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National Strategic Skills Audit for Wales 2012

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NATIONAL STRATEGIC SKILLS AUDIT FOR WALES 2012

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Views expressed in this report are those of the researcher and not necessarily those of the Welsh Government.

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Glossary of acronyms

BIMM	Building Information Management and Modelling
BRIC	Brazil, Russia, India, China
BRIMICS	Brazil, Russia, India, Mexico, Indonesia, China, South Africa
CQFW	Credit and Qualification framework for Wales
CRM	Customer Relationship Management
DfES	Department for Education and Skills
DTI	Department of Trade and Industry
EEA	European Economic Area
ERDF	European Regional Development Fund
ESF	European Social Fund
ESS	Employer Skills Survey
EU	European Union
GDP	Gross Domestic Product
GVA	Gross Value Added
HPW	High Performance Working
HtFV	Hard to Fill Vacancy
ICT	Information Communication Technology
ILO	International Labour Organisation
IP	Intellectual Property
JSA	Jobseeker's Allowance
LMI	Labour Market Intelligence
LNG	Liquefied National Gas
MAC	Migration Advisory Committee
NIESR	National Institute for Economic and Social Research
NESS	National Employer Skills Survey
NQF	National Qualifications Framework
NSSA	National Strategic Skills Audit
NSSAW	National Strategic Skills Audit for Wales
NUTS	Nomenclature of Territorial Units for Statistics
R&D	Research and Development
SME	Small or Medium Sized Enterprise
SIC	Standard Industrial Classification

SOC	Standard Industrial Classification
SSC	Sector Skills Council
SSV	Skill Shortage Vacancy
UK	United Kingdom
UKCES	UK Commission for Employment and Skills
US	United States
USA	United States of America

MINISTERIAL FOREWORD

The skills of people in Wales are vital to the future success and prosperity of the nation. Understanding the supply of, and demand for, skills is increasingly important. I am committed to investing to develop and strengthen our understanding of what skills are needed and being demanded by employers. This includes what employers are saying to us about skills supply and their demand for skills both now and in the future. So, I am excited to introduce this, the second National Strategic Skills Audit for Wales which seeks to bring together a wealth of information and analysis on skills in Wales.

In the last year we have seen the publication of several major skills surveys which have enabled us to include the very latest data and analysis on Wales in the strategic audit for 2012. Amongst the chief sources is the UK Commission for Employment and Skills' Employer Skills Survey 2011, which provides data on skills shortages and gaps from 6000 Welsh employers and Working Futures 2010-2020.

This strategic audit has an important role to play in informing labour market intelligence, supporting as it does the Welsh Government's strategy of maximising economic performance, encouraging the generation of business success and at the same time ensuring that our workforce has the best possible skills base to thrive in an ever competitive labour market.

In order for the Welsh Government to achieve its aim of maximising economic performance and to generate business success and real opportunity for individuals we need to promote the supply of economically valuable skills. Skills which will meet the changing needs and requirements of the labour market. While it remains the case that the labour market is shaped by complex forces and can be fast changing, it is important that we seek to better understand demand and take steps to guide and direct supply where it is appropriate to do so. This strategic audit also sets out some priority areas for action in the short, medium and longer term. It focuses, on the occupations and sectors where most attention is required to ensure that Wales has the essential skills to meet the emerging labour market

demands of today and tomorrow, and ultimately, to maximise economic growth and prosperity.

This strategic audit is intended to provide evidence to aid informed decision making by individuals, employers, education and training providers as well as careers and skills advisors and policy makers. It provides both insight and foresight which can inform the skills ‘marketplace’ in Wales.

I commend this research to you and hope that it will promote and inform debate on the skills needed to support and capitalise on the opportunities ahead.

Jeff Cuthbert, AM
Deputy Minister for Skills
Welsh Government

February 2013

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Executive Summary

The purpose of the NSSAW 2012

The purpose of the National Strategic Skills Audit for Wales (NSSAW) 2012 is to provide insight and foresight to create a better-informed market for skills in Wales and to support a better balance between the skills needed and the skills available. It is clear that individual actors in the labour market armed with accurate information are likely to make better choices, leading to better outcomes for citizens, firms and the nation. This report builds on the first NSSAW 2011, Skills for Jobs[1] and draws new employer survey data and economic projections together into a comprehensive and easily-accessible synthesis and adds to the extensive programme of research and labour market intelligence that is already available in Wales. The report is able to take a relatively comprehensive and long-term perspective.

It is not possible to predict and plan the exact 'numbers' of individuals with specific skills that will be needed in particular localities. The labour market is complex and dynamic and the process of adaptation in labour supply can often be slow. However, this does not mean there is not genuine value to be drawn from seeking to better understand skills demand, supply and mismatches. With appropriate interpretation, the NSSAW 2012 should help:

- **Individuals** to make appropriate, well-informed choices about future learning and career opportunities
- **Careers advisors** to support individuals in making these choices
- **Education and training providers** to assess provision and to shape curriculum content that reflect the needs of the labour market
- **Employers** to work within their representative bodies to raise demand for valued skills solutions, support strategic decision-making within businesses and promote the implementation of a skills delivery system that reflects need

[1] A summary of key messages from the Audit and the full evidence report can be found here http://wales.gov.uk/about/aboutresearch/social/latestresearch/skillsforjobs/?lang=en

- **Policy-makers** to consider policy priorities and resource allocation in the context of a strategic overview of jobs and skills in Wales.

What is the NSSAW 2012 based on?

The NSSAW 2012 has identified current and likely future trends in demand for skills and employment in Wales over the next five to ten years. It draws on a range of data including:

- National Statistics for Wales
- The Annual Population Survey / Labour Force Survey
- *Working Futures* 2012-2020
- The UK Commission's Employer Skills Survey 2011, including a boosted sample of 6,000 employers in Wales
- Sector skills assessment summary reports covering 15 sectors and produced in 2012 by the Sector Skills Councils (SSCs).

This summary highlights the key trends from the analysis and sets out priority areas for action in the short, medium and longer term. It focuses specifically on the occupations and sectors where most attention is required to ensure that Wales has the essential skills to meet the emerging labour market demands of today and tomorrow, and, ultimately, to maximise economic growth and prosperity.

Wherever possible the most recent data has been used in this report. Any data published after 5th January 2013 has not been included.

Key characteristics of skills needs in Wales

Employment has expanded over the last 15 years

Currently 1.35 million people aged 16 and over living in Wales are in employment, while there are about 1.38 million jobs located in Wales.

Although employment levels have fallen since the onset of the financial crisis, there are still more than 167,000 additional people in employment compared with 15 years ago. The demand for labour, as measured by the number of people in work has therefore increased by almost 14 per cent over the period. Employment is unevenly distributed across the nation, with large shares in the South East of the

country, reflecting the higher population share in this area**.** Employment growth has taken place across all areas of Wales in the past decade, with percentage growth highest in South West Wales, followed by North Wales and Mid Wales. Employment levels have also expanded notably in South East Wales but this conceals variations between sub-regional areas in the South East which are contracting (eg Blaenau Gwent and Vale of Glamorgan) and those which are expanding (eg Cardiff).

Changes in occupational structure will continue
To note: As with all projections and forecasts, the results presented in Working Futures 2010-2020 (and in this section below) should be regarded as indicative of likely trends and orders of magnitude given a continuation of past patterns of behaviour and performance, rather than precise forecasts of the future.

Employment is predicted to increase in Wales between 2010 and 2020, by 71,000 (see Table E1).

- The wholesale/retail and the health and social care sectors are likely to be of future economic significance in terms of productivity levels and employment growth and experience high volumes of replacement demand in both for Wales and England.
- Higher level occupations are expected to continue to increase their share of total employment in Wales in the period to 2020, at the expense of intermediate and lower level occupations. The greatest increase in occupational volumes (through expansion demand) is predicted for corporate managers, skilled construction/building trades, teaching/education professionals, health professionals, business/public service associate professionals and caring/personal service occupations. Some lower skilled roles with high shares of female employment are forecast to decline, so expanded employment opportunities in higher skilled occupations may create pressures for women to upskill to move into these roles.
- In absolute terms, the highest net requirements (including replacement demand) will be for caring/personal service occupations, administrative and

elementary administrative service occupations and teaching/education professionals.

- The occupations forecast to experience the sharpest decline in numbers of jobs will be process, plant and machine operatives and administrative/secretarial functions.

Table E1: Occupational change in Wales and UK 2010 to 2020

Occupational Group (SOC 2010)	Overall change (000s)	Direction of change in total employment 2010-2020	
		Wales	**UK**
Managers	18	↑	↑
Professionals	35	↑	↑
Associate professionals	18	↑	↑
Administrative and secretarial	-15	↓	↓
Skilled trades	7	↑	↓
Caring and leisure	12	↑	↑
Sales	11	↑	(↑)
Process operatives	-13	↓	↓
Elementary occupations	-1	(↓)	↑
All occupations	71	↑	↑

↑ Positive change of more than one per cent
↓ Negative change of more than one per cent
() Change of less than one per cent

Source: Working Futures 2010-2020

There may be a significantly higher skills profile required of women. Jobs growth is expected to be strongest in higher skilled occupations that are currently male dominated, while jobs where women currently predominate are predicted to decline, eg administrative and secretarial occupations. Women may need higher level skills to compete for jobs in expanding occupations.

Relatively high level of skills shortages in Wales

Wales has higher reported skills shortage vacancy (SSVs) densities (calculated as the percentage of vacancies) within most sectors compared to the UK, except for wholesale/retail, public administration and education, and community, social and personal services. This is accounted for by the higher SSV density in Mid Wales

compared to the other economic regions. Wales also has a higher proportion of SSVs per 1000 employees across most sectors except for wholesale/retail, financial services, community/social/personal services, manufacturing, construction, public administration and education.

The highest volumes of Welsh SSVs are found in hospitality/catering, manufacturing and business services. The highest density of SSVs is found in business services.

Commuting patterns affect the balance between labour supply and demand
Wales has strong links with the economy and labour market of England, particularly in its border areas and around its coastal corridors. Inward and outward commuting flows of skilled workers have the potential to influence the balance between supply and demand of labour, particularly since inward commuters have the strongest representation in high skilled occupations ie managers, professionals and associate professionals. There was a sharp reduction in the level of commuting into Wales between 2008 and 2009, but this has risen in subsequent years. Welsh residents may need support to help them compete for higher skilled jobs which currently attract inward commuters.

Wales has distinctive geographic patterns of supply of and demand for skills
The profile of employment varies significantly across Wales' economic regions. The manufacturing sector is of particular importance to North and South East Wales, agricultural employment is more concentrated in Mid Wales, while in South East Wales a relatively large proportion of employment is concentrated in higher level occupations and financial services. Public administration and defence, and accommodation/food sectors are relatively important across the nation.

Although a whole Wales approach is important, such variations in labour market performance and characteristics within Wales suggest a need for a targeted policy approach. This helps address challenges such as the need for job creation in some local areas relative to Cardiff and to overcome the concentration of skill shortages in Mid Wales.

Government policy in Wales influences the supply of and demand for skills

Government policy in Wales could influence the future nature of jobs and skills demand. For example, Wales' accelerated programme for reducing the carbon footprint could serve to intensify demand for jobs and skills, many at a higher level, associated with the development of a low carbon infrastructure. Government policy to support Enterprise Zones and City Regions could serve to increase demand for jobs and skills in specific occupations such as STEM professionals, associate professionals in the finance sector and creative workers in digital media. On the supply side, Wales' current policy of retaining the current compulsory school leaving age of 16 should ensure a continued labour supply to sectors that employ large numbers of young people, such as hospitality. In contrast, older workers who remain in the labour market for a longer period may reduce the availability of openings for new entrants in other occupations.

Recession has severely affected some sectors in Wales

The recession has had a more severe impact on the employment rate in Wales than in the wider UK. Particular sectors and occupations have also been relatively severely affected. For example, jobs in the production sector and in machine operative roles have declined faster than at UK level. It is unclear whether this will have a medium to long-term impact on the skills needed in Wales.

Skills needs in Wales: priority areas for action

How are priorities determined?

A key element of the NSSAW 2012 involves identifying the strategic priorities for action on skills, both today and in the future to help address the provision of current and future skills for the economy, the Government's economic initiatives and particular sectors/regions. In particular, we focus attention on the most pressing areas that have been identified in the analysis, which are accentuated when all the data sources are considered together. These include:

- Current and/or anticipated future skills needs, which are significant in scale or volume already in the labour market, or are expected to be a significant requirement in terms of future needs

- Significant current and/or emerging skills needs which are already making (or likely to make in the future) a significant contribution to economic performance (although they may be more moderate in scale)
- Concerns over whether the demand for skills will be met adequately and hence the risk of a skills deficit.

We identify where short, medium and long-term action is needed, and discuss the implications if action is not taken. Thus while it could involve action to re-skill or up-skill people, it could also equally involve action on the demand side to ensure better job matching and effective use of workers' skills.

In prioritising the areas for action, we draw on the risk-based approach adopted in Australia (Skills Australia, 2008). The approach enables us to identify the key occupations, and related sectors, where there are most likely to be important strategic skills needs, which risk not being effectively met, using the following criteria:

- Degree of certainty – this concerns the likelihood of the drivers of the skills demand materialising, and, the risk of supply failure, with assessments ranging from unknown to the outcome being definite. It also includes consideration of the significance of the skill deficit under multiple scenarios.
- Magnitude – this concerns the scale of action required based on the magnitude of skills needs. Essentially, this is broadly based on the numbers of jobs that will need filling. Future assessments of magnitude capture total employment demand and incorporate both replacement demand as well as new jobs.
- Lead time – this refers to the length of time that will be required to rectify the skills deficit. It also considers whether there are any other preferable strategies to overcome the deficit. A long lead time is defined as more than five years, three-five years captures the medium lead time, and less than three years is a short lead time. This measure includes both the learning time required for individuals and the set up time for any new training or educational provision.
- Criticality – this seeks to assess the potential risk to economic growth and development according to key sectors where the opportunity costs of skills

deficits could be high to the economy and where the consequences of skills deficits could be high within industries, even if the numbers of jobs involved are small.

Therefore, some of the likely skills deficits are about capacity – ie insufficient numbers of people with the necessary skills and knowledge, and others are about capability ie – the supply of workers is adequate, but alterations will be needed in either the level and/or type of skills required to fulfil changing job content.

Using these factors, each skills deficit is then given an importance rating or 'traffic light' colour, indicating how much of a priority it is for action:

- Red – reflecting skills deficits which are of critical importance to the economy and require immediate action, either because there are current skills needs which are already not being met and/or because lead times are such that early action is required to optimise economic growth potential fully and avoid deficits in future.
- Pink – reflecting skills deficits which are again of critical importance to the economy or a particular part of the economy or sector, in terms of expansion, survival and/or optimising returns, but which may be smaller in scale and/or have a shorter lead time than for those rated as red.
- Amber – reflecting skills deficits which are important to the economy and/or a distinct sector rather than critical (although the degree of certainty may be less clear and hence the true impact unknown, where the skills needs are connected to a developing or emerging sector in the economy). These skills deficits are either moderate in scale and/or can be filled in a medium to short time frame.

Green ratings are not separately identified as these represent areas where generally there is a better alignment between supply and demand and fewer concerns requiring urgent action.

Red priorities

The key (red) priority areas identified by this analysis are:

Managers

- Increasing skill demands and job volumes for corporate manager roles in the wholesale/retail and health and social care sectors and, to a lesser extent, in: professional services, construction, agriculture, food, drink, tobacco and media. Corporate managerial roles are forecast to experience the greatest overall expansion demand of any occupational group and the number of corporate managers is expected to rise by 12,000, with a net requirement (including replacement demand) for 39,000 between 2010 and 2020. Skill requirements vary by industry and skill development requires on the job development as well as formal education and training. This need is critical to both a wide range of industries and the overall economy of Wales.

- Need to improve management capability in exploitation of technology to optimise business benefits across a range of sectors including those with large forecast growth potential: retail/ wholesale, health/ social care, professional services, food, drink and tobacco, media and agriculture. Supply solutions include a combination of formal training and on the job development. This need is critical to both individual sectors and wider economy through improving efficiency and competitiveness of businesses and exploiting new market opportunities.

Professionals

- Continued high demand for teaching professionals in the education sector. Projections suggest substantial job volumes will be required arising from both expansion and replacement demands. There is evidence of current skills deficits linked to the changing nature of teaching roles and developing modes of delivery. There is a projected net requirement of 45,000 more workers (including replacement demand of 33,000) by 2020, although the volume of demand may be tempered by public spending cuts and a need for efficiency savings. The supply lead time is medium to long as the roles require a minimum of level 4 qualifications. High quality of teaching delivery is critical to the overall future competitiveness of Wales as well as the performance of education sector. There is likely to be a particular need for STEM teaching professionals given wider

education and skills policy priorities. The impact in terms of job volumes is also likely to be significant.

- High demand for health professionals (primarily medical practitioners). Projections from multiple sources forecast strong expansion and replacement demand in these roles. There are powerful forces driving demand, including the ageing population and increased incidence of long-term conditions. There is a projected net requirement of 38,000 health professionals (11,000 from expansion demand) for the period 2010-2020 indicating very high and rapid growth. The ability of the State and individuals to pay for health services in a period of austerity may limit expansion. Employment growth may also be offset by productivity gains. There is a long supply lead time as role requires level 4 or above qualifications. These occupations are critical to the performance of the health/ social care sector and contribute to supply of workers to other sectors through promoting wider societal well being.

Skilled trades

- Continued demand for workers in skilled construction/building trades, metal, electrical and electronic trades. Projections suggest a likely net decline for skilled metal trades and textiles but significant replacement demands across all skilled trades occupations. These occupations have ongoing skills shortages and skills gaps, with concerns about recurrence of shortages as economic recovery develops. Skill levels needed will increase for these roles as will requirements for multi-skilling. The net requirement projected is for 25,000 workers (in skilled metal, electric, electronic trades) and 33,000 workers (in construction and building trades) between 2010 to 2020. The scale of demand will ultimately be determined by future competitiveness of manufacturing in high value added global markets, progress with low carbon agenda, and speed of recovery in construction. There is a medium level lead time to secure supply as roles typically require a level 3 qualification usually acquired through apprenticeship and workplace development. Future needs may be addressed through migrant labour supply if insufficient local workers possess the skills needed. These roles are critical to specific sectors and important to the economy through their contribution to the built environment/ infrastructure and supply chains.

Care occupations

- Growing demand for caring and personal service occupations including care assistants. There are powerful forces driving demand, including an ageing population, growing consumer expectations of care services, increased incidence of long-term conditions, increased participation of women in the workforce and increased regulation of the care sector. There is a projected net requirement of over 50,000 caring/personal service workers (11,000 from expansion demand) for the period 2010- 2020. Personal service roles are believed to be the key source of skills gaps and shortages in the health and social care sector. Increasing policy concern about the quality of social care also suggests possible skills gaps/deficits in management systems for this occupational group. The role requires a short to medium-term lead time, typically involving on the job development to qualifications at levels 2 and 3. Current migration patterns may mask the potential scale of shortages. The role is critical to the sector and also a major contributor to employment and key to societal well-being. These occupations also offer an important and large-scale entry route into employment.

Pink priorities

We have also identified a number of other skill deficiencies that need attention. These areas attract a ‘pink rating’ and are less important than those (red) priority areas identified above but are still critical to parts of the Welsh economy. The types of skills needs are:

- Management capability to drive product and process innovation, to commercialise products / processes for new markets and to exploit intellectual property rights
- Change management skills (including staff engagement) driven by impact of public spending cuts and increased competition in the public sector and elsewhere
- Significant occupational and skills demands in sales/customer service

- Elementary administrative and service occupations, especially in the retail, accommodation and catering sectors

In addition the NSSAW 2012 has identified three key cross-cutting skills:

- Skills to support energy efficiency, reduce material consumption and improve resource utilisation in low carbon economy
- Employability and basic skills (team working, problem solving, communication, literacy, numeracy)
- Welsh language skills.

Amber priorities

Other important occupational and skill areas of less criticality but still important and therefore attracting an 'amber level' rating are:

- Project management capability to support the development of digital content for diverse media platforms in the creative sector
- Management capability in procurement, commissioning and financial management across a range of public and private sectors
- Science and technology professionals
- Actuaries
- Business and public service associate professionals, across a range of public and private sectors
- Investment advisers in professional and financial services.

Key sectors

Our assessment has sought to identify those sectors of the economy where particular attention to skills needs might be targeted. These sectors are those which currently exhibit the greatest economic significance and skill deficits and include food, drink and tobacco, support services, accommodation and food, the rest of manufacturing, real estate and wholesale/retail. The sectors which combine growing economic significance and predicted future skills needs are retail/wholesale and health and social care.

Contextual trends

A number of key trends provide the context for the analysis:

- Current demand – the largest numbers of people in the current labour market are employed as managers, professionals and associate professionals. Indeed, these occupations account for almost two-fifths of all jobs today.
- Broad skills shortages – the largest volumes of skills shortages in Wales are found among associate professionals, elementary staff, and skilled trades occupations, with associate professionals, machine operatives and skilled trades occupations having the highest SSV density. The highest volumes of skills shortages are found in the manufacturing and business services sectors, where the highest densities of SSVs are also found. Skills shortages are concentrated in Mid and South East Wales, with Mid Wales having a far higher SSV density than the other economic regions of Wales.
- Skills gaps – the largest proportions of skills gaps are found in sales/customer service, machine operatives, caring/personal services and elementary roles, with machine operatives having the highest skills gaps density (skills gaps as a proportion of the workforce). The highest reported volumes of staff with skills gaps are found in manufacturing, health/social care and wholesale/retail sectors, with the electricity, gas and water, and hotels and restaurants sectors having the highest skills gaps density. Associate professionals and skilled trades occupations are likely to experience the greatest number of different types of skills gaps.
- Future trends and drivers of change – drivers of change, structural trends and economic developments in the coming years are expected to accentuate the demand for many high level skills, particularly because of their importance in securing a continuing edge and competitive advantage within key sectors, and an ability to respond to on-going changes such as the effects of globalisation, technological advancements and developing consumer demands.
- Future demand – jobs amongst corporate managers, professionals, associate professionals and technicians are anticipated to exhibit the highest levels of anticipated demand in the future too, with their combined proportion of total

employment expected to increase from 36 per cent in 2010 to 39 per cent by 2020. But in addition, caring and personal service occupations also exhibit higher growth, which is accentuated when replacement demand due to people leaving the labour market is also included.

- Underemployment – over a quarter of employers report that at least 50 per cent of their staff possess skills and qualifications which are higher than those required to do their jobs, i.e. they are underemployed. Incidence of underemployment is highest among staff in lower skilled roles including caring/leisure occupations and elementary staff, and is most common in the hotel/restaurant sector. This suggests there is a need to raise employer ambitions and encourage them to find ways of getting greater value from their workforce and develop higher value product market strategies. Underemployment may also be avoided by more effective job matching and ensuring that individuals invest in economically viable skills.

- Changing attitudes, values and identities - over the next decades, changes in the population's ambitions and values are likely. The so-called Generation Y, born between 1980 and 2000 is reported to have high expectations of intrinsic job interest and little appetite for careers which are perceived as dirty, repetitive or physically demanding, including some roles in the construction and care sectors. Implications may include this generation providing a more flexible workforce and demanding and using new methods of learning with delivery of training online or through virtual reality. There is a possibility of reduced career expectations for some being accompanied by greater interest in economic or job security.

Conclusions

Skills for jobs matter

To maximise economic performance, and to generate business success and real opportunity for individuals there is a need to ensure an adequate supply of 'economically valuable' skills. Labour supply needs to meet the changing requirements of the labour market effectively to avoid structural mismatches such as skill shortages, skills gaps, structural unemployment, underemployment, and an

over-dependence on migrant workers rather than the indigenous workforce to meet labour market needs.

To address mismatches, responses are required both on the demand and supply side.

Overcoming skills deficits requires a better skills 'supply chain'
Skill shortages require action on the supply side to tackle a lack of available skills in the labour market. Skills gaps indicate deficiencies in skills in the internal labour market of employers. In addition, unemployed people may need to acquire new skills to re-enter employment.

Underemployment requires higher levels of demand
Underemployment, however, requires a response on the demand as well as the supply side. On one hand, it can be tackled where companies adopt more ambitious product market strategies to move up the value chain, into higher value added products and services. This leads them to create a knowledge-intensive work organisation as a means to deploy their more highly skilled workers more effectively through the implementation of high performance working (HPW) practices. An effective response, however, also requires individuals to pursue skills and qualifications that employers really do need.

Migrant workers raise key issues for policy-makers
The presence of non-UK migrants in the Welsh workforce masks latent mismatches between employer demand and the supply of skills from the indigenous population and it can affect training investment if employers choose ready-skilled migrants as their preferred source of labour, rather than training new entrants or existing workers. In addition, migration in some sectors is predominantly 'low skilled' and may act as a deterrent to employers to 'raise their game' and move to more highly skilled operations. A key point for policy is that indigenous workers have a better chance of competing with migrants for jobs when they can take advantage of improved sign-posting through advice and guidance and when they have ready access to education and training in the skills that employers require.

Addressing skills needs should take account of different priorities across sectors

A clear message from the NSSAW 2012 is that particular sectors have specific skills priorities. Sectoral needs are driven by specific combinations of drivers of demand which affect businesses, jobs and skills and which need to be acknowledged when forming policy. On the other hand there is also evidence of the importance of 'cross-cutting' skills needs which are pervasive across sectors.

Generic, employability and basic skills matter

Generic or 'employability' skills, such as customer-handling, problem-solving and team-working, are pervasive requirements across most sectors and meeting current and future skills needs of this type are critical to future competitiveness and productivity. Indeed, the incidence of current deficits relating to some generic skills is higher than for role-specific technical and practical skills in some sectors in Wales. Evidence is increasingly emphasising the importance of 'T-shaped' skillsets where technical aspects of jobs, requiring detailed knowledge and skills, are supplemented with more generic skills, which enable individuals to work more effectively with their colleagues and/or customers and apply their technical expertise in practice, often in commercial settings. Management skills are also a critical area of generic skill need. High quality management skills are important for co-ordinating processes of strategic change, applying technology within businesses effectively, identifying new commercial opportunities and optimal deployment of staff talent.

Jobs with high, medium and low skills needs will be important for the Welsh economy

The NSSAW 2012 highlights the increasing importance of higher skills and jobs to the economy. There is a significant demand for highly skilled workers in the labour market. Jobs requiring intermediate level skills will continue to be important. This is particularly significant since Wales has a disproportionately large concentration of employment in intermediate roles compared with the UK as a whole and this is projected to continue. On the supply side, as with the UK, there has been little change in the proportion of the workforce qualified at intermediate levels (level 3). These developments call for a growing emphasis on strengthening intermediate vocational career pathways (for level 3) to ensure that the skill requirements for

these jobs can be met. While intermediate jobs in more traditional occupations (in for example, some skilled trades) are forecast to decline, many of these roles employ a largely ageing workforce. When replacement demand is taken into account, combined with concerns about future supply, this highlights significant pressing skills needs. High densities of current skills shortages occur in many of these areas, and have persisted for some time, although they have reduced during recession. Moreover, skilled trades are expected to be a key part of the skills mix within sectors that are likely to provide job growth, such as construction.

Despite the continued growth of highly skilled jobs within Wales' labour market, and a substantial decline in recent years in routine jobs such as machine operatives, significant employment opportunities are likely to continue in areas that have traditionally demanded low skills. Working Futures projections suggest that this could amount to about a fifth of all jobs. The proportion is likely to be much higher in sectors predicted to expand substantially, such as retail/wholesale, accommodation/food and, in particular, the care sector.

The physical and emotional demands of many of these jobs can lead to high labour turnover, requiring an ongoing supply of labour and in some cases require up-skilling to meet heightened customer expectations and to meet product/service quality demands. Improving the quality of such jobs is important, not only to ensure an improved standard of goods/services but also because this area is expected to be a key source of employment. These jobs are likely to be particularly important for certain labour market groups, including women who hold a large share of these roles in some sectors, people seeking to move into employment and progress through the labour market, as well as those seeking part-time work.

1 Introduction

The National Strategic Skills Audit for Wales (NSSAW) 2012 provides a detailed evidence base and key intelligence on Wales' existing and future skills needs. The information contained in this document will help to supply the analysis required to develop Wales' skills base so that it meets the immediate and longer-term needs of a fast changing economy.

The Welsh Department for Education and Skills (DfES) was tasked in 2011 with developing and communicating labour market intelligence (LMI) to align skills supply with demand more effectively. Central to delivery against this priority is the need to build up a robust LMI evidence base for Wales on skills and employment, and to interpret, analyse and disseminate it to key audiences.

The first NSSAW, Skills for Jobs, was published in June 2011[1]. The NSSAW 2011 provided key intelligence on Wales' existing and future skills needs and was produced with the objective of informing action to develop Wales' skills base to meet the immediate and longer-term needs of a fast changing economy. Prior to this, in March 2010, the UK Commission for Employment and Skills (UKCES) had published Skills for Jobs: Today and Tomorrow: The National Strategic Skills Audit for England (NSSA for England) 2010 (UKCES 2010)[2], which employed the strategic skills approach for the first time.

The aims of the NSSAW 2012 are complementary to the wider policy context in Wales, which places economic and job growth at the heart of government policy. Building strategic relationships with anchor companies, encouraging key sectors and supporting Small and Medium sized Enterprises (SMEs) and other business structures are the central planks of government policy, which aims to nurture high quality businesses that will deliver growth. A ready supply of suitably skilled staff is essential to enable these firms to succeed. Key policy documents also emphasise the importance of skills. According to the most recent *Programme for Government (2011)*[3] and *Skills that Work for Wales: a skills and employment strategy (2008)*,

[1] A summary of key messages from the Audit and the full evidence report can be found here http://wales.gov.uk/about/aboutresearch/social/latestresearch/skillsforjobs/?lang=en
[2] http://www.ukces.org.uk/publications/nssa-vol-1.
[3] http://wales.gov.uk/about/programmeforgov/?lang=en

skills are critical to the success of individuals, businesses and communities and are key to future economic growth and equality of opportunity. Individuals need appropriate skills in order to enter and then progress in employment. For business, a skilled workforce is a route for employers to achieve higher productivity and become more innovative. Skills act as a potential source of competitive advantage and profitability in the private sector and also enable the delivery of more efficient and effective public services. A key feature of Welsh policy is the importance assigned to the role of intelligence, through an evidence base, in the operation of an informed market for skills. *Programme for Government* highlights the importance of sound labour market intelligence to assist individuals to choose careers; it also stresses the need to ensure that suitable training provision is in place to meet employers' requirements. Similarly, *Economic Renewal: A New Direction* (July 2010) notes that 'the more well-informed that individuals, employers, and learning providers are, the more effective their decisions about jobs and investment in skills are likely to be'.

In Economic Renewal, the Welsh Government set out a strategy for creating the right environment for businesses to succeed. Key priorities for skills include working with businesses to target investment on post-recession economic priorities, broadening and deepening the skills base and supporting young people to prepare for and to succeed in the world of work. Both Wales and the UK overall are facing ongoing challenges in the performance of their economies and labour markets, so it is vital to understand where the opportunities lie to support job creation and boost productivity.

The NSSAW 2012 supports the strategic approach to skills by identifying the nation's existing and future skills needs, based on the latest available evidence. The NSSAW 2012 is, therefore, a synthesis of the currently available evidence on the existing and emerging demand for, and supply of, skills in Wales. The NSSAW 2012 will help focus post-recession economic priorities through identification of important sectors for future growth and identify their future skills needs, offering all actors in the skills and employment system an evidence base from which they can work together to ensure those needs are met.

The aim of the NSSAW 2012

The overarching aim of the NSSAW 2012 is to provide valuable insights to policy-makers, employers, education and training providers and individuals on Wales' strategic skills needs. It contributes to the ongoing development of a labour market needs-led approach to skills development: one that not only ensures that current demand is effectively met by the skills system, but also future demands are identified, anticipated, shaped and stimulated.

The skills system will operate most effectively, in a way that maximises economic prosperity, if high quality information is used. This information needs to enable all parties – policy-makers, employers, individuals, universities, colleges and training providers – to make well-informed decisions about which areas of the economy are likely to provide opportunities in terms of high employment and high economic growth, and about areas of likely skills shortage and deficiencies now and in the future.

Objectives

The overall aim of the NSSAW 2012 is to present detailed intelligence about the operation and structure of the economy and labour market in Wales, in order to inform choices and decisions made by:

- Education and training providers
- Careers advisers to individuals (and individuals themselves)
- Employers
- Public agencies and government.

The intention is to use the NSSAW 2012 (and other LMI) to promote the development and deployment of skills which meet the changing needs of the labour market, to minimise structural mismatches, and to support economic recovery and future growth. At the same time this should maximise opportunities for individuals in the labour market.

It should be noted that it is not possible or desirable to plan precisely the structure of education and training provision to meet the needs of a highly complex and

dynamic labour market. The role of labour market intelligence is to support the operation of ‘intelligent markets’ by enabling participants to make better decisions through reference to accessible, relevant and rich information. Such intelligence can also inform the development of appropriate policy levers, including those relating to financial and behavioural incentives.

The specific objectives of the NSSAW 2012 are as follows:

1. To review existing national, regional and sectoral analysis and intelligence on the Welsh labour market and related skills supply and demand issues using the strategic skills framework, and drawing on the UK Commission’s Employer Skills Survey 2011 and other, up-to-date surveys and evidence. This also considers regional variations in skills and employment within Wales.

2. To distil the different elements of relevant research and analysis carried out by the Welsh Government, the UKCES and others, in order to present a coherent and robust skills narrative.

3. To provide an overview of the economic, social and technical drivers of change shaping the Welsh economy and priority skills needs.

4. To provide analysis of global developments and their implications for trends in skills and employment in Wales, including skills insight and foresight and labour market impact.

5. To consider future priority skills needs, using both quantitative projections and qualitative scenarios.

6. To highlight distinctive aspects of the employment and skills supply and demand picture for Wales, and differences in terms of key messages for priorities eg through relevant comparisons to the wider UK picture and to the position in the other nations of the UK and the English regions.

7. To provide an assessment of priority skill needs in Wales with reference to key occupations and related industry sectors.

Methodology

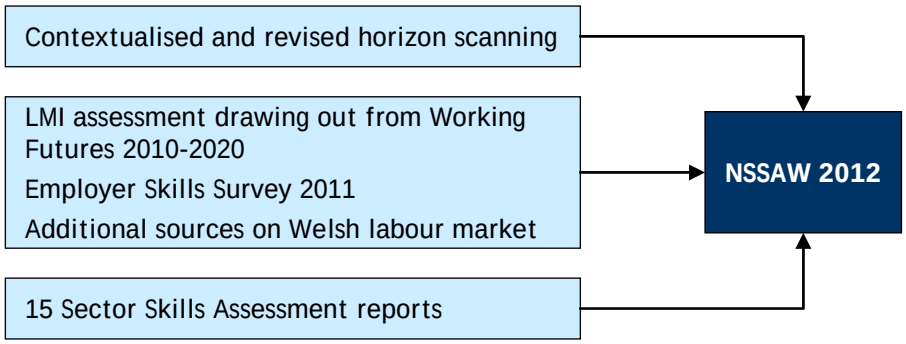
The NSSAW 2012 has been produced using the same analytical framework for organising, collecting and analysing top down data and labour market intelligence sources that was developed for the NSSA for England 2010 and subsequently applied to the NSSAW 2011. Its major contribution is through the use of much more recent data than was available for the NSSAW 2011, as significant new datasets have been released. Further details of these are given below in the description of primary resources used.

The NSSAW 2012 draws on the following strands of work:

- An initial national LMI assessment. This uses a wide range of source materials including:
  - National Statistics for Wales
  - The Annual Population Survey / Labour Force Survey
  - Working Futures 2010-2020
  - The UK Commission's Employer Skills Survey 2011, including a boosted sample of 6,012 employers in Wales.
- Sector skills assessment summary reports covering 15 sectors and produced in 2012 by the Sector Skills Councils (SSCs). These reports draw on a mix of national data supplemented by qualitative evidence and analysis of the future drivers of skills needs for each sector.

The diagram set out in Figure 1.1 shows how the different strands were used as 'inputs' to the final NSSAW 2012.

Figure 1.1: Elements of the National Strategic Skills Audit for Wales 2012



Methodological issues

The NSSA for England sets out the key issues relating to defining and measuring skills, timescale and data availability. A brief outline of these and how they have been tackled is presented here.

Defining skills and types of skills deficits

Skills can be difficult to define and measure at an aggregate level. In practical terms, skills can often be measured in terms of either the qualifications people hold, or the jobs they do (ie their occupation).

In addition, it is important to recognise that measures of employer demand for skills can take a number of different forms. Three types are commonly identified in the relevant literature:

- Skill shortages
- Known skills gaps
- Latent skills gaps.

Some skills needs are caused by factors other than a shortage of labour with the appropriate blend of capabilities, knowledge and experience. Such 'hard-to-fill' vacancies may be associated with poor pay or unattractive working conditions.

Skill shortages are marked by the absence of sufficient, appropriately qualified and experienced people to undertake particular roles when employers seek them, even if other factors such as recruitment methods and rates of pay are appropriate.

Known skills gaps occur within an existing workforce where individual employees lack the requisite skills to undertake the full range of duties in their job.

Latent skills gaps are unrecognised skills needs within an existing workforce which inhibit the capacity of the individuals and/or organisation to reach their full potential.

To this we might add a fourth type of potential skill deficiency for jobs which do not yet exist. These emergent skills needs may require relatively minor adaptations to existing skill sets, or they may require whole new sets of skills. This NSSAW 2012 explores all of these types of skills deficit, where the data allows.

Measuring skills deficits – demand and supply indicators

Skills deficits take a range of forms, and there is no single perfect measure available to assess them. The following indicators of skills needs are commonly used, all of which have advantages and disadvantages:

1. Skills demand measured through change in, or predictions of, occupational and employment change across sectors: ie through surveys of individuals, and by assessing trends in employers' reports of the volumes of staff employed in different occupations. While this measure is able to drill down to identify changes within sectors and industries, there can be difficulty in capturing occupational change at the desired level, and there may be very limited data available for new and emerging occupations. This measure is also dependent upon skills mapping neatly onto 'whole' jobs, and less readily captures changes in skills needs within occupations. This instead requires more detailed questioning of employers (or individuals) about changes in job content.

2. Skills demand measured through employers' direct and subjective opinions on current and future skills demand: This is a direct method of assessing skills shortages relying on the judgement of managers who are in a position to comment. It often reveals shortages of generic skills. There is UK evidence, however, which shows some ambiguity in how employers understand and define a number of generic skills such as communication, team working and customer service, which are commonly identified as being in short supply. For example, an applicant may be excellent at communicating with people in certain

situations, such as giving formal presentations, but may be less confident at networking. Therefore, employers' assessments of applicants' soft skills will take the context and situation into account (Newton et al, 2005). It is important, therefore, to recognise that these terms may be understood differently by different employers.

3. Skills demand measured through wage returns to qualifications/ occupations: Possession of skills or qualifications which generate higher wage returns to the individual can be an indication of employer demand. Wage premia for particular kinds of skills and occupations may develop because of a short-term increase in employer demand, a need to provide an incentive to individuals to develop particular kinds of skills or a simple reflection of the market distribution of rare skills, ie a reward for scarce skills which are not easily learned.

4. Skills supply measured through possession of qualifications: This approach has the advantage that qualifications are easy to count, and data are readily available. Some skills which are often sought by employers are not easily amenable to measurement, however (eg 'soft skills' such as problem solving, team working) and even when individuals hold qualifications, employers may be sceptical of the value of some qualifications. Unless they are technically specific and directly related to a particular occupation, qualifications may also act as proxies for a general level of ability. There is also no automatic 'read across' from possessing a qualification to actual usage in the job. This is dependent upon the way in which work is organised and how employers choose to make use of the skills of their staff.

5. Skills supply measured through the provision of training required to do a job: On the face of it, participation in training is relatively easy to measure. The difficulty with this approach is in deciding which activities constitute training, whether it must be delivered 'on-the-job' or 'off-the-job,' and whether it must be accredited. In addition there are questions about whether participation in training actually raises skill levels (or for example certifies existing levels of competence), and how well it meets individuals' and employers' needs.

Much analysis shows that measurement of skills needs requires the use of multiple measures to attain a sufficient degree of accuracy. Ideally, skills needs should be measured using sophisticated predictive econometric models which integrate analyses of both future demand and future supply, combined with an assessment of changes in demand and supply drivers. These are often robust, well tested and suited to capturing long-terms trends without being affected by marginal changes or 'noise' within employer surveys. However, the models rely on extrapolating future demand based on historical and long-term trends. This means they are poorly suited to capturing the impact of exogenous (external) shocks which produce discontinuous change. There is currently considerable uncertainty about the long-term development of European economies which means that the use of data such as that from Working Futures 2010-2020 within this report must be subject to judgement about how any changes in relevant labour market, economic and regulatory conditions may affect the credibility of the predictions.

Data availability

Significant problems of data availability encountered in the NSSAW 2011 have been overcome through the publication of the most recent Working Futures 2010-2020 projections of job volumes by sector and occupation and the most recent Employer Skills Survey 2011, which provides data on skills shortages and skills gaps from the perspective of employers.

