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The economic, social and environmental benefits of stimulating repairs and improvements to the Scottish built environment to aid a green recovery from Covid-19

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Disclaimer

The analysis in this report has been conducted by the Fraser of Allander Institute (FAI) at the University of Strathclyde. The FAI is a leading academic research centre focused on the Scottish economy.

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- PIVOTAL Consultancy
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- Scottish Event Campus (SEC)
- Turner & Townsend
- Zero Waste Scotland

The analysis and writing-up of the results was undertaken independently by the FAI. The FAI is committed to informing and encouraging public debate through the provision of the highest quality analytical advice and analysis. We are therefore happy to respond to requests for factual advice and analysis. Any technical errors or omissions are those of the FAI.

Executive Summary

The construction sector is an important contributor to the Scottish economy – directly supporting £8.5bn in Scottish GVA and supporting over 170,000 full-time equivalent jobs in the economy.

Once spill over effects are accounted for, we find that the sector supports almost £16bn in Scottish GVA and almost 300,000 full-time equivalent jobs across the Scottish economy.

According to the ONS' UK SIC 2007, the construction sector (SIC41-43) is made up of the following industries:

- Construction of buildings (SIC 41);
- Civil engineering (SIC 42); and,
- Specialised construction activities (SIC 43).

Specialised construction activities includes repair and maintenance and home improvements work. Repair work and home improvements, i.e. repair work to bring a house to standards or energy efficient improvements, are more common for older properties. Modern properties (i.e. built post-1982) are typically more energy efficient and require less repair work.

One of the main purposes of this report is to understand the differential economic multiplier effects of different construction activity with a particular focus on SIC 43. The Scottish Government's input-output tables, used for such multiplier analysis, aggregates SIC 41-43 therefore, this research involved splitting the tables into a larger table which disaggregates the construction sector.

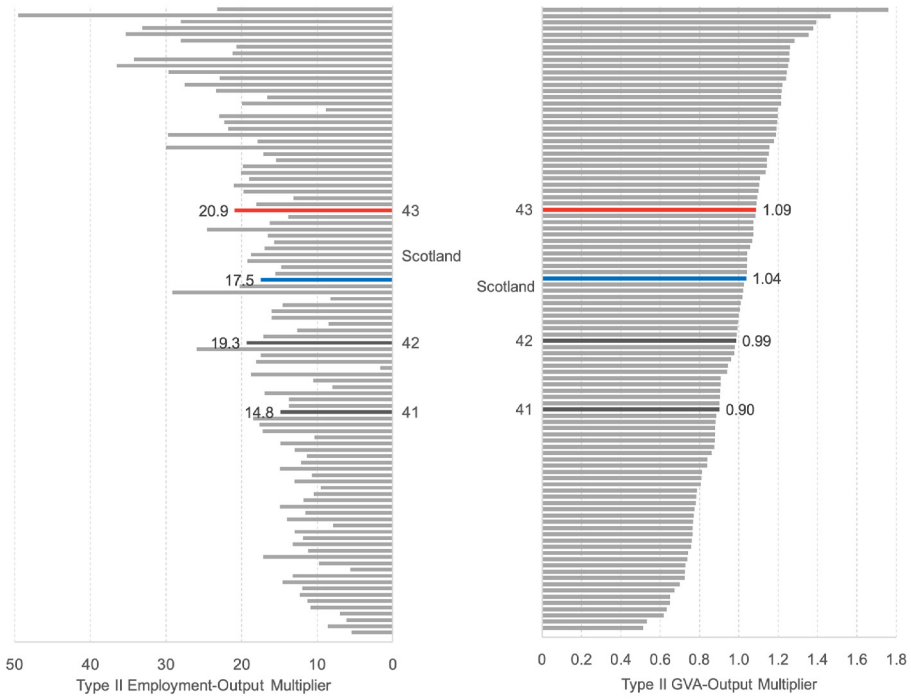
The results indicate that –

- Within the construction sector, specialised construction activities – which includes repair and improvement activities – generates the biggest economic impact of the three construction industries. Both in terms of GVA impact and employment impact. We have used new data sources to build these new multipliers.
    - We find that, once spill over effects are considered, for every £1m spent on specialised construction activities, around 21 full-time equivalent employment and £1.09m GVA is supported in the Scottish economy.

Chart 1 shows the multipliers of the 100 sectors of the Scottish economy, along with the average multiplier across Scottish industries.

These charts show that sector 43 – specialised construction activities – has larger multipliers than the other construction sectors; sectors 41 and 42. Additionally, the specialised construction sector has higher multipliers than the Scottish average.

Chart 1: Employment-output and GVA-output multipliers for 100 sectors of the Scottish economy



Source: *Fraser of Allander Institute*

Additionally, this report looks into the potential economic impact that a VAT cut from 20% to 5% in the specialised construction sector could have on the Scottish economy.

The results show that –

- The positive impact from the positive demand shock alone could generate between £80m - £400m in Scottish GVA and support between 1,500 - 7,500 full-time equivalent Scottish jobs – the economic benefit is dependent upon the price elasticity of demand.
- The net economic impact would be negative if the government does not borrow to finance its current level of expenditure as the VAT cut would result in decreased VAT receipts – this is after the positive impact on VAT receipts from the positive demand shock is accounted for.
- The gross benefit to the economy is highly dependent on the pass through rate of the VAT cut – i.e. the extent to which the reduction in VAT feeds into a change in demand.

Introduction

The construction sector is an important contributor to the Scottish economy – directly supporting £8.5bn in Scottish GVA and supporting over 170,000 full-time equivalent jobs in the economy.

The ongoing Coronavirus pandemic represents the greatest public health crisis in a generation and the subsequent economic crisis has been severe. While the economy will recover, and such recovery is already underway – albeit slowed down in recent months by local lockdowns and regional tiered restriction systems -, the pandemic will have a long-lasting and significant impact on the economy.

When the economy first locked down in March large parts of the construction sector ceased operations. As the economy began to open back up in the summer months the sector bounced back sharply and the recovery to date has been promising – economic activity in this sector is now 6% below pre-crisis levels.

Economic policy will be crucial in supporting this sector in the months and years ahead. However, effective policy requires understanding the economic contribution of this sector to the Scottish economy.

But, the construction sector is made up of three industries: construction of buildings; civil engineering; and, specialised construction activities.

It is therefore important to not only understand which sector is the most attractive to invest in - i.e. which industry gives the biggest bang for your buck for the Scottish economy – but also to highlight the potential economic impact that demand stimulants – i.e. a VAT cut – could have on this sector.

This report aims to highlight the economic impact of the construction sector, highlighting the multiplier effects that investment into this sector could stimulate and the potential economic impact that a VAT cut in repair and maintenance could have to support the Scottish economy in its economic recovery from COVID-19.

The institute is aware that this research project is highly detailed and so we have split this report into seven key sections. This report is structured as follows –

- Section 1 outlines the repair and maintenance findings from the SHCS, highlighting what types of properties need repair work and what these repairs typically involve. Additionally, it outlines the home improvement findings from the SHCS, highlighting what type of properties require energy efficient home improvements. This section also outlines what improvements are required to make properties more energy efficient.
- Section 2 discusses how the construction sector has fared throughout the ongoing Coronavirus pandemic, reflecting on the harsh hit to activity experienced early lockdown and the fast recovery experienced since summer months.
- Section 3 outlines the economic impact of the construction sector.
    - Firstly, we set out the activities of the construction sector as a whole, outlining who this sector supplies to and who it buys from for its inputs.
    - Secondly, we model the economic impact of the whole construction sector.
    - Finally, we estimate the multiplier effects of the three industries which make up the construction sector. This subsection includes analysis into why the multipliers of each of the three industries differ.

- Section 4 includes a literature review on the potential impact of a VAT rebate for repair and maintenance activity.
- Section 5 estimates the economic impact that a VAT cut of 15-percentage points would have on the repair and maintenance industry of the construction sector. Analysis is done for a range of demand elasticities and sensitivity analysis is carried out based on the potential pass through rates of the VAT cut.
- Section 6 concludes this report.
- Finally, section 7 includes case studies provided by City Building Glasgow and A.C. Whyte & Co., highlighting the importance of education and training academies in the construction sector to promote social and environmental progress.

1. Repair & Maintenance and home improvements

Repair and maintenance (R&M)

Pre-1965 properties typically have higher rates of disrepair, particularly basic, critical and urgent, than post-1965 properties. In terms of extensive disrepair, 1 in 10 pre-1919 properties are in need of extensive repair work. Table 1.

Box 1 outlines the criteria properties must meet to be considered in need of basic, critical, urgent and extensive repair.

Table 1: Rates of disrepair, 2017 & 2018

Dwelling Age	Any (Basic) Disrepair		Disrepair to Critical Elements	Urgent Disrepair	Extensive Disrepair
	No Disrepair	Some Disrepair			
pre-1919	16%	84%	73%	42%	10%
1919-1944	12%	88%	73%	36%	5%
1945-1964	16%	84%	67%	38%	8%
1965-1982	27%	72%	52%	25%	4%
post 1982	43%	56%	35%	16%	4%
Scotland total	25%	75%	57%	30%	6%

Source: *SHCS*

In terms of standards, in 2018, 2% of Scottish dwellings failed the Below Tolerable Standard (BTS). Over half of BTS stock is from Pre-1919 housing – around 6% of pre-1919 housing is BTS. Table 2.

Similar to disrepairs above, 1919-1964 properties also make up a sizeable share, over a third, of BTS properties. It appears that pre-1964 properties are in most need of repairs and most likely to fall below housing standards.

Table 2: Dwellings Below Tolerable Standard (BTS) by tenure and age, 2018

		Below Tolerable Standard	
		% of age	% of BTS Stock
Scotland (all ages)		2%	100%
Age of Dwelling	Pre-1919	6%	53%
	1919-1944	2%	13%
	1945-1964	2%	22%
	Post-1965	1%	13%

Source: *SHCS*

Box 2 outlines what the tolerable standard for housing in Scotland is.

Box 1: Basic, critical, urgent and extensive disrepair

SHCS defines basic, critical, urgent and extensive disrepair as -

- Any (or Basic) disrepair. This is the minimum threshold of disrepair measured in the SHCS and relates to any damage where a building element requires some repair beyond routine maintenance. It is the most comprehensive category covering all types of disrepair, however minor, and encompasses all other types of disrepair.
- Critical elements disrepair. This refers to disrepair to building elements central to weather-tightness, structural stability and preventing deterioration of the property. These elements are listed in section 7.8.7.3 of the 2016 Key Findings Report. There is some overlap in the building elements assessed under this category and those assessed for urgent disrepair. Not all disrepair to critical elements is necessarily considered urgent by the surveyor. The critical elements are those whose condition is central to a dwelling being wind and weather proof, structurally stable and safeguarded against further rapid deterioration. They are as follows:
    - Roof covering;
    - Roof structure;
    - Chimney stacks;
    - Flashings;
    - Roof gutters and downpipes;
    - External walls - finish;
    - External walls - structure;
    - Access decks and balustrades (common areas - flats only);
    - Foundations;
    - Damp-proof course;
    - External doors and windows (dwelling only);
    - Doors, screens, windows and roof lights (common areas - flats only);
    - Internal walls/partitions
    - Floor structure;
    - Floor finish; and,
    - Dry rot/wet rot.
- Urgent disrepair. This relates to cases requiring immediate repair to prevent further damage or health and safety risk to occupants. Urgency of disrepair is only assessed for external and common elements.
- Extensive - To be described as extensive, the damage must cover at least a fifth (20%) or more of the building element area. This category is different from the severity of damage as described by the next two categories, urgent and critical, and can be applied to any of the other 3 categories of disrepair.

Box 2: What is the BTS?

The Tolerable Standard is set out in the Housing (Scotland) Act (1987, 2006). Section 86 of the 1987 Act and Section 12 of the 2006 Act outline the tolerable standard requirements for Scottish properties. Local authorities are responsible for ensuring that properties that fail to meet the tolerable standard are closed, demolished or brought up to standard.

