for making projections of employment by occupation can be explained in simple terms. The Jordanian economy is divided into a number of economic activities or industrial sectors defined by the outputs they produce: these include 'Agriculture', 'Manufacturing', 'Education' and 'Public Administration' among others. Workers are employed

in different jobs or occupations in each of these economic activities; and the number of workers in different occupations depends partly on the nature of the particular economic activity, and partly on the demand for its products.

The Model assumes that the occupational structure of an economic activity will remain roughly constant over the short-run (about 3 to 5 years). Projections of employment by occupation are derived using projections of employment by economic activity in the projection year (2011), together with the occupational structure of economic activities in the base year (2006).

Data on employment by economic activity

Time-series data on employment by economic activity are available from two sources in Jordan: the Employment and Unemployment Survey (EUS) and the Employment Survey (ES). Neither survey provides an accurate estimate of employment by economic activity. For example, the population living in collective dwellings is not covered in the EUS: the survey does not therefore include many non-Jordanians working in Jordan (who generally live in collective dwellings). Similarly, the ES includes only registered establishments so that it does not cover workers in the informal sector (many of whom are non-Jordanians). It follows that non-Jordanians are underestimated in both the EUS and the ES. We exclude data on the armed forces from the EUS based on the international methodology.

Despite these limitations, the EUS and the ES provide the best available time-series estimates of employment in the various economic activities. The estimates from each survey have therefore been combined to provide a single time-series of employment by economic activity. These estimates are probably the best single time-series estimates of employment by economic activity in Jordan: but they significantly underestimate the number of non-Jordanians working in Jordan.

Estimates of the employment of non-Jordanians by economic activity are, however, available from the Ministry of Labour. These estimates suggest that the employment of non-Jordanians has been increasing at a much higher rate than the employment of Jordanians; thus non-Jordanians working in Jordan now form almost one-quarter of total employment in Jordan. The data also suggest that, because of the very different rates of growth of employment in the two groups, it would be sensible to make separate projections of employment for Jordanians and non-Jordanians.

Data on employment by occupation and economic activity

Data on employment by 4-digit occupation and economic activity are available from the 2004 Census and the ES for Jordanians, and for a small proportion of non-Jordanians. Analysis of the data suggests that since 2004 Census data will become increasingly out-of-date over time, it would be preferable to use ES data in the Model. However, use of ES data creates an additional difficulty: the economic activity 'Agriculture' is not covered in the ES: data from the EUS on the occupational distribution for 'Agriculture' have therefore been used in the Model.

An additional complication is that data in the EUS (and in the Census) are coded using ISCO, while recent data in the ES are coded using the JSCO. There are significant differences between

the two classifications so that the use of occupation data for 'Agriculture' from the EUS will affect the reliability of the projections for some occupations.

Projections of the employment of Jordanians by economic activity in 2011

Projections of the employment of Jordanians by economic activity in 2011 were derived using the simple extrapolation of the trends in the time-series of employment for 1995-2006 for all economic activities except 'Construction' and 'Agriculture'. We used data for the period 2000-06 for 'Construction' and 'Agriculture' since recent changes in these economic activities suggest that these data would provide a better indication of likely changes in employment.

The projections suggest that the total employment of Jordanians will increase from 954 thousand in 2006, to 1091 thousand in 2011. The projected increase over the 5-year period is 14.3%; and the annual average rate of growth of total employment is projected to be 2.7% (which is the same as it was over the period 1995-2006).

The projections indicate that 137 thousand new jobs for Jordanians will be generated between 2006 and 2011. Most of these new jobs (39 thousand) will be added in 'Wholesale and Retail Trade': this represents about 29% of all new jobs over the period. A relatively large number of new jobs is also projected for Education (26 thousand), Manufacturing (23 thousand), and Transportation (18 thousand).

How reliable are the projections of employment by economic activity?

The projections suggest that between 2006 and 2011 some jobs will be lost in 'Agriculture' and 'Mining & Quarrying', and some new jobs will be added in the other economic activities. But do the projections provide a good indicator of employment in 2011?

In order to address this question, we examined the variability of the estimates of employment by economic activity over the period of the data used for the projections. The analysis suggests that the projections for 'Agriculture', 'Mining & Quarrying', 'Construction' and 'Transportation' are subject to relatively high variability. This means that even if the trends in employment in these economic activities were to continue into the future, actual employment may turn out to be quite different from projected employment in 2011.

Projections of the employment of non-Jordanians

Projections of the employment of non-Jordanians working in Jordan, were derived by officials in NCHRD, MOL and DOS. The projections suggest that the total employment of non-Jordanians working in Jordan will increase from 290 thousand in 2006, to 405 thousand in 2011 – an increase of 40% over the 5-year period. The annual rate of growth over the period is projected to be 6.9: this much higher than the projected rate of growth of the employment of Jordanians (2.7%).

The projections also suggest that the proportion that non-Jordanians form of total employment will increase from 23% in 2006, to 27% in 2011. The proportion of non-Jordanians working in some economic activities is projected to increase considerably. For example, the proportion for 'Agriculture' is projected to increase from 71% in 2006, to 90% in 2011; and that for 'Other

iii

Community, Social & Personal Services' is projected to increase from 49% in 2006, to 56% in 2011.

Projections of employment for 1-digit occupation groups in 2011

For 1-digit occupation groups, most new jobs (35 thousand) are projected for 'Service Workers & Shop & Market Sales Workers'; and 31 thousand new jobs are projected for 'Professionals'. These two occupation groups account for nearly half of the new jobs projected for Jordan over the period 2006-2011. The projections also suggest that nearly 10 thousand jobs for 'Skilled Agricultural & Fishery Workers' will be lost over the period.

Projections of employment for 3-digit occupation groups in 2011

Most new jobs in 3-digit occupation groups are projected for 'Shop Salespersons and Demonstrators' (18 thousand). By contrast, nearly 8 thousand jobs in the occupation group 'Market Gardeners and Crop Growers' are projected to be lost between 2006 and 2011.

Which 4-digit occupations are projected to add the most new jobs?

The five 4-digit occupations that are projected to add the most jobs between 2006 and 2011 are shown in the table below. The number of new jobs projected in the five occupations in the table is about 38 thousand (about 28% of all new jobs). It follows that the new jobs projected for Jordan over the period 2006-2011 are concentrated in a small number of 4-digit occupations, and that the number of new jobs projected in most other 4-digit occupations is relatively small.

Table 1: 4-digit occupations with the most new jobs, 2006-2011
(Excluding the Armed Forces)

Occupation title	Employment in 2006 (000)	New jobs 2006-2011 (000)
Supplies Sales Persons	43.7	9.5
Basic and Pre-Primary Education Teaching Professionals	51.7	8.9
Secretaries and Correspondence Clerks	46.4	7.0
Secondary Education Teaching Professionals	40.5	6.9
Messengers and Porters	37.0	6.2

Most new jobs (10 thousand) are projected for 'Supplies Sales Persons': the annual average rate of growth (4.0%) of employment for this occupation is much higher than that for total employment (2.7%).

Which 4-digit occupations are projected to add the lowest number of jobs?

Since many small occupations are projected to add very few jobs by 2011, it is more interesting to look at new jobs in occupations that are relatively large (with, say, 1000 or more workers). The five 4-digit occupations (with employment of 1 thousand or more) that are projected to add the lowest number of new jobs between 2006 and 2011 are shown in Table 2.

Table 2: 4-digit occupations projected to add least jobs, 2006-2011
(Excluding the Armed Forces)

Occupation title	Employment 2006 (000)	New jobs 2006-2011 (000)
Building Exterior Decoration Workers	1.1	0.0
Stone-Masons and Brick Layers	1.5	0.1
Superintendents in Construction	2.5	0.1
Production and Operations Department Managers in Financial, Real-Estate, Renting and Business Services	1.5	0.1
Steel Construction Workers	1.0	0.1

Note that 4-digit occupations associated with the economic activity 'Agriculture' are not included in the table: this is because 4-digit occupation data for the economic activity 'Agriculture' could not be included in the Model.

Which 4-digit occupations in the 'Professionals' occupations group are projected to add the most jobs in 2006-2011?

The five 4-digit occupations in the, Professionals' group projected to add the most new jobs between 2006 and 2011 are shown in Table 3.

Table 3: The five 4-digit occupations for 'Professionals' projected to add the most new jobs in 2006-2011 (Excluding the Armed Forces)

Occupation title	Employment 2006 (000)	New jobs 2006-2011 (000)
Basic and Pre-Primary Education Teaching Professionals	51.7	8.9
Secondary Education Teaching Professionals	40.5	6.9
Personnel and Careers Professionals	16.2	2.3
Accountants	15.7	2.0
Medical Doctors	7.4	1.7

These occupations are projected to add about 22 thousand new jobs over the period 2006-2011: these new jobs represent 70% of the total number of new jobs projected for all 'Professionals' over the period. Most of these new jobs (9 thousand) are projected for 'Basic and Pre-Primary Education Teaching Professionals'.

Which 4-digit occupations in the 'Technicians & Associate Professionals' group are projected to add the most jobs in 2006-2011?

The five 4-digit occupations in the 'Technicians & Associate Professionals' group projected to add the largest number of new jobs between 2006 and 2011 are shown in Table 4.

Table 4: 4-digit occupations in the 'Technicians & Associate Professionals' group with most new jobs in 2006-2011 (Excluding the Armed Forces)

Occupation title	Employment 2006 (000)	New jobs 2006-2011 (000)
Nursing Associate Professionals	8.3	1.9
Book Keepers	13.2	1.7
Administrative Secretaries and Related Associate Professionals	8.2	1.2
Clearing and Forwarding Agents	5.7	1.0
Technical and Commercial Sales Representatives	4.8	0.9

The projected number of new jobs is largest for 'Nursing Associate Professionals' (2 thousand new jobs); the projected number of new jobs for 'Book Keepers' is also relatively high (1.7 thousand). The total number of new jobs projected in the occupations shown in the table is 7 thousand: this figure represents 41% of the number of new jobs projected for all 'Technicians & Associate Professionals' over the period 2006 to 2011.

Exploring a Model for Labour Supply

The number of new jobs in an occupation is only one of many factors affecting the supply of labour to different occupations. Moreover, the adjustment of the supply of labour to changes in the number of available jobs is complex; and it varies by occupation. The detailed data required for building a model for projecting the supply of workers by occupation are not available for Jordan at this time: we therefore decided to explore the development of a model for projecting the growth of the formal education of workers.

In developing such a supply model we assumed that:

• The distribution of the population by educational level, age and gender would remain constant over the period to 2011;
• The proportion of the population with jobs, by educational level, age and gender, would remain constant over the period to 2011.

We derived projections of the supply of workers by educational level by multiplying the distributions above by population projections by age and gender in 2011.

There are two limitations in using this approach.

• The number of non-Jordanians working in Jordan has been underestimated in the 2004 Census: thus projections of labour supply using this model will provide an underestimate of total labour supply.
• The supply model takes no account of changes in the educational level of the population over time: we therefore made some adjustments in the educational attainment for age-gender groups.

The data in Table 5 show the percentage distribution of the educational attainment of workers in 2006 and 2011 derived from the Supply Model.

Table 5: Projected distribution (%) of the educational attainment of workers

Educational level	*Estimated 2006*	*Projected 2011*
Post Graduates	3.0	2.6
Bachelor	17.3	17.0
Intermediate Diploma	13.6	13.1
Secondary	20.4	21.2
Less than Secondary	36.5	37.3
Apprenticeship	2.2	2.5
Illiterate\Read and Write	6.9	6.2
Total	**100.0**	**100.0**

The projections suggest that the proportion of workers in each of the three post-secondary education categories ('Post Graduates', 'Bachelor' and 'Intermediate Diploma') will fall slightly between 2006 and 2011. The proportion of workers in these three education categories is projected to fall from 33.9% in 2006 to 32.7% in 2011.

The projected fall in the proportion of workers with post-secondary education is surprising give the recent expansion of post-secondary education facilities in Jordan. Further detailed analysis may be helpful in providing an understanding of the reasons for the projected decline in the proportion of workers with post-secondary education.

Conclusions and recommendations

a. Statistics on the occupations of non-Jordanians working in Jordan are required to improve the Model

The occupation projections generated by the Model do not include projections of the occupations of non-Jordanians working in Jordan. Thus, if many non-Jordanians were to work in the same occupations as Jordanians, this could have a significant effect on the number of jobs available for Jordanians. This is a particularly important issue since the number of non-Jordanians working in Jordan has been increasing, and now represents nearly 30% of all workers in Jordan:

It is therefore important that a special study of the employment of non-Jordanians in Jordan should be carried out. The study should address questions such as the following:

• Do the occupations of non-Jordanians differ from those of Jordanians?
• Are the skills and knowledge required for the jobs in which non-Jordanians work different from those in which Jordanians work?
• Are the hours of work, working conditions, wages and other such factors different for the jobs of non-Jordanians and Jordanians?
• Are non-Jordanians employed in jobs in which Jordanians are reluctant to work?

b. The errors in the data available for use in the Occupation Projections Model need to be addressed

The errors in the data on employment by economic activity and on employment by occupation and economic activity are significant and they are likely to affect the accuracy of the projections of employment by occupation. The following need special attention:

• Estimates of employment by economic activity are available from the ES and the EUS. The estimates from the two surveys differ considerably and we had to use estimates from both surveys to develop a single time-series. The procedure we used is somewhat arbitrary and steps should be taken to develop more reliable and more accurate estimates.

• Data on employment by occupation are available from the EUS, the ES and from the 2004 Census. But data in the EUS and in the 2004 Census are coded using ISCO, while data in the ES are coded using the JSCO. The two classifications are quite different so that the EUS and

ES data are not comparable. This means that any occupational analysis that uses the data from the two surveys may lead to contradictory conclusions.

• It is important that the same occupational classification should be used in both the EUS and the ES. If it were decided that the JSCO should be used for both surveys, then a system should be developed for converting data coded using ISCO to the JSCO. If this were not done, much of the value of historical data on employment by occupation would be lost.

c. The projections are not precise indicators of employment

The projections of employment by occupation generated by the Occupation Projections Model described in this Report are subject to error for two reasons:

• There are errors in the data used in the Model; and
• The future is uncertain, so that the outcomes are subject to error.

The projections cannot therefore be regarded as precise indicators of employment at a future date. Projections of employment by occupation are nevertheless useful in that they provide an indication of the likely change in employment, and of the magnitude of the projected change.

d. Qualitative information is needed to supplement the projections

The occupational projections generated by the Model are based on quantitative data and they may not be consistent with qualitative information available in Jordan. It would therefore be useful for knowledgeable Jordanians (including business groups, researchers, government experts, economists, and decision-makers) to compare the projections with the changes in employment that seem likely given their knowledge and other qualitative information in Jordan. Addressing questions such as the following could help to improve the usefulness of the results.

• Do the projections of employment by economic activity seem reasonable in the light of the current developments in the economy?
• Is it likely that the change in employment in a given economic activity, say, 'Construction', will be as projected in the Model?
• Are the projections of employment for selected occupations (such as 'Secondary Education Teaching Professionals') consistent with the prevailing view about likely changes?

e. Improving the usefulness of the projections

The use of the occupational projections by students and others in the labour market could be improved by providing the projections on a website and in a manner that would encourage their use.

Occupational projections provide only some of the information required by students and other decision-makers. Their usefulness could be improved by providing information on the type of work involved in different occupations, on the education and training required for different occupations, and on other labour market indicators (such as hourly wages and the unemployment rate) for different occupations.

The projections of employment take no account of the new jobs that would be generated by the retirement of workers now in the labour force: they therefore probably underestimate the number of new jobs that will be generated between 2006 and 2011. Analysis to project the number of new jobs that would be generated by the retirement of workers already in the labour force would improve the usefulness of the projections.

f. More analysis of labour supply is needed

Labour market conditions are affected not only by the number of new jobs, but also by the supply of individuals qualified to work in different occupations. The education and training required for entry to different occupations vary considerably. Some occupations require little formal education and/or a short period of training: it may be relatively easy for employers to fill such jobs. But some occupations require a university degree or college certificate, and/or a long period of training: filling new jobs in such occupations may require advance planning.

The Supply Model developed as part of this Study provides a starting point for studying changes in the supply of labour. But much more work remains to be done. Analysis needs to be conducted in areas such as the following:

- Are there specific formal educational requirements for individuals to enter different occupations?
- Could the skills and knowledge required for entry to particular occupations be developed in non-formal educational programs?
- How important a factor is previous work experience in employment in particular occupations?

I. Introduction

I.1 Objectives of this Study

The initial objective of this study was to assess an occupational projections model for Jordan constructed in 2007 (see Bashir Ahamad: "A Report on Occupation Projections for Jordan in 2008", National Center for Human Resource Development, Amman, 2007). It was anticipated that the Model could be evaluated by comparing the occupation projections generated by the Model, with data on employment by occupation for a given year.

It turned out that this objective could not be met. The occupation data used in the 2007 Model were based in part on the Employment Survey (ES) for the years 2000-02. These data were coded using the International Standard Classification of Occupations (ISCO). However, since 2004 occupation data in the ES has been coded using the JSCO. The 4-digit occupations in the two classifications are quite different, so that projections generated by the Model cannot be compared with actual estimates of employment by occupation.

As a result, the primary objective of this study was changed after the work got underway. The primary objective became the development of a model that could be regularly updated to provide projections of employment by occupation for Jordan. If projections of employment by occupation were regularly updated, then students, workers, employers and other decision-makers would have a better basis for making decisions that would take account of the likely changes in employment by occupation in the Jordanian economy.

In the model described in this Report, projections of employment by occupation are derived using the current occupational structure of each of 14 economic activities, and projections of employment in each of those economic activities. Thus the projections depend on the occupational structure of each economic activity in the base year, and on the projected changes in the structure of employment by economic activity.

This model focuses on the demand for goods and services in the economy, and on the jobs required to meet those demands: as the outputs of the various economic activities change, so will the labour required to produce those outputs. An important assumption in this approach is that the supply of labour by occupation will have a minimal effect on the demand for labour by occupation. This assumption is only reasonable in the short-run since, over the long-run, changes in the labour supply by occupation will likely lead to adjustments in the demand for labour by occupation.

A secondary objective of this study is to explore the development of a model for obtaining projections of the supply of labour over the short-run. Are appropriate data available in Jordan for making short-run projections of labour supply by occupation? If not, could a model be developed for making projections of labour supply by level of education (which is one of the factors that affects the occupations of individuals)? Would such projections be useful for decision-makers?

1

In summary, there are two main objectives in this study:

- To develop a model that can be used on a regular basis to provide projections of employment by occupation for Jordan; and
- To explore the development of a model for making projections of labour supply over the short-run.

I.2 Focus of this Report

This Report addresses questions such as the following:

- What is the projected increase in jobs in Jordan between 2006 (the base year) and 2011?
- How large is the projected increase in employment in economic activities and occupations?
- Which occupations are projected to increase the most over the period?
- Which occupations are projected to add the least new jobs over the period?
- Could the projected increase in jobs be met by the projected increase in labour supply?

The Occupation Projections Model described in this Report can be used to generate projections on a regular basis. An advantage of doing so is that students, workers, employers and other decision-makers will become more aware of the changes taking place in the labour market, and will be able to make more informed decisions. The Model can also be used to generate projections for different years and using different scenarios or assumptions. This may be particularly important if decision-makers were interested in studying the effects of particular changes in the economy: for example, if decision-makers were interested in the effects of changes in a given economic activity, such as 'Construction', on jobs in different occupations.

I.3 Uses of projections of employment by occupation

Projections of employment by occupation are used for many purposes. For example:

- Individuals often base their occupational and career choices on the prospects for different occupations. Students tend to consider many factors such as wages, hours of work, and the jobs available in different occupations. And individuals already in the labour market often seek information on factors such as the jobs available in other occupations and on the prospects for promotion, to help them make decisions about changing their occupation.

- Occupation projections are used as one of the inputs for identifying changes in the educational programs provided by educational institutions. Some occupations (e.g. 'Medical Doctors') are directly related to education programs (i.e. 'Medicine') so that the projections in such occupations could be helpful for planning increases in enrolments. For most occupations, however, the relationship with educational programs is not always direct; but occupation projections can be used with other data (such the

occupational choices of individuals with different types of education) to identify the need for changes in educational programs.

- Employers may use employment projections by occupation to assess the availability of workers with the skills and knowledge required for the production of output, and to identify different strategies for recruiting workers. For example, if it became difficult to recruit individuals to work in specific occupations, employers might have to institute special training programs so that workers could develop the required skills and knowledge.

- Government decision-makers use occupation projections for policy and program development. For example, programs may be developed to encourage students to enter occupations with high growth prospects, or to discourage them from entering those with low growth prospects.

- Government policymakers may also use an occupation projections model for determining the likely effects of a particular policy (such as encouraging growth in a given economic activity) on occupational employment.

I.4 Outline of this Report

Section II of this Report describes the methodology used for making the projections of employment by occupation discussed in this Report. What is a reasonable basis or model for making projections of employment by occupation? And what are the limitations of such a model?

Section III deals with the data available in Jordan for building a model. It describes some of the recent changes in the classification of occupations that make it difficult to compare the data over time. And it discusses some of the limitations in the available estimates of total employment in different economic activities.

Employment in different occupations depends on the output (goods and services) produced by the economy and on the structure of employment by economic activity and occupation. Section IV provides a brief overview of changes in employment over the period 1995-2006. How much has employment in the various economic activities increased over the period?

Section V discusses the projections of employment by economic activity and by occupation for 2011 generated by the Occupation Projections Model. In which economic activities is employment projected to increase the most (and least)? And in which occupations is employment expected to increase the most (and least)? What are the job prospects for 'Professionals'?

Projections of employment by occupation indicate the likely changes in the types of jobs if past trends were to continue. But these projections only provide part of the picture: it is equally important to study the changes in the supply of individuals to fill those jobs. What education and training do individuals need to work in different occupations? How many jobs are likely to be filled by new graduates from the education and training system, and how many by workers already in the labour market? Such questions are explored in Section VI.

Section VII summarizes the conclusions of this study and makes some suggestions for revising and assessing the Model and for making long-term improvements in the Model.

Details about the structure of the Model, about the projections of employment by economic activity and about the projections of employment by occupation are included in the appendices to this Report:

- Appendix 1 provides a mathematical description of the Model;
- Appendix 2 provides the time-series estimates of employment by economic activity used in the Model;
- Projections of employment by economic activity for 2011 are included in Appendix 3;
- The potential variability of the employment projections is discussed in Appendix 4;
- Projections of employment by occupation in 2011 are provided in Appendix 5;
- Projections of employment by occupation in 2012 are provided in Appendix 6;
- Projections of employment for 4-digit occupations in 2011 in "Manufacturing" with most new jobs are provided in Appendix 7;
- Projections of employment for 4-digit occupations in 2011 in " Wholesale and Retail Trade" with most new jobs are provided in Appendix 8;
- Projections of employment for 4-digit occupations in 2011 in " Transportation " with most new jobs are provided in Appendix 9 ;
- Projections of employment for 4-digit occupations in 2011 in " Public Administration and Compulsory Social Security " with most new jobs are provided in Appendix 10; and
- Projections of employment for 4-digit occupations in 2011 in " Education" with most new jobs are provided in Appendix 11 .

II. Methodology

II.1. What type of model can be built for Jordan?

The type of model that can be used for making projections of employment by occupation depends on the data available for the economy. In Canada, for example, data are available on the inputs (labour, intermediate goods, etc.) that are required for producing the different types of outputs ('Agriculture', 'Manufacturing', etc.) that consumers and producers demand. It is therefore possible to build an economic model based on the relationships between the inputs and the outputs, and hence a model that can be used for exploring the effects of different economic factors on employment in Canada.

The data for building such a model are not available in Jordan, so that a simpler approach has to be adopted. The model used here is based on the assumption that recent trends in employment will continue into the future. There is therefore an implicit assumption that the relationship between employment and the economic factors that affect it, will continue to change as they have done in the past.

The model used here can be explained in fairly simple terms. The Jordanian economy is divided into a number of economic activities or industrial sectors defined by the outputs they produce: these include 'Agriculture', 'Manufacturing', 'Education' and 'Public Administration' among others. Workers are employed in different jobs or occupations in each of these economic activities; the number of workers in different occupations depends partly on the nature of the particular economic activity and on the demand for its products. For example, most workers in 'Agriculture' are likely to be employed in agricultural occupations; and most workers in 'Education' are probably working as teachers. But workers in some economic activities, such as 'Manufacturing' and 'Public Administration', are not often concentrated in one occupation or in an identifiable group of occupations.

The Occupation Projections Model described in this Report assumes that the occupational structure of an economic activity will remain roughly constant over the short-run (about 3 to 5 years). This means that if, for example, employment in 'Agriculture' were to fall over the next 3 to 5 years (as seems likely), the number of jobs in agricultural occupations would tend to fall; and if employment in 'Education' were to rise (as seems likely), the number of teaching jobs would tend to rise. Intuitively this makes sense since workers in these activities tend to be concentrated in particular occupations. But drawing conclusions about the effects of changes in employment in economic activities such as 'Manufacturing' and 'Public Administration' is not as straightforward since employment in these activities is spread over many occupations. The Occupation Projections Model provides a basis for deriving projections for all economic activities.

The Occupation Projections Model described in this Report is based on two main assumptions:

- The occupational structure of an economic activity is determined mainly by the 'state of technology' in that economic activity; and

- The 'state of technology' of an economic activity tends to change only slowly over time.

The term 'state of technology' is used here to mean the factors that are important in generating the output of a firm. These factors include: the capital stock (including the type and age of equipment) and the processes and organizational methods used for the production of output; and the skills and knowledge required by the workers employed to produce the given output.

The first assumption (above) implies that the occupational structure is determined mainly by the capital stock and the processes used in the production of output, as well as by the skills and knowledge required to produce various outputs. This in turn implies that there is little substitution between occupations in the production of output, and hence that the effects of prices and wages will be relatively small. This is certainly reasonable over the short-run since firms and individuals will need some time to respond to labour market pressures. But it is less likely to hold over the long-run since firms will be able to make adjustments in the equipment used in production so as to employ relatively more labour in excess supply; and individuals will be able to make education and training choices that allow them to enter occupations in short supply.

The second assumption (above) implies that labour market pressures (e.g. labour shortages) will only affect the occupational structure of an economic activity over the long-run. This is a reasonable assumption since the firms within an economic activity will need time to respond to labour market pressures. Moreover, since the age of the equipment varies by firm, some firms will take longer to respond to labour market pressures than others. Thus the average occupational structure of an economic activity will tend to change only slowly over time.

It follows that the Model provides a reasonable basis for making occupation projections over a period of about 3 to 5 years. But long-term projections (for say, 10 years or more) are likely to be subject to greater uncertainty because of changes in the labour market.

Another limitation in the Model should be pointed out. The Model as described in this Report, is based on data for Jordan as a whole, and it ignores regional variations in the economy. Since the economy of Amman dominates the economy of the country, the occupation projections for the country as a whole may provide a reasonable approximation of labour market developments in Amman. But the projections may be less useful for identifying labour market pressures in other governorates.

II.2. A simplified example of the Model

In the Model, projections of employment by occupation are derived using projections of employment by economic activity in the projection year (2011), and the occupational structure of economic activities in the base year (2006). There are three steps in the Model:

1. Project employment by economic activity in the projection year (2011).
2. Derive the occupational structure by economic activity in the base year (2006).

3.   Derive projections of employment by occupation (for 2011) by multiplying projected employment in each activity (in 2011) by the occupational structure in the base year (2006).

These steps can be illustrated using a simplified example of the model. Assume that the economy is divided into 3 economic activities: 'Primary' economic activities; 'Other Goods-producing' economic activities; and Service-producing' economic activities. Assume also that employment in 2006 and projected employment in 2011, are as shown in Table II.1: note that the numbers in the table are not based on actual data and are used for illustration only.

Table II.1: Projections of employment by economic activity*

Economic activity	Employment in 2006 (000)	Projected employment in 2011 (000)
Primary	75.0	70.0
Other Goods-producing	320.0	370.0
Services	700.0	860.0
Total employment	**1095.0**	**1300.0**

* Note that these estimates are not actual data: they are used here for illustration only.

The data in the table indicate, for example, that the level of employment (stock of workers) in 'Primary' economic activities in 2006 was 75 thousand; and this is projected to decline to 70 thousand in 2011. Thus these data suggest that about 5 thousand jobs will be lost in 'Primary' economic activities. By contrast, employment in the 'Services' economic activity is projected to increase by 160 thousand.

Assume that the occupations of workers are classified into 5 groups: 'Professionals'; 'Service Workers & Shop & Market Sales Workers'; 'Craft & Related Workers'; 'Plant & Machine Operators & Assemblers'; and 'Other workers' (including, for example, 'Managers', 'Agricultural workers', etc.).

The data in Table II.2 show the distribution (%) of employment by occupation in each of the 3 economic activities in 2006 (the base year). The data in the table show, for example, that in 2006, 5.0% of the workers in 'Primary' economic activities worked as 'Professionals'; 10% of those in 'Other Goods-producing' economic activities worked in this occupation group; and 15% of those in the 'Services' economic activities worked as 'Professionals'.

Table II.2: Occupational structure by economic activity in 2006 (%)*

Occupation group	Primary	Other Goods-producing	Services
Professionals	5.0	10.0	15.0
Service Workers & Shop & Market Sales Workers	1.0	2.0	20.0
Craft & Related Workers	10.0	60.0	10.0
Plant & Machine Operators & Assemblers	9.0	13.0	15.0
Other	75.0	15.0	40.0
Total	**100.0**	**100.0**	**100.0**

* Note that these estimates are not actual data: they are used here for illustration only.

In Step 3 of the model, the data in Table II.2 are multiplied with the data in Table II.1 to yield the data in Table II.3. The data in the table show, for example, that employment in the 'Professionals' occupation group is projected to increase from 140.8 thousand in 2006 to 169.5 thousand in 2011; and the employment of 'Craft and Related Workers' is projected in increase from about 270 thousand to 315 thousand.

Table II.3: Projections of employment by occupation*

Occupation group	Employment 2006 (000)	Projected employment 2011 (000)
Professionals	140.8	169.5
Service Workers & Shop & Market Sales Workers	147.2	180.1
Craft & Related Workers	269.5	315.0
Plant & Machine Operators & Assemblers	153.4	183.4
Other	384.3	452.0
Total	**1095.0**	**1300.0**

* Note that these estimates are not actual data: they are used here for illustration only.

A mathematical description of the Model is included in Appendix 1 of this Report**.**

In summary, two sets of data are required for building an occupation projections model for Jordan:

- Time-series data on employment by economic activity; and
- Data on employment by occupation and economic activity.

The availability of these data in Jordan is discussed in the next Chapter of this Report.

III. Data in Jordan for making occupation projections

III.1 Data on employment by economic activity

Time-series data on employment by economic activity are available from two main sources in Jordan: the Employment and Unemployment Survey (a household survey), and the Employment Survey (an establishment survey). However, the estimates of employment from the two surveys differ significantly: considerable analysis was therefore required to develop the time-series estimates of employment for use in the Occupation Projections Model.

a. The Employment and Unemployment Survey (EUS)

The Department of Statistics (DOS) has been conducting the EUS for a number of years so that time-series estimates of employment by economic activity are available from the EUS: but the variability of the estimates (and hence their reliability) is affected by many factors.

One of these factors is the frequency of the survey. Before the year 2000, the EUS was usually conducted on a biannual basis; but since 2000 the survey has generally been

conducted on a quarterly basis. An exception was made in 2004: the EUS was conducted only once in that year because the census was being conducted in the same year.

The sample size for the survey has also been changed over the years. The sample size in some of the older surveys was relatively small: it follows that the estimates of employment in earlier years are subject to relatively high sampling variation, and hence are less reliable than the estimates in recent years.

The reliability of the estimates of employment from the EUS is affected by other factors. For example, the sampling frame excludes the population living in remote areas (most of whom are nomads), as well as those living in collective dwellings, such as hotels, hospitals, work camps and prisons. Much of the non-Jordanian population working in Jordan (who generally live in collective dwellings) is therefore also excluded. It follows that the EUS tends to underestimate the level of employment in Jordan.

b. The Employment Survey (ES)

The ES has been conducted annually by DOS for many years. But the coverage of the survey has been changed over time. Before 1999, the survey excluded small establishments with less than 5 workers, and it included only a sample of large establishments. The survey currently covers all establishments in the public sector (excluding military and security establishments), and all establishments in the private sector with 50 or more workers; and it includes a sample of smaller establishments. It follows that the reliability of the estimates for the years before 1999 will differ from that of those since 1999.

The ES does not cover all workers in Jordan. It excludes agricultural establishments so that workers in the economic activity 'Agriculture' are excluded. In addition, since it includes only registered establishments, it does not cover workers in the informal sector. Many workers in the informal sector are employed in economic activities such as 'Construction' and 'Transportation', and in some occupations (such as 'House Keepers' and 'Domestic Helpers'); and many who work in the sector are non-Jordanians. It follows that workers in some economic activities and occupations and non-Jordanians will be underestimated in the ES.

c. Comparison of estimates from the EUS and ES

The estimates from the EUS and ES are expected to differ because of differences in sampling, coverage, coding, response, and other such factors. The estimates from the two surveys have been compared by Megill et. al. in their report '*Analysis for Comparing the Employment Estimates from the Different Surveys at the Department of Statistics*' (27 August 2003). A number of important conclusions emerge from their analysis:

- The EUS provides a more accurate estimate than the ES of total employment in Jordan.
- The estimates of employment are higher in the EUS than in the ES for most types of economic activity except Financial Services, Public Administration and Education.

- The ES provides more accurate estimates for economic activities with a high level of coverage, such as Public Administration, and activities, which are highly concentrated in a few areas or establishments, such as Mining and Quarrying.
- The EUS provides more accurate estimates than the ES for Manufacturing, Construction, Wholesale and Retail Trade, Hotels and Restaurants, and Transportation. Megill et. al. attribute these differences to better coverage of independent workers and of workers in the informal sector, as well as some under coverage of the newer (and mostly small) establishments in the frame of establishments used for the ES.

