Economic Contribution of ExxonMobil's Fife Ethylene Plant to Scotland

March 2026

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Scottish Ministers

3A-South Victoria Quay

Edinburgh

EH6 6QQ

Dear Sirs / Madams,

Please find attached the Economic Contribution of ExxonMobil's Fife Ethylene Plant Report, shared by PwC UK with the Scottish Government ("SG") in March 2026, in accordance with our agreement dated 13 January 2026. This Report has been prepared based on 2025 data shared by ExxonMobil during the period of January – March 2026. PwC has not undertaken an independent audit of the data, and no assurance is expressed over outputs derived from it.

You have asked us to estimate the economic contribution of ExxonMobil's Fife Ethylene Plant to the Scottish economy, both from a Gross Value Added and employment perspective using the latest possible data. In conjunction to this, you have asked us to analyse the plant's supply chain, helping you determine the types of businesses that are involved with the plant so that you can better understand the types of organisations the plant was interacted with.

We would like to acknowledge and thank ExxonMobil, Fife Council and the economists at OCEA for their valuable input contributing to the preparation of this report. Their engagement and assistance in providing and contextualising information has been helpful in informing our analysis.

As described in the agreement or as expressly agreed by us in writing, we accept no liability (including for negligence) to anyone else or for any other purpose in connection with this report.

Yours faithfully,

PricewaterhouseCoopers LLP

Executive Summary

Key Findings

- The economic contribution of ExxonMobil's Fife Ethylene Plant (FEP), its supply chain and the employee spending it induced, is estimated to be **£92.5 million**. It is also estimated to have supported **477 jobs across Scotland**, of which 188 are its own employees, including 180 full-time and 8 part-time roles.

- Of the 477 jobs, the FEP was responsible for 188 well-paid jobs in the local area, and roughly 105-150 contracted jobs[1]. The FEP's **median salary of approximately £68,000 was around 106% higher than average earnings in Fife and Scotland**, reflecting the concentration of skilled technical roles.

- The economic contribution of the plant was distributed across a range of sectors rather than being concentrated solely in oil and gas. While the largest share of the economic contribution arose from the plant's own operations, generating £69.8 million in GVA, indirect impacts spanned multiple sectors; the largest being construction, followed by manufacturing, wholesale and retail, and administrative and support services.

- Although 60% of suppliers were located in England, **procurement spend was evenly split between Scotland and the rest of the UK, with 48% directed to Scottish suppliers**, 48% to the rest of the UK, and approximately 4% to international suppliers[2].

- Socio-economic indicators suggest that the local area is broadly comparable to the wider Fife region and Scotland as a whole in terms of income, employment and wider measures of deprivation. This indicates that the impact of the closure is unlikely to fall disproportionately on areas with the highest levels of structural disadvantage.

[1] At time of writing the precise total figure of contracted jobs impacted remains uncertain. Estimates are provided by Fife Council (~120), Scottish Government (~150) and the modelled analysis (105), see Appendix for further detail.
[2] These figures exclude spend on feedstock, see Appendix for further detail.

The economic contribution of ExxonMobil's Fife Ethylene Plant to Scotland and local communities

Introduction

The ExxonMobil Fife Ethylene Plant (FEP) at Mossmorran ceased operations in February 2026, affecting 180 direct full-time employees, eight direct part-time employees, and around 105-150 contractors. ExxonMobil has stated that, due to prevailing market conditions, cost structures, UK government policy factors and plant efficiency, the site was no longer commercially viable in its current form, and that continued operation would have led to ongoing financial losses.

This report has been commissioned by the Scottish Government to assess the economic contribution the FEP made to Scotland while operational, thereby providing an indication of the scale of activity associated with its closure. The analysis draws on detailed employment and supply chain data provided by ExxonMobil and applies an Input–Output (I-O) modelling framework to estimate the economic impact under two scenarios: continued operation and cessation of operations. The assessment does not assume any alternative redevelopment or future use of the site. The purpose of this report is to provide an evidence-based assessment of the scale and distribution of economic effects to inform ministerial decision-making.

The economic contribution of ExxonMobil's Fife Ethylene

The Fife Ethylene Plant (FEP) contributed to £92.5 million in Gross Value Added (GVA) and 477 jobs across Scotland.

Sector	Direct	Indirect	Induced	Total
Oil and Gas	£69.8m	£112k	£3.0k	£69.9m
Construction	-	£3.7m	£137.6k	£3.9m
Real estate activities	-	£544k	£2.9m	£3.4m
Wholesale and retail trade	-	£1.4m	£1.2m	£2.7m
Manufacturing	-	£1.5m	£398.1k	£1.9m
Financial and insurance activities	-	£1.1m	£678.9k	£1.8m
Administrative and support service activities	-	£1.4m	£275.3k	£1.7m
Professional, scientific and technical activities	-	£1.3m	£213.3k	£1.5m
Transportation and storage	-	£592k	£300.8k	£892.6k
Other industries	-	£2.0m	£2.7m	£4.8m
Total GVA	**£69.8m**	**£13.8m**	**£8.8m**	**£92.5m**

Table 1: Fife Ethylene Plant's economic contribution to Scotland (GVA).
Notes: (1) The nine industries with the highest levels of spend are highlighted here, while all other industries are aggregated under "Other industries." (2) Numbers may not sum exactly due to rounding.

	Direct	Indirect	Induced	Total
Total no. of jobs	**184**	**197**	**97**	**477**

Table 2: Fife Ethylene Plant's employment contribution to Scotland (FTEs)

An Input-Output model was used to estimate the economic contribution of the FEP to Scotland in 2025. The modelling captures three channels of economic contribution, including direct, indirect and induced impacts (see Box A).

The analysis revealed that, in 2025, the FEP supported a total of 477 full-time equivalent jobs and generated £92.5 million in GVA across Scotland. This reflects the combined effect of activity at the site itself, spending with suppliers and the circulation of income through the wider economy. As a result, the plant's economic contribution extended beyond its direct operations, supporting additional activity across the Scottish economy.

Direct Impact

Direct impacts relate to the plant's own operations, including employment and the economic value generated on site.

The plant supported 184 direct FTE roles (180 full-time and eight part-time roles) and £69.4 million in GVA in the Scottish Economy. Direct employment accounted for just over one third of the total jobs supported, while direct GVA generated 75% of the total value added. This difference between the share

of total GVA and the share of jobs reflects the capital-intensive nature of the plant's operations, where a relatively small workforce is associated with a significant level of economic output.

Indirect Impact

Indirect impacts arise through the plant's supply chain, reflecting the goods and services procured from other businesses.