Tolerable Standard is a basic level of repair that a property must meet to be fit for a person to live in. Local councils have powers to force owners to carry out essential repairs to bring homes up to a tolerable standard. It is worth noting that the tolerable standard does not require homes to be wind and water tight however, the Repairing Standard does. Under the tolerable standard, homes may be unfit if:

- There is rising or penetrating damp;
- It is not structurally stable;
- There is not enough ventilation, natural and artificial light or heating;
- It is not insulated enough;
- It does not have an acceptable fresh water supply, or a sink with hot and cold water;
- It does not have an indoor toilet, fixed bath or shower, ad a wash basin with hot and cold water;
- It does not have good drainage and sewerage system;
- The electric supply does not meet safety regulations
- It does not have a proper entrance; and,
- There are no cooking facilities – there must be a place for a cooker to be installed (Landlord doesn't need to install one but there must be a place for one to be installed).

But, there are other housing standards which properties must be assessed upon. Table 3 outlines a few of these.

The Scottish Housing Quality Standard (SHQS) ensures that rented houses are: energy efficiency, safe and secure; not seriously damaged; and, have kitchens and bathrooms that are in good condition. Similar to disrepairs and BTS, older properties typically fail the SHQS more so than newer properties however, under this standard, only post-1982 appear to have a low failure rate.

Additionally, there are checks to ensure that properties pass health and safety standards and have modern facilities. Here, a similar trend is seen with health and safety standards – the failure rate increases with the age of the properties. However, in terms of modern facilities, only pre-1919 properties appear to differ from the rest of Scotland's housing stock.

Finally, there are standards surrounding the energy efficiency of a home. Again, newer properties, built since 1982, appear to be the most energy efficient – or at least are efficient enough to pass this criterion.

Table 3: Proportion of dwellings failing SHQS and individual criteria by dwelling age, 2018

	pre - 1919	1919 - 1944	1945 - 1964	1965 - 1982	post 1982	Total
SHQS Overall	54%	51%	49%	49%	17%	41%
BTS	6%	2%	2%	1%	1%	2%
Energy Efficient	32%	40%	40%	40%	10%	30%
Modern Facilities	12%	4%	6%	5%	4%	6%
Healthy, Safe and Secure	26%	13%	12%	10%	5%	13%

Source: *SHCS*

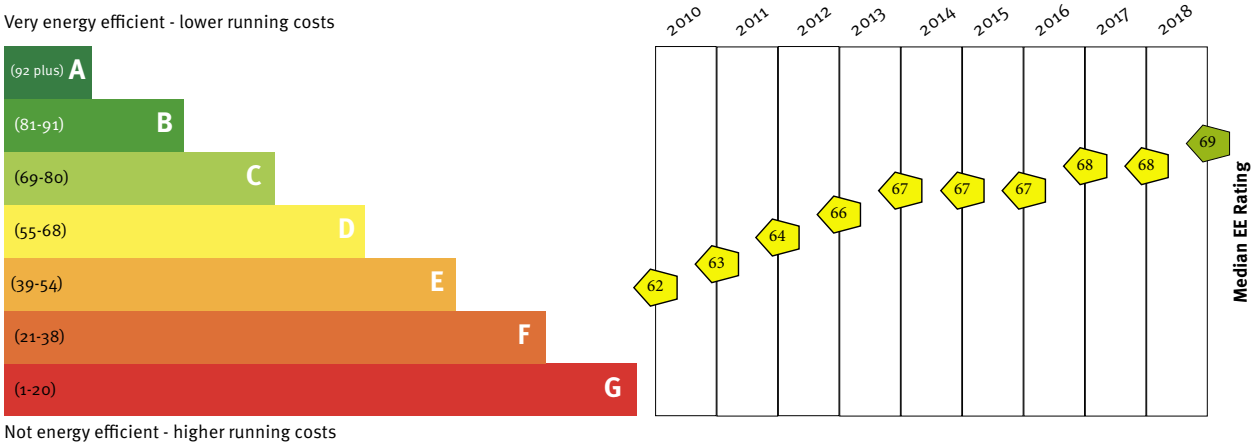
Home Improvements

In the past decade, energy efficiency in Scottish homes has increased – the median Energy Efficiency Rating (EER) in 2018 was 68, the highest rating on the Energy Performance Certificate's (EPC) band D. Chart 2. The transition of homes from lower EPC bands (G-D) to higher (C-B) can be seen in Chart 3.

This coincides with the share of households with energy use monitoring - 28% in 2018 compared to 2% in 2008. Awareness of energy efficiency has potentially increased with increased monitoring and increases in the median (and average) EER across Scotland.

> "In the last few years there has been a definite shift towards green technology in regard to heating and electricity sources"
> *- Stakeholder Quote*

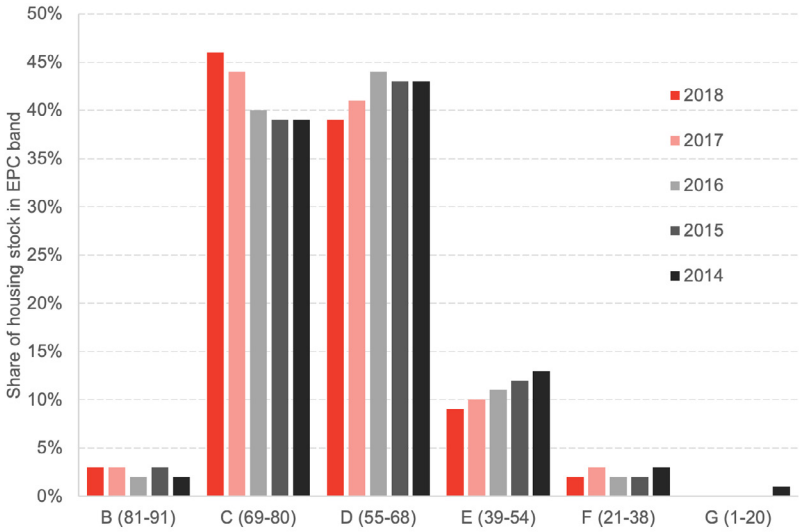
Chart 2: Median EER relative to EPC bands, SAP 2009, 2010-2018



Source: *SHCS*

> "The demand for retrofitting is there as we move towards a more net zero economy"
> *- Stakeholder Quote*

Chart 3: Median EER relative to EPC bands, SAP 2009, 2010-2018



Source: *SHCS*

Around ¾ of Scottish properties were built pre-1982 and have an average EPC band rating of 55-65 (Band D, same as Scottish average). Pre-1919 homes are the least efficient with an average EE rating of 55. Post-1982 homes have an average rating of 72 (Band C). Table 4.

Table 4: SAP 2012: Mean EER and Broad EPC band by age of dwelling, 2018

	EER Rating	Band		
Age of dwelling	**Mean**	**BC**	**DE**	**FG**
pre-1919	55.3	20%	65%	14%
1919-1944	63.1	26%	71%	2%
1945-1964	64.7	36%	61%	3%
1965-1982	64.8	39%	60%	2%
post-1982	71.7	74%	26%	0%
Scotland	64.7	43%	53%	4%

Source: *SHCS*

> "A large problem in the sector is that whilst we transition to net zero and make more energy efficient properties, there is a lot of pre-1919 built properties lying empty, with too high costs to improve"
> *- Stakeholder Quote*

Unsurprisingly, older properties are also the worst for carbon emissions - see Table 5.

Additionally, fuel poverty rates are the worst for pre-1982 homes – in 2018, poverty rates varied from 26% - 29%. On the other hand, just under 20% of post-1982 homes were considered to be in fuel poverty in 2018.

Box 3 outlines the UK government's guidance on how to improve a property's EER.

Table 5: Average Modelled Annual Carbon Emissions (tonnes per year) by Dwelling Age and Type, 2018

Dwelling Type	Dwelling Age			
	Pre-1919	1919-1982	Post-1982	All
Detached	15.8	10.1	8.1	10.2
Semi-detached	12	7.1	5.2	7.1
Terraced	10.8	5.9	4.7	6.4
Tenement	5.7	4.1	3.4	4.4
Other flats	7.8	4.8	3.7	5.2
All dwelling types	9.7	6.3	5.7	6.8

Source: *SHCS*

"Construction firms and their customers need to be conscious of their carbon footprint when improving the energy efficiency of a home"
- Stakeholder Quote

Box 3: What is needed to get homes up to standards?

The UK Government provide guidance on improving EER:

- Replacing windows and doors;
- Double glazing;
- Loft and wall insulation;
- Upgrading heating;
- Using energy efficient lighting;
- Draughtproofing; and
- Generating renewable energy sources such as wind or solar power

It is worth highlighting the need within the construction sector for a carbon assessment methodology as this could allow the sector to better understand the carbon savings from repair, maintenance and retrofitting work. Ideally, there would be a methodology accounting for embodied carbon also, providing the sector with estimates of net carbon savings.

"Whilst retrofitting provides a good way to advance existing properties, if the embodied carbon usage is worse than the carbon being saved by doing so then it is not worthwhile"
- Stakeholder Quote

An important factor in the EER EPC rating is the cost of heating a home. Table 6 highlights that poor or inadequate heating, draughts, poor insulation and the need for new windows are the most common reasons for why heating home is difficult.

Again, older properties appear to be the most difficult to heat, particularly due to draughts, need for new windows, insulation and room size.

Table 6: Reasons heating home is difficult by property age band, 2018

Reason	pre-1919	1919-1944	1945-1964	1965-1982	post 1982	Total
None reported	49%	63%	64%	69%	74%	65%
Poor or inadequate heating	18%	14%	14%	14%	13%	14%
Draughty	22%	17%	15%	14%	7%	14%
Need new windows	12%	11%	10%	7%	5%	8%
Poor insulation	17%	12%	7%	5%	3%	8%
Can't afford to heat house	5%	5%	6%	3%	3%	5%
Hard to control heating	5%	4%	2%	3%	3%	4%
Rooms too big	9%	1%	1%	1%	1%	2%
Other	2%	1%	3%	1%	2%	2%

Source: *SHCS*

Around 84% of pre-1919 properties reported having no damp or condensation in the 2018 SHCS – this compares to around 94% of post-1982 properties and a Scottish average of 89%. No post-1982 properties reported penetrating and rising and/or penetrating damp compared to 8% of pre-1919 properties. Table 7.

Table 7: Damp and condensation by dwelling age, 2018

Defect	pre-1919	1919-1944	1945-1964	1965-1982	post 1982	Total
No Damp or Condensation	84%	84%	88%	91%	94%	89%
Condensation	11%	14%	11%	7%	5%	9%
Penetrating damp	8%	4%	2%	2%	0%	3%
Rising damp	1%	*	*	*	*	0%
Rising and/ or penetrating damp	8%	4%	2%	2%	0%	3%
Condensation and any damp	3%	*	1%	*	*	1%

Notes: **=suppressed due to small sample size*

Source: *SHCS*

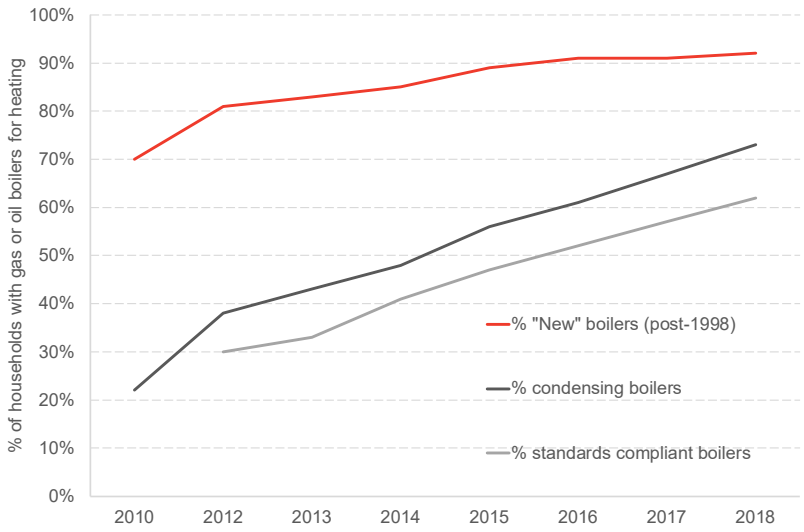
In terms of heating improvements, the share of households using gas or oil boilers to heat their homes rose from 83% to 88% between 2010 and 2018.

Additionally, the past decade saw a rise in new boilers, efficient condensing boilers and more than a twofold rise in standards compliant boilers – See Chart 4. Although there are the usual differences in boiler types and the age band of a property, the difference isn't as apparent as other indicators. Table 8.

