



Economic impact assessment of the vaping industry

A Cebr report for the United Kingdom
Vaping Industry Association

September 2022

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The report does not necessarily reflect the views of the United Kingdom Vaping Industry Association.

London, September 2022

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Executive Summary

Report overview

- This is a report by the Centre for Economics and Business Research (Cebr), on behalf of the United Kingdom Vaping Industry Association (UKVIA) detailing the economic contribution of the vaping industry.
- The report considers the direct economic contributions made as well as the wider economic footprint supported through indirect (supply-chain) and induced (wider-spending) impact layers. Within our analysis, we consider these impacts both at national and regional level.
- The report then considers the wider socio-economic spillover benefits associated with the vaping industry. Specifically, it considers the economic benefit of ex-smokers switching to vaping in accordance with current rates of switching and the associated cost to the NHS. The current cost of smoking to the NHS is estimated to be around £2.6 billion in 2015.¹ Finally, we have supplemented the analysis with a bespoke survey, capturing the trends in vaping over the years.

Methodology

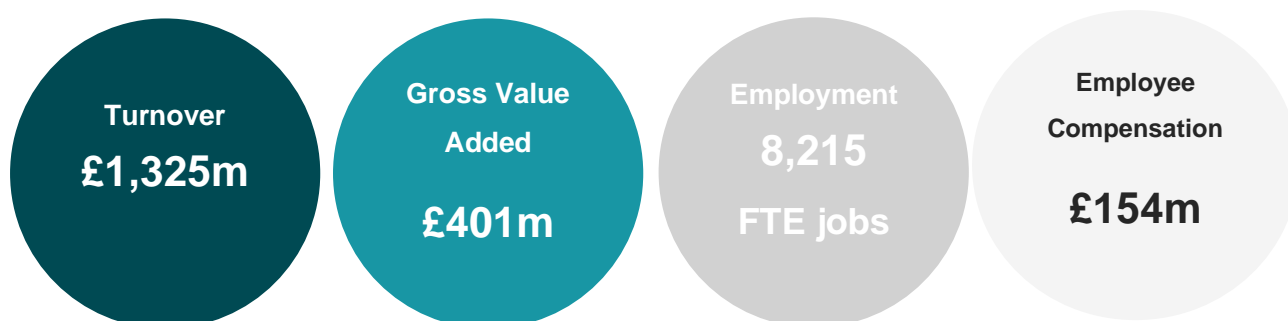
- The analysis presented in this report relied on data from Bureau Van Dijk, a data provider that provides financial information on companies across the United Kingdom (UK), broken down by Standard Industrial Classification (SIC) code. SIC codes categorise the industries that companies belong to based on their business activities. As such, the vaping sector falls into SIC code 47260 – *Retail sale of tobacco products in specialised stores*. Following this, we downloaded company financial data relating to SIC 47260 and filtered for vaping companies, using a range of filters. The filters enabled us to specifically identify vape shops across the UK, as the SIC code provides financial data on all companies that fall into the retail of tobacco products. This is further explained in the methodology section of the report.
- Additionally, to provide more granular regional data points, we gathered data from the Local Data Company, to map the location of the stores to UK regions. This, in tandem with data from our survey on the consumption patterns of vapers within different regions, was used to estimate the regional distribution of economic impacts.
- Finally, to supplement the analysis above, we undertook a bespoke vaping survey to understand the various trends across the vaping industry over the last few years, ranging from consumption on vaping products to the reasons for consumers switching from smoking to vaping.