However, two particular issues are more long-lasting, and as they will affect any future Audits and they are worth noting here:

- Availability of data for Wales. A number of key official datasets are only available at UK level whilst the usefulness of others at the level of Wales is constrained by data quality issues arising out of small sample sizes. This also affects forecasting models which rely on official statistics for their underlying basis.
- Categorisation of data. For obvious reasons of consistency and comparability, data are structured around a series of conventions, for example standard categorisations for sector, occupation, location, etc. However, as the economy and labour market change, these conventions can constrain the examination of

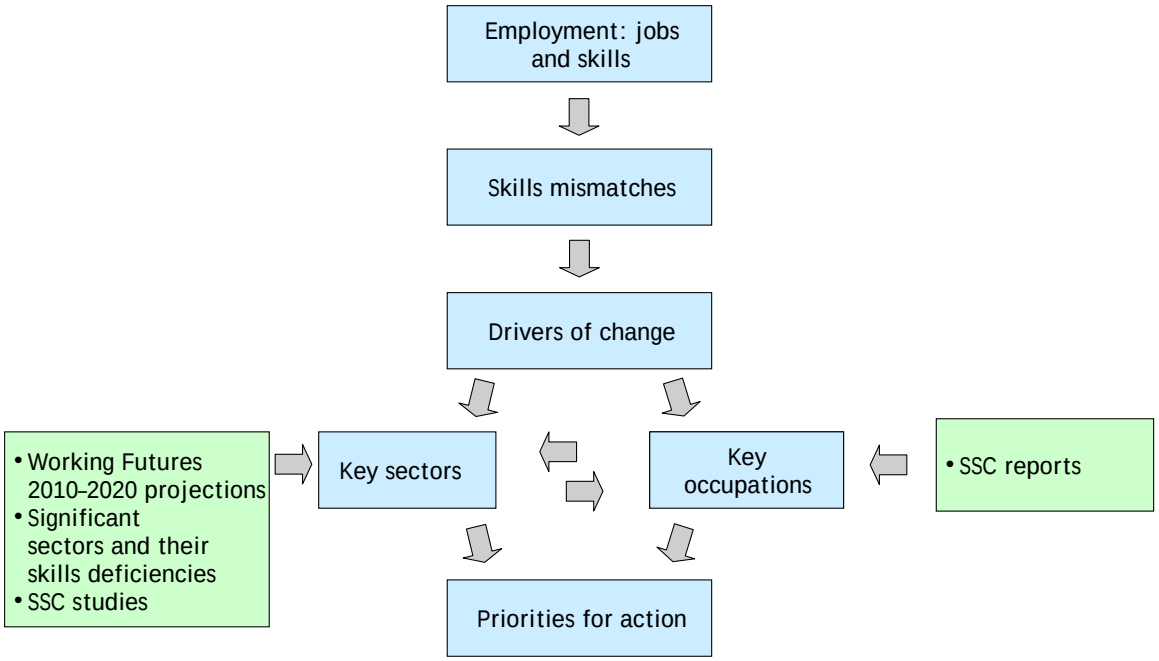
emerging or new areas of work, and therefore skills. For example new categorisations for the Standard Occupational Classification (SOC) were introduced in 2010 (replacing SOC 2000) and for the Standard Industrial Classification (SIC) in 2007 (replacing SIC 2003). Where the new classifications involve significant changes from previous definitions (usually at a high level of detail where jobs and economic activity have changed significantly) this can make time series analysis problematic. We have highlighted any such points of concern where they have occurred in the NSSAW 2012.

Wherever possible the most recent data has been used in this report. Any data published after 5th January 2013 has not been included.

The structure of the NSSAW 2012

The rest of the Audit is set out as follows (Figure 1.2).

Figure 1.2: The National Strategic Skills Audit for Wales 2012 in outline



The coverage of the remaining chapters of the NSSAW 2012 is as follows:

- Chapter 2 sets out the labour market, skills and economic foundation for the NSSAW 2012, focusing on employment and skills in Wales. It covers the overall economic position, recent employment trends, the current structure of

employment by sector and occupation, and the impact of the recession on the labour market.

- Chapter 3 examines the extent of ‘current skills mismatch’ using a framework that enables the identification of the key skills issues in the labour market in a coherent and systematic way.
- Chapter 4 examines the main forces that will shape the economy over the next ten years and therefore affect the demand for (and supply of) skills and employment in the future.
- Chapter 5 identifies key sectors that are expected to be the major sources of economic growth and employment and significant skills deficit over the next ten years.
- Chapter 6 examines, at a finer level of detail, occupational skill needs within and across sectors.
- Chapter 7 summarises the key messages and identifies areas where action is needed and timeframes for addressing them, using a risk-based approach and considering the degree of certainty attached to each skills need.

2 Jobs and Skills: the labour market

Introduction

This chapter of the report sets out the major characteristics of existing employment and skill levels, together with a brief economic context. It briefly reviews:

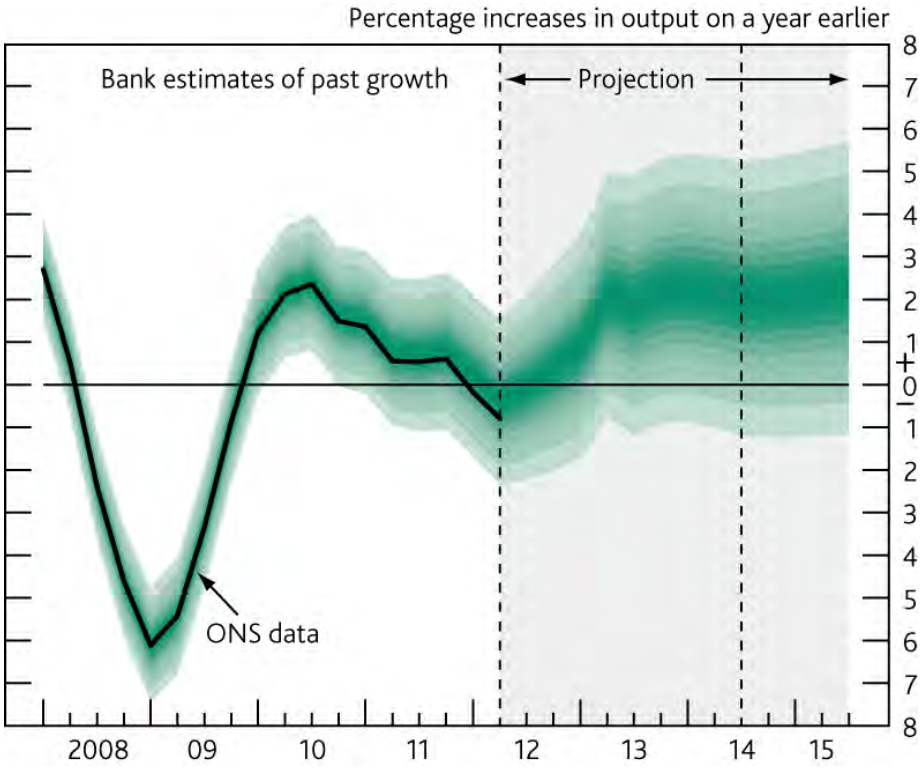
- The overall national and sub-national economic position
- Recent employment trends
- The current structure of employment by sector and occupation
- The sectors of the economy which have grown fastest in recent years
- The impact of the recession on the labour market.

Growing, globalised economy

The UK, before the recession, enjoyed a sustained period of long-term growth. Between 1995 and 2008 the UK economy grew, in real GDP terms, by an average of almost three per cent per annum, a higher rate than that seen across the Euro area and the OECD (OECD, 2010). However, the economy contracted sharply, by 4.7 per cent, in 2009 and has not recovered the output lost since then. There was a return to growth in early 2010, but annual growth rates declined for the remainder of 2010 and 2011, with a return to recession in 2012.

The Bank of England's (BoE) August 2012 Inflation Report estimated that output had contracted for three consecutive quarters, such that the level of output in the second quarter of 2012 was estimated to be lower than in the middle of 2010. The Bank's projections suggested growth would return during the remainder of 2012 and that growth would then be around two per cent per annum from mid-2013 to mid-2015 (Figure 2.1).

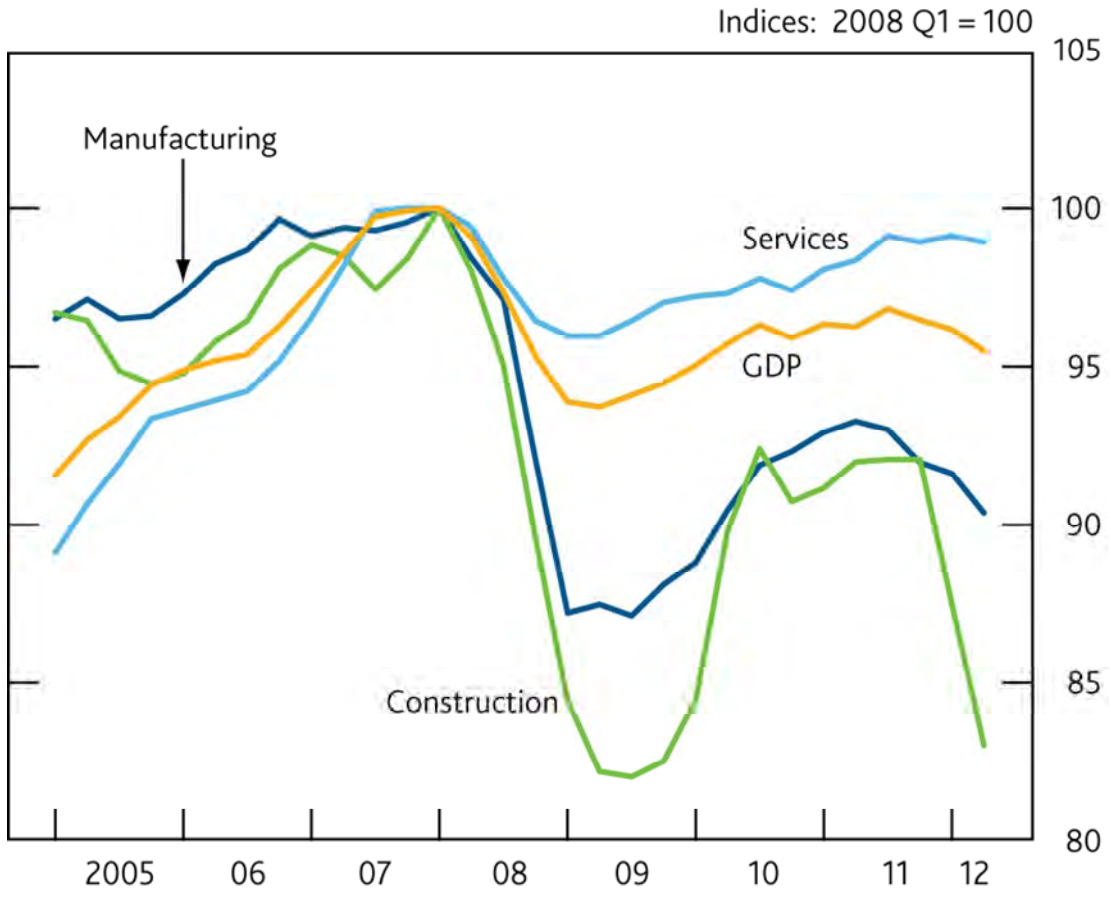
Figure 2.1: Bank of England estimates of GDP output growth, 2008-2015



Source: Bank of England 2012 Inflation Report August 2012

Output in the construction and manufacturing sectors contracted particularly quickly as the economy went into deep recession in 2008. The service sector experienced a shallower output contraction and started to recover earlier, from the start of 2009. Output in the other two sectors recovered later but rebounded faster, until late 2011, when it began to contract again (Figure 2.2).

Figure 2.2: Output by industry, 2005-12

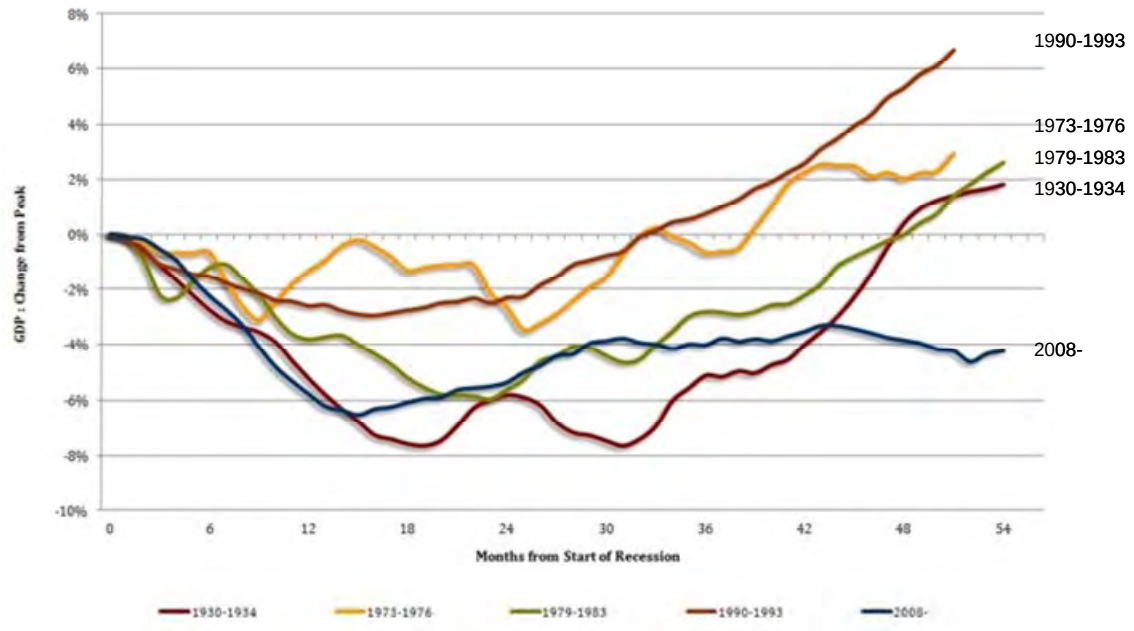


Source: Bank of England, 2012

The National Institute for Economic and Social Research (NIESR) Monthly GDP Estimates claim that while the second recession in late 2011/2012 was over, the economy is now in a 'depression' (a period when output is depressed below its previous peak), which they expect to continue until 2014, when output will return to its previous peak in early 2008.

The current recession is longer than any other recession since 1930 and deeper than most. Figure 2.3 shows the rate of change in GDP in the UK indexed to the start of the recession in 2008 and, for comparison, four previous recessions. The sharp economic contraction came to an end, initially, in the last quarter of 2009, with GDP stabilising and then starting to grow, before flattening off in the final quarter of 2010, followed by the further contraction in 2011/12. The severity of the economic downturn means that the economy is in a significantly worse position currently compared with the equivalent points in time in previous recessions. UK GDP has so far recovered about half of the output lost during the recession.

Figure 2.3: The current recession compared with previous recessions



Source: NIESR, 2012

Wales accounted for 3.6 per cent of the UK economy in terms of workplace based gross value added (GVA) in 2011. The data suggest that Wales has failed to keep pace with past growth in the UK economy. GVA per head in Wales in 2011 was £15,696 or 75.2 per cent of the UK average (although it rises to 86.9 per cent when London and the South East of England are excluded), giving Wales the lowest GVA per head of all the devolved countries and English regions. This is the lowest since 1997. Relative to the UK, GVA per head fell in each year (except for 2004/5) between 2001 and 2009 (ONS, 2010). However, between 2009 and 2011, GVA per head in Wales increased from 73.8 to 75.2 per cent of the UK average.

GVA per head fell by 2.5 per cent in Wales between 2008 and 2009, as a result of the recession, slightly less than the UK average fall. Some areas of the UK saw a smaller fall than Wales, most notably Scotland and London whilst others were more badly affected, such as the East of England and South East of England. However, in 2010, GVA per head of population increased at 4.1 per cent in Wales, faster than in any other NUTS1 region of the UK. In 2010-11, regional GVA per capita grew more slowly (at 1.9 per cent), but only in South East England and Northern Ireland did this measure grow faster (ONS, 2012).

A number of factors are responsible for Wales' low relative (GVA) per capita including low employment rate and low average wages, reflecting low average productivity (Welsh Assembly Government, 2010a). Low productivity in Wales has been found to be associated with distance from London, population density and national versus multi-national ownership, with especially pronounced effects in rural versus urban locations (Hudson, 2009).

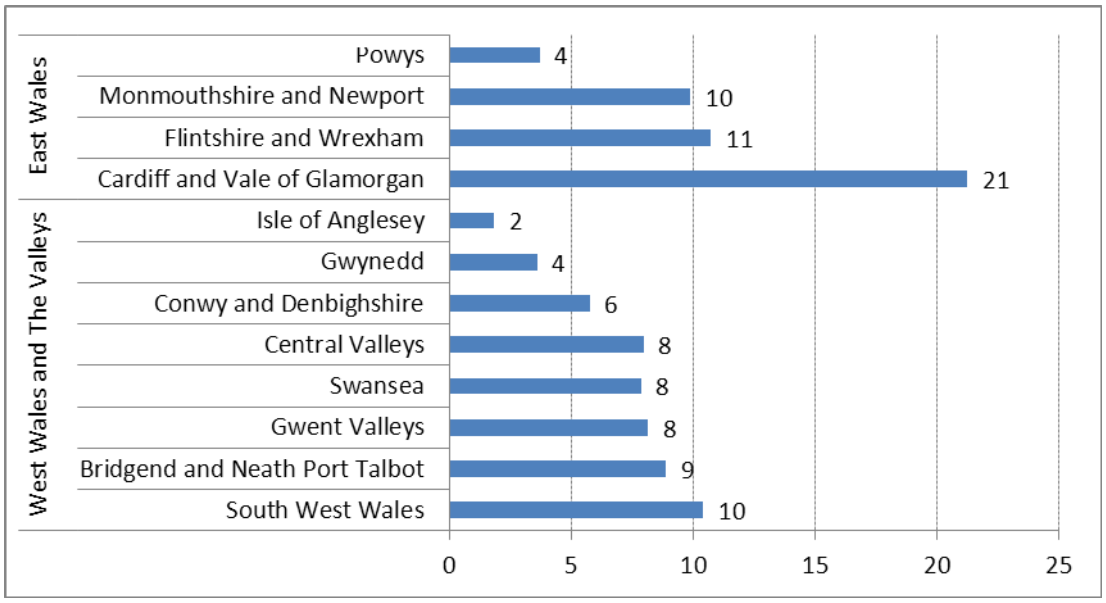
Wales, like the UK, depends heavily on international trade. Whilst the value of exports of goods in Wales is small relative to the UK, accounting for only four per cent of the UK total, as a proportion of Wales GVA the value of exports in Wales, at more than 20 per cent, actually exceeds the UK average (around 18 per cent) and is higher than any of the devolved countries and English regions, except the North East and South East of England (Department for Business, Innovation and Skills, 2010)[4].

Sub-national GVA contribution

In terms of the value of economic output, the Welsh economy is almost evenly split between the two NUTS2 regions in Wales: West Wales and the Valleys (54.5 per cent of the total) and East Wales (45.5 per cent), however around two thirds of the population live in West Wales and the Valleys. This split has remained stable over recent years. Cardiff and the Vale of Glamorgan is the most significant locality by far, in terms of its contribution, accounting for 21.2 per cent of total output in Wales (see Figure 2.4).

[4] It should be noted that these figures show exports of goods as a percentage of headline GVA which also includes services and therefore are likely to underestimate the export performance of some regions with a large share of service industries.

Figure 2.4: Sub-national share of workplace-based GVA at basic prices by NUTS Level 3 areas in Wales, 2011

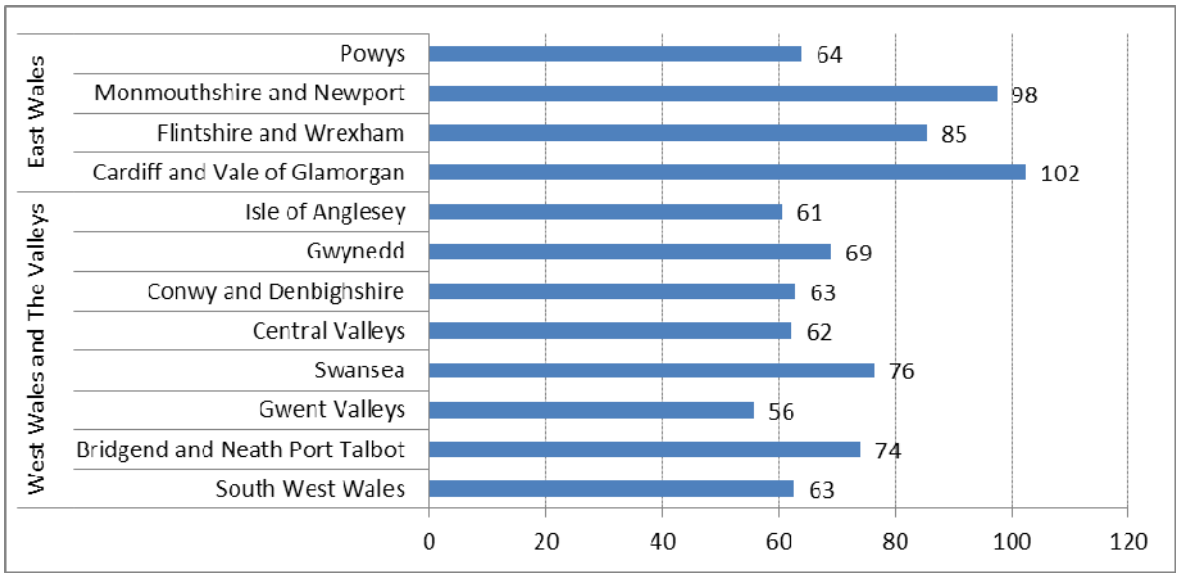


Source: ONS (2012), sub-regional GVA

There are also major differences in GVA per head within Wales. In 2011 West Wales and the Valleys had the lowest GVA per head (headline GVA per head at current basic prices) of all NUTS2 regions in the UK at 65.0 per cent of the UK average, whilst East Wales' figure was 92.5 per cent of the UK average (ONS, 2012).

With the exception of Cardiff and the Vale of Glamorgan, all NUTS3 regions in Wales had a GVA per head that was below the UK average in 2011 (see Figure 2.5). Analysis by Welsh Government indicates that there are a range of reasons for sub-national differences in GVA per head in Wales, which vary in their relative importance by locality. These include variations in the level of GVA per job, differences in the ratio of people employed relative to people of working age, variations in the ratio of people of working age to the overall population and also variations in the impact of the commuting effect.

Figure 2.5: Sub-national GVA per head index comparison with UK average, 2011 (UK=100)



Source: ONS (2012) sub-regional GVA

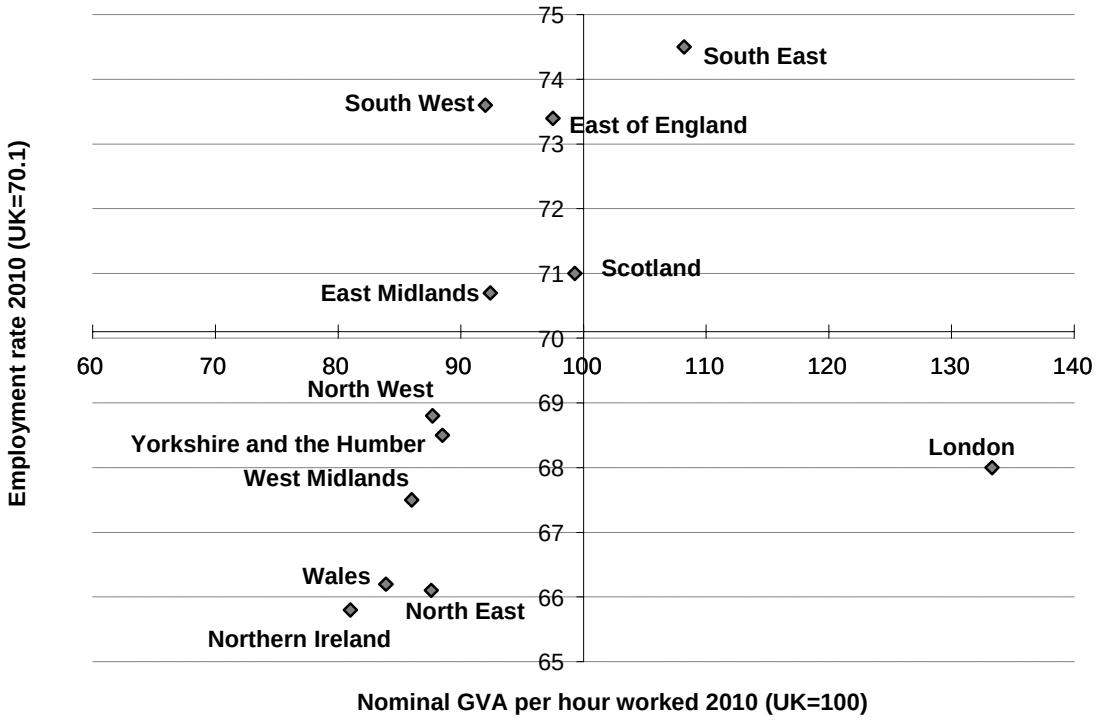
Productivity

Wales has one of the lowest levels of productivity of any area in the UK, with output per hour worked that is 81.5 per cent of the UK average[5], ranking lower than any of the English regions or Devolved Countries, with the exception of Northern Ireland (ONS, 2011).

There is some debate about the root causes of Wales' productivity deficit. Important factors appear to be an adverse skills mix, which is associated with low average wages and productivity, plus the relative absence of 'agglomeration' economies in Wales. Recent plans by the Welsh Government to develop City Regions and Enterprise Zones provides some scope for agglomeration. The associated economies derive from the presence of a large conurbation, efficiently functioning labour markets and competitive costs arising from proximity to suppliers and business services (Boddy et al., 2010).

[5] Regional output per hour worked is the ratio of Regional Accounts Place of Work Gross Value Added estimates and regional Total Workforce Hours Worked.

Figure 2.6: Productivity and employment rates in the devolved countries and English regions GVA per hour worked (UK=100)



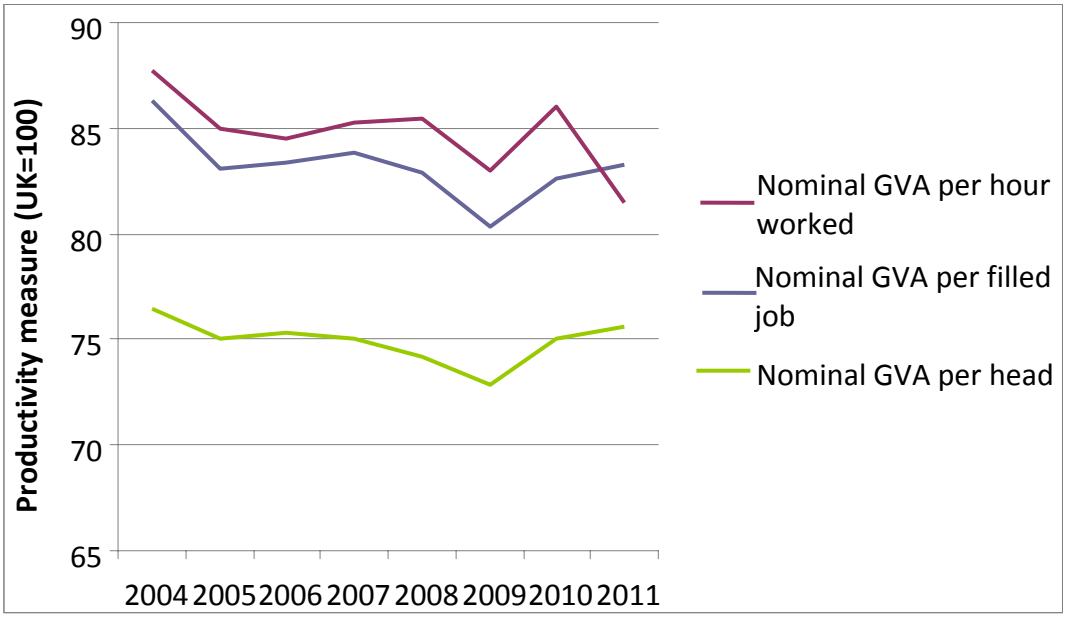
Note: Regional output per hour worked is the ratio of Regional Accounts Place of Work Gross Value Added estimates and regional Total Workforce Hours Worked

Source: ONS (2011) Labour Productivity Q3 2011. Statistical Bulletin.

Three measures of labour productivity are presented for Wales in Figure 2.7. GVA per job measures the gross level of economic output of Wales divided by the number of jobs in the Welsh labour market (some of which may be filled by people with more than one job). GVA per head divides output by the number of people living in Wales. GVA per hour worked is based the actual hours worked in the economy and would therefore take into account reductions in overtime and a shift towards part-time work. GVA per hour is generally considered the most comprehensive measure of productivity of the three[6]. All three demonstrate that productivity has been declining over the period 2004-2011, however labour productivity per hour has declined the fastest, reflecting a decline in the average hours worked by each employee.

[6] ONS Statistical Bulletin, Labour Productivity Q3, 2012, http://www.ons.gov.uk/ons/dcp171778_290542.pdf

Figure 2.7: Measures of productivity for Wales 2004-2011



Source: ONS (2012) Labour Productivity, Q2 2012.

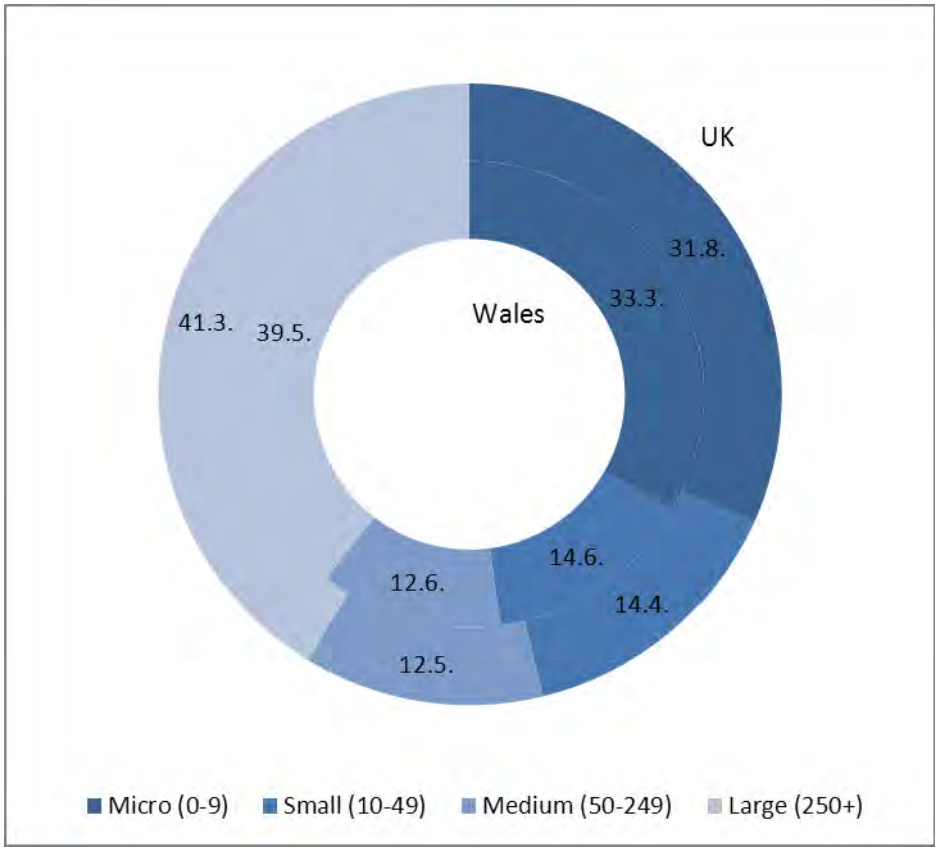
Size analysis of Welsh businesses

The size structure of businesses in Wales is similar to the average for the UK, but micro businesses were responsible for a slightly higher share of employment and large businesses provided slightly less employment, while forming a larger percentage of the total. Micro businesses represented 94.5 per cent of all private sector enterprises active in Wales in 2012, but accounted for just under a third of total employment (Figure 2.8). Medium-size (50-249 employees) and large enterprises (250+ employees), meanwhile, together accounted for 1.7 per cent of the count of enterprises but 52.1 per cent of employment. In the UK as a whole, 95.7 per cent of enterprises were micro businesses, accounting for 31.8 per cent of employment. In Wales, the 0.8 per cent of establishments with 250 or more employees accounted for 39.5 per cent of employment. In the UK as a whole, 0.1 per cent of businesses had 250 or more employees, and these large businesses accounted for 41.3 per cent of employment.

This overall picture conceals significant variation between industry sectors, with employment in agriculture almost entirely concentrated in micro businesses (92.2 per cent in Wales, compared with 75.6 per cent for the UK as a whole) and employment

in production industries concentrated in the large size-band (51.6 per cent in Wales, compared with 46 per cent in the UK as a whole).

Figure 2.8: Employment shares by employee numbers in enterprises, 2012

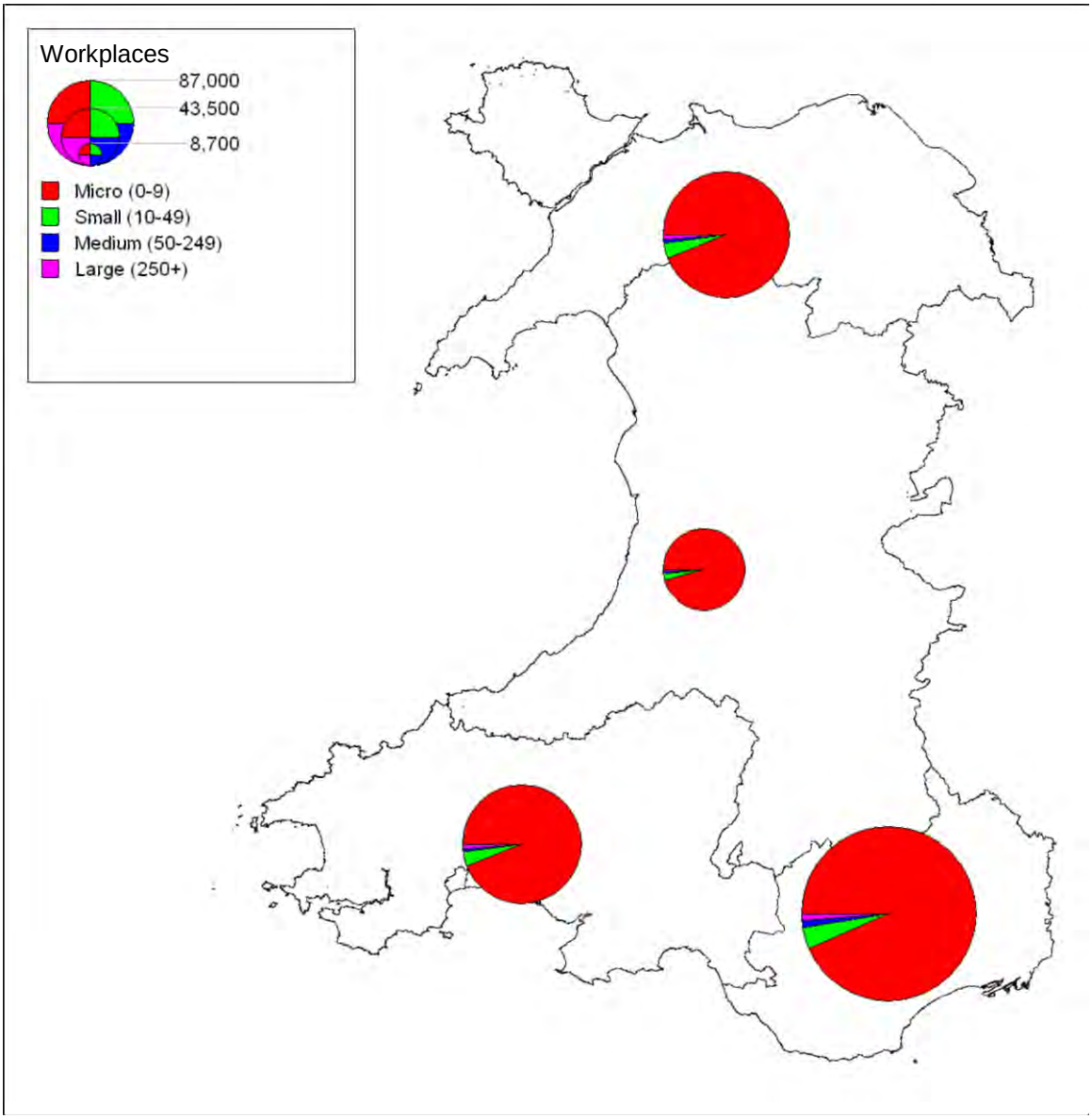


Note: relates to employment in private sector enterprises only. Local and central government organisations are excluded

Source: Statistics for Wales (2011) Size analysis of Welsh Business, 2011. First Release. SDR 198/2011.

Figure 2.9 presents the size distribution of workplaces in the four Economic Regions of Wales. There is little geographical variation across Wales, with micro businesses dominating employment in all four regions. Large businesses are present in all four regions. The absolute number of jobs which they provide is quite small in Mid Wales, but nonetheless they are significant local employers within a small employment total and within the towns in which they have employment premises eg a major retail chain.

Figure 2.9: Distribution of workplaces by size band and economic region, 2011



Source: Statistics for Wales (2012) Size analysis of Welsh Business, 2011. First Release. SDR 198

Commuting flows

According to the Annual Population Survey, there was a net outflow of 28,000 working people from Wales in 2011 (down from 32,000 in 2010). This comprised 81,700 Welsh residents working outside Wales, offset by 53,700 people resident outside Wales coming into Wales to work, in contrast with nearly 49,000 who commuted into Wales to work in 2010.

These commuting patterns are important because while a larger proportion of Welsh residents commute to England for work, the inflow of workers from England helps to address demand for skilled labour in Welsh workplaces. It is notable that the proportion of people working in Wales who are resident outside Wales is highest for skills-intensive occupations ie managers, professionals and associate professionals (because higher-skilled and better-paid workers have larger travel-to-work areas resulting from their greater ability to choose their residential location and the fact that these jobs are not found in all localities). There are quite large annual fluctuations in the level of inward and outward commuting flows, influenced by changing economic circumstances and the detailed geographical pattern of employment change. Occupational commuting trends need monitoring because of some reliance on commuting for a higher skilled labour pool.

Almost three-quarters (70 per cent) of working residents in Wales worked within the local authority area within which they lived in 2011. The largest net commuting flows within Wales were in the South East, with the biggest commuting inflows into Cardiff (50,000) and Newport (9,800) and the biggest out-commuting flows from Rhondda Cynon Taf (24,000), Caerphilly (16,500) and the Vale of Glamorgan (12,100). Elsewhere, Swansea (with net commuting of 12,000) and Gwynedd (net commuting of 4,900) attract in-commuters from neighbouring districts, whilst Flintshire has the largest out-commuting flow outside of the South East (16,300).

Growing and contracting sectors

Which sectors have seen the most growth since the early years of the century? Table 2.1 sets out the fastest / slowest growing sectors in Wales between 2005 and 2010 on the basis of the following key metrics:

- Output growth
- Employment growth
- Productivity growth
- Enterprise growth.

The fastest growing sectors across the four metrics were:

- Health and social work
- Real estate
- Electricity & gas
- Professional services
- Finance and insurance.

The contracting or slow growth sectors mainly comprise parts of the production sector including water and sewerage, engineering and construction.

Table 2.1: Growing and contracting sectors in Wales 2005 to 2010

Output	Employment	Productivity	Enterprises	Overall
		Fastest growing		
Media	Electricity & gas	IT	Electricity and gas	Health & social work
Real estate	Real estate	Other services	Health and social work	Real estate
Professional services	Agriculture	Finance & insurance	Water and sewerage	Electricity & gas
Health & social work	Professional services	Media	Mining & quarrying	Professional services
Finance & insurance	Health & social work	Engineering	Professional services	Finance & insurance
		Slowest growing		
Water & sewerage	Engineering	Agriculture	Engineering	Water and sewerage
Mining & quarrying	Rest of manufacturing	Water & sewerage	Support services	Mining & quarrying
Rest of manufacturing	Other services	Mining & quarrying	Construction	Engineering
Agriculture	Food drink & tobacco	Electricity & gas	Other services	Rest of manufacturing
Electricity & gas	IT	Construction	Rest of manufacturing	Construction

Note: The analysis is based on data for 2005 and 2010 except for the number of active enterprises where the data refer to changes between 2009 and 2011 (earlier data based on SIC 2007 were not available). Sectors are ranked according to the rate of change in the appropriate indicators. A sector with the highest rate of change achieves the highest ranking and the one with the lowest rate of change is in bottom place. The sectors are also ordered on a scale, from 0 to 1. The lowest is given the score of 0 and the highest is given the score of 1, with the remaining sectors positioned proportionately on this scale. The individual scores for each indicator are then aggregated to give a composite score.

Source: IES calculations based on Working Futures 2010-2020 and Inter Departmental Business Register

Sectors differ also in the level of 'added value' generated per person employed. This is shown in Table 2.2. Real estate is the highest performing sector on this measure, while the finance, production and information technology sectors are also strong contributors. When we look at employment, however, we can see that

some of the sectors with the largest levels of employment including retail, distribution, hotels and food,, and public administration, defence, education and health, are modest performers in terms of gross value added (GVA) per person. In sum, some sectors primarily contribute to economic growth via high levels / growth of employment, others by high levels / growth of productivity.

Table 2.2: Gross value added (GVA) per person employed in Wales by sector, 2010 (residence- based)

Industry group	GVA per worker per sector 2010 (£)
Agriculture and fishing	4,200
Production	65,400
Construction	36,900
Wholesale, retail, transport, hotels and food	25,300
Information and communication	54,200
Financial and insurance activities	76,700
Real estate activities	278,200
Professional, scientific and technical activities	23,800
Public administration, defence education and health	29,800
Other service activities	22,500
All sectors	35,600

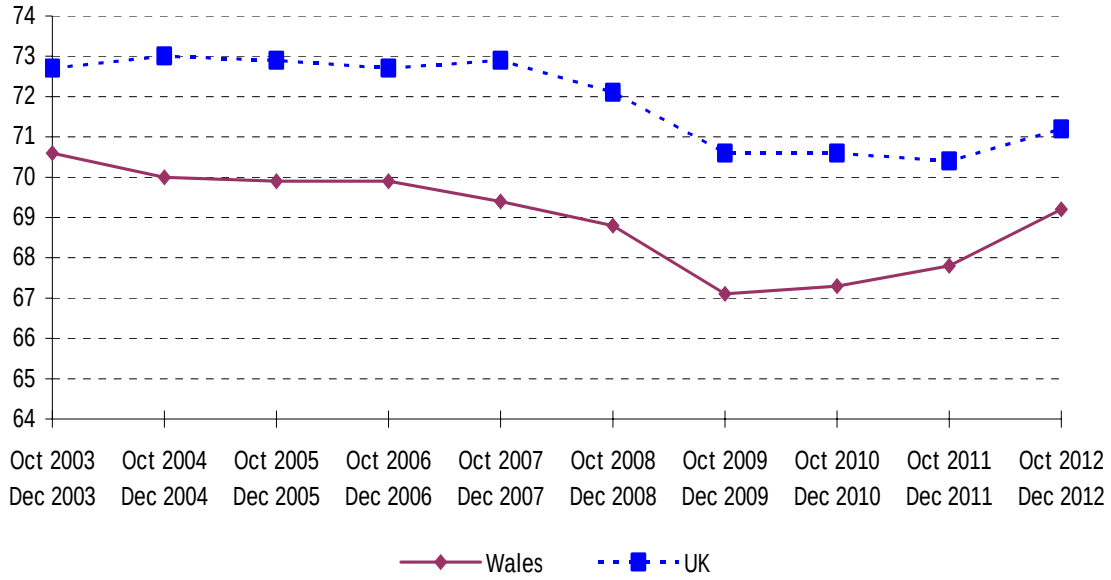
Source: IES calculated from StatsWales data (2010)

A trend towards rising employment

1.35 million people (aged 16 and over) living in Wales are in employment, while there are about 1.38 million jobs located in Wales. Although employment levels have fallen since the onset of the financial crisis, there are still more than 167,000 additional people in employment compared with 15 years ago. The demand for labour, as measured by the number of jobs being made available and filled, has therefore increased by almost 14 per cent over the period.