> "As we see the transition away from gas boilers, we will face the challenge of training engineers to be proficient in using the new energy efficient boiler technologies"
> *- Stakeholder Quote*

"Without education you are not taking enough steps to invest in an area, if you equip more people in the country to do this kind of work then it will create a much larger talent pool"
- Stakeholder Quote

Chart 4: Gas and Oil Boiler improvements, 2010, 2012-2018



Source: *SHCS*

Table 8: Gas and Oil Boiler improvements by age of property, 2010, 2012-2018

	pre-1919	1919-1944	1945-1964	1965-1982	post 1982	Total
Households using gas/oil boilers for heating						
%	87%	96%	90%	86%	84%	88%
000s	408	271	475	454	562	2,171
of which:						
% "New" boilers (post-1998)	91%	91%	93%	93%	93%	92%
% Condensing boilers	67%	69%	79%	74%	72%	73%
% Standards compliant boilers	59%	56%	65%	65%	63%	62%

Source: *SCHS*

"There's so much focus on new builds in the sector, but there's bigger opportunities in retrofitting older properties"
- Stakeholder Quote

Additionally, wall insulation has almost doubled in 6 years. In 2018, 41% of houses were un-insulated; 21% of which had solid/other wall types. 81% of properties with solid and 'other' walls were un-insulated – of which, 67% were built pre-1919 and 14% were built post-1919. See Table 9.

Table 9: Wall Insulation of solid and other wall types, by age, 2018

	Total		
	Thousands (ooos)	**% of type**	**% of all**
Un-insulated	524	81%	21%
- Pre-1919	431	67%	17%
- Post-1919	93	14%	4%
Insulated	122	19%	5%
- Retrofit	99	15%	4%
- As built	23	4%	1%
Total	646	100%	26%

Source: *SCHS*

Summary

In summary, the estimates of the SHCS are unsurprising – older properties are in greater need of repair and are less energy efficient than newer properties. This section outlined some of the key ways in which properties can be either brought up to standards, repaired or made more energy efficient. These repair and maintenance and home improvement measures fall under the specialised construction industry within the construction sector – See Appendix A.

2. The Effect of Covid-19 on the Scottish Construction Sector

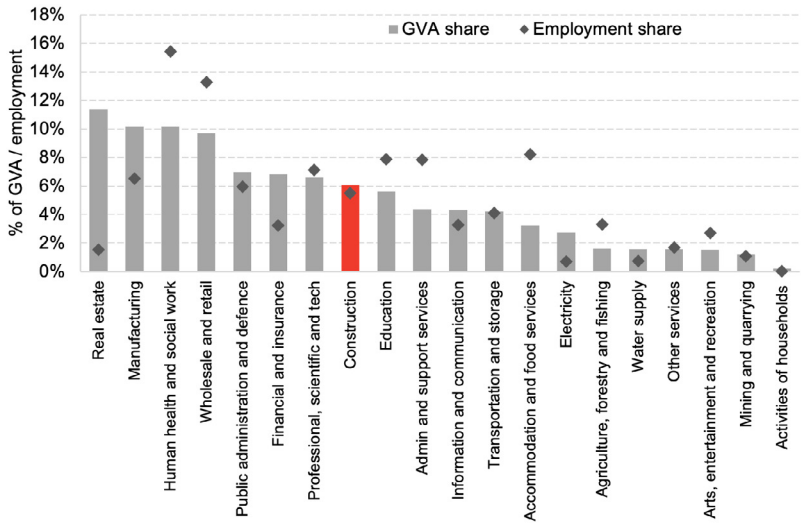
Construction is a sector which has productivity and wages in line with the Scottish average. It supports an above average share of national GVA and employment and, activity is widely dispersed across regions of Scotland. The sector is comprised mostly of SMEs and offers relatively stable forms of employment compared to other sectors.

The construction sector has been sharply affected during the first few months of the spring lockdown. However, as restrictions began to be eased it was able to recover faster relative to other sectors due to 'pent-up demand' that built up as a result of delayed projects. Demand for temporary labour has been growing in the sector since the start of July, however demand for permanent staff has failed to recover in the face of future uncertainty. Despite a considerable share of businesses facing the prospect of reduced business volumes, insecure cashflow, and potential layoffs, the construction sector faces a slightly better outlook than other parts of the Scottish economy.

Construction in the Scottish economy – industry structure

The construction sector is the 8th largest sector of the Scottish economy in terms of output. In 2018, it constituted around 6% of Scottish GVA and 5% of Scottish employment – Chart 5.

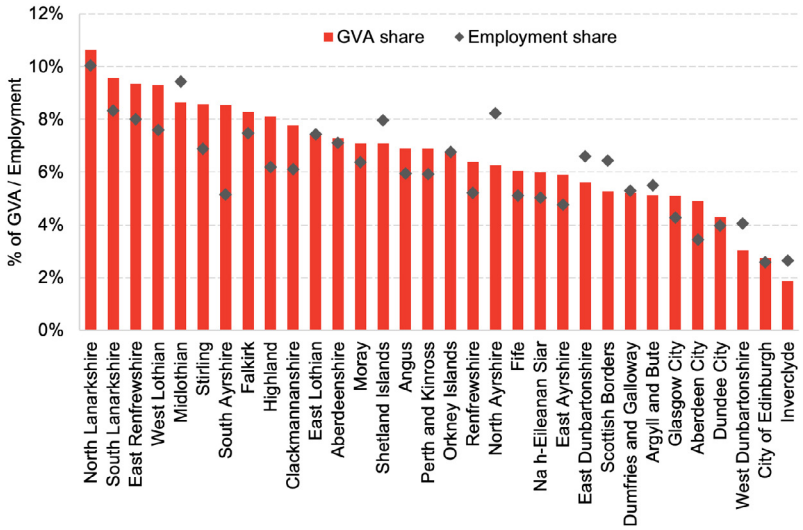
Chart 5: Share of GVA and employment by sector, Scotland, 2018



Source: *ONS, BRES*

On a regional scale, the construction sector is most prominent in North Lanarkshire and South Lanarkshire. On the other hand, Edinburgh and Inverclyde have the lowest share of GVA and employment in the construction sector.

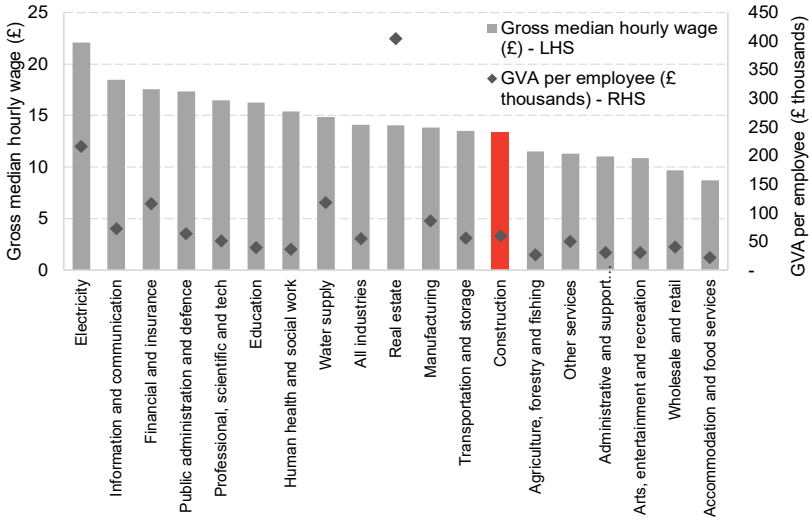
Chart 6: Share of GVA and employment in the construction sector, Scottish local authorities, 2018



Source: *ONS, BRES*

Compared to other sectors of the Scottish economy, construction is slightly above average in terms of productivity. GVA per employee was around £60,000 in 2018, which is greater than the Scottish average of £55,000. However, construction is in the lower half of sectors in terms of wages. In 2020 the gross hourly wage in construction was £13.35 which is slightly below the Scottish average of £14.10.

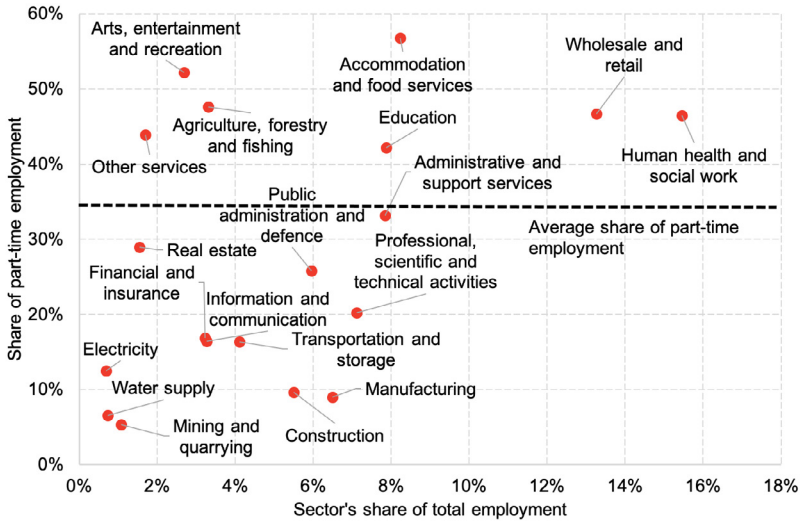
Chart 7: Gross median hourly wage (2020) and GVA per employee (2018), sectors of the Scottish economy



Source: *ASHE, ONS, FAI calculations*

Furthermore, construction is one of the sectors with the lowest shares of part-time employment – Chart 8. This suggests that workers in construction may be slightly better positioned to withstand cuts in working hours in the case of an economic downturn in comparison to sectors with a higher share of part-time workers.

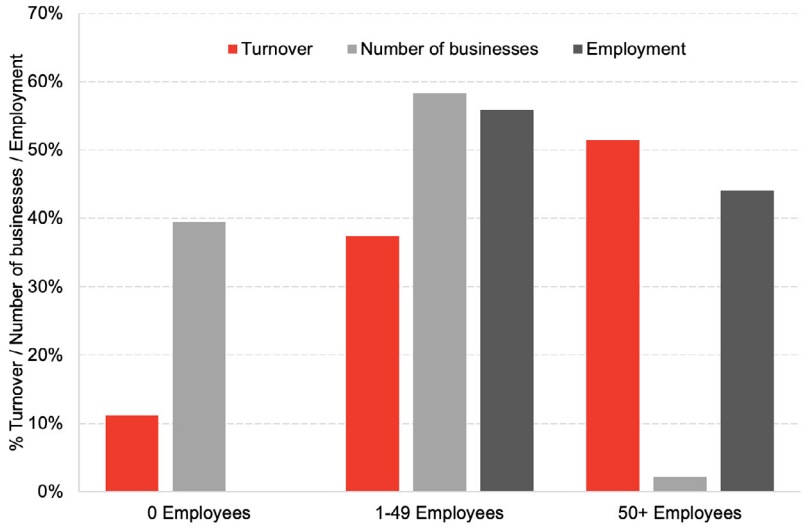
Chart 8: Share of part-time employment and sector's share of total employment, 2018



Source: *BRES, FAI calculations*

The business base in the construction sector is composed mainly of SMEs with 1 – 49 employees. SMEs support the largest share of jobs, but large businesses with 50+ employees support most of the turnover generated in the sector.

Chart 9: Structure of the business base in the Scottish construction sector, 2018



Source: *SABS*

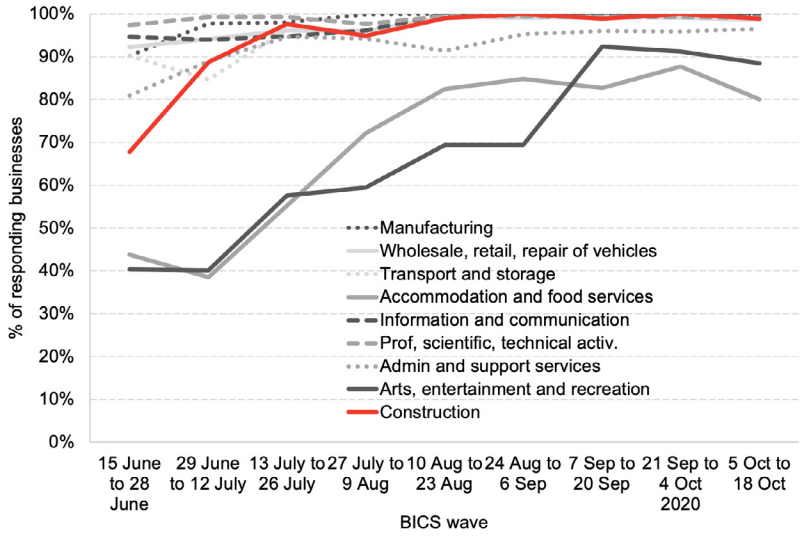
Developments in the Scottish construction sector during the lockdown and re-opening of the economy

Many businesses in the construction sector had to temporarily pause trading due to the lockdown restrictions during the first wave of Covid-19. In the second half of June only around two thirds of businesses were trading. This was one of the lowest proportions amongst sectors of the Scottish economy (only ahead of accommodation & food services and arts, entertainment, and recreation; industries hardest hit by lockdown restrictions).