Megill et. al. recommend that consideration should be given to the development of a single employment data series based on the ES and EUS. They also recommend that:

- ES data should be used for Public Administration, Mining and Quarrying, Electricity, Gas and Water, Financial Services, and any other economic activity considered to have good coverage in the establishment frame.
- An evaluation team should be set up to determine if the ES is a more accurate source of employment data for Education and Health activities.
- The employment estimates for the remaining economic activities could be based on the EUS, which has a better coverage of informal activities.

d. Conclusions about the data on employment by economic activity

Two main conclusions emerge from the analysis above:

- Time-series data on employment by economic activity are available from two sources in Jordan: the EUS and ES. Neither provides an accurate estimate of employment for the various economic activities, so that the estimates for different economic activities from each survey have been used to provide a single time-series of employment by economic activity. These estimates are probably the best single time-series estimates of employment by economic activity in Jordan: but they are somewhat arbitrary since they are based on estimates from two different surveys. They should therefore be treated as approximate indicators of employment in Jordan.

- Many non-Jordanians working in Jordan are not included in the EUS and ES. However, estimates of the employment of non-Jordanians are available from the Ministry of Labour. These estimates suggest that the employment of non-Jordanians has been increasing at a much higher rate than the employment of Jordanians; thus non-Jordanians working in Jordan now form a significant proportion of total employment in Jordan. The data also suggest that, because of the very different rates of growth of employment in the two groups, it would be more reasonable to make separate projections of employment for Jordanians and non-Jordanians.

a. Data available in Jordan

In many countries, Census data on employment by occupation and economic activity (or sector) are used for building models for making projections of employment by occupation. This choice is based in part on the type of data available: in Canada, for example, employment estimates for 4-digit occupations (which are more useful for decision-making than data at the 3-digit level) are only available from the Census.

The choice of data source in Jordan is more complex since data by 4-digit occupation and economic activity are available from two sources: the ES and the 2004 Census. Which of the two should we use?

To address this question, we need to consider the differences in the two data sets:

- Census estimates are derived from the responses of individuals in the population, while ES data are derived from information provided by officials in firms or establishments. The two estimates may be very different: there may be significant differences in the responses provided by the two groups; and there may be differences in the coding of the data by the Department of Statistics.

- The Census covers the entire population while the ES is based on a sample of establishments: ES data are therefore subject to sampling errors, which may be relatively large for small occupations. Census data may therefore provide more reliable projections.

- The Census is conducted on a decennial basis, so that Census data are likely to become increasingly out-of-date over time. By contrast, the ES is conducted on an annual basis so that the data are likely to provide an up-to-date indicator of the occupational structure of various economic activities.

- The occupational classification used for the Census is based on the International Standard Classification of Occupations (ISCO). The same occupational classification was used in the ES until 2003; but the JSCO (developed by Al Manar) has been used for ES data since 2004. There are many differences between the two classifications; and there is no simple way of integrating the 4-digit occupation data from the two classifications.

- The ES excludes workers in 'Agriculture', so that 'Agriculture' would not be part of the model if we used only ES data. In order to make the model complete, we would have to use data on the occupational distribution of workers in 'Agriculture' from the Census or from the EUS (which only includes occupation data at the 3-digit level).

- The ES does not include informal workers, many of whom are non-Jordanians working in Jordan. As noted above, data on non-Jordanians working in Jordan are

11

available from the Ministry of Labour; but no data are available on the occupations of non-Jordanians. Thus use of ES data in the model would mean that most non-Jordanian workers would not be included in the occupation projections generated by the model.

c. A comparison of ES data and Census data for occupations

In summary, there are advantages and disadvantages in using either Census data or ES data on occupation and economic activity for building an occupation projections model for Jordan. The Census is preferable because the data cover the entire population, and because it includes data for the economic activity 'Agriculture'. The ES is preferable because it is conducted every year so that the data are likely to be more up-to-date over time.

Are there large differences between estimates from the two sources? To address this question, consider the data in Table III.1: the data show the estimates of employment for 1-digit occupation groups from the ES for 2002, the ES for 2004, and the 2004 Census. Data for the ES for 2 years are included to demonstrate the variability in the ES data. The data from the ES for 2002 and from the 2004 Census are based on ISCO; the data from the ES for 2004 are based on the JSCO.

Table III.1: Estimates of employment (000) by 1-digit occupation:
ES 2002, ES 2004 and Census 2004 (Excluding the Armed Forces)

1-digit occupation	ES 2002*	ES 2004*	Census 2004
Legislators, Senior Officials & Managers	31.5	41.4	1.2
Professionals	182.3	194.0	190.5
Technicians & Associate Professionals	111.3	96.0	110.5
Clerks	111.3	92.0	53.1
Service Workers & Shop & Market Sales Workers	167.0	168.5	129.9
Skilled Agricultural & Fishery Workers	33.5	24.2	24.2
Craft & Related Workers	122.6	112.0	227.7
Plant & Machine Operators & Assemblers	83.4	99.3	127.1
Elementary Occupations	151.6	167.0	130.2
All occupations	**994.4**	**994.4**	**994.4**

* Adjusted to include data on 'Agriculture' from the Census and so that employment for all occupations in the ES is the same as in the Census.

The data in the table show that the occupational distribution of employment differs markedly not only between the two ES surveys, but also between the ES and Census. Consider first the occupational distributions from the ES in 2002 and in 2004: the differences here are mainly due to differences in the occupational classification. Although there are relatively large differences for some occupations, these may well be due to sampling errors and changes over time.

Now consider the differences between the occupational distributions from the ES in 2004 and the 2004 Census. Here again the differences between the estimates are mainly due to differences in the occupational classification. But the difference between the estimates

for 'Legislators, Senior Officials & Managers' is striking. Data from the ES indicate that there were about 41 thousand employees in this occupation group in 2004; by contrast, the Census shows that there were only about 1 thousand in this occupation group in the same year. Which of these is likely to be more accurate?

The Census estimate for 'Legislators, Senior Officials & Managers' seems to be far too low to be realistic: it is hard to believe that there are only 1.2 thousand workers in this occupation group in Jordan. A recent report on the labour market in Canada indicates that employment in management occupations in that country in 2003 was 1.4 million (*Looking Ahead: A 10-Year Outlook for the Canadian Labour Market*, HRSDC, October 2004, p.53.). Total employment in Canada in 2003 was 14.6 million so that occupations in management represent 9.4% of total employment. By contrast, the estimate for Jordan represents only 0.1% of total employment in that country.

Differences are to be expected in the proportion of managers in Canada and in Jordan because of differences in the occupational structure of industries and in the occupational classification systems used. But the difference is so large that it seems reasonable to conclude that there are likely to be significant coding and response errors in the Census data for Jordan.

This analysis therefore suggests that the projections of employment by occupation generated by the model would likely be more reliable if we were to use ES data instead of Census data in the model. ES data are subject to sampling variability, and so would the employment projections by occupation. This variability would likely be more important for small occupations than for large occupations. The effects of the sampling variability in ES data could be reduced somewhat if we were to use a 3-year average (instead of a single-year estimate) of the proportion that employment in a given occupation, forms of total employment in a given economic activity.

We therefore decided to use data on employment by occupation and economic activity from the ES for the three years 2005, 2006.and 2007 in the Model. These are the most recent data from the ES that were available when this Report was written.

d. Occupation data for 'Agriculture'

Our decision to use ES data for the Model meant that we would have to include occupation data for the economic activity 'Agriculture' from either the 2004 Census or the EUS in the Model. This would normally not present any major difficulty: but, as noted earlier, the occupational classification used for coding employment data in the 2004 Census and in the EUS, is based on ISCO; by contrast, data from the ES are coded using the JSCO. Because of the differences between the two classifications, using 2004 Census or EUS data on 'Agriculture' in the Model would create inconsistencies in the data. Would this have a major effect on the projections generated by the Model?

To address this question, we first compared the projections generated by the Model using occupation data on 'Agriculture' from the 2004 Census and from the EUS. The analysis showed that there was a relatively small difference in the projections using the two data sets (see: **'Some Issues in using EUS Data in the Occupation Projections Model for Jordan',*

by Bill Ahamad, 19 November 2009). We therefore concluded that it would be reasonable to use data from the EUS instead of the 2004 Census in the Model: a major advantage of doing so is that data for 'Agriculture' could then be updated on a regular basis, and at the same time as data for other economic activities in the Model.

We then focused on two other questions:

- Since occupation data in the EUS are coded using ISCO while ES data are coded using the JSCO, would the use of both classifications in the Model have a significant effect on the projections?

- What would be the effects of using EUS data (coded to 3-digits) for 'Agriculture' and ES data (coded to 4-digits) for other economic activities?

To address these questions, we looked at the 3-digit occupations in the economic activity 'Agriculture': employment in the five largest occupations is shown in Table III.2.

The data show that employment in 'Agriculture' is concentrated in 3 main occupations: 'Market Gardeners and Crop Growers'; 'Market-Oriented Animal Producers and Related Workers'; and 'Agricultural, Fishery and Related Labourers'. Nearly 80% of employment in the economic activity is concentrated in these three occupations, and the proportion of employment in any other occupation is less than 5%.

Table III.2: Employment (%) in five main 3-digit occupations in 'Agriculture': EUS 2005, 2006 and 2007

Code	Occupation title	EUS 2005	EUS 2006	EUS 2007
221	Life Science Professionals	2.8	3.8	4.0
611	Market Gardeners and Crop Growers	34.7	33.8	43.2
612	Market-Oriented Animal Producers and Related Workers	19.9	22.0	16.6
921	Agricultural, Fishery and Related Labourers	24.8	20.4	15.0
915	Messengers, Porters, Doorkeepers And Related Workers	3.2	3.4	3.2

The occupations 'Market Gardeners and Crop Growers' and 'Market-Oriented Animal Producers and Related Workers' are not coded in the ES so that using data from the EUS and ES in the Model will have no effect on the projections for these occupations. By contrast, the occupation 'Agricultural, Fishery and Related Labourers' is coded both in the EUS and ES: it follows that in the Model, there will be workers in this occupation in economic activities other than 'Agriculture': for example, data from the ES in 2005 show that there were 1.8 thousand workers in the occupation 'Agricultural, Fishery and Related Labourers' and in the economic activity 'Public Administration'.

Differences between the classifications used in the EUS and ES will therefore affect the projections for this occupation generated by the Model. But how large is this effect likely to be? To address this question, consider the data in Table III.3. These data show employment in the largest occupations in the economic activity 'Agriculture' as a percentage of total employment in that occupation. The data show that all employment in

14

the two occupations 'Market Gardeners and Crop Growers' and 'Market-Oriented Animal Producers and Related Workers', is in the economic activity ' Agriculture'. This is because these two occupations are coded in the EUS, but not in the ES.

Table III.3: Employment for main occupations in 'Agriculture', as a percentage of total employment* in each occupation

Code	Occupation title	2005	2006	2007
221	Life Science Professionals	27.4	38.3	34.5
611	Market Gardeners and Crop Growers	100.0	100.0	100.0
612	Market-Oriented Animal Producers and Related Workers	100.0	100.0	100.0
921	Agricultural, Fishery and Related Labourers	66.5	56.9	47.6
915	Messengers, Porters, Doorkeepers and Related Workers	1.9	1.8	2.1

*Note: * Estimates of total employment are based on the EUS for Agriculture and on the ES for other economic activities*

The data in the table show that employment in 'Agricultural, Fishery and Related Labourers' in the economic activity 'Agriculture' formed 66.5% of total employment in that occupation. Since the proportion of employment in the occupation in 'Agriculture' is relatively large, it follows that errors caused by differences in the classifications could have a relatively large effect on the projection of total employment in that occupation: thus projections for such occupations may not be reliable.

Table III.4: Occupation codes and titles for 'Agricultural, Fishery and Related Labourers' in EUS and ES

4-digit code	Occupation title in EUS	Occupation title in ES
9211	Farm-hands and labourers	Farm Labourers
9212	Forestry labourers	Forestry labourers
9213	Fishery, hunting and trapping labourers	Fishery and Hunting Labourers
9214	N.A.*	Animal Breeding and Poultry Labourers

* Not identified in the EUS

The data in Table III.4 show that there are some differences, between the EUS and ES, in the 4-digit occupations included in the 3-digit occupation 'Agricultural, Fishery and Related Labourers'. For example, the 4-digit occupation 'Animal Breeding and Poultry Labourers' is included in the 3-digit occupation in the ES but not in the EUS.

We can also use the data in Table III.3 to examine the potential underestimation of employment in 4-digit occupations caused by using 3-digit data for 'Agriculture'. The projections for some 4-digit occupations will be underestimated in the Model because no estimates are available in the EUS for the 4-digit occupations that are sub-groups of 3-digit occupations in 'Agriculture'. The underestimation will be relatively large if employment in a given occupation in 'Agriculture' formed a relatively large proportion of total employment in that occupation.

As an example of the underestimation, consider the data in Table III.3 for 'Life Science Professionals' in 2005: the data show that in 2005, 27.4% of 'Life Science Professionals' were employed in 'Agriculture'. The 3-digit occupation 'Life Science Professionals' consists of three 4-digit occupations: 'Biologists, Botanists, Zoologists and Related Professionals' (code 2211); 'Pharmacologists, Pathologists and Related Professionals' (code 2212); and 'Agronomists and Related Professionals' (code 2213). Data for these 4-digit occupations are available in the ES but not in the EUS: it follows that since a relatively large proportion of 'Life Science Professionals' are employed in 'Agriculture', the projection of employment generated by the model will be significantly underestimated for at least one of the three 4-digit occupations within the 3-digit occupation.

By contrast, consider the data in Table III.3 for 'Messengers, Porters, Doorkeepers and Related Workers': the data show that in 2005,1.9% of 'Messengers, Porters, Doorkeepers and Related Workers' were employed in 'Agriculture'. This 3-digit occupation consists of three 4-digit occupations: 'Messengers and Porters' (code 9161); 'Door Keepers and Watchmen' (9162); and 'Meter Readers' (code 9163). The projection for at least one of these 4-digit occupations will be underestimated in the Model: but since employment in the occupation 'Messengers, Porters, Doorkeepers and Related Workers' in 'Agriculture' forms only a small proportion of total employment in that occupation, the underestimation for the 4-digit groups will have a relatively small effect on the projections of employment for those occupations.

e. Conclusions about the available data on employment by 4-digit occupation and economic activity

Several conclusions emerge from the analysis in this Section:

- Data on employment by 4-digit occupation and economic activity are available from the 2004 Census and the ES. Analysis of the data suggests that it would be better to use ES data, rather than 2004 Census data, in the Model.

- However, use of ES data in the Model creates problems since the economic activity 'Agriculture' is not covered in the survey. Analysis suggests that it would be reasonable to use data on 'Agriculture' from the EUS.

- An additional complication is that data in the EUS are coded using ISCO, while data in the ES are coded using the JSCO. There are significant differences between the two classifications so that the use of data for 'Agriculture' from the EUS in the Model will affect the reliability of the projections for some occupations. The occupations affected by the differences between the classifications are identified in Appendix 5 and Appendix 6.

- The EUS data for 'Agriculture' are coded to 3-digits while the ES data for the other economic activities in the Model are coded to 4-digits. As a result, the projected employment for 4-digit occupations that are relatively important in 'Agriculture' will be underestimated. These occupations are identified in Appendix 5 and Appendix 6.

- Informal workers (many of whom are non-Jordanians) are not covered in the ES, so that data are not available on the occupations of non-Jordanians. It follows that the projections generated by the model will exclude most non-Jordanians working in Jordan.

III.3 Data for non-Jordanians working in Jordan

As noted above, the number of non-Jordanians working in Jordan is underestimated in both the EUS and the ES. Estimates of non-Jordanians working in Jordan are available from the Ministry of Labour; however, these data include the economic activities, but not the occupations, of non-Jordanians, so that these data are of limited use in an occupation projections model.

There are other difficulties in integrating the data available from the Ministry of Labour with data from the EUS and ES. The EUS excludes people living in collective dwellings: since many (but not all) non-Jordanians live in collective dwellings, the number of non-Jordanians working in Jordan is underestimated in the survey. Similarly, the ES excludes workers in the informal sector: since many (but not all) non-Jordanians work in the informal sector, the number of non-Jordanians working in Jordan is underestimated in the survey. However, the statistics from the Ministry of Labour include all non-Jordanians, irrespective of where they live or work. It follows that if the data on non-Jordanians from the Ministry of Labour were added to the data from the EUS and ES, total employment in Jordan would be overestimated.

The types of jobs held by non-Jordanians are also likely to differ from those held by Jordanians. In many countries, immigrants are often employed in jobs:

- That are temporary or short-term, and that offer little in terms of job stability or employment benefits;
- That often entail poor working conditions and long hours of work;
- In which wages are relatively low; and
- For which it is difficult to recruit local workers.

It therefore seems likely that the jobs held by Jordanians and non-Jordanians will be very different. Thus it would not make sense to assume that the occupational distribution of non-Jordanians would be the same as that of Jordanians. Non-Jordanians are therefore not included in the Occupation Projections Model described in this Report; and the occupation projections generated by the Model refer to Jordanian workers.

IV. Trends in employment by economic activity and occupation

IV.1 Recent changes in employment by economic activity

a. Data for Jordanians

In 1995, the total employment of Jordanians in Jordan was about 689 thousand; and employment had grown to about 954 thousand in 2006. This represents an annual average rate of increase of 2.7% over the 12-year period. The increase in total employment was fairly consistent over the period (see Figure IV.1).

Figure IV.1: Total employment (excluding non-Jordanians and armed force) 1995-2006 (1995=100)
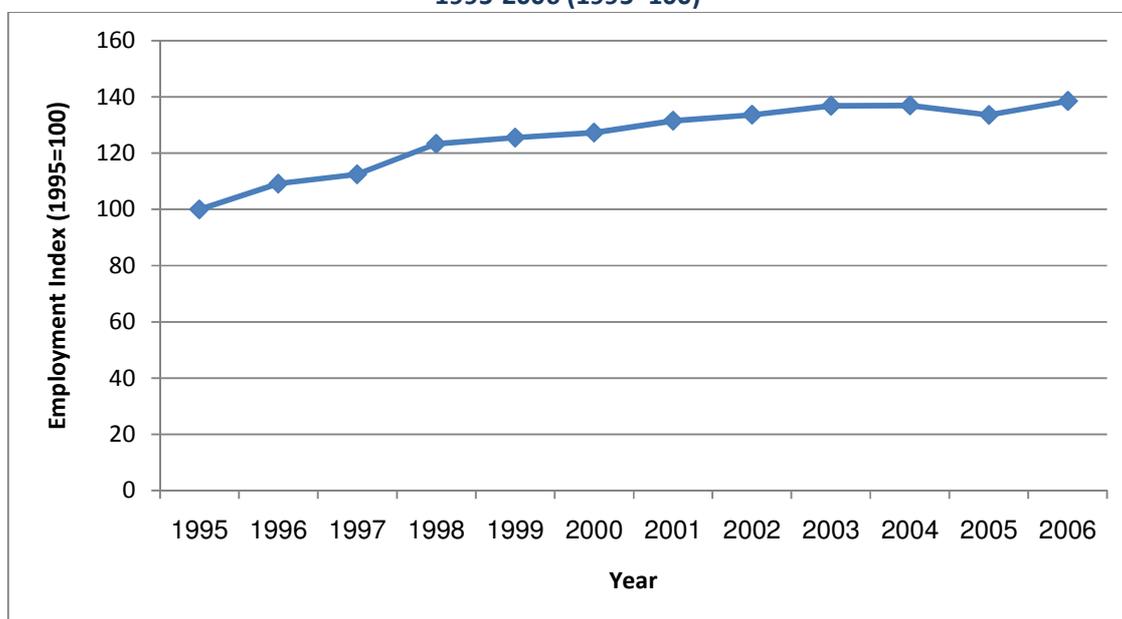
Source: Based on data from the EUS and ES

The graphs in Figure IV.2 show that the employment of Jordanians over the period was considerably higher for service-producing economic activities (which include 'Trade', 'Transportation', 'Public Administration', 'Education', 'Health & Social Work' among others), than for goods-producing economic activities ('Agriculture', 'Mining & Quarrying', 'Manufacturing', 'Construction', and 'Electric, Gas and Water Supply'). Employment in service-producing activities grew consistently over the period and at an annual average rate of growth of 3.8%; by contrast, changes in employment for goods-producing economic activities were somewhat irregular; and employment in 2006 was only slightly higher than that in 1995.

Figure IV.2: Employment of Jordanians in goods-producing and service-producing economic activities, 1995-2006 (1995=100)
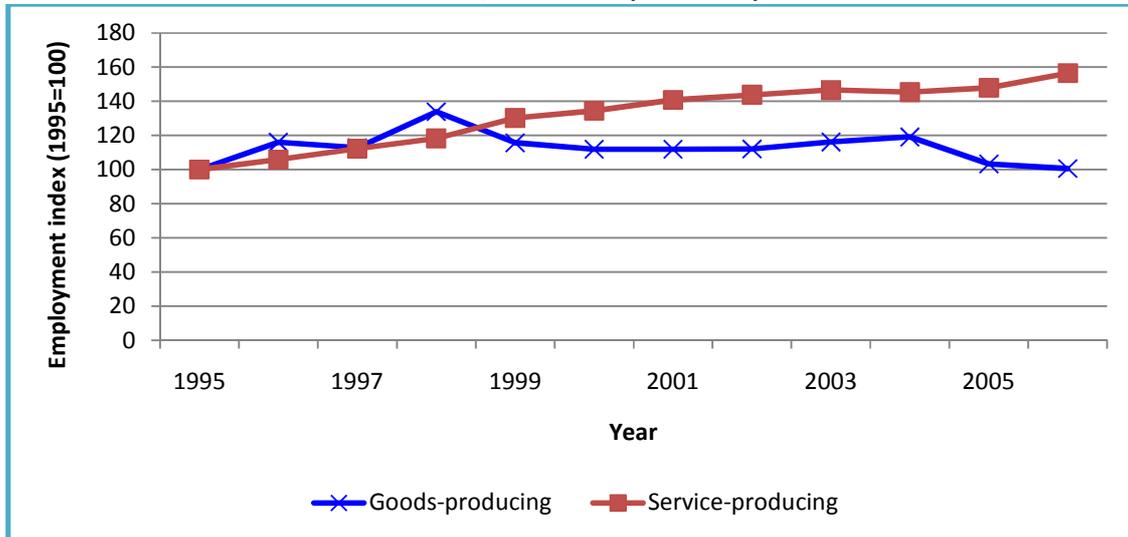
Source: Based on data from the EUS and ES

As would be expected, the change in employment over the 12-year period has been quite different for each of the economic activities within the goods-producing activities (see Figure IV.3). The trends in employment were quite different for the five goods-producing economic activities between 1995 and 2006. Employment in 'Manufacturing', 'Construction' and 'Electric, Gas and Water Supply' increased marginally by 2006. But employment in 'Agriculture' and in 'Mining & Quarrying' fell significantly by 2006.

Figure IV.3: Employment in goods-producing economic activities, Jordan 1995-2006 (1995=100)
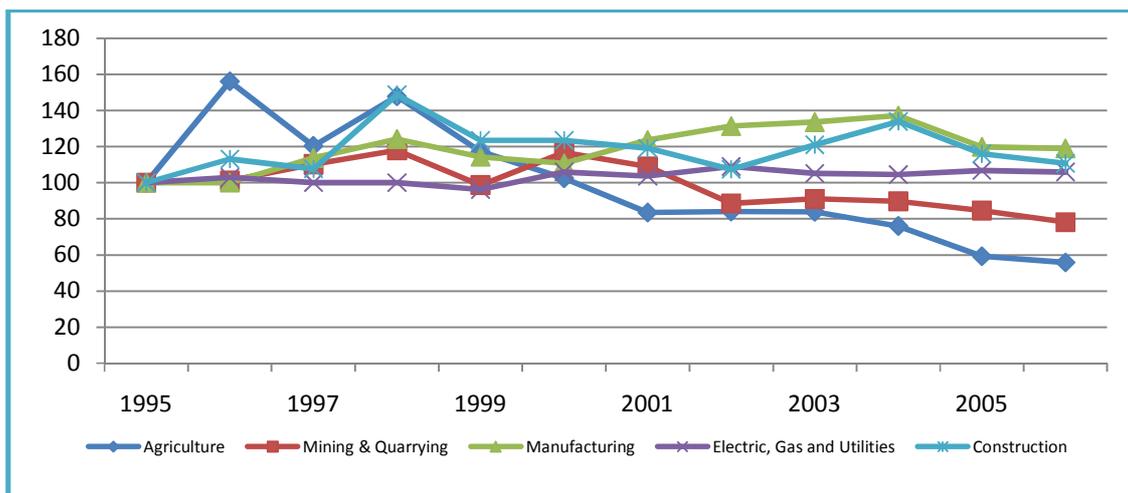
Source: Based on data from the EUS and ES

The graphs in Figure IV.4 (for the five largest service-producing activities in 2006) show that employment in these activities all increased over the period. Employment in 'Other Community,

Social & Personal Services' showed the largest increase (75%) of the economic activities in the graph; and the lowest increase was for 'Public Administration' (24%).

Figure IV.4: Employment in selected service-producing economic activities, Jordan 1995-2006 (1995=100)
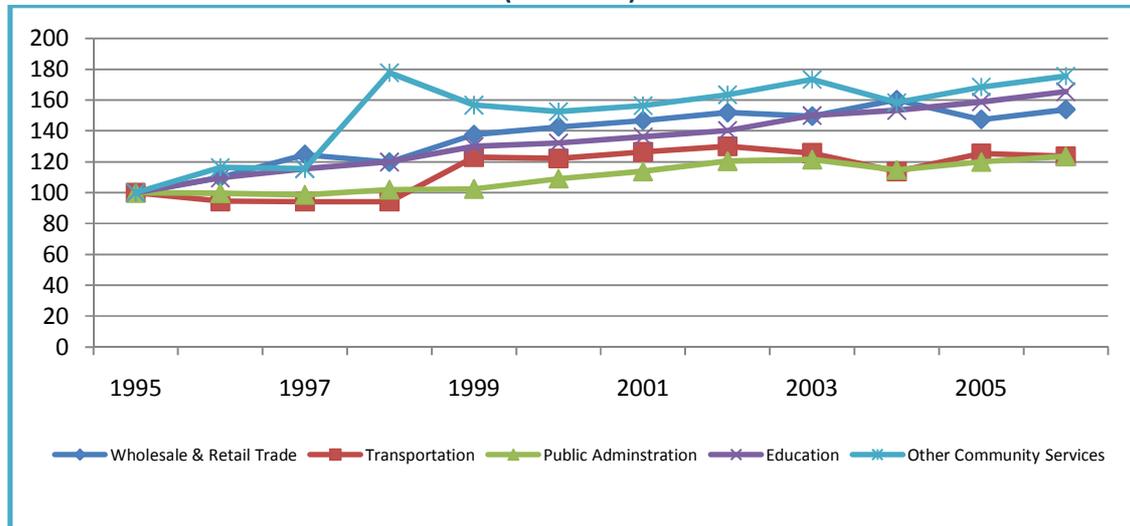
The employment of Jordanians by economic activity is shown for 1995 and for 2006 in Table IV.1.

Table IV.1: Employment of Jordanians by Economic Activity 1995 and 2006 (Excluding the Armed Forces)

Economic activity	Employment (000)		Change in employment 1995-2006 (%)	Employment share (%) in	
	1995	2006		1995	2006
Agriculture	49.5	27.6	-44.2	7.2	2.9
Mining & Quarrying	7.8	6.1	-21.8	1.1	0.6
Manufacturing	96.0	114.2	19.0	13.9	12.0
Electric, Gas and Water Supply	13.4	14.2	6.0	1.9	1.5
Construction	55.0	60.9	10.7	8.0	6.4
Wholesale and Retail Trade	116.4	179.1	53.9	16.9	18.8
Hotels and Restaurants	12.4	23.8	91.9	1.8	2.5
Transportation	79.8	98.6	23.6	11.6	10.3
Financial Intermediation	16.2	21.5	32.7	2.4	2.3
Real Estate, Renting and Business Activities	18.4	52.2	183.7	2.7	5.5
Public Administration and Compulsory Social Security	67.8	83.8	23.6	9.8	8.8
Education	93.6	154.8	65.4	13.6	16.2
Health and Social Work	27.2	54.8	101.5	3.9	5.7
Other Community, Social & Personal Services	35.6	62.5	75.6	5.2	6.6
TOTAL EMPLOYMENT	**689.1**	**954.1**	**38.5**	**100.0**	**100.0**

The table also includes data on the percentage change in employment and on the share of employment for each economic activity for 1995 and 2006.

In 1995 employment was highest for 'Wholesale and Retail Trade' (116 thousand). It was also relatively high for 'Manufacturing' (96 thousand) and for 'Education' (94 thousand). These three economic activities together accounted for 44% of total employment in 1995; but their share of employment had grown to 47% in 2006.

Employment growth over the period 1995-2006 was highest for the economic activity 'Real Estate, Renting and Business Activities': employment in this economic activity grew from 18 thousand in 1995 to 52 thousand in 2006 – an increase of 184%. The increase in employment in 'Health and Social Work' was also very high, and employment in this economic activity doubled between 1995 and 2006.

b. Data for non-Jordanians

The trends in the number of Jordanians and non-Jordanians working in Jordan over the period 2000-2006 are compared in Figure IV.5.

Figure IV.5: Employment of Jordanians and non-Jordanians working in Jordan, 2000-2006 (2000=100)
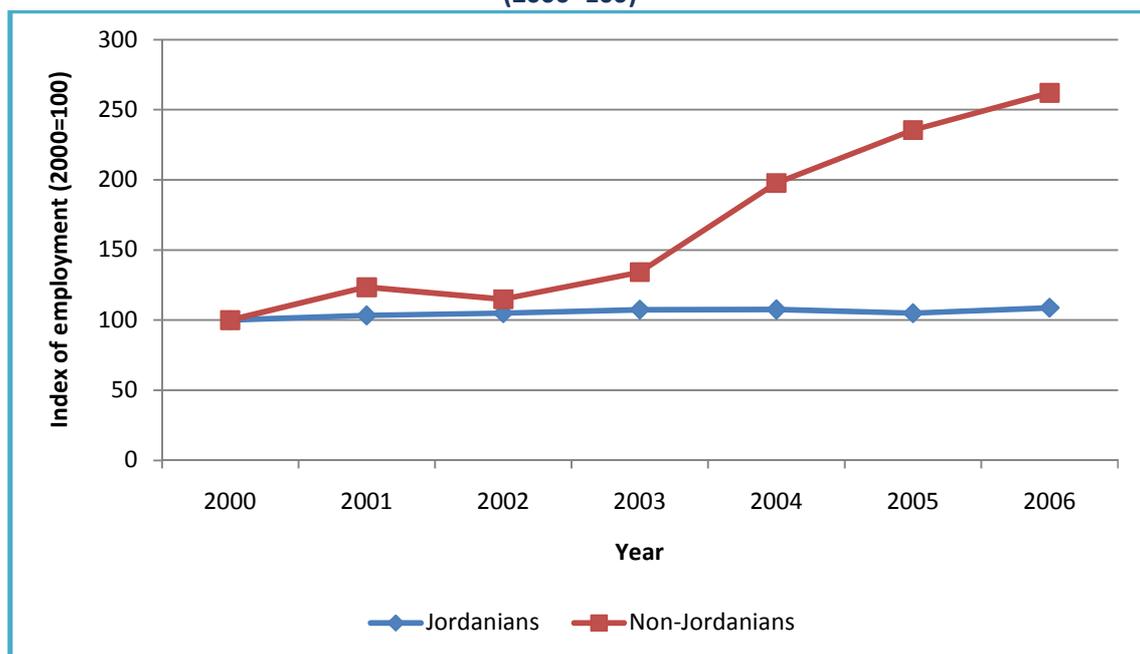
Sources: Data for Jordanians based on EUS and ES; data for non-Jordanians based on data from the Ministry of Labour

The employment of non-Jordanians increased from 111 thousand in 2000 to 290 thousand in 2006 – an increase of 162%. By contrast, over the same period the employment of Jordanians increased from 877 thousand to 954 thousand – an increase of only 9%. The difference in the growth of employment of the two groups has been particularly striking since 2003.

22

Estimates for the economic activities in which non-Jordanians worked are also available from the Ministry of Labour (see Table IV.2). The estimates show that, in 2000, about 30 thousand non-Jordanians working in Jordan were employed in the economic activity 'Agriculture': in that year, non-Jordanians formed 38% of total employment (Jordanians and non-Jordanians) in 'Agriculture'. But the numbers had changed considerably by 2006, and the number of non-Jordanians working in 'Agriculture' had increased to 68 thousand: and the proportion that non-Jordanians formed of employment in the economic activity had increased to 71%.

These data therefore suggest that non-Jordanians now provide the bulk of workers in 'Agriculture'.

Table IV.2: Employment of non-Jordanians working in Jordan by economic activity in 2000 and 2006

Economic activity	Employment (000s)		As % of total employment in the economic activity	
	2000	**2006**	**2000**	**2006**
Agriculture	30.5	68.3	37.5	71.2
Mining & Quarrying	2.3	2.9	20.2	32.5
Manufacturing	16.8	69.7	13.7	37.9
Electric, Gas and Water Supply	0.2	0.2	1.3	1.4
Construction	20.2	44.3	22.9	42.1
Wholesale and Retail Trade	10.3	19.4	5.9	9.8
Hotels and Restaurants	7.2	15.2	25.5	39.0
Transportation	1.8	2.0	1.8	2.0
Financial Intermediation	0.9	1.9	4.2	8.3
Real Estate, Renting and Business Activities	1.6	1.9	5.1	3.6
Public Administration and Compulsory Social Security	0.3	0.2	0.5	0.2
Education	1.1	1.4	0.8	0.9
Health and Social Work	0.4	1.2	0.9	2.1
Other Community, Social & Personal Services	17.0	61.0	23.9	49.4
Total	**110.6**	**289.7**	**11.2**	**23.3**

Source: Estimates of non-Jordanians were provided by NCHRD, MOL and DOS and are based on data from the Ministry of Labour; estimates of Jordanians based on data from the EUS and ES

The data in Table IV.2 are equally striking for many other economic activities. For example, in 2006 non-Jordanians formed:

- Nearly 50% of workers in 'Other Community, Social & Personal Services';
- 42% of workers in 'Construction';
- Nearly 40% of workers in 'Manufacturing' and 'Hotels and Restaurants'; and
- Nearly one-third of workers in 'Mining & Quarrying'.

It is clear, therefore, that non-Jordanians have become an increasingly important source of workers in many economic activities.