The employment rate (the proportion of the working age population (ie those aged 16-64) who have a job) has also risen and stood at 69.2 per cent as of the third quarter of 2012 (source: ONS Labour Market Statistics, 12 December 2012). The employment rate fell in the late 2000s but has risen, along with the employment rate in the UK in recent years (see Figure 2.10).

Figure 2.10: Employment trends in Wales 2003 to 2012



Source: Office for National Statistics: Labour Force Survey

The characteristics of the employed workforce

More men than women are in employment. Just over half (52.2 per cent) of the employed labour force are male (see Table 2.9 for the gender balance by sector and occupation) but this is lower than the 53.4 per cent of 10 years ago.

More than half of those in work in Wales are aged between 25 and 49 (see Table 2.3) and a further 29 per cent are aged between 50 and 64. Only 12 per cent are aged between 16 and 24. However, different sectors have different age profiles. For example, those employed in distribution / hospitality and energy and water are relatively young, while transport, other services and in particular agriculture have relatively old age profiles. Sectors with an ageing workforce could face a disproportionate level of 'replacement' demand for labour as older people retire, although the abolition of the compulsory retirement age and longer healthy life expectancy may mitigate this effect to some extent.

Table 2.3: People in employment in Welsh workplaces by age and sector (%)

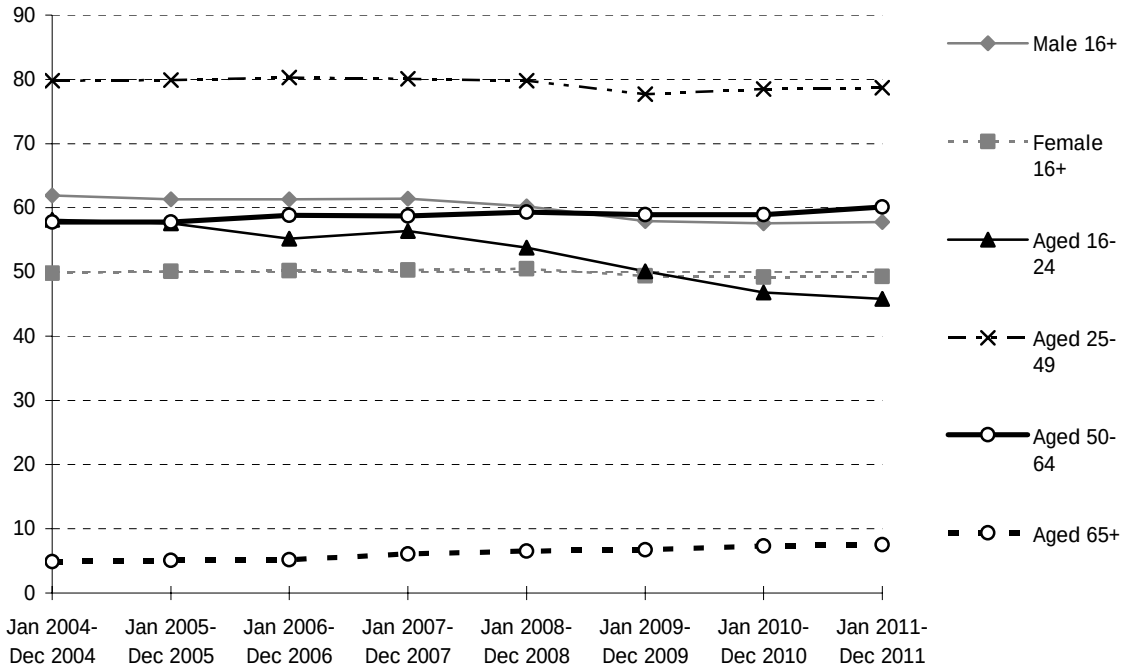
	Agriculture & fishing	Energy & water	Manufacturing	Construction	Distribution, hotels & restaurants	Transport & Communication	Banking finance & insurance etc.	Public admin education & health	Other services	Total
Aged 16 – 19 (!)	*	3	1	2	0	2	1	1	6	3
Aged 20 – 24	6	12	7	9	16	4	8	6	8	9
Aged 25 - 49	36	55	63	57	45	60	59	59	51	56
Aged 50-64	44	29	28	29	24	30	28	31	30	29
Aged 65 and over (!)	15	1	1	3	3	4	4	2	5	3
All ages	100	100	100	100	100	100	100	100	100	100

Note: industry sector relates to main job of respondent.
>25% above average >25% below average
(!) 25 and 40 responses to the survey – limited quality
* Disclosive or not sufficiently robust for publication

Source: ONS (2012) Annual Population Survey, January to December 2011

In recent years, the employment rate among older workers has risen significantly, albeit from a low base (see Figure 2.11). In 2011, 40,700 people over the age of 65 were in employment, almost 67 per cent more than in 2004, although this group still only accounts for a small proportion of the overall employed workforce (three per cent). Despite the rise, the employment rate for those over retirement age remains lower than the UK average.

Figure 2.11: Trends in employment rates by age and gender in Wales, 2004 to 2011



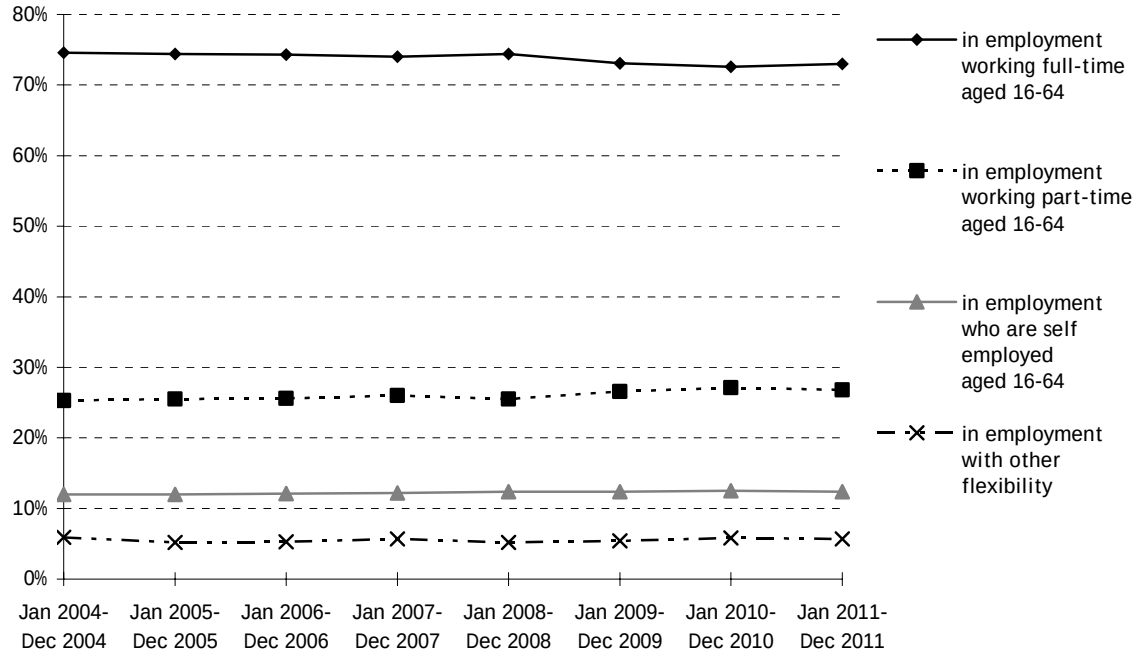
Source: ONS (2012) Annual Population Survey

Meanwhile, the employment rate for younger people has fallen steadily, from 58 per cent in 2004 to just under 46 per cent in 2011, reflecting the broad pattern for the UK.

The employment rate for men has fallen slightly, while that for women has remained fairly constant over the period 2004 to 2011.

In terms of employment status 73 per cent of people in employment work full-time, with the remaining 27 per cent working part-time (Figure 2.12). There was a small increase in the percentage of people aged 16 to 64 who were self-employed over the period 2004 to 2011, reaching 12.4 per cent in 2011. The percentage of people in employment with 'other flexibility' (mainly temporary contracts) remained fairly constant over the period from 2004 to 2011, but was lowest in the periods of economic downturn (2006 and 2008) and stood at 5.7 per cent in 2011.

Figure 2.12: Trend in employment status of people working in Welsh workplaces: 2004 to 2011



Source: ONS (2012) Annual Population Survey

Women are much more likely than men to work part-time, with 44 per cent of women and 11 per cent of men aged 16 to 64 working part-time in 2011 (Table 2.4). However, the percentage of men working part-time increased over this period, while the corresponding percentage for women remained broadly constant. Age is an important influence of part-time working. More than half of 16-19 year old men work part-time, and the percentage working part-time is highest in the youngest and oldest sections of the working age population for both genders. The percentage of younger and older workers working part-time increased markedly over this period, especially for men. For men, part-time working declines with age up to the age of 50, afterwards increasing. For women, 20-24 year olds are least likely to work part-time. While the percentage working part-time increased in all age groups for men between 2004 and 2011, this percentage fell for women aged 25 to 49.

Table 2.4: Percentage of men and women working part-time, 2004 and 2011 (%)

	2004		2011	
	Male	**Female**	**Male**	**Female**
Aged 16 - 19	46	72	59	75
Aged 20 - 24	13	32	21	37
Aged 25 - 49	4	41	6	40
Aged 50 +	14	49	18	50
Aged 16 - 64	9	44	11	44

Source: ONS (2012) Annual Population Survey

The number of people from minority ethnic groups increased its share of the workforce from 2.4 per cent in 2004 to 4.4 per cent in 2011, and the percentage of people aged 16-64 from minority ethnic groups increased from 2.5 to 4.5 per cent (Table 2.5). The migrant share of the workforce aged 16-64 increased by from 4.1 to 6.6 per cent over the same period, reflecting the high rates of international mobility experienced in the early years of the 21st century from all parts of the world, but in particular the migration of Eastern Europeans following EU expansion in 2004 and 2007. The gap between the white and minority employment rate was 11.5 per cent in 2004 and had fallen to 9.3 per cent in 2011, but this was because the white employment rate declined much faster than that for minority ethnic groups. The unemployment rate for white people was 80 per cent higher in 2011 than in 2004, while the minority unemployment rate was fractionally lower in 2004 than in 2011. However, while the impact of the current recession for people from minority ethnic groups as a whole has not been as great as for white people, particular minority groups (particularly black men and people of mixed parentage) have experienced high unemployment rates.

Table 2.5: Ethnic minorities and migrants in the workforce of Wales, 2004-2011

	2004		2011	
	All ages	**Aged 16-64**	**All ages**	**Aged 16-64**
Percent from minority ethnic groups	2.4	2.5	4.4	4.5
Percent non-UK born	3.4	4.1	5.2	6.6
Percent non-UK born white	2.2	2.5	2.8	3.5
White employment rate		69.5		67.1
Minority employment rate		58.0		57.8
Non-UK-born employment rate		67.2		67.5
White non-UK born employment rate		73.4		76.5
White unemployment rate (aged 16+)	4.6		8.2	
Minority unemployment rate (aged 16+)	11.4		12.4	

Source: ONS (2012) Annual Population Survey

Over the period 2004 to 2011, there has been a slow shift in the gender balance of employment from men to women (Table 2.6). However, there have been much larger changes in employment by age group within this overall trend. The number of young people in work has fallen, with employment for 16 to 19 year olds declining by 40 per cent for men and 33 per cent for women. There was also a small decline in the number of 20 to 24 year olds in work, but employment grew in most other age groups, except 35 to 49 year olds. The highest rates of employment increase were experienced by people aged over 50, with the number aged 65 and over in work being 65 per cent higher in 2011 than 2004 for men and 72 per cent higher for women. The number of people in the oldest age group still in work is still small, but similar to the number of 16-19 year olds in work, although far fewer women work over the age of 65 compared to men. In the normal working age range, the highest rate of increase was experienced by those aged 50 to 64.

Table 2.6: Employment change by gender and age group in Wales, 2004-2011

	2004		2011		Change 2004-2011		Percentage change	
	Male	Female	Male	Female	Male	Female	Male	Female
Aged 16-19	38,700	37,100	23,100	24,900	-15,600	-12,200	-40	-33
Aged 20-24	66,000	55,700	64,900	53,800	-1,100	-1,900	-2	-3
Aged 25-34	140,200	120,900	145,500	126,500	5,300	5,600	5	5
Aged 35-49	258,900	235,400	241,500	232,500	-17,400	-2,900	-7	-1
Aged 50-64	192,600	146,300	210,200	166,400	17,600	20,100	9	14
Aged 65+	15,300	9,000	25,200	15,500	9,900	6,500	65	72
Aged 16-64	680,900	595,200	660,000	604,100	-20,900	8,900	-3	1
Aged 16+	696,200	604,200	685,200	619,500	-11,000	15,300	-2	2

Source: ONS (2012) Annual Population Survey

Table 2.7 presents the geographical pattern of change in the number of employees within Wales over the decade from 2001 to 2011, for local authority districts and economic regions.

Table 2.7: Geographical pattern of employment change within Wales, 2001-2011

	Total employment change, 2001-2011 (thousands)	Percentage change, 2001-2011			% employees part-time 2011	Business owners as % of workers, 2011
		All employ-ment	Full-time employ-ment	Part-time employ-ment		
Anglesey	0.8	4	2	8	36	7
Blaenau Gwent	-1.8	-9	-17	8	37	3
Bridgend	7.1	16	14	20	31	3
Caerphilly	4.3	10	9	10	31	3
Cardiff	18.4	11	9	15	32	3
Carmarthenshire	7.9	15	17	12	38	5
Ceredigion	2.1	9	12	4	43	7
Conwy	3.0	9	5	14	45	6
Denbighshire	3.8	12	11	12	39	5
Flintshire	8.3	14	16	10	28	3
Gwynedd	5.6	14	14	3	39	6
Merthyr Tydfil	4.4	24	26	21	31	2
Monmouthshire	-3.2	-9	-7	-14	36	5
Neath Port Talbot	5.0	13	8	23	32	4
Newport	-0.8	-1	1	-4	31	2
Pembrokeshire	5.0	14	18	8	40	6
Powys	3.7	9	3	18	40	7
Rhondda Cynon Taf	-0.2	0	-6	14	34	3
Swansea	10.6	12	7	20	37	2
Torfaen	-1.8	-5	-1	-11	35	3
Vale of Glamorgan	-5.9	-14	-24	7	39	5
Wrexham	0.9	2	-3	12	36	3
Economic Regions						
North Wales	22.3	9	8	12	36	4
Mid Wales	5.8	9	6	12	41	7
SE Wales	26.5	5	4	8	33	3
SW Wales	23.4	13	12	15	38	4
Wales	77.1	7	5	11	35	4

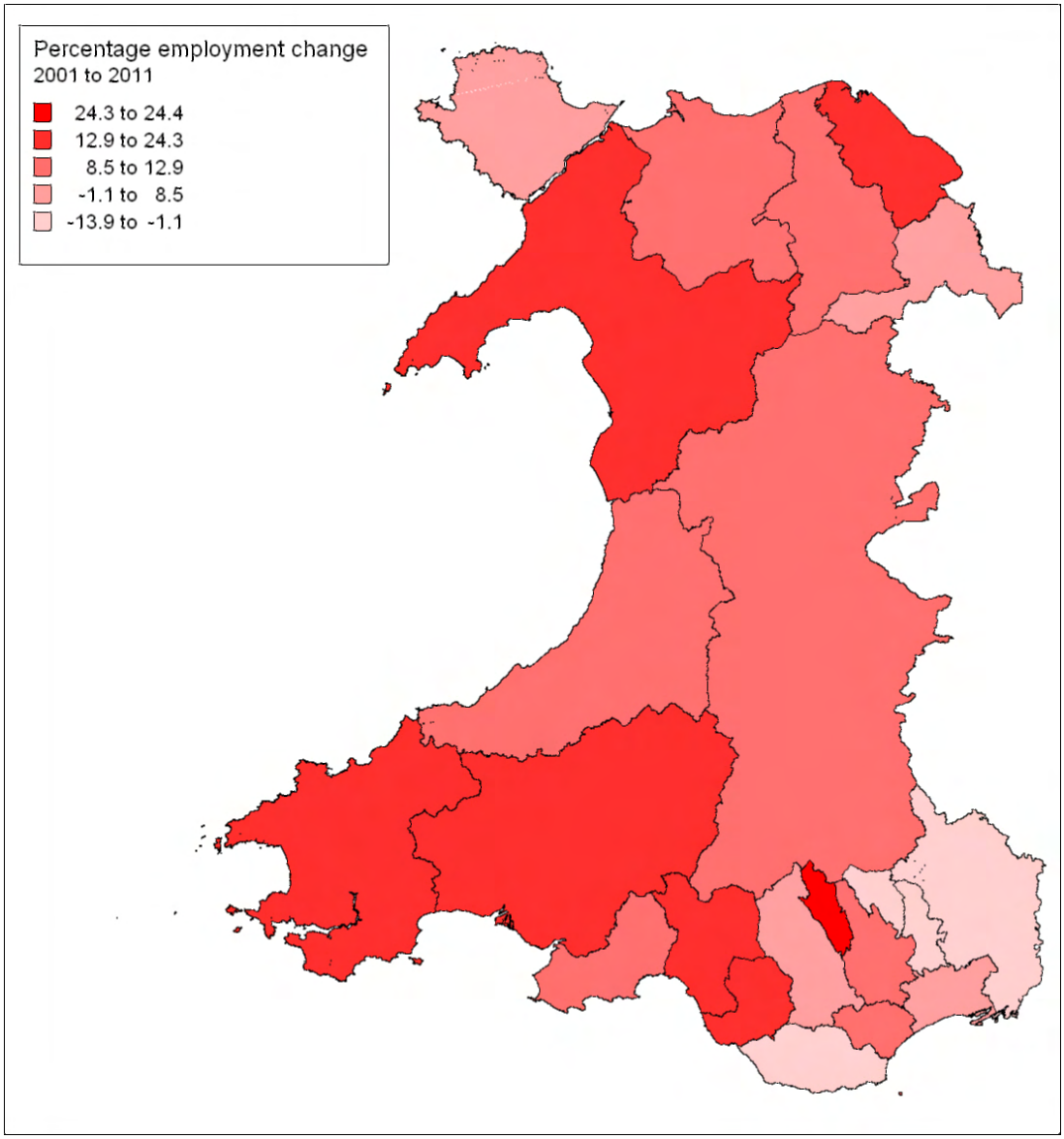
Note: Please note, the ABI and BRES are only broadly comparable sources of employment data, discontinuities exist in the data and these do not affect all local authorities in the same way.

Source: ONS Annual Business Inquiry for 2001 and Business Register and Employment Survey 2011

The overall total increased by seven per cent, with part-time employment growing twice as fast as full-time employment. By 2011, 35 per cent of employees worked part-time.

Employment increased across most of Wales, with employment loss concentrated in parts of the South East despite an overall increase of employment in the region. Here, loss of employment in Newport, Monmouthshire, Blaenau Gwent, Rhondda Cynon Taf, Torfaen and the Vale of Glamorgan was counterbalanced by job growth in Cardiff, Bridgend, Caerphilly and Merthyr Tydfil. Job growth in Cardiff may, however, be helpful in travel to work areas including the Welsh Valleys, especially if proposed improvements to the rail network take place. High rates of employment growth were also experienced in much of North, Mid and South West Wales. In most unitary authorities, the numbers of both full- and part-time jobs increased, but Blaenau Gwent, Wrexham, Rhondda Cynon Taf and the Vale of Glamorgan experienced a relative shift from full- to part-time employment. Part-time employment was most important in the more rural parts of Wales (and those in which tourism is significant) in 2011. The percentage share of business owners in the workforce was also highest in more rural parts of Wales in 2011.

Figure 2.13: Geographical pattern of employment change in Wales, 2001 to 2011



Source: ONS Annual Business Inquiry for 2001 and Business Register and Employment Survey 2011

The jobs people do and the things they make: the structure of employment

The overall structure of employment in Wales by sector and occupation is shown in Table 2.8. We can see that the sectors which employ the largest numbers of people in Wales are public administration and education and health (which alone accounts for 35 per cent of all jobs), distribution, hotels and restaurants (19 per cent) and banking, finance & insurance etc. (12 per cent). Manufacturing now accounts for one job in 10 and construction accounts for one job in 12.

Compared with the UK employment in Wales is ‘over-represented’ in public administration (35 per cent share of employment in Wales, 29 per cent in the UK) and ‘under-represented’ in business services and finance (12 per cent versus 16 per cent) and transport and communications (six per cent versus nine per cent).

The occupations that employ the largest number of people tend to be higher skilled: managers (14 per cent of employment), associate professional and technical occupations (14 per cent of employment) and professionals (13 per cent of employment). However, elementary occupations, covering lower skilled roles, also account for 12 per cent of employment in Wales.

Taken together, high level occupations (managers, professionals and associate professionals) account for two-fifths of employment in Wales (41 per cent).

Almost 12 per cent of total employment is in skilled trades, nine per cent in personal services whilst sales / customer service and operative occupations each contribute around one in 12 of people employed.

The sectoral and occupational distribution of employment is highly gendered, as shown in Table 2.9.

Table 2.8: People in employment in Welsh workplaces by occupation and sector (000s)

	Agriculture & fishing	Energy & water	Manufacturing	Construction	Distribution, hotels & restaurants	Transport & Communication	Banking finance & insurance etc.	Public admin education & health	Other services	Total	Total (%)
Managers and Senior Officials	10	17	18	15	20	15	21	8	12	180	14
Professional Occupations	~	7	8	6	1	11	15	24	10	162	13
Associate Prof & Tech Occupations	~	7	7	4	4	12	18	23	22	176	14
Administrative and Secretarial Occupations	~	10	6	5	6	9	17	15	12	138	11
Skilled Trades Occupations	56	11	24	50	9	5	6	2	7	148	12
Personal Service Occupations	!	!	!	~	1	2	2	21	25	117	9
Sales and Customer Service Occupations	!	14	2	1	32	4	6	1	1	102	8
Process, Plant and Machine Operatives	2	21	24	8	4	29	2	1	2	89	7
Elementary occupations	27	14	11	11	23	14	11	6	9	153	12
All occupations	100	100	100	100	100	100	100	100	100	1,262	100
% of employment	2	2	11	8	19	6	12	35	5	100	

Note: occupation and industry sector relate to main job of respondent.

(!) 25 and 40 responses to the survey – limited quality

(!!) 10 and 25 responses to the survey - low quality

~ Disclosive or not sufficiently robust for publication

Source: ONS (2012) Annual Population Survey, January to December 2011

Table 2.9: People in employment in Welsh workplaces by occupation and sector (women as a % of total employment)

	Agriculture & fishing	Energy & water	Manufacturing	Construction	Distribution, hotels & restaurants	Transport & Communication	Banking finance & insurance etc.	Public admin education & health	Other services	Total
Managers and Senior Officials	27	41	19	19	39	23	40	55	43	31
Professional Occupations	!	37	12	11	72	24	25	63	48	48
Associate Prof & Tech Occupations	!	~	32	33	49	35	46	66	47	53
Administrative and Secretarial Occupations	~	45	60	85	78	56	79	76	78	66
Skilled Trades Occupations	14	!	5	~	19	!	13	46	10	6
Personal Service Occupations	!	!	!	~	44	53	70	83	72	80
Sales and Customer Service Occupations	!	48	40	~	67	50	60	64	~	60
Process, Plant and Machine Operatives	!	!	21	!	8	4	!	27	~	4
Elementary occupations	33	12	21	~	58	12	41	74	68	42
All occupations	19	22	20	9	52	21	45	69	54	44

Note: occupation and industry sector relate to main job of respondent.

(!) 25 and 40 responses to the survey – limited quality

(!!) 10 and 25 responses to the survey - low quality

~ Disclosive or not sufficiently robust for publication

Source: ONS (2012) Annual Population Survey, January to December 2011

Females account for a majority of employment in administrative / secretarial and dominate personal service occupations (two-thirds of jobs in the former case and almost than four-fifths in the latter) and also in the broad industry sector of public administration, health and education. Over two-thirds of managers and senior officials are men, but there is near gender equality in professional and associate professional occupations. The vast bulk of employees in skilled trades and operative roles are men (over nine out of 10 in each case). In sectoral terms male employment dominates in agriculture, energy, manufacturing, construction and transport.

Analysis at a more detailed level reveals that around a third of female jobs are concentrated in just 20 occupations, many of which are characterised by high levels of part-time employment (see Table 2.10). The largest occupational category is caring personal service occupations, with 79,000 jobs, followed by administrative and elementary administrative occupations together accounting for 139,000 jobs. This table reveals considerable gender segregation of jobs, with women dominating those occupations in which female employment is greatest. This is a problem for future female employment prospects when women dominate declining occupations (eg the 98 per cent share of women in secretarial and related occupations).

Table 2.10: The 20 biggest female occupations in Wales by number of jobs held by females, 2011

SOC 2000 sub-major group	Number held by women 000s	% of jobs held by women
Caring personal service occupations	79	85
Administrative occupations	75	68
Elementary administration and service occupations	64	61
Sales occupations	56	66
Health and social care associate professionals	53	81
Teaching and educational professionals	49	68
Corporate managers and directors	47	35
Secretarial and related occupations	28	98
Business and public service associate professionals	26	49
Other managers and proprietors	20	41
Business, media and public service professionals	18	46
Leisure, travel and related personal service occupations	15	63
Culture, media and sports occupations	10	43
Customer service occupations	10	57
Health professionals	9	54
Textiles, printing and other skilled trades	9	38
Process, plant and machine operatives	9	19
Elementary trades and related occupations	8	16
Science, engineering and technology associate professionals	6	27
Science, research, engineering and technology professionals	5	15

Note: Workplace basis. Includes main jobs and second jobs.

Source: ONS (2012) Annual Population Survey, January to December 2011

This analysis also shows that women hold a majority of the jobs in most of these occupations. This will be a particular issue where occupations with high levels of gender segregation have significant existing and / or future skill deficits because the needs of men and women often differ.

Where have the new jobs come from?

Over the past ten years, employment in Wales has increased by 77,000, or around five per cent, but which jobs have experienced the greatest increase, and which have seen the greatest decline?

Annual Population Survey data show that there has been considerable occupational change between 2004 and 2011. Overall the bulk of employment growth has been in professional occupations (+32,000) and associate professional

occupations (+18,000) and caring and leisure occupations (+17,000). On the other hand, process operative occupations saw a decline in employment of 31,000, whilst employment in skilled trades and administrative / secretarial occupations fell by around 18,000 and 15,000 respectively. This overall trend mirrors that for the UK as a whole, although the decline in the numbers employed as process operatives was faster in Wales than elsewhere.

Table 2.11 shows the 10 fastest growing occupations between 2004 and 2011, ranked in terms of percentage growth. There was substantial growth in employment in more skilled occupations, while in intermediate and less-skilled occupations, job growth occurred in caring and customer support jobs. The number of people in health professional occupations increased by 71 per cent (an increase of 7,200 jobs). The largest increases were for corporate managers and directors (18,500 jobs) and caring personal service occupations (16,200 jobs). The other growing occupations were professionals and associate professionals in service sector industries and the public sector, but the number of professionals and associate professionals in science and engineering also increased by about an eighth.

Table 2.11: The 10 fastest growing occupations in Wales 2004 to 2011

SOC 2000 sub-major group	2004	2011	Change	% change
Health professionals	10,200	17,400	7,200	71
Caring personal service occupations	76,900	93,100	16,200	21
Business, media and public service professionals	31,600	37,700	6,100	19
Corporate managers and directors	114,200	132,700	18,500	16
Health and social care associate professionals	57,000	65,700	8,700	15
Teaching and educational professionals	61,700	71,000	9,300	15
Science, research, engineering and technology professionals	31,600	35,500	3,900	12
Customer service occupations	15,400	17,200	1,800	12
Science, engineering and technology associate professionals	18,200	20,300	2,100	11
Other managers and proprietors	42,600	47,200	4,600	11

Note: Workplace basis. Includes main jobs and second jobs.
Data are taken from the Annual Population Survey and refer to occupations categorised at the sub-major group level. Figures rounded to nearest 100.

Source: ONS (2012) Annual Population Survey, January to December 2011

The number of people working in process, plant and machine operative occupations contracted by nearly two-fifths between 2004 and 2011, representing a loss of 27,300 jobs (see Table 2.12). More skilled manual jobs declined at a slower rate, but skilled metal, electrical and electronic trades lost an eighth of employment over this period and transport and mobile machine drivers and operatives and skilled construction and building trades also lost employment relatively rapidly. These occupations tend to be male-dominated, but female-dominated secretarial and related occupations also lost 5,200 jobs (a rate of loss of 15 per cent) between 2004 and 2011. The rate of job loss in elementary occupations was slower.

This picture of occupational change largely reflects what we would expect to see, based on longer term historic trends for the UK and also reflects projected future trends as set out in Chapter 6. It should be stressed that for a number of these occupations much of the decline in employment has occurred between 2008 and 2009 (ie since the start of the recession) and in some cases may not be solely attributable to longer-term trends. The impact of the recession is explored further later in this chapter.

It is important to note that nine out of 10 occupations identified by this analysis have a dominant qualification level of level 2 and below.

Table 2.12: The 10 fastest declining occupations in Wales 2004 to 2011

SOC 2000 sub-major group	2004	2011	Change	% change
Process, plant and machine operatives	72,800	45,500	-27,300	-37
Secretarial and related occupations	33,900	28,700	-5,200	-15
Skilled metal, electrical and electronic trades	62,700	54,000	-8,700	-14
Transport and mobile machine drivers and operatives	48,400	42,900	-5,500	-11
Skilled construction and building trades	52,300	48,100	-4,200	-8
Administrative occupations	118,200	109,600	-8,600	-7
Textiles, printing and other skilled trades	25,900	24,300	-1,600	-6
Sales occupations	90,400	85,100	-5,300	-6
Elementary trades and related occupations	51,400	48,800	-2,600	-5
Elementary administration and service/ occupations	107,400	104,200	-3,200	-3

Note: Workplace basis. Includes main jobs and second jobs.
Data are taken from the Annual Population Survey and refer to occupations categorised at the 'two digit' level. Figures rounded to nearest 100.

Source: ONS (2012) Annual Population Survey, January to December 2011

Employment in the regions

How does the pattern of employment by sector and occupation vary across the economic regions of Wales?

Just under half the working population of Wales (630,000) are employed in the South East of the country. A further 24 per cent (310,000) work in North Wales and 19 per cent (245,000) in South West Wales. The remaining eight per cent (around 100,000) are employed in Mid Wales. Table 2.13 sets out the sectoral profile of the four economic regions. The key points are:

- Agriculture is of particular importance to the Mid Wales economy, relative to the other regions
- Manufacturing is of above average importance to North and South East Wales
- Business services and finance are strongly represented in South East Wales

- Public administration, education and health is an important sector for employment across the whole nation
- The distribution, hotels and restaurant sectors account for around a fifth of employment in North, Mid and South West Wales.

Table 2.13: People in employment in Welsh workplaces by sector and economic region, 2011 (percentage of regional employment)

SIC 2007 industry sections	North Wales	Mid Wales	South East Wales	South West Wales	Total
Agriculture & fishing	3.2	10.0	0.4	2.7	2.2
Energy & water	2.3	1.8	2.4	1.7	2.3
Manufacturing	13.7	7.2	10.9	6.9	10.7
Construction	8.4	8.0	7.0	8.1	7.7
Distribution, hotels & restaurants	20.0	19.6	18.5	21.8	19.4
Transport & Communication	5.3	5.1	6.9	6.6	6.2
Banking finance & insurance etc.	9.7	10.3	12.6	11.3	11.7
Public admin education & health	32.1	31.6	35.9	36.0	34.6
Other services	5.2	6.4	5.4	5.0	5.4

Note: Column percentages. Industry sector and place of work relate to main job of respondent. Percentages may not sum to 100 due to rounding.
= Relatively important sector to the region in providing employment

Source: ONS (2012) Annual Population Survey, January to December 2011

Table 2.14 presents the occupational profile of employment by economic region. This shows that South East Wales has a relatively high representation of employment in the higher level management, professional and associate professional occupations but a relatively low proportion of employment in skilled trades and semi-skilled occupations. Skilled trades are a relatively important occupation in the economies of North Wales, Mid Wales and South West Wales. These three regions also have relatively high concentrations of employment in elementary occupations. The percentage of managers and senior officials is higher than average in North and Mid Wales, while less skilled white collar occupations are relatively important in South West Wales.

Table 2.14: People in employment in Welsh workplaces by occupation and economic region (percentages of total employment), 2011

	North Wales	Mid Wales	South East Wales	South West Wales	Total
Managers and Senior Officials	14.4	16.5	14.9	10.6	14.2
Professional occupations	11.8	10.3	13.5	12.6	12.8
Associate Professional and Technical	12.7	12.0	14.9	14.0	13.9
Administrative and Secretarial	10.3	9.6	11.6	11.7	10.9
Skilled Trades Occupations	14.7	16.8	9.2	12.3	11.7
Personal Service Occupations	9.5	9.7	9.1	9.1	9.3
Sales and Customer Service Occupations	7.0	6.9	8.4	9.8	8.1
Process, Plant and Machine Operatives	7.2	5.8	6.8	6.9	7.0
Elementary Occupations	12.3	12.4	11.7	12.9	12.1

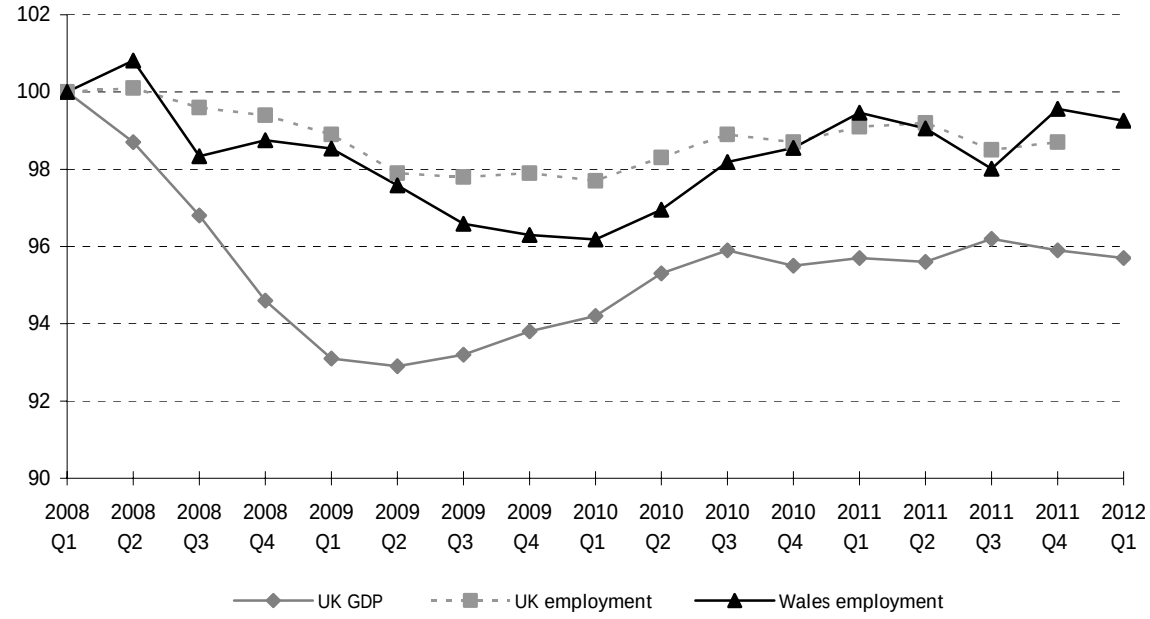
Note: Occupation and place of work relate to main job of respondent. Column percentages may not sum to 100 due to rounding.
= Relatively important sector to the region in providing employment

Source: ONS (2012) Annual Population Survey, January to December 2011

Unemployment and the recession

The contraction in employment brought on by the recession has been more pronounced in Wales than at UK level and Wales has not yet fully regained this ground. From its peak in Quarter 2, 2008 to its low point in Quarter 1, 2010, employment in Wales fell by four per cent compared with a figure of two per cent for the UK as a whole. Since then employment in Wales has grown, faster than in the UK as a whole by 10,000 in Quarter 4, 2010 and by Quarter 1, 2012 employment had grown by 40,000 and almost returned to 2008 levels (see Figure 2.14).

Figure 2.14: Employment and UK GDP growth index

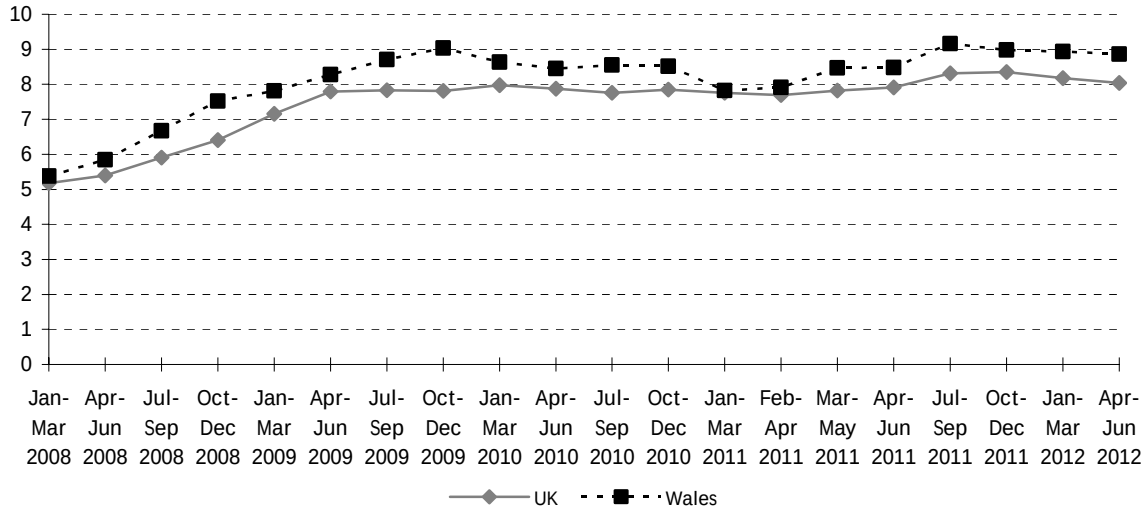


Note: Index: 2008 Q1=100

Source: ONS Gross Domestic Product (ABMI): chained volume measures, seasonally adjusted. Total employment level: Labour Force Survey, all those aged 16 and over, seasonally adjusted

In recessions, increases in unemployment tend to continue for some time after GDP starts to grow again as people continue to lose their jobs, move onto the unemployment register and take longer to find a new job and flow off again. Since the 2008-09 recession the rate of increase in unemployment has been less marked than in previous recessions, as employers appear to be retaining labour to ensure they have the skills to capitalise on in the economic recovery. This is illustrated in Figure 2.15.

Figure 2.15: Unemployment rates in Wales and the UK



Source: Labour Force Survey, all those aged 16 and over, seasonally adjusted

The (ILO measured) unemployment rate for Quarter 2, 2012 was 8.9 per cent in Wales, up from 7.8 per cent in Quarter 4, 2010, compared with an average of eight per cent for the UK. With the onset of recession, unemployment grew at a faster rate in Wales and although there are signs of convergence with the UK rate in 2010, it has remained significantly higher ever since.

Table 2.15 shows the 10 fastest declining occupations during the recession measured through change over the period 2008 to 2011. Unlike the analysis in Tables 2.11 and 2.12, the occupations are ranked in absolute terms rather than percentage terms.

Table 2.15: The 10 occupations seeing the greatest decline in Wales during the recession

Occupation	2008	2011	Change	% change
Process, plant and machine operatives	58,900	45,500	-13,400	-23
Business and public service associate professionals	60,000	52,500	-7,500	-12
Skilled construction and building trades	55,100	48,100	-7,000	-13
Skilled metal, electrical and electronic trades	59,600	54,000	-5,600	-9
Elementary administration and service occupations	109,400	104,200	-5,200	-5
Transport and mobile machine drivers and operatives	47,800	42,900	-4,900	-10
Administrative occupations	114,400	109,600	-4,800	-4
Skilled agricultural and related trades	24,300	21,300	-3,000	-12
Science, research, engineering and technology professionals	37,900	35,500	-2,400	-6
Business, media and public service professionals	39,700	37,700	-2,000	-5

Note: Data are taken from the Annual Population Survey and refer to sub-major group occupations. Figures rounded to nearest 100.

Source: ONS (2012) Annual Population Survey, January to December 2011

The largest absolute declines affected skilled and semi-skilled manual workers in manufacturing and construction and business and public service associate professionals. Job losses have been experienced in lower skilled white collar occupations.

Even in the recession, some occupations have actually grown (see Table 2.16). Areas of growth include health and social care associate professionals (including nurses), teaching professionals and managers.

