



Staff shortages and immigration in construction. A paper prepared for the Migration Advisory Committee

[Link to publication record in Manchester Research Explorer](#)

Citation for published version (APA):

Dainty, A., Clarke, L., & Chan, P. (2008). *Staff shortages and immigration in construction. A paper prepared for the Migration Advisory Committee.* (Staff shortages and immigration in construction. A paper prepared for the Migration Advisory Committee). Home Office.
<http://www.ukba.homeoffice.gov.uk/sitecontent/documents/aboutus/workingwithus/mac/239769/chanclarkedainty2008>

Citing this paper

Please note that where the full-text provided on Manchester Research Explorer is the Author Accepted Manuscript or Proof version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version.

General rights

Copyright and moral rights for the publications made accessible in the Research Explorer are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Takedown policy

If you believe that this document breaches copyright please refer to the University of Manchester's Takedown Procedures [<http://man.ac.uk/04Y6Bo>] or contact uml.scholarlycommunications@manchester.ac.uk providing relevant details, so we can investigate your claim.



STAFF SHORTAGES AND IMMIGRATION IN CONSTRUCTION

PAUL CHAN, University of Northumbria
LINDA CLARKE, University of Westminster
ANDY DAINTY, Loughborough University

2 June 2008

A PAPER PREPARED FOR THE MIGRATION ADVISORY COMMITTEE (MAC)

Web published by the Migration Advisory Committee
September 2008

www.ukba.homeoffice.gov.uk/mac

Project Overview

Executive Summary

- 1. Overview of the sector***
- 2. Employer demand: What are employers looking for?***
- 3. Labour supply: Who wants to do what?***
- 4. Immigration and labour demand: How and whom do employers recruit?***
- 5. Immigration and alternative responses: A need for migrant labour?***
- 6. Conclusion: Implications for analysing staff shortages in the sector***

Project overview

“A set of review papers on the micro-level determinants of employer demand for migrant labour and the alternatives to immigration for responding to labour shortages in key sectors of the UK economy.”

This paper is part of a research project commissioned by the Migration Advisory Committee (MAC), a body of independent economists set up by the UK Government in late 2007. The MAC has been tasked to advise the Government where in the UK economy there are skilled labour shortages that can be “sensibly” filled by migrant workers from outside the European Economic Area (EEA).¹ The MAC’s current remit focuses on skilled labour shortages. Specifically, the MAC has been asked to produce a list of “shortage occupations” for Tier 2 of the UK’s new points-based system. However, future work may also involve analysis of low-skilled labour markets. As explained in its recent report on “Identifying skilled occupations where migration can sensibly help to fill labour shortages” (February 2008), the MAC’s methods will include “top-down” approaches (including analysis of available data from employer skills surveys and the labour force survey) and “bottom-up” approaches which provide more detailed micro-level information about the nature and determinants of labour demand, supply, staff shortages and alternatives to immigration for filling vacancies in key sectors and occupations.

This research project contributes to the MAC’s bottom-up approach by providing an independent analysis and assessment of the nature and determinants of staff shortages in key sectors and occupations of the UK economy. Given the short time period within which the MAC needs to produce its first list of shortage occupations (July 2008), the main method of this project has been to mobilise existing information and research rather than to generate new data. To this end, academic experts provided an analytical research perspective on staff shortages and immigration in seven sectors of the UK economy: agriculture, food processing, financial services, construction, hospitality, health care and social care. Although taking a sectoral approach, the seven “sectoral review papers” highlight and discuss key occupations in each sector. All sectoral review papers were written during April-May 2008 and are based on a common template of questions. A separate paper discusses key concepts, selected empirical findings from the sector papers, and the implications for a skills-based immigration policy.

All papers in this research project were coordinated by Bridget Anderson and Martin Ruhs, with the assistance of Rutvica Andrijasevic and Karin Heissler (all at Centre on Migration,

¹ The EEA includes the EU 27 plus Iceland, Liechtenstein and Norway.

Policy and Society (COMPAS) at the University of Oxford). The full list of papers produced for this research project is:

Concepts and overview:

Anderson, B. and M. Ruhs (2008) "A need for migrant labour? The micro-level determinants of staff shortages and implications for a skills-based immigration policy", A report prepared for the Migration Advisory Committee, Migration Advisory Committee (MAC), London

Sectoral review papers:

Bach, S. (2008) "Staff shortages and immigration in the health sector", A report prepared for the Migration Advisory Committee, Migration Advisory Committee (MAC), London

Chan, P., Clarke, L. and A. Dainty (2008) "Staff shortages and immigration in construction", A report prepared for the Migration Advisory Committee, Migration Advisory Committee (MAC), London

Geddes, A. (2008) "Staff shortages and immigration in food processing", A report prepared for the Migration Advisory Committee, Migration Advisory Committee (MAC), London

Jones, A. (2008) "Staff shortages and immigration in the financial services sector", A report prepared for the Migration Advisory Committee, Migration Advisory Committee (MAC), London

Lucas, R. and S. Mansfield (2008) "Staff shortages and immigration in the hospitality sector", A report prepared for the Migration Advisory Committee, Migration Advisory Committee (MAC), London

Moriarty, J., Manthorpe, J., Hussein, S. and M. Cornes (2008) "Staff shortages and immigration in the social care sector", A report prepared for the Migration Advisory Committee, Migration Advisory Committee (MAC), London

Scott, S. (2008) "Staff shortages and immigration in agriculture", A report prepared for the Migration Advisory Committee, Migration Advisory Committee (MAC), London

All papers can be downloaded at the MAC's website: www.bia.homeoffice.gov.uk/mac

Executive Summary

1. Overview of the sector

The construction industry employs 1.9 million people, contributes to 10 percent of Gross Domestic Product (GDP) and has a regionally varied output, including housing, commercial, infrastructure and repair and maintenance, which increased to £83 billion by 2007. The industry includes about 186,000 private contracting companies, with firms employing over 600 persons contributing to 18 percent of employment, and 93 percent - many of which act as subcontractors - having fewer than 13 employees. The larger firms are represented by the Construction Confederation which is signatory, along with the three main trade unions, to the Working Rule Agreement. The workforce is divided between directly employed and those classified under the industry-specific self-employed tax scheme (CIS, or Construction Industry Scheme) as self-employed (47 percent), although this is often regarded as 'bogus', an increasing number of whom are migrants.

As a project-based industry exposed to the vicissitudes of the weather, the workforce is mobile and even seasonal. These are factors which may contribute to the marginalisation of employment and training opportunities for workers in local construction. The sector is exclusive, with a dominantly white male workforce and, despite attempts to increase diversity, extremely low female and Black Asian and Minority Ethnic (BAME) participation especially in the manual trades. Seventy-five percent of the workforce is manual, 25 percent is non manual, and the sector is divided into at least 50 different skilled occupations and numerous professions. It is an industry in need of change, being less productive and more labour intensive than those in other leading European countries, with a relatively stagnant and traditional division of labour, and often casual and informal employment. The accident and fatality rate is higher than for all industries, working hours are higher than average, and there is a widening differential between skilled workers and labourers, many of whom are migrants. Although data is sparse and unreliable, it is estimated that about 10 percent of the construction workforce consists of migrants from A8/A2 countries, especially Poland, many of whom are working in labouring or low-skilled occupations and as 'undeclared' labourers.

2. Employer demand: What are the employers looking for?

The Sector Skills Council, ConstructionSkills, estimates the annual labour requirement for the industry between 2008 and 2012 at 88,390, a figure to be treated with caution but which

is indicative of the shortage of skilled labour, especially given that current levels of supply through training provision can only replenish a small proportion of the workers needed. Skill shortages vary according to sector and occupation, and are particularly severe in housebuilding, refurbishment and maintenance, and in the bricklaying and carpentry trades. The strategy of the industry is for migrants to be used to 'plug' immediate skill gaps; although ConstructionSkills estimates that approximately 10,000 workers per year would be needed to fill the 'gap' if migrants from the A8 countries returned home.

Over 50 percent of employers look to migrants for their workforce, especially in the traditional building trades and in areas which, though unrecognised as 'skilled', require considerable 'multi'-skills, such as general operative work. Migrants may even be preferred because of their wider occupational profiles and greater problem-solving, transferable, social and personal skills, compared to those imparted and required under the English and Welsh National Vocational Qualifications (NVQ) system, especially at Level 2 which has increasingly become the standard for much of the industry (although not for mechanical and electrical occupations which remain at Level 3). To help improve skill levels in the industry, it is an increasing requirement that workers possess a card under the Construction Skills Certification Scheme; 1.3 million have been issued thus far, many to migrants. Migrants may also be preferred because they can be employed at lower rates, even at the minimum wage, given that the Posted Workers Directive has not yet been implemented in Britain according to the terms and conditions laid down in collective agreements. Many are required to work even longer hours than the already high industry average of 46 per week and, as self-employed, they do not receive holiday pay and other benefits. There is growing evidence of exploitation and health and safety risks for migrants, often aggravated by language problems.

3. Labour supply: Who wants to do what?

Labour supply to the industry has been complicated by extensive labour-only subcontracting and self-employment, through the practice of 'poaching' skilled labour from other firms and countries, and due to the myriad of organisations involved in skills development. Vocational Education and Training (VET) relies largely on the goodwill of individual employers, especially for the provision of work experience, but in 2007 only 7,200 of the 50,000 applicants for construction apprenticeships found placements with employers. Two-thirds of the 40,000 first year construction trainees, many of whom are women and BAME, are, as a result, based in Further Education Colleges, where the drop-out rate is estimated at 40 percent and from where it is difficult to acquire the work experience to enter the industry. In

any event, this trainee rate is inadequate to reproduce the skills required for the sector, being much lower than, even less than half, that in other leading European countries. The stock of skills in the industry is also about half the level found in, for example, Germany, where 46 percent of the workforce is estimated to have at least the equivalent of NVQ level 3 and 74 percent have NVQ level 2. In real terms, only 33 percent of the workforce has actually acquired at least an NVQ level 2 certificate and, in 2002, only 41 percent had completed an apprenticeship, although there are considerable variations according to trade. In contrast, many migrants are highly qualified, but they are often employed in lower skilled jobs.

4. Immigration and labour demand: How and whom do employers recruit?

Routes of entry for migrants vary, including by coming 'on spec', 'word-of-mouth' through family and friends, direct or group recruitment, and through agencies. There tend to be low barriers of entry to construction work, and recruitment and selection practices are invariably informal, even extending to recruitment on site as long as a worker's toolkit (still a requirement for working in the trades) is sufficient. There is a growing movement of migrants to different regions of the country.

5. Immigration and alternative responses: A need for migrant labour?

There are not likely to be significant wage increases in the industry, despite pockets of high activity. Nor is there evidence of significant changes in production methods, with over half the off-site market consisting of non-volumetric pre-assembly rather than modular and portable buildings, equating to about 2 percent of total sector output and focussed on industrial and commercial work. Technology substitution is nevertheless espoused as the panacea for the industry's skill needs, though restructuring, prefabrication and mechanisation since the 1970s have been held back by the low skilled, labour intensive route pursued. Years of under-investment in VET, itself fuelled by lack of labour market regulation, has left an ingrained legacy of a reliance on contingent, self-employed, undeclared and often migrant labour. The available evidence points to a sector already dangerously exposed to any reverse in the inflow of migrant workers from the accession states.

6. Conclusion: implications for analysing staff shortages in the sector

The industry policy to use migrants as a 'short term fix' may simply reinforce the reluctance of employers and government to establish a comprehensive, industry-wide VET scheme. Managed migration should form a component aspect of such a strategy, with migrants benefiting from and contributing to training and development and improvements in skill levels and policies for inclusion and equal treatment of all workers. Such policies include: the implementation of the Posted Workers Directive according to collectively agreed terms and conditions; equal treatment for agency workers; extension of the Gangmasters Licensing Act to construction; curtailment of 'bogus' self-employment; effective implementation of the Working Time Directive; establishment of main contractor liability; and, restriction of the subcontractor chain. For effective integration, migrants, along with other construction workers, also need to be formally and transparently recruited and selected, directly employed, and informed of their rights and collectively agreed terms and conditions. Only in this way will data on labour and migration in the industry become more reliable and extensive.