The distribution of employment by economic activity also differs markedly for Jordanian and non-Jordanian workers (see Table IV.3). 'Agriculture' seems to be the most important source of jobs for non-Jordanian workers: 28% in 2000 (and 24% in 2006) of non-Jordanian workers were

employed in this economic activity. By contrast, in 2000 only 6% (and in 2006 only 3%) of Jordanians had jobs in 'Agriculture'.

Table IV.3: Distribution (%) of the employment of Jordanians and Non-Jordanians by economic activity in 2000 and 2006 (Excluding the Armed Forces)

Economic activity	Jordanians		Non-Jordanians	
	2000	2006	2000	2006
Agriculture	5.8	2.9	27.6	23.6
Mining & Quarrying	1.0	0.6	2.1	1.0
Manufacturing	12.1	12.0	15.2	24.1
Electric, Gas and Water Supply	1.6	1.5	0.2	0.1
Construction	7.7	6.4	18.3	15.3
Wholesale and Retail Trade	18.9	18.8	9.3	6.7
Hotels and Restaurants	2.4	2.5	6.5	5.3
Transportation	11.1	10.3	1.6	0.7
Financial Intermediation	2.2	2.3	0.8	0.7
Real Estate, Renting and Business Activities	3.4	5.5	1.5	0.7
Public Administration and Compulsory Social Security	8.4	8.8	0.3	0.1
Education	14.1	16.2	1.0	0.5
Health and Social Work	4.8	5.7	0.4	0.4
Other Community, Social & Personal Services	6.2	6.6	15.4	21.1
Total	**100.0**	**100.0**	**100.0**	**100.0**

Source: Estimates of non-Jordanians were provided by NCHRD and are based on data from the Ministry of Labour; estimates of Jordanians based on data from the EUS and ES

These data therefore suggest that:

- Non-Jordanians form a significant proportion of employment in Jordan;
- Some economic activities are highly dependent on non-Jordanians as a source of labour; and
- The economic activity 'Agriculture' is the most important source of jobs for non-Jordanians.

IV.2 Employment by occupation

Estimates of employment by occupation are available from the ES; but these estimates do not include workers in 'Agriculture', and they do not include workers in the informal sector (many of whom are non-Jordanians workers). Estimates of employment by occupation are also available from the EUS: since the EUS includes workers in 'Agriculture', it provides more reliable estimates than the ES. However, the number of non-Jordanians is underestimated in the EUS.

Thus estimates of employment by occupation are not available for non-Jordanians working in Jordan. The analysis here does not therefore include the occupational employment of non-Jordanians.

The data in Table IV.4 show the percentage employment distribution of Jordanians for 1-digit occupations in 1995 and 2006, based on data from the EUS. In 1995, 'Craft & Related Workers' formed the largest occupation group (21%) of all workers; but this proportion had fallen to 18.8% in 2006. The largest occupation group in 2006 was 'Professionals' (almost 22% of all workers); the proportion had increased considerably from almost 13% in 1995.

Table IV.4: Distribution (%) of the employment of Jordanians (%) by occupation, 1995 and 2006 (Excluding the Armed Forces)

1-digit Occupation	1995	2006
Legislators, Senior Officials & Managers	1.8	0.1
Professionals	12.6	22
Technicians & Associate Professionals	11.1	12.5
Clerks	8.7	6.1
Service Workers & Shop & Market Sales Workers	14.4	15.2
Skilled Agricultural & Fishery Workers	6.8	2.1
Craft & Related Workers	21.3	18.8
Plant & Machine Operators & Assemblers	15.0	13.9
Elementary Occupations	8.2	9.3
Total	**100.0**	**100.0**

Source: EUS

The change in the proportion of 'Professionals' is not surprising given the changes in technology and the increased skills and knowledge required for many jobs.

Table IV.5: Estimated employment (%) for 'Legislators, Senior Officials & Managers', 1995 – 2006 (Excluding the Armed Forces)

Year	Legislators, Senior Officials & Managers
1995	1.8
1996	2.6
1997	3.0
1998	1.5
1999	1.3
2000	0.1
2001	0.9
2002	0.3
2003	0.2
2005	0.1
2006	0.1

Source: Based on EUS data.

Table IV.5 includes data on the employment of 'Legislators, Senior Officials & Managers'. The data show that the proportion employed in this occupation group fell from 1.8% in 1995 to 0.1% in 2006. This decline represents a fall in employment from nearly 12,000 workers in 1995 to a mere 500 workers in 2006. Such a dramatic decline seems to be far too large to be realistic: it is unlikely that it could have arisen because of changes in the labour market. It suggests that there has been a change in the information provided by respondents, or in the way these responses are coded in occupations.

These data therefore point to the need for a detailed examination of the data collection methods and coding of responses in the EUS.

V. Projections of employment

V. 1 Outlook for employment by economic activity: Jordanians

a. Projections of employment of Jordanians by economic activity

Projections of employment of Jordanians for each economic activity in 2011 were derived using the simple extrapolation of time-series data for 1995-2006 for each economic activity except 'Agriculture' and 'Construction'. For these two economic activities, we used data for the period 2000-06: recent changes in these economic activities suggested that the data for this period would provide a better indication of likely changes in employment.

Table V.1: Employment in 2006 and projections for 2011 by economic activity: Jordanians
(Excluding the Armed Forces)

Economic activity	Estimated employment 2006 (000)	Projected employment 2011 (000)	Percentage Change 2006-11	Annual average rate of growth 2006-11 (%)
Agriculture	27.6	10.7	-61.2	-17.2
Mining & Quarrying	6.1	5.7	-6.8	-1.4
Manufacturing	114.2	137.5	20.4	3.8
Electric, Gas and Water Supply	14.2	14.8	4.2	0.8
Construction	60.9	62.6	2.7	0.5
Wholesale and Retail Trade	179.1	218.2	21.9	4.0
Hotels and Restaurants	23.8	30.0	26.0	4.7
Transportation	98.6	116.4	18.0	3.4
Financial Intermediation	21.5	21.7	0.9	0.2
Real Estate, Renting and Business Activities	52.2	57.0	9.1	1.8
Public Administration and Compulsory Social Security	83.8	92.6	10.5	2.0
Education	154.8	181.1	17.0	3.2
Health and Social Work	54.8	67.8	23.7	4.3
Other Community, Social & Personal Services	62.5	74.8	19.7	3.7
TOTAL EMPLOYMENT	**954.1**	**1090.9**	**14.3**	**2.7**

Source: Based on the Occupation Projections Model: the projections in the table are based on data for 2000-06 for 'Agriculture' and 'Construction', and for 1995-2006 for all other economic activities.

The projections in Table V.1 suggest that total employment of Jordanians will increase from 954 thousand in 2006, to 1,091 thousand in 2011. The projected increase over the 5-year period is 14.3% and the annual average rate of growth of total employment is 2.7%. The rate of growth of employment is the same as that over the period 1995-2006.

Employment is projected to increase in all economic activities except 'Agriculture' and 'Mining and Quarrying'. For the other economic activities, the projected annual average rate of growth of employment is highest for 'Hotels and Restaurants' (annual average rate of growth of 4.7%). But the rate of growth is 4% or greater for two other economic activities: 'Health and Social Work' and 'Wholesale and Retail Trade'. Employment in 'Wholesale and Retail Trade' formed 19% of

total employment in 2006, so that the growth of employment for this economic activity will likely have a considerable impact on the growth and structure of employment by occupation.

The projections were obtained using the linear regression function in Microsoft Excel. The parameters of the regression equations used to derive the projections for each economic activity are included in Appendix 3: Appendix 3 also includes graphs showing the trend in the data together with the projection line for Jordanians in each economic activity.

b. How many new jobs are likely to be generated between 2006 and 2011?

The data in Table V.1 have been used to derive the projected number of new jobs (i.e. the projected change in the employment of Jordanians) by economic activity. The data in Table V.2 show that the projections indicate that 137 thousand new jobs will be generated in Jordan between 2006 and 2011.

Table V.2: Projected number of new jobs (000) by economic activity, 2006-2011: Jordanians(Excluding the Armed Forces)

Economic activity	Employment in 2006	Projected number of new jobs 2006-11
Agriculture	27.6	-16.9
Mining & Quarrying	6.1	-0.4
Manufacturing	114.2	23.3
Electric, Gas and Water Supply	14.2	0.6
Construction	60.9	1.7
Wholesale and Retail Trade	179.1	39.1
Hotels and Restaurants	23.8	6.2
Transportation	98.6	17.8
Financial Intermediation	21.5	0.2
Real Estate, Renting and Business Activities	52.2	4.8
Public Administration and Compulsory Social Security	83.8	8.8
Education	154.8	26.3
Health and Social Work	54.8	13.0
Other Community, Social & Personal Services	62.5	12.3
TOTAL EMPLOYMENT	**954.1**	**136.8**

Source: Based on the Occupation Projections Model: the projections in the table are based on data for 2000-06 for 'Agriculture' and 'Construction', and for 1995-2006 for all other economic activities.

The changes in employment by economic activity imply that the structure of the employment of Jordanians will change significantly over the 5-year period. The number of new jobs in 'Agriculture' and 'Mining & Quarrying' is projected to decline, while that in other economic activities is projected to increase. The largest projected increase is for 'Wholesale and Retail Trade' – 39 thousand jobs (which represents about 29% of all new jobs) over the period to 2011. A relatively large number of new jobs is also projected for 'Education' (26 thousand), 'Manufacturing' (23 thousand), and 'Transportation' (18 thousand).

By contrast, the employment of Jordanians in 'Agriculture' and in 'Mining & Quarrying' is projected to decline between 2006 and 2011. The projections suggest that about 17 thousand jobs will be lost in 'Agriculture'; and about 4 hundred jobs will be lost in 'Mining & Quarrying'.

c. How reliable are the projections?

Do the projections provide a good indication of employment in the various economic activities in 2011? Or are they subject to so much variability (because of the uncertain effects of political and economic factors) that they can only provide poor indicators of actual employment in that year?

Questions such as these can be addressed by studying the annual variation in employment over the time-period used for making the projections: 2000-06 for 'Agriculture' and 'Construction', and 1995-2006 for the other economic activities. If the annual variation over the period were small, then it would seem reasonable to assume that the difference between the projected employment and actual employment in 2011 would be relatively small: the projection would then provide a good indicator of employment. By contrast, if the annual variation over the period were relatively large, it would seem reasonable to assume that the projection might provide a poor indicator of employment in 2011.

The data in Table V.3 show the projections of employment of Jordanians by economic activity in 2011, together with a lower and upper option based on the variability of employment over the period 2000-06 for 'Agriculture' and 'Construction', and 1995-2006 for the other economic activities. The derivation of the two options is described in Appendix 4.

The options suggest that projected total employment in 2011 is likely to vary between 1056 thousand and 1126 thousand: this range represents ±3.2% of projected total employment. The range in the projections is relatively high for 'Agriculture' (25.4%); and it is greater than 5% for 'Mining & Quarrying' (9.9%), 'Construction' (5.4%), and 'Transportation' (5.0%). The results suggest that the projections for these economic activities are subject to relatively high variability so that the projections of employment may not provide a good indicator of employment in 2011. The range between the lower and upper option is relatively small for 'Education' (0.6%) and for 'Health and Social Work (0.9%). It would therefore seem reasonable to assume that the projections for these economic activities would provide a good indicator of employment in 2011.

Table V.3: Projections of employment by economic activity in 2011 (000) (Excluding the Armed Forces)

Economic activity	Projected employment	Lower option	Upper option	Range (%)*
Agriculture	10.7	8.0	13.4	±25.4
Mining & Quarrying	5.7	5.1	6.2	±9.9
Manufacturing	137.5	131.5	143.5	±4.4
Electric, Gas and Water Supply	14.8	14.6	15.0	±1.6
Construction	62.6	59.2	66.0	±5.4
Wholesale and Retail Trade	218.2	212.2	224.3	±2.8
Hotels and Restaurants	30.0	28.8	31.1	±3.8
Transportation	116.4	110.5	122.2	±5.0
Financial Intermediation	21.7	20.8	22.6	±4.0
Real Estate, Renting and Business Activities	57.0	55.4	58.5	±2.7
Public Administration and Compulsory Social Security	92.6	90.9	94.3	±1.8
Education	181.1	180.1	182.1	±0.6
Health and Social Work	67.8	67.2	68.4	±0.9
Other Community, Social & Personal Services	74.8	71.7	77.9	±4.1
TOTAL EMPLOYMENT	**1090.9**	**1056.0**	**1125.7**	**±3.2**

Source: Based on the Occupation Projections Model: the projections in the table are based on data for 2000-06 for Agriculture and Construction, and for 1995-2006 for all other economic activities.

* Range is half of the difference between options expressed as a % of projected employment.

The variability of the projections of employment by economic activity will affect the variability of the projections of employment by occupation. For example, since the projection of employment for 'Agriculture' is subject to relatively high variability, the projections of employment in the occupations closely associated with this economic activity (such as 'Market Gardeners and Crop Growers') will also be subject to high variability: these projections may not therefore provide a reliable indicator of employment in those occupations.

By contrast, since the projection for 'Education' is subject to relatively low variability, the projections of employment in the occupations closely associated with this activity (such as 'Secondary Education Teaching Professionals') will also be subject to relatively low variability: the occupation projections may therefore provide a fairly reliable indicator of employment in related occupations.

The two options for projected employment by economic activity have been used in the Model to derive a range for the projections of employment by occupation, and hence to provide a basis for examining the variability in the projections of employment by occupation.

V.2 Projections of employment by economic activity: non-Jordanians

Projections of the employment of non-Jordanians working in Jordan were derived by officials in NCHRD, MOL, and DOS: the projection for each economic activity in 2011 was based on the extrapolation of time-series data for the period 2000-2009 (the data used are included in Appendix 2).

Table V.4: Employment in 2006 and projections for 2011 by economic activity: non-Jordanians working in Jordan

Economic activity	Estimated employment 2006 (000)	Projected employment 2011 (000)	Percentage Change 2006-11	Annual average rate of growth 2006-11 (%)
Agriculture	68.3	99.6	45.8	7.8
Mining & Quarrying	2.9	2.7	-9.4	-2.0
Manufacturing	69.7	93.1	33.5	5.9
Electric, Gas and Water Supply	0.2	0.4	101.8	15.1
Construction	44.3	53.4	20.7	3.8
Wholesale and Retail Trade	19.4	28.3	45.4	7.8
Hotels and Restaurants	15.2	21.1	38.8	6.8
Transportation	2.0	2.6	29.0	5.2
Financial Intermediation	1.9	3.1	58.0	9.6
Real Estate, Renting and Business Activities	1.9	2.3	18.4	3.4
Public Administration and Compulsory Social Security	0.2	0.2	5.7	1.1
Education	1.4	1.6	16.0	3.0
Health and Social Work	1.2	1.5	29.2	5.3
Other Community, Social & Personal Services	61.0	95.3	56.3	9.3
TOTAL EMPLOYMENT	**289.7**	**405.2**	**39.8**	**6.9**

Source: Extrapolation of time-series Ministry of Labour data, carried out by officials in NCHRD

30

The data is Table V.4 suggest that the total employment of non-Jordanians working in Jordan will increase from 290 thousand in 2006, to 405 thousand in 2011 – an increase of 40% over the 5-year period. The annual rate of growth over the period is projected to be 6.9: this much higher than the projected rate of growth of the employment of Jordanians (2.7%).

The proportions that the employment of non-Jordanians formed of total employment in 2006, and are projected to form in 2011, are compared for different economic activities in Table V.5. These data suggest that the proportion that non-Jordanians form of total employment will increase for 23% in 2006, to 27% in 2011.

The projected changes by economic activity are equally striking. The proportion of non-Jordanians working in 'Agriculture' is projected to increase from 71% in 2006, to 90% in 2011. And the proportion for 'Other Community, Social & Personal Services' is projected to increase from 49% in 2006, to 56% in 2011.

Table V.5: Non-Jordanians working in Jordan as a proportion (%) in total employment

Economic activity	2006	2011
Agriculture	71.2	90.3
Mining & Quarrying	32.5	31.9
Manufacturing	37.9	40.4
Electric, Gas and Water Supply	1.4	2.7
Construction	42.1	46.1
Wholesale and Retail Trade	9.8	11.5
Hotels and Restaurants	39.0	41.3
Transportation	2.0	2.2
Financial Intermediation	8.3	12.4
Real Estate, Renting and Business Activities	3.6	3.9
Public Administration and Compulsory Social Security	0.2	0.2
Education	0.9	0.9
Health and Social Work	2.1	2.2
Other Community, Social & Personal Services	49.4	56.0
TOTAL EMPLOYMENT	**23.3**	**27.1**

Sources: Projections of Jordanians based on Occupation Projections Model; projections of non-Jordanians derived by officials at NCHRD

By contrast, the data suggest that the proportion that the employment of non-Jordanians forms of total employment will remain relatively small for some economic activities (such as 'Public Administration and Compulsory Social Security' and 'Education').

These projections point to the need for a special study to address questions such as the following:

- How do the jobs of non-Jordanians differ from those of Jordanians?
- Are the hours of work, working conditions, wages and other such factors different for the jobs of non-Jordanians and Jordanians?

- Are the occupations in which non-Jordanians and Jordanians become employed different?
- Are the skills and knowledge required for the jobs in which non-Jordanians work different from those in which Jordanians work?

V.3 Projections of employment for 1-digit occupations in 2011

The data in Table V.6 show estimated employment of Jordanians in 2006 and in 2011 for 1-digit occupations; the table also includes the number of new jobs projected between 2006 and 2011, as well as the projected annual average rate of growth of employment in each 1-digit occupation group.

Table V.6: Employment (000) of Jordanians by occupation, 2006 and 2011(Excluding the Armed Forces)

1-digit Occupation	Estimated employment in 2006	Projected employment in 2011	Number of new jobs, 2006-11	Annual average rate of growth of employment (%)
Legislators, Senior Officials & Managers	47.0	54.3	7.3	2.9
Professionals	203.6	234.8	31.2	2.9
Technicians & Associate Professionals	107.8	124.2	16.3	2.9
Clerks	96.0	109.8	13.8	2.7
Service Workers & Shop & Market Sales Workers	161.9	196.5	34.6	3.9
Skilled Agricultural & Fishery Workers	16.0	6.2	-9.8	-17.2
Craft & Related Workers	101.0	117.5	16.4	3.1
Plant & Machine Operators & Assemblers	81.7	94.2	12.4	2.9
Elementary Occupations	139.0	153.5	14.5	2.0
TOTAL EMPLOYMENT	**954.1**	**1090.9**	**136.8**	**2.7**

Source: Based on the Occupation Projections Model

The projections suggest that new jobs will be generated in most occupation groups between 2006 and 2011. The only exception is 'Skilled Agricultural & Fishery Workers': the projections suggest that 10 thousand jobs for 'Skilled Agricultural & Fishery Workers' will be lost over the period. This is not surprising since employment in the economic activity 'Agriculture' is projected to fall between 2006 and 2011.

Most new jobs (35 thousand) are projected for 'Service Workers & Shop & Market Sales Workers'; 31 thousand new jobs are projected for 'Professionals'. These two occupation groups account for nearly half of the new jobs projected for Jordan over the period 2006-11.

The projected annual average rate of growth of employment (Table V.6) varies somewhat by occupation group. It is substantially above average for 'Service Workers & Shop & Market Sales Workers'; and it is somewhat below average for 'Elementary Occupations'.

The data in Table V.7 show the lower and upper options for the number of new jobs projected by occupation. For example, the data in the table show that the options suggest that the new jobs for 'Service Workers & Shop & Market Sales Workers' will probably lie between 28.3 thousand

and 40.9 thousand. The range represents ±3.2% of the projected level of employment in the occupation in 2011.

The projections suggest that the number of jobs for 'Skilled Agricultural & Fishery Workers' that will be lost between 2006 and 2011 will probably fall between 8.2 thousand and 11.1 thousand. The range represents a relatively high proportion (±25.4%) of the projected level of employment in the occupation in 2011: this suggests that the projection for this occupation may not be a good indicator of employment in 2011. Notice that even after allowing for the variation in the projections, it seems likely that there will be some loss of jobs for Jordanians in this occupation group.

Table V.7: Projected number of new jobs (000) in 2006-11 by occupation(Excluding the Armed Forces)

1-digit occupation	Projected new jobs	Lower option	Upper option	Range (%)*
Legislators, Senior Officials & Managers	7.3	5.4	9.1	±3.4
Professionals	31.2	27.0	35.4	±1.8
Technicians & Associate Professionals	16.3	12.7	20.0	±2.9
Clerks	13.8	10.4	17.2	±3.1
Service Workers & Shop & Market Sales Workers	34.6	28.3	40.9	±3.2
Skilled Agricultural & Fishery Workers	-9.8	-11.1	-8.2	±25.4
Craft & Related Workers	16.4	11.9	21.0	±3.9
Plant & Machine Operators & Assemblers	12.4	8.6	16.3	±4.1
Elementary Occupations	14.5	9.0	20.0	±3.6
TOTAL EMPLOYMENT	**136.8**	**102.1**	**171.6**	**±3.2**

Source: Based on the Occupation Projections Model
* Range is half of the difference between options expressed as a % of projected employment.

V.4 Projections of employment for selected 3-digit occupations

a. Five 3-digit occupations projected to add most jobs in 2006-2011

The data in Table V.8 show the projections for the five 3-digit occupation groups that are projected to add the most jobs between 2006 and 2011. These five occupations are projected to add nearly 50 thousand jobs between 2006 and 2011: this represents 37% of all new jobs projected over the period.

Table V.8: Projected employment for the five 3-digit occupation groups projected to add most new jobs in 2006-11,(Excluding the Armed Forces)

Occupation (3-digit)	Estimated employment 2006 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Range (%)*
Shop Salespersons and Demonstrators	85.5	18.5	4.0	±2.8
Primary and Pre-Primary Education Teaching Professionals	51.7	8.9	3.2	±0.7
Messengers, Watchmen and Related Workers	57.5	8.1	2.7	±2.7
Secretaries and Keyboard-Operating Clerks	53.4	8.0	2.8	±2.8
Secondary Education Teaching Professionals	40.5	6.9	3.2	±0.6
TOTAL EMPLOYMENT	**954.1**	**135.8**	**2.7**	**±3.2**

Source: Based on the Occupation Projections Model
* Range is half of the difference between options expressed as a % of projected employment.

33

The range for the projections is relatively low for both 'Primary and Pre-Primary Education Teaching Professionals' and 'Secondary Education Teaching Professionals': this suggests that the projections for these two groups are highly reliable. By contrast, the range for the other occupations in the table is higher indicating that the projections are subject to greater uncertainty.

b. Projections for five 3-digit occupations in which most jobs are likely to be lost between 2006 and 2011

The data in Table V.9 show the projections for the five 3-digit occupation groups that are projected to lose the most jobs between 2006 and 2011.

These occupation groups are all concentrated in the economic activity 'Agriculture'. And since employment in this economic activity is projected to fall by over 60% by 2011, employment in the occupations most closely associated with this economic activity would also be expected to fall.

Table V.9: Projected employment for five 3-digit occupation groups projected to lose the most jobs in 2006-11, (Excluding the Armed Forces)

Occupation (3-digit)	Estimated employment 2006 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	*Range (%)**
Market Gardeners and Crop Growers	10.3	-7.6	-23.5	37.6
Market-Oriented Animal Producers and Related Workers	5.4	-4.0	-23.5	37.6
Agricultural, Fishery and Related Labourers	10.4	-3.2	-7.2	9.2
Agricultural and Other Mobile-Plant Operators	0.8	-0.2	-6.7	8.7
Life Science Professionals	3.3	-0.2	-1.5	4.9

Source: Based on the Occupation Projections Model
* Range is half of the difference between options expressed as a % of projected employment.

It should be noted, however, that the projections of employment in the occupations shown in Table V.7 are subject to relatively high variation. This is because employment in the occupations in the table is concentrated in the economic activity 'Agriculture'; and employment in this economic activity is subject to high annual variation. It follows that the projections for these occupations may not be very reliable.

c. Projections for 3-digit occupations within the 'Professionals' group

The data in Table V.10 show the estimated employment in 2006 and projected employment in 2011 for the five largest 3-digit occupations for 'Professionals'; the table also includes the number of new jobs projected to be generated between 2006 and 2011, as well as the projected annual average rate of growth of employment for each of these occupations.

Table V.10: Projected employment for five largest 3-digit occupation groups in 'Professionals' occupation group, (Excluding the Armed Forces)

Occupation (3-digit)	Estimated employment 2006 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	*Range (%)**
Primary and Pre-Primary Education Teaching Professionals	51.7	8.9	3.2	0.7
Secondary Education Teaching Professionals	40.5	6.9	3.2	0.6
Business Professionals	36.7	4.7	2.4	3.5
Health Professionals (except Nursing)	15.0	3.3	4.1	1.5
Architects, Engineers and Related Professionals	19.7	2.1	2.0	3.8
PROFESSIONALS	**203.6**	**31.2**	**2.9**	**±1.8**

Source: Based on the Occupation Projections Model
* Range is half of the difference between options expressed as a % of projected employment.

Employment in 'Professional' occupations is highest for 'Primary and Pre-Primary Education Teaching Professionals' in 2006 (51.7 thousand): and employment in this occupation is projected to be 60.6 thousand in 2011. Employment of 'Secondary Education Teaching Professionals' is also relatively high: 40.5 thousand in 2006 and 47.4 thousand projected for 2011.

The projected annual average rate of growth of employment for 'Health Professionals (except Nursing)' is much higher than the rate for all 'Professionals'. This suggests that relatively more jobs will be available in this occupation than in other occupations in this group.

Notice that the range for some of the employment projections in the table is relatively low. The employment projections for these occupations are therefore likely to provide a good indicator of employment in 2011.

V.5 Projections of employment for selected 4-digit occupations in 2011

The projections of employment in 4-digit occupations for 2011 are included in Appendix 5. These projections are used here to address the following questions:
- Which 4-digit occupations are projected to add the most new jobs between 2006 and 2011?
- Which 4-digit occupations are projected to add the least new jobs between 2006 and 2011?
- Which 4-digit occupations in the 'Professionals' group are projected to add the most new jobs between 2006 and 2011?
- Which 4-digit occupations in the 'Technicians & Associate Professionals' group are projected to add the most new jobs between 2006 and 2011?

a. Which 4-digit occupations are projected to add the most new jobs between 2006 and 2011?

The five 4-digit occupations projected to add the most new jobs for Jordanians between 2006 and 2011 are shown in Table V.11.

Most new jobs (9.5 thousand) are projected for 'Supplies Sales Persons': this number represents about 7% of all new jobs between 2006 and 2011. The annual average rate of growth (4.0%) of employment for this occupation is higher than that for total employment (2.7%). And the range

of options for this occupation is relatively low (±2.9), so that the projection is likely to be a good indicator of employment in the occupation in 2011.

The number of new jobs projected in the five occupations shown in Table V.9 is 38.5 thousand: this represents 28.1% of all new jobs: it follows that the new jobs projected over the period 2006-11 are concentrated in a small number of occupations, and that the number of new jobs in most other occupations is relatively small.

Table V.11: The five 4-digit occupations projected to add the most new jobs between 2006 and 2011, (Excluding the Armed Forces)

Code	Occupation title	Employment in 2006 (000)	New jobs 2006-11 (000)	Annual average rate of growth (%)	Range (%)
5221	Supplies Sales Persons	43.7	9.5	4.0	2.9
2330	Basic and Pre-Primary Education Teaching Professionals	51.7	8.9	3.2	0.7
4114	Secretaries and Correspondence Clerks	46.4	7.0	2.9	2.9
2320	Secondary Education Teaching Professionals	40.5	6.9	3.2	0.6
9161	Messengers and Porters	37.0	6.2	3.1	2.5

Source: Based on the Occupation Projections Model
* Range is half of the difference between options expressed as a % of projected employment.

b. Which 4-digit occupations are projected to add the lowest number of new jobs between 2006 and 2011?

In the Model, projections have been made for (329) 4-digit occupations (see Appendix 5). In 99 of these (30% of the total), the projected number of new jobs over the period is less than 100; and many of these occupations are relatively small (with about 100). Thus the number of new jobs projected to be added between 2006 and 2011 in each of these occupations will be relatively small.

It is therefore more interesting to look at the lowest number of new jobs in occupations that are not very small: for the analysis here, we decided to look at occupations with 1000 or more workers. The five 4-digit occupations (with one thousand or more workers) that are projected to add the lowest number of jobs between 2006 and 2011 are shown in Table V.12.

Table V.12: The five 4-digit occupations (with 1000 or more workers) projected to add the lowest number of jobs between 2006 and 2011, (Excluding the Armed Forces)

Code	Occupation title	Employment 2006 (000)	New jobs 2006-11 (000)	Annual average rate of growth (%)	Range (%)
7131	Building Exterior Decoration Workers	1.1	0.0	0.6	5.3
7122	Stone-Masons and Brick Layers	1.5	0.1	0.9	4.7
1313	Superintendents in Construction	2.5	0.1	0.7	5.1
1227	Production and Operations Department Managers in Financial, Real-Estate, Renting and Business Services	1.5	0.1	1.5	4.0
7214	Steel Construction Workers	1.0	0.1	2.1	4.2

Source: Based on the Occupation Projections Model
* Range is half of the difference between options expressed as a % of projected employment.

It should be noted that the data in Table V.12 are somewhat misleading. Since 4-digit data for 'Agriculture' are not included in the Model, projections of employment in the 4-digit occupations closely associated with 'Agriculture' are not generated in the Model. Such projections are not therefore shown in the table: but since employment in the economic activity is projected to fall, employment in the 4-digit occupations closely associated with 'Agriculture' is likely to fall.

c. Which 4-digit occupations in the 'Professionals' group are projected to add the most jobs in 2006-2011?

Table V.13: The five 4-digit occupations for 'Professionals' projected to add the most new jobs in 2006-2011, (Excluding the Armed Forces)

Code	Occupation title	Employment 2006 (000)	New jobs 2006-2011 (000)	Annual average rate of growth (%)	Range in options (%)
2330	Basic and Pre-Primary Education Teaching Professionals	51.7	8.9	3.2	±0.7
2320	Secondary Education Teaching Professionals	40.5	6.9	3.2	±0.6
2412	Personnel and Careers Professionals	16.2	2.3	2.7	±3.2
2411	Accountants	15.7	2.0	2.5	±3.5
2221	Medical Doctors	7.4	1.7	4.2	±1.1

Source: Based on the Occupation Projections Model

* Range is half of the difference between options expressed as a % of projected employment.

The five 4-digit occupations in the 'Professionals' group projected to add the largest number of new jobs between 2006 and 2011 are shown in Table V.13.

The total number of new jobs projected in the occupations shown in Table V.13 is 21.8 thousand: this figure represents 70% of the number of new jobs projected for all 'Professionals'. It follows that there are likely to be very few new jobs in many other 4-digit occupations in the 'Professionals' group; and there may be no new jobs in some occupations in this group.

d. Which 4-digit occupations in the 'Technicians & Associate Professionals' group are projected to add the most jobs in 2006-2011?

The five 4-digit occupations in the 'Technicians & Associate Professionals' group projected to add the largest number of new jobs between 2006 and 2011 are shown in Table V.14.

The projected number of new jobs is largest for 'Nursing Associate Professionals' (1.9 thousand new jobs); the projected number of new jobs for 'Book Keepers' is also relatively high (1.7 thousand). The total number of projected new jobs in the occupations shown in the table is 6.7 thousand: this figure represents 41.1% of the number of new jobs projected for all 'Technicians & Associate Professionals' over the period 2006 to 2011.

Table V.14: The five 4-digit occupations in the 'Technicians & Associate Professionals' group projected to add the most new jobs in 2006-2011, (Excluding the Armed Forces)

Code	Occupation title	Employment 2006 (000)	New jobs 2006-11 (000)	Annual average rate of growth (%)	Range (%)
3231	Nursing Associate Professionals	8.3	1.9	4.2	±1.1
3433	Book Keepers	13.2	1.7	2.4	±3.1
3431	Administrative Secretaries and Related Associate Professionals	8.2	1.2	2.8	±3.4
3422	Clearing and Forwarding Agents	5.7	1.0	3.3	±4.9
3415	Technical and Commercial Sales Representatives	4.8	0.9	3.6	±3.5

Source: Based on the Occupation Projections Model

* Range is half of the difference between options expressed as a % of projected employment.

VI. Outlook for labour supply

VI.1 Introduction

The Occupation Projections Model described in this Report is based on the assumption that, over the short-term, employment in various occupations will be determined mainly by the occupational structure of different economic activities. This assumption implies that, over the short-term, the supply of labour to an occupation will adjust to changes in the demand for labour in that occupation.

In reacting to an increase in jobs in a particular occupation, individuals are likely to consider many factors. These include:

- The new jobs available in different occupations over the short-term;
- The rate of growth of jobs in different occupations;
- The type of work involved in a particular occupation;
- The working conditions, hours of work and wages in different occupations;
- The location of available jobs;
- The licensing, legal or other certification requirements for employment in the particular occupation;
- The minimum formal education required for getting a job in a particular occupation;
- The skills and knowledge required for working in a particular occupation;
- The apprenticeship, on-the-job or other training programs required for developing the skills and knowledge required in a particular occupation;
- The education or training prerequisites for entering the education and training programs required for developing the skills and knowledge required in a particular occupation; and
- The length of the period of education or training required for developing the skills and knowledge required in a particular occupation.

The list of factors suggests that the number of jobs is only one of many factors affecting the supply of labour to different occupations. Moreover, the adjustment of the supply of labour to changes in the number of available jobs is complex; and the adjustment of the supply of labour will vary by occupation. If the skills and knowledge required for employment in a particular occupation could be developed in a relatively short training program, the adjustment of supply to demand would probably take place fairly quickly. By contrast, if the skills and knowledge required in a particular occupation could only be developed through a long education or training program, the adjustment of supply to demand could take a long time.

Consider, for example, the occupation 'Supplies Sales Persons'. The projections suggest that there will be 9.5 thousand new jobs between 2006 and 2011: this represents 21.7% of employment in the occupation in 2006. Is it likely that the supply to the occupation will adjust quickly to the projected increase in jobs? Many students in the educational system and individuals looking for a job would not be interested in a job in this occupation because of the type of work, hours of work, wages or other such factors. But some would likely be interested in taking a training program to allow them to find a job in the occupation. Such training programs can probably be completed in a few months or a year. Thus if a sufficient number of individuals

looking for a job were interested in working as 'Supplies Sales Persons', the supply of workers to the occupation would probably adjust relatively quickly to the number of new jobs in the occupation.