ExxonMobil's supply chain activity supported a further 197 jobs and £13.8 million in GVA across Scotland. In practice, this means that for every direct job at the plant, approximately 1.1 additional jobs were sustained in supplier industries. These employment effects were not concentrated in a single industry but spread across several sectors that helped to sustain day-to-day operations. Employment impacts are particularly visible in construction (52), wholesale and retail (25), and administrative and support services (35). The distribution of GVA reflects a similar pattern, with construction (4.2%), real estate (3.7%), wholesale and retail (2.9%), and manufacturing (2.0%) being among the largest contributors within the supply chain.

The indirect employment figure also captures economic activity associated with contractor services delivered through external suppliers. Based on the modelling approach, approximately 105 contractor roles are included within the indirect employment total. As redundancy consultations were ongoing, and complete contractor data was not available at time of writing, the precise number of contractor roles affected remains subject to confirmation. The estimate may therefore vary once final figures are available.

This mix of sectors highlights the range of inputs required to operate a facility of this nature, spanning specialist engineering services, the sale of industrial goods and services, and demand for operational and business support (see Sectoral Distribution of Impact section for more detail). Together, these effects illustrate how the plant's procurement activity supported a wide range of economic activity across the Scottish economy in 2025.

Induced Impact

Induced impacts reflect wider household spending effects, generated when employees, both at the plant and within its supply chain, spend their earnings in the broader economy.

In addition to the direct and indirect effects described above, employee spending supported an estimated 97 jobs and £8.8 million in GVA through induced channels. Induced impacts reflect household spending by employees at the plant and within its supply chain, which supports economic activity in sectors that provide everyday goods and services. As a result, these effects were concentrated in consumer-facing sectors such as wholesale and retail trade, accommodation and food services, alongside education and health. Real estate accounted for a particularly large share of induced GVA, reflecting household spending associated with housing costs[3] (see Sectoral Distribution of Impact section for more detail).

Although smaller in scale than the direct impact, induced effects are locally significant because they capture how employee earnings circulate through the wider economy, supporting everyday services and community infrastructure. This effect is amplified by the level of employee remuneration. The plant's average base salary was significantly higher than both the Fife and Scottish averages, meaning that the spending power associated with direct employment was greater than the headcount alone might suggest. As a result, the plant's closure will not only remove high value industrial output but will also withdraw above average wages from the local economy.

[3] In the Scottish input-output (IO) tables, the real estate sector has relatively high multipliers, which partly explains its large contribution to the estimated total GVA.

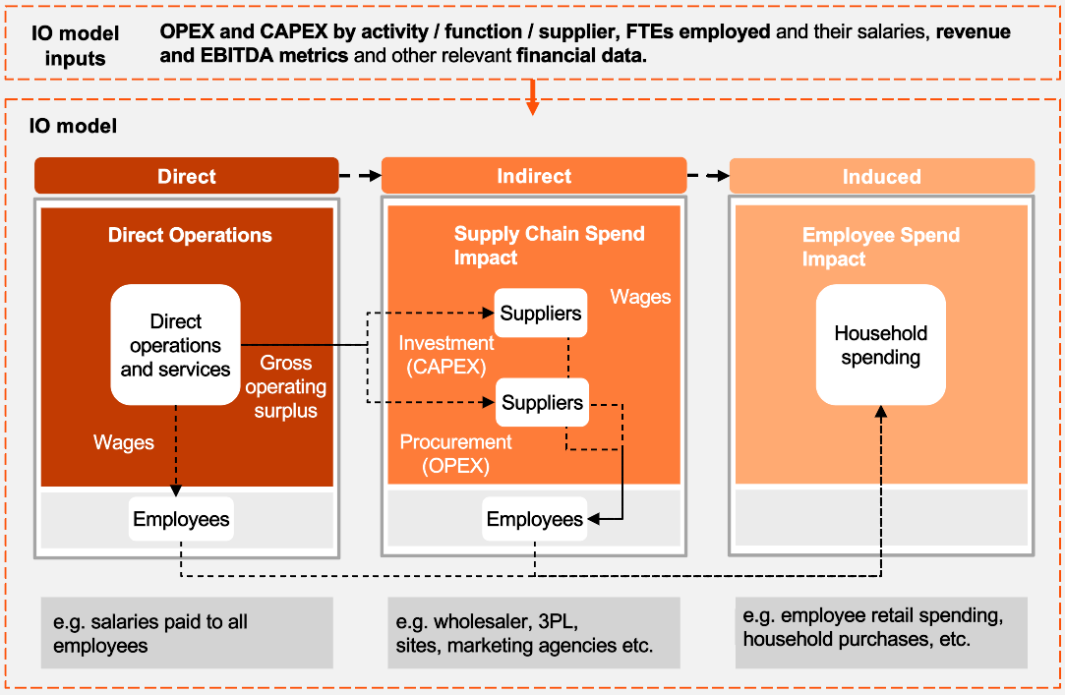
Overall, while most GVA was generated at the site itself, the employment associated with the plant was distributed more widely across Scotland through supply chain linkages and household spending. With a total employment multiplier of approximately 2.6, each direct job was associated with a further 1.6 jobs elsewhere in the economy. The plant therefore generated significant value on site, while also sustaining a broad range of economic activity across construction, services, manufacturing and consumer-facing sectors.

Methodology

This assessment uses an Input–Output (I-O) model to estimate the economic contribution of the ExxonMobil Ethylene Plant to Scotland, when it was in operation. The analysis quantifies the plant's contribution in terms of Gross Value Added (GVA), a standard measure of economic activity comparable to GDP, and employment supported across Scotland.

The modelling captures three channels of economic contribution: direct impacts, indirect impacts and induced impacts. Direct impacts are estimated using an income-based approach, drawing on financial and employment data provided by ExxonMobil. Supply chain and induced impacts are then estimated using national and Scottish Input–Output tables, which describe how industries purchase from and sell to one another. These tables allow us to estimate how changes in activity at the plant translate into wider production, GVA and employment effects across sectors. Government statistics are used to convert changes in production into employment effects by sector.

The figure below illustrates a simplified breakdown of our modelling approach. For a more detailed description of the approach, please refer to the Appendix.



Box A: An overview of the methodology used to estimate the economic impact of the FEP closure

Local labour market and community context

Defining the local impact area

ExxonMobil's Fife Ethylene Plant (FEP) workforce is geographically dispersed across Fife and neighbouring local authority areas rather than concentrated within a single community. To understand the local implications of the plant's closure, PwC therefore defined a *local impact area* based on employee residence rather than proximity to the site alone.

The impact area was constructed using the outward code data (the postcode area and district) for the residences of FEP employees (see Figure 1). This approach allows the analysis to reflect the communities most directly affected by employment and income losses associated with the plant's closure.