Most businesses in the construction resumed trading by the end of July.

> "The pandemic has changed the majority of our focus to essential repair work as opposed to new build work or retrofitting"
> - *Stakeholder Quote*

Chart 10: Estimated share of businesses that are currently trading, broken down by industry, Scotland, 15th June – 18th October 2020

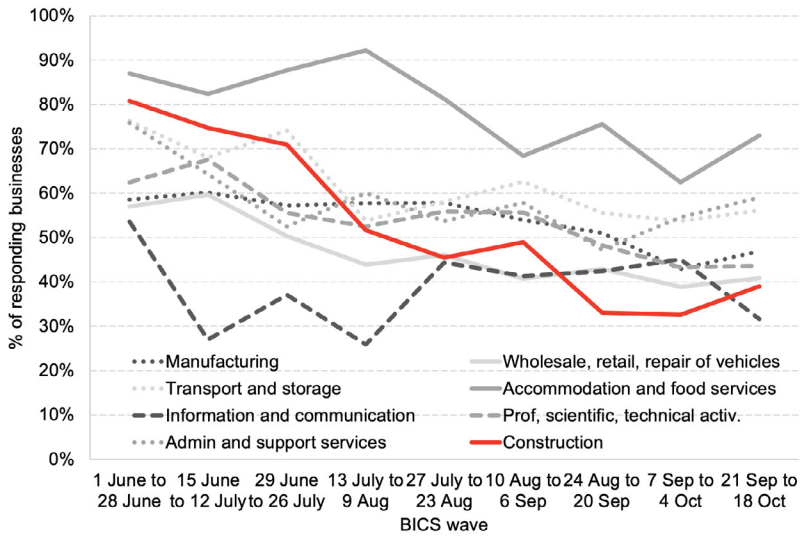


Source: *Scottish Government, BICS*

The temporary closure of businesses has led to a reduction in turnover. Throughout June more than a half of all businesses in the construction sector had reduced turnover outside of their normal range. Since then turnover has been recovering over time. In the second half of September / first half of October only 8.6% of businesses had reduced turnover.

> "The way in which the sector had to react to the pandemic was a huge learning curve for everyone involved, and practises that have been implemented as a result will last post-pandemic"
> - *Stakeholder Quote*

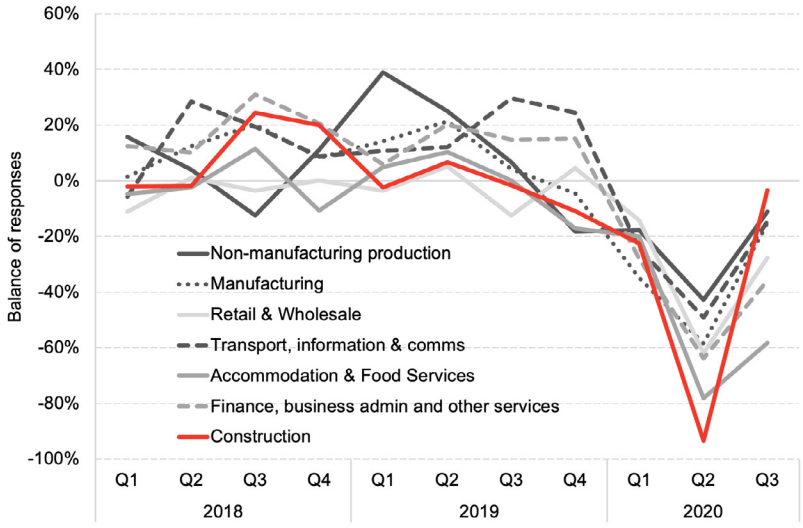
Chart 11: Estimated share of businesses with decreased turnover, broken down by industry, Scotland, 15th June – 18th October 2020



Source: *Scottish Government, BICS*

The volume of business fell most sharply for firms in the construction sector in Q2 2020. However, in Q3 2020 construction firms also saw the quickest recovery in business volumes out of all sectors. Nevertheless, the net balance of responses remained negative (a higher number of businesses experienced a decline than an expansion) at -3.4%.

Chart 12: Trend in volume of business across different sectors of the Scottish economy, net balance of responses, Q1 2018 – Q3 2020

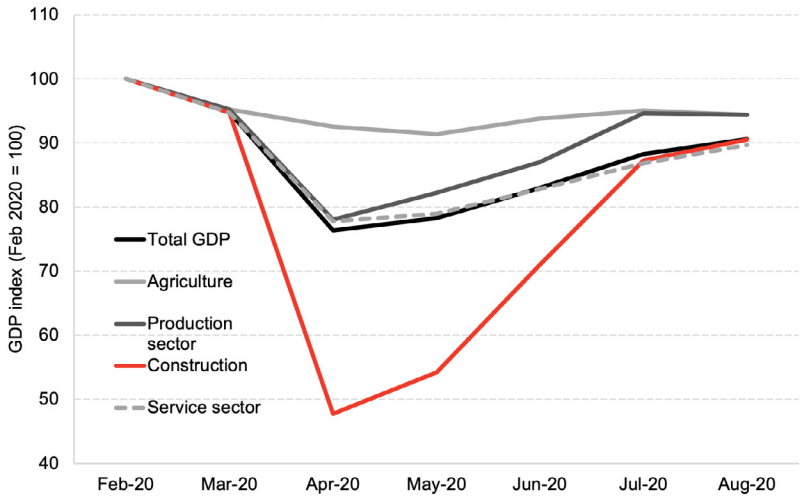


Source: *Scottish Business Monitor*

Pauses in trading, lower volumes of business and the resulting fall in turnover has contributed to a fall in GDP in the construction sector. Chart 13 shows that the contraction in GDP in the construction sector was much more pronounced than for the agriculture, production, and service sectors. However, output was able to recover relatively fast after the reopening of the sector in July. In September economic activity in the construction sector was around 6% below its pre-crisis levels in February. The Scottish economy as a whole produced around 92% of its February level in September – 8% below pre-crisis levels.

"Our original expectations of productivity levels were low with the introduction of social distancing and other restrictions; however, we were surprised that they turned out much higher"
- Stakeholder Quote

Chart 13: Monthly GDP across major sectors of the Scottish economy, February – September 2020

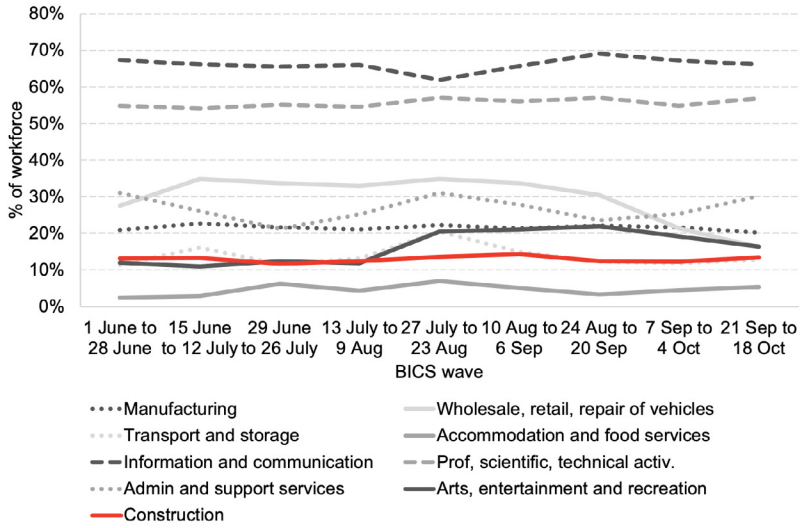


Source: *Scottish Government*

One of the possible factors behind the sharp initial contraction in GDP in the construction sector relative to the rest of the economy may have been the low ability to conduct work from home. Data from BICS shows that only just around 13% of the workforce in the construction sector has been able to work from home. This proportion has stayed constant over time and belongs to one of the lowest amongst all sectors of the Scottish economy.

"One of the main priorities has been ensuring a smooth transition for staff from inhouse to homework, and inevitably a more digital based role"
- Stakeholder Quote

Chart 14: Estimated share of workforce working remotely instead of their normal place of work, broken down by industry

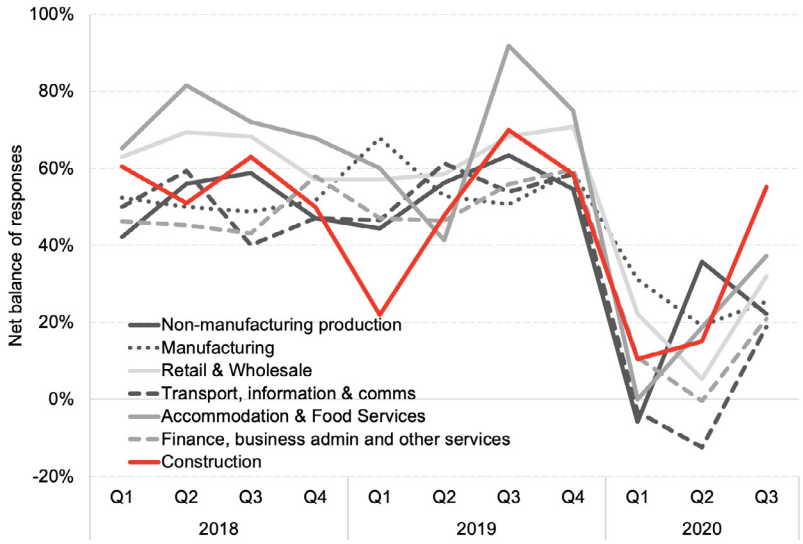


Source: *Scottish Government, BICS*

As a result of lower output most sectors of the Scottish economy have seen a fall in their variable costs. The magnitude of this effect has been less pronounced for the construction sector at the beginning of the lockdown. However, as firms in the construction industry resumed operation their variable costs rose again, leading to an increase in total costs. In Q3 more firms in the construction industry were seeing increasing costs relative to all other sectors of the Scottish economy.

> "The pandemic made the supply of materials sparse making it harder and more costly to complete projects that were due for completion"
> *- Stakeholder Quote*

Chart 15: Trend in costs, sectors of the Scottish economy, net balance of responses, Q1 2018 – Q3 2020

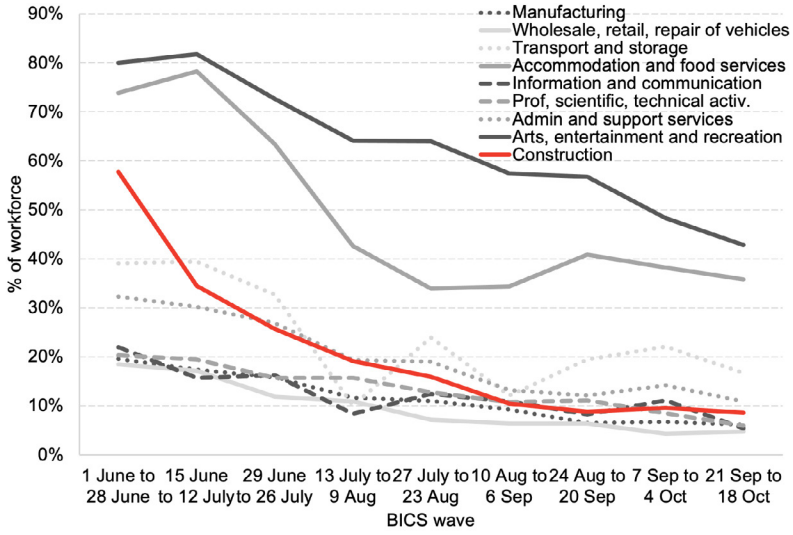


Source: *Scottish Business Monitor*

Despite the initial decline in variable costs, firms still had to meet fixed costs such as wages of their employees. The UK government has provided support to businesses in meeting these costs through the Coronavirus Job Retention Scheme. Data from BICS shows that the use of the furlough scheme was very widespread in the construction sector especially at the start of the lockdown. In the second half of June around 58% of all workers in the construction industry were on furlough. In subsequent weeks the share of furloughed workers fell sharply as firms resumed production and needed to utilise labour again. Between mid-September and mid-October only 8.5% of workers in the Scottish construction sector were estimated to remain on furlough.

