



Department
for Business
Innovation & Skills

UK CONSTRUCTION

An economic analysis of the
sector

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Foreword

In September 2012, BIS Secretary of State Vince Cable announced a review of key strategic sectors to the UK's growth and competitiveness. Construction is one of them. Historically, the UK construction sector has been a vital sector for the UK economy and a key driver of growth. In spite of the challenges the sector has recently faced, construction continues to be one of the largest UK sectors and a key source of the UK's value added and employment.

The global construction market is, however, facing major transformation as businesses continue to respond to the challenges of the economic crisis since 2008, begin to shift to green and sustainable construction, and seek to take advantage of the opportunities provided by the digital economy. The competitiveness and readiness of the UK construction sector will be crucial if the UK is to take advantage of these opportunities.

This paper reviews the latest evidence in order to inform the Industrial Strategy for Construction and provide insights on key drivers and barriers to UK growth in construction. It draws on two new pieces of research that were commissioned by BIS specifically to inform the strategy, notably: a study on Trade Credit in the UK construction industry by Graham Ive and Alex Murray from the University College London, and a Supply Chain Analysis into the UK construction sector by EC Harris.

I am grateful to the researchers and analysts who contributed to this work and for the insights they have provided which support policy development in this key sector.



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Executive Summary

Construction overview

The construction sector is a key sector for the UK economy. For the purpose of this publication, the construction sector is defined as: **(i)** construction contracting industry; **(ii)** provision of construction related professional services; and **(iii)** construction related products and materials¹.

Construction is one of the largest sectors of the UK economy. It contributes almost £90 billion to the UK economy (or 6.7%)² in value added, comprises over 280,000 businesses³ covering some 2.93 million jobs⁴, which is equivalent to about 10% of total UK employment.

The construction sector has been affected disproportionately since the recession of 2008. In 2007 the construction sector accounted for 8.9% of the UK's GVA but by 2011 the sector contribution had decreased to 6.7%. In early 2012, the construction contracting industry returned to recession for the third time in 5 years.

Despite recent economic and financial crisis which affected most developed economies, the UK construction contracting industry remains one of the largest in Europe, measured by employment, number of enterprises, and gross value added⁵. However, UK construction industry is also more fragmented than its major European competitors and the evidence shows it has higher levels of sub-contracting⁶.

UK construction in the global economy

Over the medium term a number of overarching factors are likely to affect demand for construction. These include: globalisation, demographic changes, demand for green and sustainable construction, both in the UK and abroad, increasing importance of technology in construction and growing demand from emerging economies such as China and Brazil.

¹ The definition excludes distribution and sales of construction products.

² Source: ONS Annual Business Survey (ABS), 2011 provisional results. Data is for **(i)** construction contracting industry; **(ii)** provision of construction related professional services; and **(iii)** construction related products and materials. See Annex for information on SIC codes used.

The ABS is preferred as it is the only source with sufficient detail to allow for the calculation of GVA for the wider construction sector, and for comparison of wider construction with other industries. It should be noted that the ONS National Accounts (2011) gives GVA for construction contracting alone as £90 billion as it makes adjustment for output unrecorded by the ABS; a figure for wider construction cannot be calculated from National Accounts, but it is likely to be higher.

³ Ibid.

⁴ Source: BIS analysis of ONS Labour Force Survey data, non-seasonally adjusted; January – March 2013. Data is for wider construction sector as per definition in the opening paragraph.

⁵ Source: UKCES (2012) *Sector Skills Insights: Construction*

⁶ See for example CIB Publication No. 293: The Construction Sector System Approach: An International Framework and HM Treasury (December 2010) *Infrastructure Cost Review: Technical Report*

The UK is in a good position to take advantage of global market opportunities in construction. This stems from UK's high reputation for construction services such as architecture and development of advanced technologies used in construction such as Building Information Modelling (BIM). The UK also has a relatively higher proportion of patents related to construction in comparison to an average of G7 and BRIC countries⁷.

However, despite the UK's technological capability, the picture on construction exports is mixed across its sub-sectors. UK exports in construction contracting have been growing steadily to give a trade surplus of about £590 million in 2011. The UK is also strong in exports of architecture and quantity surveying services, with a trade surplus of about £530 million in 2011⁸. On the other hand, the UK's trade performance in construction related products is less positive with a trade deficit of about £6.2 billion in 2012⁹.

Evidence shows that a relatively small proportion of UK construction contracting firms are exporters comparing to other sectors. In 2012, about 6% of construction contracting SMEs were exporting¹⁰. Of those contracting SMEs that are non-exporters, about two thirds said that they did not have a product or a service suitable for exporting and a quarter said that exporting was not part of their business plan. Construction businesses may not be fully aware of potential benefits of exporting and lack the necessary knowledge or management skills to successfully exploit overseas markets. UK construction companies tend to be smaller and collaborate less in comparison to many European countries which may make accessing foreign markets more difficult.

Drivers of long-term growth

While accessing foreign markets and increasing export activity is one driver of growth, there are a number of other factors which, if deployed adequately and efficiently, can affect growth and drive competitiveness of the UK construction sector. These are summarised below.

People and skills

Global and domestic opportunities in construction mean that a skilled and flexible workforce will be vital to the UK construction sector's future performance and competitiveness. Evidence on qualifications is positive, showing increasing proportions of individuals with higher level qualifications. However, there has been a substantial fall in apprenticeship completions in construction related industries in the last three years while completions in other sectors have continued to grow. Moreover, about one fifth of all vacancies in the wider construction sector are persistent and hard to fill because employers cannot recruit staff with the right skills, qualifications or experience¹¹. A lower proportion of firms in construction provide training and have established training plans than in other sectors on average. Training among self-employed is also low.

⁷ Source: European Patent Office EPODOC patent data

⁸ Source: ONS Pink Book (2012)

⁹ Source: BIS Monthly Bulletin of Building Materials and Components; February 2013 release

¹⁰ Source: BIS Small Business Survey (2012)

¹¹ Source: UKCES (2012) *UK Employer Skills Survey*

Access to finance

The ability of construction sector companies to access the right type of finance is vital for them to operate and grow. The evidence shows that construction contracting SMEs face more difficulties than other SMEs in accessing finance from banks. This is partly because construction businesses are considered to be of higher risk due to low levels of fixed capital and smaller firm size. Late payment is a particular problem for construction businesses, and construction contracting SMEs rely on trade credit to smooth cash flow during the period between doing the work and receiving payment. Moreover, construction contracting SMEs are often unaware of finance initiatives and existing government support programmes available to them.

Innovation capability

Innovation is essential for firms' competitiveness, survival and growth. It can drive competitive advantage, improve productivity and enable companies to capture higher value components of the value chain. The construction contracting industry in particular is perceived to have low levels of innovation, measured by R&D, compared with other sectors. Although expenditure on wider innovation such as design and organisational innovation is between two to three times larger than industry's expenditure on tangible assets such as machinery and tools (£7.42 billion versus £3.15 billion in 2007)¹², the proportion of firms innovating still ranks low relative to other sectors¹³.

A literature review points to several reasons for the apparent low levels of innovation in construction: **(i)** high level of industry fragmentation and limited collaboration; **(ii)** procurement impacting on the level of collaboration; **(iii)** sub-optimal knowledge transfer and lost learning points; **(iv)** issues around market uptake and awareness of benefits from innovation; and **(v)** access to finance and risk-averse attitude to innovation.

Supply chain development

The construction industry has a large supply chain, almost all of which is sourced within the UK. It is estimated that for every £1 spent in construction at least 90% stays in the UK¹⁴. The sector is characterised by high levels of fragmentation. Analysis carried out for BIS by EC Harris (2013)¹⁵ has shown that for a 'typical' large building project – that is, in the £20 - £25 million range - the main contractor may be directly managing around 70 sub-contracts of which a large proportion are small – £50,000 or less. For a regional project, the subcontract size may be even smaller.

The emerging findings from the same study identified a number of crucial factors which determine successful delivery of a construction project. These include: equitable financial arrangements and certainty of payment; early contractor engagement and continuing involvement of the supply chain in design development; strong relations and collaboration with suppliers and capability for effective site management, including the ability to respond to change flexibly. The research also identified opportunities for performance

¹² Source: NESTA (2012) *UK Innovation Index: Productivity and Growth in UK Industries*

¹³ Source: BIS Community Innovation Survey (2011)

¹⁴ Source: CBI (June 2012) *Construction bridging the gap*

¹⁵ Source: EC Harris for BIS (2013) *Supply Chain Analysis into the UK Construction Sector (forthcoming)*

enhancement associated with procurement of a large number of small transactions; coordination of multiple trades – particularly at the later stages of project delivery and further improvements in collaboration, design and site management.

Finally, there are other factors which, although not analysed in this publication, can impact on demand for construction and influence sector's performance and activity. These factors may, for example, include regulation and standards, land availability and the planning system¹⁶ and the wider macroeconomic environment¹⁷.

Conclusion

In spite of unprecedented challenges originating from the financial and economic crisis of 2008, the UK construction sector continues to be a vital sector of the UK economy and one of the largest construction markets in Europe. Evidence shows that the UK construction is responding well to some of its challenges and has the potential to take advantage of substantial global market opportunities in the future.

The UK has a world-class reputation for professional construction services such as architecture, and development of technology for construction purposes such as Building Information Modelling. Moreover, the proportion of employees in construction contracting with a degree, or equivalent qualification, almost doubled over the last decade, and the sector continues to run a trade surplus in construction contracting, and in some professional services such as architecture and quantity surveying.

UK construction is well placed to benefit from the opportunities presented by the global shift to a low carbon economy and green construction, but there is a continuing need to ensure investment in innovation and technology, alongside increased collaboration between businesses and research institutions to enable the UK to realise this potential. There is also scope for further progress, particularly with regard to addressing evident skills shortages, the limited awareness of financing options and of existing government support programmes, relatively low levels of exports in construction products and materials, and in improving efficiencies in the supply chain. The accompanying Industrial Strategy for Construction sets out in detail the policies and actions that the Government and industry are jointly putting in place to address these issues.

¹⁶ See for example CLG (April 2010) *The house building industry: promoting recovery in housing supply* and NHBC Foundation (March 2012) *Prospects for the UK house building industry*.

¹⁷ See BIS (2012) *Benchmarking UK Competitiveness in the Global Economy*, BIS Economics Paper No. 19 for wider discussion on UK's macroeconomic environment and comparison with other countries.

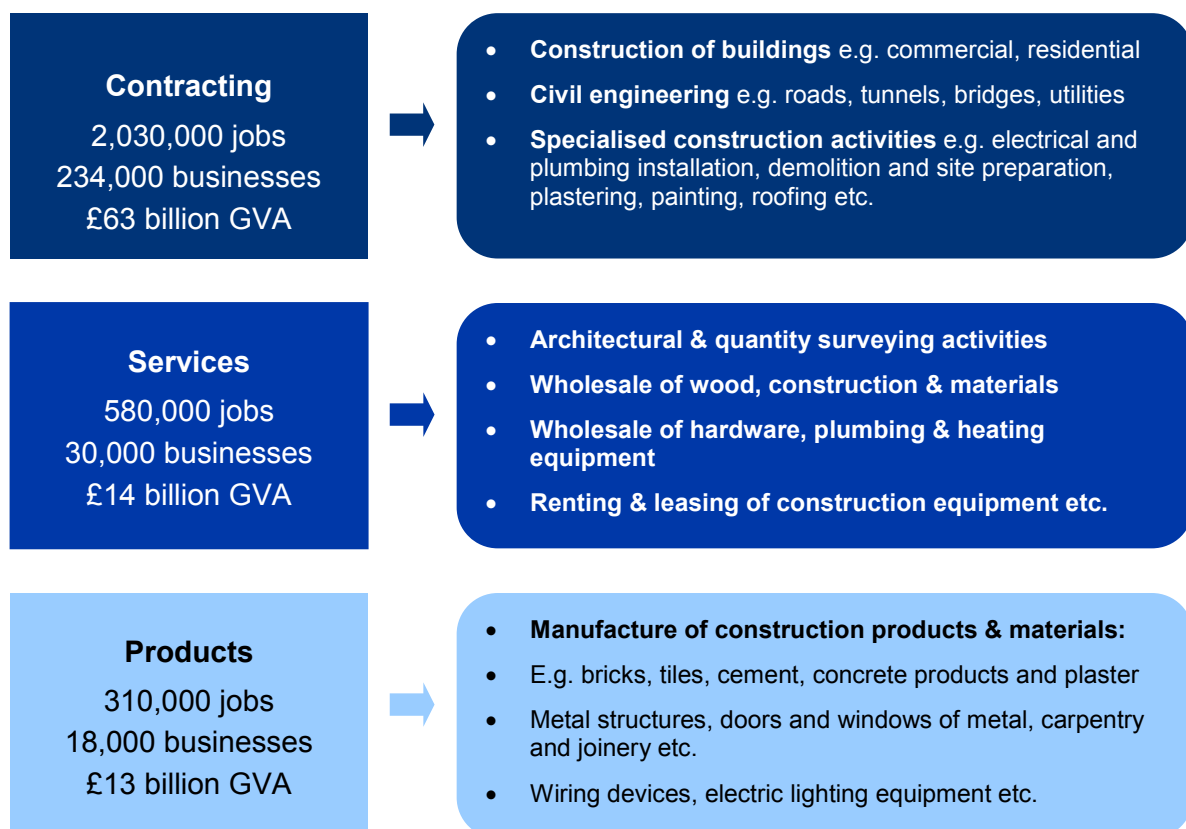
1. Sector overview

1.1 Defining the UK construction sector

The construction sector is a key sector for the UK economy and comprises a wide range of products, services and technologies. These are likely to vary in terms of the economic value they generate, reflecting differences in their use of particular factors of production (raw materials, physical capital, intangible investment, skilled and non-skilled labour and knowledge) and the value which they generate from them.