The purpose of this section is to provide socio-economic context for those communities, enabling the economic impact estimates presented above to be interpreted against the local labour market and living conditions baseline.

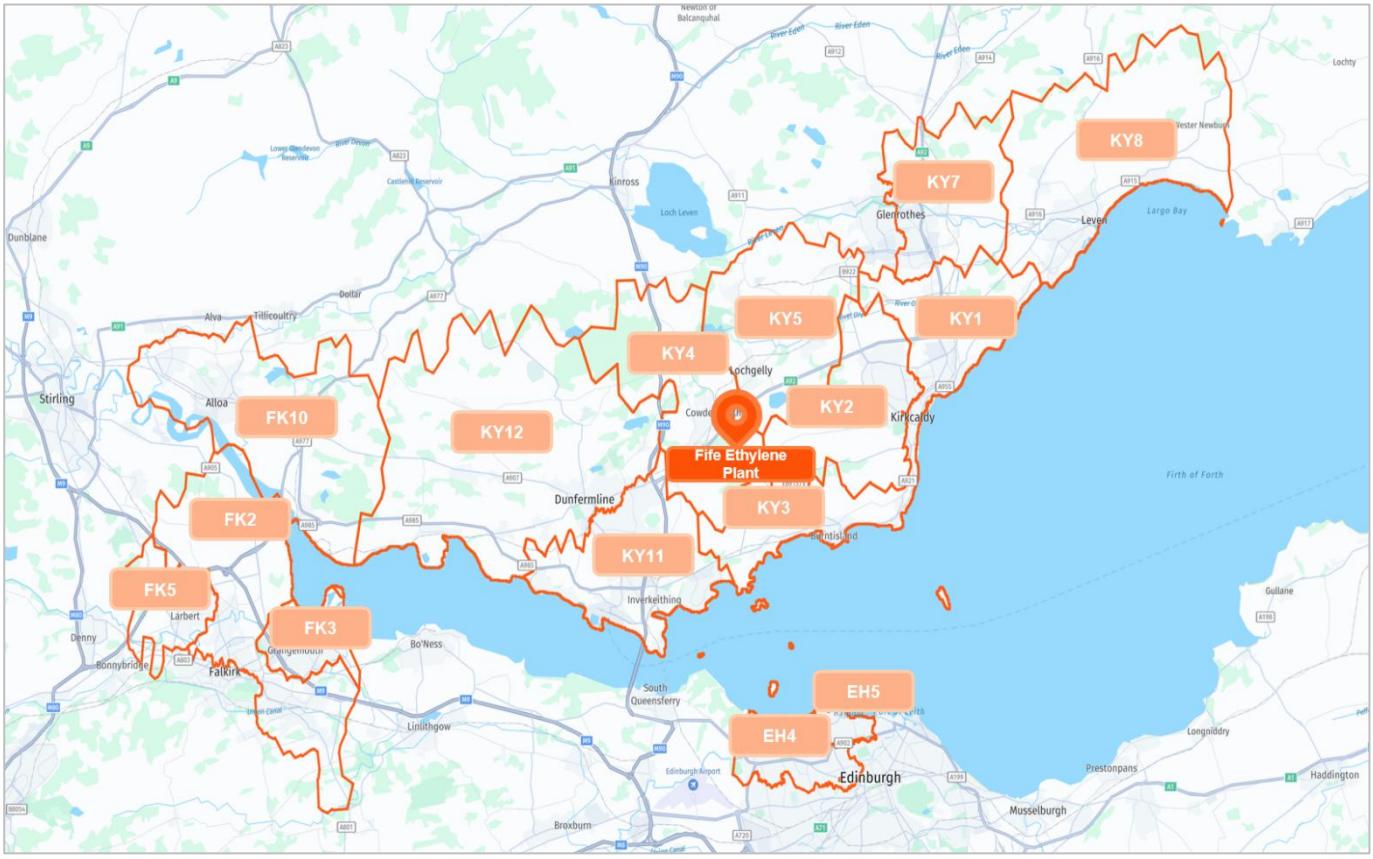


Figure 1: The local impact area for the FEP, based on employee residence in 2025

Employment scale and wage profile

In 2025, the plant employed 180 full-time workers and eight part-time workers, in addition to around 105-150 contracted employees[4]. To provide an indication of scale, this is equivalent to around 0.07-0.14% of

[4] 180 full-time employees and 8 part-time employees are included within the direct impacts. Contracted employees are captured within the indirect impacts through supply chain spending.

Fife's working-age population (226,200) during this period. Therefore, in aggregate labour market terms, the closure does not constitute a large proportion of total employment within the region.

The roles at the plant are characterised by relatively high wages and specialist technical skills. In 2025, the median annual salary for full time employees in Scotland and Fife was around £33,000 and £32,400 respectively. By comparison, the plant's median salary is £68,000, i.e. around 106% above the local average, placing the employees within the top 20% of earners in Scotland.

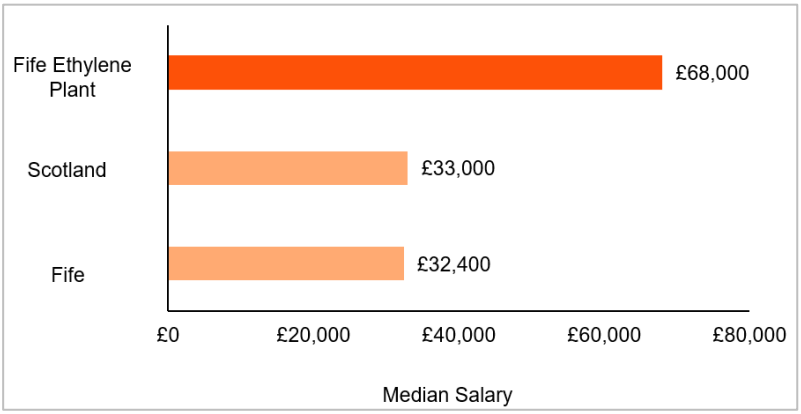


Figure 2: The plant's 2025 median employee compensation, compared to median salaries in Scotland and Fife, during the same period

Compensation is highest within engineering, process and maintenance teams, reflecting the concentration of skilled industrial roles at the site. While modest in numerical terms, the plant represents a source of high-wage technical employment within the region.

This wage differential is economically significant. It implies:

- a relatively large household income shock per displaced worker;
- stronger induced economic effects through employee spending; and
- potential re-employment considerations given the specialist nature of affected roles.

Income and employment deprivation

Across the defined local impact area, levels of income and employment deprivation[5] mirror those observed in Fife and Scotland as a whole.