> "Understanding the human and emotional side of our workforce has been a make-or-break factor for the business this year"
> *- Stakeholder Quote*

Chart 16: Estimated share of workforce on furlough leave, broken down by industry, Scotland, 1st June – 18th October 2020



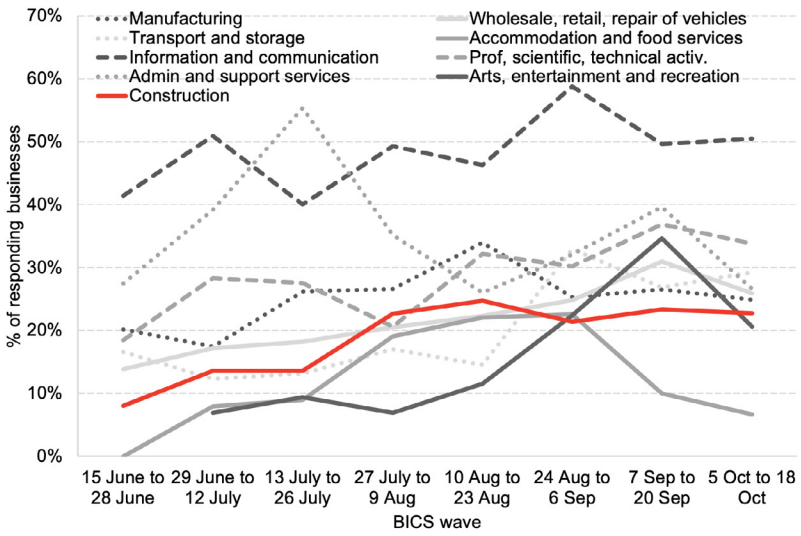
Source: *Scottish Government, BICS*

> "We used the time when employees were on furlough to invest into training, process improvements and digitalising systems so that when business resumed, we were far more able to adapt to this new way of working"
> *- Stakeholder Quote*

Lower output has also reduced the demand for labour for firms which has led to a lower number of vacancies. In the second half of June only around 8% of companies in the construction sector had any vacancies – the second lowest share out of all sectors. Since then the number of firms recruiting has picked up slightly, but in the first half of October only 23% of firms in the construction sector were recruiting – the third lowest share of all sectors.

> "One of our future challenges will be restoring apprenticeship schemes to ensure that we continue to grow the talent pool and expand the number of people with the right skillsets"
> *- Stakeholder Quote*

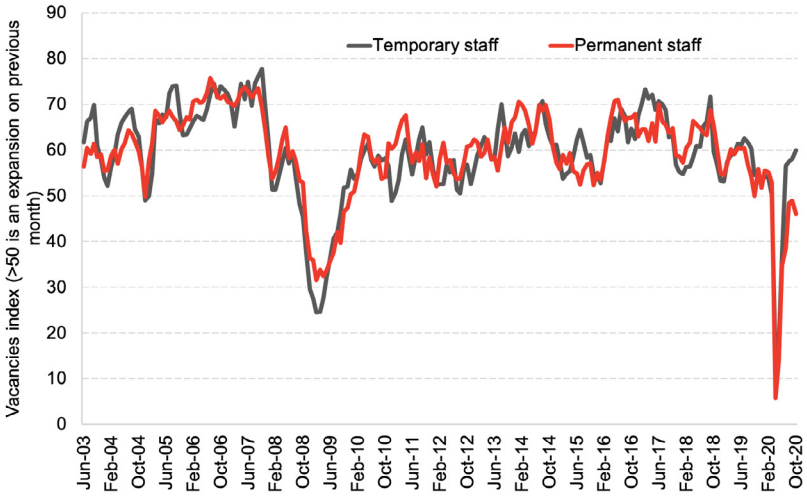
Chart 17: Estimated share of businesses with external vacancies that they are currently recruiting for, broken down by industry, Scotland, 15th June – 18th October 2020



Source: *Scottish Government, BICS*

Data from the Bank of Scotland Report on Jobs shows that the decline in labour demand in the construction sector was even more pronounced than during the 2008-2009 Financial Crisis. Moreover, the decline in vacancies was more pronounced for permanent staff than for temporary staff. Demand for temporary staff started growing again from July onwards, but demand for permanent staff has failed to grow since the beginning of the pandemic. This shows that construction firms face a high degree of uncertainty and may prefer more flexible contracts in case of a further lockdown or a lack of sustainable demand growth for their services.

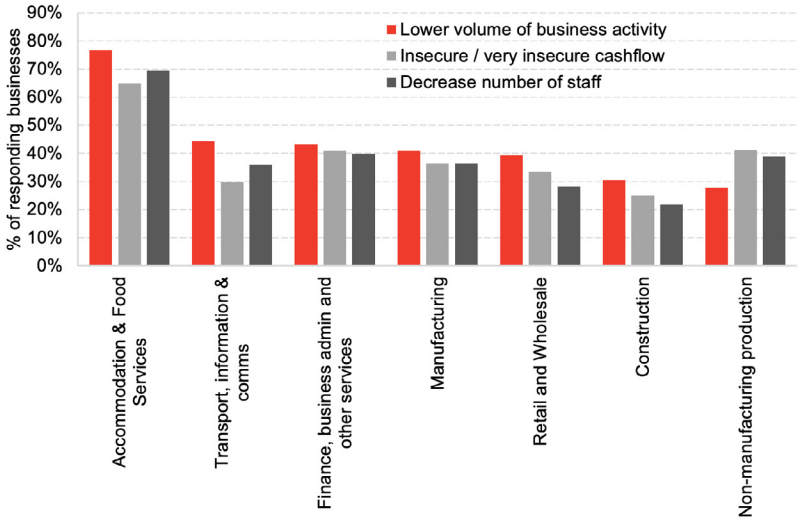
Chart 18: Temporary and permanent vacancies index for the construction sector, Scotland, June 2003 – October 2020



Source: *Bank of Scotland Report on Jobs*

The latest round of the Scottish Business Monitor shows that firms in the construction sector continue to face a challenging outlook. Over the next 6 months 31% of firms expect a lower volume of business activity, 25% have insecure or very insecure cashflow, and 22% expect to reduce staff numbers. However, the outlook for the construction sector is slightly better compared to other sectors of the Scottish economy.

Chart 19: Temporary and permanent vacancies index for the construction sector, Scotland, June 2003 – October 2020



Source: *Scottish Business Monitor*

The construction sector was heavily impacted as activity came to a standstill during the lockdown, leading to a significant decrease in housing completions in the second quarter of 2020. After its reopening at the beginning of July, the sector was able to recover quickly, but output remained 6% below pre-lockdown levels in September. Uncertainty about future lockdowns continues to act as a drag on labour demand in the sector and a third of all businesses are expecting a decrease in business activity over the next 6 months. As a result, around a quarter of construction businesses face an insecure cashflow outlook and may need to resort to cutting staff numbers.

The outlook for the whole Scottish economy remains uncertain however, given the adaptability of the construction sector it has managed to recover extremely fast relative to where it was early on in the pandemic. What is important moving forward is the economic policy in place to support this sector in the months and years ahead.

> "The construction sector is used to having health and safety protocols in the workplace; however, the pandemic brought another large adaptation to these existing procedures"
> *- Stakeholder Quote*

It is therefore important to outline the economic value that this sector adds to the Scottish economy, in terms of economic activity and jobs. And, it is important to understand the economic impact that investment into this sector could have on the whole economy.

> "The construction will be geared to deal with any problems it faces in the future, however information will be crucial, and knowing what is happening will make the process smoother"
> *- Stakeholder Quote*

3. Economic impact of the construction sector

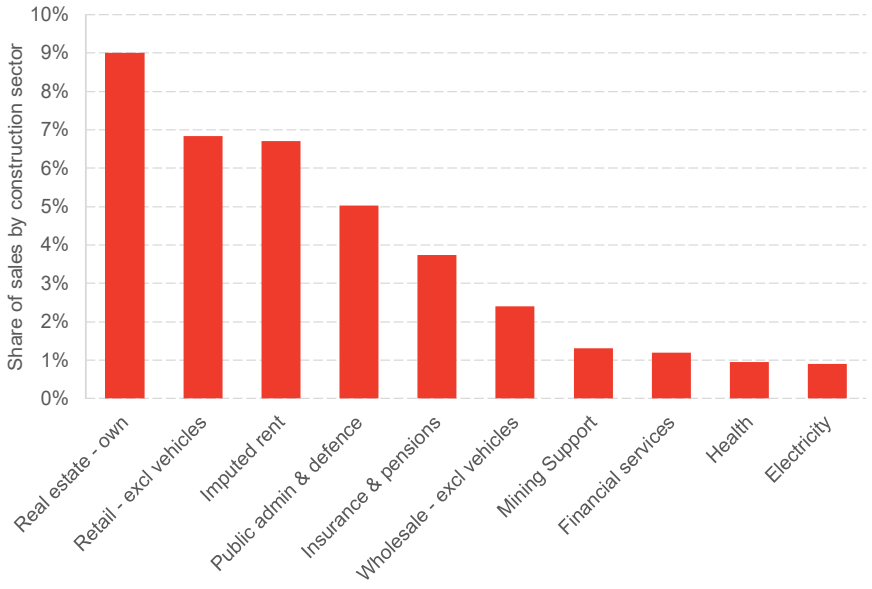
According to the ONS' UK SIC 2007, the construction sector (SIC41-43) is made up of the following industries:

- Construction of buildings (SIC41);
- Civil engineering (SIC42); and,
- Specialised construction activities (SIC43).

Before modelling the economic impact of the construction sector and its industries, it is important to understand a bit more about what is included in this sector, who it supplies to and who supplies it for its inputs.

Half of the sales made by the construction sector stay within the sector however, businesses in this sector also sell around 9% of their output to the real estate sector (this industry includes sales of properties and renting of properties). Chart 20.

Chart 20: Share of sales by construction sector, 2017

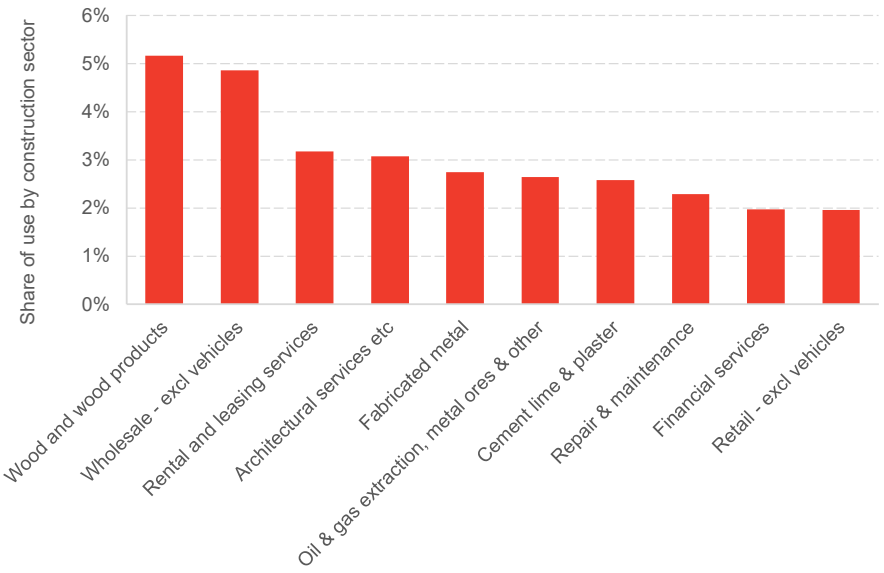


Source: *FAI calculations*

Like sales, the construction sector mostly uses inputs from the construction sector; 48% of construction input use is internally supplied. However, other common inputs include: wood and wood products; wholesale goods; rental and leasing activities; and, architectural activities. Chart 21.