Table 2.16: The 10 occupations seeing the greatest growth in Wales during the recession

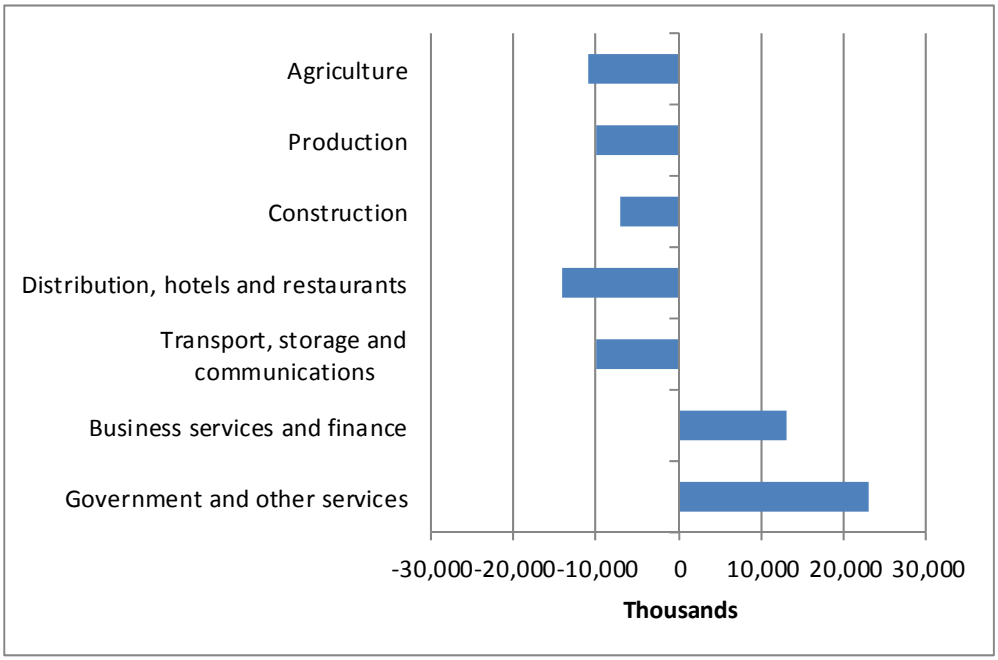
Occupation	2008	2011	Change	% change
Health and social care associate professionals	57,700	65,700	8,000	14
Teaching and educational professionals	64,900	71,000	6,100	9
Other managers and proprietors	43,200	47,200	4,000	9
Culture, media and sports occupations	21,900	23,800	1,900	9
Corporate managers and directors	131,000	132,700	1,700	1
Protective service occupations	11,900	13,500	1,600	13
Leisure, travel and related personal service occupations	23,000	24,000	1,000	4
Health professionals	16,500	17,400	900	5
Sales occupations	84,200	85,100	900	1
Textiles, printing and other skilled trades	24,200	24,300	100	0

Note: Data are taken from the Annual Population Survey and refer to sub-major groups. Figures rounded to nearest 100.

Source: ONS (2012) Annual Population Survey, January to December 2011

Changes in job volumes are related to the fortunes of different sectors, as illustrated in Figure 2.16.

Figure 2.16: Workforce jobs: change by broad sector in Wales (June 2008 to June 2012)



Source: NOMIS

The number of jobs in business services and finance and government and other services increased, with the latter increasing by 23,000 (five per cent) despite spending cuts in the public sector. Wales lost workplace jobs at twice the rate of the UK over this period (one per cent compared with 0.5 per cent for the UK). The rate of job loss for Wales was much faster in agriculture and transport, storage and communications, but the rate of growth in workplace jobs in business services and finance and government and other services was much faster.

Overall, the number of workforce jobs in Wales declined by 15,000 (one per cent) between June 2008 and June 2012. At least 10,000 workforce jobs were lost in each of four broad sectors: agriculture, the production sector, distribution, hotels and restaurants, and transport, storage and communications between June 2008 and June 2012. The relative volume of jobs lost was greatest in agriculture (28 per cent) and transport, storage and communications (12 per cent).

The skills of the workforce

We end this chapter with a brief review of the skills that are available in the current workforce. We focus in particular on skills as measured by qualification level, although, as we noted in Chapter 1, this is only one measure of skills. Table 2.17 shows that in 2011, over 30 per cent of adults resident in Wales held a qualification at level 4 or above, an increase of six percentage points on 2004 but four percentage points behind the UK average. The gap has remained fairly similar over this six year period.

Table 2.17: Highest qualification held by working age adults by CQFW level

	Wales	UK
2004		
Qualified to CQFW level 4 or above (%)	25	28
Qualified to CQFW level 3 (%)	20	20
Qualified to CQFW level 2 (%)	21	19
Qualified below CQFW level 2 (%)	17	18
No qualifications (%)	17	15
2011		
Qualified to CQFW level 4 or above (%)	32	35
Qualified to CQFW level 3 (%)	21	20
Qualified to CQFW level 2 (%)	21	20
Qualified below CQFW level 2 (%)	15	15
No qualifications (%)	11	10

Source: Stats Wales[8]

A higher proportion of women than men are qualified at level 4 or above. In 2011 34 per cent of women were qualified at this level compared with only 29 per cent of men.

The proportion of adults with no qualifications has seen a notable decline of around six percentage points between 2004 and 2011, but was still one percentage point higher than the UK in 2011. The proportion of adults qualified to level 4 or above has seen a notable increase of seven percentage points.

Around two-fifths of adults are qualified to CQFW levels 2 and 3 in Wales in 2011 (which is similar to the UK average). The percentage qualified to level 3 was one percentage point higher in 2011 than 2004.

Men were more likely to be qualified to this level in 2011. Forty-five per cent of males hold their highest qualification at level 2 or 3, compared with 40 per cent of females.

The likelihood of being in employment increases as the level of qualification held increases. The employment rate is much higher for people qualified at degree level and above than for people qualified at intermediate level, who in turn have a higher rate than low qualified and unqualified people.

[8] Credit and Qualification Framework for Wales.

Conclusions

This chapter has provided a broad brush picture of the key characteristics of jobs and skills in Wales, as this is the foundation for understanding our skill requirements.

Before the recession, the UK had enjoyed a sustained period of long term economic growth, often out-performing many other EU and OECD countries. Growth in Wales lagged behind that of the UK during this period. Productivity in Wales is 81.5 per cent of the UK average.

Around 1.35 million people are employed in Wales, over 160,000 more than 15 years ago, in spite of the impact of the recession.

The Welsh economy and labour market are globally connected and dependent, with exports of goods equivalent to over one-fifth of total GVA in Wales.

Wales' economy and jobs are strongly regionally concentrated: the economic region of South East Wales alone contributes almost half of all Wales' jobs, although employment levels have declined notably within some local areas in this region in recent years. There are also variations in regional employment and productivity levels as well as in economic structure – both sectoral and occupational.

Commuting patterns have a significant bearing on the supply of labour in Wales. Around 53,700 people commute into Wales to work. There is a net outflow of workers, however, with 81,700 Welsh residents working outside Wales.

The employed workforce is ageing. More than 40 per cent are now aged 45 or over, and the numbers of those over 64 in employment has grown by almost 67 per cent in seven years, though the age composition of different sectors does differ. Four per cent of the employed workforce is of ethnic minority origin, and this has increased from just over two per cent since 2004. The proportion of employment (aged 16-64) accounted for by those born outside the UK has increased from around four per cent to seven per cent over the same period.

The distribution of employment by occupation and sector is strongly gendered. The Welsh workforce has an almost equal gender split between men and women

(with slightly more men than women). However, men occupy the vast majority of skilled trades and operative employment while women dominate in administrative / secretarial and caring and leisure occupations. This will be a particular issue where occupations with high levels of gender segregation have significant existing and / or future skills shortages.

People also predominantly work full time: around seven out of ten do so, though ‘atypical’ employment is also considerable, and has implications for skills development. One in four works part-time, one in eight are self employed, and six per cent are on temporary contracts. And, while the vast majority of workplaces are small, employing relatively few people, in fact more than half of people in Wales actually work for medium size and large businesses with 50 or more employees.

In terms of the ‘sectoral’ structure of employment, the largest sectors are public administration, education and health, together accounting for more than one job in three. Distribution, hotels and restaurants account for around one job in five and banking, finance and insurance one in eight. Manufacturing accounts for one job in ten and construction one in 12.

In terms of the ‘occupational’ structure of employment, those which employ the largest number of people are the higher skilled groups of managers/senior officials, professionals and associate professional/technical jobs. Together, they account for over four in ten jobs.

Where have the new jobs come from in recent years? Overall, the vast bulk of growth has been in professional (+32,000), associate professional/technical (+18,000), and caring and leisure services (+17,000), roles. Employment growth has been generally concentrated in higher level occupations and has therefore been skill-intensive.

It appears that Wales and the UK have recently emerged from the deepest recession for possibly 80 years, though the impact on unemployment to date has been less marked than in the recessions of the early 1980s and 1990s. Nonetheless, unemployment has risen significantly and more markedly in Wales than in the UK. The recession has also impacted most, in terms of employment, on

lower skilled and intermediate occupations, rather than on ‘white collar’ higher skilled occupations, although some high skilled occupations have been adversely affected. Its sectoral impact has been most severe on manufacturing and transport jobs.

The qualification profile of adults in Wales is broadly similar to that of the UK, although a higher proportion hold no formal qualifications and a slightly lower proportion are qualified at level 4 and above.

3 Current Skills Needs

Introduction

Imbalances and mismatches in the labour market can take a number of forms. This chapter first illustrates the framework developed to examine current skills mismatches, which enables us to identify the key skills issues in a coherent and systematic way. In short, it is these mismatches that need to be addressed in adopting a strategic approach to skills development to meet labour market needs.

The framework set out in Figure 3.1, below, enables us to examine the degree of match/mismatch in the labour market, through examining the various components of the lack of alignment between the demand for, and supply of, skills.

Figure 3.1: Framework for assessing demand/supply mismatch

There are five components of mismatch. First, labour demand may not be fully met if the labour supply does not possess the volume/type of skills available sufficient to meet those needs. These 'skill shortages', where employers are unable to, or have difficulty in, recruiting/filling their vacancies are effectively a measure of the mismatch between demand and supply, and represent an 'excess demand' for these skills as well as a key 'pinch point' in the system.

Secondly, labour supply may exceed labour demand, giving rise to unemployment and the existence of an unused/unwanted ‘skills surplus’. These may be corrected by market trends in wages and worker behaviour, with workers responding to market signals to acquire the skills in shortage, or they may persist for a range of reasons associated with market failures or failures of public policy.

Thirdly, we can extend our analysis to the ‘internal’ labour market of organisations. It may be the case that, although employed, some workers may not be fully proficient in their job and do not meet all of their employers’ needs. This represents an internal ‘skills gap’, and is also damaging as it reduces the organisation’s capability and restricts its opportunity to fulfil its potential.

Fourthly, it may also be the case that rather than there being a ‘skills gap’ where demand (the skills required) exceeds supply (the skills available), there may be underemployment where the skills that the workforce possess are not fully utilised but rather ‘underemployed’ in their current job. This refers to staff who have both qualifications and skills that are more advanced than required for their current role.

Finally, we complete our assessment of skill mismatches by examining one final component of the employed workforce: migrants. Although employers recruit migrants for a range of reasons, if they are unable to hire domestic workers because the skills are not available in sufficient quantity or quality, they may hire employees from abroad to meet their needs. While this is beneficial for the employer and to the migrant, and indeed has no negative impact on domestic workers if the jobs would have remained unfilled, it may reduce the ‘incentive’ for domestic workers to acquire these skills. In a relatively open labour market like that in the European Economic Area (EEA), employers may ‘prefer’ on occasion to hire migrants for reasons of productivity or cost. It may also be a public policy objective to maximise employment opportunities for domestic workers, and so an assessment of the jobs that migrants hold is the final piece of our skills mismatch jigsaw. The Welsh Government works with the UK’s Migration Advisory Committee to help address this policy issue. We now examine each of the components of potential mismatch in turn.

The latest available data relating to skills shortages and skills gaps in Wales comes from the recent and robust Employer Skills Survey 2011 (UKCES 2011). This data incorporates the effects of the recession and is comparable to the findings available for the UK and the other devolved nations. This survey data is supplemented by some qualitative data relating to skills deficiencies at sectoral level obtained through the recent Sector Skills Assessment Reports produced by the Sector Skills Councils for 15 broad sectors across the UK. This offers an illustrative flavour of the kinds of occupations and types of skills needs whose volumes are reported in the ESS 2011.

The following table provides a comparison of the 'baseline' positions for Wales and the UK in respect of key indicators of skill deficit.

Table 3.1: Skills shortages and skills gaps in Wales compared to UK, 2011

	Wales	UK
% establishments with skill shortage vacancies - prompted or unprompted	3	3
Skill shortage vacancies as a % of employment - prompted or unprompted	*	*
% of establishments reporting skills gaps	13	13
Skills gaps as a % of employment	5	5

Note: '*' denotes a figure larger than zero but smaller than 0.5

Source: Employer Skills Survey 2011, UKCES

The table shows a broadly similar picture for Wales and the UK, with the proportion of establishments reporting skills gaps much higher than that reporting skills shortage vacancies.

Skill shortages: national, regional, occupational and sectoral priorities

To what extent do employers have difficulty in recruiting the people they need? In which sectors, regions and occupations are these difficulties most pronounced? Skills shortage vacancy (SSV) is a technical term used to describe a subset of vacancies, which are defined as 'hard-to-fill' because of a lack of skills, work experience or qualifications in the candidates applying for a role. This measure deals with a deficiency of skills in the labour pool external to organisations, as opposed to measuring a lack of proficiency among the internal labour pool of an organisation, known as a skills gap.

The regional picture

The number of SSVs in Wales is relatively small. Data from ESS 2011 shows that the combined number of skills shortage vacancies among employers was 5,700. However, the distribution of vacancies varies between Welsh regions, as shown in Tables 3.2 and 3.3.

Table 3.2: Skills shortages across the Welsh regions

	North	Mid	South West	South East	Total
Vacancies	4,400	3,600	5,300	12,300	25,500
Hard-to-fill vacancies	1,200	2,300	1,800	3,200	8,500
Skill-shortage vacancies – unprompted	500	1,900	700	1,200	4,300
Skill-shortage vacancies - prompted or unprompted	800	2,100	900	1,800	5,700

Note: figures may not sum to totals due to rounding

Source: Employer Skills Survey 2011, UKCES

Table 3.3: Shares of skills shortage vacancies across the Welsh regions

	North	Mid	South West	South East
Share of all employment	22	7	21	50
Share of all vacancies	17	14	21	48
Share of all HtFVs	14	27	21	37
Share of total SSVs (unprompted)	11	44	17	28
Share of total SSVs (prompted or unprompted)	13	38	17	32
Unweighted base (vacancies)	572	383	793	1,251
Weighted base (vacancies)	4,359	3,617	5,310	12,256
Unweighted base (employers with vacancies)	246	153	255	446

Source: Employer Skills Survey 2011, UKCES

This data illustrates that while South East Wales has a higher share of employment and vacancies; Mid Wales has a higher proportion of skills shortage vacancies relative to its share of employment. This may reflect high levels of dispersion in areas of economic activity, consistent with a rural economy with a lower population and more difficulty in matching jobs with people eg due to travel-to-work challenges.

The occupational picture

Skills shortages are evident across all occupations but are unevenly distributed between them as illustrated in Table 3.4.

Table 3.4: Skills shortage vacancies and SSV density by occupation in Wales

	SSVs - spontaneous /prompted (rounded to nearest 100)	% of vacancies that are SSVs - spontaneous /prompted
Managers	100	10
Professionals	500	17
Associate professionals	1,600	43
Administrative/clerical staff	200	7
Skilled trades occupations	900	34
Caring, leisure and other services staff	400	13
Sales and customer services staff	400	11
Machine operatives	600	40
Elementary staff	900	25
Total	5,700	22

Note: total numbers do not add up due to rounding

Source: Employer Skills Survey 2011, UKCES

Over one-fifth of vacancies are SSVs, as opposed to remaining unfilled due to other factors. The highest volumes of SSVs are evident among associate professional, skilled trades and elementary occupations. Higher than average shares of SSVs as a proportion of vacancies are particularly notable among associate professionals, skilled trades and machine operative occupations.

Wales has a slightly different profile of occupational skills shortages compared to other UK nations, illustrated in Table 3.5.

Table 3.5: Skills shortage vacancies by occupational type in the four UK nations

Skills shortage vacancies - (un)prompted	Wales	England	Northern Ireland	Scotland
Total	5,700	87,000	4,400	6,500
Managers	100	3,800	200	300
	1.5%	4.3%	4.0%	5.2%
Professionals	500	15,800	700	1,100
	8.5%	18.2%	16.1%	17.0%
Associate Professionals	1,600	17,400	500	600
	28.7%	20.0%	10.5%	8.6%
Administrative/clerical staff	200	6,400	300	300
	3.4%	7.4%	6.8%	5.0%
Skilled trades occupations	900	14,500	700	1,300
	16.0%	16.7%	15.8%	20.5%
Caring, leisure and other services staff	400	10,400	400	500
	7.9%	11.9%	9.0%	8.1%
Sales and customer services staff	400	6,600	300	600
	7.4%	7.6%	5.8%	9.1%
Machine operatives	600	3,900	200	800
	10.3%	4.4%	3.7%	12.1%
Elementary staff	900	7,400	200	900
	16.2%	8.5%	3.5%	14.4%
Unclassified staff	-	800	1,100	-
	-	0.9%	24.9%	*

SSV levels in Wales high relative to other UK nations

SSV levels in Wales low relative to other UK nations

'-' denotes a figure of zero.
'*' denotes a figure larger than zero but smaller than 0.5.

Source: Employer Skills Survey 2011, UKCES

Compared to other UK nations, Wales has a lower proportion of SSVs among managers and professional staff, and a relatively high proportion of SSVs concentrated among associate professionals and, to a lesser extent, elementary staff.

The sectoral picture

The distribution of skills shortages by sectors across Wales compared to the UK overall is illustrated in Table 3.6.

This illustrates that Wales has higher reported SSV densities (calculated as the percentage of vacancies) within most sectors compared to the UK, except for wholesale/retail, public administration, education, and community, social and personal services. This is accounted for by the higher SSV density in Mid Wales compared to the other economic regions, which are closer to the UK average. Wales also has a higher proportion of SSVs per 1,000 employees across most sectors except for wholesale/retail, financial services, community/social/personal services, manufacturing, construction, public administration and education.

The highest volumes of Welsh SSVs are found in hospitality/catering, manufacturing and business services. The highest density of SSVs is found in business services, where 39 per cent of vacancies are due to a lack of applicants with the required skills, qualifications or experience. Two-thirds (67 per cent) of the SSVs in business services related to associate professionals.

Evidence from SSC data illustrates the kinds of vacancies that are difficult to fill due to skills shortages and the reasons for this. The kinds of occupations identified as having common skills shortages by Lantra across the UK are:

- Skilled trades: sprayer operator, seed drill and fertiliser operators, stockperson, forestry/arboricultural worker, ground worker, tree climber, establishment/harvesting contractors, husbandry person, fisherman, fish farm worker, ghillie[9]
- Elementary groups: basic stockman, farm worker, general forestry/arboricultural worker (2012).

Among agricultural occupations, Lantra notes low levels of interest in some types of jobs. Reasons for retention difficulties are cited as long / unsocial hours, unattractive conditions of employment, geographic location and the nature of work being too difficult or physically and mentally tiring (Lantra, 2012).

In the manufacturing sector, recruitment difficulties are most likely to be found in skilled trades occupations. Difficulty in recruitment and particularly retention

[9] Ghillies advise and inform anglers on the best spots to fish and the tackle to use. They can be hired for the day on a fishery or on other waters they have experience of. Qualified guides are experienced anglers and are a very good source of information and knowledge.

problems identified within the manufacturing sector more acutely for Wales than England included: insufficient numbers of people interested in the work, unattractive hours/conditions, location of the employer, impact of the benefits trap and lack of experience among applicants (SSC Manufacturing Consortium, 2012).

In the hospitality sector, the most common types of vacancies are found in elementary occupations eg bar and waiting staff (Galbraith and Bankhead, 2012). Chefs are also a common type of occupational skills shortage, especially in niche areas such as Asian/Oriental cuisine where recruitment restrictions on migrant workers have been introduced.

Across the professional services sector, most skill shortage vacancies occur in associate professional occupations where niche, specialist skills are required.

Table 3.6: Skills shortage vacancies and SSV density by sector in Wales and UK

	Unwtd base - Wales	*Unwtd base – UK*	SSVs – Wales	SSVs – UK	Employ-ment Wales	Employ-ment UK	% of vacancies that are SSVs – Wales	% of vacancies that are SSVs – UK	SSVs per 1,000 employees –Wales	SSVs per 1,000 employees –UK
Overall	*6,012*	*87,572*	5,700	103,500	1,182,300	27,547,100	22	16	5	4
Agriculture	*102*	*939*	500	2,600	28,500	373,800	**	26	17	7
Manufacturing	*468*	*7,704*	600	9,500	138,700	2,454,800	27	24	4	4
Electricity, gas and water	*111*	*1,426*	100	500	14,800	275,600	**	10	9	2
Construction	*503*	*6,654*	300	5,400	64,300	1,435,900	*28*	19	4	4
Wholesale and retail trade	*1,069*	*15,340*	400	11,800	192,600	4,493,500	12	13	2	3
Hotels and restaurants	*675*	*8,471*	500	8,800	79,600	1,739,700	21	15	7	5
Transport, storage and communications	*439*	*7,885*	500	9,100	63,800	2,230,200	25	15	8	4
Financial services	*173*	*1,881*	100	4,300	30,000	1,048,700	**	18	3	4
Business services	*791*	*14,488*	1,800	26,900	131,400	4,575,000	39	19	13	6
Public administration	*130*	*1,617*	100	3,200	88,300	1,568,200	*4*	11	1	2
Education	*391*	*5,439*	100	3,700	117,000	2,538,500	5	11	1	1
Health and social work	*580*	*8,161*	400	6,700	183,400	3,509,200	13	10	2	2
Community, social and personal services	*558*	*7,379*	300	10,200	48,000	1,247,600	18	22	7	8

NB Totals do not sum due to rounding and figures for mining and quarrying cannot be reported due to small numbers but still contribute to totals. '**' % of vacancies that are SSVs cannot be reported due to small base sizes (under 25). Figures in italics denote base size <50: treat figures with caution.

Source: Employer Skills Survey 2011, UKCES

Qualification deficits

As this analysis shows, skills shortages are mostly concentrated in 'intermediate' level jobs/skills, primarily associate professional / technical and skilled trades roles. It is worth considering whether skills shortages may be linked to changes in the overall qualification profile of the working population. In practice, evidence shows that the level of qualifications held by the Welsh population has been rising over recent years.

We can infer from Table 3.7 that just over a quarter of the Welsh working age population are not qualified to level 2, while 31.5 per cent were qualified to a minimum of level 4 and 20.9 per cent were qualified to level 3 in 2011. The proportion qualified to level 3, which is the level most closely associated with intermediate jobs, has grown slowly over the period 2001/11. However, there has been a much faster increase in the proportion qualified to level 4 and above. The number with no or low qualifications has nearly halved.

Table 3.7: Level of highest qualification held by adults of working age in Wales, 2011

Calendar year	Level 4 and above (%)	Qualified to CQFW level 3 (%)	Qualified to CQFW level 2 or above (%)	No qualifications (%)
2001	22.1	17.4	60.4	21.5
2005	25.8	19.3	66.4	16.2
2011	31.5	20.9	73.9	11.0

Source: Statistical Bulletin: The Levels of Highest Qualification held by Working Age Adults in Wales, 2011, SB111/2012

We can examine the data on qualification levels by occupation in order to see what proportion of those in a particular job are qualified to a minimum 'appropriate' level. However, allocating the 'right' minimum level to the 'right' occupation is not straightforward. For instance, while there may be widespread agreement that people in 'professional' occupations should be qualified to at least level 4, in some sectors managers could also be expected to be qualified at level 4, while in others level 3 might be more appropriate. Nonetheless, it is useful to assess the proportion of workers without minimum qualifications 'appropriate' to their occupation, as it provides an additional perspective on the question of skills deficits, because public policy interventions often focus on the development of formal qualifications. The definition we have used is as follows: the proportion of managers and professionals without level 4+; the proportion of associate professional/technical workers who do not

hold a level 3+; and the proportion of workers in other occupations without a level 2+. The results of the analysis are presented in Table 3.8.

Table 3.8: Proportion of workers without minimum 'appropriate' qualifications for their occupation, 2011

Occupational group	Wales (%)	UK (%)
Managers and professionals (below CQFW level 4)	25	25
Associate professional and technical (below level 3)	29	26
Other occupations (below level 2)	26	26
All occupations below appropriate qualification level	26	26

Note: Residence basis. Occupation is based on main job of respondent.

Source: ONS (2011) Annual Population Survey, January to December 2011

It is notable that the deficit is highest among associate professional and technical occupations where 29 per cent of workers report their highest qualification is lower than level 3. This is also the only major distinction between Welsh and UK qualification deficits.

The following table shows that the proportion of workers in Wales affected by a notional qualification deficit appears to have fallen to a notable extent in recent years, across most categories.

Table 3.9: Change in the proportion of workers without minimum 'appropriate' qualifications for their occupation in Wales 2004-2011

Occupational group	2004 (%)	2011 (%)	Change (percentage points)
Managers and professionals (below CQFW level 4)	35	25	-10
Associate professional and technical (below level 3)	25	29	4
Other occupations (below level 2)	33	26	-7
All occupations below appropriate qualification level	32	26	-6

Note: Residence basis. Occupation is based on main job of respondent. Percentage point change may not appear to sum due to rounding. Please also note that the definitions of some occupational groups including managers changed between SOC 2000 and SOC 2010 and so any change over time should be treated with caution. The 2004 figures differ from those in the NSSAW 2011 report due to a different method of calculation

Source: ONS (2011) Annual Population Survey, January to December 2011 and January to December 2004

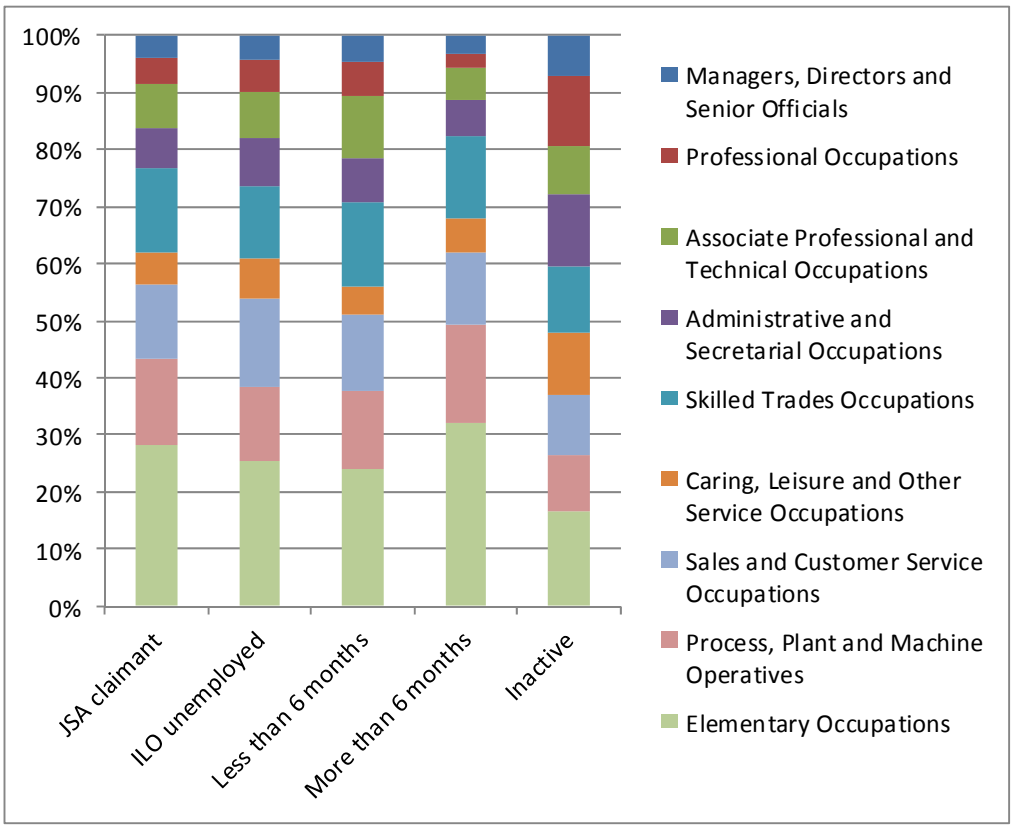
Managers and professionals and other occupations saw a decline in such deficits, with the decline particularly marked among managers (which saw falls of 10 percentage points respectively). The proportion of workers in associate professional and technical roles without appropriate qualifications increased between 2004 and

2011. Although the two sets of data are not strictly comparable the extent of the change could be interpreted as evidence of growing demand from employers for qualifications and associated skills. It is at least partly a reflection of supply side factors, particularly the number of qualified young people entering the labour market.

The skills of the unemployed

Figure 3.2 shows that the occupational distribution for unemployed people in Wales is significantly different from those in work and, indeed, from the main sources of jobs growth in the labour market.

Figure 3.2: Previous occupation of inactive and unemployed adults in Wales



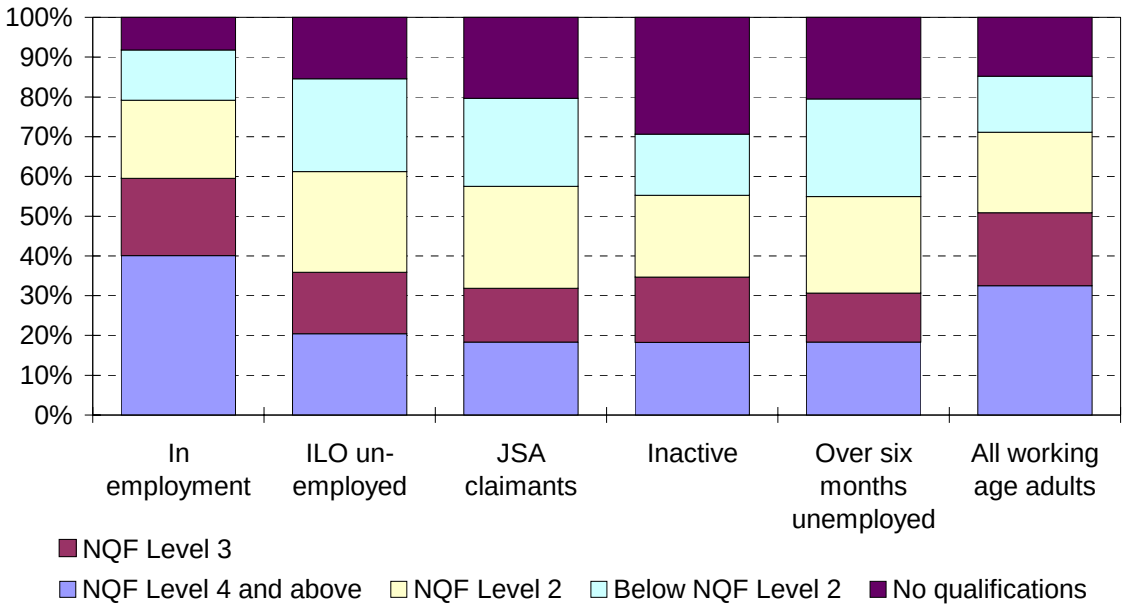
Source: ONS (2011) Annual Population Survey, January to December 2011

We see that 43.4 per cent of Jobseeker's Allowance (JSA) claimants, 38.4 per cent of the ILO unemployed and 49.3 per cent of the longer term unemployed were previously in operative or elementary occupations. This is between twice and four times the proportion of the unemployed found in the 'top' three occupational groups (managers, professionals and associate professionals). There is a significant mismatch between the jobs that need to be done and the jobs that the unemployed may be able to do without significant up-skilling. This represents a major 'surplus' of skills that are not in high demand in the labour market. This problem is even more

severe for those on the JSA and the long-term unemployed than for the short term unemployed and economically inactive.

Figure 3.3 provides a picture of the qualifications of the unemployed and compares this to the qualifications of those in work.

Figure 3.3: Highest level of qualification for unemployed and economically inactive adults in Wales



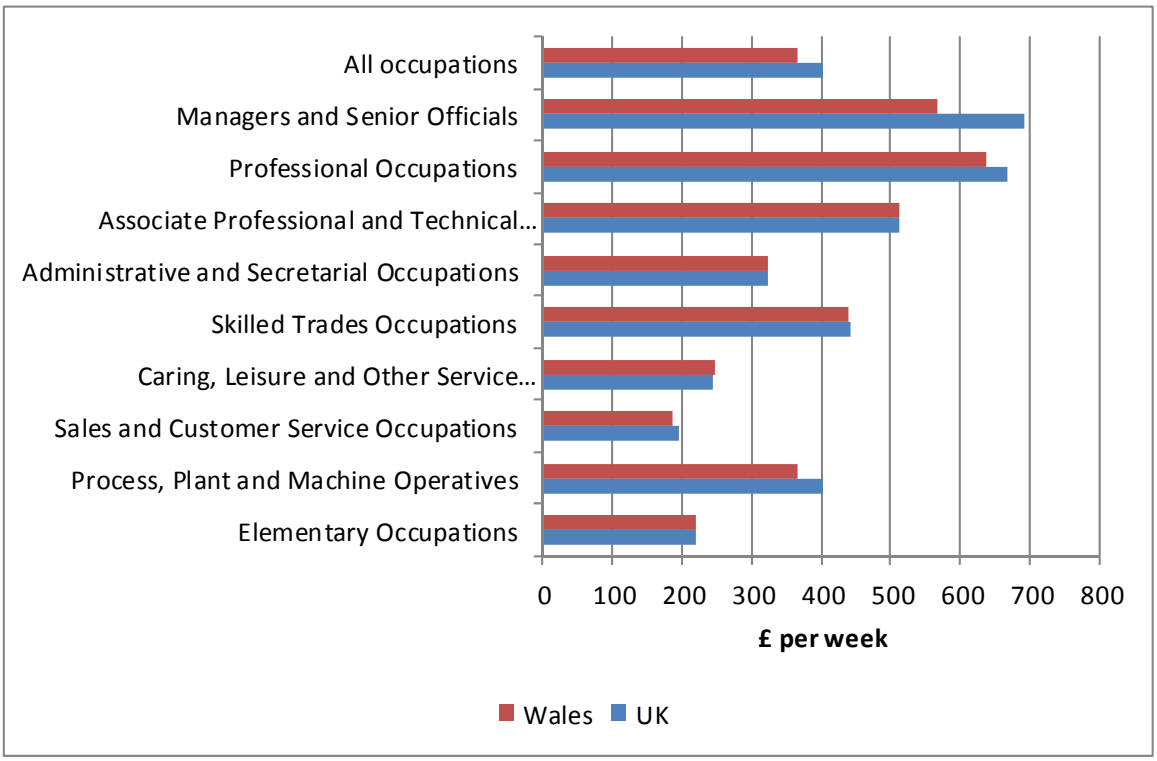
Source: ONS (2010) Annual Population Survey, January to December 2011

At both the top and bottom of the qualification distribution we can see that the unemployed have substantially lower qualifications levels than those in employment. For example, under ten per cent of those in work have no qualifications compared to over 20 per cent of the longer term unemployed. Nevertheless, it is still the case that, for example, one in five of the ILO unemployed have a level 4 qualification and more than one third have a qualification at level 3 or above. So, while there is a substantial mismatch between the skills of those not in work (as measured by qualifications and their previous job) and those in work, it is also the case that many have at least the qualification level that mirrors that of those in work. Whether these skills are appropriate for the job opportunities available is another question.

Wages

Level of earnings is an important indicator of the balance between supply and demand of labour across the various occupations. Figure 3.4 shows the wide differences in wage levels between the major occupational groups in Wales.

Figure 3.4: Median gross weekly earnings of employees in Wales and the UK by occupation April 2011



Source: ONS Annual Survey of Hours and Earnings, 2011

Median gross weekly pay for all employees in Wales was £366.50 in April 2011. The three higher-skilled occupations of managers, professionals and associate professionals each attracted median rates of pay that were well above this figure. The occupational major group with the highest median gross weekly earnings was professionals at £639.20. On the other hand, sales and customer service occupations were the lowest paid with median earnings of £186.50. Caring, leisure and other services and elementary occupations also displayed median rates of pay that were well below the overall median. Skilled trades occupations have median rates of pay well above that for all occupations.

Median weekly pay in Wales was around 90 per cent of the overall figure for the UK. With the key exception of managers (paid 82 per cent of the UK average), differences in earnings between Wales and the UK were smaller for individual occupational groupings. This suggests that the overall earnings gap between Wales and the rest of the UK is at least partly explained by the occupational mix with for example a higher proportion of the UK labour force in professional occupations in the UK as a whole than in Wales, while Wales has a higher proportion of process and machine operatives (Welsh Assembly Government, 2011d).

Analysis by Welsh Government points towards an overall shift in recent years toward the highest paid occupations in terms of employment and hours worked but combined with a polarisation of employment between the highest and lowest paid occupations. One explanation for this focuses on the substitution of technology and particularly computers for human labour in skilled but routine tasks, such as book keeping and precision manual jobs. Because of the skills required, these occupations are not at the bottom of the earnings distribution. By contrast, technology cannot be substituted for the non-routine functions of the highly paid professional and managerial occupations and, to a lesser extent, the functions of 'unskilled' jobs that are easy for the vast majority of humans to undertake but difficult for machines to replicate (Welsh Assembly Government, 2008).

Turning to wage returns to qualifications, the main message from the evidence at UK level is that higher levels of qualification attract higher wage returns. Academic qualifications carry a premium over vocational qualifications and higher level vocational qualifications carry a premium for level 4 and above. However, when the time taken to study for qualifications is taken into account the gap between vocational and academic qualifications narrows because of the longer study time required for the latter. Returns to qualifications vary between sectors and there are occupational patterns to the returns to intermediate vocational qualifications with skilled occupations and personal service occupations providing the largest premia (Garrett and Campbell, 2010). The evidence suggests that the general patterns at the aggregate UK level are replicated in each of the four countries of the UK, including Wales (Dickerson, 2008).

Skills gaps: the national, occupational, sectoral and regional picture

We now turn to the existence of skills gaps within the existing employed workforce. Skills gaps arise where employees are seen to be not fully proficient in their job.

The national and regional picture

Data on the incidence of skills gaps among business establishments are available from the Welsh sample from the UK Employer Skills Survey 2011.

Table 3.10: Distribution of skills gaps in Wales and the UK

Country	*Unwtd base*	% of establishments with any skills gaps	Number of staff not fully proficient, ie number of skills gaps	% of staff reported as having skills gaps
Wales	*6,012*	13	53,700	5
UK	*87,572*	13	1,489,500	5

Source: Employer Skills Survey 2011, UKCES

This shows that Wales and the UK have a relatively similar incidence of skills gaps, and while the share of staff with skills gaps is relatively small, a considerable number of workers are affected in each nation.

The distribution of skills gaps varies across Wales and is illustrated in the following table.

Table 3.11: Regional skills gaps in Wales

Region	*Unwtd base*	% of establishments with any skills gaps	Number of employees not fully proficient (ie number of skills gaps)	% of staff reported as having skills gaps	Share of employ-ment	Share of all skills gaps
Total	*6,012*	13	53,700	5	100.0	100.0
North	*1,431*	13	12,900	5	22	24
Mid	*798*	10	4,600	6	7	9
South West	*1,389*	12	10,400	4	21	19
South East	*2,394*	15	25,800	4	50	48

Source: Employer Skills Survey 2011, UKCES

The highest incidence of workplaces reporting skills gaps occurs in the South East, which has the highest density of workplaces and employment and the highest share of skills gaps. However, the proportion of staff with skills gaps is marginally higher in Mid Wales than other regions and the share of skills gaps is marginally higher in North Wales than its share of employment.

Table 3.12: Distribution of skills gaps by size of establishment in Wales and UK

Size of workplace (number of employees)	*Unwtd base - Wales*	*Unwtd base – UK*	% of establishments with any skills gaps Wales	% of establishments with any skills gaps UK	Number of staff not fully proficient, ie number of skills gaps Wales	Number of staff not fully proficient, ie number of skills gaps UK	% of staff reported as having skills gaps Wales	% of staff reported as having skills gaps UK	Share of employment by size of workplace Wales	Share of employment by size of workplace UK	Share of all skills gaps Wales	Share of all skills gaps UK
1-4	*1,216*	*18,955*	6	6	4,400	89,700	3	3	11	11	8	6
5-24	*3,474*	*47,770*	21	23	15,100	352,900	5	6	25	*23*	28	24
25-99	*1,074*	*15,951*	32	37	13,400	372,000	5	5	24	*25*	25	25
100-249	*151*	*3,270*	41	44	11,500	235,700	7	6	14	14	21	16
250+	*97*	*1,626*	41	47	9,400	439,300	3	6	26	27	17	29

Source: Employer Skills Survey 2011, UKCES

This data illustrates a similar incidence and density of skills gaps across businesses of different sizes in Wales and the UK. Only medium-sized businesses with 100-249 workers report a slightly higher proportion of staff with skills gaps in Wales compared to the UK. Businesses employing between 1-24 and 100-249 staff also have a higher share of skills gaps in Wales compared to those of the same size in the UK.

The occupational picture

The share of skills gaps across occupations in Wales and the UK is shown in the table below.

Table 3.13: Occupational skills gap profile in Wales compared to the UK

Occupation	% share of skills gaps Wales	% share of skills gaps UK
Managers	9	11
Professionals	4	9
Associate professionals	5	6
Administrative and clerical staff	11	11
Skilled trades occupations	11	7
Caring, leisure and other services staff	12	8
Sales and customer services staff	15	19
Machine operatives	12	8
Elementary staff	19	20

Source: Employer Skills Survey 2011, UKCES

This illustrates that Wales has a proportionately higher share of skills gaps concentrated among skilled trades, caring/leisure/services staff and machine operatives than the UK average. This reflects the occupational distribution of employment in Wales with higher proportions of workers in these occupations.

The sectoral picture

- The highest incidence of skills gaps in Wales is found in public administration, education, hotels/restaurants, wholesale/retail and manufacturing.
- The trends are similar to the UK, with higher incidences of skills gaps being found in wholesale/retail and transport/communications sectors in Wales. The highest shares of staff with skills gaps are found in the hotel and restaurant, and electricity/water/gas sectors in Wales.

Table 3.14: Sectoral distribution of skills gaps in Wales and UK

Sector	*Unwtd base - Wales*	*Unwtd base – UK*	% of establishments with skills gaps Wales	% of establishments with skills gaps UK	Number of staff with reported skills gaps Wales	Number of staff with reported skills gaps UK	% of staff with skills gaps Wales	% of staff with skills gaps UK	% share of employment Wales	% share of employment UK	% share of skills gaps Wales	% share of skills gaps UK
Overall	*6,012*	*87,572*	13	13	53,700	1,489,500	5	5	100	100	100	100
Agriculture	*102*	*939*	3	9	600	15,700	2	4	2	1	1	1
Manufacturing	*468*	*7,704*	17	17	8,500	145,500	6	6	12	9	16	10
Electricity, Gas and Water	*111*	*1,426*	15	16	1000	15,500	7	6	1	1	2	1
Construction	*503*	*6,654*	11	11	2,200	66,900	3	5	5	5	4	4
Wholesale and Retail	*1,069*	*15,340*	17	16	10,300	293,700	5	7	16	16	19	20
Hotels and Restaurants	*675*	*8,471*	18	21	5,900	155,300	7	9	7	6	11	10
Transport, Storage and Communications	*439*	*7,885*	14	9	2,400	99,300	4	4	5	8	4	7
Financial Services	*173*	*1,881*	15	17	1,100	46,200	4	4	3	4	2	3
Business Services	*791*	*14,488*	9	9	6,200	223,100	5	5	11	17	12	15
Public Administration	*130*	*1,617*	18	20	1,600	83,200	2	5	8	6	3	6
Education	*391*	*5,439*	17	19	4,000	94,900	3	4	10	9	8	6
Health and Social Work	*580*	*8,161*	16	18	7,700	180,400	4	5	16	13	14	12
Community, Social and Personal Services	*558*	*7,379*	12	13	2,200	68,200	5	5	4	5	4	5

Source: Employer Skills Survey 2011, UKCES NB Figures for mining and quarrying cannot be reported due to small numbers but still contribute to totals

- Shares of staff with skills gaps are generally higher in the UK than in Wales, with the exception of the electricity, water and gas, where a higher share is found in Wales than the UK overall.
- There is some difference in the sectors with the highest share of skills gaps in the UK and Wales. While wholesale/retail has the highest overall share across all nations, manufacturing has the second highest share in Wales, compared to business services in the UK overall.