By contrast, consider the occupation 'Medical Doctors'. The projections suggest that the number of new jobs in this occupation will be 1.7 thousand, which is 23% of employment in the occupation in 2006. Is it likely that the supply to the occupation will adjust quickly to the increase in jobs? This occupation differs considerably from 'Supplies Sales Persons' in many ways: students and individuals who wish to enter the required training program must first have graduated from secondary school with relatively high grades; the education and training programs required for entering this occupation can only be completed over several years; and the supply of labour to the occupation in 2011 partly depends on the number of students already undertaking the relevant education and training programs. Thus the supply of workers to the occupation would probably only adjust with a long time lag to the number of new jobs projected for the occupation.

VI.2 A model to explore supply adjustments

It follows from the discussion above that the development of a model for making projections of the labour supply to occupations is extremely complex. Data are required on:

- The details of the educational qualifications of new and existing members of the labour force;
- The preferences of new and existing members of the labour force with respect to occupational choice;
- The education and training requirements for different occupations;
- The length of the education and training programs required for entering different occupations; and
- Licensing, certification and other regulatory requirements that restrict employment in different occupations.

Some of the data required for building a model for exploring the supply of workers by occupation, are listed in Table VI.1.

Figure VI.1: Schematic diagram showing data needed for a supply model

Number of students in Grade 10 or of School-leaving age

Proportion of Grade 10 students continuing to Grade 11

Proportion of Grade 10 students joining the labour market and entering each occupation

Proportion of Grade 11 students continuing to Grade 12

Proportion of Grade 11 students joining the labour market and entering each occupation

Proportion of Grade 12 students continuing to College

Proportion of Grade 12 students joining the labour market and entering each occupation

Proportion of 1st year College students continuing to 2nd year

Proportion of Grade 12 students continuing to University

Proportion of 1st year students by field of study joining the labour market and entering each occupation (separately for College and University)

Proportion of 1st year University students continuing to 2nd year

Proportion of 2nd year College students continuing to 3rd year

Proportion of 2nd year students by field of study joining the labour market and entering each occupation (separately for College and University)

Proportion of 2nd year University students continuing to 3rd year

Proportion of 3rd year University students continuing to 4th year

Proportion of 3rd year students by field of study joining the labour market and entering each occupation (separately for College and University)

Proportion of 4th year University students by field of study joining the labour market and entering each occupation

41

The table starts with the number of students in Grade 10, which is assumed to be grade at which students can first leave the education system. The diagram shows that data are required on the proportion of students in a given grade continuing to the next level of education, the proportion leaving school to join the labour market, and the proportion leaving school and entering each occupation. When students get to post-secondary education (College or University), the data requirements on those who join the labour market become more complex: data are required on the proportion of students in different fields of study who join different occupations.

For simplicity, graduate education is excluded from the diagram: but similar data are required for students in post-graduate programs. Data are also required on the proportion of workers already in the labour market who move from one occupation to another.

The detailed data required for building a model, as outlined above, are not available for Jordan at this time. Thus it is not possible to build a model to explore the supply of labour by occupation for Jordan.

VI.3 A model for examining changes in the education of workers

Because of the data currently available for Jordan, the most promising approach for exploring the supply of labour would seem to be to build a model for examining the growth of the formal education of workers. Such a model would be limited since it would exclude many factors that affect the supply of labour to various occupations (such as working experience and on-the-job training). But the model may nevertheless be useful in identifying some of issues that affect the potential supply of labour.

The approach we took in developing such a supply model is straightforward. We initially assumed that:

a. The distribution of the population aged 15-64 by educational level, age and gender estimated in the 2004 Census, would remain constant over the period to 2011; and
b. The proportion of the working population, by educational level, age and gender estimated in the 2004 Census, would remain constant over the period to 2011.

Projections of the supply of workers by educational level are derived by:

- Multiplying the proportions in (a) by population projections by age and gender in 2011 to derive projections of the educational attainment of the population by age and gender; and
- Multiplying the proportions in (b) by the projections of the educational attainment of the population by age and gender to derive projections of the educational attainment of workers.

There are some limitations in using this approach. One major limitation is that the number of non-Jordanians working in Jordan has been underestimated in the 2004 Census. The 2004 Census shows an estimate of 1,122.4 thousand for the total number of workers; by contrast, the estimated number of workers in 2004 provided by Al-Manar/DOS for building the Occupation Projections Model is 1,248.9 thousand. The Census estimate is therefore about 10% lower than that used in the Occupation Projections Model. It follows that the level of employment

projected using a supply model based on Census data would be expected to be about 10% lower than the employment projection generated by the Occupation Projections Model.

The underestimation of non-Jordanians working in Jordan is also likely to affect the projected educational attainment of workers in 2011. This is because the educational attainment of non-Jordanian workers is different from that for Jordanian workers. For example, the data in Table VI.1 for workers aged 30-34 in 2004 show that more than 21% of non-Jordanian workers (but less than 5% of Jordanian workers) were classified in the lowest level of education, 'Illiterate\Read and Write'. Thus the underestimation of the number of non-Jordanian workers will lead to downward bias in the projected educational distribution of workers in Jordan.

Table VI.1: Educational attainment for Jordanian and Non-Jordanian workers aged 30-34 in 2004

Educational level	Jordanians	Non-Jordanians
Illiterate\Read and Write	4.7	21.4
Apprenticeship	2.6	3.7
Less than Secondary	42.6	28.0
Secondary	22.6	17.1
Intermediate Diploma	11.3	21.3
Bachelor	12.8	6.6
Post Graduate	2.3	0.6
Enrolled	1.0	1.4
Total (%)	100.0	100.0
Total number (000)	180.8	23.0

Source: 2004 Census

This downward bias could not be eliminated or reduced in this model because separate population projections for Jordanians and non-Jordanians are not currently available.

Another limitation in this supply model is that it takes no account of changes in the educational level of the population over time. Census data show that the average educational attainment of the population is generally higher for younger persons than for older persons. This is due, in part, to the increasing demand for education and to the expansion of educational facilities. Thus it is likely that the average education of the population in 2011 will be higher than that in 2004.

As an example, consider the charts in Figure VI.2. The charts show the percentage of the male population by age-group in the 2004 Census classified in four education categories: 'Illiterate\Read and Write', 'Apprenticeship', 'Less than Secondary', and 'Secondary'. The proportion classified in the category 'Illiterate\Read and Write' decreases consistently with age: thus the proportion in this education category is much lower for those aged 20-24 than for those aged 60-64. This suggests that there has been a decline over time in the proportion of the population who are classified in the education category, 'Illiterate\Read and Write'.

Figure VI.2: Percentage of males in the 2004 Census by age-group classified in four education categories
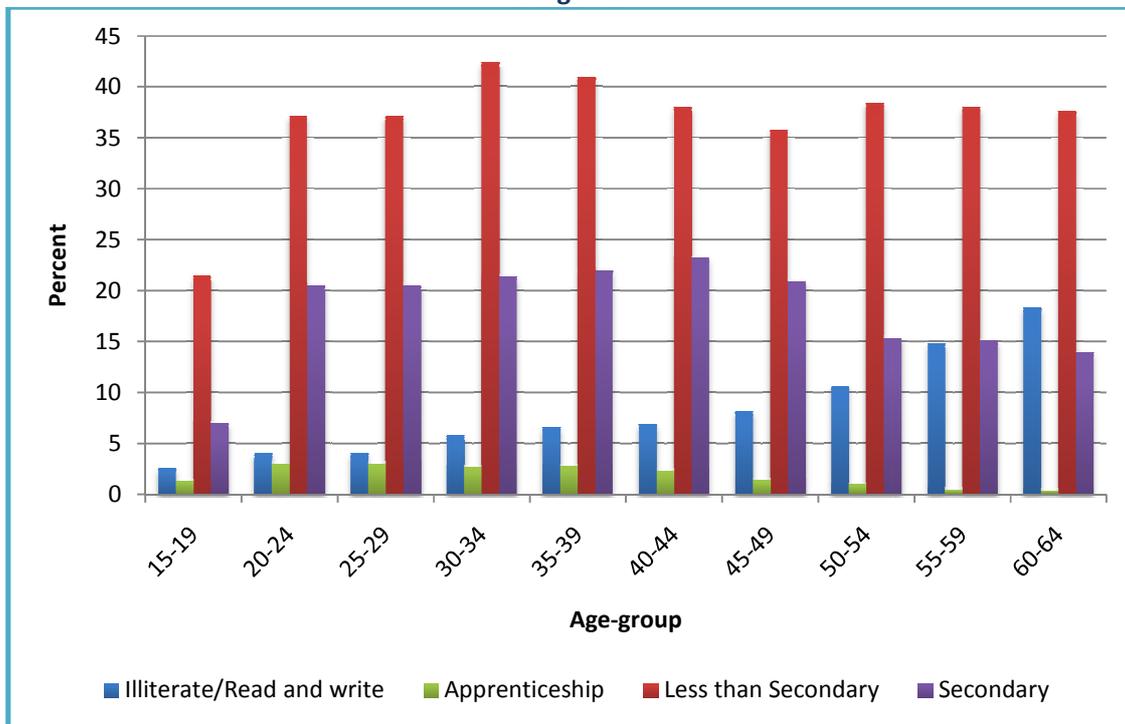
Source: Based on data from the 2004 Census.

By contrast, although the proportion classified in the education category 'Less than Secondary' varies somewhat by age, the proportion for those aged 20-24 is much the same as that for those aged 60-64. These data suggest that there has been only a small change over recent years in the proportion of the population in Jordan with less than 'Secondary' education. They also point to the need for detailed analysis to provide an understanding of the reasons for the moderate decline in the proportion of the male population with 'Less than Secondary' education.

The proportion for those aged 15-19 with 'Less than Secondary' education is much lower than the proportion for those aged 20-29. However, about 65% of those aged 15-19 were still enrolled in an educational institution, so that the proportion with 'Less than Secondary' education for those aged 15-19 may not be a good indicator of the proportion aged 20-24 with this level of education 5 years later (i.e. in 2009).

Similar data are shown in Figure VI.3 for three education categories: 'Intermediate Diploma', 'Bachelor' and 'Post Graduates'. The proportion of males with an 'Intermediate Diploma' is higher for those aged 45-49 than for those aged 60-64; but surprisingly, the proportion aged 20-24 is lower than that for those aged 45-49. This suggests that the proportion of the population with an 'Intermediate Diploma' has *declined* over recent years.

Figure VI.3: Percentage of males in the 2004 Census by age-group classified as: 'Intermediate Diploma', 'Bachelor' and 'Post Graduates'
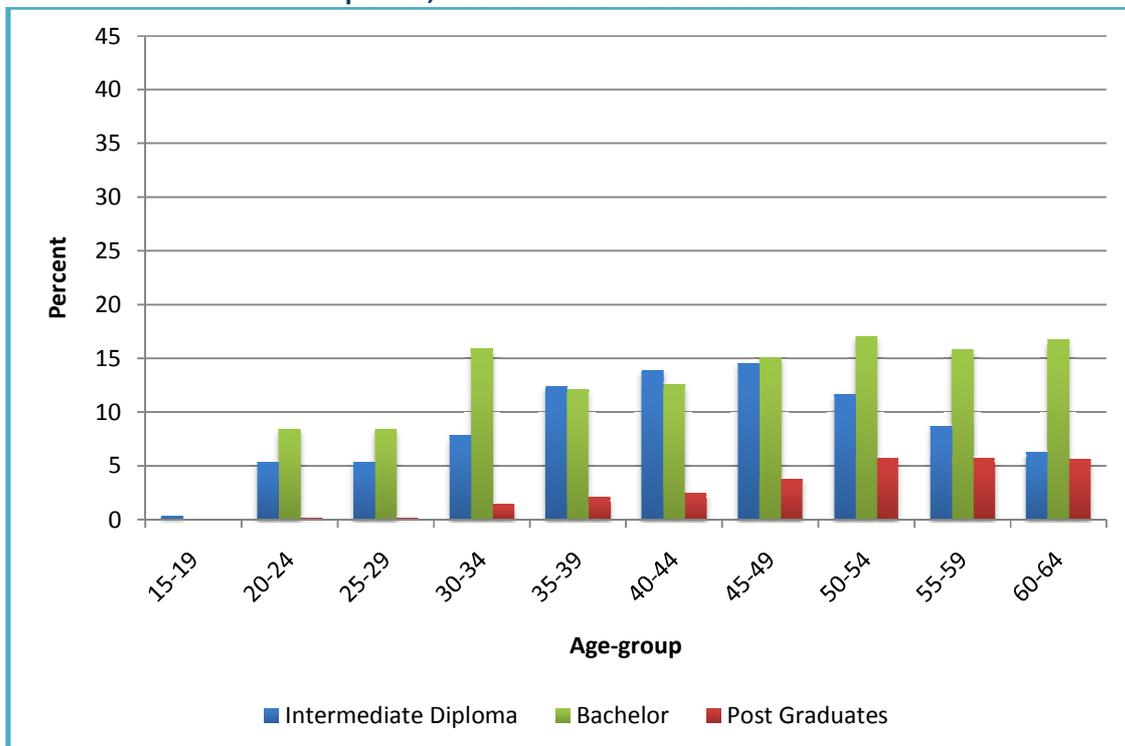
Source: Based on data from the 2004 Census.

The charts also show that for males with a 'Bachelor' degree and for 'Post Graduates', the proportion is lower for those aged 25-29 than for those aged 60-64. This suggests that the proportion of the population with a university degree has fallen over recent years. This is surprising given the expansion in post-secondary education facilities and the increasing complexity of jobs. These data therefore suggest that it would be useful to carry out a detailed analysis of the educational attainment of the population by age to provide a better understanding of the factors that have led to decline in the proportion of the population with a university degree.

In developing a supply model, we initially decided to use the 2004 Census proportion of the population in different age-groups and with different levels of educational attainment, to derive projections of the educational attainment of the population in 2011. However, examination of the charts (above) on educational attainment by age showed that these proportions differ markedly by age. It follows that the proportions would change by 2011 because of the aging of the population. For example, those aged 55-59 in 2004 will be aged 60-64 in 2009, so that level educational attainment of those aged 60-64 in 2009 will reflect the educational attainment of the survivors of those aged 55-59 in 2004.

We therefore decided that, instead of using the proportions for different age-groups in the 2004 Census, we would use the proportions as if the population were five years older. This meant that: for those aged 60-64 in 2011, we would use the proportions for those aged 55-59 in 2004; for those aged 55-59 in 2011 we would use the proportions for those aged 50-54 in 2004; and so

45

on. This assumption is reasonable except for those aged 15-19 in 2004: since many of the individuals in this age-group would not have completed their education in 2004, it would not make sense to use the proportions for this age-group in place of the proportions for those aged 20-24 in 2011. We therefore assumed that the proportions for those aged 20-24 in 2004 would remain constant over the period to 2011.

VI.4 Projections of the educational attainment of workers in 2011

The data in Table VI.2 show the percentage distribution of the educational attainment of workers in 2006 and 2011. The distribution in 2006 is estimated using population projections by age and gender for 2006, together with 2004 Census data on the proportion of the population at each educational level. The projected distribution in 2011 is based on population projections by age and gender for 2011, together with the proportion of the population at each educational level (derived from 2004 Census data).

The projections suggest that the proportion of workers in each of the three post-secondary education categories ('Post Graduates', 'Bachelor' and 'Intermediate Diploma') will fall slightly between 2006 and 2011. The proportion of workers in these three education categories is projected to fall from 33.9% in 2006 to 32.7% in 2011.

Table VI.2: Projected distribution (%) of the educational attainment of workers

Educational level	*Estimated 2006*	*Projected 2011*
Post Graduates	3.0	2.6
Bachelor	17.3	17.0
Intermediate Diploma	13.6	13.1
Secondary	20.4	21.2
Less than Secondary	36.5	37.3
Apprenticeship	2.2	2.5
Illiterate\Read and Write	6.9	6.2
Total	**100.0**	**100.0**

Source: Supply Projections Model

The projected fall in the proportion of workers with post-secondary education is surprising give the recent expansion of post-secondary education facilities in Jordan. Is the projected fall a statistical artefact created by errors in the data? If not, does the lower proportion imply that most of the available jobs do not require workers with post-secondary education? Will the growth of some occupations be limited because of insufficient numbers of qualified workers?

Questions such as these can only be properly addressed with more detailed analysis. But it is interesting to compare the projected changes in the educational attainment of workers with the projected changes in the occupational distribution of workers generated by the Occupation Projections Model (see Table VI.3).

Table VI.3: Occupational distribution (%) of workers

1-digit Occupation	Employment 2006	Projected employment 2011
Legislators, Senior Officials & Managers	4.8	4.9
Professionals	18.4	18.4
Technicians & Associate Professionals	10.4	10.5
Clerks	9.0	9.0
Service Workers & Shop & Market Sales Workers	20.4	21.9
Skilled Agricultural & Fishery Workers	3.0	2.2
Craft & Related Workers	10.9	10.8
Plant & Machine Operators & Assemblers	8.3	8.1
Elementary Occupations	14.7	14.3
Sum	100.0	100.0

The data in the table show that employment in the 'Professionals' occupation group is projected to remain the same between 2006 and 2011; and employment in the 'Technicians & Associate Professionals' occupation group is projected to increase slightly from 10.4% in 2006 to 10.5% in 2011. Since post-secondary education is required for employment in many of the occupations in these two groups, the projected decline in the proportion of workers with post-secondary education may be an indication that there will be a shortage of workers who are qualified to work in some occupations in 2011.

VII. Summary and recommendations

a. Statistics on the occupations of non-Jordanians working in Jordan are required to improve the Model

The occupation projections generated by the Model do not include projections of the occupations of non-Jordanians working in Jordan. Thus, if many non-Jordanians were to work in the same occupations as Jordanians, this could have a significant effect on the number of jobs available for Jordanians. This is a particularly important issue since the number of non-Jordanians working in Jordan has been increasing, and now represents nearly 30% of all workers in Jordan:

It is therefore important that a special study of the employment of non-Jordanians in Jordan should be carried out. The study should address questions such as the following:

- Do the occupations of non-Jordanians differ from those of Jordanians?
- Are the skills and knowledge required for the jobs in which non-Jordanians work different from those in which Jordanians work?
- Are the hours of work, working conditions, wages and other such factors different for the jobs of non-Jordanians and Jordanians?
- Are non-Jordanians employed in jobs in which Jordanians are reluctant to work?

b. The errors in the data available for use in the Occupation Projections Model need to be addressed

The errors in the data on employment by economic activity and on employment by occupation and economic activity are significant and they are likely to affect the accuracy of the projections of employment by occupation. The following need special attention:

- Estimates of employment by economic activity are available from the ES and the EUS. The estimates from the two surveys differ considerably and we had to use estimates from both surveys to develop a single time-series. The procedure we used is somewhat arbitrary and steps should be taken to develop more reliable and more accurate estimates.

- Data on employment by occupation are available from the EUS, the ES and from the 2004 Census. But data in the EUS and in the 2004 Census are coded using ISCO, while data in the ES are coded using the JSCO. The two classifications are quite different so that the EUS and ES data are not comparable. This means that any occupational analysis that uses the data from the two surveys may lead to contradictory conclusions.

- It is important that the same occupational classification should be used in both the EUS and the ES. If it were decided that the JSCO should be used for both surveys, then a system should be developed for converting data coded using ISCO to the JSCO. If this were not done, much of the value of historical data on employment by occupation would be lost.

49

c. The projections are not precise indicators of employment

The projections of employment by occupation generated by the Occupation Projections Model described in this Report are subject to error for two reasons:

- There are errors in the data used in the Model; and
- The future is uncertain, so that the outcomes are subject to error.

The projections cannot therefore be regarded as precise indicators of employment at a future date. Projections of employment by occupation are nevertheless useful in that they provide an indication of the likely change in employment, and of the magnitude of the projected change.

d. Qualitative information is needed to supplement the projections

The occupational projections generated by the Model are based on quantitative data and they may not be consistent with qualitative information available in Jordan. It would therefore be useful for knowledgeable Jordanians (including business groups, researchers, government experts, economists, and decision-makers) to compare the projections with the changes in employment that seem likely given their knowledge and other qualitative information in Jordan. Addressing questions such as the following could help to improve the usefulness of the results.

- Do the projections of employment by economic activity seem reasonable in the light of the current developments in the economy?
- Is it likely that the change in employment in a given economic activity, say, 'Construction', will be as projected in the Model?
- Are the projections of employment for selected occupations (such as 'Secondary Education Teaching Professionals') consistent with the prevailing view about likely changes?

e. Improving the usefulness of the projections

The use of the occupational projections by students and others in the labour market could be improved by providing the projections on a website and in a manner that would encourage their use.

Occupational projections provide only some of the information required by students and other decision-makers. Their usefulness could be improved by providing information on the type of work involved in different occupations, on the education and training required for different occupations, and on other labour market indicators (such as hourly wages and the unemployment rate) for different occupations.

The projections of employment take no account of the new jobs that would be generated by the retirement of workers now in the labour force: they therefore probably underestimate the number of new jobs that will be generated between 2006 and 2011. Analysis to project the number of new jobs that would be generated by the retirement of workers already in the labour force would improve the usefulness of the projections.

f. More analysis of labour supply is needed

Labour market conditions are affected not only by the number of new jobs, but also by the supply of individuals qualified to work in different occupations. The education and training required for entry to different occupations vary considerably. Some occupations require little formal education and/or a short period of training: it may be relatively easy for employers to fill such jobs. But some occupations require a university degree or college certificate, and/or a long period of training: filling new jobs in such occupations may require advance planning.

The Supply Model developed as part of this Study provides a starting point for studying changes in the supply of labour. But much more work remains to be done. Analysis needs to be conducted in areas such as the following:

- Are there specific formal educational requirements for individuals to enter different occupations?
- Could the skills and knowledge required for entry to particular occupations be developed in non-formal educational programs?
- How important a factor is previous work experience in employment in particular occupations?

Appendix 1: Mathematical description of the Model

In the Occupation Projections Model, projections of employment by occupation are derived using projections of employment by economic activity in the projection year (2011), and the occupational structure of economic activities in the base year (2006). The projections are derived using linear equations of the following type:

$$OE_{occ1,\ 2011} = (OE_{occ1,\ 2006})/(EA_{1,2006})*(EA_{1,2011}) + (OE_{occ1,\ 2006})/(EA_{2,2006})*(EA_{2,2011}) + \ldots (OE_{occ1,\ 2006})/(EA_{14,2006})*(EA_{14,2011})$$

In this equation, the subscript occ1 represents the first 4-digit occupation in the occupation classification used in Jordan (i.e. Legislators [occupation code 1110]). EA_1 represents the level of employment in economic activity 1 (Agriculture), EA_2 represents employment in economic activity 2 (Mining & Quarrying), and so on. The subscripts 2006 and 2011 represent the base year and projection year respectively.

These equations can be expressed in matrix notation as:

OE = OC*EA

In this equation:

- **OE**   is a column vector with about 350 rows, each representing projected employment in a 4-digit occupation in 2011;
- **OC**   is a matrix with 14 columns (the economic activities in the Model) and about 350 rows showing the proportion of employment in each occupation and economic activity; and
- **EA**   is a column vector showing employment in the 14 economic activities in 2011.

Appendix 2: Time-series estimates of employment by economic activity

a. Jordanian workers

As noted earlier in this Report, time-series estimates of employment by economic activity in Jordan are available from the EUS and the ES: most non-Jordanians are excluded from both surveys. Estimates from the two surveys differ significantly, and they have been compared by Megill *et al* in a report prepared for the Department of Statistics (DOS) '*Analysis for Comparing the Employment Estimates from the Different Surveys at the Department of Statistics'* (27 August 2003). Megill *et al* concluded that:

- The ES provides more accurate estimates of employment for economic activities with a high level of coverage, such as 'Public Administration', and for activities that are highly concentrated in a few areas or establishments, such as 'Mining and Quarrying'.
- The EUS provides more accurate estimates than the ES for 'Manufacturing', 'Construction', 'Wholesale and Retail Trade', 'Hotels and Restaurants' and 'Transportation'.

We followed these conclusions in developing an initial set of single time-series estimates of employment by economic activity for use in the Occupation Projections Model. The source of the initial estimate for the time-series data for each economic activity is shown in Table A2.1.

Table A2.1: Source of initial estimate for a single time-series of employment by economic activity

Economic activity	Source of initial estimate
Agriculture	EUS
Mining & Quarrying	ES
Manufacturing	EUS
Electric, Gas and Water Supply	ES
Construction	EUS
Wholesale and Retail Trade	EUS
Hotels and Restaurant	EUS
Transportation	EUS
Financial Intermediation	ES
Real Estate, Renting and Business Activities	ES
Public Administration and Compulsory Social Security	ES
Education	ES
Health and Social Work	ES
Other Community, Social & Personal Services	EUS

Estimates of employment by economic activity from the EUS and ES for the period 1995-2006 were provided by officials in the National Center for Human Resource Development (NCHRD) and the Department of Statistics (DOS) in Jordan. The data used in the Model are shown in Table A2.2.

Table A2.2: Employment (000) by Economic Activity, 1995-2006: Jordanians, (Excluding the Armed Forces)

Economic activity	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Agriculture	49.5	77.3	59.6	73.2	58.0	50.7	41.3	41.6	41.5	37.6	29.3	27.6
Mining & Quarrying	7.8	7.9	8.6	9.2	7.7	9.1	8.5	6.9	7.1	7.0	6.6	6.1
Manufacturing	96.0	96.1	109.2	119.2	109.8	106.2	118.7	126.1	128.2	131.7	115.1	114.2
Electric, Gas and Water Supply	13.4	13.8	13.4	13.4	12.9	14.2	13.9	14.6	14.1	14.0	14.3	14.2
Construction	55.0	62.2	59.2	81.8	67.9	67.9	65.5	59.1	66.6	73.7	63.8	60.9
Wholesale and Retail Trade	116.4	127.9	145.1	139.3	160.2	166.0	170.8	176.8	174.1	186.4	171.6	179.1
Hotels and Restaurant	12.4	13.8	16.7	22.4	19.5	20.9	24.0	20.5	23.9	22.8	22.9	23.8
Transportation	79.8	75.4	75.2	75.2	98.2	97.5	100.9	103.8	100.3	90.7	100.1	98.6
Financial Intermediation	16.2	16.9	15.9	16.5	17.1	19.6	20.5	17.8	18.1	18.0	18.6	21.5
Real Estate, Renting and Business Activities	18.4	19.1	24.1	21.6	27.5	30.1	38.1	37.2	37.4	34.7	34.5	52.2
Public Administration and Compulsory Social Security	67.8	67.6	66.9	69.2	69.5	74.0	77.2	81.7	82.4	77.8	81.3	83.8
Education	93.6	102.6	108.2	112.2	121.7	123.8	127.6	131.3	140.4	143.5	148.7	154.8
Health and Social Work	27.2	30.0	31.6	32.9	38.9	42.4	43.4	44.8	46.7	48.8	53.5	54.8
Other Community, Social & Personal Services	35.6	41.4	41.1	63.3	55.8	54.3	55.7	58.2	61.7	56.4	60.0	62.5
Total	689.1	752.1	774.7	849.4	864.7	876.7	906.1	920.4	942.5	943.1	920.3	954.1

b. Non-Jordanians working in Jordan

Estimates of the employment of non-Jordanians by economic activity were obtained from the Ministry of Labour: these data are shown for the period 2000-2009 in Table A2.3.

Table A2.3: Employment (000) by Economic Activity, 2000-09: non-Jordanians

Economic activity	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Agriculture	30.5	36.9	39.0	43.4	58.9	71.1	68.3	70.9	75.0	89.8
Mining & Quarrying	2.3	2.6	1.9	2.0	3.1	3.3	2.9	2.6	2.1	2.4
Manufacturing	16.8	22.4	24.8	31.7	54.3	64.2	69.7	68.5	69.4	66.9
Electric, Gas and Water Supply	0.2	0.3	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.4
Construction	20.2	26.3	19.9	22.4	36.7	42.3	44.3	58.0	35.0	38.3
Wholesale and Retail Trade	10.3	11.9	9.7	9.7	12.5	16.1	19.4	21.8	22.6	26.3
Hotels and Restaurant	7.2	8.4	6.3	6.6	9.6	12.8	15.2	15.8	16.3	19.0
Transportation	1.8	1.9	1.3	1.2	1.6	1.7	2.0	2.2	2.5	2.5
Financial Intermediation	0.9	1.1	0.7	0.6	1.4	1.4	1.9	2.1	2.9	2.5
Real Estate, Renting and Business Activities	1.6	1.9	1.2	1.2	2.0	1.9	1.9	2.6	2.1	1.8
Public Administration and Compulsory Social Security	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Education	1.1	1.1	1.2	1.2	1.1	1.3	1.4	1.3	1.4	1.6
Health and Social Work	0.4	0.6	0.5	0.6	0.9	1.0	1.2	1.0	1.1	1.3
Other Community, Social & Personal Services	17.0	21.0	20.4	27.6	36.5	43.2	61.0	65.8	72.3	82.6
Total	**110.6**	**136.6**	**127.2**	**148.4**	**218.8**	**260.4**	**289.7**	**313.2**	**303.3**	**335.7**

Appendix 3: Projections of the employment of Jordanians by economic activity

Projections of the employment of Jordanians by economic activity in 2011 (and 2012) were obtained by the simple extrapolation of the time-series data in Table A2.2. These data were used to estimate the parameters of a linear regression equation (using Microsoft Excel) for employment for each economic activity.

As noted in the text of this Report, we used data for 2000-06 for making the final projections for 'Agriculture' and for 'Construction'; but we used data for 1995-2006 for making the projections for all other economic activities.

For 'Agriculture' and 'Construction', the data were expressed in index form (with employment in 2000 =100) before the regression estimates were derived; for the other economic activities, the data were expressed in index form (with employment in 1995 =100) before the regression estimates were derived. It follows that the projections derived using the regression parameters in Table A3.1 must be adjusted by multiplying the projections by employment in 2000, or 1995, depending on the particular economic activity. Note also that projections derived using the numbers in the table may differ from those generated by the Model because of rounding errors.

Table A3.1: Employment by economic activity 1995 or 2000 (000), and parameters of linear regression equations used for projecting employment (Excluding the Armed Forces)

Economic activity	Estimated employment 1995	Estimated employment 2000	Intercept	Slope	R^2
Agriculture	N.A.	50.7	103.4	-6.9	0.891
Mining & Quarrying	7.8	N.A.	114.9	-2.5	0.484
Manufacturing	96.0	N.A.	103.9	2.3	0.484
Electric, Gas and Water Supply	13.4	N.A.	99.0	0.7	0.446
Construction	N.A.	67.9	98.3	-0.5	0.025
Wholesale and Retail Trade	116.4	N.A.	105.8	4.8	0.828
Hotels and Restaurants	12.4	N.A.	115.4	7.4	0.694
Transportation	79.8	N.A.	95.0	3.0	0.563
Financial Intermediation	16.2	N.A.	97.5	2.1	0.517
Real Estate, Renting and Business Activities	18.4	N.A.	83.2	13.3	0.814
Public Administration and Compulsory Social Security	67.8	N.A.	94.4	2.5	0.868
Education	93.6	N.A.	97.7	5.6	0.991
Health and Social Work	27.2	N.A.	91.2	9.3	0.982
Other Community, Social & Personal Services	35.6	N.A.	114.8	5.6	0.602

Notes: N.A. indicates Not Applicable. Data for 2000-06 were used for projections for 'Agriculture' and 'Construction', and for 1995-2006 for all other economic activities.

The coefficient of multiple determination (R^2) for each equation (economic activity), is also shown in Table A3.1. The coefficients for some economic activities (such as 'Education') are close to 1 (the maximum possible value), indicating that the equations provide a good fit of the data. This means that if the past trend were to continue into the future, the projections for 2011 would provide a reasonably good indication of future employment for these economic activities.

The coefficient is close to 0 (the minimum possible value) for 'Construction' indicating that the regression equation does not provide a very good fit of the data. This means that even if the past trend were to continue into the future, the projection for 2011 may not provide a good indicator of future employment in those economic activities.

It is also interesting to examine the graphs of employment for the time-period used for deriving the projections for each economic activity: 2000-06 for 'Agriculture' and 'Construction', and 1995-2006 for all other economic activities. These graphs are shown in Figures A3.1 through A3.14. The graphs show projections to 2011: they are shown in index form with employment in 2000 = 100 for 'Agriculture' and 'Construction', and with employment in 1995 = 100 for all other economic activities.