- Income deprivation: 12%
- Employment deprivation: 6%

[5] Deprivation is defined using the Scottish Index of Multiple Deprivation (SIMD), specifically income and employment domains. Income deprivation measures the percentage of the population (adults and their dependents) in receipt of specific income-related benefits. Employment deprivation measures the percentage of the working-age population (men aged 16-64 and women aged 16-60) who are on the claimant count, receive Incapacity Benefit, Employment and Support Allowance, or Severe Disablement Allowance.

These rates are aligned to Fife and national averages. While some neighbouring areas experience higher levels of deprivation, the communities in which FEP employees predominantly reside do not appear disproportionately deprived on these headline labour market measures.

This suggests that, at an aggregate level, the closure does not fall disproportionately on the most deprived communities in Scotland. However, it remains important to consider the distribution and quality of employment affected.

Broader socio-economic conditions

To provide a wider view of local conditions, we considered additional indicators drawn from the Scottish Index of Multiple Deprivation (SIMD), including educational attainment, housing conditions, crime and access to services.

Living conditions

Overall, living conditions in the local impact area remain relatively strong. While recorded crime (3.1%) is broadly in line with the national average, overcrowding (8.4%) and inadequate heating (0.9%) are lower than Scotland and comparable to Fife as a whole. Housing quality appears good and neighbourhood conditions are stable. This suggests the local area is not characterised by acute deprivation pressures, providing a relatively solid social baseline for communities affected by the plant's closure.

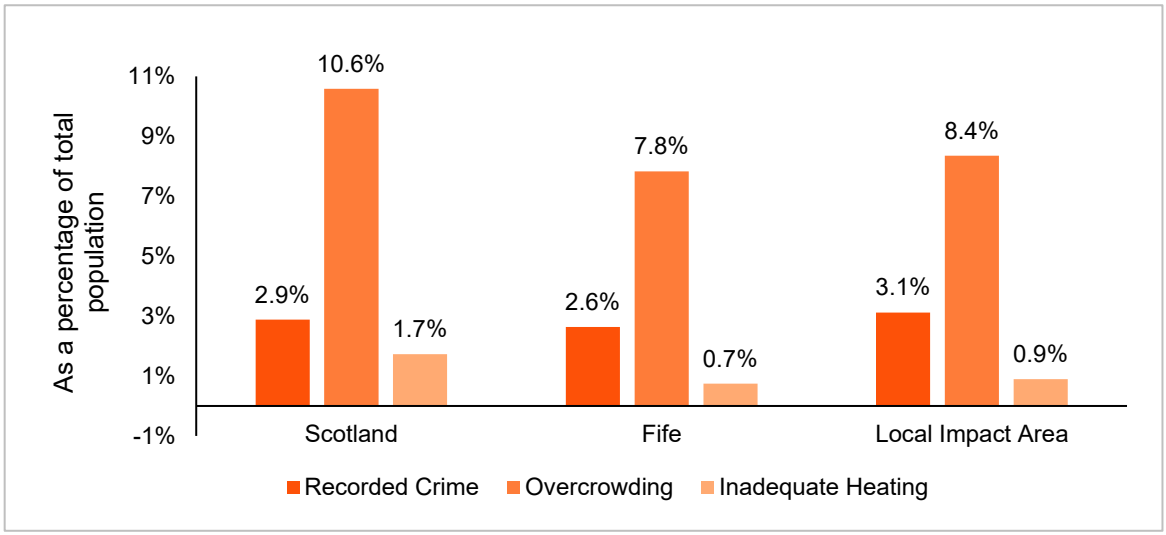


Figure 3: Living condition indicators for Scotland, Fife and the local impact area

Education and skills

School leaver attainment within the local impact area is higher than the Fife average and broadly comparable to the Scotland average (Figure 4). This suggests relatively strong educational outcomes in

affected communities, which may support longer-term labour market resilience following the plant's closure.

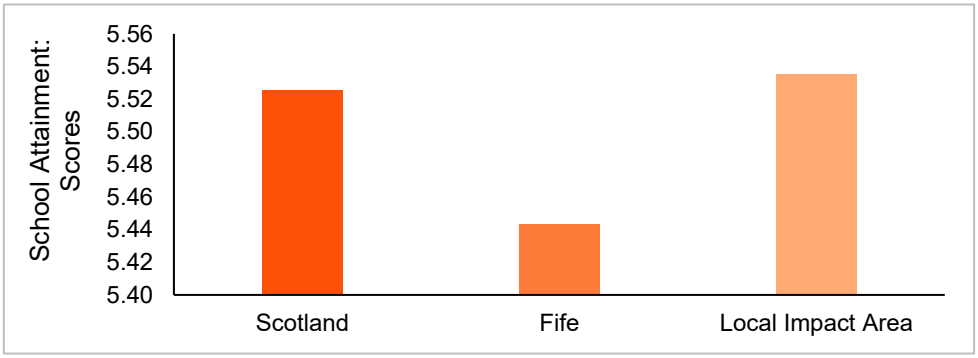


Figure 4: School Leaver Attainment: Scotland, Fife and the local impact area

Average Travel Time to Key Services

Average travel times to key services within the local impact area are broadly similar to those across Fife and Scotland. Driving times to GPs, schools, petrol stations and retail shops are generally low. Public transport journeys are longer, particularly for larger retail destinations, but remain comparable to regional averages. Overall, connectivity to essential services appears reasonable, providing a relatively solid social baseline for the communities affected by the plant's closure.