1. Overview of the sector and its labour markets

1.1 Key features and peculiarities

The UK construction sector is very diverse, accounting for approximately 10 percent of Gross Domestic Product (GDP) and employing nearly 1.9 million people (Department for Business, Enterprise and Regulatory Reform 2007). If a broader view is taken of construction - including the supply chain of producers and suppliers of raw materials, building components, manufacturers, professional services and labour organizations - the workforce is estimated at around three million (Pearce 2003). Using the Standard Industrial Classification (SIC) categories 45 and 74.2, ConstructionSkills (2008a) estimates employment of 2.4 million in 2006 and forecast to increase to 2.8 million by 2012. After a sharp decline in activity in the early 1990s, construction output has steadily increased since the mid-1990s, from £60 billion to £83 billion reached in 2007. Repair and maintenance (R&M), including housing improvements, much of which are carried out by small or one-person firms, account for 43 percent of this; housing represents 39 percent of total output and 31 percent of new work, while private industrial and commercial output represents 43 percent of new work, and infrastructure 11 percent. There are significant regional variations in output, with large concentrations in London and the South East, although there are pockets of high activity in other regions, including in the South West and the Midlands.

The output of the industry is very diverse, thereby also implying a varied deployment of labour and skills. A critical aspect of this, one which denotes a peculiarity of the British construction sector, is that the industry is very much more labour-intensive and unproductive than other leading European countries. This is evident from detailed comparative studies of housebuilding sites, which showed that 39 percent more labour was required to produce one square metre in England compared with Germany and 50 percent compared with Denmark (Clarke and Herrmann 2004a). An authoritative analysis of research projects across Europe placed the UK 55 percent on its resource-use benchmarking index, compared to 69 percent for Germany and 72 percent for Denmark (Bernard Williams Associates 2006). The report emphasised the UK's poor record in terms of investment in research and development and training, 'exacerbated by extensive sub-contracting', and the fact that 'low labour rates and efficiency do not go together.' This analysis is supported by a series of reports prepared over the last 50 years which, according to the Comptroller and Auditor General (2001):

.... have identified a lack of serious and sustained commitment to education, training, safety and research and in particular the low levels of commitment to serious skills development.... leading to consistently low levels of performance in areas such as cost, time, quality, running costs and fitness for the end user.

The industry includes about 186,000 private contracting companies. Over 93 percent of these have fewer than 13 employees, though accounting for only 37 percent of direct employment and 20 percent of the value of private contractors' work done (Department for Business, Enterprise and Regulatory Reform 2007). Firms employing over 600 persons account for 18 percent of employment and 26 percent of work done, and have significantly declined in number, as have the medium-sized firms. The largest companies are relatively small in world terms, the highest placed UK contractor being now thirteenth in a league of European contractors based on turnover. A high proportion of their output, rather than being carried out directly, is subcontracted, estimated at about 65 percent, or more than double that in other leading European countries (see, for example, Clarke and Herrmann 2004a; Gruneberg and Ive 2000). The productive capacity of the industry largely rests on the smaller firms who compete throughout the work process including as subcontractors (Bosch and Philips 2003). The trade unions: UCATT (The Union of Construction and Allied Technical Trades), UNITE (previously AMICUS and TGWU) and the GMB represent a declining proportion of employees, with trade union density estimated at 17 percent and an estimated UCATT membership of up to 120,000 (Department for Trade and Industry 2006). The employers' associations too, in particular the Construction Confederation (CC), tend to represent the larger firms rather than the myriad of small firms in the industry, some of which are in the rather smaller Federation of Master Builders. The unions and the CC are signatory to the Working Rule Agreement, covering pay and conditions in the industry (Construction Industry Joint Council 2005).

By 2006 average gross weekly earnings for full time male employees in construction had reached £563.30. For non manual workers, however, earnings were £611.30 per week and 1,482p per hour even in 2002, slightly higher than the weekly average for all sectors of £610.40, but lower than the hourly average of 1,568p. Hours too are higher for non manual workers, averaging 41.4 per week, compared with 38.9 for all sectors. There are also significant trade differences, with bricklayers earning an average £471.10 per week in 2006, carpenters and joiners £440.20, and labourers £368.60 (Department for Business, Enterprise and Regulatory Reform 2007). The earnings differential between skilled and semi/unskilled manual workers has also been widening: labourers earned on average 21.8

percent less per week (24.3 percent less per hour) when compared to bricklayers, and 16.3 percent less per week (16.9 percent less per hour) when compared to joiners and carpenters in 2006. Over a decade ago in 1996, the weekly differential between a labourer's weekly earnings and a bricklayer's and a joiner's weekly earnings was only 7.1 percent and 11.3 percent respectively. The increasing differential between skilled workers and labourers is significant with respect to migrants, who, when employed in a manual capacity in the industry, are frequently found as labourers. These earnings are significantly higher than the collectively agreed rates in the Working Rule Agreement, which were, even in June 2005, still only £264 for a 39 hour week and 677p per hour for the lowest skill level of General Operative, though the highest skill 'Craft' Rate was £351 per week and 900p per hour (Construction Industry Joint Council 2005).

The construction industry is the epitome of a project-based industry, as unique project organisations are established for every new construction project (Dainty et al. 2007a). The term 'temporary multiple organisation' (TMO) is often used to describe the project team created on every project (c.f. Cherns and Bryant 1984). They comprise a temporary and often complex set of inter-organisational relationships, which are themselves governed by project-defined interactions (Bresnen et al. 2004). The fluidity that this creates can make for an unstable employment regime and require a relatively mobile labour force. This mobility is compounded by the fact that construction is sensitive to the weather, and is to some extent seasonal, with more jobs available in the spring and summer than the winter months (Pollard et al. 2008). This has implications for migrant workers, particularly as a seasonal pattern of arrivals in the UK is evident from the Workers Registration Scheme (WRS) (Pollard et al. 2008: 39). However, fluctuations in employment throughout the year are not necessarily seasonal. For instance, the surge in direct employment observed during the second quarter of 2004 coincides very closely to the joining of the A8 countries into the EU, after which time seasonality in construction employment stabilises (Department for Business, Enterprise and Regulatory Reform 2007).

The project-based nature of construction, together with geographic mobility in terms of where construction firms can operate, results in the situation where local labour can potentially be marginalised in terms of employment and training opportunities. Whether they are regional, national, foreign-based or international, firms may rely on labour from outside the localities they operate, representing an opportunity cost of either local employment or skills development of local labour. Attempts have been made to redress this with limited success. For instance, the Construction Employment Integrator (CEI) project in the North East of England endeavoured to enforce contractual requirements for firms to employ and

train a proportion of their workforce from the locality. Section 106 clauses applied to major projects and developments, including London Heathrow's Terminal 5, Wembley and currently the Kings Cross developments, similarly seek to impose on employers requirements for the recruitment and training of local labour, thereby engaging with those who are unemployed in the area. These measures have had a limited impact; on Terminal 5, for instance 150 were employed over three years under the local labour scheme out of a total workforce of about 5,000 at any one time (Greater London Authority 2007).

As well as demanding employment conditions, the construction industry is characterised by particular working conditions. It is not only exposed to the vicissitudes of the weather and seasons, making for insecurity and fluctuations in earnings, but also to a varied working environment, whether working at height or depth, moving heavy components or handling dangerous materials. It can be one of the most hazardous and unhealthy workplaces, with a fatal and major injury rate three times higher than for all industries and the rate of reported injuries twice as high. The most common causes of injury are from: being struck by a moving object; handling, lifting or carrying; or slipping, tripping or falling from the same level or from a height (Health and Safety Executive 2008). In an occupational health pilot involving 1,300 health checks on construction workers in the Leicestershire area in 2006 run by the Constructing Better Health (CBH) Campaign, one-third had to be referred to their General Practitioner (GP) or optician, 30 percent had noise-induced hearing loss, 3 percent experienced hand/arm vibration, and a few had muscular skeletal problems. These levels are similar to those found by the occupational health team at Heathrow's Terminal 5 where, of the 7,000 screened in safety critical occupations, about 25 percent had medical problems, especially hypertension, and 2,000 experienced lifestyle-related problems (Clarke and Gribling 2007).

The industry embraces at least 50 different skilled occupations and numerous professional occupations: 75 percent of the workforce is in manual occupations, and 25 percent is in non manual (almost half are composed of office staff). A peculiarity of the British construction industry is the fact that the proportion of administrative, professional, technical and clerical (APTC) staff has remained constant at approximately 17 percent since 1970, whereas in countries such as Germany and Netherlands it has risen very considerably with the more abstract and technical nature of construction work (Clarke and Herrmann 2007a). This is a further indication of the more labour-intensive nature of the industry. Another peculiarity is its adherence to traditional trades. The largest group of manual workers (19.7 percent of the total operative workforce) is in the wood trades, above all carpentry and joinery with approximately 270,000 employed and found in joinery installation, general construction of

buildings and civil engineering works (for example, shuttering) and the erection of roof coverings and frames, as well as elsewhere, such as in exhibition work. Carpenters are followed by two other traditional trades, bricklayers (7 percent) and painters and decorators (9.1 percent), and these together with roofers (2.8 percent), floorers (2.9 percent), and plasterers and dryliners (3 percent) make up 45 percent of the manual trades. Plant operatives (3 percent) and other civil engineering operatives (4.1 percent) together constitute a significant and growing part of the manual workforce (ConstructionSkills 2008).

A key characteristic of the industry is its exclusivity: the construction workforce is composed almost entirely of white, able-bodied males (Greater London Authority 2007). Gender equality has actually worsened since the early 1990s, with female participation falling from 11 percent in 1992 to 10 percent by 2004, at a time when women represent 46 percent of the economically active population (Briscoe 2005). Even this proportion is misleading as for craft and trade occupations the proportion of women is as low as 0.3 percent, indicating extremely intense gender segregation and, given the higher proportion of women training in these areas, serious discrimination (Byrne et al. 2005). According to the Labour Force Survey, only 2.8 percent of those employed in the construction industry are from Black Asian and Minority Ethnic (BAME) groups, a figure which has risen from 1.5 percent in 1992, although these constitute 8 percent of the total economically active population (Labour Force Survey 2005). This population is far larger in London, where BAME make up 30 percent of the working population, although only 14.4 percent of those are in the construction sector and even less (12.4 percent) are in the building trades (Greater London Authority 2007). However, of the 96,000 additional people recorded as employed in the industry since 1998, 8.3 percent are from an ethnic minority, accounting for the percentage rise in their presence.

These trends raise a question regarding the efficacy of numerous exhortations made since the 1990s about encouraging more diversity in construction and efforts to raise greater awareness among women and BAME groups, who are seen as a potential untapped resource for the industry to draw upon, about career opportunities in construction (Dainty and Bagilhole 2005; Fielden et al. 2000; Mackenzie et al. 2000). However, whereas there are more female candidates applying for (and excelling in) courses in science, engineering and technology, these numbers do not translate into real job opportunities at the workplace (Powell et al. 2004). A recent study in careers advice in schools in the North East of England also found that the perceptions of school teachers of the construction industry can be ill-informed and that even family members who work in the industry are likely to dissuade their daughters from entering (Chan and Connolly 2006).

