

DRAFT (21.10.2021)

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About authors

The Bartlett School of Sustainable Construction is an international centre of excellence in the teaching and research of project management, real estate and economics.

Dr Judy Stephenson is an economic historian of early modern London, its construction industry and associated markets. Judy's research focus is on construction, labour markets, institutions, firms, finance and industries in London between about 1600 and 1850. Judy is known for her published work on London and English wages between 1650 and 1800.

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Is productivity in construction measured well in the UK?

How does the UK's construction productivity compare on a sectoral basis?

How does productivity performance and growth vary in the construction industry?

Building construction accounts for between 6 and 10% of output in the UK economy in the long run (Broadberry et al, 2015). As a vital sector that produces the bulk of the economy's fixed assets, productivity levels in construction affect both long run and short run performance in UK. Table 1 illustrates the construction industry's contribution to the UK economy in terms of GVA and employment.

Table 1 – UK construction industry: GVA and employment, 2005 to 2020

Year	Gross Value Added		Employment	
	£ (bn, cp, sa)	% of economy	Jobs (m, sa)	% of all jobs
2008	92.6	6.4%	2.3	7.1%
2009	79.5	5.7%	2.3	7.3%
2010	80.6	5.6%	2.1	6.6%
2011	84.1	5.7%	2.1	6.5%
2012	87.9	5.7%	2.1	6.5%
2013	92.6	5.8%	2.0	6.4%
2014	98.9	6.0%	2.1	6.4%
2015	106.2	6.2%	2.1	6.3%
2016	108.3	6.1%	2.2	6.5%
2017	112.2	6.1%	2.3	6.7%
2018	116.0	6.1%	2.3	6.6%