> "If you can buy supplies local you will, however, you have certain places that have better quality goods for cheaper and so many firms choose to import"
> *- Stakeholder Quote*

Chart 21: Share of uses by construction sector, 2017



Source: *FAI calculations*

> The sector relies heavily on foreign labour, in particular, lots of our tradespeople are from Eastern Europe, however given Brexit, many have returned home with no plans to come back and so we fear depletion of the workforce and the loss of certain skilled workers.
> *- Stakeholder Quote*

Hypothetical Extraction

To understand the impact and wider spill over effects of the construction sector we estimate its economic impact using our detailed model of the Scottish economy.

This model estimates the impact that the removal of the construction sector has on economic output and growth in Scotland, both directly and through knock-on effects. Additionally, it models the employment spill over effects resulting from the complete removal of employment in this sector.

This modelling looks at the economic impacts of the construction sector on output, GVA and employment in Scotland.

Output here is the total value of goods and services produced within the economy. Output is calculated as GVA plus intermediate goods and services that are excluded in GVA calculations.

GVA is the value of all final goods and services produced within the economy in a given period of time and is used to measure economic growth. GVA can be expressed generally as the difference between revenue from sales and the cost of inputs. Following standard regional modelling practices, we model GVA instead of Gross Domestic Product (GDP). GVA is technically GDP at basic prices, i.e. excluding taxes and subsidies on products.

Employment here refers to full-time equivalent (FTE) jobs. One FTE job is equivalent to one person working full-time for one year or, two people working half the hours of a full-time worker for one year, and so on.

When evaluating an economic impact like this, we examine three types of activity: direct, indirect and induced effects.

Direct impacts

These relate to the expenditure on activities of firms within the construction sector. To provide its services firms within these sectors purchase from suppliers. The reaction of suppliers to meet this demand generates GVA.

Indirect impacts

The suppliers of firms within the construction sector in turn purchase goods and services from their own suppliers, generating economic activity through the whole supply chain.

Induced impacts

The wages paid as a result of the activities of firms within the construction sector, and its supply chain, are spent on goods and services across the Scottish economy.

Hypothetical Extraction Results

The results show that the construction sector contributes over £32.5bn in output to the Scottish economy and £15.8bn in GVA.

In addition to this, the sector directly employs over 170,000 FTE staff. The spill over effects of this sector's activities supports an additional 115,000 FTE staff, bringing the total employment supported by the construction sector to almost 300,000 jobs. Table 10.

Table 10: Economic impact of the construction sector, Scotland

	Output (£bn)	GVA (£bn)	FTE Employment
Direct	19.75	8.5	171,790
Indirect	5.1	2.5	46,350
Induced	7.6	4.7	69,000
Total	32.5	15.8	287,150

*totals may not sum due to rounding

Source: *FAI Calculations*

Multipliers for SIC 41, 42 & 43

The SHCS outlined common repairs and improvements carried out in properties to bring them to standards or improve their energy efficiency. These activities predominantly belong to SIC 43. The activities of SIC43 are outlined in Appendix A.

The construction sector is grouped by SIC41-43 in the Scottish Government input-output tables so in order to understand the economic impact of repair and improvement work (SIC43) we had to split this sector into each of the its three industries:

- Construction of buildings (SIC41);
- Civil engineering (SIC42); and,
- Specialised construction activities (SIC43).

Using data from the Purchases Survey, Scottish Annual Business Statistics and the Business Register & Employment Survey, we were able to estimate the activities of each construction industry and replace the original input-output model with a new model that included each of constructions three industries.

So, how does a pound spent on each of the three sectors of construction impact on the Scottish economy?

We can understand this by studying the multipliers estimated by our economic model.

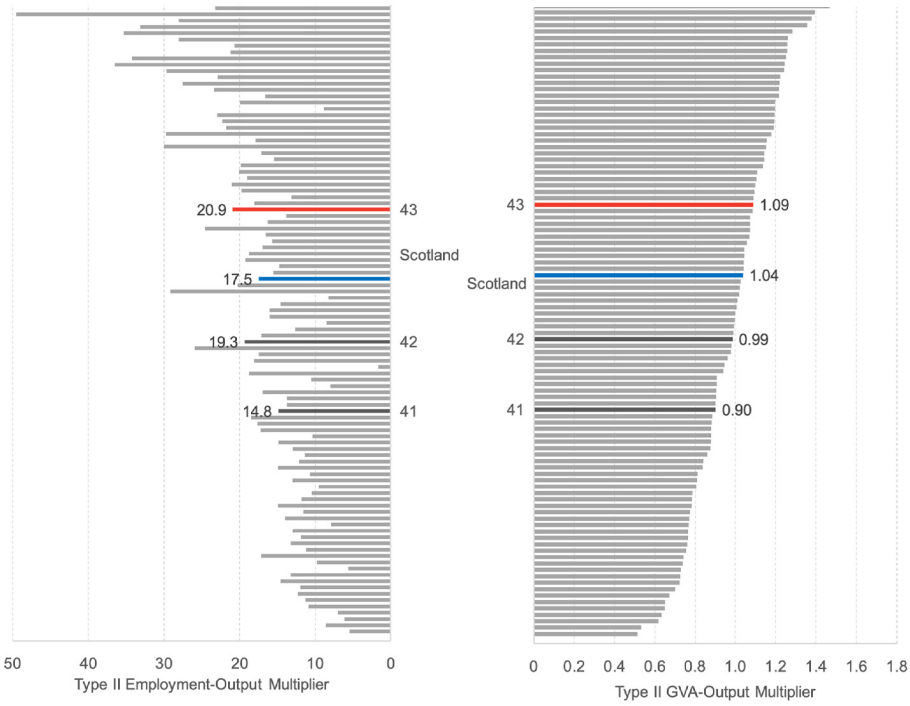
Multipliers describe the impact of a £1m increase in final demand for an industry. Final demand can include households, government, gross fixed capital formation, exports and so on. This increase in final demand requires the industry to increase its output to meet it.

The economy-wide effects from the resulting spill-overs, on output, employment and GVA give us our multipliers.

Employment-output multipliers show the number of full-time equivalent (FTE) employment supported by the increase in this sector. Similarly, GVA-output multipliers show the amount of gross value added supported.

Chart 22 shows the multipliers of the 100 sectors of the Scottish economy, along with an economy-wide average. These multipliers are "Type II". That is, they include the direct, indirect and induced effects previously mentioned.

Chart 22: Employment-output and GVA-output multipliers for 100 sectors of the Scottish economy



Source: *Fraser of Allander Institute*

These charts show that sector 43 – specialised construction activities – has higher multipliers than the Scottish average, as well as than the other construction sectors.

For every £1m spent on specialised construction activities, around 21 FTE employment and £1.09m GVA is supported in the Scottish economy.

As with all modelling, it's important to understand to what extent assumptions underpinning the model could affect the results.

In general, we find that the multipliers are driven by data rather than necessary assumptions. We have "traced" through the multipliers below to explain what is driving the differences between the three construction multipliers.

Table 11 shows how the three output multipliers vary by each effect. We can study this one multiplier to understand why the employment-output and GVA-output multipliers are higher for 43.

The output multiplier has not been shown in Chart 22 as output alone is often of less economic importance. For instance, if output increased by one million but costs also increased by one million, the value added from this is zero. However, it is useful for tracing the flow of purchases and sales through industries.

Table 11: Comparison of construction multipliers by effect type

	41	42	43
Direct	0.41	0.41	0.30
Indirect	1.18	1.18	1.13
Induced	0.40	0.56	0.58
Total	2.00	2.15	2.01

Source: *Fraser of Allander Institute*

The direct

Firstly, 43 has a smaller direct output multiplier than the other two sectors. This is because of the large labour costs involved, which are treated as a leakage from the sector spend in the direct effect.

We estimate that sector 43 imports less, which increases the direct effect as more spending is occurring domestically, however this does not mitigate the proportionally large staff costs.

The indirect

The indirect multipliers are fairly similar between the three sectors. The slight differences arise in a few areas. For instance, firms in sectors 41 and 42 (e.g. homebuilders and civil construction) are more likely to include firms in sector 43 (e.g. building completion, site preparation) in their supply chain than vice versa. 41 and 42 are also more likely to have manufacturing and professional services in their supply chains.

This multiplier depends on the purchases data used to separate these sectors from the aggregate sector 41-43.

Out of the IOCs, 54 of 100 have purchases data available. These explain 88.2% of the domestic purchases of 41-43. The remainder of the sectors, covering 11.8% of the data, are balanced to ensure the totals match the total domestic purchases of sectors 41, 42 and 43 respectively. For this to happen, 68.55% is allocated to 41, 13.25% is allocated to 42 and 18.20% is allocated to 43.

With additional information it would be possible to further adjust proportions in certain industries. E.g. you may wish to proportionately increase the amount that 43 purchases from retail and wholesale and decrease the purchases from other sectors.

The induced

The main positive effect for sector 43 is the induced effect. The wages supported by the employment supported in the direct and indirect activity drive the differences in the induced effects.

Table 12 shows that, for every million pounds of output, sector 43 supports £340,000 in employee compensation, considerably more than the other construction sectors. This is because it employs a significantly higher number of people.

Table 12: £m of employee compensation supported by each £1m of output

	41	42	43
Compensation of employees coefficient	0.15	0.28	0.34
Total Employee Compensation (£m)	1,240	980	2,685
FTE Employment in sector	38,650	25,000	76,250

Source: *Fraser of Allander Institute*

When examining the full spill-over effects of the activity of these sectors, economy-wide employee compensation supported directly and indirectly are 44% higher for sector 43 than for 41 and 2.1% higher for 43 than 42. These are what drive the higher induced effect.

Interestingly, this 44% occurs not because of employee compensation supported in other industries, or even because of employee compensation within the firm(s) directly impacted, but because so many firms in sector 43 have other firms in sector 43 in their supply chain.

That is – sector 43 indirectly supports a large amount of activity in its own sector. Combining this with the high employee compensation per million pounds of output seen in Table 12, results in this large 44% figure.

The impact on GVA-output and employment-output multipliers

As seen in Table 11, output multipliers in sector 43 are lower than the other sectors and yet it has a higher GVA-output and employment-output multiplier. The reasons for this are connected to the large induced effect.

One of the three (and typically the largest) components of GVA is employee compensation. Given the large amount of employee compensation supported throughout the economy by sector 43, it is not surprising that it has the highest multiplier of the three construction sectors.

This level of employee compensation arises from the large amount of employment in sector 43. This leads to a large direct employment-output multiplier. Combined with the large amount of firms within sector 43 that are indirectly supported by other firms in sector 43, this leads to a large indirect employment-output multiplier. And finally, the large amount of compensation of employees supported leads to a large induced employment-output multiplier.

In summary, the large GVA-output and employment-output multipliers of sector 43 arise from the large amount of employment in the sector, and the interconnectedness of firms within that sector.

4. Understanding the potential impact of a VAT rebate for Repair and Maintenance Activity

Literature Review

Section 3 outlined that investment into the repair and maintenance segment of construction, i.e. specialised construction activity (SIC 43), would generate the biggest bang-for-buck.

To stimulate demand in the repair and maintenance industry the government could cut VAT in this industry.

This literature search seeks to provide an overview of the impact a tax incentive could have in the housing repair, maintenance and improvement (RM&I) sector on the economy of Scotland by reviewing international evidence.

According to the ONS (2019) the housing repair, maintenance and improvement (RM&I) sector in Scotland is worth £1.97bn. This figure is however, an underestimate of the sector as top of this legitimate work it is estimated that an additional 56 percent (Experian, 2010) of RM&I work is undertaken in the 'informal' sector suggesting an additional £1.1bn of output in 2019. Furthermore, there is an estimated £485m of building materials purchased for DIY improvements on domestic property generating a labour element of £295m. Therefore, the total market for housing repair in Scotland for 2019 is ~£3.8bn.

There are international examples of proposed tax incentives for home improvements; these often focus on 'green improvements' such as insulation and rooftop solar (1, 2, 3). The most recent evidence comes from Experian produced reports in 2010 and 2014 for the 'cut the VAT' coalition, a group that believes that cutting the VAT in the RM&I sector will provide a raft of economic, environmental and social benefits.