A further peculiar feature of the industry is its labour arrangements, marked by often casual employment and divided between those who are directly employed 'on the cards' and those classified as 'self-employed'. A disproportionately high proportion are classified as 'self-employed', including migrants, although they may be working alongside directly employed employees and doing the same work. The self-employed number about 700,000, or an estimated 47 percent of operatives in 2006, though even the Labour Force Survey, the most reliable source of data, does not address the nature of self employment adequately (Briscoe 2006; Department for Business, Enterprise and Regulatory Reform 2007). The majority are so classified because they possess a special CIS (Construction Industry Scheme) tax certificate issued by the Inland Revenue, of which 1.9 million have been issued since the scheme began (Blackman 2007). It is a system unique to the construction sector and is often dubbed 'bogus' self-employment because the vast majority of those self-employed are for all intents and purposes in a legal sense 'employed.' It has also been subjected to considerable criticism due in part to the devastating and long-term impact it has had on training in the industry (Harvey 2002; Clarke and Wall 2000). Ironically the CIS originated from the government's attempt to curb tax evasion within the construction sector in the 1960s, although the resurgence of 'bogus' self-employment has meant that a new wave of tax evasion is being endorsed. UCATT estimates the loss to the Exchequer from tax evasion through 'bogus' self-employment at approximately £2.5bn (Stewart 2007; Harvey 2001). The government has made various attempts to tighten up the system, the latest in April 2008; however, these have as yet had little discernible impact on numbers. In principle, this newest attempt mandates self-employed persons to demonstrate their genuine status or face automatic tax deductions at point-of-payment; in practice, it may simply add to the administrative burden of those who would comply anyway and encourage those who do not into the informal economy (for example, with cash-on-hand payments). Many 'self-employed' come through agencies, a typical route of entry for migrants, and work for labour-only subcontractors, with whom a large proportion of migrants are also to be found.

Yet another and associated peculiarity is the relatively high proportion of untrained workers in the construction labour force, many of whom (echoing the persistence of a craft system) continue to be classed as labourers. Others pick up some of the skills of a trade informally and are gradually taken on and paid as tradespeople or classed as plant operatives following a short plant-specific training course.

To summarise, the industry is one which has been crying out for change, given its high labour intensity, relatively low levels of productivity, and stagnant and traditional division of

labour. Employment in construction remains, however, overwhelmingly white and male dominated, exclusive, and dogged by casual and so-called 'bogus' self-employment.

1.2 The role of migrant workers

Statistics on migrant workers in construction are extremely patchy. According to the Worker Registration Scheme (WRS), the latest cumulative number of migrant workers registered to work within the construction and land sector is 30,965, with 3 percent of the total A8/A2 migrant worker population in construction and more than a third of these registering as labourers (Border and Immigration Agency 2008). Pollard et al. (2008) however estimate from the Labour Force Survey data that just over 10 percent of A8/A2 migrants work in the construction sector. Many commentators have also suggested that the WRS figure represents a gross underestimate, since it does not take into account the number of migrant workers who are self-employed (Balch et al. 2004) or undeclared (Cremers and Janssen 2006). A recent quarterly survey (Murdoch 2008) undertaken for the National Specialist Contractors' Council revealed that 3 percent of respondents' workforces are made up of Polish workers, this figure ranging from 1 percent to 30 percent, concentrating in Greater London, the South East and East Anglia. This geographic spread corresponds tenuously with data from the Border and Immigration Agency (2008), which also indicates that the conventional view of London as the first port of call for migrant workers (Green et al. 2005) is slowly changing, with the onset of, *inter alia*, the expansion of low-cost airlines and transitory migration within the UK (Fitzgerald 2007; Pollard et al. 2008). In a recent interview for a Nuffield Foundation project, one of the largest bricklaying subcontractors in Europe, employing approximately 800 weekly paid operatives, attributed the origins of the workforce as follows: 60 percent UK, 25 percent Eastern Europe, 5 percent rest of Europe; 5 percent the Caribbean; and 5 percent Africa (Nuffield project 2008). While making an accurate assessment of the participation of migrant workers in the construction industry is impossible, given the limitations of the data and informality of the sector, all of the available evidence suggests that it is significantly higher than official labour market statistics suggest.

Based on interviews with unionists and employer association representatives, Lillie and Greer (2007) estimated the share of migrants operating within the sector to be as high as 10 percent, which is due in part to the ease of obtaining legal employment as 'free' agents in comparison with some other EU states. Stewart (2007), reporting on work commissioned for the Rowntree Foundation, suggests that the sector is the most popular for male migrants from Eastern Europe. All the indications are that many jobs opening up in the construction

labour market are filled by A8 migrants. The Chartered Institute of Building (CIOB) opinion survey (Campbell 2006) revealed that 90 percent of industry practitioners considered that migrant workers were likely to come from Eastern European states, mostly in semi-skilled or labouring positions and only very rarely in management occupations where recruitment is particularly difficult. This suggests that European Economic Area (EEA) migrant labour may be an effective strategy for filling some of the lower-skilled construction occupations, although the situation for more highly skilled and professional occupations remains unclear.

Labour Force Survey data confirms higher proportions of migrants in lower positions, whether as labourers (8.9 percent non-UK born), or in the arguably lesser skilled trades such as painting and decorating (8.2 percent non-UK born), although significant numbers of migrants (3,242) are recorded as carpenters and joiners (6.1 percent non-UK born), many of whom are from non-EEA countries. It is significant that in professional and technical areas of construction and for the more skilled and regulated electrical trades, migrants tend to come from non-EEA countries. For instance, 10.6 percent of electrical engineers are non-UK born, but 8.2 percent are non-EEA; 4.1 percent of electricians are non-UK born but 2.7 percent are non-EEA. A similar phenomenon is evident with technicians in the industry. This in part reflects the common practice for professionals and those in highly skilled construction occupations from Commonwealth countries to spend a period of time working in the UK. In contrast, only 2.9 percent of painters and decorators and 3.5 percent of building and woodworking labourers are from non-EEA countries compared with 5.3 percent and 5.4 percent respectively from EEA countries.

The relatively high level of sectoral transfers in and out of construction demonstrates, to a certain extent, rather low barriers to entry into construction work (Beaney 2007). Beaney (2006) who interrogated the Labour Force Survey to examine residential and sectoral migration in the UK found that the construction sector exhibited the highest level of labour connectivity to other industry sectors, in particular to (i) energy and water supply, (ii) mining, ores minerals and chemicals, and (iii) metal goods engineering and vehicles sectors. A series of factors complicates the picture however when trying to estimate migrant labour flows within construction. For example, many migrant construction workers are self-employed and it is also possible to enter the UK on a self-employed basis and then find employment, rendering such migrants invisible in existing statistics (Dench et al. 2006: 22; Anderson and Rogaly 2005). Furthermore, the project-based nature of construction employment can make for a corresponding flexibility in labour arrangements. Labour is often employed contingently through subcontracting chains, or construction workers are hired as if they are fully independent, or self-employed, by different sub-contractors who feed up their

supply of workers to larger sub-contractors (McKay et al. 2006). These problems are in addition to the abundance of 'undeclared' labour which evades any official labour market statistics (Cremers and Janssen 2006). According to Gribling and Clarke's study (2006), it is easy to find work illegally as a migrant worker if there is already a migrant community working on sites. Anderson et al.'s (2006) extensive study of migrant workers also revealed that some 22 percent of the migrants surveyed were found to be illegally resident.

In summary, the available statistical, survey and case study data points to relatively high proportions of migrants in the construction industry, up to 10 percent of operatives, but varying significantly according to region and trade. The higher the skill, the higher the proportion from non-EEA as opposed to EEA countries, while large numbers of those from the EEA countries are concentrated in labouring or semi-skilled occupations.

2. Characteristics and determinants of demand

Considerable effort is being expended by the industry in forecasting the demand for construction labour on the basis of traditional skill and labour loadings attached to given units of output and, as we would argue, at the neglect of examining how supply can meet the demand.

2.1 Surveys and skill shortages

ConstructionSkills runs a skills and productivity observatory process across the various regions in the UK to gather and disseminate labour market intelligence for the sector. The observatory process seeks to incorporate a more 'bottom-up' approach from key stakeholders at regional level, given that the demand for labour in construction is sensitive to locality and to differences in work flow across the regions (Chan and Dainty 2007). Nationally, there is a shortage of managerial staff in the sector, while in terms of skilled workers, areas of concern include the wood trades (carpenters and joiners), bricklayers and building envelope specialists and the electrical trades (refer to Table 1). These concerns are replicated across the regions with subtle differences linked to projected regional construction output. So, for example in Yorkshire and Humberside, the plumbing and HVAC (heating, ventilating and air conditioning) trades (7.6 percent) and the painting and decorating trades (6.0 percent) constitute a high proportion of the average annual employment requirement; in Northern Ireland, a growth is forecast in requirements for steel erectors caused by a surge in

investment in infrastructure development (ConstructionSkills 2008a). The forecast suggests a high requirement for professional workers in Greater London and a requirement for managerial occupations concentrated in the Greater London, East and South East of England regions where many of the professional services firms and head offices of construction companies are clustered. As can be seen from Table 1, the total employment requirement between 2008 and 2012 is estimated to be 88,390. In its forecasts, ConstructionSkills has also taken into account the impacts of migration by mapping migratory patterns across the regions. Based on its Network model, the projection is that, if migrants from the A8 countries (notably from Poland, Lithuania and Ukraine) return to their home countries because of more favorable economic conditions when compared with the UK (Pollard et al. 2008), the industry would require approximately 10,000 professional and skilled workers per year to fill the gap. Such estimates, need, however to be treated with considerable caution, assuming as they do that a given output equates to a given labour requirement and that current practices and skill sets can be projected forward (Briscoe 2006). The standard labour coefficients (productivity levels) on which ConstructionSkills (2008a) bases its labour requirement forecasts are also problematic because of difficulties in measuring productivity (Ive et al. 2004) and because they do not take into account how firms actually recruit and mobilise their workforce.

The nature of the sub-sector in which construction projects are located plays a part in determining skills required. Non-residential work, particularly in public buildings (in healthcare and education) is, for example, set to grow in the short-term. While a decline in housing work is forecast for a number of regions (for example, the East and West Midlands), others (for example, the North East) will see a significant amount of housing renewal work (ConstructionSkills 2008a). Indeed, a shortage of refurbishment and maintenance skills is foreseen, particularly if the government's 2016 targets for sustainable homes are to be met. Clarke and Hermann's national survey of skills shortages in housebuilding showed that this sector was affected to a greater extent than construction, with about 80 percent of all private and an even higher proportion of social housebuilding firms expressing difficulties. About 50 percent of firms had problems recruiting managers, 40 percent bricklayers and 33 percent carpenters, with over 60 percent of firms reporting at least one hard-to-fill vacancy (Clarke and Herrmann 2007).

Employers are increasingly claiming great difficulties in recruiting the skilled workers they require, thwarting their ability to bid for new work and to complete projects on time. Skills shortages are also particularly crucial with specialist contractors who carry out much of the work (Murdoch 2008). It is not easy, however, to examine skills shortages within the context

of the local labour market given the limitations of existing data sources such as the Labour Force Survey (LFS), where statistical reliability is limited when disaggregated down to a sub-regional level (Watson et al. 2006; Dainty et al. 2005a; Chan and Dainty 2007). Several regional development agencies (RDAs) have, as a result, recently commissioned research to gain a better picture of the impact of migration within their locality, such as for the East and West Midlands (Green et al. 2007a and b). However, here there is a lack of robust labour market data and only broad estimates of migration are possible, even before undocumented migrants are taken into consideration.