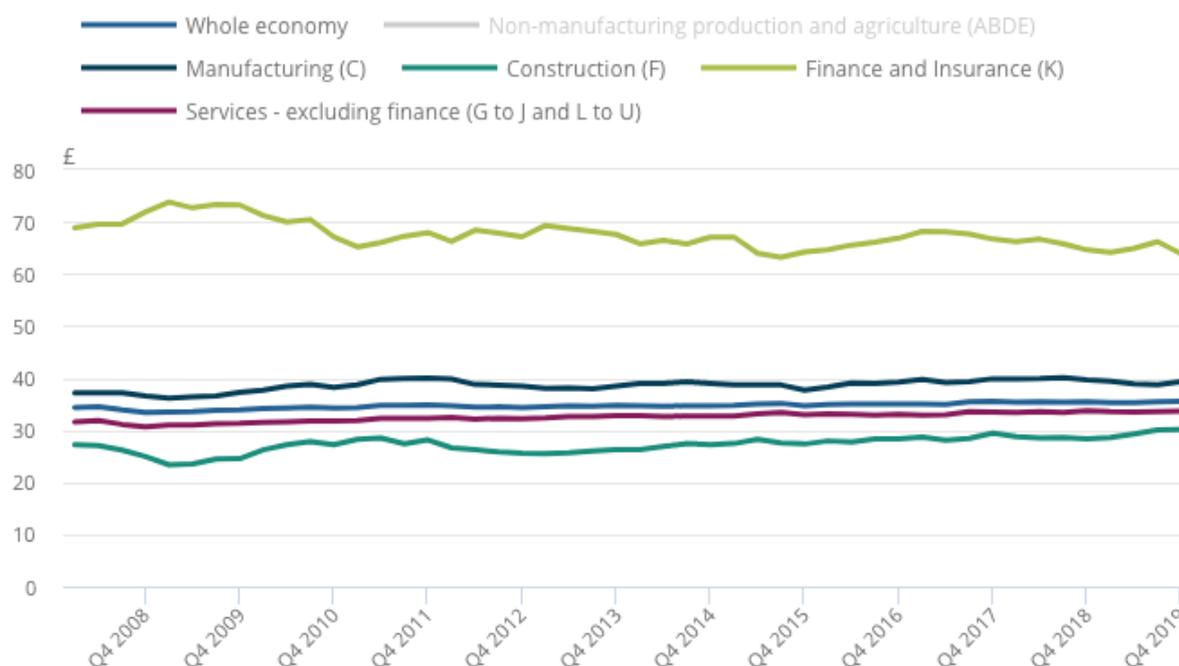
Data source: ONS, 2021

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Currently, the definition of 'construction', when it comes to measuring productivity of the construction industry includes only the 'narrow' construction sector: main contractors, specialised contractors and property developers 'on site' (Ive & Gruneberg, 2000). In practice the value of what is delivered on-site (from the 'broad' sector) has a much larger supply chain of resources, products and services of both tangible and intangible inputs and outputs. Whilst construction goods and services come from all sectors and are counted within their own sectors in the national accounts, we should note there are substantial differences in the labour and capital activity of the sectors contribution (ONS, 2021).

At an aggregate level, services are seen as more productive than construction: Figure 1 shows productivity of different sectors of the economy, where construction is the lowest, yet different to services.

Figure 1 - Output per hour (sa, cvm), UK, 2008 to 2019



Source: ONS, 2021

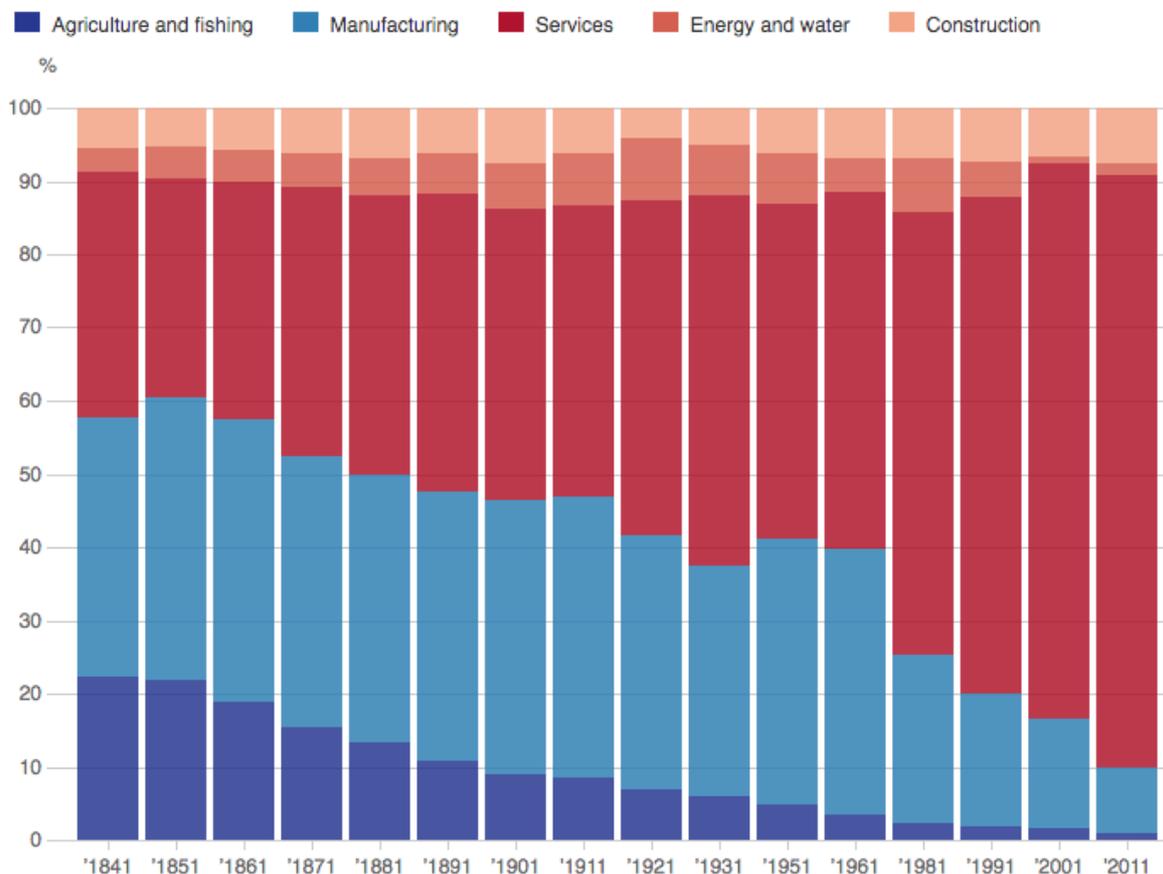
Main contractors (SIC 41.2) manage all aspects of the supply chain, specialised contractors (SIC 43) undertake labour-intensive tasks, while developers (SIC 41.1) are the capital-intensive owners of capital on whose land the works take place, and who may speculate. From any perspective, the productivity of labour, capital and TFP¹ in the activities are not expected to be similar. Furthermore, the contribution of services - the fastest growing sector of the economy - to construction productivity, has not been evaluated, nor can be from the current methodology. This matters because high level professional services have been a driver of growth in the last 50 years in the UK (see Figure 2), but low skilled services are held to hold wage growth and productivity back.