¹ Public Health England (2017) "Cost of Smoking to NHS England"

Direct economic contributions

In 2021, it is estimated that the vaping industry directly contributed:

Figure 1: Direct impacts, 2021



- The turnover and gross value added (GVA) contributed by the vaping industry have **both increased over the period from 2017 to 2021**. However, employment and compensation of employees declined over the same period.
- In absolute terms, **turnover grew by £251 million over the 2017 to 2021 period**, amounting to a **23.4% growth rate**. GVA contributed by the vaping industry grew in absolute terms **by £122 million over the 2017 to 2021 period**. This amounts to a **44% growth in GVA over the period**.
- Full-time equivalent employment² fluctuated between approximately 8,200 and 9,700 over the period. This increased **from 8,669 in 2017 to 9,673 in 2020; equivalent to a 11.6% increase over the period**. However, employment declined in 2021, in line with a slight decline in turnover and GVA, to 8,215. The decline in employment may have resulted from consumers switching preferences, from purchasing vape products in vape stores to other avenues that sell vape products such as newsagents and supermarkets. This is further supported by analysing the turnover to employment ratio for vape shops and comparing it to newsagents and supermarkets. The turnover to employment ratio is approximately double for newsagents and supermarkets compared to vape shops. As individuals' preferences changed to newsagents and supermarkets, this may have resulted in the decline in employment. Additionally, as COVID-19 support for businesses ended in 2021, this may have further contributed to the decline in employment.
- The contribution to the Exchequer through tax³ revenues was **£310 million in 2021**.

² We typically present results for employment, in full-time equivalent (FTE) terms. FTE refers to the hours worked by one employee who is employed on a full-time basis and is used to standardise the hours worked by several part-time employees to one full-time worker. This is important for comparisons across industries or businesses, where the share of employees who work full-time varies.

³ The specific taxes that contributed to the tax revenues was income tax, national insurance (both for employers and employees, corporation tax and value added tax.

Aggregate economic footprint

The aggregate footprint supported by organisations goes beyond the direct impacts discussed above. Our modelling conceptualises two further impact layers:

1. Indirect impacts consider the demand supported along the supply-chain of the vaping industry.
2. Induced impacts consider the demand supported when employees associated with the direct and indirect layers spend their earnings in the wider economy.

Our results show the following:

- For **every £10 of turnover** generated by the UK vaping industry, a **further £11.16 worth of turnover** is supported in the wider economy.
- For **every £10 of GVA** directly generated by the UK vaping industry, a **further £13.39 of GVA** is supported in the wider economy.
- For **every 10 jobs** directly generated by the UK vaping industry, a **further 11.6 jobs** are supported in the economy.
- For **every £10 in employee compensation** paid by the UK vaping industry, a **further £11.1 worth of compensation** is supported in the wider economy.

By combining these multipliers with the direct impacts, it is estimated that in 2021 the UK vaping industry supported an aggregate footprint of:

Figure 2: Aggregate impacts, FY 2021



Regional economic footprint

The total number of vape shops across the UK has increased approximately from 2,281 in 2017 to 3,644 in 2020. From a regional perspective, the North West had the highest number of vape shops in each of the years from 2017 to 2020, increasing from 381 in 2017 to 573 in 2020, a rise of approximately 50%.