Figure A3.1: Employment in Agriculture 2000-2006, and projection to 2011, (Employment in 2000 = 100)
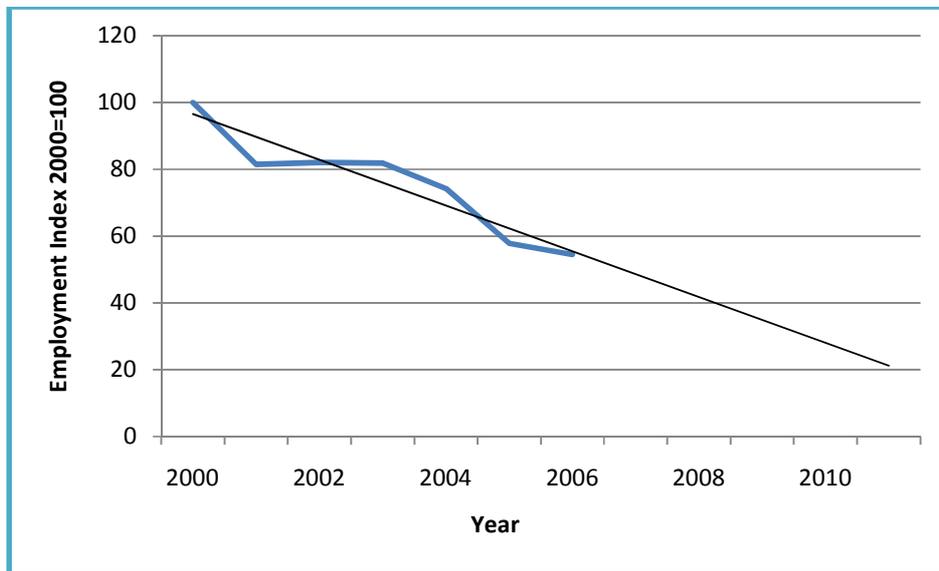
Figure A3.2: Employment in Mining & Quarrying 1995-2006, and projection to 2011, (Employment in 1995 = 100)
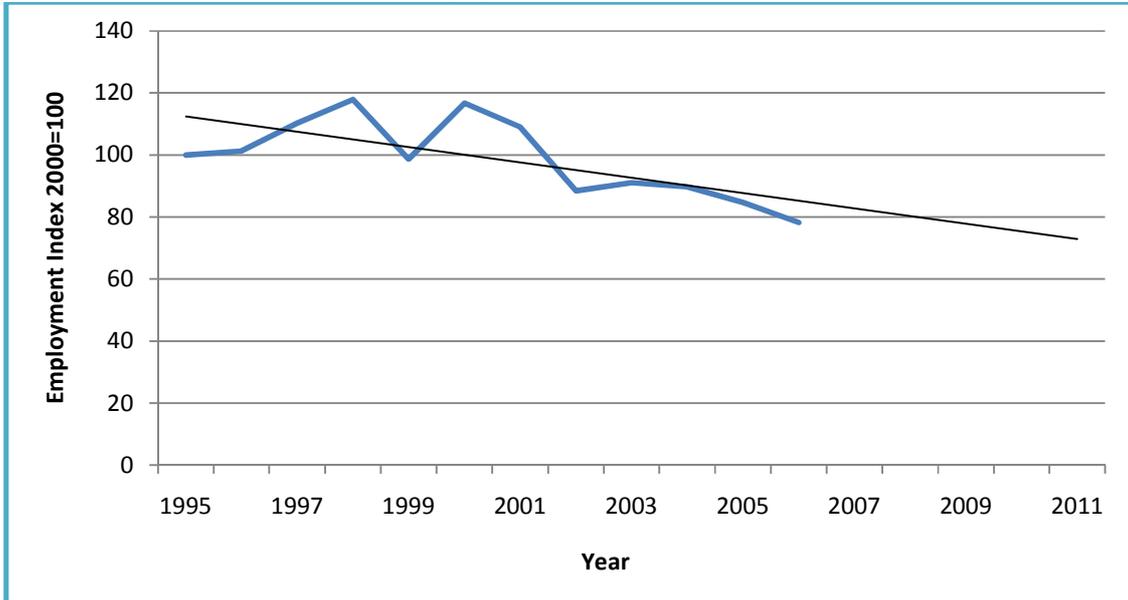
Figure A3.3: Employment in Manufacturing 1995-2006, and projection to 2011, (Employment in 1995 = 100)

59
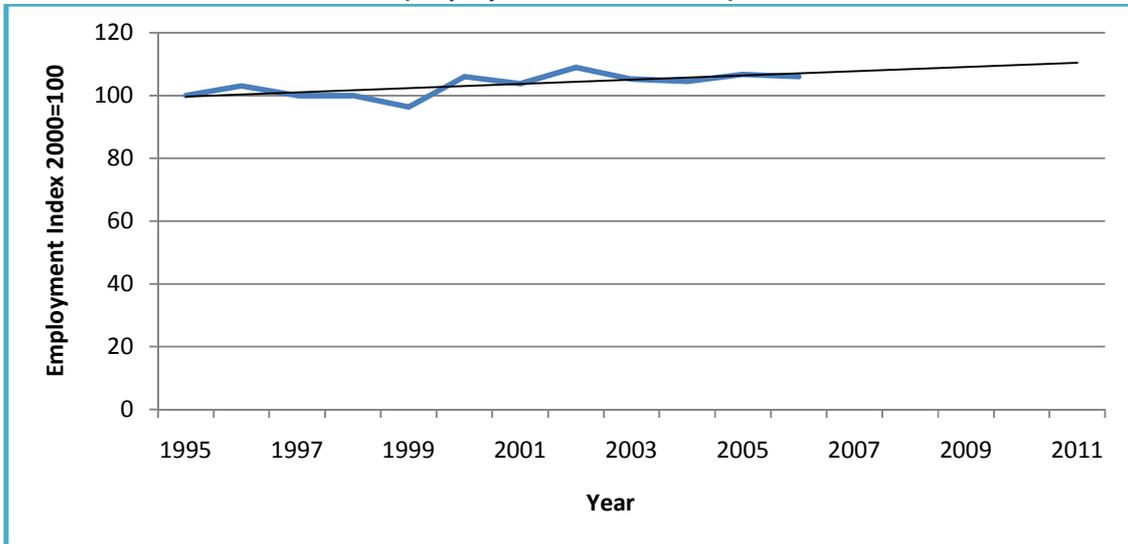
Figure A3.4: Employment in Electric, Gas & Water Supply 1995-2006, and projection to 2011, (Employment in 1995 = 100)
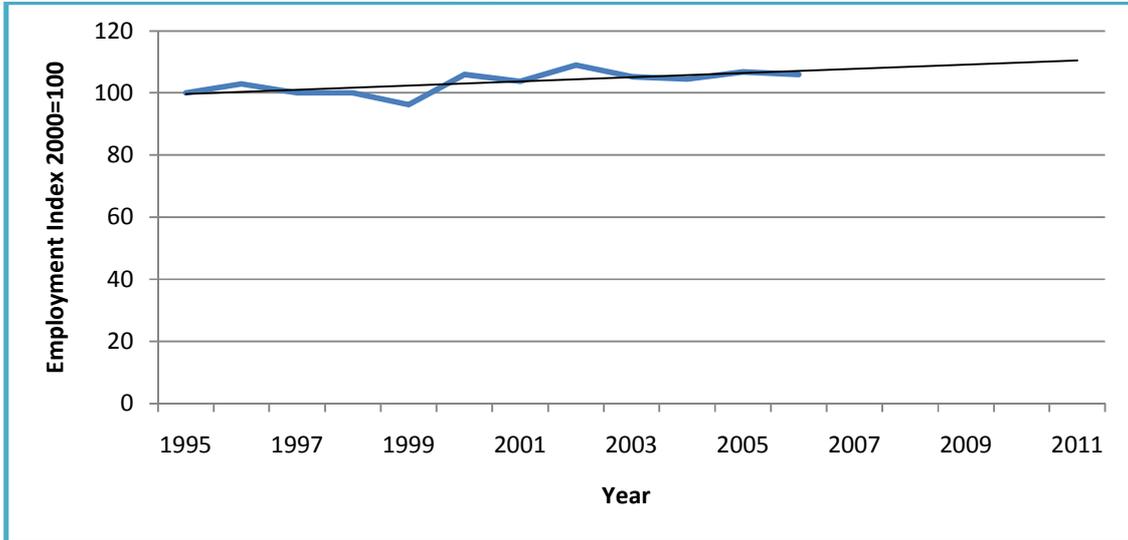
Figure A3.5: Employment in Construction 2000-2006, and projection to 2011, (Employment in 2000 = 100)
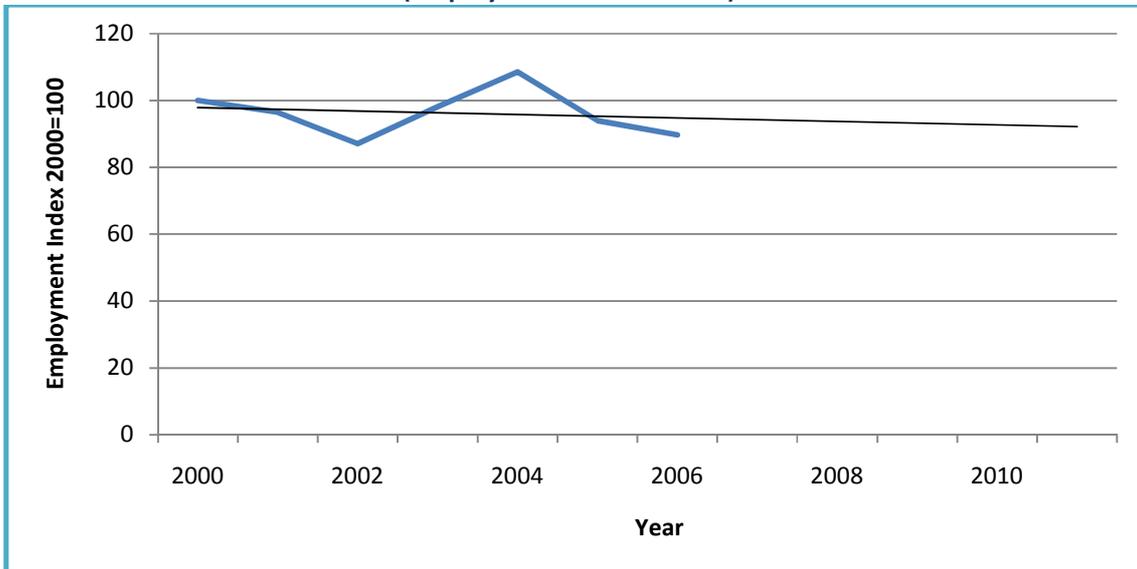
**Figure A3.6: Employment in Wholesale & Retail Trade 1995-2006, and projection to 2011,
(Employment in 1995 = 100)**
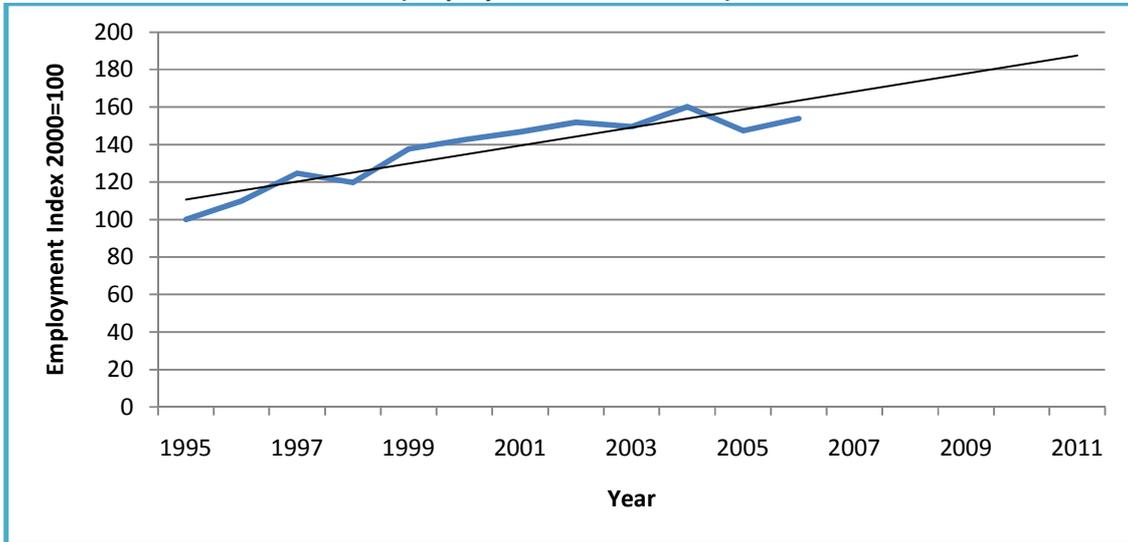
**Figure A3.7: Employment in Hotels & Restaurants 1995-2006, and projection to 2011,
(Employment in 1995 = 100)**
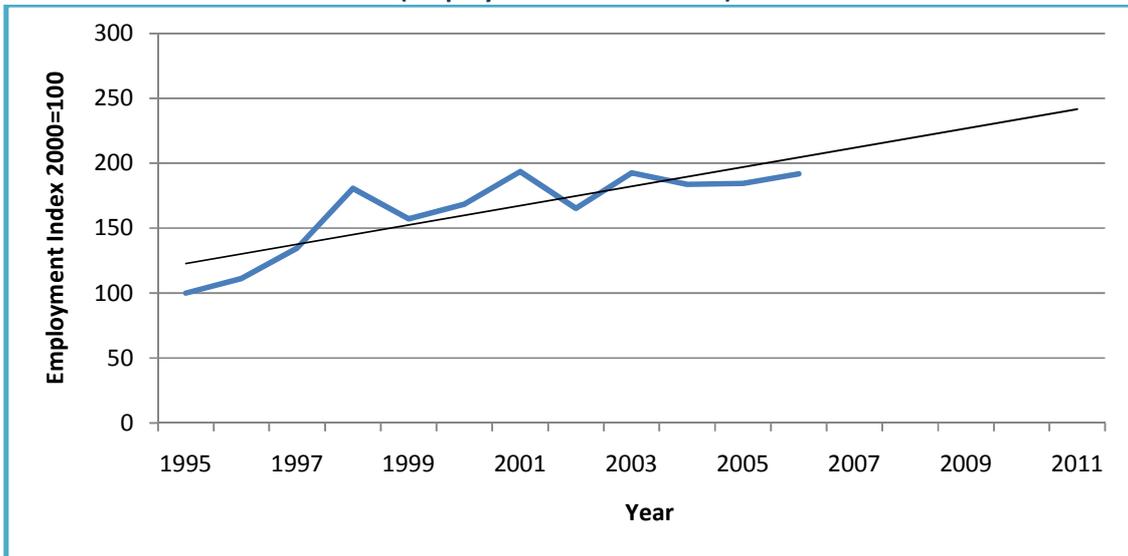
Figure A3.8: Employment in Transportation 1995-2006, and projection to 2011, (Employment in 1995 = 100)
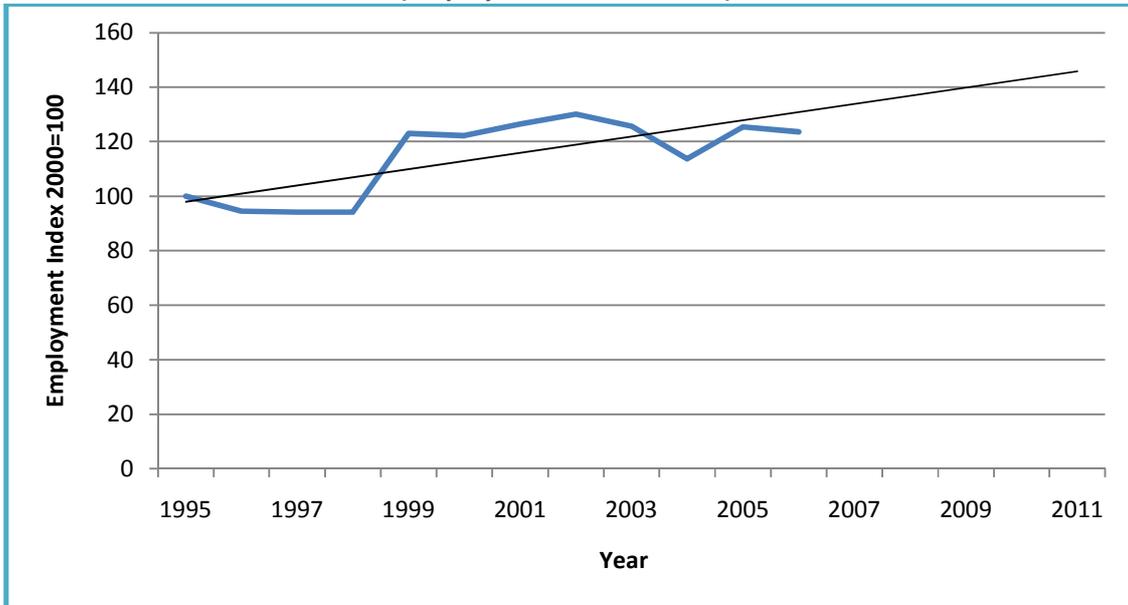
Figure A3.9: Employment in Financial Intermediation 1995-2006, and projection to 2011, (Employment in 1995 = 100)
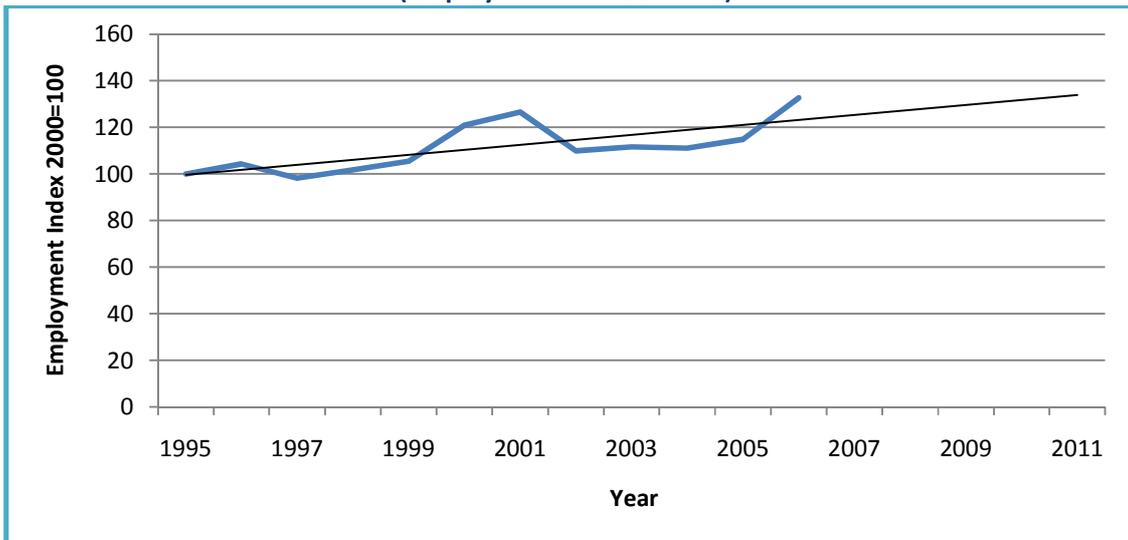
Figure A3.10: Employment in Real Estate, Renting & Business Activities 1995-2006, and projection to 2011, (Employment in 1995 = 100)
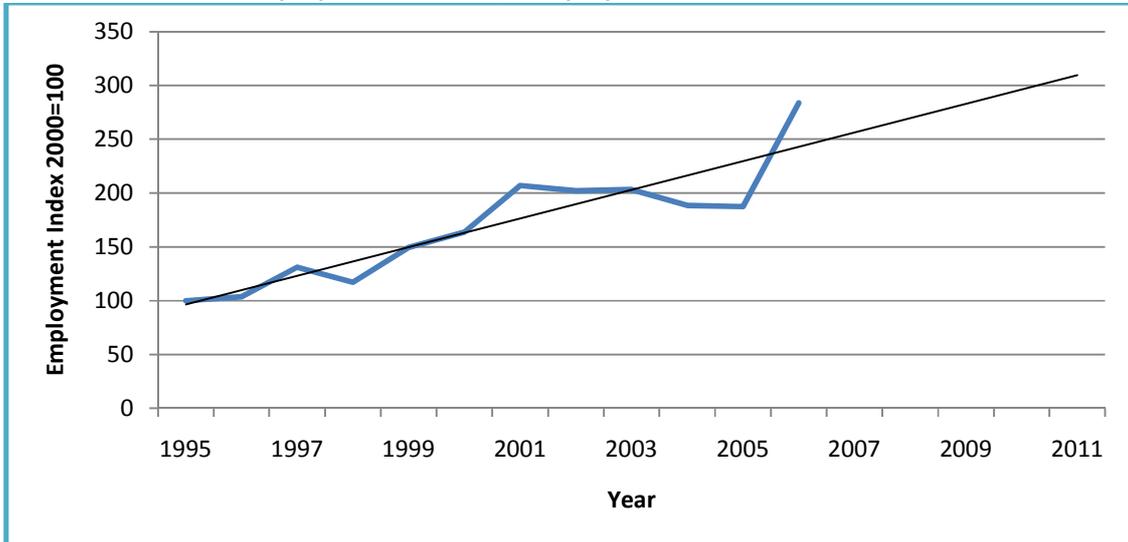
Figure A3.11: Employment in Public Administration 1995-2006, and projection to 2011, (Employment in 1995 = 100)
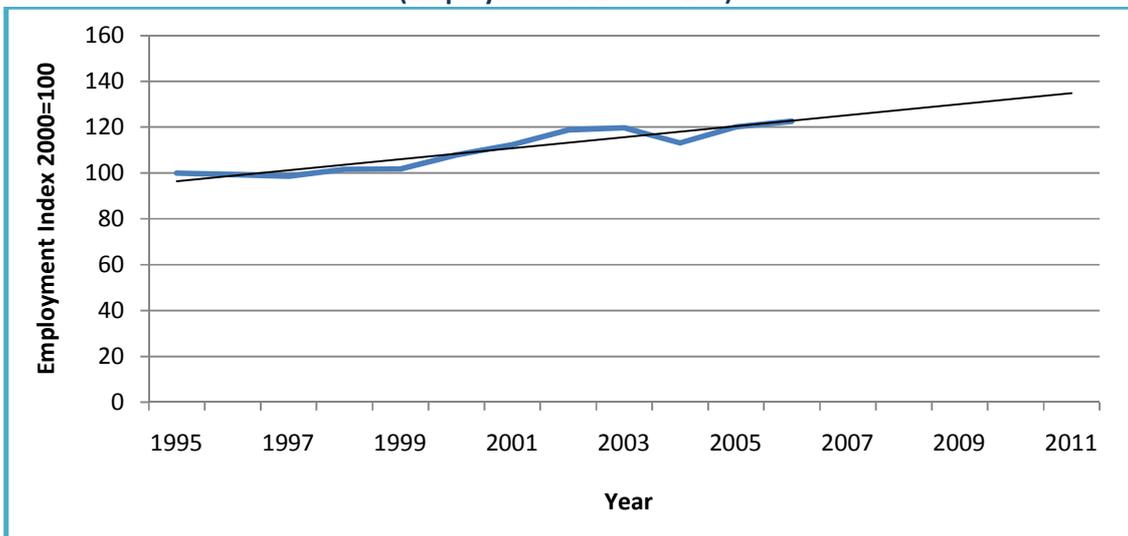
Figure A3.12: Employment in Education 1995-2006, and projection to 2011, (Employment in 1995 = 100)
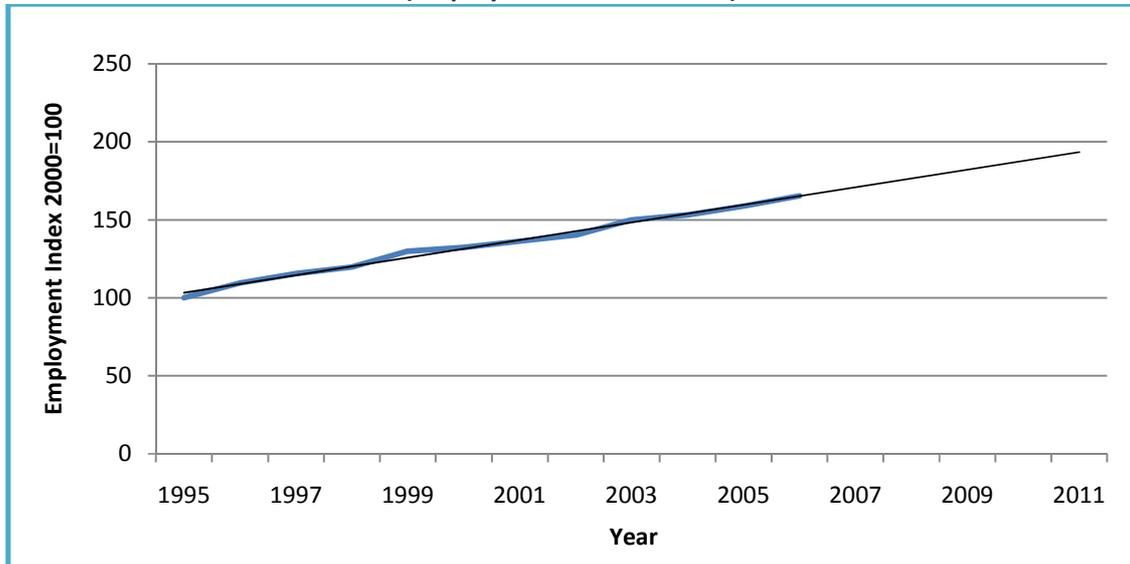
Figure A3.13: Employment in Health & Social Work 1995-2006, and projection to 2011, (Employment in 1995 = 100)

64
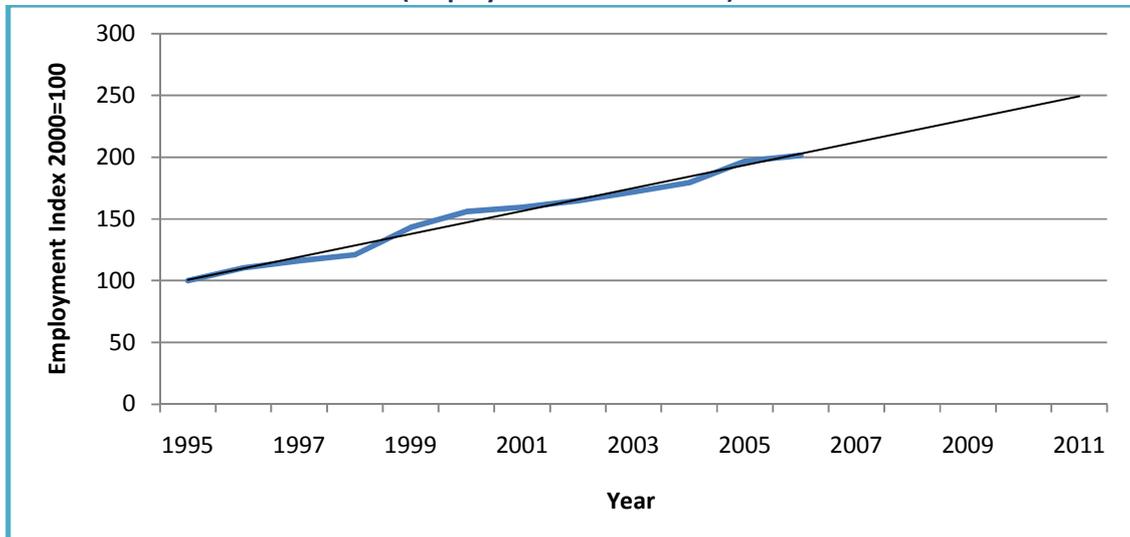
Figure A3.14: Employment in Other Community, Social & Personal Services 1995-2006, and projection to 2011, (Employment in 1995 = 100)
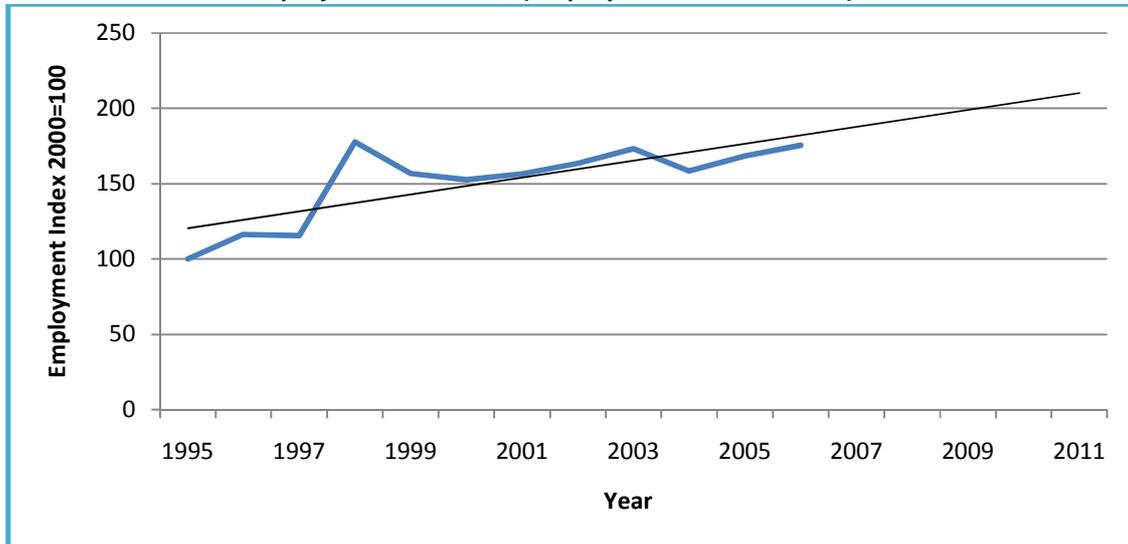
Appendix 4: The potential variability of the employment projections

The potential variability of the projections of employment by economic activity can be studied by examining the annual variation in employment over the time-period used for making the projections: 2000-06 for 'Agriculture' and 'Construction' and 1995-2006 for the other economic activities. If the annual variation over the period were small, then it would seem reasonable to assume that the difference between the projected employment and actual employment in 2011 would be small: the projection would then provide a good indicator of employment. By contrast, if the annual variation over the period were large, it would seem reasonable to assume that the projection could provide a poor indicator of employment in 2011.

Table A4.1: Average absolute deviation from the trend in employment and options for Agriculture and Construction based on data for 2000-06

Economic activity	Average absolute deviation from trend (% of value in 2000)	Lower option (000)	Upper option (000)
Agriculture	5.4	8.0	13.4
Construction	5.0	59.2	66.0

Source: Based on the Occupation Projections Model: projections based on data for 2000-06.

The data in Column (2) in Table A4.1 show the average absolute annual deviation from the trend in employment for 'Agriculture' and 'Construction' for the period 2000-06.

Similar data are shown in Table A4.2 for the other economic activities, that is, for all economic activities except 'Agriculture' and 'Construction'. The data in Table A4.2 are based on time-series data for the period 1995-2006.

The data in Table A4.2 show that the average absolute deviation was 5% or more for several economic activities: 'Mining & Quarrying'; 'Manufacturing'; 'Wholesale and Retail Trade'; 'Hotels and Restaurants'; 'Transportation'; 'Financial Intermediation'; 'Real Estate, Renting and Business Activities'; and 'Other Community, Social and Personal Services'. Thus the employment estimates for these activities have varied significantly from one year to the next between 1995 and 2006: and if this pattern of variation were to continue into the future, actual employment in 2011 could be quite different from and projected employment in that year. The projections of employment for these activities could be subject to considerable variability or uncertainty: they may not therefore provide reliable indicators of employment in these activities in 2011.

By contrast, the average absolute deviation from the trend is lower than 5% for the following economic activities: 'Electric, Gas and Water Supply'; 'Public Administration and Compulsory Social Security'; 'Education'; and 'Health and Social Work'. If the pattern of variation over the period 1995-2006 were to continue into the future, the projections of employment for these economic activities would be subject to relatively low variability or uncertainty: it would therefore seem reasonable to assume that these projections would provide fairly reliable indicators of employment in 2011.

Table A4.2: Average absolute deviation from the trend in employment for all economic activities (except Agriculture and Construction)

Economic activity	Average absolute deviation from trend (% of value in 1995)	Lower option (000)	Upper option (000)
Mining & Quarrying	7.2	5.1	6.2
Manufacturing	6.3	131.5	143.5
Electric, Gas and Water Supply	1.8	14.6	15.0
Wholesale and Retail Trade	5.2	212.2	224.3
Hotels and Restaurant	9.2	28.8	31.1
Transportation	7.3	110.5	122.2
Financial Intermediation	5.4	20.8	22.6
Real Estate, Renting and Business Activities	8.5	55.4	58.5
Public Administration and Compulsory Social Security	2.5	90.9	94.3
Education	1.1	180.1	182.1
Health and Social Work	2.4	67.2	68.4
Other Community, Social & Personal Services	8.6	71.7	77.9

Source: Based on the Occupation Projections Model: projections based on data for 1995-2006.

In order to examine the effects of the variability of the projections of employment by economic activity on the projections of employment by occupation, we derived two other projections of employment by economic activity (in Table A4.1 and Table A4.2 we refer to these as the lower option and the upper option). The two options were specified using the average absolute deviation from the trend in employment in each economic activity.

The data in Column (3) and (4) in Table A4.1 and Table A4.2 show the employment projections in 2011 based on the lower and upper option respectively. The options suggest, for example, that employment in 2011 for 'Agriculture' could lie between 8.0 thousand and 13.4 thousand. This range of 5.4 thousand is large relative to the projection, so that the projection for this economic activity may not be a good indicator of employment in 2011. By contrast, the options suggest that employment in 2011 for 'Education'' could lie between 180.1 thousand and 182.1 thousand. This range, of 2.0 thousand, is relatively small: it suggests that the projection of employment in this economic activity may be a reasonably good indicator of actual employment in 2011.

The lower and upper options for the projections of employment by economic activity in 2011 were used in the Occupation Projections Model to derive a range for the projections of employment by occupation: these are discuused in the text of this Report.

67

Appendix 5: Projections of employment for 4-digit occupations in 2011

The data in Table A5.1 show the estimated stock in 2006 and the employment projections in 2011 for 3-digit and 4-digit occupations. The estimates are rounded to the nearest thousand since exact numbers would tend to create a false sense of the reliability of the projections. Occupations with an estimated stock in 2006 of 0.1 (thousand) are excluded from the table.

The table also includes the number of new jobs (in thousands) projected for the period 2006-11, as well as the annual average rate of growth in employment (%). A lower and upper option (as a percentage of the employment projection) is also included in the table.