¹ TFP - total-factor productivity, also known as Multi-factor productivity (MFP), is defined as the residual output growth of an industry or economy after calculating the contribution from all inputs (or factors of production), effectively accounting for changes in output that cannot be explained by a change in measured inputs, reflecting on increases in the efficiency of use of these inputs.

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It is apparent that contracting and design, engineering and surveying services have expanded or evolved considerably in the last thirty years. Understanding how the development of services has impacted construction is long overdue.

Figure 2 - Percentage of the labour force working in each sector of the economy, England and Wales, 1841 to 2011



Source: 2011 Census Analysis, ONS

Patterns of employment and the structure of the labour market are also a perennial idiosyncrasy of the construction industry. Those whose labour is recorded in the 'narrow' on site definition have traditionally been and continue to be subject to a labour market that is overwhelmingly casual, where a long tail of SME's hire on irregular short term contracts. A significant proportion of those who are employed in services in the industry tend to have a more steady ongoing employment arrangement. The impact of a more integrated set of labour institutions which this implies need to be also evaluated.

Explanations for the relatively low productivity growth in the construction industry as measured do not generally look in these directions for analysis. The challenges have appeared to be around the measurement of changes in heterogeneous input and output while obvious increases in labour productivity at the construction project or site level fail to be reflected in industry level data (Sezer & Bröchner, 2014; de Valence & Abbott, 2015). This paper highlights the diversity in recorded output productivity in sectors on the industry and calls for the recording of productivity data by sector in the

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'broad' rather than 'narrow' on-site construction industry, suggesting to define the 'broad' construction industry as set out in Table 2.

Table 2. The 'broad' definition of the construction industry

Description	SIC 2007	
'Narrow' on-site construction	Developers	41.1
	Main contractors	41.2
	Civil engineering	42
	Specialised contractors	43
Construction services	Plant hire	77.32
	Architectural services	71.11
	Engineering services	71.12
	Quantity surveying	74.902
	Real estate activities	68
	Facility management	81

As seen from Figure 3, when disaggregating 'narrow' on-site construction into its components (SICs 41.1, 41.2, 42 and 43), it is very clear that, when measured in aGVA per employee, developers are significantly more productive. The aggregated (i.e. average) level of productivity (the F – Construction "line") is being predominantly determined and, effectively, "pulled down" by the relatively low productivity of specialised contractors (SIC 43)². This may be explained by the fact that they undertake the most labour-intensive, often low-skilled, on-site tasks. While noting the relative stability of the specialised contractors' productivity, there is an increasing gap between the overall construction productivity and that of specialised contractors. This may be explained by the increases in productivity of civil engineering contractors (SIC 42) as well as main contractors (SIC 41.2).