For the purpose of this publication the construction sector is defined as: **(i)** construction contracting industry; **(ii)** provision of construction related professional services; and **(iii)** construction related products and materials¹⁸. Figure 1.1 provides more information on the type of activities and products by each sub-sector and their size in terms of gross value added (GVA) and employment¹⁹.

Figure 1.1: Composition of the UK construction sector



Source: GVA and no. of businesses: ONS Annual Business Survey (2011 provisional results). Employment: BIS analysis of ONS Labour Force Survey micro-data (January – March 2013 data).

¹⁸ The definition excludes distribution and sales of construction products. See annex for info on SIC codes used.

¹⁹ Note that GVA in construction contracting is calculated here as follows: £69.5 billion (ABS total GVA for contracting) less £6.9 billion (SIC 41.1 development of building projects) which totals to £62.6 billion.

Thus the construction sector comprises a variety of industries. The full list, as currently defined in the 2007 Statistical Industry Classification (SIC) code system for industry statistics, is included in the annex. Wherever possible the analysis in this publication aims to present the statistics for a wider construction sector. However, due to data limitations this is not always possible and therefore analysis may refer to specific sub-sector(s) only.

1.2 Impact of construction on the UK economy

Construction is one of the largest sectors of the UK economy. It contributes almost £90 billion to the UK economy (or 6.7%)²⁰ in value added, comprises over 280,000 businesses²¹ covering some 2.93 million jobs²², which is equivalent to about 10% of total UK employment.

The **contracting industry** is the largest sub-sector of the construction sector, accounting for about 70% of total value added generated by UK construction and almost 70% of the sector's jobs²³. Construction **products and services**, although smaller in size, are also key to the sector's performance and generate substantial economic benefits. In 2011 some 16,000 UK-based firms alone, specialising in architecture and quantity surveying services, accounted for about £4.2 billion in gross value added²⁴. In the products sub-sector some 3,000 firms manufacturing metal structures and parts generated almost £4 billion in value added in the same year.

Construction also has a much wider significance to the economy. It creates, builds and maintains the workplaces in which businesses operate and flourish, the economic infrastructure which keeps the nation connected, the homes in which people live and the schools and hospitals which provide the crucial services that society needs. A modern, competitive and efficient construction industry is essential to the UK's economic prosperity. Its contribution is also vital if the UK is to meet its Climate Change Act commitments and wider environmental and societal obligations.

However, the construction sector has been affected disproportionately since the recession of 2008. In 2007 the construction sector accounted for 8.9% of the UK's GVA but by 2011 the sector contribution had decreased to 6.7%. The decline was experienced by all three sub-sectors²⁵. ONS data shows that in early 2012, the construction contracting industry

²⁰ Source: ONS Annual Business Survey data, 2011 provisional results. Data is for (i) construction contracting industry; (ii) provision of construction related professional services; and (iii) construction related products and materials.

The ABS is preferred as it is the only source with sufficient detail to allow for the calculation of GVA for the wider construction sector, and for comparison of wider construction with other industries. It should be noted that the ONS National Accounts (2011) gives GVA for construction contracting alone as £90 billion as it makes adjustment for output unrecorded by the ABS; a figure for wider construction cannot be calculated from National Accounts, but it is likely to be higher.

²¹ Ibid.

²² Source: BIS analysis of ONS Labour Force Survey data, non-seasonally adjusted; January – March 2013. Data is for wider construction sector.

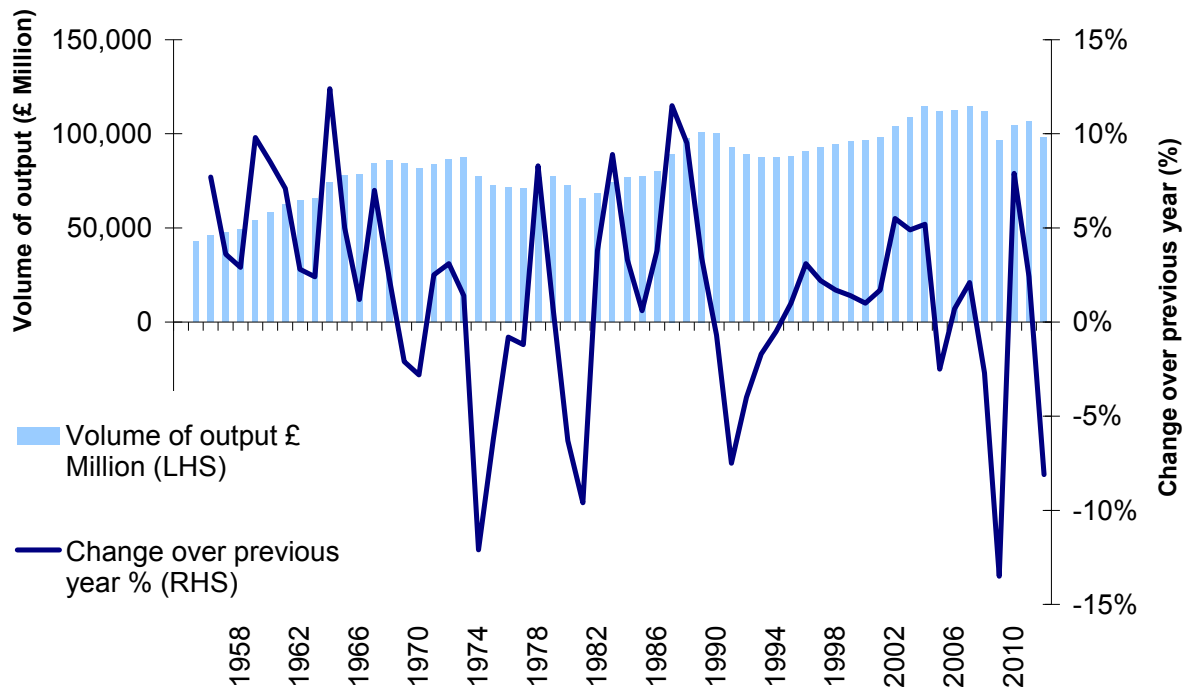
²³ Source: ONS Annual Business Survey; 2011 provisional results.

²⁴ Ibid.

²⁵ Ibid.

returned to recession for the third time in 5 years²⁶. However, despite recent falls in output, as Figure 1.2 shows, the UK construction industry has been generating substantial output to the UK economy since the 1950s which is from when comparative data is available.

Figure 1.2: Annual volume of UK construction contracting output and change over previous year in Great Britain, 1955 - 2012

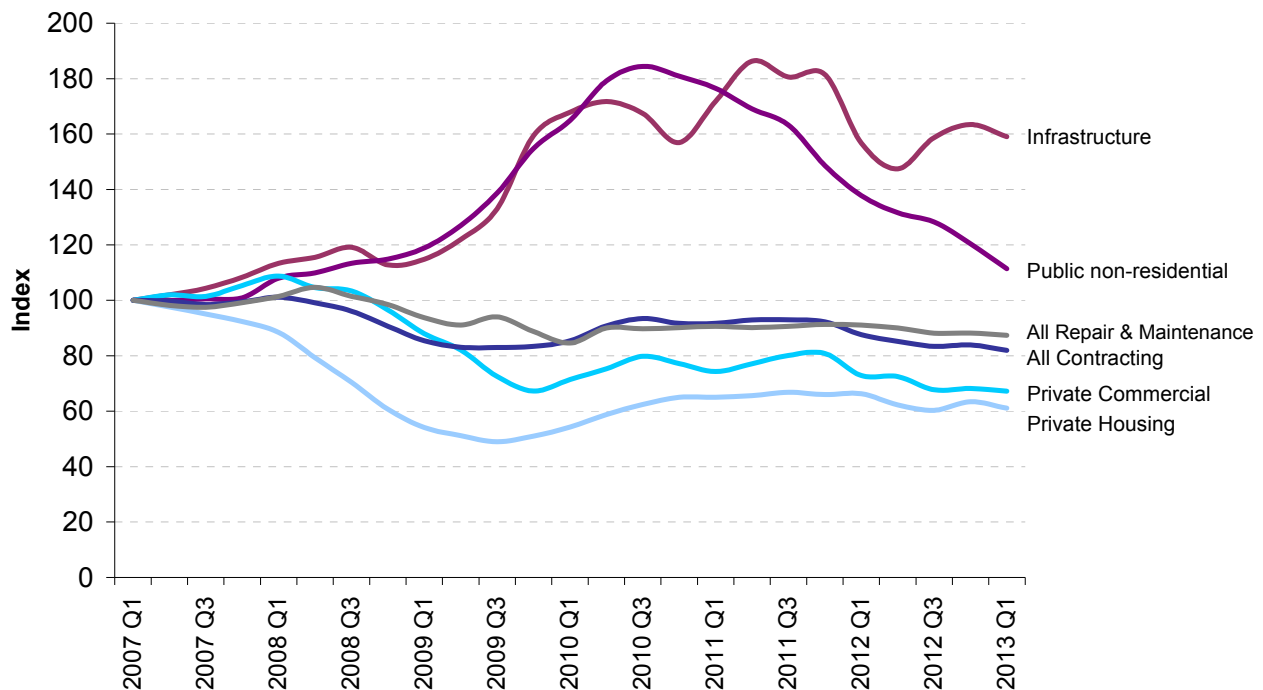


Source: ONS Output in the construction industry statistics, May 2013 release, data at constant (2005) prices. Data includes construction contracting only.

The fall in output since the pre-2008 recession level has been mainly driven by falling **private housing** and **private commercial building** which have declined respectively by about 40% and 33% since 2007²⁷. Infrastructure and public non-residential activity continued to grow after 2007, but there was a sharp fall in **infrastructure** output in the first half of 2012 and the **public non-residential** sub-sector has declined continuously since the second half of 2010 (see Figure 1.3).

²⁶ Source: ONS Output in the construction industry statistics, May 2013 release.

²⁷ Ibid.

Figure 1.3: Change in output performance in construction contracting sub-sectors

Source: ONS Output in the construction industry statistics, May 2013 release, data seasonally adjusted²⁸.

Historically, the construction sector has been a significant engine of growth following economic downturns. However, forecasts by Oxford Economics suggest that the recession in construction contracting among European countries in general is expected to last twice as long as previous recessions due to a combination of factors, including issues around access to finance, impact of public sector austerity measures, recent property market dynamics and high business and household demand uncertainty²⁹.