Table A5.1: Projected employment 2011, projected new jobs and annual rate of growth, 2006-2011(Excluding the Armed Forces)

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
LEGISLATORS			0.1	0.1	0.0	2.1	0.1	0.1
	Legislators	1110	0.1	0.1	0.0	2.1	0.1	0.1
SENIOR GOVERNMENT OFFICIALS			5.2	6.0	0.7	2.7	5.8	6.1
	Director Generals in Administrators	1121	0.5	0.5	0.1	2.2	0.5	0.5
	Diplomatic Representatives	1122	0.2	0.2	0.0	2.0	0.2	0.2
	Directors of Public Services	1123	4.5	5.2	0.7	2.7	5.1	5.3
TRADITIONAL CHIEFS AND HEADS OF VILLAGES			0.6	0.7	0.1	2.6	0.7	0.8
	Traditional Chiefs and Heads of Villages	1130	0.6	0.7	0.1	2.6	0.7	0.8
SENIOR OFFICIALS OF SPECIAL-INTEREST ORGANISATIONS			0.5	0.6	0.1	3.6	0.6	0.6
	Senior Officials of Employers and Workers'	1142	0.2	0.2	0.0	3.6	0.2	0.2

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Organizations							
	Senior Officials of Humanitarian and Other Special-Interest Organizations	1143	0.3	0.4	0.1	3.6	0.4	0.4
DIRECTORS AND CHIEF EXECUTIVES			12.2	14.1	1.9	2.9	13.7	14.5
	Directors and Chief Executives in Management	1210	12.2	14.1	1.9	2.9	13.7	14.5
PRODUCTION AND OPERATIONS DEPARTMENT MANAGERS			5.0	5.7	0.7	2.6	5.4	5.9
	Production and Operations Department Managers in Agriculture, Hunting, Forestry and Fishery	1221	0.0	0.0	0.0	3.4	0.0	0.0
	Production and Operations Department Managers in Mining and Manufacturing	1222	0.8	1.0	0.1	3.3	0.9	1.0
	Production and Operations Department Managers in Construction	1223	0.6	0.6	0.0	0.9	0.6	0.7
	Production and Operations Department Managers in Wholesale and Retail	1224	0.1	0.2	0.0	3.6	0.2	0.2

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Sales							
	Production and Operations Department Managers in Restaurants and Hotels	1225	0.3	0.4	0.1	4.5	0.4	0.5
	Production and Operations Department Managers in Transport, Storage and Communication	1226	1.2	1.4	0.2	3.3	1.3	1.5
	Production and Operations Department Managers in Financial, Real-Estate, Renting and Business Service	1227	1.5	1.6	0.1	1.5	1.6	1.7
	Production and Operations Department Managers in Personal Care, Cleaning and Related Services	1228	0.2	0.2	0.0	3.5	0.2	0.2
	Production and operations department managers not elsewhere classified	1229	0.2	0.2	0.0	3.7	0.2	0.2
OTHER DEPARTMENT MANAGERS			9.6	11.1	1.5	2.9	10.7	11.6
	Finance and Administrative	1231	5.5	6.3	0.8	2.8	6.1	6.6

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Department Managers							
	Personnel and Industrial Relations Department Managers	1232	0.5	0.6	0.1	3.2	0.5	0.6
	Sales and Marketing Department Managers	1233	1.5	1.7	0.3	3.4	1.7	1.8
	Advertising and Public Relations Department Managers	1234	0.6	0.7	0.1	2.6	0.6	0.7
	Supply and Distribution Department Managers	1235	0.6	0.7	0.1	3.0	0.7	0.8
	Computing Services Department Managers	1236	0.5	0.5	0.1	2.7	0.5	0.5
	Research and Development Department Managers	1237	0.5	0.6	0.1	2.8	0.6	0.6
GENERAL MANAGERS			13.7	15.9	2.3	3.1	15.3	16.6
	Superintendents in Agriculture, Hunting, Forestry and Fishery	1311	0.0	0.1	0.0	3.8	0.1	0.1
	Superintendents in Quarries and Manufacturing	1312	2.0	2.4	0.4	3.5	2.3	2.5
	Superintendents in Construction	1313	2.5	2.5	0.1	0.7	2.4	2.7
	Superintendents in Wholesale and Retail	1314	3.0	3.6	0.6	3.9	3.5	3.7

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Sales							
	Superintendents in Restaurants and Hotels	1315	1.1	1.4	0.3	4.3	1.4	1.5
	Superintendents in Transport, Storage and Communication	1316	1.3	1.5	0.2	3.2	1.4	1.5
	Superintendents in Business Services	1317	3.3	3.9	0.6	3.2	3.7	4.0
	Superintendents in Personal Care, Cleaning and Related Services	1318	0.5	0.6	0.1	3.6	0.6	0.6
PHYSICISTS, CHEMISTS AND RELATED PROFESSIONALS			0.6	0.7	0.1	2.2	0.7	0.7
	Chemists	2114	0.4	0.5	0.1	3.0	0.5	0.5
	Geologists and Geophysics	2115	0.2	0.2	0.0	1.3	0.2	0.2
MATHEMATICIANS, STATISTICIANS AND RELATED PROFESSIONALS			0.3	0.3	0.0	2.3	0.3	0.3
	Mathematicians	2121	0.1	0.1	0.0	3.2	0.1	0.1
	Statisticians	2122	0.2	0.3	0.0	2.1	0.3	0.3
COMPUTING PROFESSIONALS			4.6	5.2	0.6	2.4	5.0	5.4
	Computer systems designers and analysts	2131	0.7	0.8	0.1	2.3	0.8	0.9
	Computer Programmers	2132	3.9	4.4	0.5	2.5	4.2	4.5
ARCHITECTS, ENGINEERS AND RELATED PROFESSIONALS			19.7	21.8	2.1	2.0	20.9	22.6
	Architects, Town and	2141	2.2	2.4	0.2	2.1	2.3	2.5

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Traffic Planners and Engineers							
	Civil Engineers	2142	6.4	6.9	0.5	1.4	6.6	7.2
	Electrical Engineers	2143	2.5	2.8	0.3	2.0	2.7	2.9
	Electronics and Communication Engineers	2144	4.2	4.9	0.7	3.0	4.7	5.1
	Mechanical Engineers	2145	2.5	2.7	0.3	2.3	2.6	2.9
	Chemical Engineers	2146	0.7	0.8	0.1	2.5	0.8	0.9
	Mining Engineers and Metallurgists	2147	0.2	0.2	0.0	0.7	0.2	0.3
	Surveyors and Cartographers	2148	0.1	0.1	0.0	1.8	0.1	0.2
	Industrial Engineers, Safety and Environment Engineers	2149	0.6	0.7	0.1	3.0	0.7	0.7
LIFE SCIENCE PROFESSIONALS*			3.3	3.1	-0.2	-1.2	2.9	3.2
	Biologists, Botanists, Zoologists and Related Professionals	2211	0.2	0.3	0.0	3.8	0.3	0.3
	Pharmacologists, Pathologists and Related Professionals	2212	0.1	0.1	0.0	4.0	0.1	0.1
	Agronomists and Related Professionals	2213	2.0	2.4	0.3	3.3	2.3	2.4
HEALTH PROFESSIONALS (except nursing)			15.0	18.3	3.3	4.1	18.0	18.6
	Medical Doctors	2221	7.4	9.1	1.7	4.2	9.0	9.2
	Dentists	2222	2.4	3.0	0.6	4.3	2.9	3.0
	Veterinarians	2223	0.4	0.5	0.1	3.9	0.5	0.5
	Pharmacists	2224	3.9	4.7	0.8	4.0	4.6	4.8

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Paramedical Science Professionals	2225	0.8	1.0	0.2	4.0	0.9	1.0
NURSING AND MIDWIFERY PROFESSIONALS			3.1	3.7	0.7	4.0	3.7	3.8
	Nursing and Midwifery Professionals	2230	3.1	3.7	0.7	4.0	3.7	3.8
COLLEGE, UNIVERSITY AND HIGHER EDUCATION TEACHING PROFESSIONALS			7.8	9.2	1.3	3.2	9.1	9.2
	Higher Education Teaching Professionals (Colleges and Universities)	2310	7.8	9.2	1.3	3.2	9.1	9.2
SECONDARY EDUCATION TEACHING PROFESSIONALS			40.5	47.4	6.9	3.2	47.1	47.6
	Secondary Education Teaching Professionals	2320	40.5	47.4	6.9	3.2	47.1	47.6
PRIMARY AND PRE-PRIMARY EDUCATION TEACHING PROFESSIONALS			51.7	60.6	8.9	3.2	60.2	61.0
	Basic and Pre-Primary Education Teaching Professionals	2330	51.7	60.6	8.9	3.2	60.2	61.0
SPECIAL EDUCATION TEACHING PROFESSIONALS			1.4	1.7	0.3	3.4	1.7	1.7
	Special Education Teaching Professionals	2340	1.4	1.7	0.3	3.4	1.7	1.7
OTHER TEACHING PROFESSIONALS			3.0	3.5	0.5	3.1	3.5	3.5

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Educational Research and Development Professionals	2350	3.0	3.5	0.5	3.1	3.5	3.5
BUSINESS PROFESSIONALS			36.7	41.4	4.7	2.4	40.0	42.9
	Accountants	2411	15.7	17.8	2.0	2.5	17.2	18.4
	Personnel and Careers Professionals	2412	16.2	18.5	2.3	2.7	17.9	19.1
	Marketing and Promotion Professionals	2413	4.3	4.9	0.6	2.8	4.7	5.1
LEGAL PROFESSIONALS			7.2	7.9	0.7	1.8	7.7	8.1
	Lawyer and Related Professionals	2421	6.3	6.9	0.6	1.8	6.7	7.0
	Judges and Related Professionals	2422	0.8	0.9	0.1	2.0	0.9	0.9
	Attorney (Prosecutor) and Related Professionals	2423	0.1	0.2	0.0	2.0	0.2	0.2
ARCHIVISTS, LIBRARIANS AND RELATED INFORMATION PROFESSIONALS			1.6	1.9	0.3	3.0	1.9	1.9
	Social Science and Related Professionals	2432	1.6	1.9	0.3	3.1	1.9	1.9
SOCIAL SCIENCE AND RELATED PROFESSIONALS			2.1	2.4	0.3	2.6	2.4	2.5
	Economists	2441	0.4	0.5	0.0	1.8	0.5	0.5
	Sociologists, Anthropologists and Related Professionals	2442	0.2	0.3	0.0	2.8	0.3	0.3
	Philosophers, Historians and Political Professionals	2443	0.0	0.0	0.0	2.4	0.0	0.0
	Philologists,	2444	0.3	0.4	0.0	2.5	0.4	0.4

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Translators and Interpreters							
	Psychologists	2445	0.3	0.3	0.0	3.3	0.3	0.3
	Social Work Professionals	2446	0.8	0.9	0.1	2.9	0.9	0.9
WRITERS AND CREATIVE OR PERFORMING ARTISTS			1.8	2.2	0.3	3.5	2.1	2.3
	Authors, Journalists and Other Writers	2451	1.6	1.9	0.3	3.5	1.8	2.0
	Film, Stage and Related Actors and Directors	2454	0.2	0.3	0.0	3.6	0.3	0.3
RELIGIOUS PROFESSIONALS			1.3	1.4	0.2	2.6	1.4	1.5
	Religious Professionals	2460	1.3	1.4	0.2	2.6	1.4	1.5
SPORTS PROESSIONALS			1.2	1.4	0.2	3.5	1.4	1.5
	Sports Professionals	2470	1.2	1.4	0.2	3.5	1.4	1.5
PILOTS			0.6	0.7	0.1	3.3	0.7	0.7
	Pilots	2481	0.6	0.7	0.1	3.3	0.7	0.7
PHYSICAL AND ENGINEERING SCIENCE TECHNICIANS			21.8	24.4	2.6	2.3	23.5	25.3
	Chemical Science Technicians	3112	0.5	0.6	0.1	2.3	0.6	0.6
	Surveying, Architecture and Civil Engineering Technicians	3113	7.5	8.1	0.6	1.6	7.9	8.4
	Electrical Engineering Technicians	3114	3.7	4.1	0.4	2.1	4.0	4.3
	Electronic and Communication Engineering Technicians	3115	4.6	5.3	0.8	3.1	5.2	5.5

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Mechanical Engineering Technicians	3116	4.8	5.4	0.7	2.7	5.2	5.7
	Chemical Engineering Technicians	3117	0.4	0.4	0.1	2.6	0.4	0.4
	Geology, Mining and Metallurgical Technicians	3118	0.3	0.3	0.0	0.1	0.3	0.3
COMPUTER ASSOCIATE PROFESSIONALS			6.5	7.4	0.9	2.6	7.2	7.6
	Statisticians Associate Professionals	3121	0.2	0.2	0.0	3.0	0.2	0.2
	Information Associate Professionals	3122	0.2	0.2	0.0	2.6	0.2	0.2
	Computer Associate Professionals	3123	6.1	6.9	0.9	2.7	6.7	7.1
OPTICAL AND ELECTRONIC EQUIPMENT OPERATORS			2.9	3.4	0.4	2.7	3.2	3.5
	Photographers and Image and Sound Recording Equipment Operators	3131	2.4	2.7	0.3	2.5	2.6	2.8
	Broadcasting and Telecommunications Equipment Operators	3132	0.6	0.7	0.1	3.6	0.7	0.7
SHIP AND AIRCRAFT CONTROLLERS AND TECHNICIANS			1.1	1.2	0.2	2.9	1.2	1.3
	Meteorology Technicians	3141	0.2	0.2	0.0	2.3	0.2	0.2
	Aviation Technicians	3142	0.3	0.4	0.0	2.6	0.4	0.4
	Navigation	3143	0.6	0.7	0.1	3.3	0.6	0.7

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Technicians							
SAFETY AND QUALITY INSPECTORS			1.7	2.0	0.3	3.1	1.9	2.0
	Fire Fighting Technicians	3152	0.1	0.1	0.0	3.6	0.1	0.1
	Occupational Safety Technicians	3153	0.3	0.3	0.0	2.7	0.3	0.3
	Quality and Specifications Technicians	3154	1.3	1.5	0.2	3.2	1.5	1.6
LIFE SCIENCE TECHNICIANS AND RELATED ASSOCIATE PROFESSIONALS			0.6	0.6	0.1	1.9	0.6	0.6
	Life Science Technicians	3211	0.1	0.2	0.0	3.2	0.2	0.2
	Agronomy and Forestry Technicians	3212	0.3	0.4	0.1	3.3	0.4	0.4
	Animal, Poultry, Apiary and Fish Farming Technicians	3213	0.0	0.1	0.0	3.7	0.1	0.1
MODERN HEALTH ASSOCIATE PROFESSIONALS (except nursing)			9.4	11.4	2.0	4.0	11.2	11.6
	Medical Assistants	3221	1.3	1.5	0.2	3.2	1.5	1.6
	Dieticians and Nutritionists Associate Professionals	3222	0.1	0.2	0.0	4.2	0.2	0.2
	Optometrists and Opticians Associate Professionals	3223	1.5	1.8	0.3	4.1	1.8	1.8
	Dental Assistants	3224	0.5	0.6	0.1	4.0	0.6	0.7
	Physiotherapists and	3225	0.3	0.3	0.1	4.0	0.3	0.3

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Medical Rehabilitation Technicians							
	Veterinary Assistants	3226	0.1	0.2	0.0	4.2	0.2	0.2
	Pharmaceutical Assistants	3227	2.6	3.1	0.6	4.1	3.1	3.2
	Medical Laboratory Technicians	3228	2.3	2.8	0.5	4.2	2.8	2.8
	Medical Electrograph and Scanning Technicians	3229	0.7	0.8	0.2	4.2	0.8	0.8
NURSING AND MIDWIFERY ASSOCIATE PROFESSIONALS			9.6	11.8	2.2	4.2	11.6	11.9
	Nursing Associate Professionals	3231	8.3	10.2	1.9	4.2	10.1	10.3
	Midwifery Associate Professionals	3232	1.2	1.5	0.3	4.3	1.5	1.5
PRIMARY EDUCATION TEACHING ASSOCIATE PROFESSIONALS			2.4	2.8	0.4	2.9	2.7	2.8
	Audio-Visual Aids Technicians	3311	0.7	0.8	0.1	2.1	0.7	0.8
	Teaching Laboratory Apparatus Technicians	3312	1.7	1.9	0.3	3.2	1.9	2.0
	Computer Technology and Internet Technicians	3314	0.0	0.0	0.0	3.2	0.0	0.0
SPECIAL EDUCATION TEACHING ASSOCIATE PROFESSIONALS			0.2	0.2	0.0	3.7	0.2	0.2
	Special Education Teaching Associate Professionals	3320	0.2	0.2	0.0	3.7	0.2	0.2

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
OTHER TEACHING ASSOCIATE PROFESSIONALS			1.7	2.0	0.3	3.3	2.0	2.0
	Vocational Instructors / Industrial	3331	1.5	1.8	0.3	3.3	1.8	1.8
	Vocational Instructors / Commercial and Postal	3333	0.1	0.1	0.0	3.2	0.1	0.1
	Vocational Instructors / Hotel	3334	0.1	0.1	0.0	3.6	0.1	0.1
FINANCE AND SALES ASSOCIATE PROFESSIONALS			9.0	10.3	1.3	2.8	9.9	10.7
	Securities and Finance Dealers and Brokers	3411	0.4	0.4	0.0	0.3	0.4	0.4
	Insurance Representatives and Agents	3412	0.8	0.8	0.0	0.3	0.8	0.9
	Real Estate Agents	3413	0.9	1.0	0.1	2.1	0.9	1.0
	Travel Consultants and Organisers	3414	0.3	0.3	0.1	3.3	0.3	0.4
	Technical and Commercial Sales Representatives	3415	4.8	5.7	0.9	3.6	5.5	5.9
	Buyers	3416	0.8	0.9	0.1	2.9	0.9	1.0
	Appraisers, Valuers and Auctioneers	3417	1.0	1.1	0.1	2.2	1.1	1.2
BUSINESS SERVICES AGENTS AND TRADE BROKERS			6.4	7.6	1.1	3.3	7.2	7.9
	Trade Brokers	3421	0.4	0.4	0.1	3.4	0.4	0.4
	Clearing and	3422	5.7	6.8	1.0	3.3	6.4	7.1

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Forwarding Agents							
	Employment Agents and Labour Contractors	3423	0.3	0.4	0.1	3.1	0.3	0.4
ADMINISTRATIVE ASSOCIATE PROFESSIONALS			22.9	25.7	2.8	2.3	24.8	26.5
	Administrative Secretaries and Related Associate Professionals	3431	8.2	9.4	1.2	2.8	9.1	9.7
	Legal and Related Associate Professionals	3432	1.1	1.3	0.1	2.0	1.2	1.3
	Book Keepers	3433	13.2	14.9	1.7	2.4	14.4	15.3
CUSTOMS, TAX AND RELATED GOVERNMENT ASSOCIATE PROFESSIONALS			3.2	3.5	0.4	2.2	3.5	3.6
	Customs Inspectors	3441	1.5	1.7	0.2	2.2	1.7	1.7
	Government Tax and Excise Officials	3442	0.9	0.9	0.1	2.1	0.9	1.0
	Government Social Benefits Officials	3443	0.4	0.4	0.0	2.3	0.4	0.5
	Government Licensing Officials	3444	0.4	0.5	0.0	2.2	0.4	0.5
SOCIAL WORK ASSOCIATE PROFESSIONALS			0.5	0.6	0.1	3.0	0.6	0.6
	Social Research and Welfare Associate Professionals	3451	0.3	0.3	0.0	2.6	0.3	0.3
	Social Care Associate Professionals	3452	0.3	0.3	0.1	3.3	0.3	0.3
ARTISTIC,			4.1	4.8	0.7	3.3	4.6	4.9

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
ENTERTAINMENT AND SPORTS ASSOCIATE PROFESSIONALS								
	Interior Decoration, Promotion and Fashion Design Technicians	3461	2.9	3.4	0.5	3.2	3.3	3.6
	Musicians, Singers and Dancers	3463	0.1	0.1	0.0	3.7	0.1	0.1
	Sports Technicians	3465	1.0	1.2	0.2	3.6	1.2	1.3
RELIGIOUS ASSOCIATE PROFESSIONALS			4.0	4.6	0.6	2.7	4.4	4.7
	Worshipping and Religious Places Associate Professionals	3471	2.5	2.7	0.3	2.1	2.7	2.8
	Koran Reading Associate Professionals	3472	1.5	1.8	0.3	3.6	1.8	1.9
SECRETARIES AND KEYBOARD-OPERATING CLERKS			53.4	61.4	8.0	2.8	59.7	63.1
	Stenographers and Typists	4111	5.9	6.7	0.8	2.6	6.6	6.8
	Word Processors and Related Operators	4112	0.0	0.0	0.0	3.3	0.0	0.0
	Data Entry Operators	4113	1.1	1.3	0.2	2.6	1.3	1.3
	Secretaries and Correspondence Clerks	4114	46.4	53.4	7.0	2.9	51.8	54.9
FINANCIAL AND STAISTICAL CLERKS			6.8	7.5	0.7	1.9	7.2	7.7
	Financial and Accounting Clerks	4121	6.3	6.9	0.7	2.1	6.7	7.2
	Statistical Clerks	4122	0.4	0.5	0.1	2.3	0.5	0.5

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
MATERIAL-RECORDING AND TRANSPORT CLERKS			14.0	16.2	2.2	2.9	15.6	16.8
	Storage Clerks	4131	9.2	10.7	1.5	3.0	10.4	11.1
	Production Clerks	4132	0.3	0.4	0.1	3.1	0.4	0.4
	Freight and Transportation Clerks	4133	4.3	5.1	0.7	3.2	4.9	5.3
LIBRARY, MAIL AND RELATED CLERKS			3.5	3.6	0.1	0.4	3.4	3.7
	Library Clerks	4141	1.0	1.1	0.1	2.7	1.1	1.2
	Mail Carriers and Sorting Clerks	4142	1.9	2.2	0.3	2.6	2.1	2.3
OTHER OFFICE CLERKS			0.6	0.6	0.1	1.8	0.6	0.6
	Civil Status Clerks	4150	0.6	0.6	0.1	1.8	0.6	0.6
CASHIERS, TELLERS AND RELATED CLERKS			8.4	10.0	1.5	3.3	9.6	10.3
	Currency Exchangers	4211	0.2	0.2	0.0	0.4	0.2	0.2
	Cashiers	4212	5.3	6.4	1.1	3.9	6.2	6.6
	Travel and Entry Ticket Clerks	4213	1.0	1.2	0.2	3.3	1.2	1.3
	Debt Collectors	4214	1.9	2.1	0.2	2.2	2.1	2.2
CLIENT INFORMATION CLERKS			9.2	10.5	1.4	2.8	10.2	10.9
	Travel Agency Clerks	4221	2.8	3.3	0.5	3.4	3.1	3.5
	Receptionists and Reservation Clerks	4222	0.9	1.1	0.2	4.1	1.1	1.2
	Airport and Telephone Information Clerks	4223	3.9	4.5	0.6	2.9	4.4	4.7
	Rental Services Clerks	4224	1.4	1.5	0.1	1.9	1.5	1.6
TRAVEL ATTENDANTS AND RELATED WORKERS			2.9	3.4	0.5	3.4	3.3	3.6
	Attendants	5111	2.1	2.4	0.4	3.4	2.3	2.6
	Travel Guides	5113	0.8	1.0	0.1	3.3	1.0	1.0

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
HOUSEKEEPING AND RESTAURANT SERVICES WORKERS			25.1	30.8	5.7	4.2	29.7	31.9
	House Keeper	5121	1.8	2.3	0.4	4.2	2.2	2.3
	Cooks (Chefs)	5122	9.9	12.3	2.4	4.4	11.8	12.7
	Waiters	5123	10.0	12.2	2.2	4.1	11.8	12.7
	Laundry and Pressing Workers	5124	3.4	4.1	0.7	3.7	3.9	4.2
PERSONAL CARE AND RELATED WORKERS			3.4	4.2	0.8	4.0	4.1	4.2
	Childcare Workers	5131	0.8	0.9	0.1	3.3	0.9	0.9
	Institution-Based Personal Care Workers	5132	0.7	0.9	0.2	4.1	0.9	0.9
	Home-Based Personal Care Workers	5133	2.0	2.4	0.5	4.3	2.4	2.4
OTHER PERSONAL SERVICES WORKERS			30.7	36.7	6.0	3.7	35.2	38.2
	Hairdressers and Barbers	5141	28.4	34.0	5.6	3.7	32.6	35.4
	Beauticians	5142	2.2	2.7	0.4	3.7	2.6	2.8
FIRE FIGHTERS AND RELATED OCCUPATIONS			0.3	0.4	0.1	3.1	0.4	0.4
	Fire Fighters, Rescuers and First Aid Workers	5150	0.3	0.4	0.1	3.1	0.4	0.4
MODELS AND FASHION DEMONSTRATORS			0.0	0.1	0.0	2.2	0.0	0.1
	Models and Fashion Demonstrators	5210	0.0	0.1	0.0	2.2	0.0	0.1
SHOP SALESPERSONS AND DEMONSTRATORS			85.5	103.9	18.5	4.0	101.0	106.9
	Supplies Sales Persons	5221	43.7	53.3	9.5	4.0	51.8	54.8

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Textile, Clothes and Leather Products Sales Persons	5222	18.7	22.8	4.1	4.0	22.1	23.4
	Domestic Articles, Appliances and Furniture Sales Persons	5223	7.1	8.7	1.6	4.0	8.4	8.9
	Jewellery Sales Persons	5224	3.1	3.7	0.7	4.0	3.6	3.8
	Watches and Optical Sales Persons	5225	0.3	0.3	0.1	4.0	0.3	0.3
	Flower and Cosmetics Sales Persons	5226	3.0	3.7	0.7	4.0	3.6	3.8
	Gifts and Fine Arts Sales Persons	5227	1.5	1.8	0.3	3.9	1.8	1.9
	Books, Periodicals and Stationary Sales Persons	5228	3.0	3.6	0.6	4.0	3.5	3.7
	Musical Instruments and Tapes Sales Persons	5229	5.0	6.0	1.0	3.7	5.9	6.2
SPECIALISED SALES PERSONS			13.8	16.8	3.0	4.0	16.3	17.2
	Office Equipment Sales Persons	5231	1.6	1.9	0.3	3.7	1.9	2.0
	Medical Equipment and Supplies Sales Persons	5233	0.3	0.3	0.1	4.0	0.3	0.4
	Construction Materials Sales Persons	5234	3.5	4.3	0.8	4.0	4.2	4.4
	Building Materials and Supplies Sales Persons	5235	1.7	2.1	0.4	4.0	2.0	2.1

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Construction Equipment and Agro Machinery Sales Persons	5236	0.2	0.3	0.1	4.0	0.3	0.3
	Vehicle and Motorcycle Spare Parts Sales Persons	5237	5.4	6.5	1.2	4.0	6.4	6.7
	Industrial Equipment Sales Persons	5238	0.5	0.6	0.1	4.0	0.5	0.6
	Agricultural Equipment, Supplies and Materials Sales Persons	5239	0.6	0.8	0.1	4.0	0.7	0.8
STALL AND MARKET SALES PERSONS			0.3	0.3	0.1	3.9	0.3	0.3
	Stall, Street and Market Sales Persons	5240	0.3	0.3	0.1	3.9	0.3	0.3
MARKET GARDENERS AND CROP GROWERS			10.3	4.0	-6.3	-17.2	3.0	5.0
MARKET-ORIENTED ANIMAL PRODUCERS AND RELATED WORKERS			5.4	2.1	-3.3	-17.2	1.6	2.6
FORESTRY AND RELATED WORKERS			0.2	0.1	-0.1	-17.2	0.1	0.1
FISHERY WORKERS, HUNTERS AND TRAPPERS			0.1	0.0	-0.1	-17.2	0.0	0.0
MINERS, SHOTFIRERS, STONE CUTTERS AND CARVERS			0.8	0.9	0.1	3.0	0.9	1.0
	Stone Cutters and Carvers	7113	0.8	0.9	0.1	3.0	0.9	1.0
BUILDING FRAME AND RELATED TRADES WORKERS			8.0	8.2	0.3	0.7	7.8	8.7
	Stone-Masons and Brick Layers	7122	1.5	1.6	0.1	0.9	1.5	1.7

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Concrete Places, Builders and Related Workers	7123	6.4	6.6	0.2	0.7	6.3	7.0
BUILDING FINISHERS AND RELATED TRADES WORKERS			1.4	1.5	0.0	0.4	1.4	1.6
	Building Exterior Decoration Workers	7131	1.1	1.1	0.0	0.6	1.1	1.2
	Plasterers	7132	0.2	0.3	0.0	1.6	0.2	0.3
	Tile Setters	7133	0.1	0.1	0.0	0.6	0.1	0.1
PAINTERS, BUILDING STRUCTURE CLEANERS AND RELATED TRADES WORKERS			0.8	0.9	0.1	1.9	0.8	0.9
	Building Painters	7141	0.8	0.9	0.1	1.9	0.8	0.9
METAL MOULDERS, WELDERS, SHEET-METAL WORKERS, STRUCTURAL-METAL PREPARERS, AND RELATED TRADES WORKERS			9.3	10.9	1.6	3.2	10.5	11.4
	Foundry (Metal Melting and Casting) Workers	7211	0.2	0.2	0.0	3.4	0.2	0.2
	Arc and Oxyacetylene Welders	7212	1.4	1.6	0.2	2.5	1.5	1.7
	Sheet Metal Workers	7213	1.5	1.7	0.3	3.5	1.7	1.8
	Steel Construction Workers	7214	1.0	1.1	0.1	2.1	1.1	1.2
	Metal Doors and Window Fabrication Workers	7215	5.2	6.2	1.0	3.5	6.0	6.5
BLACKSMITHS, TOOL-MAKERS AND RELATED			2.2	2.5	0.4	3.3	2.4	2.7

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
TRADES WORKERS								
	Blacksmiths and Forge Press Operators	7221	0.2	0.3	0.0	3.7	0.3	0.3
	Lathe and Milling Machines Setters-Operators	7222	1.6	1.9	0.3	3.5	1.8	2.0
	Grinding Machine Setters-Operators	7223	0.1	0.1	0.0	1.8	0.1	0.1
	Tool and Dye Makers	7224	0.0	0.1	0.0	3.7	0.1	0.1
	Auto Machinists	7225	0.2	0.2	0.0	3.7	0.2	0.2
MACHINERY MECHANICS AND FITTERS			5.2	5.7	0.5	1.7	5.5	5.9
	Refrigeration and Air Conditioning Mechanics	7231	1.2	1.4	0.2	3.7	1.4	1.5
	Plumbers (Plumbing Mechanics)	7232	3.7	3.9	0.2	1.3	3.8	4.0
	Central Heating Mechanics	7233	0.3	0.3	0.0	3.2	0.3	0.3
OTHER MECHANICS AND REPAIRERS			28.1	33.4	5.3	3.5	32.3	34.5
	Light Vehicle Mechanics	7241	13.3	16.1	2.8	3.9	15.6	16.5
	Bus and Truck Mechanics	7242	2.5	2.9	0.5	3.5	2.8	3.0
	Heavy Equipment Mechanics	7243	1.4	1.6	0.2	2.5	1.5	1.7
	Railway and Locomotive Mechanics	7244	0.2	0.2	0.0	2.7	0.2	0.2
	Aircraft Mechanics	7245	0.8	0.9	0.1	3.2	0.9	1.0
	Agro Machinery Mechanics	7246	0.1	0.2	0.0	3.7	0.2	0.2
	Auto Body Repairs	7247	4.5	5.4	0.9	3.9	5.2	5.6

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	and Painters							
	Industrial Machinery and Equipment Mechanics	7248	5.3	6.0	0.7	2.5	5.8	6.2
ELECTRICAL AND ELECTRONIC EQUIPMENT MECHANICS AND FITTERS			8.9	9.9	1.1	2.3	9.6	10.3
	Power Generation Electricians	7251	0.6	0.7	0.1	1.9	0.7	0.7
	Power Transmission and Distribution Electricians	7252	0.9	1.0	0.1	1.6	1.0	1.0
	Substation Electricians	7253	0.3	0.4	0.0	1.8	0.4	0.4
	Electrical Installation Electricians	7254	3.2	3.5	0.2	1.4	3.3	3.6
	Machine and Circuit Breakers Electricians	7255	1.0	1.2	0.2	3.2	1.2	1.3
	Instrumentation Electricians	7256	0.2	0.2	0.0	2.3	0.2	0.2
	Auto Electricians	7257	2.5	2.9	0.5	3.7	2.9	3.0
ELECTRONIC AND COMMUNICATION FITTERS			2.7	3.2	0.5	3.3	3.1	3.4
	Industrial Electronics Fitters	7261	0.4	0.5	0.1	3.6	0.5	0.5
	Computer, and Electronic Medical and Office Machines Fitters	7262	0.4	0.4	0.1	2.5	0.4	0.4
	Radio and TV Fitters	7263	0.4	0.5	0.1	3.6	0.5	0.5
	Telecommunication Fitters	7264	1.5	1.8	0.3	3.4	1.7	1.8
PRECISION WORKERS IN METAL AND RELATED MATERIALS			0.6	0.8	0.1	3.8	0.7	0.8

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Instrumentation Mechanics	7311	0.0	0.0	0.0	2.0	0.0	0.0
	Goldsmiths	7313	0.6	0.8	0.1	3.8	0.7	0.8
POTTERS, GLASS-MAKERS AND RELATED TRADES WORKERS			1.1	1.4	0.2	3.8	1.3	1.4
	Potters	7321	0.1	0.2	0.0	3.8	0.2	0.2
	Glass-Makers	7322	0.9	1.1	0.2	4.0	1.0	1.1
	Glass, Ceramics and Related Workers	7324	0.1	0.1	0.0	2.6	0.1	0.1
HANDICRAFT WORKERS IN WOOD,TEXTILE, LEATHER AND RELATED MATERIALS			0.2	0.3	0.0	3.7	0.3	0.3
	Handicraft Workers in Wood	7331	0.2	0.2	0.0	3.6	0.2	0.2
	Handicraft Workers in Textile	7332	0.1	0.1	0.0	3.7	0.1	0.1
PRINTING AND RELATED TRADES WORKERS			2.3	2.7	0.4	3.3	2.6	2.8
	Type-Setters and Related Workers	7341	0.8	0.9	0.1	2.8	0.9	0.9
	Machine-Operators / Printing	7342	1.0	1.2	0.2	3.6	1.2	1.3
	Book Binding Workers	7343	0.4	0.5	0.1	3.7	0.5	0.5
FOOD PROCESSING AND RELATED TRADES WORKERS			4.2	5.1	0.9	3.9	4.9	5.3
	Butchers and Fish Mongers	7411	0.7	0.9	0.1	3.8	0.8	0.9
	Bakers, Pastry-Cooks and Confectionary Makers	7412	3.5	4.2	0.7	3.9	4.0	4.4
WOOD TREATERS,			12.1	14.4	2.3	3.6	13.8	15.0