Productivity of construction-related services is higher than productivity of the on-site activities (see Figure 3). A notable exception with particularly low productivity is facility management (SIC 81, services to buildings and landscapes activities), Although FM service may be expected to be very labour-intensive and very low-skilled, its GVA contribution is significant³. The lack of relative growth in productivity of engineering services (SIC 71.12) is apparent. The engineering services are of particular importance in terms the direct, practical contribution to the construction process. It may be argued that contractors' productivity is a reflection of how well the on-site tasks are performed, the productivity (or the actual add value) of the output produced by the contractors heavily depends on the input from engineering services. As fact that productivity of architectural services (SIC 71.11), engineering services (SIC 71.12) and quantity surveying (SIC 74.902) was in decline, while contractors saw relative

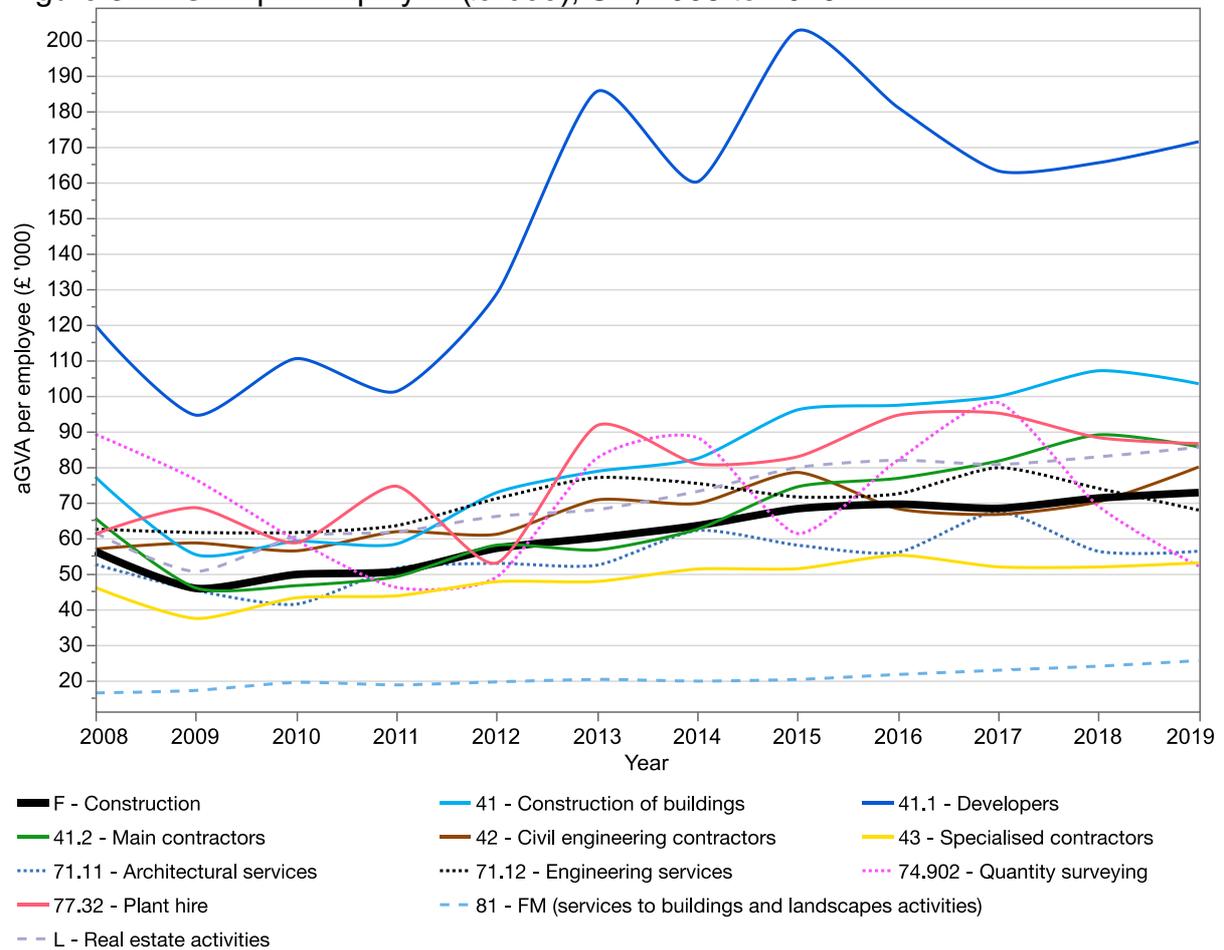
² SIC 43 – Specialised contractors accounts for ~55% of employment of F – Construction, while SIC 41.1 - Developers accounts for ~6.5%.