The latest Construction Product Association forecasts show a fall in construction output of 2.1% in 2013 due to the effects of cuts in public investment, but they forecast growth of 1.9% in 2014 and 3.8% in 2015 driven by an increase in private sector activity. These forecasts are alienated with the latest Experian's forecasts of a 2.6% fall in 2013, followed by an increase of 0.8% in 2014 and 3.0% in 2015. It is clear that the industry continues to experience challenging times and that full recovery may take some time.

²⁸ Data includes construction contracting only in Great Britain. Public housing and private industrial (not shown on the chart) went down by 11% and 48% since 2007. However, these two sub-sectors account for a relatively small proportion of construction contracting output, equivalent to about 7% to 8% in total over time.

²⁹ Source: Oxford Economics / Haver Analytics; November 2012

1.3 International comparisons

Across the globe the construction sector has been hit hard since the economic and financial crisis of 2008 and has been in decline in many developed economies. Despite this, the UK construction contracting industry remains one of the largest in Europe, measured by employment, number of enterprises, and gross value added³⁰.

In international terms the UK accounted for almost 16% of construction contracting value added³¹ and about 8% of construction enterprises in the EU-27 in 2010³². The UK also accounted for about 10% of construction contracting employment among the EU-27 countries in 2007³³.

UK-based construction companies perform relatively well in comparison to their European counterparts. According to a recent assessment by Deloitte³⁴, the UK takes third place in the ranking of total sales by country. **Thirteen** UK based companies were amongst the top fifty companies (by sales) identified as major players in Europe in 2011³⁵ accounting for combined sales of around EUR38 billion. These included Balfour Beatty PLC (8th), Carillion PLC (14th), Morgan Sindall PLC (21st) and Kier Group PLC (22nd). Total UK sales in 2011 remained in line with those recorded in the previous year. UK groups also recorded above-average performance in terms of market capitalisation in comparison with other European countries.

At the same time the UK construction industry has a large number of privately owned companies and is thought to be **more fragmented** than its major competitors such as Germany or France³⁶. High fragmentation is likely to be driven by a relatively high proportion of self-employment in the UK construction industry³⁷ and a relatively high number of small and micro businesses.

Sub-contracting is also common as most construction projects could not be efficiently completed without some degree of sub-contracting. However, the evidence suggests higher levels of **sub-contracting** and greater competition at all levels are a particular feature of the UK construction market³⁸.

³⁰ Source: UKCES (2012) *Sector Skills Insights: Construction*

³¹ Data for value added in factor prices. Eurostat statistics are available for construction contracting only.

³² Source: Eurostat: Annual detailed enterprise statistics for construction (NACE Rev.2, F, sbs_na_con_r2) http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

³³ Source: Eurostat (2010) *The EU-27 construction sector: from boom to gloom*

³⁴ Source: Deloitte (July 2012) *European powers of construction*

³⁵ Ibid.

³⁶ See for example CIB Publication No. 293: *The Construction Sector System Approach: An International Framework*.

³⁷ See for example HM Treasury (December 2010) *Infrastructure Cost Review: Technical Report*

³⁸ Ibid.

2. UK construction in the global economy

2.1 Changing global demand

Over the last five years there have been some dramatic changes in the construction market. Businesses across many parts of the world were faced with unprecedented challenges arising from a number of factors. These included rising prices of raw materials, limited availability of funding, corporate failures arising from the inappropriate management of risks, government spending cuts and falling consumer spending coupled with new accounting standards and regulatory requirements³⁹. Such factors have affected how companies in construction operate today. Moreover, over the medium term a number of overarching factors are likely to impact on demand for construction and transform the construction sector even further. It is anticipated that global construction market will increase by 4.3% per annum; from USD\$8,663 billion in 2012 to USD\$15,030 billion in 2025. This is an increase of over 70%⁴⁰.

Globalisation

A key feature of the latest phase of globalisation has been its application to the manufacturing value chain. As a result of improvements in global transport infrastructure, advancements in information and communication technologies, and significant progress in the elimination of tariff and non-tariff barriers, businesses are now able to separate the different parts of the manufacturing value chain and carry out particular economic activities in different geographical locations around the world.

Demographic change

Demographic change also drives demand in the sector. An ageing population and changes in the overall health of the population has implications for the provision of healthcare facilities, housing, education and infrastructure. Increased life expectancy and the health of older people impact on the need for hospitals and care homes and thus their construction, repair and maintenance. The ageing population also has implications for the construction sector workforce and supply of skills in the sector. Key skills can be lost through retirement and there is a need to inspire and attract younger workers to the industry in order to replace lost skills⁴¹.

³⁹ http://www.ey.com/UK/en/Industries/RealEstate/Construction_and_Infrastructure_Overview

⁴⁰ Source: *Global Construction 2025*, Global Construction Perspectives and Oxford Economics (1 July 2013) See www.globalconstruction2025.com for additional information on global construction industry.

⁴¹ Source: UKCES (2012) *Sector Skills Insights: Construction*

Consumer demand

As the construction sector covers a wide variety of sub-sectors, including civil engineering, engineering manufacturing and house building, consumer preferences vary considerably across parts of the sector. Overall, greater consumer uncertainty and restricted credit conditions since 2008 have dampened consumer demand for a range of construction products. However, over the past 20 years there has been a general growing interest in property development in the UK and globally, with individuals placing increasingly high demands on builders including requirements for energy efficiency and high quality finishes. Preferences between urban and rural dwellings, and regarding home ownership versus rental accommodation, also have important effects on the demands placed upon the sector⁴².

Green and sustainable construction

The global green and sustainable building industry is forecast to grow at an annual rate of 22.8% between now and 2017⁴³ as a result of increasing low carbon regulatory requirements and greater societal demand for greener products. It seems that the market is recognising these opportunities. According to recent research by McGraw-Hill Construction (2013)⁴⁴ around half the architects, engineers, contractors, building owners and building consultants around the world anticipate that at least 60% of their work will be green by 2015, up from 28% of firms in 2012 and from only 13% in 2009. As the world's sixth largest low carbon market⁴⁵, the UK is well placed to take advantage of these opportunities.

There are also green construction opportunities in the UK market. The UK's existing housing stock, which accounts for over half of the greenhouse gas emissions from the built environment, presents growth and development opportunities for the UK's low carbon and sustainable construction market⁴⁶. The Government's flagship policy in this area is the Green Deal⁴⁷, which helps homes and businesses to pay for some of the cost of energy efficiency improvements through savings on their fuel bills.

There is also scope for improvements in the construction sector's performance by being more energy efficient. In this respect the UK construction industry is supported by Climate Change Agreements (CCA), a scheme which allows eligible energy-intensive businesses to receive up to a 90% discount from the Climate Change Levy (CCL) in return for

⁴² Source: UKCES (2012) *Sector Skills Insights: Construction*

⁴³ Source: IbisWorld (April 2012) *Report Top 10 Fastest Growing Industries*

⁴⁴ Source: McGraw Hill Construction (2013) *World Green Building Trends – Business benefits driving new and retrofit market opportunities in over 60 countries*

⁴⁵ Source: K-Matrix, Low Carbon and Environmental Goods and Services data (2010-11). Note all figures include the supply chain.

⁴⁶ Under the Carbon Emissions Reduction Target (CERT) 2.6 million cavity wall insulations were installed, as well as 3.5 million professionally installed loft insulation measures in Great Britain to date. Source: DECC (October 2012) *Quarterly estimates of home insulation levels (GB)*. The Feed in Tariff resulted in 441,929 solar photo-voltaic installations in domestic and commercial properties to date. Source: DECC (June 2013), *Weekly solar PV installation & capacity based on registration date*.

⁴⁷ <https://www.gov.uk/green-deal-energy-saving-measures/how-the-green-deal-works>

improving energy efficiency⁴⁸. Taking advantage of the research in green and sustainable construction, combined with an increased focus on retrofit of the existing buildings⁴⁹, will be key if the UK construction sector is to play its part in meeting the ambitious emission reduction targets.

Off-site construction

Off-site construction refers to structures built at a different location than the location of use. Research shows that off-site construction methods, when used appropriately, can minimise waste and deliver quality architecture while reducing costs⁵⁰. These findings were supported by a recent review undertaken by Cambridge and Oxford Brookes Universities (2013)⁵¹. Off-site forms of construction have substantial potential advantages in performance levels over traditional forms of construction, particularly in terms of speed of build on site, quality, sustainability (energy use and whole-life carbon footprint), health and safety, and waste reduction. Off-site construction also reduces working capital requirements from developers or contractors (and passing it to a supplier) may help to address increasing demand for housing. However, despite potential benefits, the off-site supply chain is a relatively immature industry both in the UK and also in much of the world⁵².

Emerging markets

Emerging markets, particularly Brazil and China, are expected to continue to experience transformational changes in economic performance compared with developed economies, with countries such as China and Brazil at the forefront. Although developed economies are likely to have substantial demands in areas such as utilities provision and infrastructure renewal, the major growth nations are likely to be those where the principal opportunities for big-ticket commercial and infrastructure development will arise⁵³. By 2020 emerging economies are expected to account for 55% of all construction spending⁵⁴. Research also suggests that the Asian market overall could increase its global market share from 31% in 2015 to about 46% in 2020⁵⁵.

⁴⁸ The construction industry is represented in CCAs by a number of sectors, but most notably cement, ceramics, glass, wall coverings, and wood panelling sectors. These sectors, comprising of almost 200 sites, agreed to targets (from a 2008 baseline) of 3.4%, 6.1%, 5%, 6%, and 8.8% respectively. See: <https://www.gov.uk/government/news/industry-agree-stretching-energy-efficiency-targets-with-government>

⁴⁹ Source: University of Cambridge, Oxford Brookes University and Construction Industry Council (2013) *Offsite Housing Review*

⁵⁰ See for example Davies Langdon (September 2011) *Cost model: off-site manufacturing*

⁵¹ Source: University of Cambridge, Oxford Brookes University and Construction Industry Council (2013) *Offsite Housing Review*

⁵² Ibid.

⁵³ Source: Ernst & Young: *Construction and Infrastructure: unprecedented challenges of the changing economy*

⁵⁴ Source: Global Construction Perspectives, PwC and Oxford Economics (2011) *Global Construction 2020*

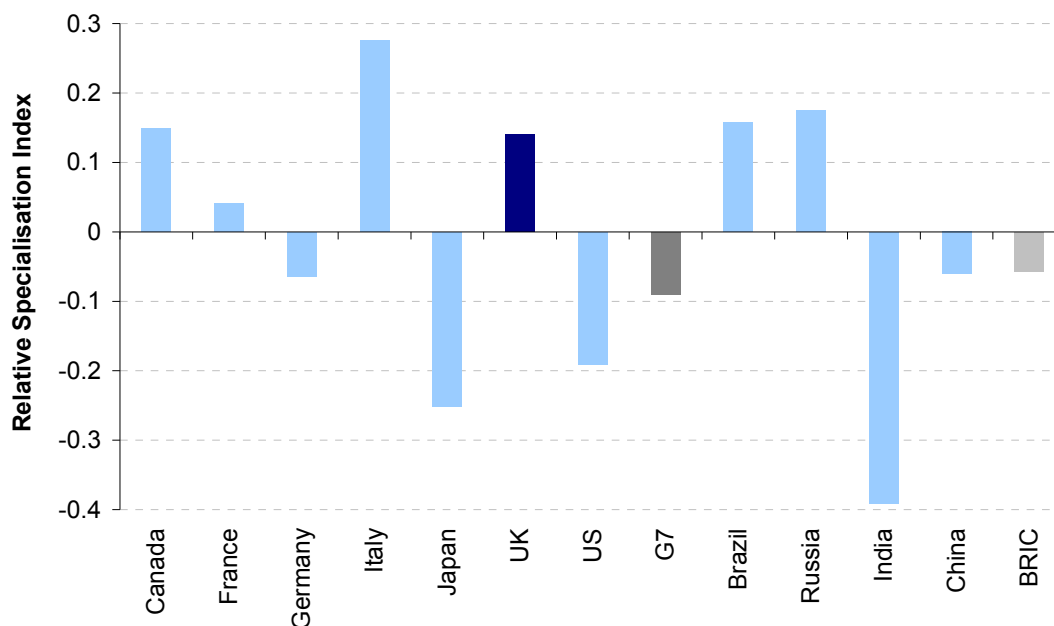
⁵⁵ Source: Davis Langdon (2012) *World Construction 2012*; based on HIS Global Insight (2011)

2.2 UK construction export capability

Research shows that firms which export generally tend to be larger, more productive, have higher absorptive capacity ('know how') and be more likely to engage in research and development or wider innovation activity than those that do not export⁵⁶. Evidence shows that only a relatively small proportion of UK construction contracting firms are exporters in comparison to other UK sectors. In 2012, about 6% of construction contracting SMEs were exporting⁵⁷. However, those businesses that do export tend to innovate more. According to the UK Community Innovation Survey (2011) some 60% of construction contracting exporters were also involved in some form of innovation activity in 2010⁵⁸.