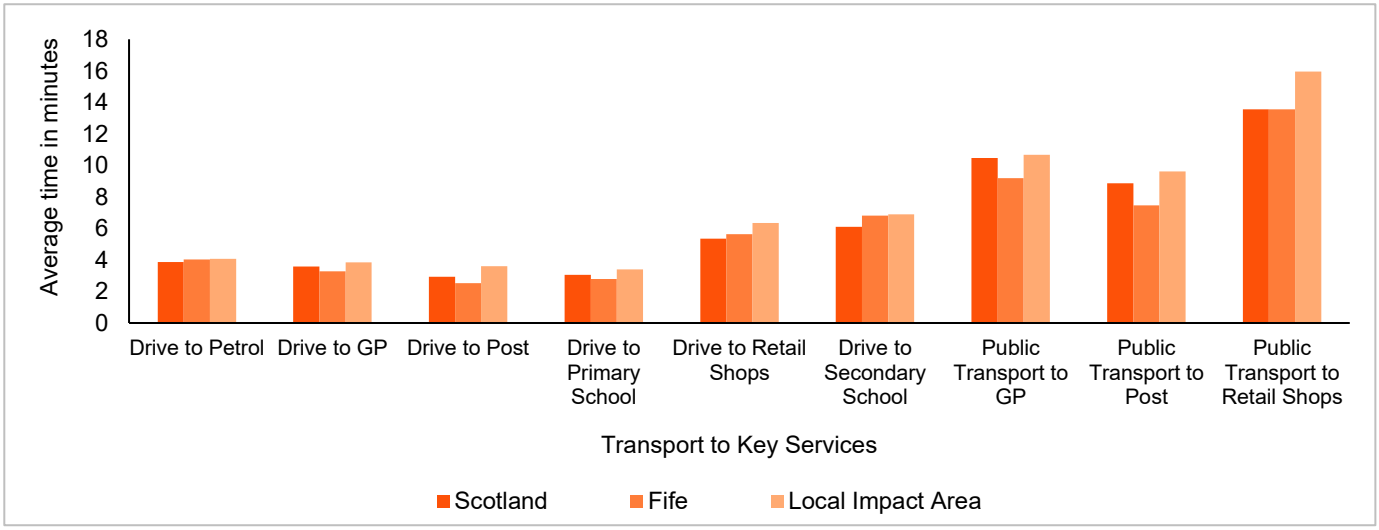


Figure 5: Average travel time to key services for Scotland, Fife and the local impact area

Taken together, the evidence suggests that while the number of direct roles affected represents a relatively small share of overall employment within the local region, the plant constitutes a concentration of high-wage, specialist industrial employment. The communities in which employees reside are, on average, comparable to Fife and Scotland in terms of deprivation and broader socio-economic indicators, and do not exhibit characteristics of acute structural disadvantage. This indicates that the closure does not disproportionately affect the most deprived areas; however, the loss of relatively high incomes and technical roles may still have implications for household spending, local service activity and re-employment pathways. The economic impact estimates presented in this report should therefore be interpreted in the context of a broadly resilient local baseline, but with a material loss of high-value employment and associated spending power.

Sectoral and geographic distribution of impact

Sectoral distribution of impact

The sectoral distribution of impacts provides further insight into how the Fife Ethylene Plant contributed to the Scottish economy. The largest share of this contribution arose from the plant's own operations. As previously set out, 188 roles generated £69.8 million in GVA, accounting for around three quarters of total value added while representing just over one third of total employment supported. Beyond the site itself, supply chain effects were most evident in construction, wholesale and retail, and administrative and support services. See Figure 6 for a breakdown of procurement spend by sector.

Within the supply chain, construction supported 54 jobs and £3.9 million in GVA, representing the largest employment effects. This reflects the types of services required to support the plant's operations. Rather than being linked to one-off construction projects, this activity is more likely associated with ongoing maintenance, inspection, repair and engineering work required to keep the facility operational. In this way, the plant helped sustain demand for specialist contracting services and supported construction and engineering capabilities within the Scottish economy.

A similar pattern can be seen in wholesale and retail, which supported 46 jobs and £2.7 million in GVA across the total impact. These effects reflect both ExxonMobil's procurement spending and household spending. The scale and complexity of the plant's operations required a wide range of intermediate goods supplied through distribution networks, while employee spending supported retail demand in local communities through purchases of groceries, household goods and other everyday items. The presence of this sector among the largest employment effects therefore illustrates how activity at the plant translated into wider commercial activity across the economy.

In addition to construction and retail, the plant's operations supported activity across a range of business services. Administrative and support services supported 42 jobs, reflecting demand for functions such as facilities management, technical support and other operational services required for day-to-day plant operations. While these activities are generally less capital intensive than construction or manufacturing, they form an important part of the service network supporting the facility.

A related effect can be observed in the real estate sector, which generated £3.4 million in GVA through supply chain activity and a further £2.9 million through induced effects. These impacts primarily reflect spending on property services and housing by both suppliers and employees linked to the plant. For example, suppliers operating locally require commercial premises, while employees allocate a portion of their income to housing costs. As a result, some of the economic value associated with the plant flowed into the real estate sector.

Finally, induced impacts generated 97 jobs and £8.8 million in GVA, concentrated in consumer-facing sectors including wholesale and retail, accommodation and food services, education and health. An important driver of these effects was the relatively high level of employee remuneration. Average base salaries at the plant were substantially above both local and national averages, meaning each direct role supported a greater level of household spending than would typically be expected from headcount alone. The induced multiplier therefore captures not only the presence of employment, but also the strength of spending power circulating through local goods and services.

Overall, the results show that while the majority of GVA was generated at the plant itself, the employment associated with its activity was distributed more widely across the economy, spanning sectors such as construction, manufacturing, services and consumer industries.

It should be noted that feedstock purchases are excluded from the analysis (see Appendix). As a result, the economic contribution is not heavily concentrated in the oil and gas extraction sector. Instead, the impacts are more visible across construction, manufacturing and business services, reflecting the operational and local supply chain footprint of the plant rather than the upstream value of crude or other primary inputs. Additionally, although utilities accounted for a relatively large share of ExxonMobil's procurement spend (15% of the total procurement spend in 2025), this expenditure has been excluded from the impact analysis as the relevant companies are classified as England-based and the geographic scope of the analysis is limited to Scotland.