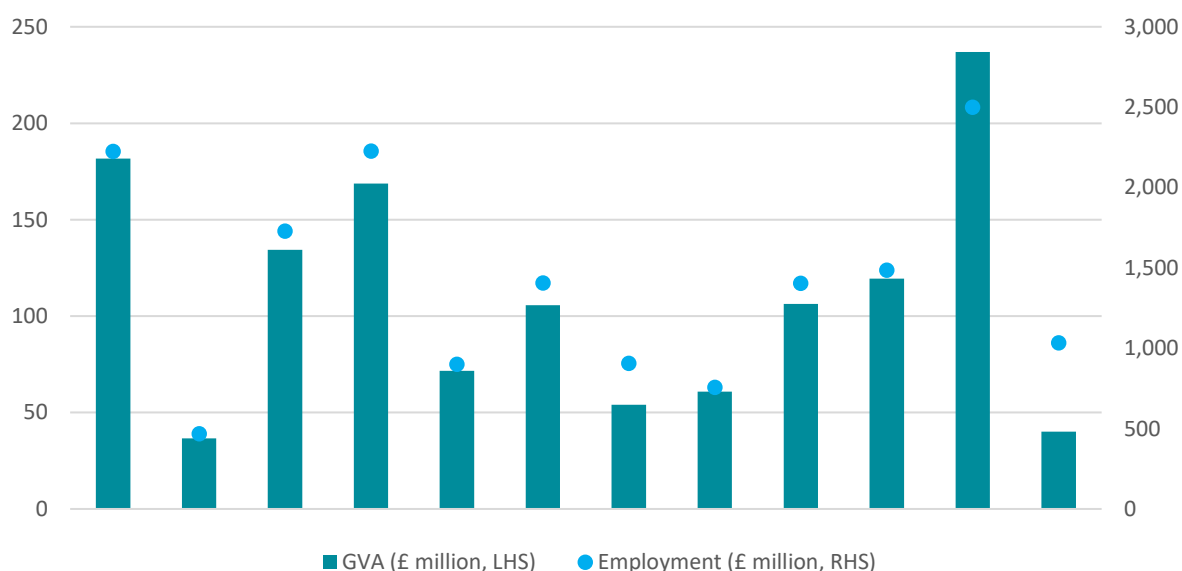
The **direct regional impacts** contributed by the UK vaping industry:

- The region with the highest level of GVA generated by the vaping industry was the **South East in 2020 at £72 million**. The region with the lowest level of GVA was the **South West at £12 million**. The region which saw the **highest GVA growth** over the 2017 to 2020 period **was the North East at 156%**.
- The vaping industry directly **employed the most people in 2020 in Scotland at 1,341** which also grew the most (in absolute terms) over the **2017 to 2020**

period at 70%. The region which had the least employees was Northern Ireland at 261.

- The **highest levels of turnover and employee compensation** were also supported in the **South East**.
- The regional distribution of GVA and employment directly supported by the vaping industry in 2020 are summarised in Figure 3 below.

Figure 3: Regional distribution of direct GVA and employment impacts, 2021

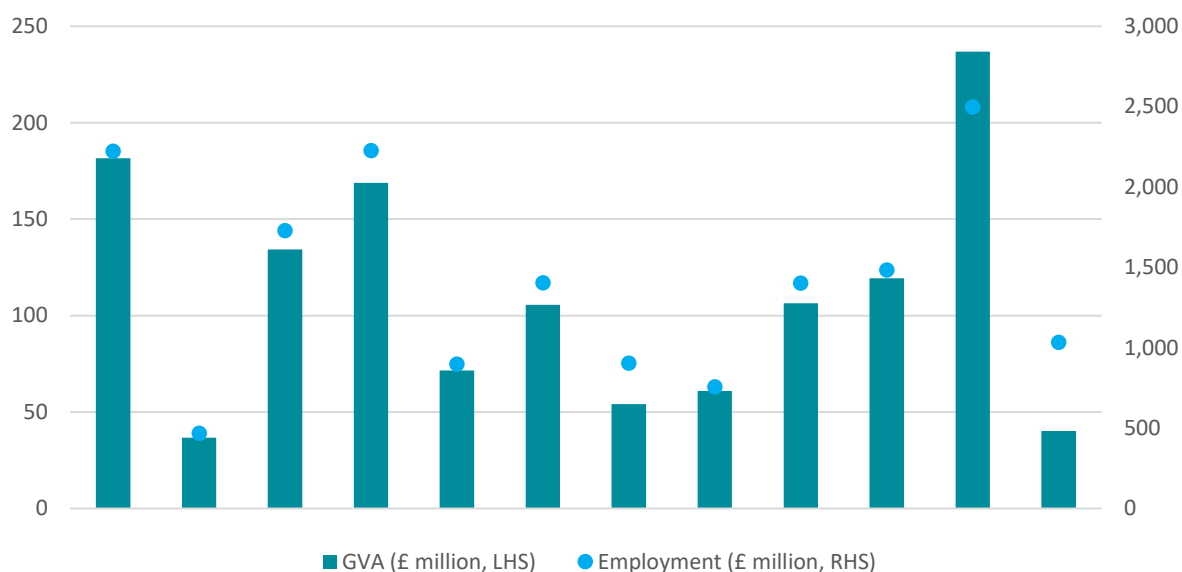


Source: ABS, Opinium, FAME, BRES, Cebr analysis

The **aggregate regional impacts** of the vaping industry:

- The highest regional aggregate impacts for **turnover and GVA** were estimated to be **£459 million and £237 million** respectively in the **South East**.
- The largest estimated regional multipliers for **turnover and GVA** were **2.16 and 2.33** respectively, for **Yorkshire and the Humber**.
- The highest regional aggregate impacts for employment and employee compensation were estimated to be **£2,498 million and £52 million** respectively in the **West Midlands**.
- The largest estimated regional multiplier for employment was **2.10** in the **East Midlands**, whilst the **South West** had the highest regional employee compensation multiplier at **2.07**.
- The aggregate impacts for GVA and employment in 2020 are summarised in
- Figure 4 below.

Figure 4: Regional distribution of aggregate GVA and employment impacts, 2020



Source: ABS, Opinium, FAME, BRES, Cebr analysis

Wider socio-economic spillover benefits

Our analysis of the economic spillover benefits as a result of the substitution effect of smokers switching to vaping yielded the following results:

- The **total saving in healthcare costs** associated with smokers switching to using vaping products is **estimated to be £322 million in 2019**. The potential healthcare saving if 50% of all smokers switched to vaping is **£698 million in 2020**.
- The **total increase in productivity** associated with smokers switching to using vaping products is **estimated to be £1.30 billion in 2019**. The potential productivity increase if 50% of all smokers switched to vaping is **£3.33 billion**.

The **Opinium survey data** revealed the following trends amongst vapers:

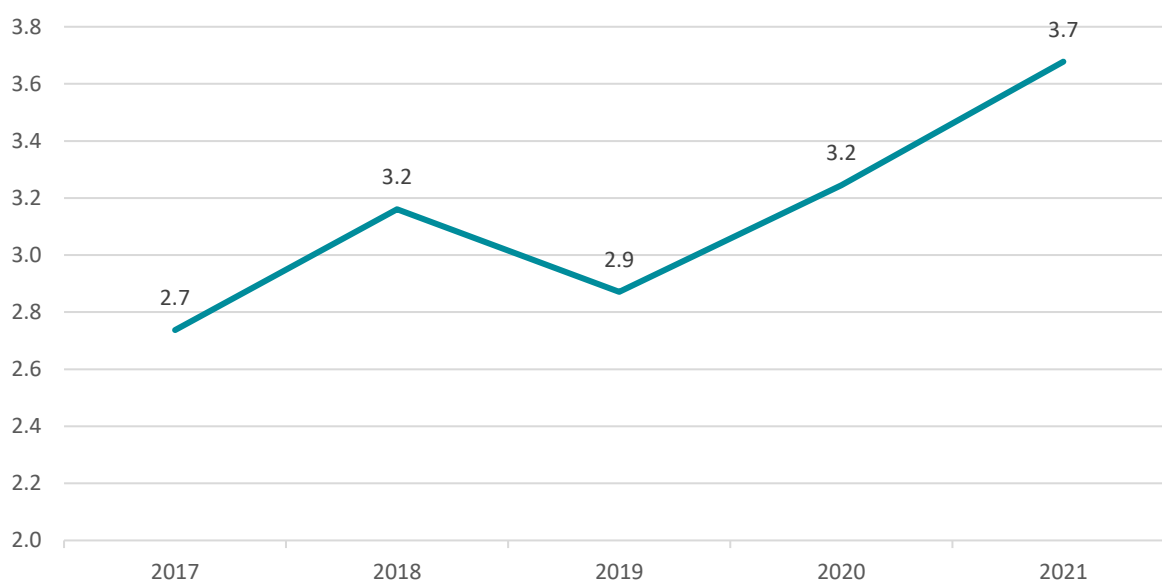
- Of the smokers who switched to vaping, **80% at least smoked less whilst 50% quit smoking entirely**.
- **76% of those aged 55+ began vaping “to quit smoking”** and because it is a “healthier way to use nicotine”. This figure is 35% for those aged 18 – 24.
- The most popular spending avenue to purchase vaping products was **physical vape shops at 39% of spending in 2017**. This remains the case in 2021 at 33%.