Qualitative evidence from some of the recent Sector Skills Assessment reports provides information on the likely nature of some of the skills gaps within the sectors.

For example, the key need for improved customer service skills within the hospitality industry needs interpreting within each organisation's context and strategy. Research shows that 'customer service' may refer to a variety of skills and attributes including communication and product knowledge (Galbraith and Bankhead, 2012). One of the major skills gaps reported for chefs is cooking fresh ingredients as this represents a trend away from reheating prepared products. Management skills gaps may arise because of the relative youth and early promotion opportunities gained by new entrants to management roles. Other skills required among higher skilled occupational groups include IT skills for owner managers and leadership skills for those in larger businesses.

Within the retail sector, skills gaps focus on the need to adapt to the demands of online retailing, including ordering and delivery processes which may be undertaken through third parties. Smaller retailers may need particular support to achieve this and to undertake marketing through social media tools (Mosley et al., 2012).

A wide range of skills needs is reported for the manufacturing sector, reflecting the diversity of industries it encompasses (Manufacturing Consortium of SSCs, 2012). This includes knowledge of business improvement techniques including lean production and process efficiency systems, development of innovative capacity and skills in product marketing, supply chain management and product development within multiple networks, management of intellectual property rights, STEM skills to

apply and commercial innovations in a number of new technologies including nanotechnologies, metamaterials, interdisciplinary skill set of both the laboratory and production scale in chemical/pharmaceutical manufacturing, export market management skills.

The types of skills causing skills gaps

It is helpful to know more about the kinds of skills that employers find lacking in their workforce. This is illustrated in Table 3.16 which shows the nature of skills gaps by occupation.

- The types of skills gaps most frequently reported in different occupations across sectors are job specific skills. This is the single most frequent need reported for professionals, associate professionals, administrative/clerical, skilled trades occupations, machine operatives and elementary staff.
- Associate professionals and skilled trades occupations experience the highest incidence of reported skills gaps across the greatest range of skills with gaps reported in six and five different types of skills respectively.
- Gaps in generic skills in planning and teamworking are relatively common across different occupational groups, and planning and organisational skills gaps are particularly common among managers.
- Oral communication and teamworking skills gaps are found among skilled trades and customer service occupations.
- Sales and customer service staff have commonly reported skills gaps in customer handling, planning and organisation and job specific skills.
- Welsh language skills gaps are more common among higher skilled occupations, including associate professionals, which is the occupational group covering translators and interpreters.

Table 3.15: Types of skills causing occupational skills gaps

	Total	Managers	Profess-ionals	Associate professionals	Administrative /clerical staff	Skilled trades occupations	Caring, leisure and other service staff	Sales and customer services staff	Machine operatives	Elementary staff
Unweighted Base	*1,355*	*304*	*100*	*108*	*305*	*204*	*160*	*328*	*115*	*365*
Total	53,700	5,100	2,300	2,600	6,100	6,100	6,200	8,300	6,700	10,400
Basic computer literacy / using IT	21	18	10	37	18	20	17	17	41	19
Advanced IT or software skills	21	24	30	26	40	35	11	15	12	12
Oral communication skills	36	25	29	20	24	47	21	45	56	36
Written communication skills	31	18	30	14	35	50	41	23	48	18
Customer handling skills	39	20	35	48	41	49	33	60	18	39
Team working skills	40	34	34	55	26	53	31	42	42	44
Written Welsh language skills	11	15	10	38	13	6	9	11	4	8
Oral Welsh language skills	12	16	14	39	14	6	10	13	4	10
Foreign language skills	7	7	7	6	6	23	4	8	2	3
Problem solving skills	41	30	39	20	39	61	40	40	57	34
Planning and Organisation skills	48	50	42	67	45	61	46	46	53	35
Strategic Management skills	19	44	31	22	16	35	7	12	13	12
Numeracy skills	22	11	10	2	15	45	16	21	31	21
Literacy skills	26	7	12	34	20	42	41	22	39	19

	Total	Managers	Profess-ionals	Associate professionals	Administrative /clerical staff	Skilled trades occupations	Caring, leisure and other service staff	Sales and customer services staff	Machine operatives	Elementary staff
Office admin skills	24	24	14	44	47	19	20	19	29	11
Technical or practical skills	34	23	36	66	18	63	17	24	57	26
Job specific skills	53	37	51	76	50	66	44	55	65	45
Personal attributes (eg motivation, work ethos, common sense, initiative, reliability, commitment, punctuality, flexibility)	2	3	*	1	2	1	*	2	1	3
Experience/lack of product knowledge	*	-	-	-	*	-	-	-	-	-
Other	*	*	*	-	-	1	-	2	-	-
No particular skills difficulties	4	3	1	3	7	3	3	4	4	5
Don't know	16	21	33	7	16	9	18	8	17	22

Base: All establishments. Percentages are based on all skills gaps followed up rather than all establishments with skills gaps, figures therefore show the proportion of skills gaps in each occupation caused by a lack of each listed skill.

highest incidence of skills gaps across occupations

most common skills gap within an occupation

Multiple responses possible, '-' denotes a figure of zero '*' denotes a figure larger than zero but smaller than 0.5.

Source: Employer Skills Survey 2011, UKCES

Table 3.16: Reasons for skills gaps in current staff

Reason for skills gap in staff	% of skills gaps where reason reported
Unweighted base	*1,355*
Their training is currently only partially completed	50
They are new to the role	46
They have been on training but their performance has not improved sufficiently	32
Staff lack motivation	31
The introduction of new working practices	27
They have not received the appropriate training	25
The development of new products and service	21
The introduction of new technology	20
Unable to recruit staff with the required skills	19
Problems retaining staff	8
Lack of other skills eg communication, interpersonal	1
Lack of aptitude to do job/reached maximum potential	1
Non-work related problems eg health or personal problems	1
Staff are too old to carry out the work required	*
Other	1
No particular cause	1
Don't know	16

Base: All establishments reporting skills gaps. Results are based on skills gaps rather than establishments with skills gaps, the figures therefore show the proportion of skills gaps caused by each factor reported by employers.

Note: column percentage exceeds 100% because of multiple response

'*' denotes a figure larger than zero but smaller than 0.5

Source: Employer Skills Survey 2011, UKCES

Staff being new to the role and not having completed training are the major reasons for skills gaps occurring. However, a quarter of responses indicated that staff had not received appropriate training while employers did not know why 16 per cent of skills gaps had developed.

Underemployment

The analysis so far has focussed on different aspects of shortfalls in skills needed. However, a further indicator of skills mismatch can be considered through the incidence of staff who have higher levels of skills or qualifications than those required in their job. The Employer Skills Survey 2011 provides specific data on this for

Wales. It should be noted that underemployment was derived from a single, experimental question.

Table 3.17: Proportions of staff reported as underemployed by region in Wales

	North	Mid	South West	South East	Total
Unweighted base	*1,431*	*798*	*1,389*	*2,394*	*6,012*
0%	55	49	46	50	50
Over 0% and below 10%	3	3	3	2	2
10% to 19.9%	5	4	4	5	4
20% to 29.9%	6	3	5	6	5
30% to 49.9%	5	6	6	4	5
50% to 99.9%	9	9	12	13	12
100%	12	20	21	15	16
% of establishments reporting any underemployed staff	39	44	50	45	45
Don't know	6	7	4	5	5
	100	100	100	100	

Base: All employers

Source: Employer Skills Survey 2011, UKCES

While around half of employers across Wales report no incidence of underemployment of staff, the data shows that over a quarter of employers report that at least 50 per cent of their staff are underemployed (28% in Wales compared to 33% in the UK). The highest share of establishments reporting underemployed workers is found in South West Wales. This is likely to reflect the higher concentration of graduates from HE institutions in the region. Overall, the highest proportion of staff that are underemployed is found in Mid Wales (see Table 5.9, UKCES, 2012).

Underemployment is likely to be related to size of workplace, as illustrated in Table 3.18.

Table 3.18: Proportions of employers reporting that staff are underemployed by size of workplace

	1 to 4	5 to 24	25 to 99	100 to 249	250+
Unweighted base	*1,216*	*3,474*	*1,074*	*151*	*97*
0%	52	50	36	20	17
Over 0% and below 10%	0	3	18	22	13
10% to 19.9%	0	11	13	14	10
20% to 29.9%	3	10	7	6	8
30% to 49.9%	3	9	7	8	4
50% to 99.9%	15	7	5	4	4
100%	23	5	1	0	0
% of establishments reporting any underemployed staff	44	45	51	54	38
Don't know	4	5	13	26	44
	100	100	100	100	100

Base: All employers

Source: Employer Skills Survey 2011, UKCES

This data shows that the incidence of high levels of underemployment is concentrated among very small employers with 1-4 staff, with less widespread underemployment also occurring for up to a fifth of workplaces with 25-249 staff. Interestingly, over 40 per cent of large employers reported not knowing whether staff are underemployed, suggesting a lack of knowledge about skill levels among their workforce.

Table 3.19: Incidence of underemployment reported at workplace level by occupation

Occupation	% Yes	% No
Managers	46.3	48.3
Professionals	47.6	43.7
Associate professionals	47.0	42.6
Administrative/clerical	41.5	50.6
Skilled trades	38.4	55.8
Caring services/leisure	49.0	44.7
Sales and customer services	47.1	45.8
Machine operatives	36.8	56.1
Elementary staff	49.4	43.3

Note: Results may not sum to 100% due to 'don't know' and non-responses
Base: All employers
Source: Employer Skills Survey 2011, UKCES

This data shows that the lowest incidence of reported underemployment occurs for skilled trades and machine operatives. The highest incidence of underemployment occurs for caring services and leisure occupations and elementary staff. This may reflect the low skilled job content associated with some of the roles undertaken in these occupational categories.

There are also sectoral variations in levels of underemployment, illustrated in Table 3.20.

Table 3.20: Proportions of staff underemployed by sector in Wales

	Agric-ulture	Manufac-turing	Electricity, gas and water	Const-ruction	Whole-sale and retail	Hotels and restau-ants	Transport, storage and commun-ications	Financial services	Business services	Public administration	Education	Health and social work	Community, social and personal services
Unweighted base	*102*	*468*	*111*	*503*	*1,069*	*675*	*439*	*173*	*791*	*130*	*391*	*580*	*558*
0%	61	55	57	55	47	40	41	43	59	44	35	42	49
Over 0%, below 10%	0	5	6	1	2	2	1	0	2	4	15	5	1
10% to 19%	2	4	7	2	5	6	2	4	3	8	13	8	5
20% to 29%	1	5	4	2	8	10	3	9	3	7	5	6	7
30% to 49%	4	3	5	5	7	5	4	8	3	7	3	5	6
50% to 99%	15	10	2	14	12	12	17	16	8	9	6	10	13
100%	15	13	14	16	15	19	23	14	17	7	15	16	15
Don't know	3	5	5	5	4	6	8	5	5	13	7	7	4
% of establishments reporting any underemployed staff	37	40	38	40	49	55	51	52	36	42	57	51	47
	100	100	100	100	100	100	100	100	100	100	100	100	100

Base: All employers

Source: Employer Skills Survey 2011, UKCES

- The sectors where the highest proportions of staff are most frequently reported as being underemployed are hotels/restaurants and transport, storage and communications.
- At least 10 per cent of employers in all sectors apart from public administration report all staff being underemployed.
- Agriculture, electricity/gas/water, manufacturing, construction and business services are most likely to report no staff being underemployed.

Migration

Another potential measure of imbalance between the skills available and the skills needed is migration. Although employers recruit migrants for a range of reasons, if they are unable to hire domestic workers because the skills are not available in sufficient quantity or quality, they may hire employees from abroad to meet their needs. In some senses, then, migrant labour market participation provides a barometer of mismatches between market demand and indigenous labour supply, although skills are not the sole factor driving these mismatches. This will be especially true of jobs held by migrants from within the EEA and those entering the UK from outside the EEA via the Points-Based Migration system.

Here we focus in particular on those occupations and industries that have a high level of reliance on migrant labour. It should be noted that the definition of migrants used here is broad and includes anyone that does not have the UK as their country of birth. We examine occupations or sectors which have a high level (absolute number) of migrant workers and, to a lesser extent, a high proportion of international migrants.

According to the Annual Population Survey for 2011, around 86,831 people employed in workplaces in Wales were born outside the UK, compared to 77,000 in 2009.

Detailed analysis at occupational and industry level is constrained by the reliability of available data for Wales. This particularly affects niche areas which have a high density of migrants but relatively low absolute numbers in employment. In these cases statistical estimates are of low quality. However,

where occupations are also present at the top of the overall UK list of migrant-intensive occupations this can offset some of our concerns about statistical reliability.

Taking all of this into account, those occupations (at SOC minor group level) which seem to have a high proportion of employment accounted for by migrants, include a mix of higher and lower level occupations: health professionals (29 per cent), food preparation trades (16 per cent), managers in hospitality and leisure (16 per cent), assemblers/ routine operatives (15 per cent) and elementary cleaning occupations (11 per cent).

Analysis at UK level indicates that the distribution of migrants varies depending on whether they are from within the EEA or from outside the EEA. On the whole, non-EEA immigrants tend to be employed in relatively high level occupations. This seems to be reflected in the Welsh picture with health associate professionals and health professionals the two largest groups among non-EEA migrants. EEA immigrants tend to be more heavily represented in lower level elementary occupations (in cleaning and personal services, for example) and operative occupations (process, plant and machine operatives, for example).

Turning to those occupations with a high level of migrants in absolute terms, the largest number of migrants at SOC sub-major group (2-digit) level work in elementary administration and service occupations, which includes elementary cleaning roles and elementary personal service roles such as kitchen staff and waiters / waitresses. The second largest category of migrants is health professionals. The third largest area of migrant employment is caring personal service occupations, which includes workers in health care and childcare. The migrant share of the workforce is largest by far among health professionals, with nearly an eighth of science, research, engineering and technology professionals also being migrants.

Table 3.21: Top migrant occupational groups in Wales, 2011

SOC Code	Occupation	Level of employment occupied by all migrants)	% of all employment in SOC accounted for by migrants
92	Elementary administration and service occupations	11,876	10
22	Health professionals	10,360	17
61	Caring/personal service occupations	7,823	8
21	Science, research, engineering and technology professionals	5,626	11
41	Administrative occupations	4,949	4
81	Process, plant and machine operatives	4,824	11

Note: Residence basis. A minimum cell size of 40 unweighted cases has been applied.

Source: ONS (2012) Annual Population Survey, January to December 2011

With regard to absolute numbers, the list of key industry sectors for migrant employment (Table 3.22) broadly matches that seen at UK level. The emphasis is on service activities, including health and social work, hotels and restaurants, real estate, renting and business activities, wholesale, retail and motor trade and education. The sectors with the highest density of migrant employment as a proportion of all employment are hotels and restaurants and health and social work.

Table 3.22: Top migrant sectors in Wales

Sector	Level of employment occupied by all migrants	% of all employment in sector accounted for by migrants
Health & social work	20,558	10
Hotels & restaurants	10,799	15
Manufacturing	10,670	7
Real estate, renting & business activities	10,168	8
Wholesale, retail & motor trade	9,962	6
Education	7,522	5

Note: Residence basis. A minimum cell size of 40 unweighted cases has been applied.

Source: ONS (2012) Annual Population Survey, January to December 2011

The scale and importance of different dimensions of mismatch

If we combine together the five dimensions of mismatch we have discussed, we can gain an understanding of their relative scale and importance.

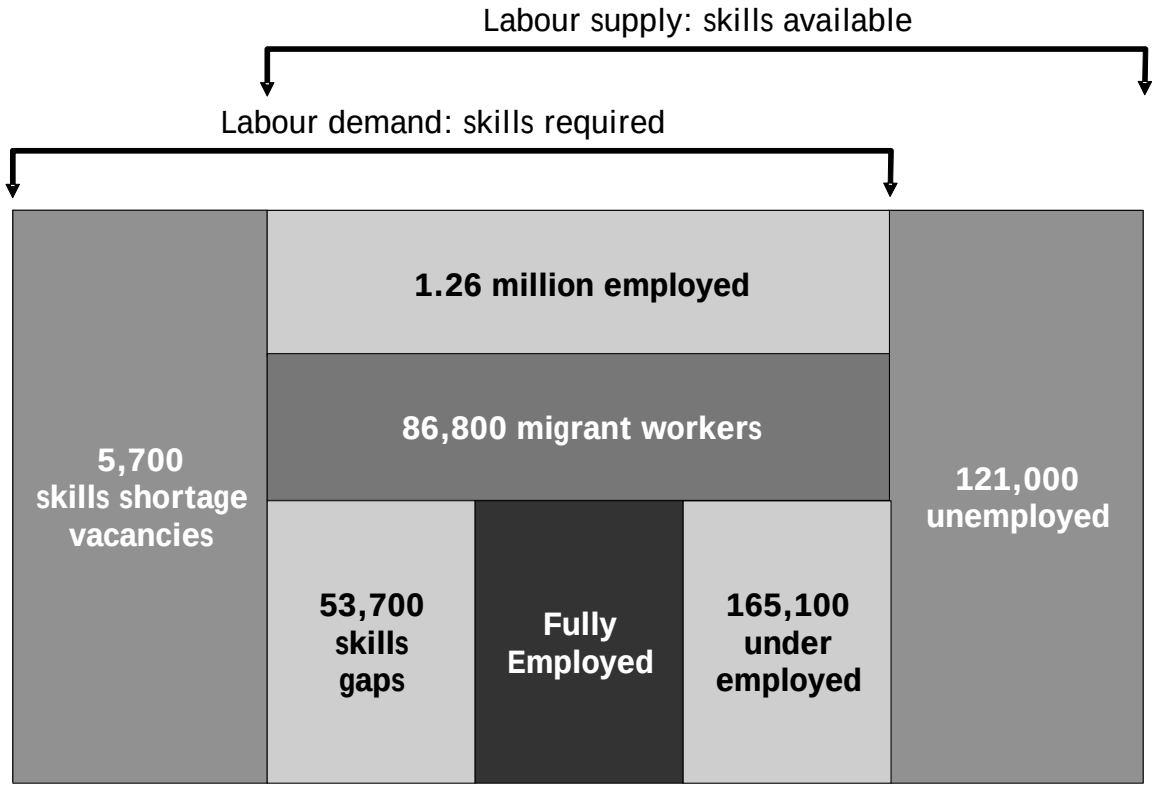
The data analysed for the NSSAW 2012 show the following evidence of skills mismatch:

- There are in the region of 5,700 skill shortage vacancies in the economy, compared to an estimated 2,000 in the NSSAW 2011
- Far more significant are the 53,700 employees who suffer from skills gaps, although this figure has reduced from the 84,000 estimated[10] in the NSSAW 2011
- According to Labour Force Survey estimates (from Quarter 3, 2012) there are 121,000 unemployed people in Wales. In addition to this we should add an estimated 165,100 employees who are underemployed. Taken together, this means there are more than 286,000 people who are un- or underemployed in the potential workforce
- On this basis, we estimate the number of fully-employed (ie those not suffering from skills gaps or believed to be over-qualified) to be in the region of 1,041,200 out of workforce in Wales of 1.26 million.

The diagram also shows the number of migrants currently employed. This is based on the widest definition of migration being (i) all non-UK born people currently employed and (ii) without any time limited on their date of entry. Of course, a proportion of these migrants could be underemployed or suffer from skills gaps in their current job.

[10] Figures for skill shortage vacancies and skills gaps in the NSSAW 2011 were reached by extrapolating forward the results of the Future Skills Wales 2005 Sector Skills Survey using National Employer Skills Survey (NESS) data for England. Differences between current position and estimates contained in NSSAW 2011 may reflect inaccuracy of extrapolations used in 2011 rather than real change. More detail on this process can be found in the NSSAW 2011.

Figure 3.5: Skills mismatches: key components in Wales



Note: All numbers in this figure are rounded to the nearest 1000

Conclusions

If employers are unable to, or have difficulty in, employing the people they need to because they are not available in sufficient numbers with the skills they require, this may hinder competitiveness and the capacity of firms to generate economic growth and further job opportunities through expansion. Similarly, if those seeking work have the 'wrong' sorts of skills to be able to access job opportunities, this may hinder their entry to employment. Additionally, if the people already in work are either not fully proficient in their jobs or are overqualified for them, this indicates an imbalance and inefficiencies in the use of human capital.

The data used in this chapter is drawn from the most recent sources and therefore is able to provide an up to date picture of skills mismatches in Wales. 'Skill shortages' are important because they constrain organisations from being able to meet market needs, opportunities or public service objectives, and are a prime signal of a 'mismatch' between supply and demand, between the skills available and skills required.

However, as we have seen, the imbalances/mismatches in the labour market can also take a number of other forms and we need to look at these together to give a more complete picture of mismatch.

Overall, the evidence suggests that skill shortages are relatively small. We estimate that there are only 5,700 skill shortages in Wales, in the face of continuing recessionary conditions and a reduced demand for labour.

Skill shortages affect three per cent of establishments in Wales, and the largest numbers are found in Mid Wales which also has a higher proportion of skills shortage vacancies relative to its share of employment. This may reflect challenges in recruiting labour across a wide rural geographic area.

The highest proportion of skill shortages vacancies lie in skilled trades, associate professionals and elementary staff occupations. The highest volumes of SSVs are found in business services, hospitality/catering and manufacturing. The highest density of SSVs is found in business services.

Occupational characteristics and qualification levels of unemployed people differ substantially from those of people in work, and this represents a significant mismatch between the skill levels of the unemployed and those commonly sought by employers. This suggests that significant reskilling may be required for a large proportion of unemployed people seeking work. However, a minority of unemployed people do possess both higher level qualifications and occupational experience which appears to match labour market needs, although it is unknown whether the *type* of skills and *subject* of qualifications held by unemployed people meets the needs of potential employers.

Data on wages shows that pay is strongly related to skill level. Median weekly pay in Wales was around 90 per cent of the overall figure for the UK, with the key exception of managers who are paid 82 per cent of the UK average. This may reflect lower living costs and the type of managerial roles in the Welsh labour market.

Migrant labour market participation provides an indication of mismatches between the skills required by the labour market, and those available in the domestic labour

force. Sectors with a high proportion of employment accounted for by migrants, include a mix of those in which higher and lower level occupations predominate: health and social work (10 per cent), hotels and restaurants (15 per cent), manufacturing (seven per cent), real estate (eight per cent), wholesale/retail (six per cent), education (five per cent). The largest numbers of migrants work in elementary administration and service occupations, which includes elementary cleaning roles and elementary personal service roles such as kitchen staff and waiters / waitresses, with the second largest category in health professions and the third largest group in caring personal service occupations, which includes workers in health care and childcare. The migrant share of the workforce is largest in health professionals, and science, research, engineering and technology professionals.

Skill shortages and unemployment represent skill deficiencies which arise in the 'external' labour market, while skills gaps arise within the 'internal' labour markets of organisations. The most recent data from ESS 2011 show that skills gaps affect 13 per cent of Welsh workplaces compared to estimations of 28 per cent of workplaces in 2010[11]. The proportion of the employed workforce with skills gaps is around five per cent or 53,700 workers, compared to estimations of eight per cent in the NSSAW 2011. This decline in reported skills needs is likely to reflect a decline in employment during difficult economic conditions and greater choice of job applicants for employers, who are more likely to be able to hire workers with the exact skills needed for the role.

Skills gaps are concentrated in workplaces in South East Wales, which has the highest density of workplaces and employment, and among smaller businesses with between five and 249 staff. In terms of occupational groups, the highest incidence of skills gaps are found among elementary and sales/customer service staff. Wales has a proportionately higher share of skills gaps concentrated among skilled trades, caring/leisure/services staff and machine operatives than the UK

[11] Figures for skill shortage vacancies and skills gaps in the NSSAW 2011 were reached by extrapolating forward the results of the Future Skills Wales 2005 Sector Skills Survey using National Employer Skills Survey (NESS) data for England. Differences between current position and estimates contained in NSSAW 2011 may reflect inaccuracy of extrapolations used in 2011 rather than real change. More detail on this process can be found in the NSSAW 2011.

average. This reflects the occupational distribution of employment in Wales with higher proportions of workers in these occupations.

The highest incidence of skills gaps in Wales is found in public administration, education, hotels/restaurants, wholesale/retail and manufacturing.

Shares of staff with skills gaps are generally higher in the UK than in Wales, with the exception of the electricity, water and gas, where a higher share is found in Wales than the UK overall.

The types of skills gaps most frequently reported in different occupations across sectors are job specific skills. This is the single most frequent single need reported for professionals, associate professionals, administrative/clerical, skilled trades occupations, machine operatives and elementary staff. Associate professionals and skilled trades occupations experience the highest incidence of reported skills gaps across the greatest range of six and five different types of skills respectively. Gaps in generic skills in planning and teamworking are relatively common across different occupational groups, and planning and organisational skills gaps are particularly common among managers. Oral communication and teamworking skills gaps are found among skilled trades and customer service occupations. Staff being new to the role and training being only partially completed are the major reasons for skills gaps, although a quarter of skills gaps are due to staff not having received appropriate training while employers did not know why 16 per cent of skills gaps had developed.

There is some evidence of ‘underemployment’, where employers report that staff have higher levels of skills and qualifications than required for the jobs they are doing. Over a quarter of employers report that at least 50 per cent of staff are underemployed with more advanced skills and qualifications than are required to perform their current role. The highest shares of establishments reporting underemployed staff are found in South West Wales. The highest incidence of underemployment is found among caring, leisure and other services and elementary staff, possibly reflecting the low skilled job content of these roles. It should be noted that underemployment was derived from a single, experimental question.

It is clear that both ‘external’ and ‘internal’ labour market mismatches need addressing. The major concern in terms of mismatch is with underemployment of staff, followed by skills gaps, rather than skills needs.

4 Drivers of Skills Needs

Introduction

While immediate skills needs are an important concern, we must consider how the demand for skills is likely to change as labour markets respond to structural trends and developments in the coming years. What are the main forces stimulating change, and what are their possible implications for skills? This chapter provides an overview of the major drivers of future demand for, and supply of, skills. The analysis of drivers of future change follows a framework covering political, economic, environmental, social, technological, and demographic change, and provides a review of key developments within each of the drivers. The purpose is to indicate the nature and direction of major types of change, and provide a broad analysis of how they may influence skills demand and supply. This qualitative analysis can be placed alongside our technical labour market forecasting to add value to our understanding of future skill needs.

The chapter is based primarily on an updated analysis of the extensive work undertaken through the Welsh horizon scanning/scenario development study specially commissioned as part of the NSSAW 2011 research (SAMI, 2010). This study reviewed approximately 100 UK-level drivers originally identified in the NSSA for England 2010. These drivers were then reassessed according to their potential impact and likelihoods of occurring within a Welsh context, from which key drivers for Wales were identified for further detailed analysis and horizon scanning.

In addition to examining the likely direction and the nature of change this chapter provides:

- Indicative analysis of the impact of different drivers on employment and skills
- Analysis of those occupations and sectors where change is likely to be most pronounced
- An assessment of the varying level and nature of impact on employment and skills of the key drivers within different scenarios of the future.

Main skills drivers

To understand future developments and identify implications for skills provision, we want to examine, in a systematic way, the main drivers of change that will affect the labour market and jobs in the coming years. We categorise the drivers under seven headings of change and examine them in turn. The categorisation used here is based on the work of Davies et al. (2001). This work emerged from a detailed study conducted for the Performance and Innovation Unit of the Cabinet Office, which synthesised the findings of over 50 recent studies and grouped them into core sets of drivers. As such, it is probably the most systematic study of this type available. These ‘seven drivers of change’ are presented diagrammatically in Figure 4.1. It is the relationships between the drivers that are critical to determining impact. The dependencies mean that each may mitigate or reinforce each other’s impact, and it is therefore important to recognise these dynamics in analysing the trends in the demand for, and supply of, skills.

Figure 4.1: The major drivers of change

Summary of the key drivers

Economics and globalisation: including rate of overall economic growth, distribution of wealth between individuals and nations, management practices and structure of organisations, nature of the workforce and international trade. Economic growth in developing economies may create pressure on Wales and the UK to move into higher value added markets, which may lead to increasing demands for higher level skills in some jobs, reduced demand for lower-skilled routine jobs and place demands on capacity to adapt to the requirements of emerging overseas markets.

Regulation and multi-level governance: covering management of borders between states or trading blocs or political associations (like the European Union), threats to (inter)national security, changes in global power, national and

international conflict, and domestic regulation. Regulation can have an important influence on skills supply because it may affect labour supply through controlling entry to, and exit from, education and the labour market, and can influence skills demands through setting of either training, product or service standards.

Demographic and population change: covering the impact of global population change, relative changes between advanced, developing and transitional nations, changes in the age profile of populations, migration pressures, infertility and life expectancy. Demographic change can be an important influence on skills needs because it can affect labour supply through population change and location of different sources of labour, and population change in itself can lead to increases and decreases in consumer demand for different kinds of goods and services, leading to expansion and contraction in related job volumes.

Environmental change (whether due to natural causes or human agency): covering climate change, pollution, changes in demand levels for different types of energy, availability and use of water and food, development of cities versus rural areas, disease and deforestation. Environmental change may lead to skills needs as a result of government policy and investment to tackle climate change through stimulating the development of a low carbon economy.

Technological change (including new developments and new applications of existing technologies): covering development of biotechnology, nanotechnology and AI (Artificial Intelligence), digital communications and IT. The development of technologies may create demands for skills at higher levels in research and development (R&D), and at lower levels in manufacturing new products devised, while there may also be skills needs requirements in supporting consumers to use new technologies.

Changing values and identities: covering family structures, attitudes towards government, citizenship, education and religion. Changes in values and identities will include attitudes to work and may therefore affect labour supply through influencing choices about type and conditions of work.

Changing consumer demand: covering changing consumer choices and expectations about type and quality of products and services. The development of

niche consumer markets, consumer preferences for tailored goods and services and rising consumer expectations about service quality may lead to skills needs within a variety of segments of the service sector.

The key drivers in detail

In this section, we discuss in more detail the nature of change associated with each of the factors, together with some indication of the skills implications that each of these drivers of change are likely to have. This qualitative analysis is based on the horizon scanning work described at the beginning of this chapter.

Economics and globalisation

Economic performance at global and national level will have a critical bearing on future demand for skills in Wales.

International context

It is important to situate developments in the Welsh economy in the context of broader trends. Following the financial crisis and subsequent recessions, the global economy remains turbulent and the outcomes could have significantly different impacts on the global, European, UK and Welsh economies. There remains a risk of a further financial crisis and instability, particularly within the Eurozone. It is possible that the Welsh economy will be slower to recover from recession than the rest of the UK, because of the higher proportion of the economy concentrated in public services, which will remain under severe pressure due to reduced government spending. This means that the route to economic recovery will be heavily reliant on private sector growth. Many potential private sector product and service markets are dependent on international rather than national markets as a result of globalisation, so it is worth considering what the implications of economic development overseas might be for Wales.

Globalisation has been fuelled by the emergence of the BRIMICS countries – Brazil, Russia, India, Mexico, Indonesia, China, South Africa – as growing economic powers with large and, in most cases, young populations. Their growth rates prior to recession exceeded those of major Western economies, including the EU, the US and Japan. For example, in 2007 the growth rate of China and India were 11.9 per cent and nine per cent respectively, as opposed to that of the

EU which was three per cent (US Central Intelligence Agency, 2009). In particular, within the next 40-50 years the GDP of the BRIC countries (Brazil, Russia, India, China) are expected to exceed those of the largest EU countries, the US and Japan (although these nations may remain relatively poor in terms of per capita). Some reports draw particular attention to the growth of China as an economic power, since its annual increase in economic output makes the single largest contribution to world economic growth. This means that China may challenge the USA for economic supremacy in the 2020s (DCDC, 2007 SAMI, 2010). The scale of investment in countries such as China and India, including in higher education, may result in their labour market moving up the value chain. An example of this is China's huge investment in its transport infrastructure which is likely to result in design as well as manufacturing capabilities locating there, since suppliers often locate near their customers when transport costs for finished goods are high (SAMI, 2010). The education, skills and innovation systems of BRIMICS countries vary in quality, which may present a window of opportunity to cement current advantage by developing long-term relationships, however at the same time developing economies are investing significantly in secondary and higher education.

Globally, the number of graduates has doubled in the last 10 years. Moreover, in many developing countries, economic prosperity has fuelled a massive expansion of the middle classes who are also investing in young people's education to provide a significant volume of highly skilled workers. Asia is already producing more engineers and physical scientists than Europe and North America combined (ESRC, 2008). This supply of skills is enabling developing countries to compete not only on cost but also on the quality, skills, creativity and innovation capabilities of their human resources. As the economies of developing countries absorb these talent pools, advanced economies may have to compete in an expanding global labour market for workers including high quality graduates, scientists and researchers (Schlotter et al., 2008). This must be offset against any political instability, deficits in material resources or effects of climate change which may encourage migration from developing to developed countries.

UK firms have already taken advantage of the opportunities in developing economies. Since 2002 UK exports to India and China have grown 14 per cent and 19 per cent a year respectively (ONS, 2012). However, for firms operating in export markets where developing economies will be a significant customer there is a continued need to develop an understanding for how that country does business, how it can complement rather than necessarily compete and how it can access enabling skills such as appropriate language skills and financial advice. The key question for Wales is how far it can position itself as an attractive location for firms seeking locations which combine appropriate skill levels with competitive production costs versus being at risk of losing manufacturing base to other more competitive nations.

Economic growth in Wales and the UK

The rate of recovery will affect the size of the UK financial services sector, which has been deeply affected by ongoing economic and financial crisis. Recession has been deeper and longer than initially anticipated with prolonged effects on unemployment levels (see Chapter 2), so the pace and nature of recovery currently remains somewhat uncertain. Government investment is focussed on stimulating demand and expansion for higher value products and services, and, if successful, this would increase the demand for soft skills and sector-specific technical skills.

Cost and availability of capital

Capital investment is a key driver of jobs and successful development of the Welsh economy requires investment at an affordable price. Evidence suggests that Wales' performance in attracting inward investment has declined since 2004 and it is somewhat less successful than other UK nations and regions (Crawley, Munday and Delbridge, 2011). This points to a need to improve perceptions of Wales as a competitive location for investment. The provision of good quality skilled labour and strong supply chains are important here, together with the quality of the infrastructure, environment and a favourable regulatory context for businesses. Policy and sales skills will be needed to find and manage capital.

Infrastructure and networks

Much of Wales' existing infrastructure is ageing and already being replaced. This is likely to continue to at least some degree, in spite of the constraints on capital investment (SAMI, 2010). In order to support business development, improvements and replacements will be required to improve communication systems, including national high bandwidth broadband and networks to manage intelligent transport systems. The Welsh programme for reducing the nation's carbon footprint, if sustained, will heighten the need for investment to improve infrastructure (Welsh Assembly Government, 2010a).

Increasingly complex new digital infrastructure, networks, and systems will require higher levels of skills in design, programming and installation of networks and for installation of ancillary and consumer units. High demand for digital access for a wide range of users will lead to high levels of demand for maintenance workers. However some jobs could be lost as much network maintenance can be done remotely. Network users (ie the general public) may also need training in the use of new systems. An effective broadband network will facilitate training and education in remote areas and help provide focussed training for businesses such as SMEs, which may find it difficult to source and access training which meets their needs through standard methods.

Existing industries

In spite of the wide range of opportunity presented by new technologies and industry, existing industries will play the majority role in the employment landscape in 2020. Nevertheless, they will have to adapt and improve to survive with new sources of competition within their own industries and from new industries. Investment in skills will play a major part in their survival. The European Commission predicts that in 2020, almost three quarters of jobs in the EU will be in services, with substantial job creation in areas like business services. Manufacturing and the primary sector are forecast to lose a large quantity of jobs while construction should increase as a result of government investment in capital infrastructure. Replacement demand would still provide a substantial number of job openings in manufacturing, which will therefore remain a crucial sector for the

EU economies. This broad pattern of change is supported by forecasts for Wales and the UK, including Working Futures 2010-2020 (see Chapter 5, below).

Existing industries will need to invest in skills to replace staff that retire/leave but will also need up-skilling to ensure that existing employees can cope with new techniques, materials or standards brought about by regulation, market forces, new products or the search for productivity gains. In some sectors, such as office or administration functions, employees will require additional competences as more routine functions are automated. For example in the financial sector middle office functions will require people highly skilled in financial processes but also with more legal expertise, an international background, language skills and a good knowledge of IT. In many knowledge-intensive sectors both managerial skills and scientific knowledge are needed. In social care and education further skill upgrading is needed to improve the quality of services. This reflects the growing demand from employers for cross-cutting key competencies, such as problem-solving and analytical skills, self-management and communication skills as well as ongoing ability to harness the power of new IT applications and devices. For example, high street retailers may need to provide a higher level of service to compete against the ease-of-use and pricing of on-line retailing. On the other hand any increase in on-line buying will demand new marketing, CRM and logistics skills.

Knowledge economy

The knowledge economy refers to industrial sectors or sub-sectors where the economic competitiveness and performance of organisations are increasingly determined by their investment in ‘knowledge based’ or intangible assets such as R&D, design, software, human and organisational capital, and brand equity and less by investment in physical assets such as machines, buildings, and vehicles. New technologies and developments in the organisation of work result in job expansion at the ends of the job spectrum but especially at the higher level. New technologies cannot yet substitute either the ‘non-routine’ tasks typical of high-skilled occupations (eg cognitive and communication tasks), or low skilled jobs, especially in the service sector (eg personal care). However, medium skilled

routine tasks and repetitive work can be replaced more easily by automation and computerisation, or outsourced overseas, with a consequent decline in jobs at this level.

The proportional growth of highly skilled jobs and, to a lesser extent, lower skilled jobs at the expense of intermediate jobs is referred to as ‘the hourglass’, reflecting the shape and the rate of job creation, wide at the top and bottom and relatively narrow in the middle.

The squeeze in the middle does not necessarily mean an overall reduction in jobs, but ‘good’ jobs towards the lower end of the scale will be harder to get and will require more training.

There is a range of implications for employment and skills:

- Demand for more soft skills (such as assimilation of information, communication, relationships, logic, knowledge management) will increase, meaning that lifelong learning is important for workers to protect their employability.
- New forms of certification could be developed to demonstrate possession of these soft skills.
- Automation of manual or knowledge-based transactions means that fewer transactional skills will be needed.
- It will be important to balance attention between the training needs of higher skilled jobs with lower skilled jobs as the bulk of the workforce occupies the lower level.

Regulation and government policy

The increasing impact and scale of regulation, the role of government at different levels and changes to the retirement age will have a significant impact on employment and skills in Wales.

Regulation

Multi-level regulation and cross-country co-operation is more likely to help solve complex problems relating to issues such as international financial systems, and global terrorism challenges, as well as international crime.

Regulation of business and private activities is generally expected to increase although to a substantially different level of intensity and with different targets in different scenarios. Regulation is an important driver in relation to skills needs and training in many industries, including hospitality, food and drink manufacturing, energy generation and supply, financial services and social care. It affects primarily on health, safety and security, but also in relation to the environment and in labour markets. Employees need training in health and safety, environmental and other regulated activities and require certification or accreditation to undertake many jobs. Quality requirements imposed by insurance companies can be just as important as legal restrictions.

Regulation is imposed within the UK as a result of global, EU, and national legislation and agreements, in addition to which Wales has powers to introduce further regulation within scope of its devolved authority, and to work with the UK Government and the European Union to pursue policy objectives. A number of broad trends in regulation may affect the demand for skills, including the role of public sector procurement regulation on levels of competence required within supply chains and increasing risk aversion, particularly in response to new technologies, which may lead to public pressure on government to impose regulatory standards. Certification increases training requirements and may drive up skill levels. New jobs may also arise in inspection and regulation in the workplace and at home, such as in electrical and gas certification of properties, as well as with respect to a raft of environmental, financial and commercial regulations.

The level of public spending as a proportion of GDP has a significant impact on jobs and training demands. Welsh Government action in terms of levels of public intervention and funding of education and training could have a significant impact on jobs and skills.

For the medium term, the key questions appear to be whether cuts in government spending will lead to permanent loss of particular workforce skills, whether those made redundant in the public sector will have the right skill-set and mind-set to compete for employment in the private sector, and whether specific retraining will be needed for public sector employees to re-skill to meet private sector needs.

Devolution, the EU and trade liberalisation

Further trade liberalisation would enable markets available to UK exporters to grow and lead to economies of scale for successful businesses, although permitting earlier and more intense competition from abroad. Liberalisation of trading services will encourage the clustering of knowledge-based skills such as law, design, finance in particular locations, while a shift towards protectionism would have opposite effects. The degree and direction of liberalisation or protectionism may vary between scenarios (see below).

The current level of devolution in the UK is reinforced by regionally-focused EU policy. EU Cohesion Policy investments, through the Structural Funds (ERDF & ESF) in Wales, have been significant over the current seven year cycle (2007-13). However the level of funding available for the 2014-2020 programmes remains uncertain until agreement of the EU's Multiannual Financial Framework (EU Budget). Devolution provides the opportunity for the Welsh Government to make Wales more or less attractive to new business through a variety of actions and policies.

Retirement age and school leaving age

Raising the male state pension age in the UK by one year, and raising the age at which women are entitled to a state pension from 60 to 66 will lengthen working lives. It is also likely to increase the quantity and quality of skills supply. In England this must be offset against the raising of the UK compulsory leaving age from education or training to 17 in 2013 and 18 in 2015, although this is not the current policy in Wales.

In the medium to long-term, the relatively younger segments of today's workforce will have higher levels of qualifications than the older age cohorts which are retiring from the labour market. Across the EU the proportion of working age population with low educational attainments (closely linked to age) is decreasing. This, in turn, means that in future there will be a greater supply of workers with higher education levels. As a result, current forecasts point to the risk of elementary jobs being increasingly occupied by workers with mainly intermediate level qualifications (Cedefop, 2009).