RM&I sector structure

The Experian reports cite the 1996 GB Home Improvement Market survey, undertaken by Construction Forecasting and Research (CFR) and the Building Services Research and Information Association (BSRIA). The survey provided a detailed breakdown of the types and proportions of expenditure undertaken by households in Great Britain within the RM&I sector covering both the formal and informal economy. Table 13 shows the breakdown of household expenditure within the RM&I sector in 1996.

Table 13: Household Expenditure on home improvements, 1996

	No. of Households		Expenditure		Average Expenditure per Household
	(0000s)	%	£ m	%	£
Total	7161	100	12362	100	1726
Home extensions, additions, conversions	605	8	2711	22	4481
Roof/guttering/ external drainage	976	14	807	7	827
Kitchens & Bathrooms	1341	19	2102	17	1567
Central Heating	1235	17	1044	8	845
Doors & Windows	2114	30	3328	27	1574
Electrical/security systems	1305	17	464	4	356
Damp proofing/ dry/wet rot/ woodworm & insulations	528	7	202	2	383
Internal/external decorations	1898	27	979	8	516
Misc repair & Maintenance	2011	28	724	6	360

Source: *CFR/BISRA (1996) (Adapted from Experian, 2010)*

From this survey Experian (2010) assert that the main reason for spending in the sector was cyclical and use this as supporting evidence for a price elasticity of demand in the sector to be less than 1.

"The survey showed that the main reason for expenditure on home improvements was due to things being worn out or damaged, i.e. cyclical." (Experian, 2010)

Since then there have been a number of factors that may change the proportions and reasons for expenditure: home energy efficiency requirements have increased markedly, the fast-growing rooftop solar market, the huge market for remediation works to address flammable cladding and possible behavioural changes affected by the COVID-19 pandemic.

How Scotland differs from the UK

The CFR/BISRA 1996 survey finds some notable differences between the devolved nations. Firstly, a relatively larger 'informal' sector in Scotland than the GB average 56 percent and 35 percent respectively. Secondly, the RM&I sector makes up a relatively smaller proportion of the Scottish housing sectors than the GB average 20 percent and 23 percent respectively.

Demand and price elasticity

In order to understand the economic impact of a VAT rebate on the RM&I sector it is important to understand the sensitivity of demand in the sector to a change in price referred to as the price elasticity of demand (PED). PED figures are not routinely collected by statistics authorities and are dependent on time and resource intensive surveys.

In 1999 the EU permitted reduced VAT on labour-intensive services for member states on an experimental basis. Belgium, France, Italy, the Netherlands, Portugal, Spain and the Isle of Man in the UK took part in the experiment reducing VAT in all or part of the 'renovation and repair of private dwellings' sector. These experiments provide the most recent and available evidence on the impact of the proposed VAT changes and can give an indication of the PED. The reports are not available to the public and therefore, analysis of secondary resources is required. Table 14 summarizes the findings of the Experian (2010) report that evaluated these experiments.

Table 14: International examples of a VAT cut in the RM&I sector Source: Experian (2010)

Country(ies)	Comment
Netherlands & Spain	Focused on a very small segment of the RM&I sector too small to generalize findings from
Belgium	Evidence from Belgium had too many competing factors to clearly discern the impact of the tax cut on demand
Italy	Evidence suggests the VAT cut led to an increase in employment in the sector however, the lack of a clear methodology and the competing impacts of other major changes to the system of taxation in the country makes the evidence weak
The UK (Isle of Man)	Strong qualitative evidence that the VAT cut had increased business in the RM&I sector however, they did not provide quantitative data and the positive impact could be any number
France	The French case yielded useful findings that could be generalized. Experian (2010) through econometric modelling determined a figure for net additional demand created by the VAT reduction, 4.75 percent in 2000.

The Experian (2010 & 2014) analyses lean heavily on the evidence found in the French case with limited other evidence available of sufficient quality to provide quantitative analysis. It is important to note that this case covers a VAT reduction from 17.5 percent to 5 percent.

The Experian (2010) report summarizes that the VAT reductions across the EU have shown how difficult it is to assess the effect on activity, employment and the formal/informal economy in a quantitative manner. There is however, strong qualitative evidence that there is a positive impact on activity and employment.

Table 15 provides a summary of the figures behind the low, central and high impact scenarios of a cut in RM&I sector VAT from 17.5 percent to 5 percent used in Experian 2010 and 2014:

Table 15: Experian VAT cut scenarios UK

	Low	Central	High	Source(s)
Labour share of sector	38%	38%	38%	CFR/BISRA 1996 survey
Demand	2%	5%	10%	CAPEB report from France for 2000 & Euroconstruct Network
PED	0.16	0.4	0.8	CFR/BISRA 1996 survey
Shift from Informal Sector	10%	20%	30%	Unspecified

Interrogating these numbers for Scotland in 2020:

The demand figure leans heavily on the CAPEB report from France for 2000. Access to this report is not public and therefore, the numbers cannot be interrogated. The numbers are somewhat outdated and there has been a change in emphasis since 2000 on home energy efficiency. Experian (2010) suggests that these figures align well with RM&I numbers from the Euroconstruct Network which showed a 4.25 percent increase in RM&I output in 2000 (these figures are not cited and cannot be corroborated).

The price elasticity of demand figures are informed by the demand figures and the observation in the CFR/BISRA 1996 survey that due to the cyclical nature of RM&I demand the elasticity is likely to be less than 1.

The relatively larger size of the informal sector in Scotland will affect these figures. The shift in demand from the informal sector percentages regard legitimate firms ceasing to provide cash in hand VAT exclusive prices. The numbers provided however, do not have any empirical backing and with the relatively larger size of the informal sector in Scotland these figures may make a significant difference.

To conclude, the figures produced by Experian (2010 & 2014) are the most available currently. There is some empirical backing however, dated and the application of these numbers to Scotland in 2020 should be viewed with caution.

5. Modelling the impact of a 15-percentage point VAT cut in R&M

In this section we model the impact of cutting the VAT rate on the repair and maintenance industry (SIC 43) from 20% to 5% - i.e. a 15-percentage point (p.p.) cut.

Using price elasticity of demand (PED) ranges from the CFR/BISRA 1996 survey, we calculated the positive impact on demand from a VAT cut of 15-p.p. – See Table 16.

Table 16: PED, change in price and change in demand from 15-p.p. VAT cut

	Low	Medium	High
PED	0.16	0.4	0.8
Change in price	15%	15%	15%
Change in demand	2.4%	6.0%	12.0%

Source: *Fraser of Allander Institute; CFR/BISRA 1996 Survey*

The economic impact of the VAT cut under each scenario is a positive shock to demand in the repair and maintenance sector – ranging from 2 – 12%.

We shocked our economic model to obtain the direct, indirect and induced effect of this positive demand shock. Table 17.

Under the highest PED scenario, the VAT cut generates £400m in Scottish GVA and supports just under 7,500 FTE jobs across Scotland.

Under the low – medium PED scenarios, the 15-p.p. VAT cut is estimated to generate around £80m-£200m in Scottish GVA and support around 1,500-3,700 FTE Scottish jobs.

Table 17: Economic impact of positive demand shock in SIC 43

	Output (£m)	Employment	GVA (£m)
Low	145	1495	80
Medium	365	3735	200
High	730	7475	400

Source: *Fraser of Allander Institute*

But, there is also a negative economic impact associated with a VAT cut. Central government revenue is highly dependent on income from taxes. A VAT cut from 20% to 5% in this industry of the construction sector will result in a decline in government income.

To account for the negative hit to government revenue, we calculated the difference in tax income between the old specialised construction final demand and 20% tax rate and the new specialised construction final demand and 5% tax rate. This was carried out for each scenario. We then apportioned this decline in tax revenue across each sector that the government spends money on; this apportionment is based on the sectoral split of government spend.

However, there is also a positive impact on government revenue. The impact of the positive demand shock in the repair and maintenance sector has spill-over effects on the entire Scottish economy, generating economic activity across this sector's supply chain. The increased economic activity throughout the supply chain supports jobs and therefore wages. These wages are used by households to purchase goods and services – of which around 13% is taxed.

After accounting for this increase in government VAT income, we obtain a total, net negative, change in government income from VAT. This is then modelled using the same economic model that generated the economic impacts in Table 17.

Table 18 outlines the estimated negative economic impact caused by the reduction in government revenue from VAT and subsequent reduction in government spending.

Under the highest PED scenario, the hit to GVA from the reduction in government spending is estimated to be around £475m with just under 7,700 FTE jobs lost. Under the low – medium PED scenarios, GVA is estimated to decline by around £495m - £510m with around 8,100 – 8,300 FTE jobs lost.

Table 18: Economic impact of negative shock to government spending

	Output (£m)	Employment	GVA (£m)
Low	-840	-8300	-510
Medium	-820	-8070	-495
High	-780	-7690	-475

Source: *Fraser of Allander Institute*

Given the estimates from both the positive and negative economic shocks, the net economic impact without any government intervention, would be negative under even the highest PED scenario.

However, if, after receiving lower tax receipts, the government avoids reducing its expenditure through borrowing then the net economic impact of the VAT cut could be positive under all PED scenarios.

There is also the potential positive impact that the informal sector could have on the net economic impact – that is, there would likely be a shift away from the informal sector under a VAT cut to 5% in R&M as the benefit of avoiding tax reduces significantly. While this is worth mentioning, the literature on the impact of a VAT cut on the informal sector is not robust enough for us to quantify this economic impact.

Pass through rate

The size of the economic impact of reducing VAT will depend not only on the elasticity of demand, but on the "pass through rate". That is, if VAT was to fall by 15%, the prices of these goods and services to consumers may not necessarily fall by the full amount.

This can affect the beneficial effects of a VAT cut to a large degree. A situation where, on aggregate, 50% of the tax cut is passed through will result in 50% of the economic benefits.

A study by the IMF[1] examined Eurozone VAT reforms on a large number of products between 1999 and 2013. The average cumulative pass through rate, starting from 12 months before the VAT decrease and ending 12 months after, is 32%. This has a 95% confidence interval of around 14% – 50%.

However, this covers a broad range of products and the pass through rate of a VAT cut on construction activities would likely differ from many of these products, such as food, alcohol, package holidays and so on.

Unfortunately, there is little evidence on the pass-through rate of a VAT cut on dwelling repair and maintenance.

Theory tells us that the pass through rate depends on the relative elasticities of supply and demand.

When demand is relatively price inelastic, a decrease in prices will lead to a proportionally smaller increase in demand. Therefore, firms would do better by retaining the tax cut and less of the tax cut would be passed through to prices for consumers.

From the findings above, it appears that dwelling repair and maintenance activities are relatively demand inelastic.

However, the construction industry is likely fairly competitive. This level of competition means that firms are less able to retain any tax cut as profit and instead must pass it on in the form of lower prices to remain competitive. This is a reflection of the price elasticity of supply.

This high level of competition in the construction industry is likely to increase the pass through rate.

Due to the level of uncertainty in the pass through rate, we have shown the gross benefit of a VAT cut on SIC43 for a range of different pass through rates and elasticities. These pass through rates have been chosen to provide an understanding of how they can affect the results, rather than representing a particular likelihood.

Table 19: Gross benefit to output from a 15% cut in VAT for SIC 43, by pass through rate and elasticity assumption

		Pass through rate		
		0.2	**0.5**	**0.8**
Demand elasticity	**0.16**	30	75	115
	0.4	75	180	290
	0.8	145	365	585

Source: *Fraser of Allander Institute*

1 See IMF

6. Conclusions

The construction sector is a significant sector in the Scottish economy – directly supporting £8.5bn in Scottish GVA and supporting over 170,000 full-time equivalent jobs in the economy.

The sector has been heavily impacted by the Coronavirus pandemic and subsequent lockdowns however, after its reopening from the first lockdown last spring, at the beginning of July, the sector was able to recover quickly.

While the outlook for the whole Scottish economy remains uncertain, the adaptability of the construction sector has meant that it has managed to recover extremely fast relative to where it was early on in the pandemic.

A green recovery from COVID-19 will allow the economy to grow out of this crisis in a green way that combats the climate change challenge we are facing. There are opportunities here for the specialised construction industry - particularly in repair and maintenance and home improvements work - to grow in the coming years as Scotland approaches its target year for net zero emissions. Whilst newer properties are designed to be more energy efficient, there is work to be done to ensure that older properties are brought up to standards through retrofitting measures.