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
CABINET-MAKERS AND RELATED TRADES WORKERS								
	Carpenters (Cabinet Makers)	7421	5.3	6.4	1.1	3.7	6.1	6.7
	Joiners	7422	2.7	3.2	0.5	3.1	3.1	3.3
	Wood Products Painters	7424	0.8	1.0	0.2	3.8	0.9	1.0
	Upholsterers	7425	2.8	3.4	0.6	3.9	3.2	3.5
	Curtain, Carpet, Wall-Paper and False Sealing Fitters	7426	0.4	0.5	0.1	3.9	0.5	0.5
TEXTILE, GARMENT AND RELATED TRADES WORKERS			12.4	14.9	2.5	3.8	14.3	15.6
	Garment Pattern-Makers	7431	0.2	0.3	0.1	3.9	0.3	0.3
	Tailors / Men's Clothes	7432	4.3	5.1	0.9	3.8	4.9	5.4
	Tailors / Women's Clothes	7433	7.0	8.5	1.4	3.8	8.1	8.8
	Tailors / Children's Clothes	7434	0.6	0.7	0.1	3.8	0.7	0.7
	Embroidery Workers	7436	0.3	0.3	0.1	3.8	0.3	0.3
PELT, LEATHER AND SHOEMAKING TRADES WORKERS			0.6	0.7	0.1	3.9	0.7	0.8
	Pelt Dressers and Tanners	7441	0.0	0.0	0.0	3.8	0.0	0.0
	Saddle Makers	7442	0.1	0.2	0.0	3.8	0.2	0.2
	Shoe Makers	7443	0.4	0.5	0.1	3.9	0.5	0.6
MINING- AND MINERAL-PROCESSING PLANT OPERATORS			0.4	0.4	0.0	-0.5	0.4	0.4

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Mineral, Ore and Stone-Processing Plant Operators	8112	0.4	0.4	0.0	-0.5	0.4	0.4
METAL-PROCESSING-PLANT OPERATORS			0.8	1.0	0.2	3.8	0.9	1.0
	Metal Melters, Casters, and Rolling-Mill Operators	8121	0.4	0.4	0.1	3.8	0.4	0.5
	Metal Drawing and Extruding Machines Operators	8123	0.5	0.5	0.1	3.8	0.5	0.6
GLASS, CERAMICS AND RELATED PLANT OPERATORS			0.5	0.6	0.1	3.8	0.6	0.6
	Glass Plant Operators	8131	0.2	0.2	0.0	3.8	0.2	0.2
	Ceramic Plant Operators	8132	0.3	0.4	0.1	3.8	0.4	0.4
WOOD-PROCESSING-AND PAPERMAKING-PLANT OPERATORS			0.5	0.6	0.1	3.8	0.5	0.6
	Wood -Processing Plant Operators	8141	0.1	0.1	0.0	3.8	0.1	0.1
	Paper-Making Plant Operators	8143	0.4	0.4	0.1	3.8	0.4	0.4
CHEMICAL-PROCESSING-PLANT OPERATORS			2.3	2.8	0.5	3.8	2.7	2.9
	Crushing, Grinding and Chemical Mixing Machinery Operators	8151	0.5	0.6	0.1	3.7	0.6	0.6
	Chemical Filtering and Separation Equipment Operators	8153	0.1	0.1	0.0	3.5	0.1	0.1
	Chemical Still and Reactor Operators	8154	0.1	0.1	0.0	2.9	0.1	0.1
	Petroleum and	8155	1.7	2.0	0.4	3.9	1.9	2.1

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Natural Gas Refining Equipment Operators							
POWER-PRODUCTION AND RELATED PLANT OPERATORS			1.0	1.0	0.0	-0.5	0.9	1.0
	Power Production, Water Purification and Sewage and Waste Treating Plant Operators	8161	0.3	0.4	0.1	3.6	0.4	0.4
	Power Production Plant Operators	8162	0.5	0.5	0.0	1.3	0.5	0.5
METAL- AND MINERAL-PRODUCTS MACHINE OPERATORS			5.5	6.6	1.1	3.7	6.3	6.8
	Metal Fabrication and Machinery Equipment Operators	8211	0.5	0.6	0.1	3.8	0.6	0.6
	Marble and Stone Sawing Machinery Operators	8212	2.1	2.6	0.4	3.7	2.4	2.7
	Brick and Tile Machinery Operators	8213	2.6	3.1	0.5	3.7	3.0	3.2
	Cement Pipes and Piles Making Equipment Operators	8214	0.3	0.3	0.1	3.7	0.3	0.3
CHEMICAL-PRODUCTS MACHINE OPERATORS			1.0	1.3	0.2	3.8	1.2	1.3
	Pharmaceutical Products Machinery Operators	8221	0.6	0.7	0.1	3.8	0.7	0.8
	Soap and Detergent Products Machinery Operators	8222	0.1	0.2	0.0	3.8	0.1	0.2
	Cosmetics Products Machinery Operators	8223	0.2	0.2	0.0	3.8	0.2	0.2

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Metal Plating and Coating Machinery Operators	8224	0.1	0.2	0.0	3.7	0.2	0.2
RUBBER- AND PLASTIC-PRODUCTS MACHINE OPERATORS			1.6	1.9	0.3	3.8	1.9	2.0
	Plastic Products Machine Operators	8231	1.4	1.6	0.3	3.8	1.6	1.7
	Petrochemical Manufacturing Machinery Operators	8232	0.2	0.3	0.0	3.8	0.3	0.3
PRINTING-, BINDING- AND PAPER-PRODUCTS MACHINE OPERATORS			0.5	0.6	0.1	3.7	0.5	0.6
	Press Printing Machines Operators	8251	0.1	0.2	0.0	3.6	0.2	0.2
	Book Binding Machines Operators	8252	0.3	0.3	0.1	3.8	0.3	0.3
	Paper Products Machinery Operators	8253	0.1	0.1	0.0	3.8	0.1	0.1
TEXTILE-, FUR- AND LEATHER-PRODUCTS MACHINE OPERATORS			15.2	18.3	3.1	3.8	17.5	19.1
	Spinning Machine Operators	8261	0.1	0.1	0.0	3.8	0.1	0.1
	Weaving Machine Operators	8262	0.2	0.2	0.0	3.8	0.2	0.2
	Knitting Machine Operators	8263	1.8	2.1	0.4	3.8	2.0	2.2
	Dyeing Machine Operators	8264	0.1	0.1	0.0	3.9	0.1	0.1
	Industrial Sewing Machine Operators	8265	12.8	15.5	2.6	3.8	14.8	16.1
	Embroidery Machine Operators	8266	0.1	0.1	0.0	3.8	0.1	0.1

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Shoe Making and Hand Bag Machinery Operators	8268	0.2	0.2	0.0	3.8	0.2	0.2
FOOD AND RELATED PRODUCTS MACHINE OPERATORS			3.0	3.6	0.6	3.8	3.4	3.7
	Meat Processing Machinery Operators	8271	0.1	0.1	0.0	3.8	0.1	0.1
	Dairy Products Machine Operators	8272	0.5	0.6	0.1	3.8	0.6	0.7
	Grain and Spices Machine Operators	8273	0.3	0.4	0.1	3.6	0.4	0.4
	Bakery, Flour and Chocolate Products and Yeast Machinery Operators	8274	0.5	0.6	0.1	3.8	0.5	0.6
	Fruit, Vegetable and Beans Processing Machinery Operators	8275	0.3	0.4	0.1	4.0	0.4	0.4
	Oil Processing Machinery Operators	8276	0.5	0.6	0.1	3.8	0.6	0.7
	Coffee and Kernel Products Machinery Operators	8277	0.3	0.3	0.1	3.8	0.3	0.4
	Brewers, Wine and Other Beverage Machine Operators	8278	0.1	0.2	0.0	3.8	0.1	0.2
	Tobacco Production Machinery Operators	8279	0.3	0.4	0.1	3.8	0.3	0.4
ASSEMBLERS			0.4	0.5	0.1	3.8	0.5	0.5
	Mechanical Equipment Assemblers	8281	0.3	0.3	0.1	3.8	0.3	0.3
	Electrical Equipment Assemblers	8282	0.1	0.1	0.0	3.8	0.1	0.1

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Rubber and Plastic Products Assemblers	8284	0.0	0.1	0.0	3.8	0.1	0.1
	Wood Work Products Assemblers	8285	0.0	0.0	0.0	3.8	0.0	0.0
LOCOMOTIVE-ENGINE DRIVERS AND RELATED WORKERS			0.5	0.5	0.1	2.7	0.5	0.6
	Train Drivers	8311	0.2	0.3	0.0	2.4	0.3	0.3
	Railway Brakes Man, Signallers and Shunters	8312	0.2	0.3	0.0	3.2	0.3	0.3
MOTOR-VEHICLE DRIVERS			37.2	42.5	5.3	2.7	40.9	44.1
	Motor Vehicle Drivers	8320	37.2	42.5	5.3	2.7	40.9	44.1
AGRICULTURAL AND OTHER MOBILE-PLANT OPERATORS			0.8	0.6	-0.2	-5.4	0.6	0.6
	Agro Machinery Drivers	8331	0.3	0.3	0.0	3.0	0.3	0.3
	Agro Machinery Operators	8332	0.1	0.1	0.0	2.7	0.1	0.2
EQUIPMENT OPERATORS AND DRIVERS			10.6	11.5	0.9	1.6	10.9	12.0
	Heavy Equipment Drivers	8341	8.6	9.2	0.6	1.3	8.7	9.6
	Mobile Power Generator Operator and Asphalting and Lifting Equipment Operators	8342	2.0	2.3	0.3	3.0	2.2	2.4
STREET VENDORS AND RELATED WORKERS			0.3	0.4	0.1	3.6	0.4	0.4
	Street Food Vendors	9111	0.0	0.0	0.0	3.8	0.0	0.0
	Street Non-Food	9112	0.1	0.1	0.0	4.0	0.1	0.1

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
	Vendors							
	Door-To-Door Sales Persons	9113	0.2	0.3	0.0	3.8	0.3	0.3
SHOE CLEANING AND OTHER STREET SERVICES ELEMENTARY OCCUPATIONS			0.1	0.0	0.0	-3.9	0.0	0.1
	Shoe Cleaning and Related Workers	9120	0.1	0.0	0.0	-3.9	0.0	0.1
DOMESTIC AND RELATED HELPERS, CLEANERS AND LAUNDERERS			12.5	14.8	2.3	3.5	14.4	15.2
	Domestic Helpers	9131	0.2	0.3	0.0	3.7	0.2	0.3
	Office and Hotel Helpers and Cleaners	9132	11.4	13.6	2.1	3.5	13.2	13.9
	Hand Launderers and Pressers	9133	0.8	1.0	0.2	3.7	0.9	1.0
BUILDING CARETAKERS, WINDOW AND RELATED CLEANERS			2.2	2.6	0.4	3.0	2.5	2.7
	Building Cleaners	9141	1.9	2.1	0.3	2.9	2.1	2.2
	Motor Vehicle Cleaners	9142	0.4	0.4	0.1	3.7	0.4	0.5
MESSENGERS, WATCHMEN AND RELATED WORKERS			57.5	65.5	8.1	2.7	63.7	67.3
	Messengers and Porters	9161	37.0	43.2	6.2	3.1	42.1	44.3
	Door Keepers and Watchmen	9162	19.1	21.5	2.4	2.4	20.9	22.1
	Meter Readers	9163	0.5	0.5	0.0	0.8	0.5	0.5
GARBAGE COLLECTORS AND RELATED LABOURERS			9.7	10.8	1.1	2.2	10.6	11.0
	Garbage Collectors and Dustmen	9170	9.7	10.8	1.1	2.2	10.6	11.0
AGRICULTURAL, FISHERY			10.4	7.7	-2.7	-5.7	7.1	8.4

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	New jobs 2006-11 (000)	Annual average rate of growth 2006-11 (%)	Lower option 000)	Upper option (000)
AND RELATED LABOURERS*								
	Farm Labourers	9211	3.8	4.4	0.5	2.6	4.3	4.5
	Forestry Labourers	9212	0.5	0.7	0.1	4.0	0.7	0.7
	Animal Breeding and Poultry Labourers	9214	0.4	0.5	0.1	3.8	0.5	0.5
MINING AND CONSTRUCTION LABOURERS			24.3	25.4	1.1	0.9	24.2	26.5
	Mining and Construction Labourers	9310	24.3	25.4	1.1	0.9	24.2	26.5
MANUFACTURING LABOURERS			12.0	14.3	2.3	3.6	13.7	14.9
	Manufacturing Labourers	9320	12.0	14.3	2.3	3.6	13.7	14.9
TRANSPORT LABOURERS AND FREIGHT HANDLERS			10.1	11.9	1.8	3.4	11.4	12.5
	Transport and Freight Labourers	9330	10.1	11.9	1.8	3.4	11.4	12.5
Total			954.1	1090.9	136.8	2.7	1056.0	1125.7

* Employment projections for this occupation may not be reliable because of biases in the data for the economic activity 'Agriculture'.

Appendix 6: Projections of employment for 4-digit occupations in 2012

The data in Table A6.1 show the estimated stock in 2006 and the employment projections in 2012 for 3-digit and 4-digit occupations. The estimates are rounded to the nearest thousand since exact numbers would tend to create a false sense of the reliability of the projections. Occupations with an estimated stock in 2006 of 0.1 thousand are excluded from the table.

The table also includes the number of new jobs (in thousands) projected for the period 2000-2012, as well as the annual average rate of growth in employment (%). A lower and upper option (as a percentage of the employment projection) is also included in the table.

Table A6.1: Projected employment 2012, projected new jobs and annual rate of growth, 2006-2012, (Excluding the Armed Forces)

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
LEGISLATORS			0.1	0.1	0.0	2.1	0.1	0.1
	Legislators	1110	0.1	0.1	0.0	2.1	0.1	0.1
SENIOR GOVERNMENT OFFICIALS			5.2	6.1	0.9	2.6	6.0	6.2
	Director Generals in Administrators	1121	0.5	0.5	0.1	2.2	0.5	0.6
	Diplomatic Representatives	1122	0.2	0.2	0.0	2.0	0.2	0.2
	Directors of Public Services	1123	4.5	5.3	0.8	2.7	5.2	5.4
TRADITIONAL CHIEFS AND HEADS OF VILLAGES			0.6	0.8	0.1	2.6	0.7	0.8
	Traditional Chiefs and Heads of Villages	1130	0.6	0.8	0.1	2.6	0.7	0.8
SENIOR OFFICIALS OF SPECIAL-INTEREST ORGANISATIONS			0.5	0.6	0.1	3.5	0.6	0.6
	Senior Officials of Employers and Workers' Organizations	1142	0.2	0.2	0.0	3.5	0.2	0.2

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Senior Officials of Humanitarian and Other Special-Interest Organizations	1143	0.3	0.4	0.1	3.6	0.4	0.4
DIRECTORS AND CHIEF EXECUTIVES			12.2	14.4	2.2	2.8	14.0	14.8
	Directors and Chief Executives in Management	1210	12.2	14.4	2.2	2.8	14.0	14.8
PRODUCTION AND OPERATIONS DEPARTMENT MANAGERS			5.0	5.8	0.8	2.5	5.5	6.0
	Production and Operations Department Managers in Agriculture, Hunting, Forestry and Fishery	1221	0.0	0.0	0.0	3.2	0.0	0.0
	Production and Operations Department Managers in Mining and Manufacturing	1222	0.8	1.0	0.2	3.0	0.9	1.0
	Production and Operations Department Managers in Construction	1223	0.6	0.6	0.0	0.8	0.6	0.7
	Production and Operations Department Managers in Wholesale and	1224	0.1	0.2	0.0	3.4	0.2	0.2

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Retail Sales							
	Production and Operations Department Managers in Restaurants and Hotels	1225	0.3	0.4	0.1	4.2	0.4	0.5
	Production and Operations Department Managers in Transport, Storage and Communication	1226	1.2	1.4	0.2	3.1	1.4	1.5
	Production and Operations Department Managers in Financial, Real-Estate, Renting and Business Services	1227	1.5	1.7	0.1	1.6	1.6	1.7
	Production and Operations Department Managers in Personal Care, Cleaning and Related Services	1228	0.2	0.2	0.0	3.5	0.2	0.2
	Production and operations department managers not elsewhere classified	1229	0.2	0.2	0.0	3.5	0.2	0.2
OTHER DEPARTMENT MANAGERS			9.6	11.4	1.7	2.8	10.9	11.8
	Finance and	1231	5.5	6.5	0.9	2.7	6.2	6.7

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Administrative Department Managers							
	Personnel and Industrial Relations Department Managers	1232	0.5	0.6	0.1	3.0	0.6	0.6
	Sales and Marketing Department Managers	1233	1.5	1.8	0.3	3.2	1.7	1.8
	Advertising and Public Relations Department Managers	1234	0.6	0.7	0.1	2.6	0.7	0.7
	Supply and Distribution Department Managers	1235	0.6	0.7	0.1	2.8	0.7	0.8
	Computing Services Department Managers	1236	0.5	0.5	0.1	2.7	0.5	0.6
	Research and Development Department Managers	1237	0.5	0.6	0.1	2.7	0.6	0.6
GENERAL MANAGERS			13.7	16.3	2.6	2.9	15.6	16.9
	Superintendents in Agriculture, Hunting, Forestry and Fishery	1311	0.0	0.1	0.0	3.5	0.1	0.1
	Superintendents in Quarries and Manufacturing	1312	2.0	2.4	0.4	3.2	2.3	2.5
	Superintendents in Construction	1313	2.5	2.5	0.1	0.6	2.4	2.7

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Superintendents in Wholesale and Retail Sales	1314	3.0	3.7	0.7	3.7	3.6	3.8
	Superintendents in Restaurants and Hotels	1315	1.1	1.5	0.3	4.1	1.4	1.5
	Superintendents in Transport, Storage and Communication	1316	1.3	1.5	0.2	3.0	1.4	1.6
	Superintendents in Business Services	1317	3.3	4.0	0.7	3.1	3.8	4.1
	Superintendents in Personal Care, Cleaning and Related Services	1318	0.5	0.7	0.1	3.5	0.6	0.7
PHYSICISTS, CHEMISTS AND RELATED PROFESSIONALS			0.6	0.7	0.1	2.1	0.7	0.7
	Chemists	2114	0.4	0.5	0.1	2.8	0.5	0.5
	Geologists and Geophysics	2115	0.2	0.2	0.0	1.2	0.2	0.2
MATHEMATICIANS, STATISTICIANS AND RELATED PROFESSIONALS			0.3	0.3	0.0	2.3	0.3	0.4
	Mathematicians	2121	0.1	0.1	0.0	3.1	0.1	0.1
	Statisticians	2122	0.2	0.3	0.0	2.0	0.3	0.3
COMPUTING PROFESSIONALS			4.6	5.3	0.7	2.4	5.2	5.5
	Computer systems designers and analysts	2131	0.7	0.8	0.1	2.3	0.8	0.9
	Computer Programmers	2132	3.9	4.5	0.6	2.5	4.3	4.6
ARCHITECTS,			19.7	22.1	2.4	2.0	21.3	23.0

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
ENGINEERS AND RELATED PROFESSIONALS								
	Architects, Town and Traffic Planners and Engineers	2141	2.2	2.5	0.3	2.3	2.4	2.6
	Civil Engineers	2142	6.4	7.0	0.6	1.5	6.7	7.3
	Electrical Engineers	2143	2.5	2.8	0.3	1.9	2.7	2.9
	Electronics and Communication Engineers	2144	4.2	5.0	0.8	2.9	4.8	5.2
	Mechanical Engineers	2145	2.5	2.8	0.3	2.2	2.7	2.9
	Chemical Engineers	2146	0.7	0.9	0.1	2.3	0.8	0.9
	Mining Engineers and Metallurgists	2147	0.2	0.2	0.0	0.6	0.2	0.3
	Surveyors and Cartographers	2148	0.1	0.2	0.0	1.7	0.1	0.2
	Industrial Engineers, Safety and Environment Engineers	2149	0.6	0.7	0.1	2.9	0.7	0.8
LIFE SCIENCE PROFESSIONALS*			3.3	3.0	-0.2	-1.2	2.9	3.2
	Biologists, Botanists, Zoologists and Related Professionals	2211	0.2	0.3	0.1	3.7	0.3	0.3
	Pharmacologist, Pathologists and Related Professionals	2212	0.1	0.1	0.0	3.8	0.1	0.1
	Agronomists and Related	2213	2.0	2.4	0.4	3.2	2.4	2.5

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Professionals							
HEALTH PROFESSIONALS (except nursing)			15.0	18.9	3.9	3.9	18.6	19.2
	Medical Doctors	2221	7.4	9.4	2.0	4.1	9.3	9.5
	Dentists	2222	2.4	3.1	0.7	4.2	3.1	3.1
	Veterinarians	2223	0.4	0.5	0.1	3.8	0.5	0.5
	Pharmacists	2224	3.9	4.8	1.0	3.8	4.7	5.0
	Paramedical Science Professionals	2225	0.8	1.0	0.2	3.9	1.0	1.0
NURSING AND MIDWIFERY PROFESSIONALS			3.1	3.9	0.8	3.9	3.8	3.9
	Nursing and Midwifery Professionals	2230	3.1	3.9	0.8	3.9	3.8	3.9
COLLEGE, UNIVERSITY AND HIGHER EDUCATION TEACHING PROFESSIONALS			7.8	9.4	1.6	3.1	9.4	9.5
	Higher Education Teaching Professionals (Colleges and Universities)	2310	7.8	9.4	1.6	3.1	9.4	9.5
SECONDARY EDUCATION TEACHING PROFESSIONALS			40.5	48.7	8.3	3.1	48.4	49.0
	Secondary Education Teaching Professionals	2320	40.5	48.7	8.3	3.1	48.4	49.0
PRIMARY AND PRE-PRIMARY EDUCATION TEACHING PROFESSIONALS			51.7	62.4	10.7	3.2	62.0	62.8

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Basic and Pre-Primary Education Teaching Professionals	2330	51.7	62.4	10.7	3.2	62.0	62.8
SPECIAL EDUCATION TEACHING PROFESSIONALS			1.4	1.8	0.3	3.4	1.8	1.8
	Special Education Teaching Professionals	2340	1.4	1.8	0.3	3.4	1.8	1.8
OTHER TEACHING PROFESSIONALS			3.0	3.6	0.6	3.1	3.6	3.6
	Educational Research and Development Professionals	2350	3.0	3.6	0.6	3.1	3.6	3.6
BUSINESS PROFESSIONALS			36.7	42.2	5.5	2.4	40.8	43.7
	Accountants	2411	15.7	18.2	2.4	2.4	17.5	18.8
	Personnel and Careers Professionals	2412	16.2	18.9	2.7	2.6	18.3	19.5
	Marketing and Promotion Professionals	2413	4.3	5.1	0.7	2.7	4.8	5.3
LEGAL PROFESSIONALS			7.2	8.2	1.0	2.1	8.0	8.4
	Lawyer and Related Professionals	2421	6.3	7.1	0.9	2.2	6.9	7.3
	Judges and Related Professionals	2422	0.8	0.9	0.1	2.0	0.9	1.0
	Attorney (Prosecutor) and Related Professionals	2423	0.1	0.2	0.0	2.0	0.2	0.2
ARCHIVISTS,			1.6	1.9	0.3	3.0	1.9	1.9

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
LIBRARIANS AND RELATED INFORMATION PROFESSIONALS								
	Social Science and Related Professionals	2432	1.6	1.9	0.3	3.0	1.9	1.9
SOCIAL SCIENCE AND RELATED PROFESSIONALS			2.1	2.5	0.4	2.6	2.4	2.5
	Economists	2441	0.4	0.5	0.1	1.9	0.5	0.5
	Sociologists, Anthropologists and Related Professionals	2442	0.2	0.3	0.0	2.8	0.3	0.3
	Philosophers, Historians and Political Professionals	2443	0.0	0.0	0.0	2.3	0.0	0.0
	Philologists, Translators and Interpreters	2444	0.3	0.4	0.1	2.6	0.4	0.4
	Psychologists	2445	0.3	0.3	0.1	3.2	0.3	0.3
	Social Work Professionals	2446	0.8	0.9	0.1	2.8	0.9	1.0
WRITERS AND CREATIVE OR PERFORMING ARTISTS			1.8	2.2	0.4	3.4	2.1	2.3
	Authors, Journalists and Other Writers	2451	1.6	2.0	0.4	3.4	1.9	2.0
	Film, Stage and Related Actors and Directors	2454	0.2	0.3	0.0	3.5	0.3	0.3
RELIGIOUS PROFESSIONALS			1.3	1.5	0.2	2.5	1.4	1.5
	Religious	2460	1.3	1.5	0.2	2.5	1.4	1.5

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Professionals							
SPORTS PROESSIONALS			1.2	1.5	0.3	3.4	1.4	1.5
	Sports Professionals	2470	1.2	1.5	0.3	3.4	1.4	1.5
PILOTS			0.6	0.7	0.1	3.1	0.7	0.8
	Pilots	2481	0.6	0.7	0.1	3.1	0.7	0.8
PHYSICAL AND ENGINEERING SCIENCE TECHNICIANS			21.8	24.8	3.0	2.1	23.9	25.7
	Chemical Science Technicians	3112	0.5	0.6	0.1	2.2	0.6	0.6
	Surveying, Architecture and Civil Engineering Technicians	3113	7.5	8.3	0.8	1.6	8.0	8.6
	Electrical Engineering Technicians	3114	3.7	4.2	0.5	2.0	4.0	4.3
	Electronic and Communication Engineering Technicians	3115	4.6	5.5	0.9	3.0	5.3	5.7
	Mechanical Engineering Technicians	3116	4.8	5.5	0.8	2.5	5.3	5.7
	Chemical Engineering Technicians	3117	0.4	0.4	0.1	2.4	0.4	0.4
	Geology, Mining and Metallurgical Technicians	3118	0.3	0.3	0.0	-0.1	0.3	0.3
COMPUTER ASSOCIATE PROFESSIONALS			6.5	7.6	1.1	2.6	7.4	7.8
	Statisticians Associate Professionals	3121	0.2	0.2	0.0	3.0	0.2	0.2

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Information Associate Professionals	3122	0.2	0.2	0.0	2.6	0.2	0.2
	Computer Associate Professionals	3123	6.1	7.1	1.0	2.7	6.9	7.3
OPTICAL AND ELECTRONIC EQUIPMENT OPERATORS			2.9	3.5	0.5	2.8	3.4	3.6
	Photographers and Image and Sound Recording Equipment Operators	3131	2.4	2.8	0.4	2.7	2.7	2.8
	Broadcasting and Telecommunications Equipment Operators	3132	0.6	0.7	0.1	3.5	0.7	0.7
SHIP AND AIRCRAFT CONTROLLERS AND TECHNICIANS			1.1	1.3	0.2	2.8	1.2	1.3
	Meteorology Technicians	3141	0.2	0.2	0.0	2.3	0.2	0.2
	Aviation Technicians	3142	0.3	0.4	0.1	2.5	0.4	0.4
	Navigation Technicians	3143	0.6	0.7	0.1	3.1	0.7	0.7
SAFETY AND QUALITY INSPECTORS			1.7	2.0	0.3	2.9	1.9	2.1
	Fire Fighting Technicians	3152	0.1	0.1	0.0	3.4	0.1	0.2
	Occupational Safety Technicians	3153	0.3	0.3	0.0	2.5	0.3	0.3
	Quality and Specifications Technicians	3154	1.3	1.5	0.2	2.9	1.5	1.6

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
LIFE SCIENCE TECHNICIANS AND RELATED ASSOCIATE PROFESSIONALS			0.6	0.6	0.1	1.9	0.6	0.7
	Life Science Technicians	3211	0.1	0.2	0.0	3.0	0.2	0.2
	Agronomy and Forestry Technicians	3212	0.3	0.4	0.1	3.3	0.4	0.4
	Animal, Poultry, Apiary and Fish Farming Technicians	3213	0.0	0.1	0.0	3.6	0.1	0.1
MODERN HEALTH ASSOCIATE PROFESSIONALS (except nursing)			9.4	11.8	2.4	3.9	11.6	12.0
	Medical Assistants	3221	1.3	1.6	0.3	3.1	1.6	1.6
	Dieticians and Nutritionists Associate Professionals	3222	0.1	0.2	0.0	4.1	0.2	0.2
	Optometrists and Opticians Associate Professionals	3223	1.5	1.9	0.4	3.9	1.8	1.9
	Dental Assistants	3224	0.5	0.7	0.1	3.8	0.6	0.7
	Physiotherapists and Medical Rehabilitation Technicians	3225	0.3	0.4	0.1	3.9	0.3	0.4
	Veterinary Assistants	3226	0.1	0.2	0.0	4.1	0.2	0.2
	Pharmaceutical Assistants	3227	2.6	3.2	0.7	4.0	3.2	3.3
	Medical Laboratory Technicians	3228	2.3	2.9	0.6	4.1	2.9	2.9

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Medical Electrograph and Scanning Technicians	3229	0.7	0.8	0.2	4.1	0.8	0.9
NURSING AND MIDWIFERY ASSOCIATE PROFESSIONALS			9.6	12.2	2.6	4.1	12.1	12.3
	Nursing Associate Professionals	3231	8.3	10.6	2.3	4.1	10.5	10.7
	Midwifery Associate Professionals	3232	1.2	1.6	0.3	4.2	1.6	1.6
PRIMARY EDUCATION TEACHING ASSOCIATE PROFESSIONALS			2.4	2.8	0.5	2.9	2.8	2.9
	Audio-Visual Aids Technicians	3311	0.7	0.8	0.1	2.4	0.8	0.8
	Teaching Laboratory Apparatus Technicians	3312	1.7	2.0	0.3	3.1	2.0	2.0
	Computer Technology and Internet Technicians	3314	0.0	0.0	0.0	3.2	0.0	0.0
SPECIAL EDUCATION TEACHING ASSOCIATE PROFESSIONALS			0.2	0.2	0.0	3.6	0.2	0.2
	Special Education Teaching Associate Professionals	3320	0.2	0.2	0.0	3.6	0.2	0.2
OTHER TEACHING ASSOCIATE PROFESSIONALS			1.7	2.1	0.4	3.2	2.0	2.1
	Vocational Instructors / Industrial	3331	1.5	1.9	0.3	3.2	1.8	1.9

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Vocational Instructors / Commercial and Postal	3333	0.1	0.1	0.0	3.1	0.1	0.1
	Vocational Instructors / Hotel	3334	0.1	0.1	0.0	3.5	0.1	0.1
FINANCE AND SALES ASSOCIATE PROFESSIONALS			9.0	10.6	1.6	2.7	10.2	10.9
	Securities and Finance Dealers and Brokers	3411	0.4	0.4	0.0	0.5	0.4	0.4
	Insurance Representatives and Agents	3412	0.8	0.8	0.0	0.5	0.8	0.9
	Real Estate Agents	3413	0.9	1.0	0.1	2.4	1.0	1.0
	Travel Consultants and Organisers	3414	0.3	0.3	0.1	3.1	0.3	0.4
	Technical and Commercial Sales Representatives	3415	4.8	5.9	1.1	3.4	5.7	6.1
	Buyers	3416	0.8	1.0	0.1	2.8	0.9	1.0
	Appraisers, Valuers and Auctioneers	3417	1.0	1.2	0.2	2.4	1.1	1.2
BUSINESS SERVICES AGENTS AND TRADE BROKERS			6.4	7.7	1.3	3.1	7.4	8.1
	Trade Brokers	3421	0.4	0.4	0.1	3.3	0.4	0.5
	Clearing and Forwarding Agents	3422	5.7	6.9	1.2	3.1	6.6	7.2
	Employment Agents and Labour Contractors	3423	0.3	0.4	0.1	3.0	0.4	0.4
ADMINISTRATIVE ASSOCIATE			22.9	26.2	3.3	2.3	25.3	27.0

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
PROFESSIONALS								
	Administrative Secretaries and Related Associate Professionals	3431	8.2	9.6	1.4	2.7	9.3	10.0
	Legal and Related Associate Professionals	3432	1.1	1.3	0.1	2.0	1.3	1.3
	Book Keepers	3433	13.2	15.2	2.0	2.4	14.7	15.6
CUSTOMS, TAX AND RELATED GOVERNMENT ASSOCIATE PROFESSIONALS			3.2	3.6	0.4	2.1	3.5	3.7
	Customs Inspectors	3441	1.5	1.7	0.2	2.2	1.7	1.8
	Government Tax and Excise Officials	3442	0.9	1.0	0.1	2.0	0.9	1.0
	Government Social Benefits Officials	3443	0.4	0.5	0.1	2.2	0.4	0.5
	Government Licensing Officials	3444	0.4	0.5	0.1	2.1	0.5	0.5
SOCIAL WORK ASSOCIATE PROFESSIONALS			0.5	0.7	0.1	2.9	0.6	0.7
	Social Research and Welfare Associate Professionals	3451	0.3	0.3	0.0	2.6	0.3	0.3
	Social Care Associate Professionals	3452	0.3	0.4	0.1	3.2	0.3	0.4
ARTISTIC, ENTERTAINMENT AND SPORTS ASSOCIATE PROFESSIONALS			4.1	4.9	0.8	3.2	4.7	5.1
	Interior Decoration, Promotion and	3461	2.9	3.5	0.6	3.1	3.4	3.7

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Fashion Design Technicians							
	Musicians, Singers and Dancers	3463	0.1	0.1	0.0	3.6	0.1	0.1
	Sports Technicians	3465	1.0	1.3	0.2	3.5	1.2	1.3
RELIGIOUS ASSOCIATE PROFESSIONALS			4.0	4.7	0.7	2.6	4.5	4.8
	Worshipping and Religious Places Associate Professionals	3471	2.5	2.8	0.3	2.1	2.7	2.8
	Koran Reading Associate Professionals	3472	1.5	1.9	0.3	3.4	1.8	1.9
SECRETARIES AND KEYBOARD-OPERATING CLERKS			53.4	62.9	9.5	2.8	61.2	64.6
	Stenographers and Typists	4111	5.9	6.8	1.0	2.6	6.7	7.0
	Word Processors and Related Operators	4112	0.0	0.0	0.0	3.0	0.0	0.0
	Data Entry Operators	4113	1.1	1.3	0.2	2.5	1.3	1.4
	Secretaries and Correspondence Clerks	4114	46.4	54.7	8.3	2.8	53.1	56.2
FINANCIAL AND STAISTICAL CLERKS			6.8	7.6	0.8	1.9	7.4	7.9
	Financial and Accounting Clerks	4121	6.3	7.1	0.8	2.1	6.9	7.3
	Statistical Clerks	4122	0.4	0.5	0.1	2.2	0.5	0.5
MATERIAL-RECORDING AND TRANSPORT CLERKS			14.0	16.5	2.5	2.8	15.9	17.1