The UK construction sector has a strong reputation for construction services such as architecture and development of advanced technologies used in construction such as Building Information Modelling (BIM) which enables businesses to make more intelligent use of data and hence minimise waste from construction processes. This is reinforced by relatively high numbers of patents in UK construction. Data collected between 2008 and 2012 on patents registered in construction⁵⁹ shows that UK has a technological advantage and is relatively specialised in construction research (see Figure 2.1)⁶⁰.

Figure 2.1: Relative Technological Advantage in construction, 2008 – 2012



Source: European Patent Office EPODOC patent data

⁵⁶ See for example BIS Economics Paper No. 10A *Manufacturing in the UK* (December 2010)

⁵⁷ Source: BIS Small Business Survey (2012)

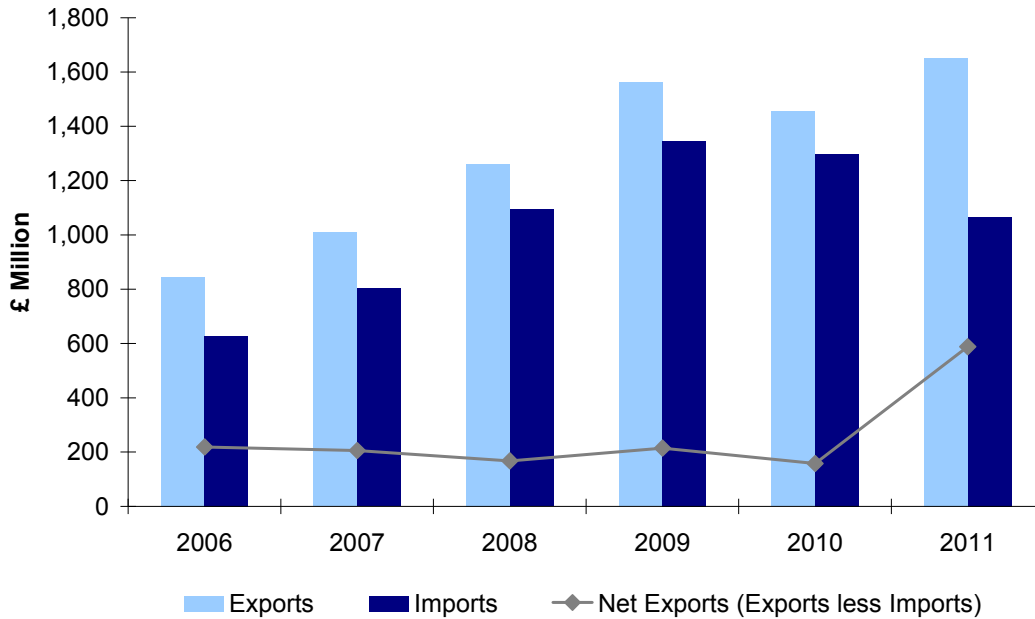
⁵⁸ Source: BIS UK Community Innovation Survey (2011); 2010 data

⁵⁹ Source: European Patent Office EPODOC patent database. Selected patents construction processes and materials defined by E01-04
<http://web2.wipo.int/ipcpub/#&version=20130101&symbol=E¬ion=scheme&refresh=page>

⁶⁰ That is, UK construction related registered patents account for a relatively higher share of all UK patents in comparison to other countries and their share of construction patents.

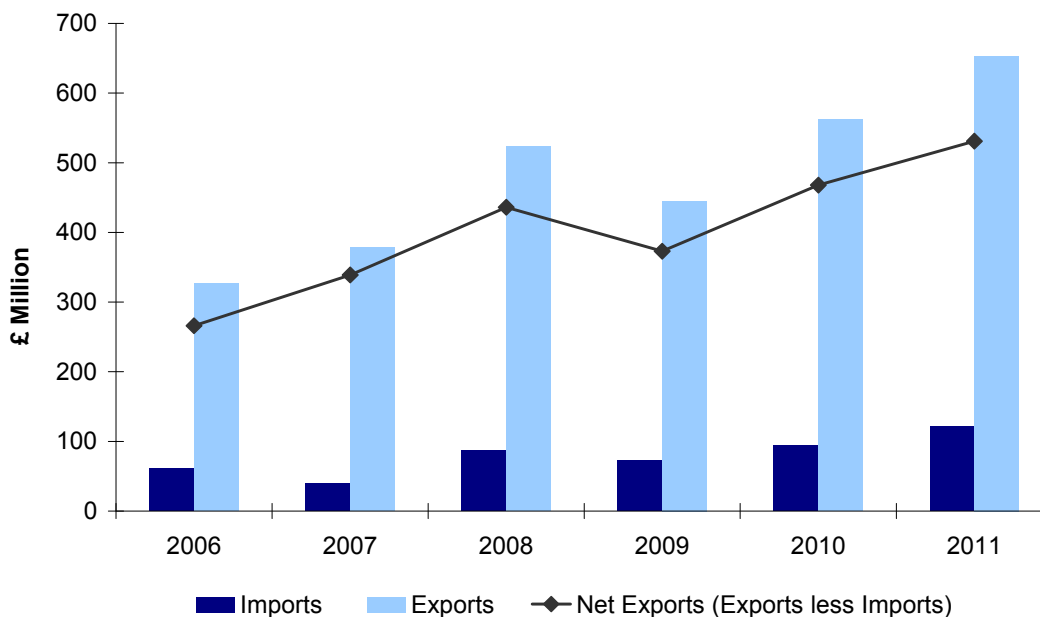
Despite technological capability, the UK picture on construction exports is mixed across its sub-sectors. UK exports in construction contracting have been growing over time and in 2011 they were equivalent to about £1.65 billion with a trade surplus of about £590 million (see Figure 2.2). The UK is also strong in exports of architecture and surveying services, with a trade surplus of about £530 million in 2011 (see Figure 2.3).

Figure 2.2: UK Trade in construction contracting



Source: ONS Pink Book (2012)

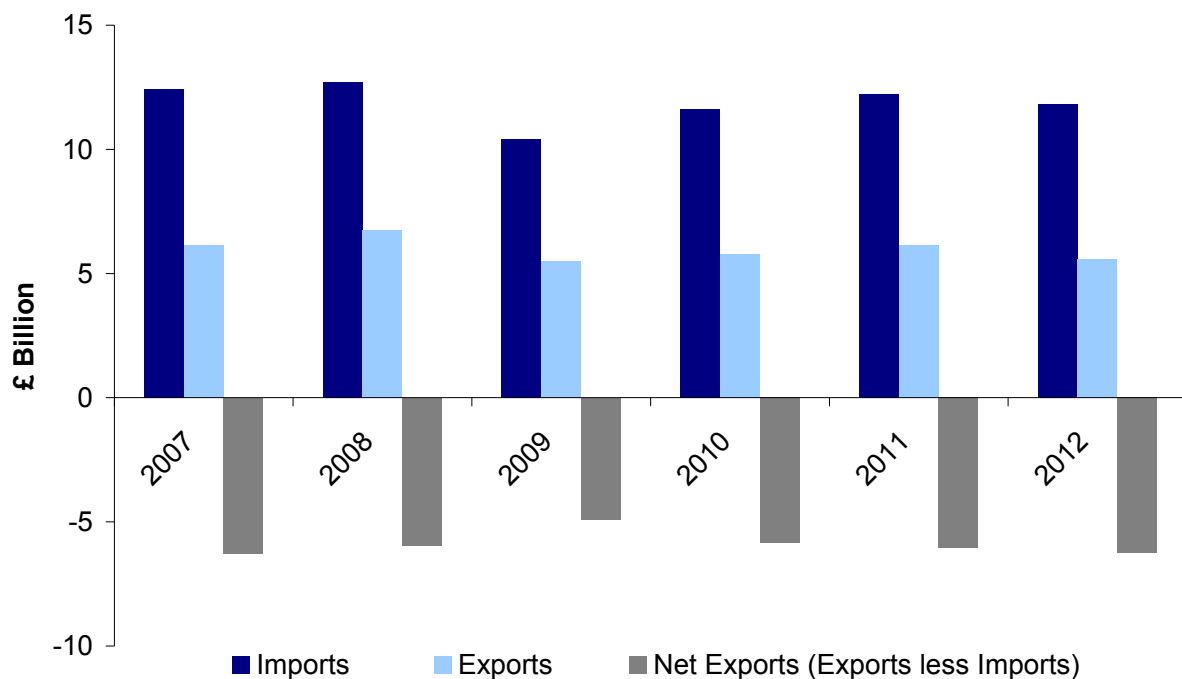
Figure 2.3: UK Trade in architecture and quantity surveying services



Source: ONS Pink Book (2012)

On the other hand, the UK's trade performance in construction related products is less positive. Figure 2.4 shows that the UK continues to experience a trade deficit in building materials and components (about £6.2 billion in 2012). Four out of five of the largest UK export sub-sectors in construction products were in trade deficit in 2012, with the largest trade deficit experienced by the electrical wires sub-sector (£860 million), followed by lamps and fittings (£310 million), air conditioning equipment (£270 million), and plugs and sockets (£120 million). On the other hand, the paints and varnish sub-sector displayed a trade surplus of about £120 million in the same year⁶¹.

Figure 2.4: UK Trade in building materials and components



Source: BIS Monthly Bulletin of Building Materials and Components; February 2013 release

Despite technological capability, high numbers of patents in construction relative to many other countries and a trade surplus in construction contracting and in selected construction services, the UK has not yet specialised in construction exports. Overall, UK exports of construction⁶² account for less than 2% of all UK exports⁶³ and the UK is not considered to have a relative comparative advantage in construction contracting exports; other countries have higher exports of construction relative to their overall size of exports⁶⁴. Although it is

⁶¹ Source: BIS Monthly Bulletin of Building Materials and Components; February 2013 release

⁶² This includes construction contracting, building materials and components, architecture and surveying services only.

⁶³ Source: BIS calculations based on ONS data. It should be noted however that foreign direct investment (FDI) is an important aspect of international trade in construction. This is because construction projects that last longer than a year are classified as foreign direct investment. The stock of FDI in construction by UK firms decreased from £3.3 billion in 2010 to £2.4 billion in 2011. This corresponds to FDI flows showing a net disinvestment of almost £400 million in 2011. Despite the disinvestment from FDI by UK firms, earnings from FDI were both positive and increasing. Source: ONS FDI MA4 (2012).

⁶⁴ BIS analysis of International Trade Centre data; 2001- 2011

difficult to assess precisely why other countries are more specialised in construction, it is likely to be driven by larger firm size, higher collaboration and better awareness of benefits from exporting among other countries relative to the UK.

2.3 Export barriers & future strategic challenges

When deciding whether to enter overseas markets, businesses in the construction sector, as in other sectors, may have insufficient information to enable them to make a well-informed decision. They may not be fully aware of the potential benefits of exporting and lack the necessary knowledge, capability or products to successfully exploit overseas markets. They may also lack critical management skills or resources. This can cause some firms to decide not to export or engage in lower levels of export activity than they would otherwise undertake⁶⁵. UK construction companies tend to be smaller and collaborate less which may make accessing foreign markets more difficult. Table 2.1 shows the most frequent reasons for not exporting cited by construction contracting SMEs.

Table 2.1: Reasons given by UK construction contracting SMEs for not exporting

Reason for not exporting	% of contracting SMEs
Do not have a product / service suitable for exporting	66%
Not part of business plan	26%
Have sufficient business in the UK already	11%
Too costly	3%
Lack of management time to pursue export opportunities	2%

Source: BIS Small Business Survey (2012). Note: Firms could give multiple reasons.