³ SIC 81 - Services to buildings and landscapes activities accounts for ~£18bn, which is ~£2bn more than SIC 42 - Civil engineering contractors contribute to the economy.

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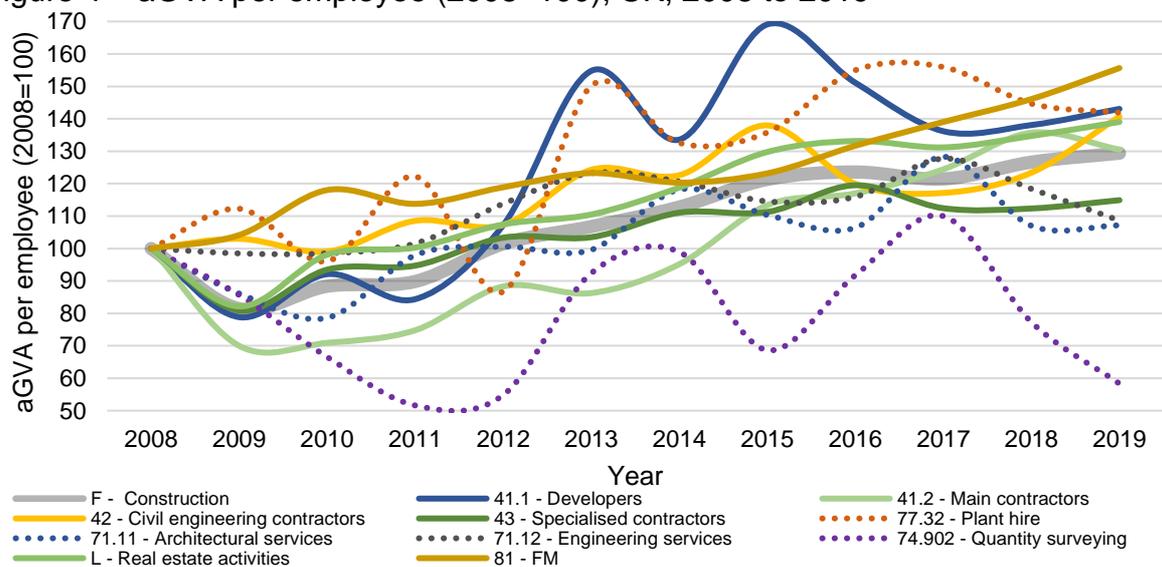
increases in their productivity (and with greater growth rates, as shown in Figure 4) further highlights the need for further investigation of the relationship between on-site construction and construction-related services.

Figure 3 – aGVA per employee (£ '000), UK, 2008 to 2019



Data source: ONS, 2021

Figure 4 – aGVA per employee (2008=100), UK, 2008 to 2019



Data source: ONS, 2021

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To conclude, there is an obvious variance in productivity data for particularly closely interlinked parts of the construction supply chain: on-site activities and directly related services. An empirical productivity study that takes into account the 'broad' definition of the construction industry could not only bring a more reflective understanding of the state of the industry but also offer new explanations to its relatively low performance.

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