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Storage Clerks	4131	9.2	10.9	1.7	2.8	10.6	11.3
	Production Clerks	4132	0.3	0.4	0.1	2.9	0.4	0.4
	Freight and Transportation Clerks	4133	4.3	5.2	0.8	3.0	5.0	5.4
LIBRARY, MAIL AND RELATED CLERKS			3.5	3.6	0.1	0.3	3.4	3.7
	Library Clerks	4141	1.0	1.2	0.2	2.7	1.2	1.2
	Mail Carriers and Sorting Clerks	4142	1.9	2.3	0.3	2.5	2.2	2.3
OTHER OFFICE CLERKS			0.6	0.6	0.1	2.1	0.6	0.7
	Civil Status Clerks	4150	0.6	0.6	0.1	2.1	0.6	0.7
CASHIERS, TELLERS AND RELATED CLERKS			8.4	10.2	1.7	3.2	9.9	10.5
	Currency Exchangers	4211	0.2	0.2	0.0	0.6	0.2	0.2
	Cashiers	4212	5.3	6.5	1.3	3.7	6.3	6.7
	Travel and Entry Ticket Clerks	4213	1.0	1.2	0.2	3.1	1.2	1.3
	Debt Collectors	4214	1.9	2.2	0.3	2.1	2.1	2.2
CLIENT INFORMATION CLERKS			9.2	10.8	1.6	2.8	10.4	11.2
	Travel Agency Clerks	4221	2.8	3.4	0.6	3.2	3.2	3.6
	Receptionists and Reservation Clerks	4222	0.9	1.2	0.2	3.9	1.1	1.2
	Airport and Telephone Information Clerks	4223	3.9	4.7	0.7	2.8	4.5	4.8
	Rental Services Clerks	4224	1.4	1.6	0.2	2.3	1.5	1.6
TRAVEL ATTENDANTS AND RELATED WORKERS			2.9	3.5	0.6	3.2	3.4	3.6
	Attendants	5111	2.1	2.5	0.4	3.2	2.4	2.6

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Travel Guides	5113	0.8	1.0	0.2	3.2	1.0	1.0
HOUSEKEEPING AND RESTAURANT SERVICES WORKERS			25.1	31.7	6.6	4.0	30.6	32.8
	House Keeper	5121	1.8	2.3	0.5	4.0	2.3	2.4
	Cooks (Chefs)	5122	9.9	12.6	2.7	4.1	12.2	13.1
	Waiters	5123	10.0	12.6	2.6	3.9	12.1	13.0
	Laundry and Pressing Workers	5124	3.4	4.2	0.8	3.5	4.0	4.3
PERSONAL CARE AND RELATED WORKERS			3.4	4.3	0.9	3.9	4.3	4.4
	Childcare Workers	5131	0.8	0.9	0.2	3.2	0.9	0.9
	Institution-Based Personal Care Workers	5132	0.7	0.9	0.2	4.0	0.9	0.9
	Home-Based Personal Care Workers	5133	2.0	2.5	0.5	4.2	2.5	2.5
OTHER PERSONAL SERVICES WORKERS			30.7	37.7	7.0	3.5	36.2	39.1
	Hairdressers and Barbers	5141	28.4	34.9	6.5	3.5	33.5	36.3
	Beauticians	5142	2.2	2.7	0.5	3.5	2.6	2.8
FIRE FIGHTERS AND RELATED OCCUPATIONS			0.3	0.4	0.1	2.8	0.4	0.4
	Fire Fighters, Rescuers and First Aid Workers	5150	0.3	0.4	0.1	2.8	0.4	0.4
MODELS AND FASHION DEMONSTRATORS			0.0	0.1	0.0	2.5	0.1	0.1
	Models and Fashion Demonstrators	5210	0.0	0.1	0.0	2.5	0.1	0.1
SHOP SALESPERSONS AND DEMONSTRATORS			85.5	106.6	21.1	3.8	103.6	109.6

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Supplies Sales Persons	5221	43.7	54.6	10.9	3.8	53.1	56.2
	Textile, Clothes and Leather Products Sales Persons	5222	18.7	23.3	4.6	3.8	22.7	24.0
	Domestic Articles, Appliances and Furniture Sales Persons	5223	7.1	8.9	1.8	3.8	8.7	9.2
	Jewellery Sales Persons	5224	3.1	3.8	0.8	3.8	3.7	3.9
	Watches and Optical Sales Persons	5225	0.3	0.3	0.1	3.8	0.3	0.3
	Flower and Cosmetics Sales Persons	5226	3.0	3.8	0.8	3.8	3.7	3.9
	Gifts and Fine Arts Sales Persons	5227	1.5	1.9	0.4	3.7	1.8	1.9
	Books, Periodicals and Stationary Sales Persons	5228	3.0	3.7	0.7	3.7	3.6	3.8
	Musical Instruments and Tapes Sales Persons	5229	5.0	6.2	1.2	3.6	6.0	6.4
SPECIALISED SALES PERSONS			13.8	17.2	3.4	3.7	16.7	17.7
	Office Equipment Sales Persons	5231	1.6	2.0	0.4	3.6	1.9	2.0
	Medical Equipment and Supplies Sales Persons	5233	0.3	0.4	0.1	3.8	0.3	0.4
	Construction Materials Sales Persons	5234	3.5	4.4	0.9	3.8	4.3	4.5

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Building Materials and Supplies Sales Persons	5235	1.7	2.1	0.4	3.8	2.1	2.2
	Construction Equipment and Agro Machinery Sales Persons	5236	0.2	0.3	0.1	3.8	0.3	0.3
	Vehicle and Motorcycle Spare Parts Sales Persons	5237	5.4	6.7	1.3	3.8	6.5	6.9
	Industrial Equipment Sales Persons	5238	0.5	0.6	0.1	3.8	0.6	0.6
	Agricultural Equipment, Supplies and Materials Sales Persons	5239	0.6	0.8	0.2	3.8	0.8	0.8
STALL AND MARKET SALES PERSONS			0.3	0.3	0.1	3.7	0.3	0.3
	Stall, Street and Market Sales Persons	5240	0.3	0.3	0.1	3.7	0.3	0.3
MARKET GARDENERS AND CROP GROWERS			10.3	2.7	-7.6	-20.0	1.7	3.7
MARKET-ORIENTED ANIMAL PRODUCERS AND RELATED WORKERS			5.4	1.4	-4.0	-20.0	0.9	1.9
FORESTRY AND RELATED WORKERS			0.2	0.1	-0.2	-20.0	0.0	0.1
FISHERY WORKERS, HUNTERS AND TRAPPERS			0.1	0.0	-0.1	-20.0	0.0	0.0
MINERS, SHOTFIRERS, STONE CUTTERS AND CARVERS			0.8	0.9	0.1	2.7	0.9	1.0

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Stone Cutters and Carvers	7113	0.8	0.9	0.1	2.7	0.9	1.0
BUILDING FRAME AND RELATED TRADES WORKERS			8.0	8.2	0.2	0.5	7.8	8.6
	Stone-Masons and Brick Layers	7122	1.5	1.6	0.1	0.8	1.5	1.7
	Concrete Places, Builders and Related Workers	7123	6.4	6.6	0.2	0.5	6.2	6.9
BUILDING FINISHERS AND RELATED TRADES WORKERS			1.4	1.5	0.0	0.3	1.4	1.6
	Building Exterior Decoration Workers	7131	1.1	1.1	0.0	0.4	1.1	1.2
	Plasterers	7132	0.2	0.3	0.0	1.4	0.2	0.3
	Tile Setters	7133	0.1	0.1	0.0	0.4	0.1	0.1
PAINTERS, BUILDING STRUCTURE CLEANERS AND RELATED TRADES WORKERS			0.8	0.9	0.1	1.8	0.8	0.9
	Building Painters	7141	0.8	0.9	0.1	1.8	0.8	0.9
METAL MOULDERS, WELDERS, SHEET-METAL WORKERS, STRUCTURAL- METAL PREPARERS, AND RELATED TRADES WORKERS			9.3	11.1	1.8	2.9	10.6	11.6
	Foundry (Metal Melting and Casting) Workers	7211	0.2	0.2	0.0	3.1	0.2	0.2
	Arc and Oxyacetylene Welders	7212	1.4	1.6	0.2	2.3	1.6	1.7

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Sheet Metal Workers	7213	1.5	1.8	0.3	3.2	1.7	1.8
	Steel Construction Workers	7214	1.0	1.2	0.1	2.0	1.1	1.2
	Metal Doors and Window Fabrication Workers	7215	5.2	6.3	1.1	3.2	6.1	6.6
BLACKSMITHS, TOOL-MAKERS AND RELATED TRADES WORKERS			2.2	2.6	0.4	3.0	2.5	2.7
	Blacksmiths and Forge Press Operators	7221	0.2	0.3	0.1	3.3	0.3	0.3
	Lathe and Milling Machines Setters-Operators	7222	1.6	1.9	0.3	3.2	1.8	2.0
	Grinding Machine Setters-Operators	7223	0.1	0.1	0.0	1.6	0.1	0.1
	Tool and Dye Makers	7224	0.0	0.1	0.0	3.4	0.1	0.1
	Auto Machinists	7225	0.2	0.2	0.0	3.3	0.2	0.2
MACHINERY MECHANICS AND FITTERS			5.2	5.8	0.5	1.6	5.6	6.0
	Refrigeration and Air Conditioning Mechanics	7231	1.2	1.5	0.3	3.5	1.4	1.5
	Plumbers (Plumbing Mechanics)	7232	3.7	3.9	0.3	1.2	3.8	4.1
	Central Heating Mechanics	7233	0.3	0.3	0.1	3.0	0.3	0.4
OTHER MECHANICS AND REPAIRERS			28.1	34.1	6.0	3.3	33.0	35.2
	Light Vehicle Mechanics	7241	13.3	16.5	3.2	3.7	16.0	16.9

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Bus and Truck Mechanics	7242	2.5	3.0	0.5	3.3	2.9	3.1
	Heavy Equipment Mechanics	7243	1.4	1.6	0.2	2.3	1.6	1.7
	Railway and Locomotive Mechanics	7244	0.2	0.2	0.0	2.6	0.2	0.2
	Aircraft Mechanics	7245	0.8	0.9	0.2	3.0	0.9	1.0
	Agro Machinery Mechanics	7246	0.1	0.2	0.0	3.4	0.2	0.2
	Auto Body Repairs and Painters	7247	4.5	5.5	1.1	3.6	5.4	5.7
	Industrial Machinery and Equipment Mechanics	7248	5.3	6.1	0.8	2.3	5.8	6.3
ELECTRICAL AND ELECTRONIC EQUIPMENT MECHANICS AND FITTERS			8.9	10.1	1.2	2.1	9.7	10.4
	Power Generation Electricians	7251	0.6	0.7	0.1	1.8	0.7	0.7
	Power Transmission and Distribution Electricians	7252	0.9	1.0	0.1	1.5	1.0	1.0
	Substation Electricians	7253	0.3	0.4	0.0	1.7	0.4	0.4
	Electrical Installation Electricians	7254	3.2	3.5	0.3	1.3	3.4	3.6
	Machine and Circuit Breakers Electricians	7255	1.0	1.2	0.2	3.0	1.2	1.3
	Instrumentation	7256	0.2	0.2	0.0	2.2	0.2	0.2

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Electricians							
	Auto Electricians	7257	2.5	3.0	0.6	3.5	2.9	3.1
ELECTRONIC AND COMMUNICATION FITTERS			2.7	3.3	0.6	3.2	3.2	3.4
	Industrial Electronics Fitters	7261	0.4	0.5	0.1	3.4	0.5	0.5
	Computer, and Electronic Medical and Office Machines Fitters	7262	0.4	0.4	0.1	2.6	0.4	0.5
	Radio and TV Fitters	7263	0.4	0.5	0.1	3.5	0.5	0.6
	Telecommunication Fitters	7264	1.5	1.8	0.3	3.1	1.7	1.9
PRECISION WORKERS IN METAL AND RELATED MATERIALS			0.6	0.8	0.1	3.5	0.8	0.8
	Instrumentation Mechanics	7311	0.0	0.0	0.0	2.0	0.0	0.0
	Goldsmiths	7313	0.6	0.8	0.1	3.5	0.8	0.8
POTTERS, GLASS-MAKERS AND RELATED TRADES WORKERS			1.1	1.4	0.3	3.5	1.3	1.4
	Potters	7321	0.1	0.2	0.0	3.4	0.2	0.2
	Glass-Makers	7322	0.9	1.1	0.2	3.7	1.0	1.1
	Glass, Ceramics and Related Workers	7324	0.1	0.1	0.0	2.7	0.1	0.1
HANDICRAFT WORKERS IN WOOD,TEXTILE, LEATHER AND RELATED MATERIALS			0.2	0.3	0.0	3.4	0.3	0.3
	Handicraft Workers in Wood	7331	0.2	0.2	0.0	3.3	0.2	0.2

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Handicraft Workers in Textile	7332	0.1	0.1	0.0	3.4	0.1	0.1
PRINTING AND RELATED TRADES WORKERS			2.3	2.7	0.5	3.1	2.6	2.8
	Type-Setters and Related Workers	7341	0.8	0.9	0.1	2.8	0.9	0.9
	Machine-Operators / Printing	7342	1.0	1.3	0.2	3.3	1.2	1.3
	Book Binding Workers	7343	0.4	0.5	0.1	3.4	0.5	0.6
FOOD PROCESSING AND RELATED TRADES WORKERS			4.2	5.2	1.0	3.5	5.0	5.4
	Butchers and Fish Mongers	7411	0.7	0.9	0.2	3.6	0.8	0.9
	Bakers, Pastry-Cooks and Confectionary Makers	7412	3.5	4.3	0.8	3.5	4.1	4.5
WOOD TREATERS, CABINET-MAKERS AND RELATED TRADES WORKERS			12.1	14.7	2.6	3.3	14.1	15.2
	Carpenters (Cabinet Makers)	7421	5.3	6.5	1.2	3.4	6.3	6.8
	Joiners	7422	2.7	3.2	0.5	2.8	3.1	3.4
	Wood Products Painters	7424	0.8	1.0	0.2	3.4	0.9	1.0
	Upholsterers	7425	2.8	3.4	0.6	3.5	3.3	3.5
	Curtain, Carpet, Wall-Paper and False Sealing Fitters	7426	0.4	0.5	0.1	3.6	0.5	0.5
TEXTILE, GARMENT AND RELATED TRADES			12.4	15.2	2.8	3.4	14.5	15.8

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
WORKERS								
	Garment Pattern-Makers	7431	0.2	0.3	0.1	3.6	0.3	0.3
	Tailors / Men's Clothes	7432	4.3	5.2	1.0	3.4	5.0	5.5
	Tailors / Women's Clothes	7433	7.0	8.6	1.6	3.4	8.3	9.0
	Tailors / Children's Clothes	7434	0.6	0.7	0.1	3.4	0.7	0.7
	Embroidery Workers	7436	0.3	0.3	0.1	3.4	0.3	0.3
PELT, LEATHER AND SHOEMAKING TRADES WORKERS			0.6	0.7	0.1	3.6	0.7	0.8
	Pelt Dressers and Tanners	7441	0.0	0.0	0.0	3.4	0.0	0.0
	Saddle Makers	7442	0.1	0.2	0.0	3.4	0.2	0.2
	Shoe Makers	7443	0.4	0.6	0.1	3.6	0.5	0.6
MINING- AND MINERAL-PROCESSING PLANT OPERATORS			0.4	0.4	0.0	-0.8	0.4	0.4
	Mineral, Ore and Stone-Processing Plant Operators	8112	0.4	0.4	0.0	-0.8	0.4	0.4
METAL-PROCESSING-PLANT OPERATORS			0.8	1.0	0.2	3.4	1.0	1.0
	Metal Melters, Casters, and Rolling-Mill Operators	8121	0.4	0.4	0.1	3.4	0.4	0.5
	Metal Drawing and Extruding Machines Operators	8123	0.5	0.6	0.1	3.4	0.5	0.6
GLASS, CERAMICS AND RELATED PLANT OPERATORS			0.5	0.6	0.1	3.4	0.6	0.6

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Glass Plant Operators	8131	0.2	0.2	0.0	3.5	0.2	0.2
	Ceramic Plant Operators	8132	0.3	0.4	0.1	3.4	0.4	0.4
WOOD-PROCESSING- AND PAPERMAKING- PLANT OPERATORS			0.5	0.6	0.1	3.4	0.6	0.6
	Wood -Processing Plant Operators	8141	0.1	0.1	0.0	3.4	0.1	0.2
	Paper-Making Plant Operators	8143	0.4	0.4	0.1	3.4	0.4	0.5
CHEMICAL- PROCESSING-PLANT OPERATORS			2.3	2.9	0.5	3.5	2.8	3.0
	Crushing, Grinding and Chemical Mixing Machinery Operators	8151	0.5	0.6	0.1	3.4	0.6	0.6
	Chemical Filtering and Separation Equipment Operators	8153	0.1	0.1	0.0	3.1	0.1	0.1
	Chemical Still and Reactor Operators	8154	0.1	0.1	0.0	2.6	0.1	0.1
	Petroleum and Natural Gas Refining Equipment Operators	8155	1.7	2.0	0.4	3.6	2.0	2.1
POWER-PRODUCTION AND RELATED PLANT OPERATORS			1.0	1.0	0.0	-0.6	0.9	1.0
	Power Production, Water Purification and Sewage and Waste Treating Plant Operators	8161	0.3	0.4	0.1	3.4	0.4	0.4

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Power Production Plant Operators	8162	0.5	0.5	0.0	1.2	0.5	0.5
METAL- AND MINERAL-PRODUCTS MACHINE OPERATORS			5.5	6.7	1.2	3.4	6.4	6.9
	Metal Fabrication and Machinery Equipment Operators	8211	0.5	0.6	0.1	3.4	0.6	0.6
	Marble and Stone Sawing Machinery Operators	8212	2.1	2.6	0.5	3.4	2.5	2.7
	Brick and Tile Machinery Operators	8213	2.6	3.1	0.6	3.4	3.0	3.3
	Cement Pipes and Piles Making Equipment Operators	8214	0.3	0.3	0.1	3.4	0.3	0.3
CHEMICAL-PRODUCTS MACHINE OPERATORS			1.0	1.3	0.2	3.4	1.2	1.3
	Pharmaceutical Products Machinery Operators	8221	0.6	0.7	0.1	3.4	0.7	0.8
	Soap and Detergent Products Machinery Operators	8222	0.1	0.2	0.0	3.4	0.2	0.2
	Cosmetics Products Machinery Operators	8223	0.2	0.2	0.0	3.4	0.2	0.2
	Metal Plating and Coating Machinery Operators	8224	0.1	0.2	0.0	3.3	0.2	0.2
RUBBER- AND PLASTIC-PRODUCTS MACHINE OPERATORS			1.6	2.0	0.4	3.4	1.9	2.1

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Plastic Products Machine Operators	8231	1.4	1.7	0.3	3.4	1.6	1.7
	Petrochemical Manufacturing Machinery Operators	8232	0.2	0.3	0.1	3.4	0.3	0.3
PRINTING-, BINDING- AND PAPER-PRODUCTS MACHINE OPERATORS			0.5	0.6	0.1	3.4	0.6	0.6
	Press Printing Machines Operators	8251	0.1	0.2	0.0	3.3	0.2	0.2
	Book Binding Machines Operators	8252	0.3	0.3	0.1	3.4	0.3	0.3
	Paper Products Machinery Operators	8253	0.1	0.1	0.0	3.4	0.1	0.1
TEXTILE-, FUR- AND LEATHER-PRODUCTS MACHINE OPERATORS			15.2	18.6	3.4	3.4	17.8	19.4
	Spinning Machine Operators	8261	0.1	0.1	0.0	3.4	0.1	0.1
	Weaving Machine Operators	8262	0.2	0.2	0.0	3.4	0.2	0.2
	Knitting Machine Operators	8263	1.8	2.2	0.4	3.4	2.1	2.3
	Dyeing Machine Operators	8264	0.1	0.1	0.0	3.5	0.1	0.1
	Industrial Sewing Machine Operators	8265	12.8	15.7	2.9	3.4	15.0	16.4
	Embroidery Machine Operators	8266	0.1	0.1	0.0	3.4	0.1	0.1
	Shoe Making and Hand Bag Machinery Operators	8268	0.2	0.2	0.0	3.5	0.2	0.2

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
FOOD AND RELATED PRODUCTS MACHINE OPERATORS			3.0	3.7	0.7	3.4	3.5	3.8
	Meat Processing Machinery Operators	8271	0.1	0.1	0.0	3.4	0.1	0.1
	Dairy Products Machine Operators	8272	0.5	0.7	0.1	3.5	0.6	0.7
	Grain and Spices Machine Operators	8273	0.3	0.4	0.1	3.3	0.4	0.4
	Bakery, Flour and Chocolate Products and Yeast Machinery Operators	8274	0.5	0.6	0.1	3.4	0.5	0.6
	Fruit, Vegetable and Beans Processing Machinery Operators	8275	0.3	0.4	0.1	3.7	0.4	0.4
	Oil Processing Machinery Operators	8276	0.5	0.6	0.1	3.4	0.6	0.7
	Coffee and Kernel Products Machinery Operators	8277	0.3	0.3	0.1	3.5	0.3	0.4
	Brewers, Wine and Other Beverage Machine Operators	8278	0.1	0.2	0.0	3.4	0.1	0.2
	Tobacco Production Machinery Operators	8279	0.3	0.4	0.1	3.4	0.4	0.4
ASSEMBLERS			0.4	0.5	0.1	3.4	0.5	0.5
	Mechanical Equipment Assemblers	8281	0.3	0.3	0.1	3.4	0.3	0.3

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Electrical Equipment Assemblers	8282	0.1	0.1	0.0	3.4	0.1	0.1
	Rubber and Plastic Products Assemblers	8284	0.0	0.1	0.0	3.4	0.1	0.1
	Wood Work Products Assemblers	8285	0.0	0.0	0.0	3.4	0.0	0.0
LOCOMOTIVE-ENGINE DRIVERS AND RELATED WORKERS			0.5	0.6	0.1	2.5	0.5	0.6
	Train Drivers	8311	0.2	0.3	0.0	2.3	0.3	0.3
	Railway Brakes Man, Signallers and Shunters	8312	0.2	0.3	0.0	3.0	0.3	0.3
MOTOR-VEHICLE DRIVERS			37.2	43.3	6.1	2.6	41.7	44.9
	Motor Vehicle Drivers	8320	37.2	43.3	6.1	2.6	41.7	44.9
AGRICULTURAL AND OTHER MOBILE-PLANT OPERATORS			0.8	0.6	-0.2	-5.6	0.5	0.6
	Agro Machinery Drivers	8331	0.3	0.3	0.0	2.9	0.3	0.3
	Agro Machinery Operators	8332	0.1	0.2	0.0	2.7	0.1	0.2
EQUIPMENT OPERATORS AND DRIVERS			10.6	11.5	1.0	1.5	11.0	12.1
	Heavy Equipment Drivers	8341	8.6	9.2	0.6	1.2	8.8	9.6
	Mobile Power Generator Operator and Asphalting and	8342	2.0	2.4	0.4	2.8	2.2	2.5

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Lifting Equipment Operators							
STREET VENDORS AND Related WORKERS			0.3	0.4	0.1	3.3	0.4	0.4
	Street Food Vendors	9111	0.0	0.0	0.0	3.4	0.0	0.0
	Street Non-Food Vendors	9112	0.1	0.1	0.0	3.8	0.1	0.1
	Door-To-Door Sales Persons	9113	0.2	0.3	0.1	3.6	0.3	0.3
SHOE CLEANING AND OTHER STREET SERVICES ELEMENTARY OCCUPATIONS			0.1	0.0	0.0	-4.0	0.0	0.1
	Shoe Cleaning and Related Workers	9120	0.1	0.0	0.0	-4.0	0.0	0.1
DOMESTIC AND RELATED HELPERS, CLEANERS AND LAUNDERERS			12.5	15.2	2.7	3.3	14.8	15.6
	Domestic Helpers	9131	0.2	0.3	0.1	3.7	0.3	0.3
	Office and Hotel Helpers and Cleaners	9132	11.4	13.9	2.5	3.4	13.6	14.3
	Hand Launderers and Pressers	9133	0.8	1.0	0.2	3.5	1.0	1.0
BUILDING CARETAKERS, WINDOW AND RELATED CLEANERS			2.2	2.7	0.4	3.0	2.6	2.7
	Building Cleaners	9141	1.9	2.2	0.3	2.9	2.1	2.3
	Motor Vehicle Cleaners	9142	0.4	0.5	0.1	3.5	0.4	0.5
MESSENGERS, WATCHMEN AND RELATED WORKERS			57.5	67.1	9.7	2.6	65.3	68.9

Occupation (3-DIGIT) and (4-digit)		4-digit Code	Estimated stock 2006 (000)	Projected employment 2012 (000)	New jobs 2006-12 (000)	Annual average rate of growth 2006-12 (%)	Lower option (000)	Upper option (000)
	Messengers and Porters	9161	37.0	44.3	7.3	3.0	43.2	45.3
	Door Keepers and Watchmen	9162	19.1	22.1	3.0	2.5	21.5	22.7
	Meter Readers	9163	0.5	0.5	0.0	0.8	0.5	0.5
GARBAGE COLLECTORS AND RELATED LABOURERS			9.7	11.0	1.3	2.2	10.8	11.2
	Garbage Collectors and Dustmen	9170	9.7	11.0	1.3	2.2	10.8	11.2
AGRICULTURAL, FISHERY AND RELATED LABOURERS*			10.4	7.1	-3.2	-6.0	6.5	7.8
	Farm Labourers	9211	3.8	4.5	0.6	2.6	4.4	4.6
	Forestry Labourers	9212	0.5	0.7	0.1	3.9	0.7	0.7
	Animal Breeding and Poultry Labourers	9214	0.4	0.5	0.1	3.5	0.5	0.5
MINING AND CONSTRUCTION LABOURERS			24.3	25.4	1.0	0.7	24.2	26.5
	Mining and Construction Labourers	9310	24.3	25.4	1.0	0.7	24.2	26.5
MANUFACTURING LABOURERS			12.0	14.5	2.6	3.3	14.0	15.1
	Manufacturing Labourers	9320	12.0	14.5	2.6	3.3	14.0	15.1
TRANSPORT LABOURERS AND FREIGHT HANDLERS			10.1	12.2	2.1	3.2	11.6	12.7
	Transport and Freight Labourers	9330	10.1	12.2	2.1	3.2	11.6	12.7
Total			954.1	1112.3	158.2	2.6	1077.5	1147.2

* Employment projections for this occupation may not be reliable because of biases in the data for the economic activity 'Agriculture'.

Appendix 7: Projections of employment for 4-digit occupations in 2011 in "Manufacturing" with most new jobs.

The data in table A7.1 show the estimated stock of workers by occupation in the economic activity 'Manufacturing' in 2006 and projections in 2011 for 4-digit occupations.
The table also includes the number of new jobs (in thousands) projected for the period 2000-2011. A lower and upper option for the projections is also included in the table.

Table A7.1: Projected employment in 2011 in 'Manufacturing' with most new jobs

Occupation (4-digit)	4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	Lower option (000)	Upper option (000)	New jobs 2006-11 (000)
Industrial Sewing Machine Operators	8265	12.7	15.3	14.7	16	2.6
Manufacturing Labourers	9320	8.3	10	9.5	10.4	1.7
Tailors / Women's Clothes	7433	6.8	8.2	7.8	8.5	1.4
Carpenters (Cabinet Makers)	7421	4.7	5.7	5.4	5.9	1
Metal Doors and Window Fabrication Workers	7215	4.3	5.2	5	5.4	0.9
Tailors / Men's Clothes	7432	3.9	4.7	4.5	4.9	0.8
Messengers and Porters	9161	3.5	4.2	4.1	4.4	0.7
Secretaries and Correspondence Clerks	4114	3.6	4.4	4.2	4.6	0.7
Bakers, Pastry-Cooks and Confectionary Makers	7412	3.1	3.7	3.5	3.9	0.6
Motor Vehicle Drivers	8320	2.8	3.4	3.3	3.6	0.6
All "Manufacturing"		**114.2**	**137.5**	**131.5**	**143.5**	**23.3**

Appendix 8: Projections of employment for 4-digit occupations in 2011 in "Wholesale and Retail Trade" with most new jobs.

The data in Table A8.1 show the estimated stock of workers by occupation in the economic activity 'Wholesale and Retail Trade' in 2006 and projections in 2011 for 4-digit occupations. The table also includes the number of new jobs (in thousands) projected for the period 2000-2011. A lower and upper option for the projections is also included in the table.

Table A8.1: Projected employment in 2011 in 'Wholesale and Retail Trade' with most new jobs

Occupation (3-DIGIT) and (4-digit)	4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	Lower option (000)	Upper option (000)	New jobs 2006-11 (000)
Supplies Sales Persons	5221	40.4	49.3	47.9	50.6	8.8
Textile, Clothes and Leather Products Sales Persons	5222	18.1	22	21.4	22.6	4
Light Vehicle Mechanics	7241	11.5	14	13.6	14.4	2.5
Messengers and Porters	9161	9	11	10.7	11.3	2
Domestic Articles, Appliances and Furniture Sales Persons	5223	6.8	8.3	8.1	8.5	1.5
Vehicle and Motorcycle Spare Parts Sales Persons	5237	5.3	6.4	6.3	6.6	1.2
Musical Instruments and Tapes Sales Persons	5229	4.3	5.2	5	5.3	0.9
Auto Body Repairs and Painters	7247	3.7	4.5	4.4	4.6	0.8
Cashiers	4212	3.5	4.2	4.1	4.3	0.8
Secretaries and Correspondence Clerks	4114	3.7	4.5	4.4	4.6	0.8
All		**179.1**	**218.2**	**212.2**	**224.3**	**39.1**

Appendix 9: Projections of employment for 4-digit occupations in 2011 in "Transportation" with most new jobs.

The data in Table A9.1 show the estimated stock of workers by occupation in the economic activity 'Transportation' in 2006 and projections in 2011 for 4-digit occupations.
The table also includes the number of new jobs (in thousands) projected for the period 2000-2011. A lower and upper option for the projections is also included in the table.

Table A9.1: Projected employment in 2011 in 'Transportation' with most new jobs

	4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	Lower option (000)	Upper option (000)	New jobs 2006-11 (000)
Motor Vehicle Drivers	8320	14.4	17	16.1	17.8	2.6
Transport and Freight Labourers	9330	7.1	8.4	8	8.8	1.3
Secretaries and Correspondence Clerks	4114	6.7	7.9	7.5	8.2	1.2
Clearing and Forwarding Agents	3422	5.3	6.3	6	6.6	1
Personnel and Careers Professionals	2412	5.2	6.2	5.8	6.5	0.9
Freight and Transportation Clerks	4133	3.4	4	3.8	4.2	0.6
Accountants	2411	2.8	3.3	3.2	3.5	0.5
Messengers and Porters	9161	2.9	3.5	3.3	3.6	0.5
Travel Agency Clerks	4221	2.8	3.3	3.1	3.5	0.5
Administrative Secretaries and Related Associate Professionals	3431	2.2	2.6	2.5	2.8	0.4
All		**98.6**	**116.4**	**110.5**	**122.2**	**17.8**

137

Appendix 10: Projections of employment for 4-digit occupations in 2011 in "Public Administration and Compulsory Social Security" with most new jobs.

The data in Table A10.1 show the estimated stock of workers by occupation in the economic activity 'Public Administration and Compulsory Social Security' in 2006 and projections in 2011 for 4-digit occupations.

The table also includes the number of new jobs (in thousands) projected for the period 2000-2011. A lower and upper option for the projections is also included in the table.

Table A10.1: Projected employment in 2011 in 'Public Administration and Compulsory Social Security' with most new jobs

	4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	Lower option (000)	Upper option (000)	New jobs 2006-11 (000)
Garbage Collectors and Dustmen	9170	8.5	9.4	9.2	9.6	0.9
Secretaries and Correspondence Clerks	4114	8	8.9	8.7	9	0.8
Motor Vehicle Drivers	8320	4.3	4.7	4.6	4.8	0.5
Mining and Construction Labourers	9310	3.5	3.9	3.8	4	0.4
Door Keepers and Watchmen	9162	2.5	2.7	2.7	2.8	0.3
Messengers and Porters	9161	3.3	3.6	3.5	3.7	0.3
Personnel and Careers Professionals	2412	3.3	3.6	3.5	3.7	0.3
Stenographers and Typists	4111	2.6	2.8	2.8	2.9	0.3
Accountants	2411	1.8	2	1.9	2	0.2
Book Keepers	3433	2.3	2.5	2.5	2.6	0.2
All		**83.8**	**92.6**	**90.9**	**94.3**	**8.8**

Appendix 11: Projections of employment for 4-digit occupations in 2011 in "Education" with most new jobs.

The data in Table A11.1 show the estimated stock of workers by occupation in the economic activity 'Education' in 2006 and projections in 2011 for 4-digit occupations.
The table also includes the number of new jobs (in thousands) projected for the period 2000-2011. A lower and upper option for the projections is also included in the table.

Table A11.1: Projected employment in 2011 in 'Education' with most new jobs

	4-digit Code	Estimated stock 2006 (000)	Projected employment 2011 (000)	Lower option (000)	Upper option (000)	New jobs 2006-11 (000)
Basic and Pre-Primary Education Teaching Professionals	2330	49.4	57.8	57.4	58.1	8.4
Secondary Education Teaching Professionals	2320	39.8	46.6	46.3	46.9	6.8
Messengers and Porters	9161	11	12.9	12.9	13	1.9
Higher Education Teaching Professionals (Colleges and Universities)	2310	7.8	9.2	9.1	9.2	1.3
Motor Vehicle Drivers	8320	5	5.9	5.8	5.9	0.9
Directors and Chief Executives in Management	1210	4.7	5.5	5.5	5.5	0.8
Secretaries and Correspondence Clerks	4114	4.9	5.7	5.7	5.7	0.8
Educational Research and Development Professionals	2350	2.8	3.3	3.2	3.3	0.5
Personnel and Careers Professionals	2412	2.7	3.2	3.2	3.2	0.5
Door Keepers and Watchmen	9162	1.5	1.8	1.8	1.8	0.3
All		**154.8**	**181.1**	**180.1**	**182.1**	**26.3**