Construction firms operate in a sector with increasing levels of regulation ranging from health and safety to sustainability and carbon emissions requirements, and they also face increasing global competition. Meeting these demands requires high levels of capability and management skills, which presents further challenges to construction businesses. The UK construction sector is well placed to meet the challenges over the medium term. Many employers have shown willingness and readiness to comply with various environmental and sustainability requirements and many UK firms have won international contracts and taken part in international collaborations. The role of higher skills and management capabilities are crucial for the construction sector in taking advantage of forthcoming opportunities and to addressing evident challenges⁶⁶.

⁶⁵ See for example BIS Economics Paper No. 5 (2010) *Internationalisation of Innovative and High Growth SMEs*

⁶⁶ Source: UKCES (2012) *Sector Skills Insights: Construction*

The Review of Engineering Construction⁶⁷ found that whilst some UK-based companies are taking advantage of business opportunities overseas, there is evidence that cultural and linguistic differences may pose significant barriers for UK companies seeking to win work in other EU countries. The review found little evidence that there were significant differences between the craft skills in the UK and other countries. However, the skills required for international competition are thought to be more varied than those required when operating solely in a domestic market⁶⁸.

To compete effectively in the world economy and take advantage of global opportunities such as in green construction, UK construction businesses will have to make further efforts to differentiate themselves from lower cost countries including China, India and Brazil which are steadily moving into higher value activities. This means that UK construction businesses will have to continue to innovate: develop and bring to market new, more sophisticated construction processes and materials and adapt their business models in ways that add further value to the construction products they supply and services that they provide. By responding quickly to the new opportunities created by predicted changes in global demand, UK construction businesses can exploit first mover advantage and enhance their prospects of securing a larger share of the global construction market.

At the same time, many UK construction businesses will also need to become more internationalised. By engaging in international markets, UK construction businesses could gain greater exposure to new ideas and knowledge as well as access to customers, suppliers and skills from around the world. This would keep them at the forefront of ongoing developments in innovation and technology.

While accessing foreign markets and increased export activity is one driver of growth, there are also other fundamental factors which are likely to enable the construction sector to grow and transform successfully in the light of increasing globalisation, competition and consumer demand. These are discussed in the following chapter.

⁶⁷ Source: Gibson, A. (2009) *Changing to Compete, Review of Productivity and Skills in UK Engineering Construction*

⁶⁸ Source: UKCES (2012) *Sector Skills Insights: Construction*

3. Drivers of long-term growth

A number of different factors underpin growth, competitiveness and performance of the UK construction sector. The focus of this chapter is to assess key enablers of growth which will be of vital importance as the construction sector continues to develop and takes advantage of global market opportunities both now and in the longer term. These enablers are: people and skills; access to finance; innovation and supply chain capability. The complex and inter-related nature of these factors means that they cannot be assessed in isolation. The future success of the UK construction sector will be underpinned by ensuring the right combination of these factors.

3.1 People and skills

The changing nature of the construction market, combined with increasing demand for low carbon and energy efficient construction, greater opportunities in off-site manufacturing and technology deployment means that a skilled and flexible workforce will be vital the UK construction sector's future performance and competitiveness. Changes in the sector's skills needs are particularly relevant for management and professional occupations, with increasing demand for higher level skills⁶⁹.

Skill-shortage vacancies

Despite high redundancy, low vacancy rates and high mobility of construction workers⁷⁰, there continue to be reports of some acute skills shortages in the UK construction sector. About one fifth of all vacancies in the wider construction sector are persistent and hard to fill because employers cannot recruit staff with the right skills, qualifications and experience⁷¹. These shortages are evident mainly in skilled trades and professional occupations. More than half (53%) of employers in construction contracting sector reported skills shortages in professional or associate professional occupations and some 28% reported skills shortages in trade occupations⁷². Employers report that these shortages lead to increased costs, delays, inefficiency and lost business and that the lack of capable people is likely to become more of a challenge, with implications for sector competitiveness⁷³.

Qualifications & apprenticeships

Recent evidence on qualifications is generally positive, showing increasing proportions of individuals with higher level qualifications. The proportion of employees in construction contracting with a degree or equivalent qualifications (Level 4) almost doubled over the

⁶⁹ Source: Source: UKCES (2012) *Construction Sector Skills Assessment*

⁷⁰ Mobility in construction is high although it differs by region. Around 30-40% of workers in London, South East and West Midlands work in different region to where they live. This is equivalent to about 10-15% in North East, North West and Yorkshire. Source: *Construction Skills 2012 Mobility Survey*

⁷¹ Source: UKCES (2012) *UK Employer Skills Survey*

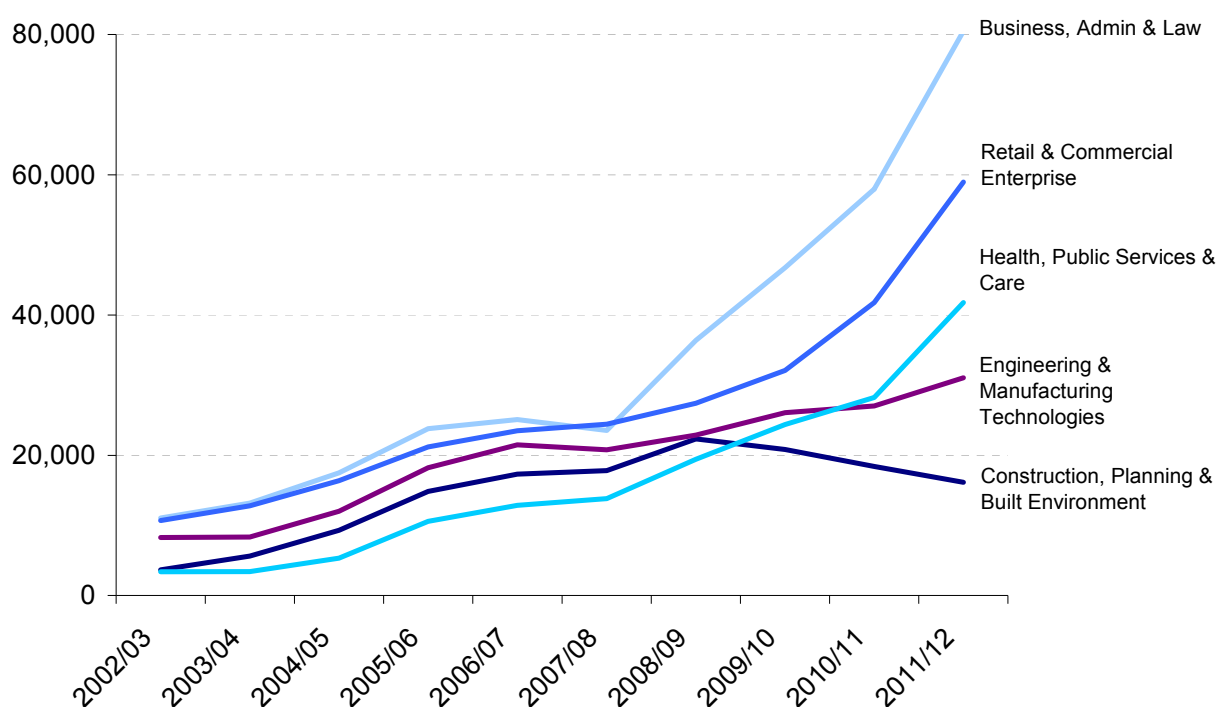
⁷² Source UKCES (2012) *Sector Skills Insights: Construction*

⁷³ Ibid.

last decade, from about 12% in 2001 to about 22% in 2012⁷⁴. At the same time the construction contracting industry has a higher proportion of employees with Level 3 qualifications than any other UK sector⁷⁵.

The construction sector is an important provider of apprenticeships. Employers in the wider construction sector are more likely than average to offer formal apprenticeships: 17% compared to the all sector average of 13%⁷⁶. However, at the same time economic conditions have led to a substantial fall in apprenticeship completions in construction related industries: from about 22,000 in 2008/09 to about 16,000 in 2011/12⁷⁷ (see Figure 3.1). This is at a time when apprenticeship completions in other major areas continued to grow. Recent analysis shows that some 86% of employers in the construction sector said they would be unlikely to start an apprentice in the next 12 months⁷⁸.

Figure 3.1: UK Apprenticeship completions by major sector subject area



Source: BIS Single Individualised Learner Record (ILR) data

⁷⁴ Source: ONS Labour Force Survey (2012 Quarter 4). Data is for construction contracting only.

⁷⁵ Ibid. About 40% of construction contracting workers have Level 3 qualifications comparing to 28% in manufacturing and 24% for UK average.

⁷⁶ Source: UK Commission's Employer Perspective Survey (2012)

⁷⁷ Source: BIS Single Individualised Learner Record (ILR) data

⁷⁸ Source: The Construction Industry Training Board (CITB) *Training and Skills in the Construction*

Training & development

Training and development activity in the construction sector is low⁷⁹ and likely to be driven by the high number of self-employed who often face an ‘earn or learn’ dilemma. Only 17% of sole traders had funded or arranged training for themselves or indirect staff compared to 41% of employers in the wider construction sector⁸⁰. The self-employed are half as likely to participate in training as employees in the sector⁸¹. Many businesses in construction do not have an established training plan in place. Only about 27% of businesses in wider construction said they had a training plan and 19% had a training budget. This compares to about 38% and 29% respectively for businesses across all UK sectors on average⁸².

Management skills

Management skills are vital to the performance of the construction sector. Analysis carried out by EC Harris for BIS (2013)⁸³ into the structure and performance of construction supply chains has demonstrated the central role of a capable and effective management workforce on the outcome of projects. Due to the disaggregated nature of the construction supply chain and the one-off nature of projects, there is a high dependence on the successful coordination of activities both on-site and off-site by project managers in the supply chain. This capability is becoming more important as the construction supply chain is engaged at an earlier stage in the project, and as project teams integrate to a greater degree to improve efficiency and to eliminate waste.

Whilst the EC Harris research found plentiful evidence of the positive effect of highly capable project and site management, the study also found examples where less effective management at all levels in the supply chain had an adverse effect on project outcomes. The research concluded that the management capability of project teams is a very important enabler of successful project outcomes, and that continuing investment in the development of the skills is necessary to assure continuing improvement in industry performance.

Construction image

Evidence indicates that parts of the construction sector have an image problem that may deter people from entering the industry. Survey data shows⁸⁴ that the overall appeal of the construction industry as a career option for young people is low (scoring an average of 4.2 out of 10 among 14 to 19 year olds) and only slightly higher among careers advisers (5.6 out of 10). Parents score the industry higher but still at a relatively low level (6.2 out of 10). Construction is also seen as a less attractive career option than engineering, manufacturing and retail (see Table 3.1)⁸⁵ and perceived to be about “being outdoors and

⁷⁹ About 54% of employers in the wider construction sector provide training compared to 59% for UK average (UKCES).

⁸⁰ Source: ConstructionSkills Survey (2011). The definition of construction covers contracting and professional services.

⁸¹ Source: UKCES (2011) *Skills for self employment*

⁸² Source: UK Commission’s Employer Skills Survey (2011)

⁸³ Source: EC Harris for BIS (2013) *Supply Chain Analysis into the UK Construction Sector (forthcoming)*

⁸⁴ Source: CITB-ConstructionSkills (March 2013) and Pye Tait consulting (2012)

⁸⁵ Source: CITB-ConstructionSkills (March 2013) and Pye Tait consulting (2012)

getting dirty” and most suited to “young people who do not get into college or university”. The survey also found that construction has difficulty appealing to women.

The poor image of construction has a detrimental impact on construction businesses’ ability to recruit and retain people with the right type of skills, with analysis showing that the sector has more hard to fill vacancies than the UK average⁸⁶.

Table 3.1: Construction as a career choice in comparison to other sectors

Construction has more appeal than:	Young People	Parents	Career Advisers
Engineering	14%	13%	6%
Manufacturing	18%	25%	20%
Retail	17%	33%	23%

Source: CITB-ConstructionSkills (March 2013) and Pye Tait consulting (2012).

Note on reading the table: data shows, for example, that only 14% of young people would prefer a career in construction over engineering. This is equivalent to 86% of young people who would prefer engineering over a career in construction.