Attempts to identify skills in the industry have been given considerable impetus through the Construction Skills Certification Scheme (CSCS), intended to register skilled workers, to ensure that certain criteria are met, including health and safety requirements, and to provide a degree of regulation not hitherto present. It is very much geared to those with experience and skills, although the eventual system is intended to recognise what skills are needed as a means to develop these. To date, 1.3 million cards have been issued and they are increasingly a requirement for those working on sites, including migrant workers. The process involves passing a health and safety test that is completed on a computer and repeated every 5 years. ConstructionSkills even considered setting up a permanent On-site Assessment Training (OSAT) centre in Poland in order to certify those seeking to work in construction in the UK. Under CSCS, those who have attained a National Vocational Qualification (NVQ) of at least level 2 are recognised as 'skilled', although in other European countries such as Denmark and Germany the base qualification would be Level 3 (Clarke 2006).

It is extremely difficult to accurately assess skill levels in the industry given the nature of NVQs, which underpin the industry's skills framework and which have been widely criticised for their lack of academic rigour and dilution of technical content (Callender 1997; Clarke and Winch 2004). They comprise narrowly-focused, task-based standards devoid of significant theoretical content or underpinning knowledge, and divorced from training provision or curricula, whose specification, it has been argued, effectively achieves a Taylorist separation of conception and execution (Steedman 1992; Grugulis 2007). Thus, while NVQs are the means established to recognise skills existing in the industry, these are of a variable quality (Dainty et al. 2005b). Indeed, the fact that employers are less and less involved in the formal framework of skills development and resort more and more to informal options, such as on-the-job-training, only adds to the suspicion that even those skills which are identified represent unknown quantities and qualities (IFF Research Ltd. 2003).

Construction is divided into different sectors, some of which are significantly more regulated and demanding in terms of formal Vocational Education and Training (VET) and qualifications than others. Most demanding and covered by highly regulated collective agreements are the mechanical and electrical (M&E) and engineering construction sectors, the latter concerned with large projects such as power stations. The building sector, embracing housebuilding and the traditional 'wet' and 'dry' trades such as roofing, carpentry, bricklaying, plastering, painting and decorating, and glazing, is much less regulated and demanding, except in certain specialist areas such as exhibition work and shopfitting. The civil engineering sector is perhaps the least demanding in a formal sense, the wage, for all intents and purposes, still being constructed around the status of the labourer, with 'plus rates' accorded for working in particular areas. This contrasts with other countries such as the Netherlands and Germany where a comprehensive civil engineering VET scheme is in place. To operate particular plants in Britain, certification is necessary on a plant-by-plant basis, obtained by attending a short training course. Only for certain trades, especially M&E, is NVQ level 3 a prerequisite; in these areas, workers have usually been through a formal VET scheme of three or more years (four years in Scotland). Here too, as a formal process of trans-national recognition of qualifications through the European Qualifications Framework (EQF) and the European Credit Transfer System (ECVET), has not yet been established, the use of migrant labour from elsewhere in Europe, and particularly from Eastern Europe may be lower than for some of the traditional building trades.

It is in the traditional building trades and general operative work that migrant labour is generally concentrated, and for these there is no formal qualification entry requirement. Although at least an NVQ level 2 would be expected in areas such as bricklaying and level 3 for carpentry, many succeed in working their way up from, for instance, labourer or 'mate' to bricklayer, perhaps by attending day release in a Further Education College at the same time for a year or so. Given the low underpinning knowledge required, it is therefore possible for such workers to obtain an NVQ level 2, and possibly to progress to NVQ level 3, through the OSAT process under ConstructionSkills. This situation compares with other European countries such as Germany, the Netherlands and Denmark where it is increasingly difficult to work in skilled areas of construction without the equivalent of at least level 3 and in all other areas without the equivalent of level 2, so that qualifications obtained through a formal VET process are becoming a prerequisite to work on site. In Britain, especially in the building sector, qualifications are not a condition of entry, except in the M&E trades and in areas such as engineering construction.

2.2 Demand for and experience of migrants

The current emphasis within the industry appears to be on using migration to 'plug' immediate skills gaps. Indeed, this is the stated strategy of the Sector Skills Council, which has an overt policy to integrate migrant labour as part of its broader skills, training and qualifications strategy (ConstructionSkills 2008b). Over 50 percent of construction employers allude to looking to foreign shores for the workers they require (Institute of Employment Research 2006), with clear implications for the productive capacity of the industry. One reason is that the industry tends to rely on traditional, craft-based occupational boundaries, reducing the reflexive nature of skills-in-use (Chan and Cooper 2006; Stasz 2001). As a result, there is the danger of latent skills shortages, where skills gaps remain unknown simply because employers and workers just cope through improvisation (Mayhew 2003). This is becoming increasingly apparent on large sites, such as London's Heathrow Terminal 5, where there are often different skill requirements, for instance in the areas of groundworks, concreting, formwork, fitting out work and even bricklaying. Representatives of firms interviewed at Terminal 5 stressed the need for wider occupational profiles for each area of activity, in particular in relation to general operative work and carpentry (Clarke and Gribling 2008). Groundworkers, for instance, should be able to carry out steel-fixing, plant operation (including operating cranes and forklifts), scaffolding, paving, drainage, banking, concreting and concrete finishing. This 'multi-skilling' is also seen as facilitating greater mobility of labour and the later relocation of workers which should go together with a large directly employed workforce. More recently on a large Bristol project, bricklaying supervisors complained of the need to improvise constantly, given the range of different materials used, including stone and metal, with which traditional British bricklayers had little experience (Nuffield project 2008).

One of the peculiarities of the British construction industry is that many areas of work associated with the General Operative status, including concreting and groundworks, remain unrecognised as 'skilled areas,' although they require considerable skill and expertise and are currently the subject of extensive lobbying by concreting contractors for a comprehensive and recognized three-year scheme of training (Clarke and Wall 1998). Another peculiarity is that British workers, unlike their counterparts in Germany or Poland, tend to be 'single-skilled,' rather than trained and upskilled for a greater range of activities and in social and problem-solving skills. As a result it can be very difficult for contractors to recruit those with appropriate skills; one estimated its labour turnover to be unnecessarily high, even 50 percent where there is high demand, in part because occupations are too

narrowly conceived and NVQs give only restricted ability to extend experience (Clarke and Gribling 2008). Often migrant workers may be preferred simply because they are more 'multi-skilled' in areas such as groundworks, more adept at problem-solving, and have more transferable skills to move onto different activities and projects, which is attributable in large part to higher levels of education and training than their British counterparts.

Another reason why migrant labour may be preferred is that it can be employed at lower rates given the failure to implement the Posted Workers Directive according to the terms and conditions laid down in collective agreements. The Directive requires that host country conditions should apply when workers are 'posted' to another country, whether employed directly or by an agency or subcontractor. There has been much lobbying, in particular on the part of the trade union AMICUS (now UNITE), representing those in skilled areas such as the mechanical and electrical trades, that the Directive be applied according to the terms and conditions of the collective agreement, that workers be directly rather than self-employed, and even that there be statutory recognition of the collective agreement. However, current government policy is only that migrants should not be paid below the minimum wage.

The low status of many jobs in the industry may act as a barrier for employers seeking to recruit British workers, but may be attractive for employers and agencies exploiting migrant labour (Anderson et al. 2006). Indeed, the industry, in particular the building sector, is often synonymous with high cost, low quality and chaotic working practices. As Anderson and Rogaly (2005: 27) suggest:

Migrant workers appear to be popular in the construction industry as they constitute cheap labour working long hours in an industry with a labour shortage.

The long hours of work on many construction sites, and the renowned failure to implement the Working Time Directive in the sector are other factors which make vulnerable migrants open to exploitation by the industry. Average weekly hours are as high as 46, compared with 44 for all other sectors (Department for Business, Enterprise and Regulatory Reform 2007). Pollard et al. (2008) have suggested that migrants work, on average, four hours longer than their local counterparts. Recent studies of construction sites with large concentrations of migrant workers have pointed to excessively long hours, including for workers employed on the Heathrow Terminal 5 site, and to the immense barrier this poses to encouraging greater diversity in construction (Greater London Authority 2007; Clarke and

Gribling 2008). Fitzgerald (2006) found evidence of poor treatment and abuse of migrant workers in construction in the North East, giving first-hand accounts and anecdotal evidence of companies under-paying migrant workers, at times below the statutory minimum wage; many did not receive wage slips or have employment contracts. Although it is not known how widespread such malpractices are, evidence is mounting with regards to the exploitation of migrant workers due to their lack of awareness of their employment and legal rights and of the basic terms and conditions accorded to indigenous workers. RIFT, an organisation operating since 1999 for auditing wage and tax payments of migrants in the UK and handling about 3,000 cases per year, also reports considerable irregularities in the payment of wages and taxes to migrants in the construction sector (CLR-News 2007).

Despite encouraging statistics in recent years showing a downward trend in fatalities and serious injuries, the number of deaths on UK construction sites rose during 2006 and 2007, a rise attributed to the large number of immigrant workers on construction sites, where language barriers have led to difficulties in enforcing health and safety policies (Owen 2007). However, there is no current method of identifying whether there are any specific additional or increased health and safety risks for migrant workers, and existing Health and Safety Executive (HSE) programmes and recording systems only report a limited number of workplace incidents (McKay et al. 2006). It is however, acknowledged that there is considerable under-reporting of accidents, with only 30 percent of reportable accidents actually reported to the HSE (Davies et al. 2007). In such an unregulated and casual sector as construction, the record is likely to be even worse.

In terms of obtaining CSCS cards, special measures are in place for migrants. At the Terminal 5 test centre, for example, where in 2006 the vast majority of new recruits coming on site were from mainland Europe, and particularly Eastern Europe, there were translations and interpreters brought in to cover all languages, including Polish, Portuguese, Czech, Bulgarian and Romanian (Clarke and Gribling 2008). Each operative had to have a card within 28 days, with all cards being requested and checked at the general one-day induction. Some problems of understanding and language were reported, as well as difficulties for older workers to use a computer, contributing to a high, albeit improving, failure rate in passing the test, for which three attempts were possible. By 2006, about 95 percent of trades on the Terminal 5 site had CSCS cards.

In summary, the evidence from case studies is increasingly suggesting a preference for migrants because they have a broader range of skills and wider occupational capacity than typically found of British construction workers in traditional trades. Indeed, the high

education level, problem-solving abilities and transferable skills of many migrants are themselves throwing into relief the often narrow and traditional trade-based nature of construction skills, VET and NVQ qualifications in Britain. In this regard, their employment can be of positive benefit for the industry, while at the same time disadvantaging further those trained in Britain and seeking to work in the industry, including women and those from BAME groups. Other reasons for employers preferring migrants, however, include the often lower labour costs involved, and the ability to exploit them in terms of pay, working hours and conditions. The effect of such exploitation can only be negative, in particular in terms of health and safety and of accentuating disparities in employment and working conditions between different groups in the industry. To combat this and to facilitate the integration of migrants, equal treatment measures are needed, including implementation of the Agency Workers Directive and the Posted Workers Directive on the basis of terms and conditions laid down in collective agreements and adherence to the Working Time Directive. For this to take place, however, changes are needed in terms of the treatment of workers, migrant or otherwise, and of the effective enforcement of legislation by appropriate authorities.

3. Characteristics of supply

Supply relations are complicated by the existence of labour-only-subcontracting (LOSC) and the persistence of self-employment, both deterring investment in training for the industry and contributing to what might be regarded as a 'fossilization' of existing skill divisions (Clarke 2006). The situation is exacerbated by 'poaching,' with some indication that workers benefit from training under direct employment before switching to self-employed status or employment with LOSC (IFF Research Ltd. 2003). Clarke and Herrmann (2007) demonstrate for the housebuilding sector how 'poaching' from other firms of skilled operatives and supervisors, so typical of craft labour markets, is rife, perpetuating the exclusion of women and those from BAME groups, and blurring divisions between craft and secondary labour markets (Marsden 1999). However, a fundamental concern of this demand-driven system is that training largely relies on the goodwill of individual employers, many of whom are unable or unwilling to train. There is an acute shortage of opportunities for trainees to obtain the necessary work experience as part of modern apprenticeships, and employers generally abdicate responsibility, in particular, the small construction firms that dominate the sector (Clarke 2006; Forde and MacKenzie 2004).