One of the main purposes of this report is to understand the differential economic multiplier effects of different construction activity with a particular focus on this specialised construction industry.

Our results showed that specialised construction activities generates the biggest economic impact of the three construction industries -both in terms of GVA impact and employment impact. Once spill over effects are accounted for, for every £1m spent on specialised construction activities industry, around 21 FTE employment and £1.09m GVA is supported in the Scottish economy.

Given that this part of the construction sector generates the largest economic impact of the three construction industries and will play an important role in Scotland's green recovery from COVID-19, it is important to understand how policy can stimulate demand in this industry. One demand stimulant is a VAT cut. This report looked into the potential economic impact that a VAT cut from 20% to 5% in the specialised construction sector could have on the Scottish economy.

The results showed that the positive impact from the positive demand shock alone could generate up to £400m in Scottish GVA and support up to 7,500 FTE Scottish jobs, depending upon the price elasticity of demand and the pass through rate of the VAT cut.

For a VAT cut to be effective, and generate a net positive effect, government will need to borrow to finance its current level of expenditure. Otherwise the VAT cut would result in decreased government spending, due to lower VAT receipts, causing a net negative economic impact; even after the positive impact on VAT receipts from the positive demand shock is accounted for.

What is important moving forward is the economic policy in place to support this sector in the months and years ahead. In particular, the industry needs support and clear communication from government on their green recovery plans so that they can be equipped to support them in their net zero emissions target.

7. Case Studies

A key theme from our stakeholder interviews was that proper training is required in order to equip construction workers with the necessary skills to support making properties greener in the future.

City Building Glasgow and A.C. Whyte provided the Fraser of Allander Institute with case studies, highlighting the importance of apprenticeship training programmes and skills academies in promoting environmental and social progress.

New Craft Apprenticeship Training College - City Building Case Study

What is it?

The New Craft Apprenticeship Training College is a joint venture between Glasgow City Council (GCC) and Wheatley Housing Group (WHG) and aims to deliver 2000 new craft apprenticeships over the next 30 years.

Currently, City Building Glagow employs 250 craft apprenticeship, equivalent to around 13% of its overall workforce and 4% of craft apprentices in Scotland. The training centre will be undertaken by City Building and is a significant commitment to supporting the much needed future skills and training required for the city and the construction industry as a whole.

City Building have a proven track record in delivering future apprenticeship schemes, with their current programme winning The Queens Award for Enterprise in 2018 and the Investors in Young People Gold Award for the outstanding work that is undertaken by the business for young people in the city.

The social and economic benefits of Apprenticeship training schemes

Prior work conducted by the FAI estimated that a total of 3877 jobs and £108.5 million worth of wages across the Glasgow economy is supported by City Building. For every 2 jobs in City Building, a further 1.44 are created. This is a significant contribution, with 1 in 120 people in the city employed in the business and 1 in 8 of all construction jobs with City Building.

Since 2007, the business has returned over £70m in surplus to Glasgow City Council for re-investment in frontline services. It is estimated that 73.5% of all supplier spend is with local companies.

City Building craft apprentices account for 13% of its overall workforce and a study by Genanalytics into City Building's workforce and diversity highlighted 38% of City Building apprentices are recruited from the most deprived data zones in Scotland, with 54% of apprentices living in the two most deprived data zone areas.

What benefits will the programme offer?

The recipe for success of City Building's craft apprenticeship programme is due to a number of factors including:

- The method of recruitment that guarantees all applicants an interview/assessment and places more emphasis on work ethic and commitment than formal qualifications.
- The successful candidates are engaged and committed and value the job and the unique opportunity they are getting.
- Instructors, other staff and trades people are passionate about the training and development of young people.
- In-house SVQ accredited training facility.
- City Building is the Training Provider, Managing Agent and the Employer providing wrap-around support.
- Stringent on-going monitoring including site reports and college reports.
- Variety and types of work available.
- Citizenship programmes including opportunities to engage in sport activities and local communities.
- Softer skills approach focused on social awareness, financial wellbeing, drug and alcohol awareness, social media and counselling services.
- Healthy Living, Health and Safety and Community Engagement Programmes
- National Progression Awards
- Recognition of individual achievements through Annual Apprentice Awards.

A.C. Whyte Skills Academy

The Name You Can Trust

A.C. Whyte & Co. Ltd is an established, experienced main contractor delivering major external refurbishment projects throughout the UK and specialise in installing external wall insulation. We work with Local Authorities and Housing Associations across the country to not only upgrade properties, we aim to transform communities and positively impact residents' lives.

At A.C. Whyte our people are our strength, they consistently and proudly deliver our quality as standard commitment to clients and their residents. Every member of our experienced, knowledgeable, skilled team adopts and delivers our right first-time approach which is underpinned with extensive investment in training and development. Our Management Team have over 360 years collective industry experience and we have a dedicated, directly employed, fully trained NVQ Level 2 workforce of over 160, all of whom thrive in our culture of continuous improvement.

The A.C. Whyte Skills Academy

A.C. Whyte consider ourselves to be more than a contractor. As a Family Business and a responsible and fair company, we embrace our corporate and social responsibility, because it's the right thing to do.

Our values closely align with those outlined in the Scottish Governments National Performance Framework. We are a thriving and innovative business with quality jobs and fair work for everyone. With every Local Authority partnership we aim to:

- Increase the wellbeing of people living in Scotland.
- Give opportunities to all people living in Scotland.
- Create sustainable and inclusive growth.
- Reduce inequalities and give equal importance to economic, environmental and social progress.

To meet these aims and to continue delivering our right first-time approach and achieve our quality as standard commitment to our clients, A.C. Whyte took the proactive step of securing a sustainable workforce into the future by creating the A.C. Whyte Skills Academy. The industry led Academy, now in its third year, was initially developed in partnership with West College Scotland, both teams worked closely to create an inimitable curriculum that provides students, with a formal qualification as well as relevant knowledge and skills to allow them to graduate to professional, A.C. Whyte external wall insulation installers. A.C. Whyte have recently collaborated with South Lanarkshire College to launch the second Academy as we enter 2021.

The Course

The course is designed to allow the students, or Akademos as they are known, to experience a blend of practical training within the purpose-built training facilities at the Greenock Campus of West College Scotland and South Lanarkshire College, as well as in a real live site environment, under the expert supervision of some of A.C. Whytes' most experienced operatives.

On successful completion of the training, the Akademos are offered full-time, permanent jobs with A.C. Whyte, making this proposition completely unique and a first of its kind. Every member of A.C. Whyte's team is empowered to go the extra mile, exceeding client, and residents' expectations. The Skills Academy presents an exciting opportunity to embed these values into the curriculum and organically create future A.C. Whyte stars with the right attitude and approach from day one. The Skills Academy provides a diverse group of local residents, from the communities we work in with training, employment and ultimately career opportunities. Working for A.C. Whyte, they will go on to help deliver Scotland's' ambitious but achievable energy efficiency targets.

Outcomes:

- Local residents upskilled.
- Quality jobs created, with fair work for everyone.
- Local communities empowered.
- Just transition to Net Zero achieved - environments enhanced, improved housing stock.
- Inclusive sustainable economic growth.
- Fuel Poverty and poverty reduced due to energy efficiency improvements and the sharing of opportunities, wealth and power more equally.

Akademos

Chris Clamp (36), A.C. Whyte EWI Installer

"This is a change in direction for me, I was stuck in a job for over 10 years that I didn't enjoy. I want to show my kids it's never too late to learn something new and love what you do."

Chris is married with a family of 4 children between the ages of one to sixteen and worked in the Horticultural industry for 15 years. He carried out an array of training within a garden centre, ranging from horticultural training to customer service. He felt he had little job satisfaction and decided he needed a change, not only for himself but to be a good role model and set a good example for his family. The Skills Academy was the perfect vehicle into a new sector and career. Having trained and worked alongside some of our most experienced operatives, Chris has particularly enjoyed learning a new skill set which has given him exposure to a variety of sites across Scotland as well as varied construction types and challenges. Having successfully graduated into full time employment with A.C. Whyte, he thrives on knowing he is helping improve residents' quality of life, by making their home more energy efficient.

"This opportunity means as much to me as it does my family. I now have a trade and a career that satisfies me, and I work for a company that values its team."

Josh English (34), A.C. Whyte EWI Installer

With a wife and young family, Josh strived throughout his teens and early twenties to secure an apprenticeship without success. With limited opportunities available he worked hard in roles that paid the bills and offered a light touch to learning a trade but gave him very little job satisfaction. The Skills Academy presented the opportunity Josh feared had passed him by. He welcomed the opportunity to become an 'Akademo' and learn and master a trade with guaranteed employment at the end. He thrived on the course, quickly grasping the skills and techniques to becoming an external wall insulation installer and has embraced A.C. Whyte's values as a full time, permanent employee.

"This opportunity was a real start in life for me, I'm excited to see what my long term future will look like with A.C. Whyte and the career development opportunities it will bring."

Kenny Mearns (20), A.C. Whyte EWI Installer

Kenny played junior football for 8 years and left school at 16 to pursue a career in football. He faced the harsh reality that he wasn't going to play professionally and went back to school to complete his 6th year. As a school leaver, he was looking for an opportunity to work outdoors to be 'hands on' with the potential for career progression, he wanted to build a positive future for himself. He joined the Skills Academy as one of the youngest Akademos. With a diverse group coming together, the Akademos quickly played to each other's strengths, Kenny's confidence was bolstered by the more mature Akademos supporting him whilst he helped them navigate technologies. Collectively they demonstrated the supportive and inclusive values A.C. Whyte are renowned for across their teams. Currently out on site with A.C. Whyte, Kenny is fulfilling his dream of an outdoor career that requires skill and provides continuous development opportunities.

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9. Appendices

Appendix A

Table 20: Specialised Construction Activities (SIC43)

Type of repair, maintenance or improvement	Description
Demolition, Site Preparation, Test Drilling and boring, and Scaffold erection	This group includes activities of preparing a site for subsequent construction activities, including the removal of previously existing structures. Test drilling and boring includes: test drilling, test boring and core sampling for construction, geophysical, geological or similar purposes. Scaffold erection includes: scaffolds and work platforms erected, dismantled and rented from the same unit.
Electrical installation	This class includes the installation of electrical systems in all kinds of buildings and civil engineering structures. i.e. electrical wirings, lighting systems, fire alarms, etc.
Plumbing, heat and air-conditioning installation	This class includes the installation of plumbing, heating and air-conditioning systems, including additions, alterations, maintenance and repair. i.e. heating systems, gas fittings, etc.
Other construction installation	This class includes the installation of equipment other than electrical, plumbing, heating and air conditioning systems or industrial machinery in buildings and civil engineering structures. i.e. elevators, escalators, automated doors, thermal insulation, etc.
Plastering	This includes: application in buildings or other construction projects of interior and exterior plaster or stucco, including related lathing materials.
Joinery Installation	This class includes: installation of doors (except automated and revolving), windows, door and window frames, of wood or other materials; installation of fitted kitchens, built-in cupboards, staircases, shop fittings and the like; interior completion such as ceilings, movable partitions, etc.
Floor and wall covering	This class includes: laying, tiling, hanging or fitting in buildings or other construction projects of: ■ ceramic, concrete or cut stone wall or floor tiles, ceramic stove fitting ■ parquet and other wooden floor coverings, wooden wall coverings ■ carpets and linoleum floor coverings, including of rubber or plastic ■ terrazzo, marble, granite or slate floor or wall coverings ■ wallpaper
Painting, Glazing, and Other building completion and finishing work	This class includes: interior and exterior painting of buildings; painting of civil engineering structures; installation of glass, mirrors, etc.; cleaning of new buildings after construction; other building completion and finishing work n.e.c.
Roofing activities	This class includes: erection of roofs; roof covering.

Type of repair, maintenance or improvement	Description
Specialised construction activities	This class includes: construction activities specialising in one aspect common to different kind of structures, requiring specialised skill or equipment: ■ construction of foundations, including pile driving ■ damp proofing and water proofing works ■ de-humidification of buildings ■ shaft sinking ■ erection of steel elements ■ steel bending ■ bricklaying and stone setting ■ erection of chimneys and industrial ovens ■ work with specialist access requirements necessitating climbing skills and the use of related equipment, e.g. working at height on tall structures
Other	Any other construction activities

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