⁸⁶ Almost two fifths of all vacancies are hard to fill in the wider construction sector compared to nearly one quarter across all UK sectors on average (UKCES (2012) *UK Commission’s UK Employer Skills Survey*).

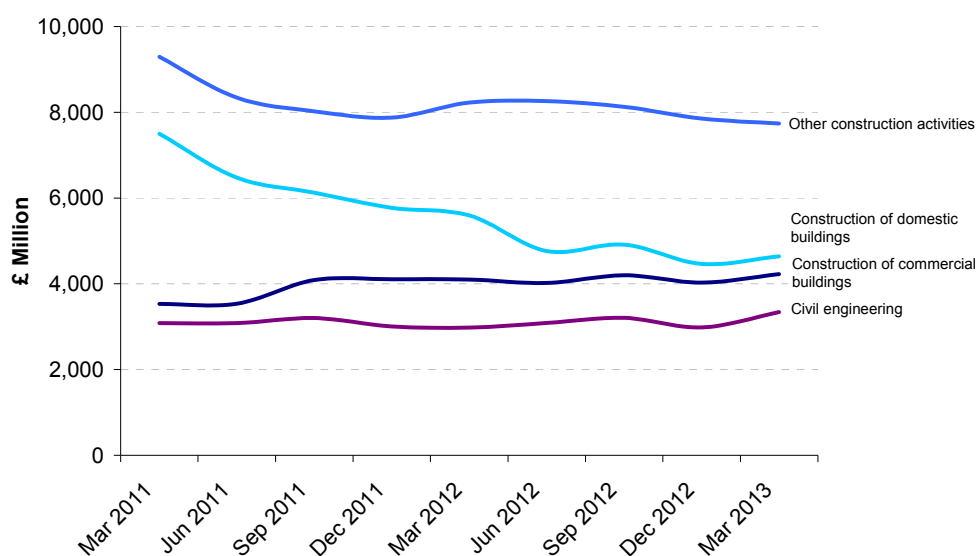
3.2 Access to finance

The ability of construction companies to access the right type of finance is vital for them to operate and grow. Finance is commonly used to purchase fixed assets or to fund expansion, and is also used to fund working capital needs. This section looks at the types of finance commonly used by construction companies and considers the finance issues which are affecting the sector. The focus is on Small and Medium Enterprises (SMEs) as they comprise some 99.9% of UK construction contracting businesses⁸⁷ and are more likely to experience finance problems than larger companies due to a narrower range of finance options available to them⁸⁸.

Bank lending

Bank lending is a common form of finance sought by construction contracting SMEs. Of those construction contracting SMEs employers who sought finance in the preceding 12 months, 36% sought a bank loan and 53% sought a bank overdraft facility⁸⁹. However, bank lending to the construction contracting sector decreased both in absolute terms and relative to other sectors during the recession - from about £32.2 billion in early 2009 to £19.9 billion in December 2012⁹⁰. This is equivalent to a reduction of 38% and compares with a fall of less than 5% on average across all UK sectors.

Figure 3.2: Bank lending to construction contracting subsectors



Source: Bank of England. Note: Quarterly data is not seasonally adjusted.

⁸⁷ Source: BIS Business Population Estimates for the UK and Regions (2012). SMEs are defined here as businesses with less than 250 employees.

⁸⁸ Due to data availability, analysis in this section is focused largely on construction contracting SMEs.

⁸⁹ Source: BIS Small Business Survey (2012)

⁹⁰ Source: Bank of England bank lending data. Note that Bank of England 'construction sector' data presented here comprises the four subsectors of: construction of commercial buildings, construction of domestic buildings, civil engineering, and 'other construction activities'. It excludes 'development of building projects' and thus excludes most housing developers. It relates essentially to lending to contractors.

Recent changes in bank lending vary by construction contracting subsectors (see Figure 3.2 above). The largest change in lending was experienced by the *construction of domestic buildings subsector*, which is dominated by smaller firms working for individual owner occupier customers and working locally for national housing developers. A large decline was also observed in the *other construction activities subsector*, which is dominated by specialist trades subcontractors working for the main contractors. On the other hand, lending to the *civil engineering subsector* and *construction of commercial buildings*, which mainly comprise larger contractors, has been relatively stable since 2011.

SMEs in the construction contracting industry are less successful than other sector SMEs on average in applying for overdrafts (59% compared to 71% overall) and loans (44% compared to 59% overall)⁹¹. A quarter of construction contracting businesses surveyed said they had lost business or had to abandon plans for growth because they were unable to raise the necessary funds⁹².

Trade credit

Trade credit involves companies delaying the requirement for payment by a set period, for example by 60 days, and plays a particularly important role in the construction sector. Companies which receive trade credit often obtain a discount if they can pay for the goods within a shorter period of time. Trade credit is more important to construction contracting businesses than to other sectors. The Small Business Survey 2010 asked SME employers whether they gave or received credit. It showed that 100% of SME respondents in the construction contracting sector reported that they give trade credit and 89% reported that they received credit. This is substantially higher than that of other sectors⁹³.

The results also indicate that trade credit plays a more important role for financing of construction companies than in other sectors. Some 47% of all companies who received trade credit considered it to be very important for company growth⁹⁴. For construction contracting this was reported by about 68% companies. According to a report by the CBI (2010)⁹⁵ trade credit is likely to be more important than bank lending, and SMEs are increasingly having to think and act like lenders themselves. However, many SMEs lack the tools to manage credit risk well. It suggests that the significance and implications of trade credit are often overlooked.

Recent research commissioned by BIS and undertaken by the University College London (2013)⁹⁶ assessed availability of trade credit to UK construction contracting firms and analysed their reliance upon credit to deliver construction output. Key findings are summarised in Box 3.1 below.

⁹¹ Source: SME Finance Monitor (2013 Q1)

⁹² Source: FMB Survey (March 2013)

⁹³ Source: BIS Small Business Survey (2010). 93% of all respondents give credit and 74% of all respondents across all UK sectors receive credit.

⁹⁴ Source: BIS Small Business Survey (2010)

⁹⁵ Source: CBI (2010) *Small business finance and the recovery*

⁹⁶ Source: UCL for BIS (2013) *Trade credit in the UK construction industry – an empirical analysis of construction contractor financial positioning and performance (forthcoming)*

Box 3.1: Trade Credit in UK Construction Industry

Research undertaken for BIS into the role of trade credit for construction contracting companies shows that in construction, **trade credit is by far the most important** and wide spread source of finance for operations, whereas short term bank finance is an expedient used by some firms some of the time (at any one moment the majority of construction firms have no short term bank debt).

Construction contracting firms⁹⁷ make **between two and three times more use of** trade credit than companies in the rest of the economy. Credit received from suppliers has a value equal to 32% of construction contractors' total assets (24% of construction SMEs' assets) compared to 11% for the rest of economy. Trade credit given by construction contractors makes up 20% of total assets for construction contractors (21% for construction SMEs) compared with 8% for the rest of economy.

Looking at the differences between tier 1 (main contractor) and tier 2 contractors⁹⁸, shows that **tier 2 firms are net providers** of trade credit, that is they extend more trade credit to tier 1 firms than they receive from their own suppliers, while **tier 1 firms are net receivers** of trade credit, that is they receive more trade credit from suppliers (including tier 2 firms) than they offer to construction clients.

While (non-micro) tier 2 firms are large providers of trade credit to tier 1 firms, the price they obtain for this in terms of **higher margins appears to offset the cost** in terms of lower turnover per £ of capital employed. Thus there is no "free lunch".

The research found that SMEs face some limits in the amount of trade credit their suppliers are willing to afford them. In the period since the 2008 financial and banking crisis, the research shows that, for construction contractors, bank credit has fallen in relative importance and **trade credit has risen in importance**. That is, construction contractors have been switching their finance sources from bank funding towards other sources of funding including trade credit.

The research shows that trade credit plays a vital role in the balance sheets of construction contractors, with lower tier contractors receiving trade credit from firms outside the industry, which then allows them to give trade credit to contractors further up the supply chain, and ultimately to the client. The **cascading nature** of this trade credit provision suggests that if contractors in the lower tiers experience problems accessing trade credit this could have implications throughout the supply chain. Therefore, monitoring of trade credit is important, especially at tier 2 level.

Source: UCL for BIS (2013) *Trade credit in the UK construction industry (forthcoming)*

⁹⁷ Note that the study excludes construction businesses in products and services subsectors, and excludes micro-firms. The study includes only 'established survivors' that is businesses that were already established in 2005 and still in business in 2011.

⁹⁸ Tier 1 firms are often referred to as main contractors, that is, as firms undertaking to deliver whole projects while Tier 2 firms, specialist contractors undertaking work in one specific trade, are referred to as their subcontractors.

Other types of finance

There are also other finance options available to construction SMEs, which include asset based financing, personal funds or equity finance. Although these are less commonly used in construction they also play a role in financing construction activities.

Factoring and invoice discounting are the two main types of asset based finance. They involve funding which is secured against unpaid invoices, thus allowing companies to receive payment much more quickly than they otherwise would, which helps smooth cash flow for companies. ABFA, the body that represents the asset based finance industry, reports that use of invoice financing is increasing although this form of finance was sought by only 4% of construction contracting firms who were seeking finance in the last 12 months (compared to 6% of all respondents)⁹⁹.

Companies in the construction sector (27% of respondents) were more likely than all respondents (24%) to feel that they had to inject *personal funds*, rather than choosing to do so¹⁰⁰. This could be caused by the fact that companies in the construction sector experience greater difficulty in accessing finance.

Equity finance enables the raising of share capital from external investors in return for handing over a share of the business and can be sought from venture capitalists (VCs), business angels and friends or family. Only a small minority of SMEs as a whole (about 3%) sought equity finance, and this is even smaller for construction companies (about 1%)¹⁰¹. Many SMEs may not have adequate resources or expertise to seek equity finance.

Barriers to access to finance

Access to finance is one of the constraints to growth typically cited by construction firms¹⁰². The Small Business Survey (2012) found that 13% of construction contracting SME employers cited cash flow as the biggest obstacle to the success of their business, higher than the 10% of all SME employers. Difficulties in accessing finance are likely to be due to a combination of supply side and demand side factors:

(i) supply side factors – risk and uncertainty

Banks consider construction companies to be high risk in comparison to other sectors. Reasons for this are likely to include low levels of fixed capital/assets and smaller than average firm size in comparison to other industries. The SME Finance Monitor Survey gathered external risk ratings for companies in the survey. For all SMEs, companies within the highest risk rating were significantly less successful in obtaining loan or overdraft facilities. Of the nine sectors considered, construction contracting companies had the second largest proportion of companies in the highest risk category¹⁰³. As it may be

⁹⁹ Source: BIS Small Business Survey (2012)

¹⁰⁰ Source: SME Finance Monitor (2013 Q1). Some 15% of construction contracting respondents said they chose to inject funds compared to 18% of all respondents.

¹⁰¹ Source: BIS Small Business Survey (2012)

¹⁰² <http://www.constructionproducts.org.uk/economics/construction-trade-survey/>

¹⁰³ Source: SME Finance Monitor (2013 Q1)

difficult and costly for lenders to distinguish between high and low risk companies, banks may therefore rely on companies' financial track record or collateral to make their decision rather than the economic viability of the business. This may be a particular problem when lenders become more risk averse due to uncertain economic conditions¹⁰⁴.

(ii) *demand side factors – lack of skills or awareness of financing options*

SMEs in the construction contracting sector are less likely to be aware of the initiatives available to them and less likely to seek financial advice than SMEs in other sectors. For example, only 19% of construction contracting SMEs were aware of government support schemes such as the Enterprise Finance Guarantee Scheme, compared to 24% of all SMEs¹⁰⁵. The SME Finance Monitor survey also found that when applying for loans, advice was sought by 1 in 10 of construction contracting SMEs compared to 1 in 3 in some other sectors.

Moreover, construction businesses may lack sufficient *financial skills* to apply successfully for bank or other types of finance and to demonstrate that their project is a viable investment opportunity. Businesses that are investment ready (i.e. that meet appropriate standards of governance, are able to demonstrate and communicate a business plan to investors or lenders and are comfortable with the concept of third party control) are more likely to be successful in accessing external finance.