Technological change

Developments in ICT are likely to have a major impact in both the nature of products and services offered and the way in which work takes place. Technological change in Wales is likely to take a number of forms with implications for skills development. These are in medical science, nanotechnology and materials science and ICT across the economy.

The rate of change of technology is increasing, and technology lifecycles are shortening, with a requirement for more frequent updating of skills among those workers affected. Major advances in personalised healthcare are predicted, including drug customisation for individuals, further use of gene therapy and drugs to decelerate or reverse ageing, and technical developments to improve quality of life might include bionic implants and more animal transplants. These will require skills both to introduce and maintain operation of new devices to extend and improve quality of life among health and social care workers. Nanotechnology is similarly developing swiftly with requirements for inter-disciplinary understanding of new materials and their properties, design methodologies for product development and technical communication. Similar skills implications arise from the development of new composites, meta-materials, polymers, plastic/printed electronics, silicon electronics and industrial biotechnology. The trends in technology will drive a need for more research and development and result in more manufacturing of new products, although increased research and development activity may not lead to large numbers of new jobs, but may require new skills among those who provide after-sales service and maintenance.

Because of the predicted extension of ICT applications across the economy, the workforce is likely to need to use basic office and workplace digital tools more productively, to keep up to date with new software and to maintain productivity improvements as new ways of working emerge. Some industries will continue to develop from ICT eg online gaming, extended e-commerce in mainstream retail, independent craft-based enterprises selling directly to a global market place. IPod 'apps' offer a route to market for entertainment, datasets, expertise and games. Across all sectors, organisational readiness and agility to take advantage of new ICT requires management and leadership capabilities to recognise and exploit the potential of ICT as supporting or enabling technologies. A high percentage of workers are increasingly likely to need ICT skills, to exploit the technology to work more productively.

In addition, further developments in teleworking through videoconferencing, cloud computing and accessing online training has the potential to free up choices about the location of businesses and workplaces. Younger workers who grew up with social networking tools are more likely to be ready to use technology in this way and older workers may need to learn and adapt to collaborative working at a distance. This greater flexibility could reduce migration because there is less need for a labour force to travel to industrial clusters around the world, but also increase opportunities for Wales to off-shore some its business activities because businesses can be run from locations with low overhead costs but source workers, in theory, from around the world. To keep Wales as an attractive destination for foreign direct investment, the labour force needs to have the right skills and the flexibility to adapt to new methods and industries. Developing unique sources of competitive advantage will also be important to attract customers to buy from Welsh firms.

The new technologies and methods also provide valuable new tools for the delivery of training, using distance learning to optimise the use of specialist trainers, reach inaccessible areas, provide affordable service to SMEs and provide affordable specialist training to niche businesses. User-generated training content, development of IT software such as webcams and the trend among some learning providers such as universities to make content freely available as part of their

public service role (SAMI, 2010). There may also be a role for government here in helping users to navigate and assess the quality and content of proliferating online learning provision through supporting accreditation mechanisms.

Environmental change

Wales' response to environmental challenges will have a direct and significant impact on jobs and skills in the period to 2020.

Reducing carbon emissions and resource use

Mitigation of climate change and the impact of consumption of non-renewable resources have an important place within Welsh Government policy and the current trend of tightening regulation to reduce carbon emissions across the EU is also likely to continue. Wales has adopted a policy of faster reduction in the carbon footprint than the rest of the UK, and this will affect industry, government and the public with a target of carbon emissions reductions of three per cent per year and an overall reduction in emissions of 40 per cent compared to the 1990 baseline figure (Welsh Government, 2010b). Some sectors are specifically targeted for change including: transport, residential buildings, business, agriculture/land use, waste management and the public sector. There is an expectation that businesses will innovate in their products/services to help tackle the effects of climate change, and this has skills needs implications, particularly in supply chains, for energy, construction and transport companies and across the wider economy (Welsh Government, 2010b).

Other drivers affecting carbon consumption come from increases in the price of energy, fostered by the possibility of constrained capacity for energy generation in the UK and increased demand as the population expands, although the rate of increase is uncertain. Energy industries will need to develop new technologies to increase efficiency, improve their methods of production, and use new technologies to replace inputs which become less available. Wales is potentially well placed to capitalise on the trends for renewable energy and energy efficiency. It has potential for hydro, wind, wave and tidal power and nuclear installations. In addition, Milford Haven is already one of Europe's largest oil and gas ports and has developed liquefied national gas (LNG) capacity to supply 30 per cent of the

UK’s gas requirements, so can take advantage of the likely increase in use of LNG in the UK over the next couple of decades. However, the development of new markets for environmentally friendly products and services is shown to be heavily dependent on government regulation to stimulate initial demand, and is vulnerable to any changes in policy direction, so the scale of growth is, as yet, hard to predict (Cedefop, 2012).

There is a range of possible implications for jobs growth and skills needs. The scale of demand for entirely new jobs in the low carbon economy is uncertain. However, the level of job creation which is connected directly to new, low carbon energy technologies may be relatively small within Wales, which currently has little manufacturing in this field. New skills needs may be more likely to emerge for those working in the waste management sector and among R&D staff designing new products and services where energy efficiency consideration in design and use may become more important to consumers. There may also be wider impacts on working practices across all sectors, as a result of changes to workplace behaviour involving less business travel, less commuting, and reducing energy consumption. However, changes to core skills required for roles in the wider economy may not be particularly far-reaching except for individuals working in facilities management or procurement.

In contrast, it is clear that a new skill set will be needed for existing roles in the construction industry to reduce the carbon footprint of new and existing buildings, and energy industries, in particular. Following devolution of responsibility for building regulations to the Welsh Government from the UK government in 2011, the government has set a 55 per cent reduction in carbon emissions from new buildings by 2013 compared to a 1990 baseline and a requirement for new housing to meet level 3 of the Code for Sustainable Homes. Changes in sourcing of resources and energy will require new or reinforced networks, and in Wales, development of wind, tidal and nuclear electricity sources will demand new skillsets. Much of the built environment will need retro-fitting to meet modern insulation standards and carbon emissions targets. Micro-generation of renewable energy sources for individual residences and local communities will require some changes in the skills of installation engineers. Traditional skills for repairing and

replacing existing physical infrastructure (water, gas, nuclear etc) will continue to be needed, but a blend of old and new technologies will require broadening of skillsets. Adaptation to new climate and weather conditions is likely to lead to more employment on projects such as flood defences, improving drainage systems, protecting transport systems and predicting and managing extreme meteorological conditions.

Land and the urban / rural balance

Wales has a distinct pattern of urbanisation with its narrow urban coastal strips in the north and south and a large rural expanse in the centre. In spite of a net flow from rural Wales to the towns, Wales' lack of a critical mass of urbanisation / agglomeration, serves as a limiting factor on business formation and growth. The Welsh Government's announcement of Wales's Enterprise Zones and City Regions may be a positive response towards addressing this. Lack of urbanisation has probably been a disadvantage to job creation and productivity, with the implication that Wales' ability to move up the career quality chain is limited and demand for high end skills is reduced. In rural areas there is concern that it is often difficult to provide services and retain staff. In some deprived areas of Wales the low development value of land has the potential to limit investment and hence job creation (SAMI, 2010). Planning restrictions are cited as a cause of lack of investment in the coastal strips. There are also planning issues in the rural areas, where a balance between development for tourism or housing and preserving the rural environment can be difficult to achieve.

Demographic and population change

Population growth, ageing and migration

According to national population projections for Wales, the population is projected to increase by five per cent to 3.17 million by 2020 and 12 per cent to 3.37 million by 2035 (Welsh Government, 2011a). The key features are relative stability in the volume of the working age (16-64) population, achieved through inward migration, and a significant increase in the proportion of people aged over 65. Overall, the number of children is projected to increase by seven per cent between 2010 and

2035, but the number of people aged 16-64 is projected to increase by only one per cent between 2010 and 2035 (20,000). The number of people aged 65 and over is projected to increase by around 306,000 or 55 per cent between 2010 and 2035. The effects of progressively raising the retirement age to 68 or higher is also likely to influence the overall volume of the labour supply and the average age of the working population, especially when combined with limited pension savings for some workers. These demographic changes are likely to imply a need for retraining or up-skilling among older workers during a prolonged working life, and a move from manual to non-manual work for older workers.

Wales has experienced overall net immigration in recent years, with an estimated average of 73,000 immigrants per year between 1998 and mid-2009 and an average of 63,300 people per year leaving Wales, leaving an average net inward flow of 9,600 people per year. International migrants account for approximately 11,800 immigrants and 9,500 emigrants per year, but the main source of migration is between Wales and the rest of the UK, amounting to around 50,000 per year (Welsh Government, 2011b).

Immigration patterns vary at local levels across Wales, with Flintshire, Rhondda Cynon Taf, Blaenau Gwent and Torfaen experiencing a net outflow composed of internal and international emigrants between 2005 and 2010. In contrast, Cardiff experienced the highest levels of immigration, exclusively accounted for by over 14,000 new international residents (Welsh Government, 2011b). Much international migration is accounted for by the movements of international students in locations with Higher/Further Education institutions, and the highest turnover rate by age for Anglo/Welsh migration patterns is in the 16-24 year old category, suggesting that patterns of mobility are strongly linked to educational choices. Average net internal migration patterns within Wales show outflows from North, Mid and South East Wales to South West Wales from 2005 to 2010 (Welsh Government, 2011b).

The implications of migration for skills needs primarily affect labour market supply. Continuing net average immigration does not suggest a particular concern, but this is dependent on whether immigrants' skills match those required by employers, and whether any skills needs can be fulfilled by people living outside Wales

through teleworking by taking advantage of developments in ICT. In addition, developing the skills among the Welsh unemployed population, rather than relying on the skills of incoming residents may be a policy priority. The Welsh Government is working closely with the Department of Work and Pensions (DWP), Jobcentre Plus and other stakeholders to help young people and adults into jobs, and develop better planning and integration of employment, skills and other programmes.

In our scenarios (see below), the international migration picture is a key differentiator between the envisaged futures for the UK with sharply differing levels of international migration. These effects are likely to be diluted for Wales because of the high levels of immigration from England.

Consumers' needs and expectations

Consumer behaviour is a central driver of the economy and the skills and employment landscape. Consumers are becoming used to greater personal attention from retailers seeking their custom as well as public service providers. Retailers in particular are offering consumers increased choice, low prices, immediate fulfilment, a pleasant and captivating experience, and money-back guarantees. An older population will generate demand for health and social care and leisure services, raising a particular issue for Wales of finding adequate numbers of people to work in the growing care sector, if funding permits sustained services. It is uncertain whether the increased number of retirees in the next ten years will be richer or poorer than those of today. Those entering retirement are initially likely to be fitter, creating demands for leisure activities for older people. Stimulating voluntary provision to replace public services experiencing reduced or withdrawn funding could lead to older people undertaking more voluntary work, creating training needs eg in relation to new technologies. Among older retired citizens, there may be increased demands for new healthcare technologies aimed at keeping older people in their home.

Lifestyle changes such as healthier living behaviours will generate new service jobs, new fashions and trends will create new or replacement jobs in manufacturing, distribution and retailing. Use of the internet is improving information available to consumers which may make them more discriminating in

their choices. Citizens are likely to continue to shop in physical stores where these offer a premium leisure experience and the purchase is not simply transactional. Consumer expectations of improved service quality are likely to affect the use of public services in general and training requirements in particular. Simple messages, simple access to services and rapid response will be necessary to achieve desired outcomes from the provision of both public and private services, and also to achieve the cost efficiencies that the UK and Welsh governments are seeking to provide through online delivery of services. Both private and government training services will need to become more customer-focused and accessible and will need to provide training in interpersonal and service skills. High level interpersonal skills will be demanded by customers and clients.

Changing values and identities

Values and identities have a key bearing on individuals' attitudes to the world of work, family life and leisure time.

1. Access to global influences on values will continue the trend for individuals to adopt multiple and virtual identities on a short-term basis, especially among those born since 1990 who create and access identities easily through technologies.

2. Continued and growing individualisation of values may influence attitudes to work and working time.

3. Changes in values and identity are partly driven by demographic changes. These include shifting family structures, growth of single parent families and single person households and increased female participation in the labour market. This will contribute to a continuing demand for good quality child and eldercare provision.

4. Fragmentation and reconfiguration of values and identities across traditional lines of formation such as place of residence and nationality makes implications for the labour market difficult to predict. They are likely to have indirect as well as direct effects on skill demands. In Wales, possible resurgence of the Welsh language may shape a distinctively Welsh identity, though this may not develop evenly across the nation.

5. Skills supply through the education system is a necessary but not sufficient condition to guarantee adequate supply of workers for particular jobs, as heightened individual expectations and aspirations will affect occupational choice, albeit mitigated by the effects of recession.

The social dimension of change in the next few decades is likely to be dominated by the impact of globalisation on culture, values, identity and beliefs (DCDC, 2007). Faced by both the effects of globalisation, the spread of access to ICT and greater travel opportunities for many people, individuals will extend their bonds and networks beyond physical locality. Continuing effects of migration patterns will result in individuals holding multiple allegiances. Relationships and multiple identities can also be developed remotely, benefiting from the creation of virtual worlds through the internet. This development of multiple connections and common global interests will contribute to greater cultural plurality and complexity and may also lead to greater fluidity in the evolution of identities and values. People may adopt values on a short-term basis and in relation to particular interests, rather than as enduring guides for behaviour (DCDC, 2007).

Individual loyalty to governments and institutions may become dependent on perceptions of their capacity to meet personal interest and support allegiances of personal identity. Dex (2008) already notes a loss of deference in an educational context, which is also reflected in the political debate and campaign of the mid-2000s about how to cultivate ‘respect’ in society. This trend means that although national, cultural and ethnic origin will continue to be significant factors in determining identity, they will be employed increasingly selectively, based on their utility in context and in relation to personal interest (DCDC, 2007). The increasing individualisation of values and emphasis on personal rather than collective goals may influence individual employment aspirations. This is supported again through developments in information technology, making independent trading between individual producers and consumers much easier.

Over the next decades, changes in the population’s ambitions and values are likely. The so-called Generation Y, born between 1980 and 2000, will form the next cohort of middle managers and has grown up with different values, especially in relation to status, speed of information exchange and use of technology. The rise

of instant communication technologies and social networking sites may explain Generation Y's reputation for developing multiple peer-based networks due to easier communication through technology which will continue for future generations. Self-expression and acceptance is highly important to this generation, which reported to be more radically and culturally tolerant than previous generations, but remains questioning, ambitious and holds high expectations of work. Individualisation of personal interests and expectations of work may also be fuelled by a backlash against intensive patterns of working time. The prevalence and intensity of long working hours has increased in the UK, which is often compared unfavourably with other EU countries. Research shows this has a negative impact on a variety of well-being measures including injuries and diseases caused by work-related stress (see Hogarth and Bosworth, 2009, for a review). In this context, pursuit of work options which offer greater personal control over working time, including self-employment, may increase in popularity. This generation is reported to have high expectations of intrinsic job interest and little appetite for careers which are perceived as dirty, repetitive or physically demanding, including some roles in the construction and care sectors.

However the experience of all generations over the next few years could lead to a nation with significantly different attitudes by 2020, dependent on the following:

- The strength of economic growth and the employment prospects
- Changes in working conditions and wealth (for the employed skilled and semiskilled)
- Changes in leisure time with or without the funds to enjoy it (for the growing proportion of retired people).

Likely implications of this driver for employment and skills are as follows:

- Generation Y will provide a more flexible workforce and will demand and use new methods of learning with delivery of training online or through virtual reality
- Ambitious individuals will need training in entrepreneurial skills to help them to achieve their goals

- There is a possibility of reduced career expectations for some being accompanied by greater interest in economic or job security
- Changes in the relationship between the trainee and the trainer as a group of potentially ambitious and achieving employees have the means to fulfil those ambitions through training. Improved methods of training can be adopted.

Language

The Welsh language is a strong focus for national identity and culture. The Welsh Language Measure came into force in 2011 and set a duty on public organisations to treat the Welsh language no less favourably than English. This has implications for ensuring that Welsh citizens have access to public services in Welsh and may require Welsh language training to ensure an adequate supply of staff able to deliver front line services. The cumulative effect of migration over time has led to around a quarter of the Welsh population being born outside Wales. Recent 2011 Census figures indicate a decrease in the number and proportion of people able to speak Welsh, with the largest decreases in the West and North West. Around 19 per cent of the population are now able to speak Welsh. The Welsh Language Act 1993 gave the Welsh language parity with the English language in the public sector in Wales. 2010 Sector Skills Assessments point to an increase in the need for Welsh language skills in some sectors. Competent Welsh speakers are also needed by business and public bodies to comply with legislation requiring public engagement provision through the Welsh language.

The implications for skills

Table 4.1, below, summarises the implications for skills arising out of the key drivers identified in the previous analysis. It focuses on those drivers which are most likely to have a significant impact on the demand for and / or supply of, skills. Each driver is placed within a framework that seeks to assess whether the impact and scale of the driver is likely to increase or decrease, the way in which it is expected to shape demand for skills and the main sectors that are most likely to be affected. These are qualitative judgments that are subject to challenge and further discussion and debate. Nonetheless, they provide an indication of direction of travel and of broad potential impacts.

Table 4.1: Summary of implications of drivers for skills needs

Nature of driver and impact on skills	Current, ongoing driver or new driver	Increase or decrease in a) impact b) scale of effects	Impact on supply of or demand for labour	Impact on demand for skills	Which sectors will be affected
Regulation and governance					
Spending cuts will lead to significant redundancies among the public sector workforce. Many of the affected workers will require a degree of re-skilling to compete for private sector opportunities	Ongoing	Increase in impact and widespread scale	Change in the overall profile of demand for labour and increase in the available supply	There will be a reduction in demand for skills specifically associated with public sector roles	Public administration, health, education are likely to be most affected. Many businesses that lie outside the formal confines of public sector also draw on public funding
Regulation of product service / quality and need to minimise consumer risk will shape skill requirements and drive investment in training	Ongoing	Increased impact, widespread in scale	Demand	Will increase demand	All but particularly strong impact on financial services, passenger transport, food and drink manufacturing, social care
National regulation affecting age of labour market exit will influence labour supply. (Raised school leaving age not adopted in Wales.)	New	Increase in impact, moderate scale	Supply	Regulation encouraging later departure from the labour market will increase labour supply but older workers will have retraining needs	All
Stronger emphasis on training as evaluation criterion in public procurement decisions may drive training investment	New	Likely increase in impact, moderate in scale	Demand	May raise demand	Public sector suppliers
Demographic and population change					
Ageing population will lead to increase in demand for particular goods / services, leading to job growth in a range of sectors. Both high and low level occupations are likely to be affected	Ongoing	Increase in impact, widespread in scale	Demand	Increased demand for workers in a variety of occupations. In combination with growing consumer expectations likely to lead to requirement for skill development	Widespread impact on sectors but particularly health and social care

Nature of driver and impact on skills	Current, ongoing driver or new driver	Increase or decrease in a) impact b) scale of effects	Impact on supply of or demand for labour	Impact on demand for skills	Which sectors will be affected
Longer working lives may increase proportion of older workers in labour market, reducing opportunities for young people trying to access jobs or people wishing to re-join the workforce	Ongoing	Increase in impact, widespread in scale	Supply	Demand may reduce if older workers remain in current jobs, but increase if they move to different roles to accommodate effects of ageing	All sectors, but especially sectors/occupations where older workers predominate eg senior managerial roles, transport, agriculture, manufacturing
Net inflow of workers from rest of UK may help to meet Welsh labour demand but net outflow could expose skills deficits	Ongoing	Projected increase in net inflow; scale moderate	Supply	Demand may increase as a function of reduced supply or may reduce if supply is increased	All
Government policy will determine the extent to which immigration affects supply of labour; a tightening of restrictions will limit supply	Ongoing	Likely increase in impact due to recession; moderate in scale	Supply	Immigration restrictions would raise demand for labour	All; but likely to be particularly severe for sectors with non-EEA migrants like health and social care
Reduction in size of cohort of young people and ageing workforce will lead to fewer young people in workforce and increased reliance on older workers	Ongoing	Increase in impact, widespread in scale	Supply	Demand for re-skilling of older workers to meet changing needs of economy	All
Increased life expectancy, medical advances and reduced pension provision may lead to longer working lives	New	Increase in impact, widespread in scale	Supply	Would raise demand for retraining	All
Higher levels of qualification among young people entering labour market versus older workers will change profile of labour supply	Ongoing	Impact likely to increase, depending on impact of policy on higher education participation; scale widespread	Supply	May mitigate some existing skills needs but work experience will be important in meeting employer needs as well as formal qualifications	All

Nature of driver and impact on skills	Current, ongoing driver or new driver	Increase or decrease in a) impact b) scale of effects	Impact on supply of or demand for labour	Impact on demand for skills	Which sectors will be affected
Environmental change					
Spatial shift in supply of labour away from rural areas and into urban areas	Ongoing	Likely to be increasing impact; scale of effects moderate	Supply	May reduce demand in urban areas but increase demand and potentially skills deficiencies in rural areas	Likely to particularly affect industries that are concentrated in rural areas such as agriculture and tourism
Development of low carbon infrastructure may lead to increased demand for STEM skills	New	Impact will increase but scale uncertain	Demand	Will increase demand for STEM skills in a variety of disciplines and at a range of levels	Particularly in energy generation and engineering construction
Pressure for greater efficiency in terms of energy consumption and resource utilisation will affect job content	Ongoing	Impact will increase, scale will be widespread	Demand	Will lead to change in the skills within existing jobs as well as the emergence of new job roles	All
Economics and globalisation					
Competitive advantage in international markets will increasingly depend on process of continuous innovation and organisational agility as overseas competitors continue to move up the value chain	Ongoing	Increase in impact, scale of effects widespread	Demand	Increased demand for managers who can facilitate organisational response to growing competitive pressures	Advanced manufacturing but also creative media, financial services
Routine manufacturing roles will continue to be transferred to low-cost locations overseas	Ongoing	Impact will continue to be significant and effects will be widespread	Demand	The demand for routine manufacturing skills eg operatives will continue to decline	Manufacturing
Expansion in demand for intermediate / low level personal service skills	Ongoing	Increase in impact, scale of effects widespread	Demand	Increase in occupational demands for personal service roles. Growing consumer expectations may lead to a requirement for up-skilling	Personal service intensive sectors including social care, hospitality and tourism

Nature of driver and impact on skills	Current, ongoing driver or new driver	Increase or decrease in a) impact b) scale of effects	Impact on supply of or demand for labour	Impact on demand for skills	Which sectors will be affected
Technological change					
Development of new materials and technologies will increase skills demands and possibly create new job openings in R&D and related high level functions	Ongoing	Increase in impact; scale moderate	Demand	Increased demand, including for individuals with ability to apply high level scientific knowledge	Advanced manufacturing sectors
Continuing development of digital economy will create new skills needs	Ongoing	Increase in impact, widespread scale	Demand	Increased demand for individuals with specific technical skills but also for individuals with new combinations of generic skills	Creative industries, ICT
Exploitation of new technologies across economy will require enhanced management and leadership skills	Ongoing	Increase in impact, widespread scale	Demand	Increased skills demands for management workforce	All
Changing values and identities					
Changing values will affect individuals' preferences around patterns of work in terms of working time, interest in self-employment	Ongoing	Likely to increase in impact, scale likely to be widespread	Supply	May increase demand in segments of workforce where supply is affected by changing preferences	All
Increasing participation of women in labour force will increase demand for childcare and other care services	Ongoing	Impact and scale Increasing	Demand	Likely to increase occupational demands in respect of caring personal service roles	All
Avoidance of careers in a variety of sectors / occupations, including care, traditional manufacturing etc may result in future skills shortages	Ongoing	Impact currently high but uncertain as to whether it will increase; scale widespread	Supply	Demand will increase as a function of supply	Care, manufacturing, low carbon sectors

Nature of driver and impact on skills	Current, ongoing driver or new driver	Increase or decrease in a) impact b) scale of effects	Impact on supply of or demand for labour	Impact on demand for skills	Which sectors will be affected
Recession may reduce career expectations while leading to increased interest in jobs offering greater security	New	Impact may increase; scale likely to be widespread	Supply	May be better balance between demand and supply in some parts of the labour market	Areas like public sector and social care may benefit from increased labour supply
Increasing use of Welsh language in some sectors	Ongoing	Impact increasing, widespread scale	Demand and supply	Increase in demand for Welsh speakers	Widespread effects but will be particular impact on education, passenger transport and public administration
Changing consumer demand					
Constrained consumer demand arising out of recession and fiscal consolidation will impact on a range of service and production sectors	New	Impact likely to increase; scale will be widespread	Demand	Demand for labour is likely to be weakened in sectors which are sensitive to domestic consumer demand	Most sectors of the economy, including retail, hospitality, some manufacturing sectors
Customer service function will face challenges of fragmented consumer demand, raised consumer expectations of quality of service, more widespread direct engagement with consumers in sectors like manufacturing	Ongoing	Impact will increase, scale will be widespread	Demand	Growing skills demands in customer service function and possibly increasing occupational demands	All
Demand for skills relating to online sales and marketing, logistics management as well as remote customer relationship management	Ongoing	Impact increasing, scale widening	Demand	Growing skills demands for managers, IT roles, customer service roles	All; but particularly retail, hospitality

Implications of impact

We have already stressed the importance of not viewing each driver in isolation but rather as a set of interdependent trends. Similarly the impact of drivers will vary according to the socio/political/economic environment. The potential variability in possible impact of some of the drivers on skills is captured in the horizon scanning and future scenarios development work commissioned as part of the NSSAW 2011 (SAMI, 2010). SAMI's work draws on the Foresight Futures Vision 2020 scenarios developed for the then Department of Trade and Industry (DTI, 2002). The scenarios are not predictive forecasts, rather they are depictions of alternative possible futures, plausible 'stories' of how the world may look in the future and intended to inform policy decision making by illustrating what society might look like under different trajectories of development.

It should be noted that these scenarios are grounded in two 'axes':

1. the degree of influence from policy and regulation at local, national and international levels, sometimes referred to as 'systems of governance'
2. the degree of individualisation of personal values, which we can refer to as 'social values.'

A brief overview of the alternative scenarios is given below.

Three scenarios for 2020

The 'World Markets' scenario – individual aspirations thrive in a global economy sustained by international co-operation – reflects a world driven by aspirations of personal independence, personal and corporate wealth and mobility, to the exclusion of wider social goals, a belief in the continued efficacy of integrated global markets and internationally coordinated policy, light regulation and a philosophy of 'minimal government.' In the original DTI foresight scenario, it identified likely fast growing sectors as health/leisure, media/information, financial services and bio-nanotechnology.

Under 'National Enterprise' – individuals and governments seek autonomy and independence – people aspire to personal independence and material wealth, embracing liberalised national markets to secure national self reliance and security

but political and cultural institutions are strengthened to buttress national autonomy in a more fragmented world and international co-operation is limited. In the original foresight scenario, fast growing sectors were identified as private health/education, domestic and personal services, tourism, retail and defence.

In ‘Global Sustainability’ – a caring world where individuals value community and look to government for welfare and sustainability – people aspire to high levels of welfare within communities characterised by shared values, more equal distribution of opportunities and a sound environment. They believe these objectives are best achieved through active public policy and international co-operation and markets are regulated to encourage competition. In the original foresight scenario, fast growing sectors were identified as education/training, large systems engineering, new and renewable energy and information services.

It should not be assumed that these three scenarios are equally likely nor are they exclusive. The eventual outcome may comprise a ‘blend’ from each of them, or they may combine to form another ‘scenario.’ The scenario approach alerts us to the uncertainty inherent in the future, yet makes it more explicit.

Common trends in skills drivers and demands across scenarios

In their analysis of the scenarios, SAMI (2010) identify that some drivers will be common in their nature and likely impact under all three visions of the future.

Demographic drivers appear to be more predictable than other factors as they are based on ongoing long-term trends. This means that greater certainty can be attached to the need to confront socio-economic challenges and skills demands arising from these developments including the provision of care services and the possibilities arising for servicing an older consumer population.

Globalisation drivers affecting the location of manufacturing are likely to have a pervasive effect, coupled with the use of ICT which will enable increasing flexibility in the location of production and work for individuals as well as organisations. The operation of these drivers would be affected to only a moderate extent by the different scenarios (see below).

In broad terms technological change is a common feature of all scenarios. The types of technological innovation which will have most impact are extremely difficult to predict, suggesting that a broader common policy objective may be required of fostering capacity to exploit innovations. The availability of training and learning materials and environments which can be accessed online will feature in all of the scenarios. Design, media and engineering innovations have the potential to continue as strengths of the national economy under all scenarios, and a generalised demand for higher level skills may occur as the source of competitive advantage for UK firms that move to higher value-added markets.

Key differences in implications for skills demand between scenarios

The key differences between the scenarios relate to the degree of government intervention and the extent to which it promotes or restricts integration with the global economy. This has an important bearing on the nature and level of the impact of individual drivers, and their implications for employment and skills.

Structural change in the economy of Wales would be more pronounced and rapid under the World Markets scenario, with an acceleration of existing trends. This would lead to the steady attrition of traditional industries which continue to see an erosion of their competitive advantage in global markets. Moreover, investment in new industries would have a strong tendency to gravitate to existing clusters of expertise under this scenario, which in some cases reside at UK rather than Welsh level. However, Wales is endeavouring to develop clusters of expertise in key sectors and is developing Enterprise Zones and City Regions as a response to the economic circumstances, which may help to foster the development of successful business clusters.

The pace of technological change and associated trends like the development of the knowledge economy is also more rapid under the World Markets scenario, as a result of heightened competition, investment and spread of best practice.

The level and nature of investment in infrastructure, including digital infrastructure, varies markedly across the three scenarios. Under the globalised, liberalised World Markets scenario substantial infrastructure development would be driven by private sector development, whilst under National Enterprise such development

would be constrained by a lack of access to global sources of capital. Under the Global Sustainability scenario, development would be driven by public as well as private investment, with a greater emphasis on sustainable, low carbon infrastructure.

More generally the Global Sustainability scenario would drive greater government investment in the low carbon agenda, with associated skills demands in energy generation, building services, engineering and advanced manufacturing enterprises, and a broader array of resource and waste management skills needs across the wider economy.

Differences in the degree of government intervention have a direct impact on migration across the three scenarios. Under the World Markets scenario there would be a highly mobile labour force with major international competition for skilled workers and with immigrants filling low-paid service jobs. Levels of immigration would be much lower under the National Enterprise scenario, particularly among unskilled workers, as a result of government controls. The UK would therefore need to be more self-reliant and able to ensure that the education and training system produces a labour force with balanced skills.

Moreover, a ‘National Enterprise’ scenario would see a more intensive approach to regulating product standards and qualification levels directly where these affect goods and services that are perceived as having high consumer risk. This could lead to higher demands for skills in financial, property and healthcare services, for example. In an environment of strengthened national political and cultural institutions defined by the National Enterprise scenario, demand for Welsh language skills might increase, driven by heightened cultural identity and government employment policy.

The second dimension of each of the scenarios relates to individualism of personal values. In the World Markets scenario, high levels of personal ambition and individualism shape career choice, whereas under the other scenarios considerations of economic security, quality of life and serving the community play a more prominent role.

Conclusion

In this chapter, we have gained an insight into the likely direction, type and nature of drivers of change and how these drivers may affect employment and skills in Wales. The drivers and scenarios demonstrate the high degree of uncertainty and risk attached to predicting the future but nonetheless increase our insight into how skill needs in Wales are most likely to change in the coming years.

Our examination of the implications of the drivers of change for skills demands shows that the general trend is for increased demand in skill levels, chiefly amongst higher skilled occupations.

This qualitative analysis of key dynamics/processes, when set alongside our more technical forecasting of employment, can add real value to our understanding of future skill needs.

5 Key Sectors and their Skills Needs

Introduction

This chapter draws together the major sources of evidence on current and likely future sectors of economic and jobs growth, together with the evidence on the skill deficiencies that these sectors currently face, and those that they could face in the future. The evidence base comprises:

- The Working Futures 2010-2020 projections of occupational and sectoral change to 2020
- A purpose-built model to identify economically significant sectors potentially constrained by skill deficits
- Insights from the sector skills assessments completed by SSCs and clusters of SSCs.

The core scenario: evidence from Working Futures 2010-2020

The core scenario about future skills demand is based on data from Working Futures 2010-2020 (Wilson and Homenidou, 2012). The econometric models upon which these predictions are based is robust and well tested. However, they also rely on extrapolating future demand based on historical long-term trends. This makes them less able to capture the impact of exogenous shocks which produce discontinuous change. For example, the effects of the continuing low level of economic activity are not accommodated within these forecasts.

It is important not to conflate structural trends and cyclical movements, and to recognise that recoveries from previous recessions have seen employment and the structure of the economy resume broadly their previous paths relatively quickly. However, there is also the potential for change, with new sectors emerging even more strongly and the potential for some 'rebalancing' of the economy, with financial services and parts of the public sector growing less quickly than before.

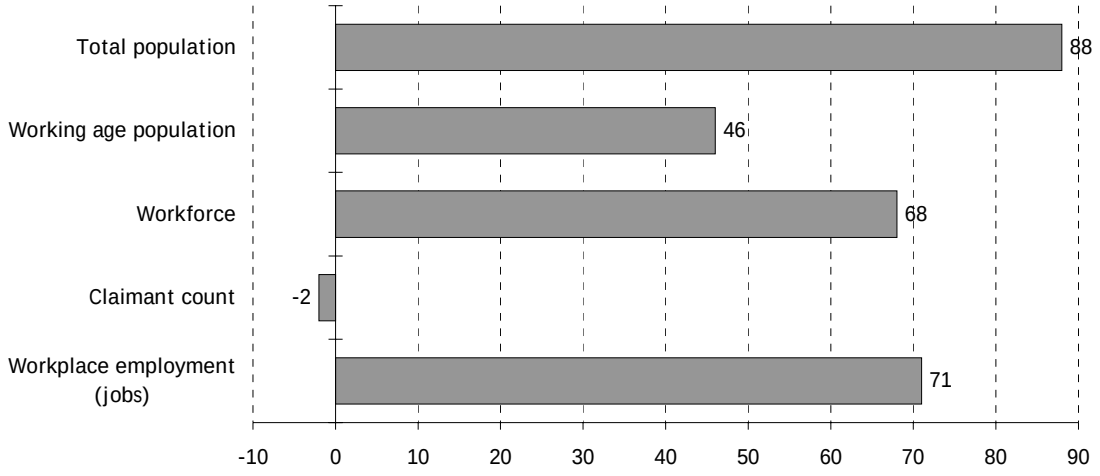
The Working Futures 2010-2020 forecasts use a standard sector classification, now based on 22 sectors, and are therefore unable to identify smaller emerging sectors. Essentially, the approach to this part of the NSSAW 2012 consists of

considering the projections made in Working Futures 2010-2020 and assessing the nature and likelihood of any deviations from the proposed trends. When combined with an understanding of the drivers of change (as outlined in chapter four), their potential impact, and the implications of the different scenarios, this can provide us with a rounded view of likely developments in jobs and skill needs.

What is the projected overall employment change?

Figure 5.1 shows projected employment change for Wales between 2010 and 2020, drawing on data from Working Futures *2010-2020*. It shows an expansion in both jobs and the size of the potential workforce. It estimates a net growth in jobs in Wales of around 71,000, while the workforce is expected to grow by a little less, resulting in a small fall in unemployment.

Figure 5.1: Changes in key labour market indicators for Wales, 2010-20 (000s)



Source: Working Futures 2010-2020, Main report, Table 6.4

It might be expected that the persistent low levels of economic activity and reductions in public expenditure would have a dampening effect on the labour market and that the Working Futures 2010-2020 predictions could therefore be seen as optimistic. However since 2010 the UK labour market has performed better than generally expected and especially so in Wales, with overall employment 1.4 per cent higher than a year earlier and unemployment 1.2 per cent lower[12]. While this may mean there is limited scope for further expansion of

[12] Labour Market Statistics December 2012, ONS, 12 December 2012

the workforce once economic recovery gets underway, it does mean that there is currently no strong reason to doubt the broad direction of the Working Futures 2010-2020 predictions.

Compared to the NSSAW 2011, based on Working Futures 2007-2017, the scale of expansion in total population, working age population and workforce is smaller than previously estimated, though the scale of change in predicted numbers of jobs remains broadly similar.

Projected employment change by sector

Within the overall projections for employment growth, there is significant sectoral variation, as demonstrated by Table 5.1.

Table 5.1: Projections of employment by industry groups, absolute levels and changes (000s) in Wales

	Levels			Changes		
	2010	2015	2020	2010-2015	2015-2020	2010-2020
Agriculture	27	29	31	2	1	3
Mining and quarrying	2	2	1	0	0	-1
Food drink and tobacco	22	24	25	2	1	3
Engineering	20	16	14	-4	-2	-6
Rest of manufacturing	91	90	88	-1	-2	-3
Electricity and gas	5	5	4	0	-1	0
Water and sewerage	9	9	10	0	0	1
Construction	96	106	111	9	6	15
Wholesale and retail trade	228	241	258	13	18	31
Transport and storage	44	42	40	-2	-2	-4
Accommodation and food	107	109	113	2	5	7
Media	9	9	11	1	2	2
Information technology	12	12	12	1	0	1
Finance and insurance	26	26	28	0	1	2
Real estate	12	12	11	0	-1	-1
Professional services	61	71	77	10	7	17
Support services	87	91	93	4	2	6
Public admin. and defence	90	78	82	-12	5	-7
Education	135	128	130	-6	2	-5
Health and social work	178	175	184	-3	9	6
Arts and entertainment	36	37	39	0	3	3
Other services	34	33	37	-1	3	2
All industries	1,330	1,344	1,401	14	57	71

Sectors where employment is expected to fall by at least 5,000 between 2010 and 2020

Sectors where employment is expected to rise by at least 10,000 between 2010 and 2020

Source: Working Futures 2010-2020, National workbook for Wales, Table 3.4a

Between 2010 and 2020, overall employment is expected to grow in 14 sectors, and to contract in seven[13]. The major growth industries in terms of jobs are:

- Wholesale and retail trade, with employment expected to rise by more than 31,000, accounting for almost half of the total growth in jobs expected over the period of total growth

[13] Comparisons with the NSSA for Wales 2011 cannot be made precisely due to changes in the number of industrial categories used within the Working Futures dataset.

- Construction, where the numbers employed are predicted to rise by 15,000
- Professional services sector, which is expected to see growth in employment of around 17,000.

These growth sectors, which represent industries with a mixture of demands for both higher and lower skill levels in their workforces, will account for just over 30 per cent of employment in 2020. Any current skill shortages within these sectors may be exacerbated by future expansion and have a limiting impact on growth. It is important to know, therefore, which sectors are both (a) the most significant in terms of their contribution to the economy and (b) those which suffer most from skills deficiencies. It may then be possible or desirable to focus to some degree on these parts of the labour market in order both to reduce the most significant skill deficiencies in the economy, and to remove an important barrier to the development of jobs in these sectors. This does not imply that the sole focus of action should be on such sectors, but merely that these are likely to be important sectors.

Sectors predicted to experience significant decline in the absolute numbers employed are engineering, public administration and education, with the latter two sectors affected, in particular, by reductions in public expenditure. These projections are broadly consistent with the implications of the major drivers in skills demands discussed in the previous chapter.

Significant sectors potentially constrained by skill deficits

To identify significant sectors constrained by skills deficits, we have used the model developed for previous audits which both assesses the economic significance of a sector and the extent to which it suffers from skills deficiencies.

Defining the economic significance measures

To identify the economic significance of a sector, a measure has been developed which captures the performance of each sector in the UK economy across the two key dimensions of the economy: productivity and employment. Sectors can be defined as economically significant because of their level of growth in terms of productivity. Analysis of the most recent *Working Futures* data for Wales shows

that the two sectors with the highest levels of productivity are currently information technology and finance and insurance.

Productivity, however, is not the only criterion of economic significance. The level and growth of employment is also important. Here, the analysis shows that retail, health and social care, education and hospitality are the sectors with the highest employment levels. In order to measure economic significance, the model combines the two key dimensions of productivity and employment into one overall measure. We combine both the levels of productivity and employment, which signify their contribution to the current volume of output, with changes in productivity and employment which signify their contribution to economic growth, the growth in output. Each indicator is given equal weight.

The productivity indicator used consists of two measures derived from Working Futures 2010-2020:

- Labour productivity in 2010 (based on the proportion of GDP attributable to a sector divided by the sector's proportion of total employment)
- The growth in labour productivity between 2005 and 2010.

The employment indicator consists of two measures derived from Working Futures 2010-2020:

- Employment levels in 2010
- The growth or decline in employment between 2005 and 2010.

Defining the skills deficit measures

To identify skill deficiency, the skills measures used are based on two forms of skills deficit:

- Reported skills deficits
- Occupation/qualification deficits.

Reported skills deficit

This consists of two indicators based on data from the Employers Skills Survey 2011. These are:

- The ratio of reported skill shortage vacancies (ie vacancies that employers find hard-to-fill due to a lack of suitable qualified, skilled or experienced applicants) to employees in each sector
- The proportion of employees that the employer believes are not fully proficient at their job, ie the extent of skills gaps.

Occupational qualification deficits

Reported skills shortage and gap indicators may overlook situations where employers are unaware of a skills deficit, or where employers alter job design, competition strategies or product and service ranges to accommodate skills deficits even if they are 'sub-optimal' for organisational performance. Employers may therefore experience a 'hidden' or latent skills deficit. There are no direct measures of such skills deficits, but we calculate a proxy indicator based on the adequacy of qualification level relative to the level of occupation (although we recognise that qualifications are not perfect measures of skills and there is not a perfect alignment of qualification levels and occupational level). The three measures used cover:

- The proportion of managers and professional workers qualified to a minimum level of level 4 or above
- The proportion of associate professionals or technicians qualified to a minimum of level 3 or above
- The proportion of all other workers with level 2 or above qualifications.

Each measure is weighted according to the occupational distribution of the sector. For example, if managers and professionals accounted for 30 per cent of all jobs in a particular sector then the weight for the relevant measure in that sector would be 0.30.

It should be noted that the available data (from the Labour Force Survey) for the three measures are not reliable for Wales; therefore we have substituted UK-level data. The occupational distribution weightings, however, are based on Welsh data.

Which are the current key sectors?

We report below the relative ranking of sectors based on the calculation of overall measures for both economic significance and skills deficits[14]. It is worth noting that a sector could have a high relative position if it scored highly on one of the measures. For example, a high ranking in the economic significance measure can be because of high productivity performance or employment (or indeed both). However, in the analysis we show only the results of the overall measures.