The diversity of the sector is reflected in the fact that there are at least six Sector Skills Councils with an involvement, and they include; ConstructionSkills; Summit Skills (for

building services engineering); Asset Skills (for housing, property and facilities management); Energy and Utilities Skills; Proskills (for materials, products and manufacturing), and; LANTRA (for environmental and land-based sectors). Together with the Engineering Construction Industry Training Board (ECITB), these Sector Skills Councils form part of the Built Environment Skills Alliance. ConstructionSkills plays a dominant role, coordinating the construction industry training levy, labour market intelligence and the sector skills agreement. However, with no single body having overarching responsibility for defining policy, responses to the deficit of skills within the labour market, for example, as manifest in policies, have arguably tended to be fragmented and reactive. Ongoing work (Chan and Moehler 2007) to disentangle the myriad of organisations involved in skills development in construction reveals the complexity of networks that construction companies have to deal with, deriving from the fragmented (even fractured) nature of the sector. As has been shown in other countries, a lack of coordination between the various agencies involved in tackling construction skills shortages can severely limit their long-term impact (Lobo and Wilkinson 2007). A central problem within the UK concerns the number of agencies that must work together to oversee its labour market governance. The breadth, informality and fragmented nature of the sector poses considerable difficulties in defining and delineating it, which in turn leads to multi-agency governance of skills policy (Pearce 2003; Clarke and Herrmann 2004b).

3.1 The inadequacy of existing provision

Table 1 provides some evidence of where supply is seen to be coming from with regards to first year entrant figures to construction-related courses in Further Education colleges, captured by the Learning and Skills Council datasets. The current first year entrant figures are already inadequate to meet the projected average annual employment requirement. Even if all of the 40,000 trainees went on successfully to a career in construction, this would meet, at best, two-thirds of the projected average annual employment requirement set out in Table 1. However, the drop-out rate from college courses is higher than 40 percent for those in the main building trades, many students being unable to cope with demands because they lack basic numeracy and literacy skills, and struggle with theoretical aspects (Further Education Funding Council 2001; Construction Industry Training Board 2004). Compounding this, the vast majority of first year entrants, nearly two-thirds, are based in Further Education Colleges and only about one-third are in work-based training, including in apprenticeships. Many local people go to colleges to do construction courses in order to avoid unemployment, to learn a trade and to develop a career in construction. Yet, for such trainees the link to

work experience and employment is unclear, placements are rare and those that do exist are often limited in scope. There are far more women and women from BAME groups in Further Education colleges than on actual sites. For instance, in London a disproportionately high percentage of those from BAME groups (35 percent) are in training and 9 percent of first year construction trainees are also women, far higher proportions than found in construction employment (Construction Industry Training Board 2005; Byrne 2005). The suggestion is that there is no shortage of women and those from BAME groups seeking to train and work in the industry.

This was apparent from the example of an Further Education college in the vicinity of Heathrow Terminal 5, where estimated demand exceeded the current and approximate 300 trainee capacity by four-fold. Here 6 percent of the 285 construction trainees were women, and 17 percent came from BAME backgrounds. Courses included a one-year programme for a level 2 Intermediate Construction Award (not NVQ) that ran for 14-15 hours per week, although no funding was available for level 3 NVQ and there was little financial support for adults seeking to move to construction. Trainers in this college considered that very few of the trainees had any chance of working in the industry, let alone on nearby Terminal 5, because they were not able to obtain the necessary work experience and thus their pursuit of NVQ level 2 or 3. To help overcome difficulties such as these, ConstructionSkills has now established programme-led apprenticeships whereby the employer receives £2,000 to provide work experience for potential apprentices seeking to achieve NVQ level 2. However, only 150 of these are currently planned for the whole London area.

This illustrates that there is no shortage of applicants for construction training. Indeed, good training schemes are found to be vastly oversubscribed and, there were 50,000 applicants for construction apprenticeships in 2007, though only 7,200 actually succeeded in being placed with employers in the industry (Blackman 2007). The main problem is that the construction training provision which does exist is woefully inadequate in European terms and concentrated in traditional trade areas. Indeed, the existing VET framework reinforces traditional, craft-based boundaries particularly in the development of qualifications such as NVQs which relies on lobbying by only a few, usually larger, employers (Farlie 2004). This has contributed to the narrowing of skills and knowledge in construction in Britain, especially as employers tend to focus on existing practices so that the scope for innovation is limited (Brockmann et al. 2008). First year bricklaying trainees constitute 9.2 percent of those employed as bricklayers, but trainees in the wood trades are only 5.5 percent of those employed in this area, plasterers and dry liners only 4.6 percent, painters and decorators 2.5 percent, roofers 1.4 percent, and floorers a shocking 0.9 percent (ConstructionSkills 2008a).

This compares with rates per trade in other European countries of anything from 8 percent to 16 percent (Clarke and Wall 1998). Even for those areas which are encompassed by training provision, such as 'bricklaying', this has a completely different form, quality and scope from other European countries, with training being in general very narrow and with only very restricted knowledge components (Clarke and Wall 1996). However, large areas of construction activity remain without any training provision, including, as indicated, groundworks and concreting, precisely the areas which stood out as areas of high labour intensity in a comparative study of labour deployment on sites and where many migrants are to be found (Clarke and Herrmann 2004a).

Training provision is therefore inadequate to meet the present, let alone the future reproduction of skills required for the sector. The widespread practice of 'bogus' self-employment has tended to erode the incentive for construction employers to engage in training, and they have placed increasing emphasis on on-the-job training and 'learning-by-doing' (IFF Research Ltd. 2003). Therefore, numerical quantification of skills shortages and the use of qualifications as a convenient proxy for skills only tells a partial story; there is also the issue of the quality of existing skills and qualifications, and of all the areas where training provision is lacking and/or of low quality (Stasz 2001). If the VET system is inadequate, then it is understandable that employers will look elsewhere rather than to trainees to meet their requirements, and in this sense they are not just seeking to 'plug' skill shortages as conventionally conceived.

The industry's indifference to formal qualifications is symptomatic of the low skills equilibrium into which it has sunk, and relates to the fundamental flaws in the qualifications and training infrastructure as a basis for improving the quality of skills in the labour market (Clarke 2006). Since the demise of the Standard Training Scheme of the 1970s and the introduction of NVQs, as qualifications divorced from training provision and curricula, the standard of skills in the industry has becoming increasingly variable, and in this sense an unknown quantity. The proportion of those with the equivalent of at least a NVQ level 2 was estimated at 74 percent in 2002, having increased from 65 percent in 2000, while the proportion of those with at least the equivalent of a NVQ level 3 was estimated at 46 percent, having increased from 39 percent in 2000, and representing about half the proportion found in Germany (Construction Industry Training Board 2004; Richter 1998). At the same time, 13 percent of the workforce was estimated to have the equivalent of a NVQ level 4, although for the manual occupations this was only 5 percent. However, the words 'equivalent' and 'estimated' are important; the real picture is very different. In 2002, only 7 percent of the directly employed construction workforce had actually acquired a NVQ level 2 or above, a

figure which had risen to 33 percent by 2007 (Department for Business, Enterprise and Regulatory Reform 2007). This represents a situation far removed from the aspirations of ConstructionSkills for a fully qualified workforce in the industry, an aspiration increasingly realised in other leading European countries. It signifies both the inadequacy of VET provision and the lack of confidence in the qualifications system by employers.

Further indications of the low levels of qualifications and training in the industry are given through apprenticeship completions. In 2002, only 41 percent of the workforce had completed an apprenticeship, although significant differences were found between trades. For construction trades as a whole, 57 percent had completed apprenticeships, although the rate for the building trades was only 45 percent. It was as high as 73 percent for the wood trades and 67 percent for the electrical trades, but as low as 8 percent for machine drivers. A relatively high number of managers and administrators were also found to have undertaken apprenticeships (Construction Industry Training Board 2004). The patchiness of data on the workforce does nevertheless hamper efforts to determine exact levels of the current stock of skills.

3.2 Differences between migrants and local supply

There is a paucity of knowledge on the extent to which recently arrived migrant workers actually fill the skills gaps within the construction labour market. Lucio et al. (2007) point to serious institutional failures in terms of how the experiences, biographies and skills of migrants are addressed.

In many instances, the lack of proficiency of migrants in the English language creates barriers to accessing jobs for which they are qualified (Dench et al. 2006). Interviews recently conducted as part of the Nuffield Foundation project on a major Bristol site revealed ways of overcoming this, including the employment of an English speaking, medically-qualified worker by an agency responsible for bringing in workers from the Ukraine; and another of these workers was qualified as a laboratory chemist, although employed as a bricklayer (Nuffield project 2008). Numerous reports have indicated that many migrants tend to be highly qualified (Green et al. 2005; Pollard et al. 2008). Migrant workers are sometimes unable to work in areas they have been trained for simply because their qualifications have not been recognised in the UK and they have to settle for a job that requires a lower skill (Lucio et al. 2007). For many, the intention is to maximise the wage premium before returning back to their home countries. On the other hand, there are

migrant workers who attempt to re-train in specific occupational areas and/or to gain proficiency in English in order to move to a more stimulating job. Researchers have found that proficiency in the language narrows the gap between migrant and British workers (Green et al. 2005). Barriers to entry into skilled construction occupations for migrants are also evident. For example, Pollard, et al. (2008:37) observed,

a large discrepancy between the high levels of education that many post-enlargement migrants have and the low-skilled and poorly paid jobs in which the majority are working [...] workers who have higher education qualifications are more likely to be working in elemental professions [...] than those with vocational skills, who are able to find work in skilled trades.

Fitzgerald (2007) has noted that migrant workers in construction are increasingly compelled by construction employers or their agents to register as a self-employed person. Indeed, until the formal accession of these countries, many from Bulgaria and Romania were routinely issued such certificates as 'entrepreneurs.' In other words, the migrant worker unknowingly foregoes such benefits as holiday and sick pay entitlement, and employers' contribution to national insurance and the pension scheme.

4. Immigration and labour demand

A ready supply of highly skilled migrants from the A8 accession states is seemingly sustaining the industry's current productive capacity. It is important to understand routes to employment and the issues faced by migrant workers when they arrive in the UK. Fitzgerald (2007) examined the routes to entry for migrant workers in the construction and food processing industries in the North West and North East of England. He noted five routes, namely 'on spec' (for example, migrant workers arriving into the UK with no firm job offer), through family and friends, direct recruitment (for example, through companies directly recruiting from other countries), direct agency (recruitment through an agency, based either in the UK or overseas) and group recruitment (for example, where a group of companies pool resources to recruit from overseas). Interestingly, Fitzgerald (2007) observed that construction workers were moving from the North East to the North West, signifying secondary movements of migrant workers, an issue which remains relatively under-researched, although ConstructionSkills is undertaking some work in this area. The study of Terminal 5 found that each company had its own way of recruiting, mainly word-of-mouth for manual jobs, although the press and gangmasters were also used, and some companies

had their own agencies or agencies they worked with that were, for example, specialised in bringing in Germans carpenters, Polish groundworkers or Portuguese concretors (Clarke and Gribling 2008). Other firms, such as the bricklaying firm interviewed, relied on workers turning up on site, classifying about 50 percent of these as 'chancers,' that is those without the skills to do the work required and who were released directly this was apparent (Nuffield project 2008).