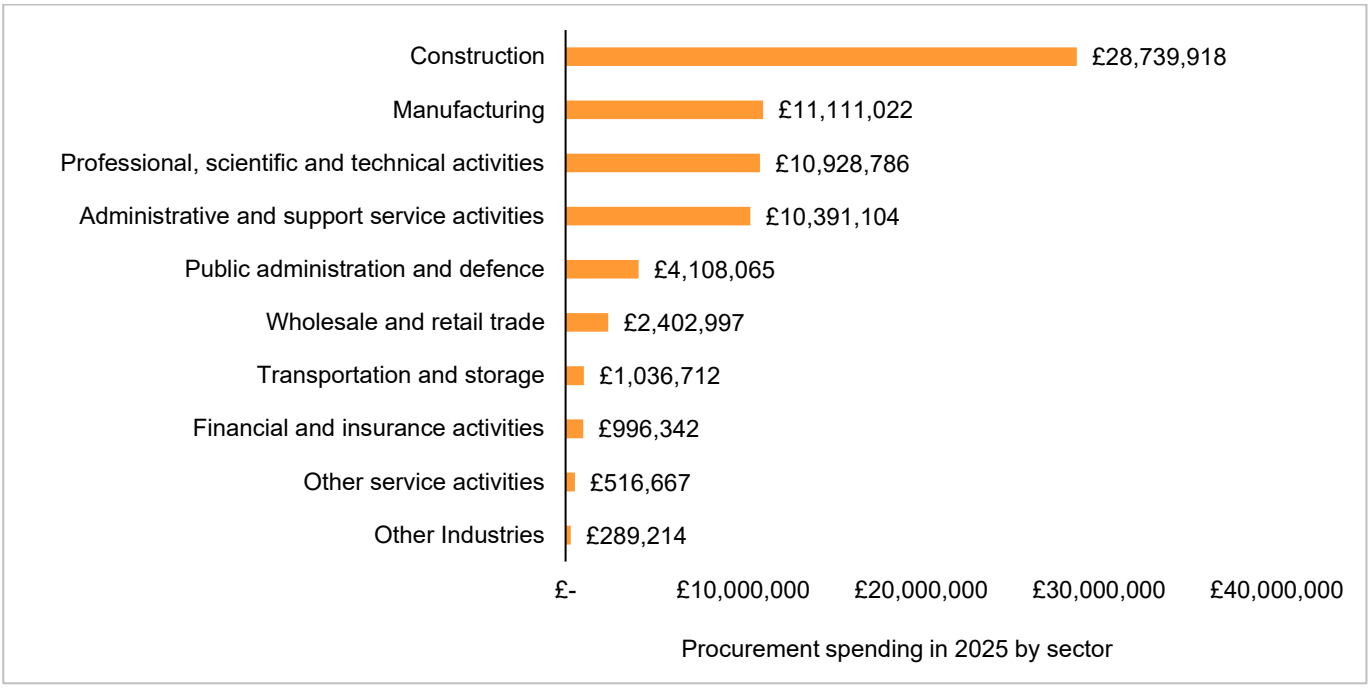


Figure 6: Procurement spending by industry in 2025

Geographic distribution of impact

The Fife Ethylene Plant's supply chain extended across the UK and internationally, reflecting the mix of specialised industrial inputs and operational services required to support plant activity. Suppliers were geographically diverse, with approximately 31% located in Scotland, around 60% in England and Wales, and the remaining 9% internationally. This distribution indicates that the plant relied on a broad supplier base across the UK, with a significant proportion of firms located outside Scotland, particularly in regions with established industrial and manufacturing capabilities.

It is important to note that this economic impact assessment focuses solely on the plant's contribution to the Scottish economy. As such, only activity associated with Scottish suppliers has been included in the economic impact modelling. While many suppliers are headquartered elsewhere in the UK or internationally, additional analysis was undertaken to account for headquartering effects. This involved identifying where economic activity was likely to take place rather than relying solely on the registered location of a company's headquarters. This approach helps ensure that expenditure is attributed to Scotland where work was delivered locally, providing a more accurate reflection of the plant's contribution to the Scottish economy (see Appendix for further detail).

Despite the large number of suppliers located elsewhere in the UK, a substantial share of total procurement spending remained within Scotland in 2025. Approximately 48%[6] of total expenditure was

[6] These figures exclude any spend on feedstock – See Appendix for further detail

directed to Scottish suppliers, indicating that the plant utilised local firms to deliver a number of high-value contracts. This pattern suggests that Scottish suppliers played an important role in providing core operational services, while a wider network of suppliers across England and Wales contributed specialised components, equipment or services required less frequently.

The geographic distribution of suppliers highlights several identifiable clusters. As shown in Figure 7, concentration of firms was visible across the Central Belt of Scotland, particularly around Falkirk, Glasgow and Edinburgh. This reflects the presence of engineering contractors, technical services and business support firms located close to the plant. The presence of these clusters illustrates how large industrial facilities can anchor local supply networks by sustaining demand for nearby specialist services.

Beyond the Central Belt, a further concentration of suppliers was visible in north-east Scotland, particularly around Aberdeen. This reflects the strong presence of oil and gas engineering expertise in the region. Firms located in Aberdeen form part of Scotland's wider energy supply chain and provide specialist capabilities in areas such as engineering services, fabrication and technical consultancy. Their involvement demonstrates how the plant's operations are connected to Scotland's broader energy and industrial ecosystem.

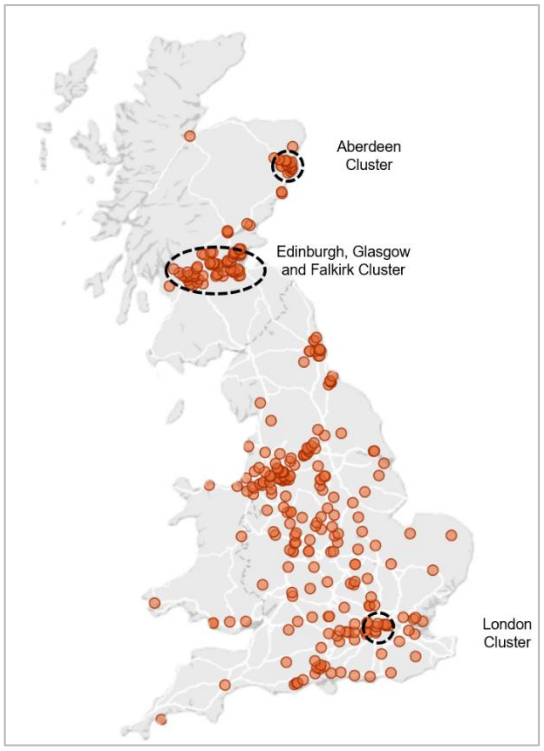


Figure 7: Geographic distribution of ExxonMobil's suppliers

Across England, suppliers were more widely dispersed, with noticeable clusters in major industrial and commercial regions, including London, the Midlands and parts of the Northeast of England. These suppliers are likely to provide specialised manufacturing outputs, fabricated components, and professional services that are less dependent on geographic proximity.

Overall, the geographical distribution of suppliers illustrates how the plant was embedded within both local and national supply networks. The concentration of higher value expenditure in Scotland highlights the importance of local contractors and engineering services in supporting day-to-day operations. At the same time, the wider spread of suppliers across the UK reflects the specialised and technical nature of the plant's supply chains, which draw on capabilities distributed across different industrial regions.

Concluding remarks

In total, the plant the plant supported 477 jobs and generated £92.5 million in GVA across Scotland across its direct operations, supply chain activity and employee spending. While the number of direct roles at the site was relatively small, the economic value generated there was substantial. Around three quarters of total GVA arose from the plant's own operations. This reflects the nature of the facility, where a relatively small number of highly skilled roles generate a significant level of economic output and income.

The analysis also shows that the plant's economic contribution extended beyond the site itself. Through the goods and services it purchased, the plant supported activity in sectors such as construction, manufacturing and business services. At the same time, the wages earned by employees contributed to spending on local services and retail. In this way, the plant acted as a source of income that circulated through the wider economy, sustaining a wider network of economic activity beyond the facility's immediate operations.