Sectoral economic significance measure

Table 5.2 shows that the sectors scoring highest on the economic significance scale are primarily in the service sector: wholesale and retail services, health and social care, support services (which includes sub-sectors such as travel, security and employment services) and education. The lowest scoring sectors are engineering, water and sewerage and agriculture.

Skills deficit measure

Table 5.2 also shows the sectors which display the greatest 'skills deficit' on the overall measure are water and sewerage, agriculture, support services and food drink and tobacco.

[14] For each measure the sectors are ordered on a scale (from 0 to 1). The lowest is given the score of 0 and the highest is given the score of 1. The remaining sectors are positioned proportionately to their score on the measure between 0 and 1 and then aggregated to produce a composite score (again between 0 and 1). This approach gives a more appropriate representation of the differences between sectors than alternative approaches such as ranking, as it enables recognition of the different degrees of 'distance' between the values.

Table 5.2: Current sectoral economic significance and skill deficiency in Wales

Order of significance (most significant first)	Economic significance	Skills deficits
1	Wholesale and retail trade	Water and sewerage
2	Health and social work	Agriculture
3	Support services	Support services
4	Education	Food drink and tobacco
5	Accommodation and food	Accommodation and food
6	Professional services	Transport and storage
7	Public admin. and defence	Rest of manufacturing
8	Media	Wholesale and retail trade
9	Construction	Engineering
10	Finance and insurance	Real estate
11	Other services	Electricity and gas
12	Food drink and tobacco	Arts and entertainment
13	Real estate	Mining and quarrying
14	Rest of manufacturing	Other services
15	Information technology	Professional services
16	Arts and entertainment	Construction
17	Mining and quarrying	Media
18	Transport and storage	Information technology
19	Electricity and gas	Finance and insurance
20	Engineering	Health and social work
21	Water and sewerage	Education
22	Agriculture	Public admin. and defence

Source: IES based on data from Working Futures 2010-2020, Employer Skills Survey 2011, UKCES and Labour Force Survey April – June 2012

A sector priority matrix

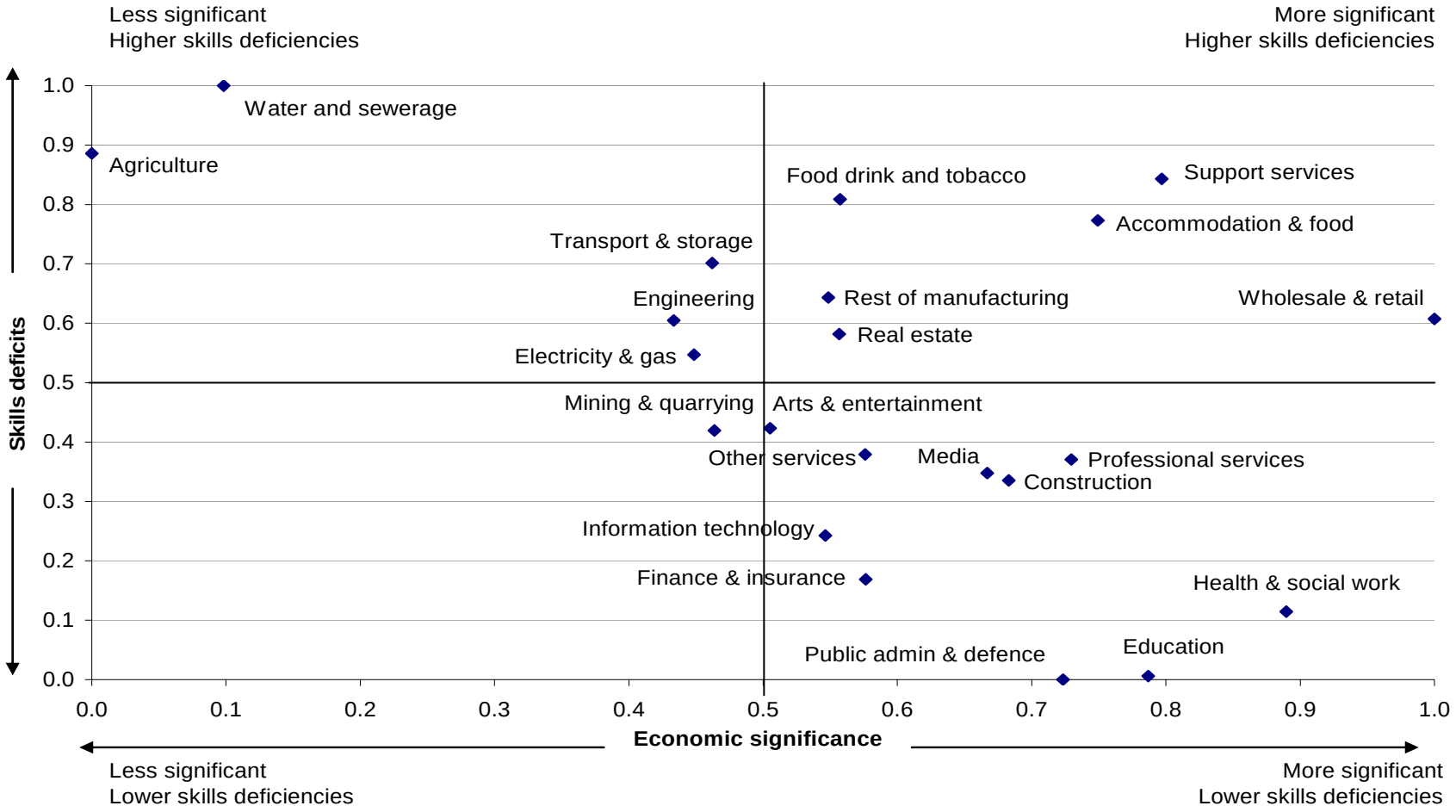
The key sectors – based on combining the economic significance and skills deficit measures, are identified in Figure 5.2. The sectors which currently have the highest relative economic significance while also being constrained by the highest level of skill deficits (ie those in the top right quadrant) are support services, food, drink and tobacco manufacture, accommodation and food, the rest of manufacturing (other than engineering), wholesale and retail and real estate.

The transport, engineering and electricity and gas sectors are all in the top left quadrant indicating that they are of less economic significance but still prone to skill deficits. Water and agriculture have some of the most pressing skill deficiencies but, based on the model criteria are less of an economic priority.

It is helpful to compare the results with those from the NSSAW 2011 and NSSA for England 2010. The key points of commonality and difference are:

- Retailing features in both the current and the previous Welsh audit in the top right hand quadrant
- Since 2011, the accommodation and the food sector has become relatively more economically significant in Wales and moved into the top right hand quadrant
- Meanwhile the financial services sector has become less economically important and also less prone to skill deficiencies and has moved from the top right hand quadrant in 2011 to the bottom right hand quadrant
- Retail and hotels/restaurants features within the top right quadrant in England as does accommodation and food in Wales
- Agriculture features in both nations as having less economic significance but high levels of skills deficiencies (and much higher than identified in the NSSAW 2011). The water industry, which comes out top of the skill deficiency scale in NSSAW 2012) is not separately identified in the previous English or Welsh audits as it is included within a broader utilities sector.
- The sectors with the lowest levels of skill deficits, although still important economically, are those providing public services such as education, health and defence.

Figure 5.2: A sector priority matrix for Wales – current



Source: IES based on data from Working Futures 2010-2020, Employer Skills Survey 2011, UKCES and Labour Force Survey April – June 2012

Identifying future economically significant sectors with potential skills issues

While it is important to identify economically significant sectors which are currently constrained by skill deficits, it is also valuable, but more difficult still, to identify those sectors which are expected to be economically important in the future and which are likely to face skills constraints.

In terms of future economic significance, we again look at productivity and employment:

- Future labour productivity is based on two measures:
  - Projected labour productivity in 2020
  - Labour productivity in 2010 and the productivity forecast for each sector between the two periods 2010 and 2020.
- Future employment based on:
  - Projected levels of employment within each sector in 2020
  - The average change in employment forecast for the sector between the two periods 2010 and 2020.

On the skills deficit side there are, of course, no available data on future skill shortages, skills gaps or sectorally-specific forecasts of qualifications levels. So, a future-oriented model needs to look elsewhere.

Future skills deficits and mismatches are at risk of occurring where the need for new employees is greatest, as in principle it is most likely to outstrip supply and to be quantitatively more important to the economy and labour market. It is clear from both Working Futures 2010-2020 and future insights offered by the sector-based skills assessments, that the demand to replace people who leave existing jobs, primarily through retirement, is the key dimension of future demand for labour. Projections of this 'replacement demand' for labour are available from Working Futures 2010-2020, and have been used here as a proxy measure for skills requirements. This is more of a measure of demand for employment than skills, but does provide an indication of where skills constraints are most likely to occur due to the volume of demand for people to take the place of existing experienced

employees. It differs from the measure of employment used on the economic significance side of the model, as it is based on the absolute numbers of predicted replacement demand rather than net actual growth in jobs. Replacement demand represents a partial picture of the future skills situation, as some sectors with a relatively young workforce (such as Information Technology) are ranked low but could still encounter skills issues in the future.

A future-oriented sector priority matrix

On this basis of future economic significance, the key sectors include those from the service sector: media, information technology, professional services, wholesale and retail, health and social work and support services. On the skills demand side, the key sectors are a mix of public and private sector services: wholesale and retail, health and social care, education, accommodation and food (see Table 5.3).

Table 5.3: Future sectoral economic significance and skill deficiency in Wales

Order of significance (most significant first)	Economic significance	Skills deficits
1	Media	Wholesale and retail trade
2	Information technology	Health and social work
3	Professional services	Education
4	Wholesale and retail trade	Accommodation and food
5	Health and social work	Construction
6	Support services	Rest of manufacturing
7	Finance and insurance	Support services
8	Rest of manufacturing	Public admin. and defence
9	Accommodation and food	Professional services
10	Construction	Transport and storage
11	Other services	Arts and entertainment
12	Food drink and tobacco	Agriculture
13	Engineering	Other services
14	Education	Finance and insurance
15	Transport and storage	Food drink and tobacco
16	Electricity and gas	Engineering
17	Arts and entertainment	Real estate
18	Public admin. and defence	Water and sewerage
19	Agriculture	Media
20	Real estate	Information technology
21	Water and sewerage	Electricity and gas
22	Mining and quarrying	Mining and quarrying

Source: IES based on data from Working Futures 2010-2020

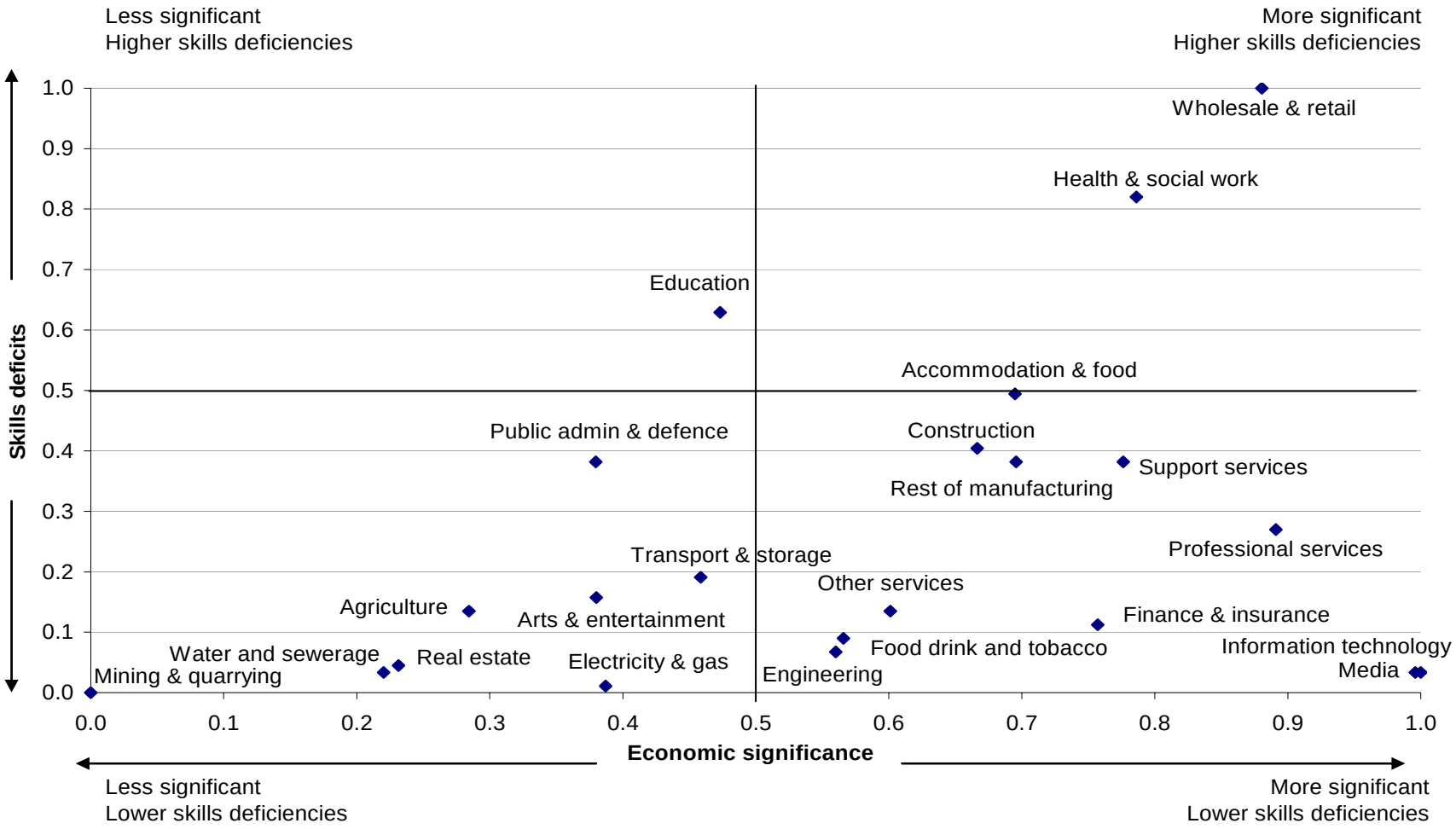
When combined into the matrix (Figure 5.3), we can see that the wholesale and retail sector and the health and social work sector, are the two that are likely to be *both* particularly economic significant *and* expected to have the most skill deficits. The information technology and media sectors are likely to be the most economically significant but have relatively low levels of replacement demand and so do not score highly on the skill deficit criterion.

Mining and quarrying is the sector that features lowest on the future economic significance scale and also lowest on the future skill deficits scale.

A comparison with the results from the previous NSSAW and the previous NSSA for England 2010 shows retail (and wholesale) and health and social care feature in both the Welsh and English audits as economically important sectors with potential future skills deficits.

Both the sectors highlighted in Wales as combining high future economic significance and high replacement demands also have high current levels of female employment. Women account for around three-quarters of employment in health and social care and more than 60 per cent of retail employment (see Figure 5.3).

Figure 5.3: A sector priority matrix – future



Source: IES based on data from Working Futures 2010-2020

Towards identifying significant sectors

Synthesising the material and messages from the different sources of information discussed here is difficult, and interpretations need to be made with caution. The issues of forecasts, footprints and timescales as well as the inherent uncertainty about the future, about emerging sectors and the impact of the drivers of change through time, all make a solid assessment difficult.

Nonetheless, an indicative comparison of the magnitude of likely employment demand in different sectors is shown in Table 5.4 based on the Working Futures 2010-2020 predictions and our sector models.

Table 5.4: Summary of key sectors

Sectors with highest forecast employment growth (from Working Futures, see Table 5.1)	Economically significant sectors potentially constrained by skill deficits (see Figures 5.2 and 5.3)	
	Current	Future
Construction	Food drink and tobacco	Wholesale and retail
Wholesale and retail	Support services	Health and social work
Professional services	Wholesale and retail	
	Accommodation and food	
	Rest of manufacturing	
	Real estate	

Conclusions

This chapter has examined sectors with potential strategic importance in terms of jobs and skills. We first considered likely growth sectors in terms of jobs and then sought to identify key sectors in terms of both economic significance and skill needs, now and in the future. Over the next few years, employment expansion is expected in a range of sectors – including construction, wholesale and retail, and professional services.

We undertook an initial assessment to identify significant sectors of the economy which are also potentially constrained by skill deficiencies both now and in the future.

Taking the current situation first, we found that sectors which exhibit both the greatest economic significance and greatest skill deficiency are food, drink and tobacco, support services, wholesale and retail, accommodation and food, rest of

manufacturing and real estate. Retail appeared in this list for the NSSAW 2011 but the other sectors noted are newly identified.

Looking to the future, the sectors which combine growing significance and future skill needs are wholesale and retail and health and social work. Both these sectors were identified as having future significance in the NSSAW 2011, suggesting some consistency in projections over time.

The quantitative assessment we have undertaken is valuable and offers insight into the key sectors that may merit attention in terms of action on skills. However, it is important to remember that this assessment is based on quantitative analysis of existing sectors only, and that qualitative data also offers valuable insights, particularly into new or ‘emerging’ sectors. We now turn our attention to an examination of the occupational areas where skills demand and potential mismatches are likely to be most significant.

6 Key Future Occupational Skills Needs

Introduction

As with the previous chapter, this chapter takes the Working Futures 2010-2020 projections as its starting point and then supplements these with findings from the sector skills assessment reports produced by SSCs. In this chapter, however, attention is turned to look in more detail at likely future *occupational* skills needs within and across sectors.

What are the likely patterns of occupational change?

Table 6.1 shows the projected demand for workers in different occupational categories in Wales, absolute numbers, by gender and their share of the workforce.

Table 6.1 shows that the highest levels of absolute and percentage job growth in Wales are predicted for managerial, professional and associate professional occupations, while the occupations with the sharpest decline in numbers of jobs will be process, plant and machine operatives and administrative/secretarial functions. This implies a general trend towards a demand for higher skilled individuals for these occupations.

Between the genders, the greatest share of employment growth is predicted for men but the greatest share of change is predicted for the female workforce, with significant absolute increase in the numbers of women in professional occupations, and significant declines in the absolute numbers of women as well as their share of employment in administrative and secretarial roles, as process, plant and machine operatives, and in elementary occupations. This suggests that there may be a significantly higher skills profile required of women moving into the higher level occupations.

Compared to the UK, the largest increases in percentage change in employment in Wales should also take place in the three highest skilled occupations, and the percentage change in growth for professionals is higher in Wales than the UK average, as is that for skilled trades, sales and customer service occupations. Like the UK average, the occupational group predicted to experience the sharpest percentage decline in number of jobs is process, plant and machine operatives but

to a greater extent than the rest of the UK, and the numbers of people in elementary occupations will decline in Wales but rise in other UK nations. Skilled trades occupations will grow in Wales but shrink in the UK overall. The growth in sales and customer service occupations will predominantly benefit women, while job growth in skilled trades will predominantly benefit men.

Table 6.1: Projected demand for workers in different occupations from 2010-2020 by volumes, gender and shares of total

Standard Occupational Classification (SOC) 2010	Overall change (000s)	Males		Females		Percentage share of employment		% change in total employment 2010-2020	
		Change (000s)	Change (%)	Change (000s)	Change (%)	2010	2020	Wales	UK
Managers, directors and senior officials	18	10	12.8	8	25.7	8.1	9.0	16.8	18.0
Professional occupations	35	9	8.2	26	21.3	17.3	18.9	15.1	14.9
Associate professional and technical	18	8	9.7	10	17.3	10.5	11.2	12.9	14.0
Administrative and secretarial	-15	4	10.1	-19	-16.1	11.6	9.9	-10.0	-10.5
Skilled trades occupations	7	10	6.3	-3	-13.9	13.9	13.7	4.0	-6.5
Caring, leisure and other service	12	4	16.6	8	7.3	9.6	10.0	8.9	11.5
Sales and customer service	11	0	0.0	11	13.4	9.4	9.7	9.1	0.1
Process, plant and machine operatives	-13	-7	-7.9	-6	-40.1	7.9	6.6	-12.3	-10.9
Elementary occupations	-1	11	12.5	-12	-16.8	11.7	11.1	-0.8	3.2
All occupations	71	47	6.7	24	3.8	1,330	1,401	5.4	5.1

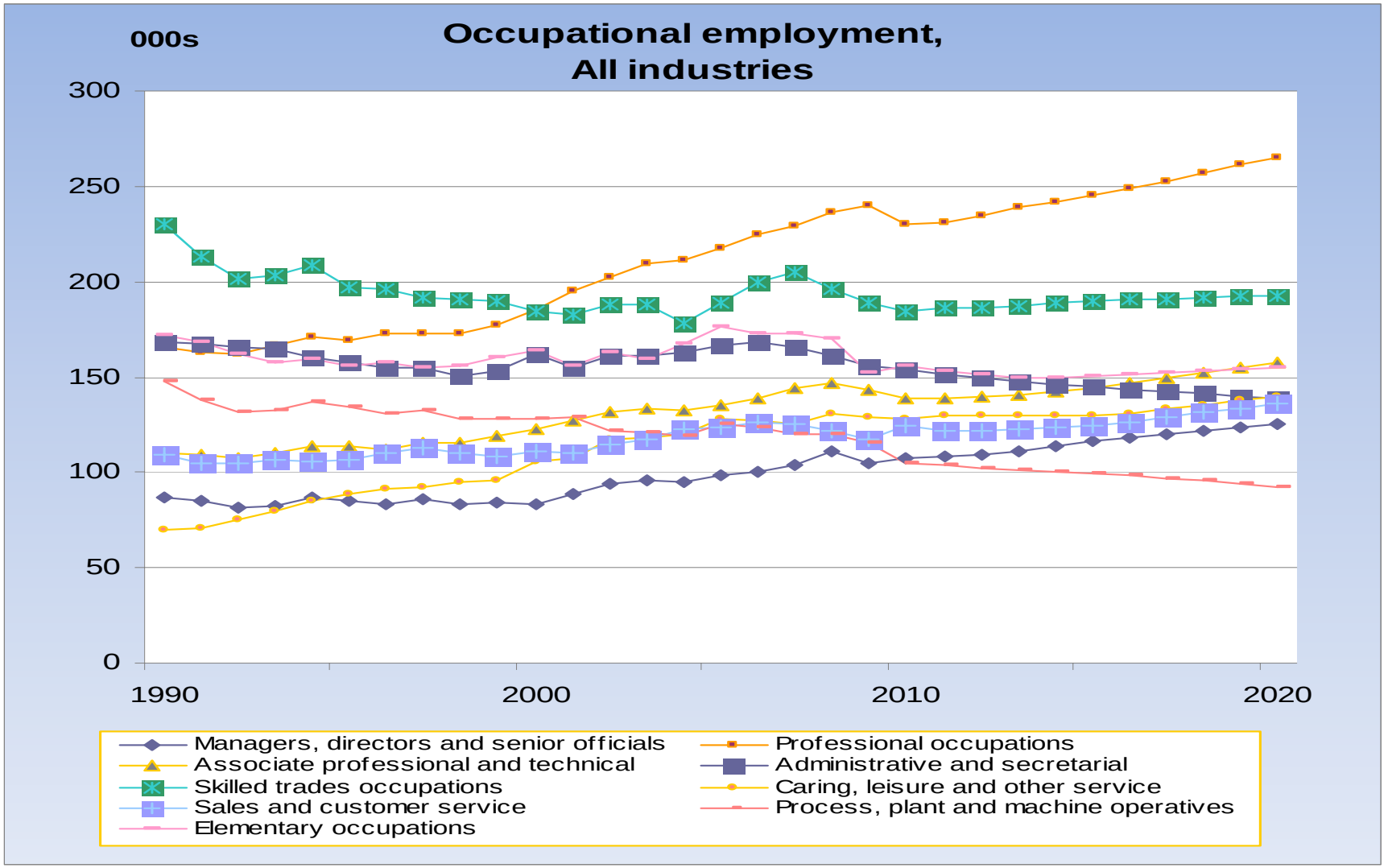
High level of growth relative to column/row headings
High level of decline relative to column/row headings
Source: Working Futures 2010-2020

It is also helpful to place these changes in context over time as shown in Figure 6.1 below.

Major trends evident from Figure 6.1 are the ongoing and projected increases in the high volumes of people employed in professional occupations as well as increases in the numbers of managers, directors and senior officials, albeit from a

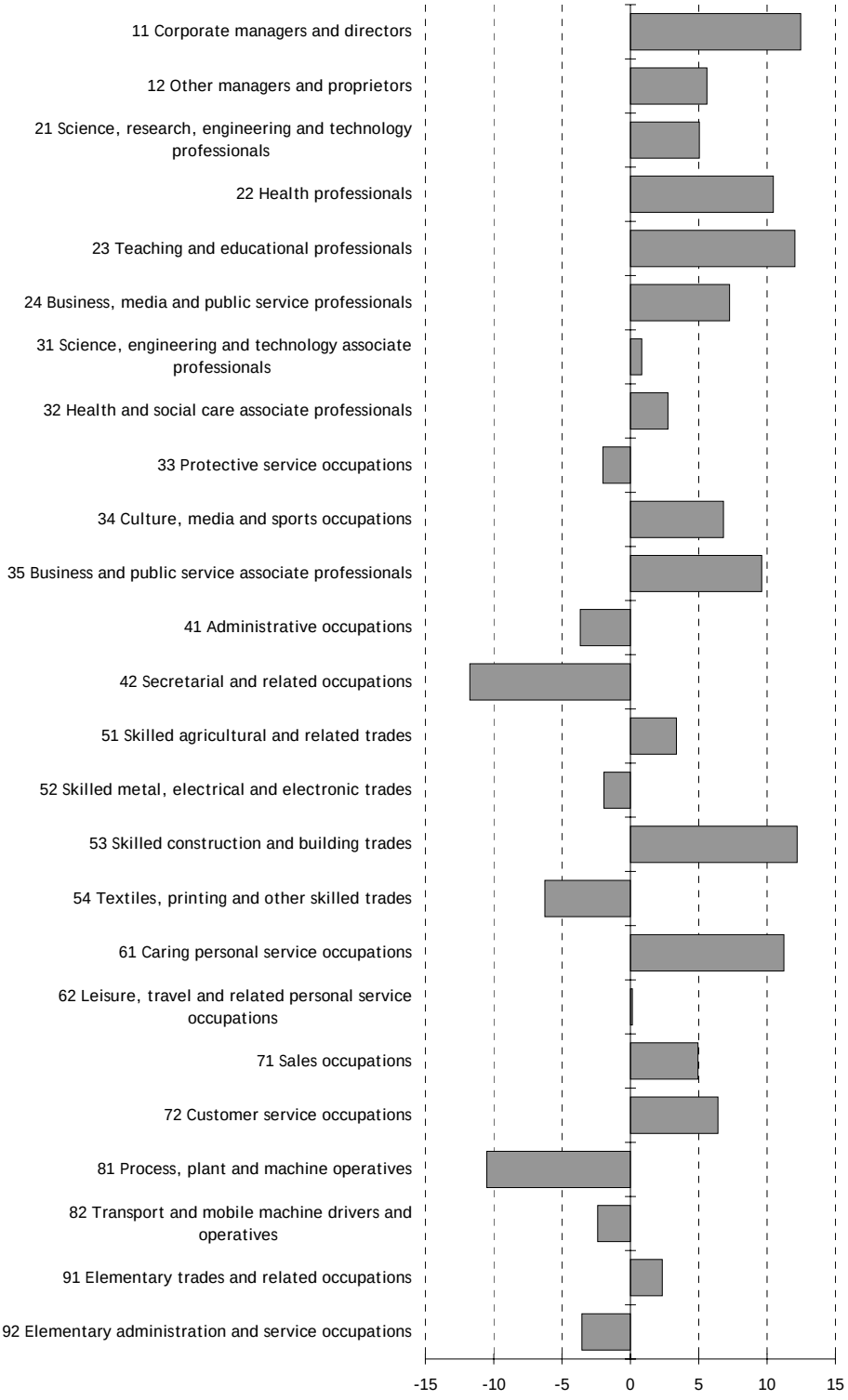
smaller base. The effects of the recession from 2008-2010 are also evident across most occupations. Long-term decline in job volumes is evident among process, plant and machine operatives and in secretarial/administrative occupations.

Figure 6.1: Change in employment volumes across all occupations in Wales over time



Evidence of projected change is also available at a more detailed occupational group level.

Figure 6.2: Changes in occupational employment structure by sub-major groups (000s), Wales, 2010-2020

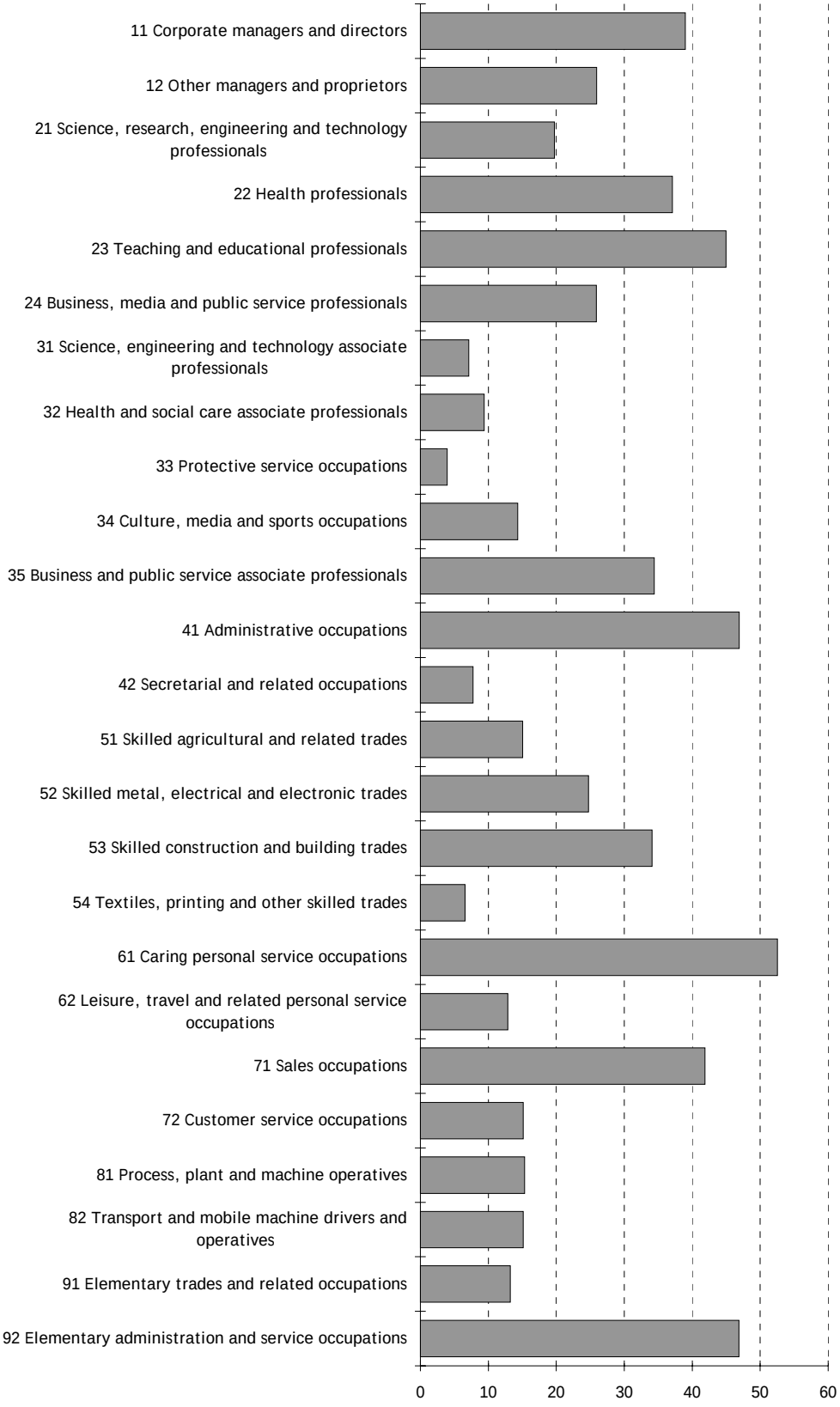


Source: Working Futures 2010-2020

Overall this shows that the greatest increase in occupational volumes is predicted for corporate managers, skilled construction/building trades, teaching/education professionals, health professionals, business/public service professionals and caring/personal service occupations. This indicates a tendency towards highest increases in job volumes among the higher skilled occupational groups. This is especially marked when considering the concurrent decline in lower skilled occupational groups of secretarial/administrative workers and process, plant and machine operatives, consistent with the data presented in Table 6.1.

It is also necessary to take into account the absolute volume of change through jobs being created when workers leave the labour market, as well as those created by business expansion. This data is shown in Figure 6.3.

Figure 6.3: Net requirements by Standard Occupational Classification (SOC) 2010 sub-major group (000s), Wales, 2010-2020



Source: Working Futures, 2010-2020

The figures indicate that the largest net requirements arising from replacement demand combined with expansion demand will be for caring/personal service occupations, administrative and elementary administrative/service occupations and teaching and education professionals. Overall, most of the demand for new jobs will arise from replacement demand for close to 540,000 vacancies compared to just over 70,000 vacancies due to expansion demand. The UK is similarly predicted to experience demand for nearly 14 million jobs by 2020, of which around two-fifths are accounted for by a combination of net and replacement demand.

It is projected that high level occupations (managers, professionals and associated professionals) will contribute to over 260,000 job openings in Wales over the period 2010-2020. Intermediate roles (defined as administrative, skilled trades, personal service and sales roles) will contribute to over 250,000 roles, while over 90,000 vacancies will come from lower level occupations (operative and elementary roles).

For some occupations overall demand for workers will remain relatively strong, even where there is limited projected expansion in the number of new jobs created, due to replacement demand where workers leave the labour market eg on retirement. There will be a net requirement for workers in all occupations.

In summary the data show that:

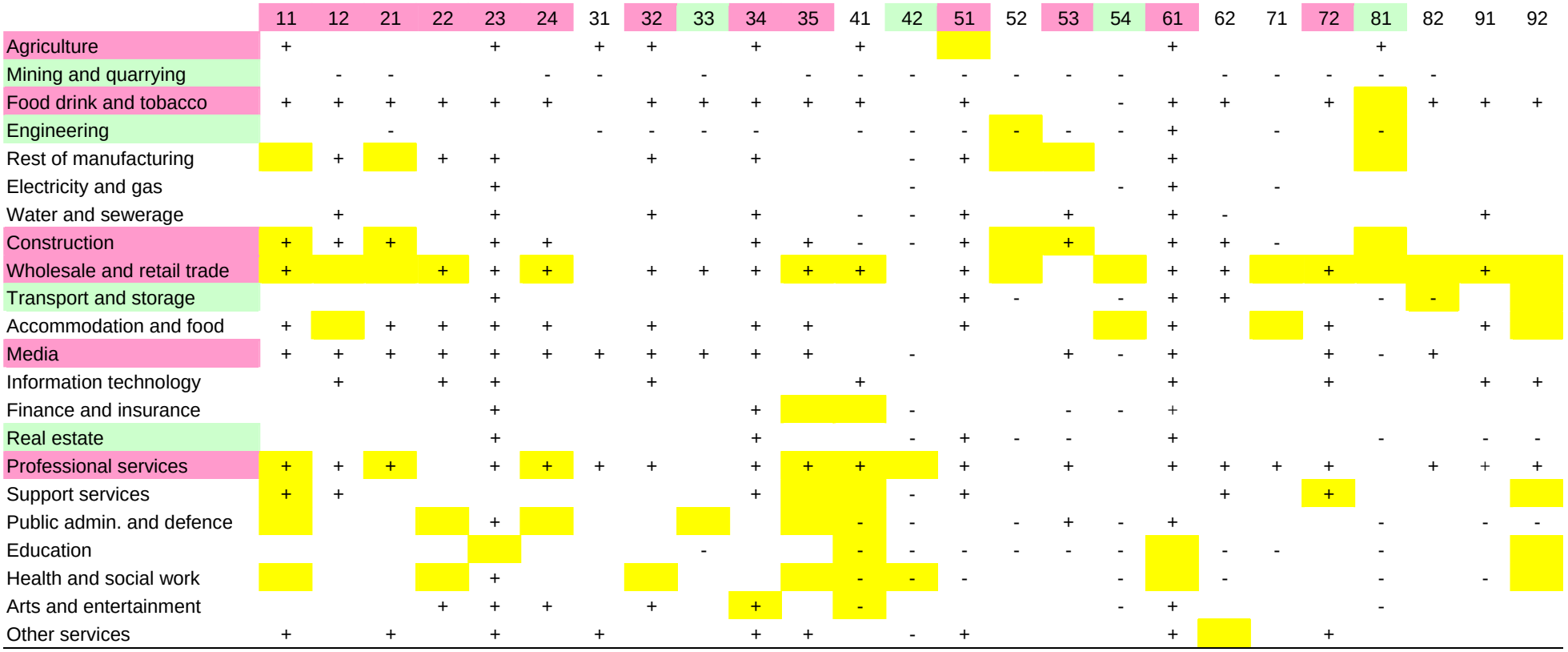
- Among the professional and managerial groups, demand will be particularly strong for teaching/research professionals, in terms of both expansion and net demand, while managerial roles will experience the greatest overall expanded demand. In absolute terms, the growth in professional occupations will be highest.
- At associate professional level, business/public service occupations will contribute the bulk of the projected net requirement.
- In the skilled trades group, positive expansion demand will come mainly from construction trades which also account for substantial replacement demand.

- Care work accounts for most of the expansion in personal service roles and this subgroup contributes the largest single net requirement of any occupation across the workforce.
- Within the sales and customer service group, the main source of demand overall comes from replacement workers required for direct sales roles.
- There will be an overall decrease in the number of new roles projected for transport operatives and process, plant and machine operatives but this will be offset by significant replacement demand to create a positive net requirement.
- Most of the projected net job openings in the elementary occupations group will be concentrated in administrative and service occupations.

What are the likely future changes in occupations within industrial sectors?

The discussion so far has focused on occupations in the economy as a whole, but how does this pattern of occupational change vary across different sectors in Wales? Table 6.2 provides detail of likely change in net employment for specific occupations within different sectors. Particular attention is drawn to those ‘occupation / industry’ groups which may be of special importance ie where the level of future growth of the sector and/or occupation is especially large. This enables us to indicate the significant concentrations of potential job growth.

Table 6.2: Occupational change in Wales across the 22 industries within sub-major groups



Level of employment in 2010 and/or 2020 is 5,000 or greater
\+ Growth in employment between 2010 and 2020 is forecast to be 20% or greater
\- Growth in employment between 2010 and 2020 is forecast to be -20% or less
Growth in sector or occupation between 2010 and 2020 forecast to be 10% or greater
Growth in employment in sector or occupation between 2010 and 2020 forecast to be -10% or less

11 Corporate managers and directors, 12 Other managers and proprietors, 21 Science, research, engineering and technology professionals, 22 Health professionals, 23 Teaching and educational professionals, 24 Business, media and public service professionals, 31 Science, engineering and technology associate professionals, 32 Health and social care associate professionals, 33 Protective service occupations, 34 Culture, media and sports occupations, 35 Business and public service associate professionals, 41 Administrative occupations, 42 Secretarial and related occupations, 51 Skilled agricultural and related trades, 52 Skilled metal, electrical and electronic trades, 53 Skilled construction and building trades, 54 Textiles, printing and other skilled trades, 61 Caring personal service occupations, 62 Leisure, travel and related personal service occupations, 71 Sales occupations,72 Customer service occupations, 81 Process, plant and machine operatives, 82 Transport and mobile machine drivers and operatives, 91 Elementary trades and related occupations, 92 Elementary administration and service occupations

Source: Working Futures 2010-2020

The likely areas of most significant future occupational change are summarized in Table 6.3 below:

- High growth occupations in large sectors with expanding employment: where the occupations are likely to experience growth of at least 20 per cent in sectors with employment growth of over 10 per cent and where the sector employs at least 50,000 people.
- High growth occupations in sectors with at least 5,000 people employed in the occupation.

Table 6.3: High growth occupations by sector in Wales

High growth occupations in large sectors with expanding employment	High growth occupations in sectors with at least 5000 staff in the occupation
■ **Construction**: corporate managers; science/engineering/technology professionals; skilled construction and building trades; caring/personal service occupations ■ **Wholesale/retail**: corporate managers; health professionals; business/media/public service professionals and associate professionals; customer service occupations ■ **Professional services**: corporate managers; science/engineering/technology professionals; business/media/public service professionals and associate professionals; science, engineering and technology associate professionals; health and social care associate professionals; culture, media and sport occupations	■ **Support services**: corporate managers; customer service occupations ■ **Arts and entertainment**: culture media and sport occupations

Overall, the Working Futures 2010-2020 data shows considerably greater diversity in the number of sectors and occupations within those sectors where growth is

expected, compared to the findings from the NSSAW 2011. It is important to recognise that the volumes of jobs involved may be highly variable, and the magnitude of future skills demands is considered in more detail in the next chapter. In addition to occupations highlighted within growing sectors, further occupations are likely to provide substantial job growth across a number of other sectors. These include: teaching and education professionals, health and social care associate professionals, culture, media and sport occupations and caring personal service occupations.

In addition to the Working Futures 2010-2020 data predictions, qualitative sources can help flesh out what some of the future skills needs may be for each occupation within some of the sectors highlighted above. The analysis below draws on a range of Sector Skills Assessment reports produced by Sector Skills Councils in 2012. The sectors do not necessarily map precisely onto the Working Futures classifications, and, where possible, specific implications for Wales are drawn out.

Construction

In 2010 the workplace-based GVA for the broad construction sector in Wales was almost £3,286 million which accounted for seven per cent of the nation's total GVA and made construction the sixth largest out of 20 sectors in Wales. It provides over 90,000 jobs as of June 2012 and accounts for six per cent of employment. . While the sector has been severely affected by recession, government policy may stimulate some future renewal. The drivers of change discussed in Chapter 4 highlight the potential of the Welsh government's policies on tackling climate change through reducing carbon emissions, combined with the UK government 'Green Deal' to fund domestic energy efficiency improvements, to change the shape of skills needs and create some job opportunities.

Recent research shows that the sector's workforce holds a lower than average level of qualification and is less likely to engage in training (Construction Skills, 2012). New technical roles may emerge as a result of government funding of the 'Green Deal' providing financial incentives to improve the energy efficiency of domestic buildings. These include energy advisor, insulation installer, renewable technology or building services installer but these roles are likely to build on the

skills of existing workers rather than constitute entirely new jobs (Construction Skills, 2012).