On Terminal 5 it was found that despite attempts to make agreements on pay harmonisation, many operatives, even those doing similar work and of the same age, skill and experience, were taken on at different rates (Clarke and Gribling 2008). A major problem was the lower wages received by East Europeans, 'multi-skilled' German workers, and workers of other origins. This reinforces Lucio et al.'s (2007) argument, that migrant workers' qualifications are not necessarily recognised and hence are not put to full use in the British workplace, prompting their call for recognition of qualifications to avoid unnecessary social exclusion of migrant workers (or any worker) from the labour market. ConstructionSkills is currently evaluating some foreign qualifications against UK national occupational standards (ConstructionSkills 2008). NARIC, the British-based National Agency responsible for providing equivalency and benchmarking services to improve understanding of overseas qualifications and skills, is also referred to by many British construction employers. However, recognition will be a requirement once the EQF and the ECVET are implemented.

A further problem concerning discriminatory recruitment and selection practices in the sector is the requirement, long outdated in many European countries, that workers in the recognised skilled trades provide their own tools. An example is given by Clarke and Herrmann (2007) of a carpentry subcontractor recruiting workers on the basis of their tool kits, valued as high as £3,500 each, including power tools, and thus creating a significant barrier to entry. Employment practices in construction in any case tend to be informal, with employers preferring to recruit through word-of-mouth and to promote from within the firm's internal labour, thereby paying little regard to strategic 'best practice' models of human resource management (Clarke and Herrmann 2007; Lockyer and Scholarios 2007). Furthermore, the long-term view of planning, deploying and developing human resources is claimed to be challenging, given the need for construction companies to deliver projects within a finite time frame and to make sufficient profits for survival (Raidén and Dainty 2006). Lockyer and Scholarios (2007) suggest that informal employment practices do not, in themselves, create the problem; in fact, there are numerous examples where such practices can be effective (Chan 2007). However, informal employment practices invariably result in a 'no-outsiders' mentality, thereby locking the industry in a somewhat homogenous state, as

evident in its dominant white-male make-up. In the main, 'word-of-mouth' practices rely heavily on existing known networks. Therefore, if employers (and workers as well) do not step out of their immediate circle of contacts, alternative sources of employment remain potentially opaque to the parties concerned.

5. Alternatives to immigration

5.1 Raising wages and improving employment conditions

Reward in the industry tends to be contingent on individual performance and this, coupled with the low-cost, low-quality employment patterns in many areas, renders the possibility of significant wage rate increases unlikely at present. Increasing wage rates could, however, have an impact on the attractiveness of working in the industry and therefore could alleviate skills shortages in the longer term. However, such an effect would take many years to come to fruition, and in any case, wage rate increases are impeded by the conditions which structure the labour market. Indeed, the use of migrant labour is an attempt to deflate wage rates and the additional costs associated with the direct employment of domestic workers, *inter alia*, Vocational and Education Training.

5.2 Changing production

Although the industry, and in particular the housebuilding industry, does not rely upon a high degree of technological sophistication (Clarke and Wall 1998), suggestions for substituting human inputs with technological innovations have been mooted by many industry commentators in recent years (Chan and Dainty 2007). This has been fuelled by influential reports such as Egan (1998) and Barker (2004), which emphasis the benefits of embracing new techniques and innovative technologies in a bid to improve productivity and performance in the construction and housing sectors respectively. However, there is little evidence that modern and innovative methods are having a great deal of purchase in the industry. For example, Goodier and Gibb (2005) suggest that the total value of the Offsite market in 2004 was around £2.2bn, over half of which was in non-volumetric pre-assembly rather than modular and portable buildings. This equates to just 2.1 percent of the total output of sector and tends to be focused on large industrial and commercial buildings. Callcutt (2007) has suggested that the reason for a lack of technological advancement,

particularly in the UK housebuilding industry, is because it takes time for modern methods to be tried and tested by industry actors (including designers, contractors and clients). It should also be noted that the size of the repair and refurbishment sector, which accounts for around half of the output of the sector, does not lend itself to the application of many innovative methods, and especially those involving off-site fabrication (Chan and Dainty 2007). New technologies also create their own skills requirements, some of which may be scarce within the labour market (Venables et al. 2004). Thus, despite the rhetorical claims as to the potential of technology substitution as an espoused panacea for the industry's skills needs, there is little evidence of this being the case. Moreover, given that much of the sector's productive activity takes place at the point of consumption (Bosch and Philips 2003), alternative strategies such as off-shoring appear largely irrelevant to the sector. There is perhaps more scope for off-shoring construction support services such as design, although no data could be found on the extent of such practices within the UK sector.

The re-structuring of the sector since the 1970s has led to a relatively low-skill, poorly equipped and labour-intensive development path, in particular in the building (including housebuilding) and civil engineering sectors (Bosch and Philips 2003). Many of the larger employers that previously invested in initiatives to improve productivity have effectively become 'hollowed-out' firms, with an attendant focus on management and coordination functions. The cumulative effects of this change have arguably undermined the industry's capacity to translate research into innovation (Gann 2001). Given the institutionally embedded nature of the sector's development path over the last 30 years, assumptions that skills requirements will be offset through technological developments seem, therefore flawed in the short-to-medium term.

5.3 Policy changes needed

The complexity of supply relations does little to clarify such issues as employer liability, and serves to promote unequal treatment between various segments of workers. Currently, there are debates surrounding a number of legislative mechanisms that could potentially result in greater regulation of the construction labour market. For example, a long discussed measure at the European level is the question of establishing main contractor liability. This would certainly help to remove the tendency for migrant workers to be exploited lower down the chain of subcontracting and, by making the main contractor ultimately responsible for all employees on-site, would make employment more transparent and deter illegal practices. One way to achieve this has been recently introduced into the Spanish construction industry.

In this case, regulation is now in place to control supply relations and curtail the extent of subcontracting by restricting it to three tiers (Ministerio de Trabajo y Asuntos Sociales España (MTAS) 2006). Another measure being espoused by the trade unions is for an extension of the Gangmaster Licensing Act to the construction sector in order to prevent the worst abuses of employment by gangmasters. Finally, implementation of the Posted Workers Directive to ensure the principle of host country conditions on the basis of collective agreements and not just the minimum wage would also help to establish more equal pay and conditions in the sector for all construction workers, including migrants. Although a range of alternatives to non-EEA labour are available to the industry for addressing current skills concerns, when they are considered within the context of the fractured and deregulated labour market, none offer long-term solutions to mitigating the problems that casual and contingent employment, and in particular 'bogus' self-employment, have created.

The review of the literature surrounding migration in the construction sector reveals evidence of a discord between the policy decisions made in relation to improving the construction skills base and the practicable impact that this is having on skills provision within the sector. Years of under-investment in VET, itself fuelled by lack of regulation of the industry's labour market, has left an ingrained legacy of a reliance on contingent, self-employed and undeclared labour. Normative labour market and taxation policies and quasi-regulatory attempts to control the industry's employment and training practices have seemingly done little to safeguard the long-term sustainability of skills provision (Dainty et al. 2005b). The available evidence points to a sector already dangerously exposed to any reverse in the inflow of migrant workers from the accession states. Given heightened construction activity in Poland, for instance, there is already evidence of workers returning (CLR-News 2007). As workers from the A8 countries acquire the right to go to other EU Member States, and at the same time the A8 states themselves grow economically, it is likely to lead to a reduction in emigration from these countries.

6. Conclusions: Expert assessment of optimal responses to staff shortages

Given the context of the industry however, using migrant labour as a short-term fix may simply reinforce and justify employers' apparent reluctance to invest in the training and development necessary for alleviating the industry's ingrained skills gaps. Ultimately, a revised VET system is required which recognises and addresses the structural factors outlined in this paper. Managed migration should form a component aspect of such a strategy, with migrant workers themselves benefiting from a renewed emphasis on training

and development within the sector. However, without such a policy shift, migration could obscure the true extent of skills requirements while providing a disincentive for domestic workers to acquire new skills.

Years of deregulation, privatisation and taxation policy have shifted direct employment for wages into large-scale self-employment, undermined managerial control and enforced low-skill, low-wage strategies upon the sector (Harvey 2003; Clarke 2006). This, in turn, has increased the informality of the labour market, extended the use of undeclared labour and further undermined training and skills development within the sector (CLR-News 2007). The result is that it is impossible to gain an accurate picture of the size of the industry's labour market, where and how people are employed, and the extent of skills availability. The situation with regards to understanding the role and importance of non-EEA migrant workers is a case in point; without better data it is difficult to speculate as to the appropriateness of current migration policy with respect to meeting the industry's skills needs.

The construction industry is one of the most highly criticised with regards to its employment practices and industrial relations climate. Underlying this criticism is a fundamental tension; too often construction relies upon informal and casualised employment practices which provide low barriers to entry for those wanting to work within the sector. Yet it also maintains an ingrained exclusionary culture which militates against the entry of those who cannot conform to its norms and stereotypes (Dainty et al. 2007a). As the industry employs an increasingly diverse range of migrant workers it will become increasingly important for employers to facilitate their integration. In the short term, effective ways of integrating migrant workers into the workforce must therefore be found. Implementation of the Posted Workers Directive according to the terms and conditions laid down in collective agreements would provide one important means to such integration, as would statutory recognition of agreements. Another is the implementation of the Agency Workers Directive, requiring equal treatment for those employed through agencies, many of whom are migrants, and third is the extension of the Gangmasters Licensing Act.

Unequal treatment and discrimination against different groups of workers lie at the heart of the problems of social relations of production in the industry. Effective implementation of equal treatment legislation would not only improve the participation and position of women and BAME groups and help to break down the exclusivity of the sector, but also would facilitate the integration of migrant workers. Currently the industry relies on informal practices and procedures, for instance in terms of the recruitment and selection of workers, which favours the appointment of 'likes', is relatively indifferent to qualifications and which

instead prioritizes experience (Beck et al. 2003). Requiring formal and transparent recruitment and selection procedures for different groups of workers, whether women, those from BAME groups, or migrants would give greater weight to more objective selection criteria such as qualifications and VET. Equal treatment of all groups would also help to prevent the inequalities in pay and conditions which currently exist, with migrant workers undertaking similar work to non-migrants but paid at different, even at labourers' rates. One key problem to be addressed in this respect is that construction workers are at a higher risk of accidents than in any other industry in the UK (Greater London Authority 2007). Despite a decline in the numbers of fatalities in UK construction for the past several years, in 2007 there was a 28 percent rise in construction fatalities on-site, up from 60 percent to 77 percent (Mathiason and Mead 2008), which some commentators have attributed to the large numbers of migrant workers who have hitherto been using less safe working procedures (Owen 2007). While there is no empirical evidence that this is the case, ensuring the safety, health and welfare of migrant workers is a key priority in the short-term.

While migrant labour has been effective in filling some skills 'gaps,' given the construction industry's propensity to employ undeclared labour, the regulatory implications for the industry are of crucial importance in the longer term. On larger sites, illegal working has been mostly associated with migrant workers (Gribling and Clarke 2006). Thus, merely responding to employer demand for non-EEA labour by relaxing immigration controls would represent a short-term fix to a deeply ingrained problem within the UK construction sector. Informing migrant construction workers of their rights and construction employers of their responsibilities is one short-term measure to combat the use of undeclared labour. Another response would be to establish main contractor liability and restrict the subcontracting chain, which would also help ensure the availability of statistics on all those employed on-site according to gender and ethnicity. In the longer term, the deregulation which has dogged the industry for decades must be addressed through 'joined-up' VET and skills policy measures, of which the management of migration should be a component part.