Socio-economic indicators suggest that the surrounding area is broadly comparable to Fife and Scotland more broadly in terms of income, employment and wider measures of deprivation. This indicates that the effects of closure are unlikely to fall disproportionately on areas experiencing the highest levels of structural disadvantage. Nevertheless, the plant represented a concentration of high-wage, specialist industrial employment and the loss of these roles, and the spending they supported, indicates the potential for a reduction in economic activity both locally and across the plant's wider supply network.

Appendix

Methodology

Overview

The economic contribution of ExxonMobil's Fife Ethylene Plant (FEP) is assessed in terms of its contribution to GDP and employment supported. PwC also considers wider product market and spillover effects.

To estimate the plant's contribution, we use an Input-Output (I-O) model on the ExxonMobil's employment and supply chain data. This approach traces how activity at the plant generates economic effects across its supply chain and through employee spending. This type of I-O model is appropriate for this analysis as it captures the specific production structure and supply-chain relationships associated with the plant, rather than assuming it is representative of a typical firm in the local area. Given the plant's specialised operations and its closure, it would be unreasonable to assume that its economic footprint mirrors that of other businesses in the region.

Data cleaning

PwC received data from ExxonMobil's Finance, Human Resources and Procurement teams to estimate the direct, indirect and induced impacts associated with the FEP's closure. Each data set required cleansing and alignment with the I-O model structure, with the most extensive work undertaken on the Procurement data. This dataset provided detailed information on ExxonMobil's supply chain and was critical to estimating indirect and induced impacts, as well as for understanding the scale, sectoral composition and geographic distribution of effectives arising from the closure. As such, particular care was taken to interrogate and accurately represent this information within the model.

In addition, data from official statistical sources were used to construct the Input–Output (I-O) models underpinning the analysis. While the data provided by ExxonMobil was thoroughly reviewed and subject to a number of clarification discussions, PwC has not undertaken an independent audit of the data and no assurance is expressed over outputs derived from it.

Approach to cleaning the supply chain data

1. Data collection and review: received data and held clarification calls with Procurement to interrogate accuracy and completeness of the data

2. Companies House matching: undertook a Companies House matching exercise to obtain SIC codes, registered locations, and company registration numbers.

3. Adjust to account for headquartering effects[7]: undertook an exercise to distinguish between the HQ locations and operational delivery locations of each of the companies in the supply chain, using Companies House and postcode data provided by ExxonMobil. Validated exercise with stakeholders from Fife Council to accurately represent where economic activity occurs.

[7] Allocating spend to where activity takes place is essential for accurate I-O modelling. If a supplier's headquarters is in England but the operational activity occurs in Scotland, attributing spend to the HQ location would underestimate Scotland's direct and supply chain impacts. For the FEP, this approach allowed PwC to capture the true regional economic contribution in terms of GVA and jobs as accurately as possible.

4. SIC mapping and spend apportionment: mapped companies to the relevant SIC codes and apportioned spend where multiple SIC classifications applied.

Challenge	Mitigation and approach
Missing data	*Contractor data:* Contractor workforce information was only received from two of the three contracting companies associated with the plant. As complete information on contractor employment and wage distribution was therefore not available at the time of analysis, contractor roles could not be incorporated within the direct employment estimates. Instead, contractor services are captured through procurement expenditure and are therefore reflected within the indirect (supply chain) impacts, in line with standard Input-Output modelling practice. Based on this approach, the model estimates that approximately 105 contractor roles are included within the indirect employment total. As redundancy consultations were ongoing at the time of writing, there remains some uncertainty regarding the final number of contractor roles affected. Should the confirmed figure differ from the modelled estimate, the indirect estimate may be adjusted accordingly. The total indirect employment impact is estimated at 197 jobs. Given the modelled estimate of approximately 105 contractor roles, this implies that around 92 jobs are associated with the wider supply chain beyond contractor services. It should be noted that this estimate reflects only Scottish-based supply chain activity, consistent with the geographic scope of the analysis. Supply chain activity occurring elsewhere in the UK is therefore not included within these estimates. Contractor-related activity reflected within the model is attributed to sectors based on the SIC codes of companies providing these services. As a result, contractor employment effects cannot be disaggregated further than the sectors associated with those firms, which are primarily within construction and manufacturing. Several robustness checks were undertaken to confirm the appropriateness of this treatment. First, indirect employment impacts were estimated both excluding and including the contractor related procurement expenditure. The difference between these two estimates is 105 jobs, providing the indicative estimate of contractor roles captured within the supply chain impacts. This compares with Fife Council's estimate of contractor roles of ~120, and Scottish Government's estimate of ~150. Second, the employment data that was available from two of the three contractors was temporarily incorporated within the direct employment estimates. This resulted in only a modest change to the overall results, increasing total GVA by approximately £3million. Given the incomplete contractor dataset and the results of these robustness checks, capturing contractor services through procurement expenditure is considered to provide a reasonable representation of the economic contribution associated with contractor activity. **This treatment is also consistent with the approach adopted in the previous Grangemouth impact assessment.**

	Intercompany transactions: ExxonMobil was unable to provide information on intercompany transactions. While the company has other operations in Scotland, any transactions between these entities and the FEP have not been included in the dataset used for this analysis. To the extent that such transactions occur, their exclusion may result in an understatement of the estimated economic impact. *Location:* Six companies within the dataset provided lacked location data. These were independently researched and assigned a location, which were subsequently verified with stakeholders from Fife Council. PwC is therefore comfortable *including* these companies in the analysis.
Feedstock	Feedstock expenditure has been excluded from the analysis. Given the fungible nature of oil and related inputs, it is assumed that, in the event of the plant's closure, these products would be reallocated to alternative markets. As such, their inclusion was not expected to materially affect the estimated economic contribution. This treatment was discussed with OCEA economics and agreed to be appropriate for the purposes of this assessment. **This mirrors the approach taken in the previous Grangemouth impact assessment.**
Headquartering effects	PwC conducted a comprehensive review of the companies included in the supply chain dataset by comparing multiple data sources, including supply chain data and Companies House records. The purpose was to assess the location of economic activity, particularly where companies were headquartered elsewhere and/or the location of activity was unclear. For these cases, additional analysis was undertaken alongside ExxonMobil, Scottish Government and Fife Council. Access to Fife Council CRM data further informed this assessment. The findings of this review determined the inclusion of Scottish based companies (or companies operating in Scotland) and associated spend in the final model. This provides a high level of confidence that the right companies are included in the analysis.
SIC code mapping and multiplier allocation	For the majority of companies (316 of 383), Companies House indicated just one SIC code per company, which was subsequently used in the analysis. The remaining companies had more than one SIC code. For these companies, several additional steps and assumptions were made. • Firstly, for certain line items, multiple five-digit SIC codes were identified, but each shared the same first two digits. Scottish Input–Output multipliers are defined at the two-digit SIC level, with additional digits representing further disaggregation within the same broader industry category. In practice, industries that share the same first two digits fall within the same industry classification and are assigned the same multiplier. It is therefore standard practice to map activity based on the first two digits of the SIC code. These line items were consequently treated in the same way as the 316 entries that had a single SIC code and were included accordingly in the analysis. • Secondly, for some line items, ExxonMobil's procurement data provided a description of the of the goods or services purchased. In these cases, a judgement was made to assign the most appropriate SIC code based on the nature of the spend described. • For the majority of outstanding line items, a judgement call was made to allocate spend equally across the SIC codes. This approach was discussed with OCEA economists and was considered appropriate, as the associated