Finally, **late payment** is also a key obstacle facing construction SMEs. Contractors in the construction industry are often not paid for their work until some time after it is done. It is not unusual for lower tier supply chain members to have to wait for up to 100 days to receive payment¹⁰⁶. This harms the company's cash flow and means they often need to rely on borrowing to pay for materials and labour.

According to the Construction Trade Survey¹⁰⁷ late payment is the single most important issue affecting construction businesses, with only 5% of specialist contractors being paid within 30 days. The Small Business Survey (2012) also found that, compared to other sectors, late payment is a particular issue for construction contracting SMEs. Some 33% of construction contracting SME employers state that customers paying them later than they require them to in their normal terms of business is a big problem. This is compared to 19% of all SME employers citing late payment as a big problem.

¹⁰⁴ Source: BIS (January 2012) *SME Access to External Finance*

¹⁰⁵ Source: SME Finance Monitor (2013 Q1)

¹⁰⁶ Source: Government Construction, Project bank Accounts - briefing document February 2012

¹⁰⁷ <http://www.constructionproducts.org.uk/economics/construction-trade-survey/>

3.3 Innovation capability

Innovation - often defined as the successful exploitation of knowledge and new ideas to create new or improved products, processes and organisational structures - is essential for firms' competitiveness, survival and growth. Leading on or adapting to rapidly changing technology can drive competitive advantage, improve productivity and enable companies to capture higher value components of the value chain.

Traditionally, innovation has been measured by R&D expenditure or patents granted but wider innovation can be also measured by business expenditure on training and skills development, software, advertising and market research or expenditure on other improvements in organisational design or processes.

Traditional forms of innovation

The UK has a strong reputation for world class research. However it scores relatively low on traditional measures of innovation such as R&D expenditure in comparison with its major competitors¹⁰⁸. The construction sector in particular is perceived to have low levels of innovation, measured by R&D, compared with other sectors. Expenditure on R&D by UK construction contracting firms is also low relative to other European countries, although there are differences in composition of large contracting firms between the UK and those in Europe.

Construction contracting registered £22 million¹⁰⁹ of R&D expenditure in 2011¹¹⁰, one of the lowest levels of all sectors, and this has also been declining since 2000. This contrasts with average growth in R&D expenditure of 35% across all UK sectors since 2000 and an average UK sector spend of over £500 million¹¹¹.

The low levels of R&D recorded in the official statistics may arise for two reasons: **(i)** measurement and classification errors - firms are carrying R&D, but it is not being fully accounted for¹¹², or they are innovating but not through formal R&D; and / or **(ii)** innovation levels are genuinely sub-optimal due to barriers to innovation which persist in the market.

¹⁰⁸ See for example BIS Economics Paper No. 19 (2012) *Benchmarking UK Competitiveness in the Global Economy*.

¹⁰⁹ The £22m refers to R&D carried out specifically on construction. If you widen this definition to R&D being carried out by construction contracting companies that amount increases to £37m. Therefore, some construction contractors have been carrying out R&D on things other than construction.

¹¹⁰ Source: ONS; Research and Development in UK Businesses (2011)

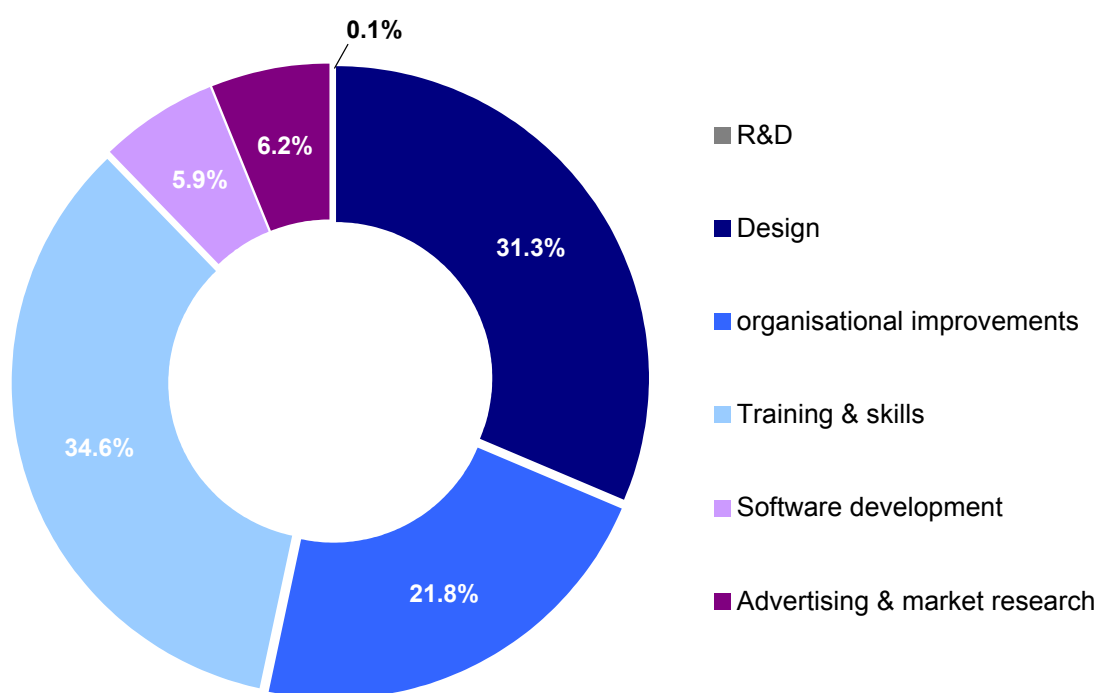
¹¹¹ Ibid.

¹¹² Measurement errors can explain some of the discrepancy as both definition of construction and definition of innovation tend to be narrow in focus in the data collected by the ONS (this is particularly the case for R&D expenditure data) and hence exclude relevant information. For example, in the now discontinued DTI R&D Scoreboard there were 17 explicitly classified construction and material firms in the top 1000 firms, totalling £103.4 million of R&D investment in 2010. This is much higher than the £14 million reported spent in the 2010 ONS figure which is confined to contracting firms only. In addition, iterative project-specific improvements and innovation is unrecorded in the official statistics.

Wider innovation

However, innovation is more than simply expenditure on R&D. Construction contractors invest between two and three times more in intangible assets, such as design and organisational innovation, than in tangible assets such as tools and machinery¹¹³. The UK construction contracting sector invested £3.15 billion in tangible assets and £7.42 billion in intangible assets in 2007. A large proportion of the total intangible investment was on training and skills development, design and organisational improvements (see Figure 3.3).

Figure 3.3: Breakdown of UK construction contracting intangible investment expenditure in 2007



Source: NESTA Innovation Index (2012)

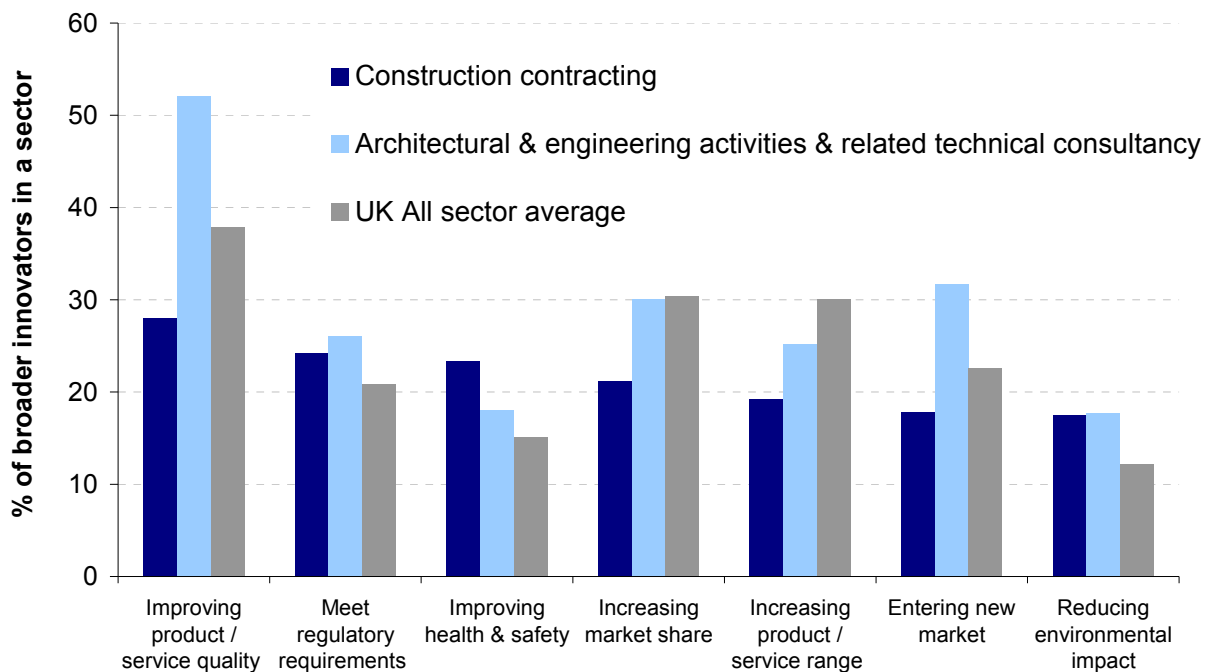
NESTA and the Community Innovation Survey, with wider definitions of innovation, present a different picture of the sector, indicating there is considerably more innovation activity occurring. However, the proportion of firms innovating still ranks low relative to other sectors. Of surveyed businesses, only about 35% in construction contracting self-declared as broader innovators in 2010. This fraction was slightly higher for construction related services firms (about 37%) and substantially higher for producers of construction products and materials (some 49%)¹¹⁴.

¹¹³ Source: NESTA (2012) *UK Innovation Index: Productivity and Growth in UK Industries*. Based on a 10 year average data from 1997 to 2007. See Table 3.

¹¹⁴ Source: BIS Community Innovation Survey (2011). These figures should be treated with a degree of caution as they are based on a sample of surveyed businesses and not scaled up to the whole population level.

Innovation may be driven by market forces (firms innovate to survive competitive pressure or innovate to seize market opportunities) or by regulation (firms have to innovate to remain compliant). Figure 3.4 shows that although the most common reason for innovating among businesses in construction contracting and related professional services is to improve a product or service quality, around a quarter of firms in both sub-sectors innovate to meet regulatory requirements. However, while improving health and safety and increasing market share are the next most frequent reasons for driving contractor innovation, more important drivers for construction services firms are to enter new markets, to increase market share and to broaden their product range.

Figure 3.4: Reported main drivers of innovation among broader innovators in construction



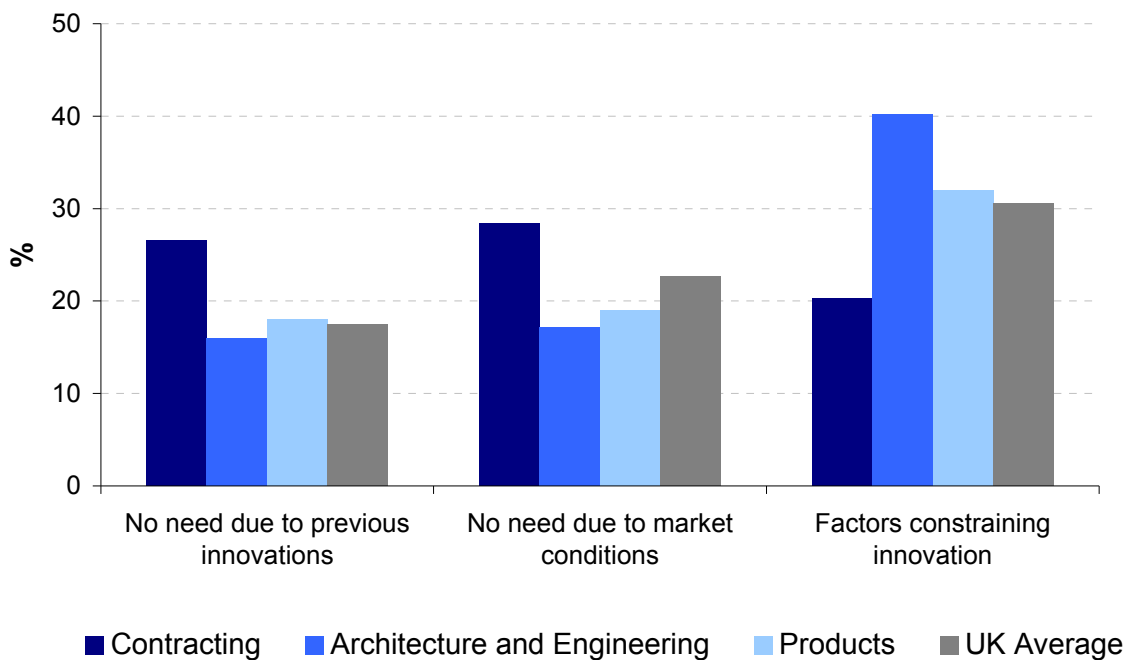
Source: BIS Community Innovation Survey (2011)

Barriers to innovation

Figure 3.5 shows a comparison of reasons given by surveyed businesses in construction. Over a quarter of construction contractors do not innovate because they consider there is no need to do so given current market conditions. Some 40% of non-innovating architectural and engineering firms and 32% of surveyed construction products businesses attributed market barriers to their lack of innovation.