In light of the evidence-base presented within this paper, the optimal longer-term response would therefore be to develop an improved and comprehensive VET system, supported with measures to better manage the integration of migrant workers into the sector. These measures would need to be supported with tighter regulation of the labour market and would have the potential both to secure the productive capacity of the industry and to ensure a more robust skills infrastructure for the future. The importance of training as an alternative to migrant labour cannot be overstated. A structured long-term VET policy meeting the needs of both the demand and supply sides is the only sustainable solution to coping with the

variability of the production-process (Arkani et al. 2003). It is also a policy which may be increasingly forced on the government as VET gradually ceases to be an area of no competence with respect to European policy-making. As evident from this report, British policy with regard to the construction industry currently effectively relies on 'poaching' labour trained and educated at considerable expense elsewhere, in particular in East European and formerly socialist countries. This constitutes a form of social dumping, which is in the long term unsustainable, especially as East European workers return to their countries of origin. With the implementation of the EQF and ECVET, the disparity between skill levels in construction in Britain and other countries will increasingly become transparent, including through European Commission implementation projects for the construction industry, for instance in the area of bricklaying (Clarke and Winch 2006).

In the immediate short term, specific measures can be taken with respect to training and inclusion. These include the channelling of funds to encourage employers to take on more trainees and to change the current funding regime, which does little to encourage upskilling and career development, as full funding is only secured at NVQ level 2. Assessment of unemployment benefits could also be improved so that they are not automatically deducted from unemployed persons seeking employment opportunities with participant construction firms, thereby empowering individuals to move out of unemployment, as was achieved in the CEI initiative in the North East, which worked closely with the local JobcentrePlus and Department of Work and Pensions.

It has been shown in other European countries that, managed effectively, migrant workers can be a force for positive change. For example, Pereira (2007) reveals that in Switzerland, working with migrants has strengthened the union's role as a representative of all workers and has led to considerable improvements in terms of the knowledge, expertise and know-how of workers. In this respect, the fact that many migrants are well educated, with transferable skills, and now with considerable experience in the industry is likely to be critical to improving the skills basis and establishing an effective VET programme.

References

- Anderson, B. and B. Rogaly. 2005. "Forced Labour and Migration to the UK." Oxford: COMPAS with the Trades Union Congress. Accessed at: <http://www.tuc.org.uk/international/tuc-9317-f0.pdf>
- Anderson, B., M. Ruhs, B. Rogaly and S. Spencer. 2006. "Fair Enough? Central and East European migrants in low-wage employment in the UK." York: Joseph Rowntree Foundation. Accessed at: <http://www.jrf.org.uk/bookshop/eBooks/1617-migrants-low-wage-employment.pdf>
- Arkani, S., L. Clarke and E. Michielsens. 2003. "Regulation for Survival: training and skills in the construction labour market in Jersey, Channel Islands." *Journal of Vocational Education and Training* 55(3): 261-280.
- Balch, A., I. Fellini, A. Ferro, G. Fullin and U. Hunger. 2004. "The political economy of labour migration in the European construction sector." In *Organisational recruitment and patterns of migration*, eds. M. Bommers, K. Hoesch, U. Hunger and H. Kolb. Osnabrück, Germany: Institut für Migrationsforschung und Interkulturelle Studien (IMIS) and Universität Osnabrück.
- Barker, K. 2004. "The Barker Review of Housing Supply." London: HM Treasury.
- Beaney, W. D. 2006. "An exploration of sectoral mobility in the UK labour force: a principle components analysis." Newcastle: Newcastle Business School, Northumbria University. Unpublished M.Sc. thesis.
- Beaney, W. D. 2007. "A principal components analysis of labour sectoral transfers." In *23rd Annual ARCOM Conference, 3-5 September 2007, Belfast, UK. Volume 1*, ed. D. Boyd. Belfast: Association of Researchers in Construction Management: 233-242.
- Beck V., L. Clarke and E. Michielsens. 2003. "National Report UK: Overcoming marginalisation: obstacles to inclusion in strongly segregated sectors. Final report to the European Commission, TESR 5 programme.

- Blackman, B. 2007. "Regulating the situation for migrants in the British construction industry." CLR-News 4(2007), European Institute for Construction Labour Research.
- Border and Immigration Agency 2008. Accession monitoring report: May 2004 – Dec 2007. London, The Home Office. Accessed at: http://www.ukba.homeoffice.gov.uk/sitecontent/documents/aboutus/reports/accession_monitoring_report/report14/may04dec07.pdf on 5 May 2008.
- Bosch, G. and P. Philips. 2003. Building Chaos: An international comparison of deregulation in the construction industry. London: Routledge.
- Bresnen, M.J., A. Goussevskaia and J. Swan. 2004. "Embedding New Management Knowledge in Project-Based Organizations." *Organization Studies* 25(9): 1535-1555.
- Briscoe, G. 2004. "Human Capital. Paper presented to the CRISP Colloquium, 'The Social and Economic Value of Construction.'" London: Davis Langdon.
- Briscoe G. 2005. "Women and minority groups in UK construction: Recent trends." *Construction Management and Economics* 23(10): 1001-05.
- Briscoe, G. 2006. "How useful and reliable are construction statistics?" *Building research and information*. 34(3): 220-229.
- Brockmann, M. L. Clarke and C. Winch. 2008. "Knowledge, Skills, Competence: European divergences in vocational education and training – the English, German and Dutch cases." *Oxford Review of Education* 34(5).
- Byrne J., L. Clarke and M van der Meer. 2005. "Gender and ethnic minority exclusion from skilled occupations in construction: A Western European comparison." *Construction Management and Economics* 23(10): 1025-34.
- Bernard Williams Associates. 2006. "Benchmarking of use of Construction (Costs) Resources in the Member States, Final Report." Bernard Williams Associates.
- Callcutt, J. 2007. "The Callcutt Review of Housebuilding Delivery." London: Department of Communities and Local Government.

- Callender, C. 1997. "Will NVQs work? Evidence from the construction industry. Report by the Institute of Manpower Studies (IMS) for the Employment Department Group."
- Campbell, F. 2006. "Skills Shortages in the UK Construction Industry: Survey 2006." Ascot: Chartered Institute of Building.
- Chan, P. 2007. "Managing human resources without Human Resources Management Departments: some exploratory findings on a construction project." In Proceedings of the CME25: Construction Management and Economics: Past, present and future. 16-18 July 2007, ed. W. Hughes. Reading: University of Reading.
- Chan, P. and M. Connolly. 2006. "Combating skills shortages: examining careers advice in schools." *Construction Information Quarterly* 8(3): 131-137.
- Chan, P. and R. Cooper. 2006. "Talent management in construction project organisations: do you know where your experts are?" *Construction Information Quarterly* 8(1): 12-18.
- Chan, P.W. and A.R.J. Dainty. 2007. "Resolving the UK construction skills crisis: a critical perspective on the research and policy agenda." *Construction Management and Economics* 25(4): 375-386.
- Chan, P. W. and R. Moehler. 2007. "Developing a 'road-map' to facilitate employers' role in engaging with the skills development agenda." In 23rd Annual ARCOM Conference, 3-5 September 2007, Belfast, UK. Vol. 1, ed. D. Boyd. Belfast: Association of Researchers in Construction Management: 409-18.
- Cherns, A. B. and D.T. Bryant. 1984. "Studying the client's role in construction." *Construction Management and Economics*, 2: 177-84.
- Clarke, L. 2006. "Valuing Labour." *Building Research and Information* 34(3): 246-256.
- Clarke, L. and M. Gribling. Forthcoming 2008. "Obstacles to diversity in construction: the example of Heathrow Terminal 5." *Construction Management and Economics*

- Clarke, L. and G. Herrmann. 2004a. "The Institutionalisation of the Skills in Britain and Germany: examples from the construction sector." In *Skills that Matter*, eds. C. Warhurst and I. Grugulis. Basingstoke: Palgrave Macmillan.
- Clarke, L. and G. Herrmann. 2004b. "Cost versus production: labour deployment and productivity in social housing construction in England, Scotland, Denmark and Germany." *Construction Management and Economics* 22: 1057-1066.
- Clarke, L. and G. Herrmann. 2007a. "Divergent Divisions of Labour." In *People and Culture in Construction*, ed. A. Dainty. London: Taylor and Francis.
- Clarke, L. and G. Herrmann, 2007b. "Skills shortages, recruitment and retention in the house building sector." *Personnel review* 36(4): 509-527.
- Clarke, L. C. 1996. "Skills and the Construction Process: a comparative study of vocational training and quality in social housebuilding." Bristol: Policy Press in association with Joseph Rowntree Foundation.
- Clarke, L. and C. Wall. 1998. "A blueprint for change: construction skills training in Britain." Bristol: Policy Press.
- Clarke, L. and C. Winch. 2004. "Apprenticeship and applied theoretical knowledge." *Educational Philosophy and Theory* 36(5): 509-21.
- Clarke, L. and C. Winch. 2006. "A European skills framework? - but what are skills? Anglo-Saxon versus German concepts." *Journal of Education and Work* 19(3): 255-269.
- CLR-News. 2007. "Labour Migration, No. 4." European Institute for Construction Labour Research.
- Comptroller and Auditor General. 2001. "Modernising Construction: Report by the Comptroller and Auditor General." London: National Audit Office. Accessed on 10 May 2008 at: http://www.nao.org.uk/publications/nao_reports/00-01/000187.pdf
- Construction Industry Joint Council. 2005. "Working Rule Agreement." London, Construction Industry Joint Council.

- Construction Industry Training Board. 2004. "Skills Foresight Report 2004." Bircham Newton: Construction Industry Training Board.
- Construction Industry Training Board and ConstructionSkills. 2005. "Trainee Numbers Survey." Bircham Newton.
- ConstructionSkills. 2008a. "Blueprint for UK construction skills 2008 to 2012." Kings Lynn: ConstructionSkills.
- ConstructionSkills. 2008b. "Sector Skills Agreement: Our Challenges." Accessed April 2008 at:
<http://www.constructionskills.net/sectorskillsagreement/ourchallenges/qualifyingtheworkforce/integratingmigrantlabourtobridgeskillgaps/index.asp?subpage=theidea>
- Cremers, J and J. Janssen. 2006. Shifting employment: Undeclared labour in construction. Rotterdam: Antenna.
- Dainty, A.R.J., B.M. Bagilhole and R.H. Neale. 2000. "A grounded theory of women's career under-achievement in large UK construction companies." *Construction Management and Economics* 18: 239-250.
- Dainty, A.R.J. and B.M. Bagilhole. 2005. "Equality and diversity in construction: guest editorial." *Construction Management and Economics* 23(10): 995-1000.
- Dainty, A.R.J, S.G. Ison and Root, D. 2005a. "Averting the Construction Skills Crisis: A Regional Approach." *Local Economy* 20(1): 79-89.
- Dainty, A.R.J., S.G. Ison and G.H. Briscoe. 2005b. The construction labour market crisis: the perspective of small-medium sized firms. *Construction Management and Economics* 23: 387-98.
- Dainty, A. S. Green and B. Bagihole. 2007a. *People and Culture in Construction: A Reader*. Oxford: Taylor and Francis: 26-38.
- Dainty, A.R.J. and A.G. Gibb and P.B. Bust and C.I. Goodier. 2007b. "Health and safety of migrant workers in the South East." London: Institution of Civil Engineers.

- Davies, J.C., G.C. Kemp and S.P. Frostick. 2007. "An investigation of reporting of workplace accidents under RIDDOR using the Merseyside Accident Information Model, RR528." Health and Safety Executive.
- Dench, S., J. Hurstfield, D.Hill and K. Akroyd 2006. "Employers' use of migrant labour: summary report. Report undertaken for the Home Office by the Institute of Employment Studies." London, The Stationary Office.
- Department for Business, Enterprise and Regulatory Reform (BERR). 2007. "Construction Statistics Annual 2007." London: Department for Business, Enterprise and Regulatory Reform.
- Department for Trade and Industry (2006). Employment market analysis and research. March. London: Department for Trade and Industry.
- Egan, J. 1998. Rethinking Construction. London: The Department of Trade and Industry.
- Farlie, V. 2004. "Are apprenticeships any longer a credible vocational route for young people, and can the supply side respond effectively to government policy, and address the needs of learners and employers?" The Nuffield Foundation. Nuffield Review of 14–19 Education and Training. Working Paper 28. Accessed at: <http://www.nuffield14-19review.org.uk/files/documents52-1.pdf>.
- Fielden, S.L., M.L. Davidson, A.W. Gale and C. Davey. 2000. "Women in construction: the untapped resource." Construction Management and Economics 18: 113-121.
- Fitzgerald, I. 2006. "Organising migrant workers in construction: experience from the North East of England." Newcastle: Trade Unions Congress North.
- Fitzgerald, I. 2007. "Working in the UK: Polish migrant worker routes into employment in the North East and North West construction and food processing sectors." London: Trades Union Congress.
- Forde, C. and R. MacKenzie. 2004. "Cementing skills: training and labour use in UK construction." Human Resource Management Journal. 14(3): 74-88.