	Input–Output multipliers were typically very similar (for example, 1.25 versus 1.21). Allocating spend equally, rather than selecting a single code, was therefore not expected to materially affect the overall impact estimates. • Finally, there were five companies for which no company number or SIC code information was available. Three of these were Scottish companies, accounting for approximately 0.01% of total spend. Given the negligible scale of this expenditure, these companies were excluded from the analysis, as their inclusion would not materially affect the final impact estimates. This approach was also discussed and agreed with OCEA economists.

Table 3: Challenges and mitigations for available data

Economic Modelling Approach

We estimated FEP's economic contribution to the Scottish economy against two indicators:

1. Contributions to GDP: measured in terms of Gross Value Added (GVA)

2. Employment: expressed as the number of full time equivalent (FTE) jobs supported.

GVA measures the value that is added by a business or industry sector. It is measured as the difference between the value of goods and services produced and the goods and services used as an input. It is, therefore, the company and sector level equivalent of GDP, and summing all sector–level GVA in an economy produces a measure of that economy's GDP

The contribution across the indicators are divided into three tiers:

- Direct impacts arise from the plant's own operations and include the employment and economic value generated on-site.

- Indirect impacts are generated through the plant's supply chain, reflecting the procurement of goods and services from other businesses.

- Induced impacts arise from the spending of earnings by employees across the value chain, including both the plant's own workforce and those employed within its supply chain.

Approach to estimating the direct economic contribution

We use an income approach using data from ExxonMobil's financial accounts to calculate its direct contribution to GVA, which is shown below. To calculate the direct employment contribution, we used human resources data.

Direct contribution to GVA

= profit before interest and taxation + employee costs + depreciation + amortisation.

Approach to estimating indirect and induced economic contribution

We used an input-output model to estimate ExxonMobil's FEP's indirect and induced contribution to the economy. Input-output modelling enables us to account for how industries interact and relate to one another, by estimating how activity by one company stimulates economic activity elsewhere in the economy.

An input output table provides information on what a typical business in the suppliers sector requires for producing one unit of output. It allows us to trace the typical input requirements through the entire supply chain for production activities in each sector and calculate the total value of production stimulated. An input-output table also provides data on the share of revenue that constitutes profit and wages for each sector. Hence, we can apply this ratio to the total production value simulated and estimate the total GVA in the supply chain by sector associated with this.

Additional statistics on employment provide information on the number of individuals that work in any particular sector. As we know the output simulated in each sector, we can estimate the production value to job ratio. We then apply this to the total production value simulated in the supply chain, which allows us to estimate indirect employment, i.e. the number of jobs supported in the supply chain.

These steps are repeated to calculate the induced contribution, with an addition of using wage data to estimate how much production is stimulated in the supply chain that supports the products employees buy, e.g. arts, entertainment and food.

We then applied ExxonMobil's financial and employment data to the multipliers for each of the key indicators, to estimate the indirect and induced contribution across the UK.

Deriving the multipliers

We derive Type I and Type II, multipliers for output, GVA and employment, using publicly available input-output tables for Scotland. Type I multipliers account for the direct and indirect impact, while Type II also capture the induced impact. In order to derive the multipliers, we first construct a technical matrix, A, which shows detailed purchases per unit of output by the purchasing firm from the various domestic supplying industries. It is calculated by dividing the entry in each row by the total gross output for its respective column.

Calculating Type I multipliers:

- We use a technical A1 matrix, in which each cell in row i and column j represents the value of industry i's output required to produce a unit of output in industry j.

- In the case of the Scotland model, the technical matrix A1 is a 22 x 22 matrix.

Calculating Type II multipliers

- To calculate Type II multipliers, we also include an additional notional sector, 'endogenous labour'. It involves adding a new row that is composed of the ratio between compensation of employees and total output, and a column that consists of the ratios of private consumption on each industries output to an estimated household income.

- Hence for the Scotland model the technical matrix A2 becomes a 23 x 23 matrix.

From the A matrices, we then calculate the Leontief matrices. In order to do this we first construct the I - A matrix, where I is an identity matrix with the same dimensions as A.

For Type I multipliers we invert the I - A matrix, excluding the column for private consumption and row for compensation of employees, yielding L1=I - A1-1. This returns a matrix of output multipliers.

To calculate Type I GVA and employment multipliers we take each sectors respective 22 x 1 column vector of output multipliers for L1: (Note 22 x 1 column vector for Scottish model) Where i = buying (column) the plant's sector corresponding to the Input Output Table We then calculated the 1 x 22 row vector of GVA-to output ratios across the buying sectors:

$$x = \left[\frac{GVA_1}{Output_1} \dots \frac{GVA_{22}}{Output_{22}}\right]$$

To calculate the GVA effect for each sector we multiply the row vector by the column vector:

$$GVA\ Effect_i = x \cdot l_i$$

The type I GVA multiplier is then calculated as the following:

$$Type\ 1\ GVA\ Multiplier\ for\ sector\ i = \frac{GVAEffect_i}{GVA_i\ /\ Output_i}$$

Repeating the steps above, but instead with a row vector of employment-to-output ratios for each buying sector will yield Type I Employment Multipliers.

$$y = \left[\frac{Employment_1}{Output_1} \dots \frac{Employment_{22}}{Output_{22}}\right]$$

$$GVA\ Effect_i = y \cdot l_i$$

$$Type\ 1\ Employment\ Multiplier\ for\ sector\ i = \frac{EmploymentEffect_i}{Employment_i\ /\ Output_i}$$

For Type II multipliers, we inverted the I - A matrix, including the column for private consumption and row for compensation of employees yielding I2=(I-A2)-1. As explained above, the L2 differs from L1 because it includes the induced effects in addition to the direct and the indirect effects. The induced effect is a result of the additional spending of employees. Again, repeating the steps above to calculate the sectoral GVA output ratios, GVA effects and GVA multipliers using L2 instead of L1 will yield Type II GVA multipliers, and similarly for Type II Employment multipliers.