A survey of the literature appears to point to several reasons for the apparent low levels of innovation in construction: **(i)** high level of industry fragmentation and limited collaboration; **(ii)** procurement impacting on the level of collaboration; **(iii)** sub-optimal knowledge transfer and lost learning points; **(iv)** issues around market uptake and awareness of benefits from innovation; and **(v)** limited access to finance and risk-averse attitude to innovation.

Figure 3.5: Reasons for not innovating across surveyed business in construction subsectors in 2010



Source: BIS Community Innovation Survey (2011). Note figures on construction products should be treated with some degree of caution as they based on surveyed businesses only and not scaled up to the whole population level.

From the perspective of those that are innovating, the barriers they perceive as affecting them most are economic factors, in particular cost and availability of finance and uncertain demand for innovative products¹¹⁵. The impact of this on innovation levels is unknown so it is difficult to determine the extent of innovation that could have occurred in the absence of these barriers.

There are three general reasons why the market may fail to provide a sufficient incentive for firms to innovative: the spillover rationale: firms are unable to appropriate all the returns from their innovations, reducing the benefits from innovation; co-ordination failures as agents are unable to act collectively towards a common goal; and information failures where differences in the information available to the parties concerned prevents transactions from taking place and knowledge from transferring.

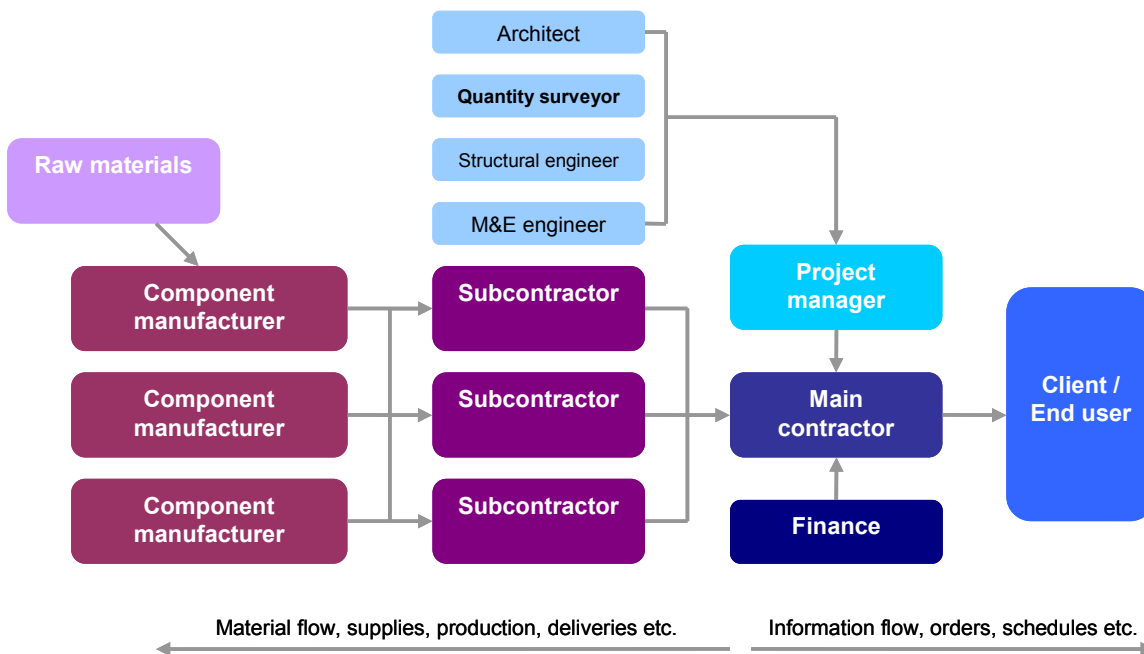
¹¹⁵ Source: BIS Community Innovation Survey (2011)

3.4 Supply chain development

The construction industry has a large supply chain - accounting for around £124 billion of intermediate consumption in 2010 - almost all of which is sourced within the UK. In other words, construction spend tends to stay within the UK supply chain. Nearly half of these inputs are from the construction industry itself but it is also a large purchaser of materials in form of metals, plastics and mineral products, administration and support services and professional services¹¹⁶. It is estimated that for every £1 spent in construction at least 90% stays in the UK¹¹⁷.

The UK construction sector is characterised by high levels of fragmentation. While there are some large businesses, at least 99.9% of firms are SMEs and, of those, some 83% employ no more than one person¹¹⁸. The industry tends to rely on a high degree of sub-contracting and has a high proportion of self employment, with over 40% of construction contracting jobs being self employed¹¹⁹. This makes the industry as a whole highly flexible and responsive to changes in market conditions, but the high degree of fragmentation does have other consequences. Figure 3.6 shows a simplified picture of a supply chain for a typical construction project.

Figure 3.6: The construction supply chain



Note: This is a very simplified representation of construction supply chain. In practice a construction project may rely on tens of subcontractors and component manufacturers.

¹¹⁶ Source: BIS Analysis of ONS supply use data

¹¹⁷ Source: CBI (June 2012) *Construction bridging the gap*

¹¹⁸ Source: BIS Business Population Estimates for the UK and Regions (2012). SMEs are defined here as businesses with less than 250 employees.

¹¹⁹ Source: BIS analysis of ONS Labour Force Survey data, non-seasonally adjusted; January – March 2013.

Analysis carried out for BIS by EC Harris (2013)¹²⁰ has shown that for a “typical” large building project – that is, in the £20 - £25 million range - the main contractor may be directly managing around 70 sub-contracts of which a large proportion are small – £50,000 or less. For a regional project, the subcontract size may be even smaller – with examples of projects where 70% of sub-contracts were below £10,000. This is clear evidence of the scale of fragmentation in the industry and a real demonstration of the challenge of building integrated supply chains with a close focus on the end product and customer value.

Notwithstanding the structure of the industry, the study found plentiful evidence of effective use of frameworks, early contractor engagement on projects and high levels of cooperation amongst supply chain members on projects. The study also found evidence of the impact of the downturn on the supply chain, as well as the pressure that is being placed on well established relationships as a result of increased competitive pressure.

The emerging findings from the same study identified a number of crucial factors which determine successful delivery of a construction project. These include: equitable financial arrangements and certainty of payment; early contractor engagement and continuing involvement of the supply chain in design development; strong relations and collaboration with suppliers; and capability for effective site management including the ability to respond to change flexibly. The research also identified opportunities for performance enhancement associated with procurement of a large number of small transactions; coordination of multiple trades – particularly at the later stages of project delivery and further improvements in collaboration, design and site management.

One key finding of the research is that the industry has a low awareness of the sources of waste and duplication that are embedded in current construction practice. This finding emphasises the fact that in order to deliver the targeted improvements many aspects of construction delivery at all levels of the supply chain must be addressed.

¹²⁰ Source: EC Harris for BIS (2013) *Supply Chain Analysis into the UK Construction Sector (forthcoming)*

Annex

A list of SIC codes included in 'big construction' sector

The international definition of construction in the SIC (2007) codes is 41, 42 & 43. However, whilst the definition covers contracting, it excludes construction related services and products. For instance, engineering activities and related technical consultancy (71.1), and Manufacture of bricks, tiles and construction products, in baked clay (23.32) are not included.

For the purpose of this analysis we used a wider definition of construction sector wherever the data availability would allow us to do so. However, it should be noted that there will be some services and products that are excluded, for example manufacture of steel. This is because it is not possible to determine what proportion of steel is used specifically for the purposes of construction and in other sectors such as automotive and aerospace.

In extracting the headline statistics, the following SIC codes were used to define the wider construction sector.

CONTRACTING

41 Construction of buildings

41.1 Development of building projects (excluded from the statistics)

41.10 Development of building projects

41.2 Construction of residential and non-residential buildings

41.20 Construction of residential and non-residential buildings

41.20/1 Construction of commercial buildings

41.20/2 Construction of domestic buildings

42 Civil engineering

42.1 Construction of roads and railways

42.11 Construction of roads and motorways

42.12 Construction of railways and underground railways

42.13 Construction of bridges and tunnels

42.2 Construction of utility projects

42.21 Construction of utility projects for fluids

42.22 Construction of utility projects for electricity and telecommunications

42.9 Construction of other civil engineering projects

42.91 Construction of water projects

42.99 Construction of other civil engineering projects n.e.c.

43 Specialised construction activities

43.1 Demolition and site preparation

43.11 Demolition

43.12 Site preparation

43.13 Test drilling and boring

43.2 Electrical, plumbing and other construction installation activities

43.21 Electrical installation

43.22 Plumbing, heat and air-conditioning installation

43.29 Other construction installation

43.3 Building completion and finishing

43.31 Plastering

43.32 Joinery installation

43.33 Floor and wall covering

43.34 Painting and glazing

43.34/1 Painting

43.34/2 Glazing

43.39 Other building completion and finishing

43.9 Other specialised construction activities

43.91 Roofing activities

43.99 Other specialised construction activities n.e.c.

43.99/1 Scaffold erection

43.99/9 Specialised construction activities (other than scaffold erection) n.e.c.

SERVICES

46.13 Agents involved in the sale of timber and building materials

46.73 Wholesale of wood, construction and materials and sanitary equipment

46.74 Wholesale of hardware, plumbing and heating equipment and supplies

77.32 Renting and leasing of construction and civil engineering machinery and equipment

71.11 Architectural activities

74.90/2 Quantity surveying activities

PRODUCTS

08.11 Quarrying of ornamental and building stone, limestone, gypsum, chalk and slate

08.12 Operation of gravel and sand pits; mining of clays and kaolin

09.9 Support activities for other mining and quarrying

16.1 Sawmilling and planing of wood

16.21 Manufacture of veneer sheets and wood-based panels

16.22 Manufacture of assembled parquet floors

16.23 Manufacture of other builders carpentry and joinery

22.23 Manufacture of builders' ware of plastic

23.11 Manufacture of flat glass

23.12 Shaping and processing of flat glass

23.31 Manufacture of ceramic tiles and flags

23.32 Manufacture of bricks, tiles and construction products, in baked clay

23.42 Manufacture of ceramic sanitary fixtures

23.51 Manufacture of cement

23.52 Manufacture of lime and plaster

23.61 Manufacture of concrete products for construction purposes

23.62 Manufacture of plaster products for construction purposes

23.63 Manufacture of ready-mixed concrete

23.64 Manufacture of mortars

23.65 Manufacture of fibre cement

23.69 Manufacture of other articles of concrete, plaster and cement

23.7 Cutting, shaping and finishing of stone

23.99 Manufacture of other non-metallic mineral products n.e.c

25.11 Manufacture of metal structures and parts of structures

25.12 Manufacture of doors and windows of metal

25.21 Manufacture of central heating radiators and boilers

25.72 Manufacture of locks and hinges

27.33 Manufacture of wiring devices

27.4 Manufacture of electric lighting equipment

28.14 Manufacture of other taps and valves

28.25 Manufacture of non-domestic cooling and ventilation equipment

33.11 Repair of fabricated metal products

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