Among managers, especially site managers, pressures for efficiency and value for money will lead to requirements for ongoing implementation of ‘lean’ and ‘agile’ to cope with market change, increasing competition. This may also demand adoption of high performance work practices and ability to deploy change management techniques. Use of collaborative software in the construction project lifecycle through Building Information Management and Modelling (BIMM) techniques will be important given the fragmented structure of the industry and will require expertise in supply chain management. Commercial awareness and entrepreneurship skills will be needed, especially for SME managers competing against larger firms, together with knowledge of integrated design and build processes.

Architects, surveyors and engineers will need understanding of building life-cycle assessment and life-cycle cost analysis to meet regulations supporting sustainability in construction. Managers will also need skills to understand how to source and evaluate carbon accounting principles and methodologies, possibly from third party providers.

Employability skills in numeracy, literacy and customer service will be important for front line construction and installation workers who may need to explain and market energy saving technologies and techniques to the general public. Construction of parts of buildings through prefabrication offsite is likely to grow, shifting demand for location of building site trades to static locations. However, the possibility for enhanced automation of construction methods may also reduce the volumes of people needed in these trades in the long-term.

Retail

The retail and wholesale sector’s workplace-based GVA for 2010 was £5,060 million, accounting for 11 per cent of Welsh GVA and made retail the third largest sector out of 20 in Wales. It provides over 200,000 jobs as of June 2012 and accounts for 14 per cent of employment. It is projected to grow by 13 per cent

between 2010 and 2020 and create around 30,000 jobs (Skillsmart Retail, 2012)[15]. However, growth is likely to be subject to the pace of economic recovery, which means it may be uneven between different locations and parts of the sector.

The recent SSA for the retail sector provides some detail about the kinds of skills needs associated with different occupations in the sector (Mosley et al., 2012). For more senior staff, technology, particularly e-commerce and 'm-commerce' or mobile technology, is currently developing and will require managers to spot opportunities to exploit the benefits of the new technology and IT skills among front line staff to handle it. Skills in web analytics to track customers, marketing through social media and web design will be required among professional staff. There are particular challenges for small retailers which are less likely to employ specialist teams in developing multi-channel retailing, as they will need skills to manage outsourcing of these activities. Development of customer service skills and problem-solving skills will remain an ongoing priority for front line retailing staff.

The wholesale sub-sector will require improvements to skills in managing logistics and operational delivery to ensure all order requirements are met. Improved customer service for face-to-face transactions and investment in good web design skills as customers increasingly use e-commerce will be needed.

Professional services

Professional services covers two industrial groups which typically appear in analysis of sectoral performance – financial and insurance activities, and professional, scientific and technical activities. Combined workplace-based GVA for 2010 for both sectors was £3,955 million (£2,255 million for financial and insurance activities and £1,700 million for professional, scientific and technical activities). The combined proportion of GVA was nine per cent (five per cent for financial and insurance activities and four per cent for professional, scientific and technical activities). This makes the combined sectors the fifth largest source of GVA in Wales out of 20 sectors. Financial and insurance activities provides over 32,000 jobs and professional, scientific and technical activities provides over

[15] As of 2013 Skillsmart Retail ceased to exist

65,000 jobs as of June 2012, accounting for two per cent and five per cent of employment respectively.

Dominated by professional and managerial staff, the sector is likely to experience skill shortages in risk and management skills, legal, analytical, statistical, IT, leadership and management, change management, language, regulatory and compliance knowledge and skills. Front line staff will need to improve customer service skills and those selling financial products will be more highly qualified as a result of the Retail Distribution Review, stipulating minimum qualifications. Demands for actuaries, underwriters, graduate accountants and professionals offering pensions advice is likely to increase (Skills for Justice, 2012).

Arts and entertainment

There is no exact match between workplaces which fall into this broad sector and standard codes used to compile data on economic performance. In Wales, there are estimated to be 3,640 establishments in the broad creative, media and entertainment sectors which employ 32,000 people (Skillset and Creative and Cultural Skills, 2012). In 2009, GVA per head for the sector stood at £30,000. This is substantially higher than the average in the wider Welsh economy of £22,000, but below the sector average across the whole of the UK, of £49,000 (ABI/BRES/ABS, 2009). Both establishment and employment indices for the sector have shown growth which stopped in 2009, but has since partly recovered. The sector in Wales is expected to grow substantially by 2020 with an additional 14,000 new jobs created, raising overall employment levels to 52,000 people, with a growing demand for associate professional and technical and professional occupations. Skill levels are relatively high with over half the workforce holding a level 4 qualification and around two fifths of the workforce is self-employed.

Skills needs for the sector will be focussed on management skills in coping with market change and increasing competition due to reduced public funding eg cuts in S4C budget and Arts Council budgets. Fundraising, sales and marketing skills to generate alternative sources of revenue in the face of public sector cuts will be important (Skillset and Creative and Cultural Skills, 2012).

Managers will also need relationship handling skills for developing content through networks across different industries and locations, project management skills, and hybrid skills combining creativity and STEM skills, together with understanding of technology and intellectual property. Professional skill needs included graphic design and digital skills eg in visual effects which is recognised through presence on the MAC occupation shortage list (Skillset and Creative and Cultural Skills, 2012). Attracting and keeping good labour market entrants within Wales, in the face of likely migration to media clusters in Manchester, London and Bristol will be important.

Conclusions

This chapter has shown that in broad terms, the highest volume of job openings up to 2020 is most likely to be found in caring/personal service occupations, administrative and elementary administrative/service occupations and teaching and education professionals. Occupations predicted to experience highest levels of *new* jobs being created are corporate managers, skilled construction/building trades, teaching/education professional, business/public service associate professionals and caring/personal service occupations.

Overall, high level occupations (managers, professionals and associate professionals) will contribute to nearly 260,000 job openings in Wales over the period 2010-2020. Intermediate roles (defined as administrative, skilled trades, personal service and sales roles) will contribute to over 250,000 roles, while over 90,000 vacancies will come from lower level occupations (operative and elementary roles). Most vacancies will derive from replacement demand from existing roles as people leave the labour market, which is eight times as large as expansion demand from new roles being created.

It is also possible to examine these occupational changes on a sector-by-sector basis, creating a ‘matrix’ of occupation/industry requirements. To do this we looked at high growth occupations in two types of sector: large sectors with expanding employment and high growth occupations in sectors employing at least 5,000 people . We then reviewed some detailed sector studies, which corroborate and support much of evidence on these trends. In particular, the additional data provides evidence of:

- Skills gaps emerging amongst managers and professionals across a range of sectors, in relation to ICT and technological change more broadly.
- A need for improved management skills across several sectors, often specific in character, related to the sector.
- Some demand for highly skilled, specific STEM related occupations and for STEM skills within managerial groups.
- Significant expansion of frontline personal service occupations, especially in the care sector.
- Skills demands in front-line customer care occupations.

Additionally, individual sectors experience a range of particular skills challenges. The next chapter draws all the evidence from NSSAW 2012 together and reviews and prioritises skills needs for Wales overall.

7 Conclusions and Strategic Priorities

Introduction

The NSSAW 2012 has identified current and likely future trends in demand for skills and employment in Wales over the next five to 10 years, using a range of available national data sources, and supplemented by an analysis of sectoral and occupational data. It has sought to provide greater insight into, and foresight concerning, Wales' existing and future skills needs.

This final chapter draws together the material analysed so far, and sets out some priority areas for action in the short, medium and longer term. It focuses, more specifically, on the occupations and sectors where most attention is required to ensure that Wales has the essential skills to meet the emerging labour market demands of today and tomorrow, and, ultimately, to maximise economic growth and prosperity. To provide context to the analysis, we also highlight some of the key characteristics of jobs and skills that are distinctive to Wales.

The intention of this chapter is not to be prescriptive, but to provide intelligence about strategic skills needs to stakeholders in the skills and employment system and act as a basis for better informed choices, and enable further dialogue and action on the most pressing skills priorities for Wales. The aim is to assist all stakeholders in making their education, training and development decisions, enabling a better response to current needs. It should help inform and influence all stakeholders so that they take appropriate action on demand and supply and achieve a better balance between the 'skills we need and the skills we have'. The findings may be of particular interest to learning providers and employers in helping them to prioritise skills solutions for current and future workforce needs.

Key characteristics of skills needs in Wales

To provide context to our analysis of skills priorities in this chapter we have drawn together a range of key conclusions about skills and opportunities in Wales, which show how Wales' position is distinct from that of the wider UK.

Current employment in Wales

1.35 million people aged 16 and over living in Wales are in employment, while there are about 1.38 million jobs located in Wales. Although employment levels

have fallen since the onset of the financial crisis, there are still more than 167,000 additional people in employment compared with 15 years ago. The demand for labour, as measured by the number of jobs being made available and filled, has therefore increased by almost 14 per cent over the period. Employment is unevenly distributed across the nation, with large shares in the South East of the country**,** reflecting the higher population share in this area. Employment growth has taken place across all areas of Wales in the past decade, with percentage growth highest in South West Wales followed by North Wales and Mid Wales. Employment levels have also expanded notably in South East Wales but this conceals variations between sub-regional areas in the South East which are contracting (eg Blaenau Gwent and Vale of Glamorgan) and those which are expanding (eg Cardiff).

Changes in occupational structure will continue

Modelling sectors which are likely to have future economic significance in terms of productivity levels and employment growth and experience high volumes of replacement demand reveals that wholesale/retail and the health and social care sectors are likely to be important, both for Wales and UK.

Higher level occupations are expected to continue to increase their share of total employment in Wales in the period to 2020, at the expense of intermediate and lower level occupations. The highest levels of absolute and percentage job growth in Wales are predicted for managerial, professional and associate professional occupations. The greatest increase in occupational volumes is predicted for corporate managers, skilled construction/building trades, teaching/education professionals, health professionals, business/public service professionals and caring/personal service occupations.

In absolute terms, the highest net requirements for job volumes will be for caring/personal service occupations, administrative and elementary administrative service occupations and teaching/education professionals. This takes into account replacement demand for those workers who leave the labour market due to factors such as retirement.

The occupations forecast to experience the sharpest decline in numbers of jobs will be process, plant and machine operatives and administrative/secretarial functions.

Compared to the UK, the largest increases in percentage change in employment in Wales should also take place in the three highest skilled occupations, and the percentage change in growth for professionals is higher in Wales than the UK average, as is that for skilled trades, sales and customer service occupations. Like the UK average, the occupational group predicted to experience the sharpest decline in number of jobs is process, plant and machine operatives but to a greater extent than the rest of the UK, and the numbers of people in elementary occupations will decline slightly in Wales but rise in other UK nations. Skilled trades occupations will grow in Wales but shrink in the UK overall.

There may be a significantly higher skills profile required of women moving into higher level occupations, because while overall employment growth should be highest for men, a higher share of women will be moving into professional occupations.

There may be differences in the profile of mismatches in Wales

The currently distinctive features to the profile of Wales' skills deficits are higher levels of skills shortage vacancies among associate professional occupations and elementary staff, and lower levels of skills shortage vacancies among professional staff and managers compared to other UK nations. There are also higher densities of SSVs overall and within most sectors compared to the rest of the UK. This is due to higher SSV density in Mid Wales compared to other regions of the nation. Notably higher densities of SSVs are found in transport/storage/communications, construction, hotels/restaurants and business services in Wales compared to the rest of the UK.

Commuting patterns affect the balance between supply and demand

Wales has strong links with the economy and labour market of England, particularly in its border areas and around its coastal corridors. Inward and outward commuting flows of skilled workers have the potential to influence the balance between supply and demand of labour, particularly since inward

commuters have the strongest representation in high skilled occupations ie managers, professionals and associate professionals. It is notable that while there was a sharp reduction in the level of commuting into Wales between 2008 and 2009, but this has risen in subsequent years. Residents of Wales may need support to help them compete for higher skilled jobs which draw currently attract inward commuters.

Distinctive geographic patterns within Wales in terms of supply and demand for skills

The profile of employment varies significantly across Wales' economic regions. For example, the manufacturing sector is of particular importance to North and South East Wales, agricultural employment predominates in Mid Wales, while in South East Wales a relatively large proportion of employment is concentrated in higher level occupations and financial services. Public administration and defence, and accommodation/food sectors are relatively important across the nation. Changes in the urban / rural balance referred to in Chapter 4 also have the potential to impact on the balance between supply and demand of labour at local level. This means that the profile of opportunities varies markedly across regions and localities.

Such variations in labour market performance and characteristics within Wales suggests a need for a targeted policy approach to help address challenges such as the need for job creation in some local areas relative to Cardiff and to overcome the concentration of skill shortages in Mid Wales.

Government policy in Wales influences the supply and demand of skills

Government policy in Wales could serve to influence the future nature of jobs and skills demand. For example, Wales' accelerated programme for reducing the carbon footprint could serve to intensify demand for jobs and skills, many at a higher level, associated with the development of a low carbon infrastructure. Government policy to support Enterprise Zones and City Regions could serve to increase demand for jobs and skills in specific locations such as STEM professionals, associate professionals in the finance sector and creative workers in digital media. On the supply side, Wales' current policy on the school leaving age could affect the balance of labour supply and demand in sectors that employ

large numbers of young people, such as hospitality, while older workers who remain in the labour market for a longer period may reduce the availability of openings for new entrants.

Recession has had a particularly deep impact on some sectors in Wales

Recession has had a more severe impact on the employment rate in Wales than in the wider UK. Particular sectors and occupations have also been affected more deeply in proportionate terms. For example, jobs in the production sector and in machine operative roles have seen a steeper decline than at UK level. It is unclear whether this will have a medium to long-term impact on the composition of labour demand in Wales. However, employment growth has taken place across all areas of Wales in the past decade, with percentage growth highest in South West Wales, followed by North Wales and Mid Wales.

Priority areas for action

In this final part of the analysis within the NSSAW 2012, we seek to identify the skills which are strategic priorities for action, both currently and in the future. In particular, we focus attention on the most pressing areas that have been identified in the analysis, which are accentuated when the data is brought together. This is essentially where there are:

- Current and/or anticipated future skills needs, which are significant in scale or volume already in the labour market, or are expected to be a significant requirement in terms of future needs.
- Significant current and/or emerging skills needs which are already making (or likely to make in the future) a significant contribution to economic performance (although they may be more moderate in scale).
- Concerns over whether the skills needed will be adequately met and hence there is a skills deficit (or there may be questions over future supply if future demand is stimulated).

We identify where short, medium and long-term action is needed, and discuss the implications if action is not taken. Thus while it could involve action to re-skill or

up-skill people, it could also equally involve action on the demand side to ensure better job matching and effective use of workers' skills.

In prioritising the areas for action, we draw on the risk-based approach adopted in Australia (Skills Australia, 2008) as this has already been used and effectively deployed in a policy context, in developing a national workforce development strategy. The approach enables us to identify the key occupations, and in turn related sectors, where there are most likely to be important strategic skills needs, which risk not being effectively met. The risk-based approach uses the following criteria:

- Degree of certainty – this essentially considers the likelihood of the drivers of the skills demand materialising, and, the risk of supply failure, with assessments ranging from 'unknown certainty' to the outcome being definite. It also includes consideration of the significance of the skill deficit under multiple scenarios.
- Magnitude – this considers the scale of action required based on the magnitude of skills needs. Essentially, this is broadly based on the numbers of jobs that need filling. Future assessments of magnitude capture total employment demand and incorporate both replacement demand as well as new jobs.
- Lead time – this seeks to assess the length of time taken to rectify the skills deficit. In doing so, it also considers whether there is an absence of alternative preferred strategies to overcome the deficit. It deploys categories ranging from short to long term, with: the long lead time being more than five years, three-five years capturing the medium lead time, and less than three years applying to the short lead time. This measure includes both the learning time required for individuals and the set up time for any new training or educational provision.
- Criticality – this seeks to assess the potential risk to economic growth and development according to:

  a. the priority sectors analysis of Chapter 5 to identify where the opportunity costs of skills deficits could be high to the economy

b. the analysis in Chapter 6 to identify where the consequences of skills deficits could be high within industries, even if the numbers of jobs involved are small.

Therefore, some of the likely skills deficits are about capacity – ie insufficient numbers of people with the necessary skills and knowledge, and others are about capability ie – the supply of workers into the roles is adequate, but alterations will be needed in either the level and/or type of skills required to fulfil changing job content in those roles.

Depending on how these factors combine, each skills deficit is then given an importance rating or 'traffic light' colour, indicating how much of a priority it is for action. The only weighting given to these factors is whether the opportunity costs of skills deficits could be high to the economy overall and require immediate action. The specific ratings used are:

- Red, reflecting skills deficits which are of critical importance to the economy and require immediate action, either because there are current skills needs already not being met and/or because lead times are such that early action is required to fully optimise economic growth potential and avoid deficits in future.
- Pink, reflecting skills deficits which are again of critical importance to the economy or a particular part of the economy or sector, in terms of expansion, survival and/or optimising returns, but which may be smaller in scale and have a shorter lead time than for those rated as red.
- Amber, reflecting skills deficits which are important to the economy and/or a distinct sector rather than critical (although the degree of certainty may be less clear and hence the true impact unknown, where the skills needs are connected to a developing or emerging sector in the economy). Furthermore, skills deficits are either moderate in scale and/or can be filled in a medium to short time frame.

Green ratings are not separately identified as these represent areas where generally there is a better alignment between supply and demand and so there are fewer concerns about skills issues requiring additional action.

Table 7.1 presents a summary of the results of our priorities analysis. The table is organised under broad skill/occupational priority headings (these are illustrated in the white rows in the table), it also seeks to show in which sectors of the economy the effects are being felt (or expected to be felt). Overall, the analysis taken together points to the importance of a number of key strategic skills we need to address to meet the emerging demands of the labour market and, ultimately, to maximise economic growth. In general, this broadly highlights higher skilled occupations including managers, professionals and associate professionals and technicians. However it also extends to some other areas such as personal service occupations and skilled trades in particular parts of the economy, as well as more pervasive generic skills.

A number of key trends provide the context for the priorities analysis:

- Current demand: The largest numbers of people in the current labour market are collectively employed as managers, professionals and associate professionals. Indeed, these occupations account for almost two-fifths of all jobs today.
- Broad skills shortages: The largest volumes of skills shortages in Wales are found among associate professionals, elementary staff, and skilled trades occupations, with associate professionals, machine operatives and skilled trades occupations having the highest SSV density. The highest volumes of skills shortages are found in the manufacturing and business services sectors, where the highest densities of SSVs are also found. Skills shortages are concentrated in Mid and South East Wales, with Mid Wales having a far higher SSV density than the other economic regions of Wales.
- Skills gaps: The largest proportions of skills gaps are found in sales/customer service, machine operatives, caring/personal services and elementary roles, with machine operatives having the highest skills gaps density (skills gaps as a proportion of the workforce). The highest reported volumes of staff with skills gaps are found in manufacturing, health/social care and wholesale/retail sectors, with the electricity, gas and water and hotels and restaurants sectors having the highest skills gaps density. Associate professionals and skilled

trades occupations are likely to experience the greatest range of different types of skills gaps.

- Underemployment: over a quarter of employers report that at least 50% of their staff are underemployed, while over 40 per cent of employers with over 250 staff do not know. Incidence of underemployment is highest among staff in lower skilled roles including caring/leisure occupations and elementary staff, and among managers, professionals and associate professionals and is most common in the education sector.

- Future trends and drivers of change: Drivers of change, structural trends and developments in the coming years in the economy are expected to accentuate the demand for many of these high level skills, particularly because of their importance in securing a continuing edge and competitive advantage within key sectors, and an ability to respond to on-going changes in the labour market due to factors such as the effects of globalisation, technological advancements and developing consumer demands.

- Future demand: Jobs amongst managers, professionals, associate professionals and technicians are anticipated to exhibit the highest levels of anticipated demand in the future too, with their combined proportion of total employment expected to increase from 36 per cent in 2010 to 39 per cent by 2020 (see Table 6.1). But in addition, caring and personal service occupations also exhibit high growth, which is accentuated when replacement demand due to people retiring from the labour market is also included. Such trends highlight key future skills demands for skilled trades due to forecast net demand in the construction and building sector, and administrative staff.

In addition, our initial assessment has sought to identify those sectors of the economy where particular attention to skills needs might be targeted. While this assessment will require review and development over time, these sectors are characterised as:

- Key sectors: Our earlier analysis identifies those sectors which currently exhibit the greatest economic significance and skill deficits. These include: food, drink and tobacco, support services, accommodation and food, rest of manufacturing,

real estate and wholesale/retail. The sectors which combine growing economic significance and future skills needs, are retail/wholesale and health and social care.

Given these general trends, we now summarise the main priorities in our priority action matrix.[16]

[16] Caution is required when comparing the occupational employment figures for 2011 and projections from Working Futures 2010-2020 presented in table 7.1. 2011 employment figures from the Annual Population Survey are based on SOC 2000 definitions, whilst Working Futures 2010-2020 projections are based on SOC 2010 definitions. Some occupations will be affected more than others, for example, health professionals will be affected by nursing occupations being reclassified from associate professional occupations in SOC 2000 to professional occupations in SOC 2010. Further detail can be found in SOC 2010: The revision of the Standard Occupational Classification 2000 (Elias and Birch, 2010).

Table 7.1: Priority action matrix

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
Managers					
Increasing skill and occupational demands for corporate manager roles across a wide range of industry sectors (Red rating)	Growth in occupational demands is expected to be highest in the following sectors: • Wholesale/ retail • Health and social care and to a lesser extent Professional services Construction Agriculture Food, drink, tobacco Media	Definite Increasing demand for managers is a well-established trend in the labour market.	Large Projected net requirement for corporate managers of 39,000 between 2010 and 2020. Corporate managerial roles forecast to experience greatest overall expansion demand of any occupational group. 132,700 jobs in corporate managerial occupations in 2011	Medium Skill requirements vary by industry and on the job development is needed as well as formal education and training.	Critical to both wide range of industries and the overall economy of Wales.
Need to improve management capability in exploitation of technology in order to optimise business benefits	Impact will be economy-wide. Chapter 4 illustrates potential application of general purpose technologies across sectors.	Definite e-skills UK stress the importance of enabling managers across the economy to exploit the strategic potential of	Large Highlighted by a wide range of sectors Managers in most sectors are affected to	Medium Could require a combination of formal training and on the job development	Critical to both individual sectors and wider economy through improving efficiency and competitiveness of businesses and exploiting new market opportunities.

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
(Red rating)		ICT	some extent including those with large forecast growth potential including retail/wholesale, health/social care, professional services, food, drink and tobacco, media, agriculture		
Management capability to drive product and process innovation, to commercialise products / processes for new markets and to exploit intellectual property rights (Pink rating)	Manufacturing, media, retail/wholesale, professional services but not exclusively	Definite Evidence of existing deficits within individual industries	Small Available evidence does not allow us to quantify the scale of need Need mainly confined to senior management roles	Medium Mixture of on-the-job and off-the-job training required, including 'hybrid' mix of IT and management skills in FE/HE provision in IT/management subjects	Up-skilling of a small number of individuals could lead to significant productivity benefits with potential spillovers for wider economy Continuous innovation is critical to survival of these sectors in high value markets Protection of IP critical to competing in global markets for some sectors

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
Change management skills (including staff engagement) driven by impact of public spending cuts and increased competition (Pink rating)	Economy-wide Specific examples include health and social work, public administration and defence	Definite All workforces will be subject to the impact of changing government policy, technological change, increasing consumer demands and global competition, requiring continual change in business operations and workplace organisation	Large Pervasive and large scale skill need, will be required across managers at all levels of seniority	Short to medium	Will be key to successful adaptation to change across the economy and securing maximum effectiveness from workforce as well as retention of critical skills within companies / industries
Management capability to support development of digital content for diverse media platforms. Project management skills to support shift to outsourcing, distributed project teams and use of freelancers (Amber rating)	Creative / digital media	Likely Highlighted by Skillset as a clear skill priority for creative media sector in Wales	Small	Medium Requires ongoing concerted action by the industry to influence HE provision and workforce development arrangements. Learning provision needs to accommodate fragmented industrial structure and large share of self-employment/ micro-businesses in the sector.	Critical to enhancing performance in sector predicted to expand. Impact in terms of job volume relatively limited.

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
Specific management capability in procurement, commissioning and financial management Financial constraints created by recession mean these skills are critical to winning business and ensuring value for money and quality of service in the public sector (Amber rating)	Range of public and private sectors eg public administration, education, health and social care, support services, construction. Companies in the private sector need skills to win business through public procurement processes while public sector customers need to maximise quality and value for money	Definite	Small-medium Managers with purchasing responsibilities in public sector, general managers in supplier companies across public, private and third sectors	Short Potential to address deficit through targeted development programmes	Critical to business performance and productivity in these sectors
Professionals					
Teaching professionals (Red rating)	Education	Definite Projections suggest substantial occupational demands arising out of both expansion and replacement demands Evidence of current skills deficits linked to changing nature of	Large Projected net requirement for 2010-2020 of 45,000 (including replacement demands of 33,000) 71,000 jobs in these occupations in 2011	Medium Requires minimum of level 4 qualifications	High quality of teaching delivery is critical to overall future competitiveness of Wales as well as performance of education sector. Likely to be particular need for STEM teaching professionals given wider education and skills policy priorities

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
		teaching role and developing modes of delivery Volume of demand possibly tempered by public spending cuts and need for efficiency savings			Impact in terms of job volume is also likely to be significant
Health professionals (primarily medical practitioners) (Red rating)	Health	Definite Projections from multiple sources forecasts strong expansion and replacement demand, health/social care emerges as critical future sector from sector matrix analysis Powerful forces driving demand, including ageing population, increased incidence of long-term conditions Ability of state and individuals to pay for health services in a	Large Projected net requirement of 38,000 health professionals (11,000 from expansion demand) for period 2010-2020 17,400 jobs in these occupations in 2011, suggests very high and rapid growth.	Long Requires level 4 or above qualifications	Occupation critical to performance of health/ social care sector and contributes to supply of workers to other sectors through promoting wider societal well being Potential impact on sector productivity and job volumes

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
		period of austerity is key constraining factor. Employment growth may also be offset by productivity gains Potential recruitment challenges in rural/remote areas (Skills for Health, 2012)			
Science and technology professionals Includes specialised postgraduate STEM skills (Amber rating)	Healthcare Limited demand in parts of manufacturing and low carbon sectors eg utilities, construction, agriculture	Development of new technologies likely for healthcare and manufacturing Development of low carbon products/services currently low, dependent on presence and impact of government regulation	Small/Medium Projected net requirement of 20,000 science, research, engineering and technology professionals (5,000 from expansion demand) for period 2010- 2020 35,500 jobs in these occupations in 2011; 65,700 health and social care associate professional jobs in 2011	Long Requires postgraduate qualifications, specialist training and workplace development	Roles are critical to survival and development of some sectors in high value added markets (eg manufacturing) Requirement moderate in terms of job volume but individuals have disproportionate impact on business performance Likely to be important given wider education and skills policy priorities

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
Demand for actuaries (Amber rating)	Financial services	Possible Needed in the sector to monitor and assess financial risk Evidence of acute shortages at UK level but little evidence to enable us to assess scale of problem in Wales	Believed to be small based on current small level of employment	Long Level 4 qualification is required and there is evidence of long training periods, low pass rates and low industry attractiveness	Job volumes are small but critical to the industry and to financial stability of UK
Associate professionals					
Business and public service associate professionals (Amber rating)	Variety of sectors including health/social care, wholesale/retail, professional services, construction, food/drink and tobacco, media	Likely Difficult to predict with certainty given diversity of roles and sectors covered , but rise of specialist technical roles across many sectors makes demand likely	Medium Projected net requirement of 34,000 business/public service associate professionals (9,000 from expansion demand) for period 2010- 2020 52,500 jobs in these occupations in 2011	Medium Level 3-4 qualifications required, highly diverse learning input required depending on nature of occupation	Likely to be important for relevant industry, but more significant for Welsh economy in terms of numbers of relatively higher skilled job volumes involved

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
Investment advisers (Amber rating)	Professional and financial services	Definite Retail Distribution Review in 2012 imposes requirement to hold level 4 qualification for investment advisers in financial services sector. Existing evidence at UK level of shortages of qualified advisers Ongoing reform of pensions arrangements likely to lead to increased demand for financial planning (Skills for Justice, 2012)	Small Around 6,000 people are employed as finance and investment analysts / advisers in Wales, according to the Annual Population Survey for 2009	Medium Requires level four qualification	Essential to service delivery and consumer protection in affected sectors

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
Skilled trades					
Continued demand for workers in skilled construction/building trades, metal, electrical and electronic trades (Red rating)	Construction Manufacturing Electricity and gas Water	Definite Projections suggest likely net decline for skilled metal trades but significant replacement demands Remains a key source of both skills shortages and gaps, with concerns about recurrence of shortages as recovery develops. Migrants may help address future needs Skill levels needed will increase for these roles with requirements for up- skilling and multi-skilling Scale of demand will ultimately be determined by future competitiveness of manufacturing in high	Large Net demand projected for 25,000 workers (skilled metal, electric, electronic trades) and 33,000 workers (construction and building trades) between 2010 to 2020	Medium Requires level 3 qualification usually acquired through apprenticeship and workplace development	Critical to specific sectors and important to economy through contribution to built environment/ infrastructure and supply chains

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
		value added global markets, progress with low carbon agenda, and speed of recovery in construction			
Caring, leisure and other services					
Growing demand for caring personal service occupations including care assistants (Red rating)	Social care	Definite Powerful forces driving demand, including ageing population, growing consumer expectations of care services, increased incidence of long-term conditions, increased participation of women in the workforce, increased regulation of care sector Personal service roles are believed to be the key source of skills gaps and shortages in the health and social care sector Migration may mask	Large Projected net requirement of over 50,000 caring/personal service workers (11,000 from expansion demand) for period 2010- 2020 93,100 people are employed in caring personal service roles in 2011.	Short to medium. Typically involves on the job development to qualifications at Levels 2 and 3	Critical to relevant industry, major contributor to employment and key to societal well-being Occupation also offers an important and large-scale entry route into employment

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
		potential scale of shortage Increasing public and policy concern about quality of social care delivered suggests possible skills gaps/deficits in management systems for this occupational group			
Sales and customer services					
Significant occupational and skills demands in sales/customer service (Pink rating)	Range of sectors but particularly retail/wholesale, finance/insurance, professional services, accommodation and food, media, IT. After-care services in manufacturing also important	Definite Projections suggest significant expansion demands and replacement demands in sales jobs High incidence of customer handling skills gaps among existing sales/customer service staff	Medium Projected net requirement of over 40,000 sales workers (5,000 from expansion demand) for period 2010- 2020 85,100 jobs in sales occupations in 2011	Short Intermediate level skills / qualifications required	Essential to service delivery for relevant industries but technology may be substitutable in some instances Customer service roles offer a key route into employment and progression and it is expected that there will be job creation in this

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
		Impact of recession may constrain growth in some sectors eg financial services, public administration			area
Elementary occupations					
Elementary administrative and service occupations (pink rating)	Pervasive, but especially wholesale/retail, accommodation and food	Highly likely Ongoing demand for jobs involving front line service where automation is not possible Some existing recruitment difficulties eg kitchen staff	Large Projected net requirement of over 45,000 workers in these occupations due to replacement demand for period 2010- 2020 104,200 jobs in elementary administrative/service occupations in 2011	Short – qualifications requirements often low or absent, but employability skills in communication, teamwork and problem-solving may be important	Roles have potential to offer entry to employment, but progression routes into higher skilled occupations not always clear. Relatively large job volumes.
Cross-cutting skills					
Skills to support energy efficiency, reduce material consumption and improve resource utilisation in low carbon economy	All sectors	Definite Some evidence across a range of sectors of emerging skills needs linked to “greening” of job content in response	Large Difficult to assess full scale of impact but there is potential for effects to be felt across every job	Short / medium Drive for energy / resource efficiency leads to a large and diverse range of skill needs that need to be	Critical to achieving policy goals for a low carbon economy Impact mainly via change to existing jobs than creation of new

Skill / occupational priority	Sector(s) affected	Degree of certainty – definite, likely, possible, unknown?	Magnitude – large, medium, small (current and future)	Lead time – short/medium/long?	Criticality to a) the relevant industry b) Welsh economy through GVA and/or job volume?
(Pink rating)		to consumer pressure, regulation and carbon / waste reduction targets	in the economy Impact is likely to be widespread but "shallow"	addressed by individual sectors and businesses	jobs
Employability and basic skills (team working, problem solving, communication, literacy, numeracy) (Pink rating)	All sectors	Definite All of these cross-cutting skills areas are important sources of deficits, and some are more widespread than technical / practical deficits, as evidenced by findings of SSC analysis and of the Employer Skills Survey 2011.	Large Incidence and level of skills gaps is high for areas like team working and problem solving	Short / medium Some cross-cutting skills needs can be addressed quickly but basic skills issues are not as susceptible to resolution	Critical to performance of workforce and wider economy of Wales; some generic skills are key at all occupational levels
Welsh language skills (Pink rating)	All sectors but particularly public administration, education, accommodation and food, and passenger transport	Likely Recent regulation to support citizens using Welsh language likely to strengthen demand, while decline in number of adults speaking Welsh may restrict supply	Medium Some evidence of skills gaps at associate professional level	Medium to long School age education is key mechanism for driving development of Welsh language skills	Critical to performance of a wide range of sectors with customer-facing dimension Particularly important to North and Mid Wales

Conclusions

We believe that the NSSAW 2012 represents a valuable updated assessment of the skills priorities facing Wales and provides a strong foundation for further dialogue between stakeholders on this key issue. We hope that the process of publishing and disseminating the NSSAW 2012 will enable the key 'change agents' in the labour market – individuals and their advisers, employers, education and training providers, public agencies and government – to adapt their behaviour in the light of intelligence on current and future skills.

High quality intelligence is crucial to inform better decisions

The purpose of the NSSAW 2012 is to provide insight and foresight to create a better-informed market for skills in Wales and to achieve a better balance between the skills needed and the skills available. It is clear that individual actors in the labour market armed with accurate information are likely to make better choices, leading to better outcomes for citizens, firms and the nation. This report draws new employer survey data and economic projections together into a comprehensive and easily-accessible synthesis and adds to the extensive programme of research and labour market intelligence that is already available in Wales. The report is able to take a relatively comprehensive and long-term perspective.

It is not possible to predict and plan the exact 'numbers' of individuals with specific skills that will be needed in particular localities. The labour market is complex and dynamic and the process of adaptation in labour supply can often be slow.

Instead, the NSSAW 2012 is intended to provide evidence to aid decision making by individuals (particularly prospective learners), employers, policy makers, education and training providers and providers of careers and skills advice. With appropriate interpretation for each of these audiences, the NSSAW 2012 should help:

- Individuals to make appropriate, well-informed choices about future learning and career opportunities
- Careers advisors to support individuals in making these choices

- Education and training providers to assess provision and to shape curriculum content that reflect the needs of the labour market
- Employers to work within their representative bodies to raise demand for valued skills solutions, support strategic decision-making within businesses and promote the implementation of a skills delivery system that reflects need
- Policy-makers to consider policy priorities and resource allocation in the context of a strategic overview of jobs and skills in Wales.

While it is not possible to plan provision or individual / employer behaviour, information and policy levers can encourage, stimulate and 'nudge' it, especially when intelligence is supplemented with other initiatives providing financial and/or behavioural incentives.

Skills for jobs matter

To maximise economic performance, and to generate business success and real opportunity for individuals we need to ensure that we supply 'economically valuable' skills, which meet the changing needs and requirements of the labour market effectively. The supply of skills must align with demand in both volume and type. Without this we risk: structural mismatches in the labour market which could present as skill shortages, structural unemployment, skills gaps, underemployment, and an over-dependence on migrant workers rather than the indigenous workforce to meet labour market needs. There are clear negative implications for economic performance and individual opportunity arising out of this scenario.

The Welsh Government works with the UK's Migration Advisory Committee to help address this policy issue.

Greater attention needs to be given to the issue of skill demand

The NSSAW 2012 draws attention to the variation in the nature and scale of different skills mismatches ie imbalances between the supply of skills and the skills that are demanded for specific jobs. To address these mismatches, responses are required both on the demand and supply side. Skill shortages evident as recruitment difficulties require action on the supply side to tackle a

lack of available skills in the labour market. Skills gaps indicate deficiencies in skills in the internal labour market of employers. In addition, unemployed people may need to acquire new skills to re-enter employment. Underemployment, however, requires a response on the demand as well as the supply side. On one hand, it can be tackled where companies adopt more ambitious product market strategies to move up the value chain, into higher value added products and services. This leads them to create a knowledge-intensive work organisation as a means to deploy their more highly skilled workers more effectively. An effective response, however, also requires individuals to pursue skills and qualifications that employers really do need.

Skill utilisation is key to performance

An appropriate supply of skills and learner choice are necessary requirements for addressing skills deficits but are not in themselves sufficient. If skills needs that are internal to organisations are to be addressed i.e. skills gaps and underemployment, which account for a substantial proportion of total deficits, and firm performance raised, then attention needs to be given to how skills are utilised in the workplace. The implementation of high performance working (HPW) practices which seek to improve the management of organisations, and their staff, is critical to achieve this.

Migrant workers raise key issues for policy-makers

The presence of non-UK migrants in the Welsh workforce has a range of implications for the labour market and skills: it can mask latent mismatches between employer demand and the supply of skills from the indigenous population and it can affect training investment if employers choose ready-skilled migrants as their preferred source of labour, rather than training new entrants or existing workers. In addition, migration in some sectors is predominantly ‘low skilled’ and may act as a deterrent to employers to ‘raise their game’ and move to more highly skilled operations. A key point for policy is that indigenous workers have a better chance of competing with migrants for jobs when they can take advantage of improved sign-posting through advice and guidance and when they have ready access to education and training in the skills that employers require.

Action on skills needs to take account of differing needs within sectors

A clear message from the NSSAW 2012 is that particular sectors have specific skills priorities. Sectoral needs are driven by specific combinations of drivers of demand which impact on businesses, jobs and skills. These differences need to be acknowledged when forming policy action. On the other hand there is also clear evidence of the importance of 'cross-cutting' skills needs which are pervasive across sectors.

High level skills and jobs will be critical to the Welsh economy

The NSSAW 2012 highlights the increasing importance of higher skills and jobs to the economy. There is a significant demand for highly skilled workers in the labour market, with the largest number of people collectively employed as managers, professionals and associate professionals and in technical roles, with associated requirements for higher level skills. Although this part of the workforce is still under-represented in Wales relative to the UK, it has grown more rapidly in Wales in recent years than at a UK level. The importance of these roles is anticipated to increase notably in future with the effects of drivers of change such as globalisation, on-going technological developments and continued growing sophistication in consumer demand. Ensuring that high skilled workers hold the economically-valuable skills that will be needed in the labour market of the future presents a major challenge. The evidence of the NSSAW 2012 indicates that there are significant mismatches between the supply and demand of higher level skills, some of which have the potential to intensify over time. Demand side issues also appear to be challenging. Despite the recent growth in high skilled jobs, there are indications that the UK (and probably Wales) has recently experienced a relatively slow rate of high skilled job creation, and certainly one which is well below the overall growth in the supply of high skilled people. There is evidence of underemployment in the workforce, in terms of 'over-qualification' in a formal sense, together with 'under-utilisation' of skills. This raises questions about the relevance of supply, and whether employers are fully optimising their employees' skills, as well as the adequacy of job matching in the labour market. Evidence shows that there may be particular opportunities for women to upskill and move into professional roles, as some of the

occupations in which women currently dominate are predicted to experience significant decline eg secretarial and administrative roles.

Jobs requiring intermediate level skills will continue to be important

There are also strategic skills issues at intermediate skills levels. This is particularly significant since Wales has a disproportionately large concentration of employment in intermediate roles compared with the UK and this is projected to continue. The NSSAW 2012 highlights the growing importance of associate professional roles, driven by growing technological complexity and development of global value chains, within emerging sectors as well as existing sectors. This means there is a requirement for vocational knowledge and workers with the ability to apply an in-depth understanding of a particular technical field in a practical setting. It is expected that this will be addressed by a combination of new entrants and up-skilling of existing workers to meet the needs of evolving roles. On the supply side, as with the UK, there has been little change in the proportion of the workforce qualified at intermediate levels (level 3). These developments call for a growing emphasis on strengthening the intermediate vocational career pathways (from level 3) to ensure that the skill requirements for these jobs can be met and people can progress into these areas. In addition although intermediate jobs in more traditional areas (in for example skilled trades) are forecast to decline, many of these areas comprise a largely ageing workforce, and when replacement demand is taken into account, combined with issues about the adequacy of supply, this highlights significant pressing skills supply needs. High densities of current skills shortages occur in many of these areas, and have persisted for some time, although they have reduced during recession. Moreover, skilled trades are expected to be a key part of the skills mix within sectors that are likely to provide job growth, such as construction.

Generic, employability and basic skills matter

Generic or ‘employability’ skills, such as customer-handling, problem-solving and team-working, are pervasive requirements across most sectors and meeting current and future skills needs of this type are critical to future competitiveness and productivity. Indeed, the incidence of current deficits relating to some generic skills is higher than for role-specific technical and

practical skills in some sectors in Wales. Evidence is increasingly emphasising the importance of ‘T-shaped’ skillsets where technical aspects to jobs, requiring detailed knowledge and skills, are supplemented with more generic skills, which enable individuals to work more effectively with their colleagues and/or customers and apply their technical expertise in practice, often in commercial settings. Analysis of the Employer Skills Survey 2011 (UKCES, 2012) provides evidence that employers perceive that workers lack a range of technical and practical skills in combination with generic skills. Management skills are also a critical area of generic skill need. High quality management skills are critical to the co-ordination of processes of strategic change, the effective application of technology within businesses, identification of new commercial opportunities and the optimal deployment of staff capabilities.

Low skilled jobs are expected to persist

Despite the continued growth of highly skilled work within Wales’ labour market, and a substantial decline in recent years in routine jobs, particularly at operative level, significant employment is likely to remain in areas that have traditionally demanded low skills. Working Futures 2010-2020 projections suggest that this could amount to about a fifth of all jobs. The proportion is likely to be much higher in substantially growing sectors such as retail/wholesale, accommodation/food and care of the young and elderly; in these sectors low-skilled jobs are expected to be a major source of job creation. The physical and emotional demands of many of these jobs can lead to high labour turnover, requiring a continual supply of labour and in some cases require up-skilling to meet heightened customer expectations and to meet product/service quality demands. Improving the quality of such jobs is important, not only to ensure an improved standard of goods/services but also because this area is expected to be a key source of employment. These jobs are likely to be particularly important for particular labour market groups, including women holding a large share of employment in these roles in some sectors, those seeking to move into employment and progress through the labour market, as well as people seeking part-time work.

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