- Forde, C. and R. MacKenzie. 2007. "Getting the mix right? The use of labour contract alternatives in UK construction." *Personnel review* 36(4): 549-563.
- Further Education Funding Council. 2001. "Construction in Further Education: National Report from the Inspectorate 2000-1." London: Further Education Funding Council.
- Gann, D. 2001. "Putting academic ideas into practice: technological progress and the absorptive capacity of construction organisations." *Construction Management and Economics* 19: 321-330.
- Goodier, C.I. and A.G. Gibb. 2005. "The value of the UK market for Offsite. A Report for BuildOffsite." London: Loughborough University: 13.
- Greater London Authority. 2007. "The Construction Industry in London and Diversity Performance." London: Greater London Authority.
- Green, A., D. Owen and R. Wilson. 2005. "Changing patterns of employment by ethnic group and for migrant workers. Report prepared for the Learning and Skills Council by Warwick Institute for Employment Research." Coventry: Learning and Skills Council.
- Green, A.E., P. Jones and D. Owen. 2007a. "Migrant workers in the East Midlands Labour Market." Coventry: Warwick Institute for Employment Research, University of Warwick.
- Green, A.E., D. Owen and P. Jones. 2007b. "The economic impact of migrant workers in the West Midlands." Coventry, Institute for Employment Research, University of Warwick.
- Gribling, M. and L. Clarke. 2006. "Undeclared Labour in the Construction Industry: Country Report Great Britain." European Institute for Construction Labour Research.
- Grugulis, I. 2007. *Skills, Training and Human Resource Development: Critical Text*. Basingstoke: Palgrave Macmillan.
- Harvey, M. 2001. "Undermining construction: the corrosive effects of false self-employment." London: The Institute of Employment Rights.

- Harvey, M. 2003. "The United Kingdom: Privatization, fragmentation, and inflexible flexibilisation in the UK Construction Industry." In *Building Chaos: An international comparison of deregulation in the construction industry*, eds. G. Bosch and P. Philips. London: Routledge: 188-209.
- Health and Safety Executive. 2008. "Work-related injuries and ill health in construction." Accessed at: www.hse.gov.uk/statisticsreston.
- Institute for Employment Research. 2006. "LMI future trends: Construction." Coventry: Warwick Institute for Employment Research, University of Warwick. Accessed on 5 May 2008 at: <http://www.guidance-research.org>.
- IFF Research Ltd. 2003. "The effect of employment status on investment in training." London: Construction Industry Training Board (CITB)-ConstructionSkills and Department for Education and Skills (DfES).
- Ive, G., S. Gruneberg, J. Meikle and D. Crosthwaite. 2004. "Measuring the competitiveness of the UK construction industry: Volume 1." London: The Stationary Office.
- Lillie, N. and I. Greer. 2007. "Industrial Relations, Migration, and Neoliberal Politics: The Case of the European Construction Sector." *Politics and Society* 35(4): 551-581.
- Lobo, Y.B. and S. Wilkinson. 2007. "New approaches to solving the skills shortage in the New Zealand Construction industry." *Engineering, Construction and Architectural Management*, 15(1): 42-53.
- Lockyer, C. and D. Scholarios. 2007. "The "rain dance" of selection in construction: rationality as ritual and the logic of informality." *Personnel Review*, 36(4): 528-548.
- Lucio, M. M., R. Perrett, J. McBride and S. Craig. 2007. "Migrant workers in the labour market: the role of unions in the recognition of skills and qualifications. Research paper number 7." London: Trades Union Congress.
- Mayhew, K. 2003. "The UK skills and productivity gap. Talk given to the Council for Industry and Higher Education/Advanced Institute of Management Research Colloquia (CHIE/AIM colloquia)." London, 30 October 2003.

- McKay, S., M. Craw and D. Chopra. 2006. "Migrant workers in England and Wales: an assessment of migrant worker health and safety risks. Report for Health and Safety Executive (HSE)." London: Working Lives Research Institute, London Metropolitan University.
- Mackenzie, A., A.R. Kilpatrick and A. Akintoye. 2000. "UK construction skills shortage response strategies and an analysis of industry perceptions." *Construction Management and Economics* 18(7): 853-862.
- Marsden D. 1999. *Theory of Employment Systems: Microfoundations of Societal Diversity*. Oxford : Oxford University Press.
- Mathiason, N. and K. Mead (2008). "A high cost in builders' lives." In *The Observer*, London. Accessed at:
<http://www.guardian.co.uk/business/2008/may/11/construction.tradeunions1>).
- Ministerio de Trabajo y Asuntos Sociales España (MTAS). 2006. "Ley 32/2006 reguladora de la subcontratación en el Sector de la Construcción. " Madrid: Ministerio de Trabajo y Asuntos Sociales España. Accessed at:
<http://www.mtas.es/Insht/Legislation/L/L32subcont.htm> on 24 March 2008.
- Murdoch, I. 2008. "NSCC State of trade report 2008: Quarter 1." Newcastle upon Tyne: Northumbria University.
- Nuffield Project (2008) "Cross-national Equivalence of Vocational Skills and Qualifications: case study Bricklaying in England", Kings College London, unpublished research report.
- Office of National Statistics. 2005. "Labour Force Survey." London: Office of National Statistics.
- Owen, E. 2007. "Shock rise in site deaths down to language barrier." *New Civil Engineer* 22 March 2007: 11.
- Pearce, D. 2003. "The social and economic value of construction: the construction industry's contribution to sustainable development." London, nCRISP [the UK Construction Industry Research and Innovation Strategy Panel].

- Pereira, M. 2007. "Supporting migrants in Switzerland: The role of trade unions." CLR-News: Labour Migration 4(2007): 43-49.
- Pollard, N., M. Latorre and D. Sriskandarajah. 2008. "Floodgate or turnstiles? Post-EU enlargement migration flows to (and from) the UK." London: Institute of Public Policy Research (IPPR).
- Post, J. 2007. "Auditing wage and tax payments of migrants in the UK." In CLR-News on labour migration, ed. J. Cremers. Brussels: European Institute for Construction Labour Research: 4(2007): 25-28.
- Powell, A., B.M. Bagilhole and A.R.J. Dainty. 2004. "The problem of women's assimilation into UK engineering cultures: Can critical mass work?" Equal Opportunities International 25(8): 688-699.
- Raidén, A. B. and A.R.J. Dainty. 2006. "Human resource development in construction organisations: an example of a "chaordic" learning organisation?" The Learning Organisation 13(1): 63-79.
- Richter A. 1998. "Qualifications in the German construction industry: stocks, flows and comparisons with the British construction sector." Construction Management and Economics 16(5): 581-592.
- Royal Holloway. 2002. "Retention and career progression of Black and Asian people in the construction industry. EMI Research Report No. 15, prepared for the Construction Industry Training Board (CITB)." London: University of London.
- Smithers, A. 1993. "The contribution of NVQs to the growth of skills in the UK." British Journal of Industrial Relations 41(3): 457-475.
- Stasz, C. 2001. "Assessing skills for work: two perspectives." Oxford Economic Papers 3: 385-405.
- Steedman H. 1992. "Mathematics in vocational youth training for the building trades in Britain, France and Germany. National Institute of Economic and Social Research (NIESR) NIESR Discussion Paper, No. 9." London.

Stewart, D. 2007a. "False self-employment costs £2.5bn a year." Building 19 March, London.

Stewart, D. 2007b. "Third of Eastern European Migrants work in Construction." Building Magazine, London.

Venables, T., J. Barlow and D. Gann. 2004. "Manufacturing Excellence - UK Offsite Capacity." London: Innovation Studies Centre, Imperial College: 62.

Warwick Institute of Employment Research. 2006. Coventry: University of Warwick.

Watson D., S. Johnson and R. Webb. 2006. "Employer perceptions of skills deficiencies in the UK labour market: a subregional analysis." Environment and Planning A 38(9): 1753-1771.

Occupational Group	National	First Year Entrant Figures 2006 - 2007	Scotland	North East	North West	Yorkshire and Humber	East Midlands	West Midlands	Wales	East of England	Greater London	South East	South West	Northern Ireland
Senior & Executive Managers	190		<50	<50	<50	<50	<50	<50	<50	<50	60	70	<50	<50
Business Process Managers	2770		150	70	160	200	140	220	160	420	610	400	140	100
Construction Managers	6350		330	170	570	560	350	480	130	910	1090	1320	320	120
Office-based Staff (excl. Managers)	6420		300	120	590	530	330	340	360	1010	920	1260	390	270
Other Professionals/Technical Staff & IT	790	4864	<50	<50	70	100	50	100	240	<50	<50	90	<50	<50
Wood Trades & Interior Fit-out	12860	14126	1360	370	1120	970	820	800	800	1290	2060	1750	800	720
Bricklayers and Building Envelope Specialists	10670	9083	710	430	1270	620	550	610	290	1330	1790	1460	1010	600
Painters & Decorators	4490	3362	370	170	410	350	170	400	190	730	830	460	330	80
Plasterers & Dry Liners	1570	2037	70	50	220	100	90	60	70	270	220	280	70	70
Roofers	2020	553	200	80	150	160	80	240	50	350	300	160	160	90
Floorers	840	377	<50	<50	70	<50	<50	60	130	70	170	120	50	<50
Glaziers	1110	10	50	<50	140	70	<50	100	50	170	100	280	70	<50
Specialist Building Operatives nec	2210	605	170	80	90	150	130	210	140	360	240	400	170	70
Scaffolders	1200	925	160	80	80	170	<50	90	90	90	170	140	90	<50
Plant Operatives	1570	2899	180	90	70	90	70	50	230	280	160	130	130	90
Plant Mechanics/Fitters	940	331	70	80	200	<50	60	<50	120	110	<50	190	<50	<50
Steel Erectors/Structural	1000	5	110	<50	100	70	<50	50	130	80	170	90	<50	90
Labourers nec	1940		180	80	140	220	90	120	250	250	420	<50	160	<50
Electrical Trades & Installation	9960		620	380	950	770	600	790	240	1640	1610	1600	530	230
Plumbing & HVAC Trades	4690		260	150	390	440	230	370	250	590	830	710	300	170
Logistics	650		50	<50	60	<50	<50	<50	150	130	80	50	<50	<50
Civil Engineering Operatives nec	2040	1187	210	100	200	160	90	180	170	270	170	350	140	<50
Non-construction Operatives														
Maintenance Operatives		46												
Total (SIC 45)	76280	40410	5570	2650	7070	5810	4060	5330	4250	10430	12050	11310	4910	2840
Construction Professionals & Technical Staff	12110		750	420	1800	810	470	860	500	580	2880	1830	1070	140
Total (SIC 45 & 74.2)	88390		6320	3070	8870	6620	4530	6190	4750	11010	14930	13140	5980	2980

Table 1. Average annual employment requirement forecasts 2008-2012 (nationally and by regions) against first year entrant figures 2006-2007 (Source: ConstructionSkills 2008; and Department for Business, Enterprise and Regulatory Reform (2007): 149.