1. Introduction

This is a report by the Centre for Economics and Business Research (Cebr), on behalf of the United Kingdom Vaping Industry Association (UKVIA) detailing the economic contribution of the vaping industry to the UK economy using key macroeconomic indicators such as turnover, Gross Value Added (GVA), employment and employee compensation.

The vaping industry, particularly standalone vape shops, has seen significant growth in recent years. Between 2017 and 2020, the number of vape shops in the United Kingdom (UK) has increased from 2,280 to close to 3,650, approximately a 61% increase. This trend is also mirrored by the number of vapers in the UK, as shown in Figure 5 below.

Figure 5: Number of vapers in the UK, millions, 2017 – 2021



Source: ONS, ASH, Cebr analysis

The number of vapers in the UK has increased from 2.7 million in 2017 to 3.7 million in 2021, approximately a 37% increase, per ONS data.⁴ In recent years, vaping has become popular for an aid to stop smoking in the UK and is estimated to be 95% less harmful than smoking,⁵ according to Public Health England. However, in 2019, there was an outbreak of an e-cigarette or vaping use-associated lung injury (EVALI) illness.

The EVALI crisis occurred almost exclusively in the United States and cases peaked in September 2019. By February 2020, the Centers for Disease Control and Prevention (CDC) had recorded over 2800 hospitalizations due to EVALI, along with 68 deaths caused by the condition.⁶

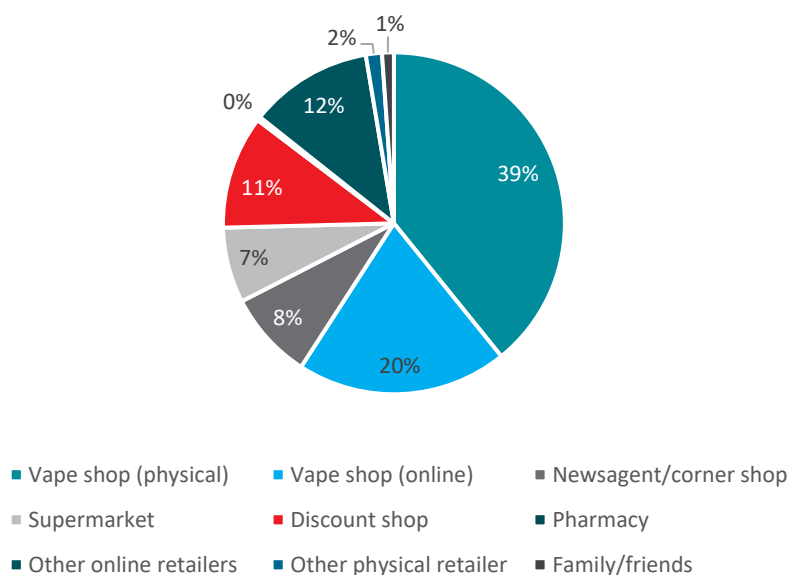
⁴ Note that the number of vapers in 2021 is estimated by extending the ONS data, per growth in the number of vapers as set out by Action on Smoking and Health (ASH) data.

⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/733022/E-cigarettes_an_evidence_update_A_report_commissioned_by_Public_Health_England_FINAL.pdf

⁶ <https://www.yalemedicine.org/conditions/evali>

By 2020, as there was a substantial decrease in cases, the CDC stopped reporting specifically on case, although this continued to be monitored and a low number of cases has persisted. Much of the blame for this outbreak was placed by the CDC on harmful chemicals in illegal cannabis vaping products. Whilst there was no similar outbreak in the UK, associated concerns and the negative publicity are likely a contributing factor to the slight decrease from 3.2 million to 2.9 million vapers in the UK, observed in 2019. There was not a similar outbreak in the UK, most likely because vaping was tightly regulated in the UK and such oils that may have caused the outbreak at banned in the UK⁷.

Figure 6: Preferred spending avenues of vapers to purchase vaping products, %, 2017



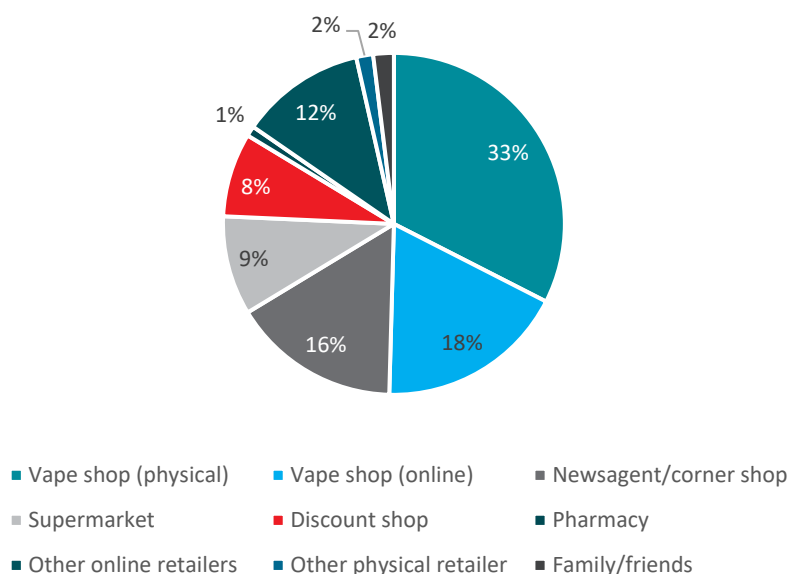
Source: *Opinium, Cebr analysis*

Figure 6 above reveals the 2017 spending avenue proportions for vaping products, revealing physical vape shops to be the most popular way to purchase vaping products, with 39% of total production occurring in these outlets. Figure 7 below illustrates a different consumer preference in spending avenues for 2021. The most popular spending avenue for vapers remains physical vape shops at 33% (a 6% decrease since 2017) with online vape shops remaining in second at 18% (a 2% decline since 2017). There has been an increase in newsagent/corner shops purchases from 8% in 2017 to 16% in 2021 and supermarkets increasing from 7% in 2017 to 9% in 2021.

As such, there seems to have been a movement away from solely vaping retailers (both physical and online) to newsagents, corner shops and to a lesser extent supermarkets. This may have been caused by the COVID-19 pandemic where vaping retailers were forced to close, whereas newsagents/corner shops were allowed to remain open. To satisfy demand consumers likely shifted their consumption pattern towards these open retailers, a trend which at least to some extent seems to have remained entrenched.

⁷ <https://www.reuters.com/article/us-health-vaping-britain-idUSKBN1WT1XP>

Figure 7: Preferred spending avenues of vapers to purchase vaping products, %, 2021



Source: *Opinium, Cebr analysis*

However solely considering these *relative consumption trends*, does not take into account the broader growth in the market, over the same period. As will be seen in Section 3.1, over the entire period total consumption on vaping products increased significantly. Therefore it would be wrong to state that solely because the *share of consumption* in specific vaping retailers decreased, that the economic impact of this segment declined.

1.1 Background and aims of the study

The research presented herein seeks to estimate the economic impact of the UK's vaping industry. Specifically, we estimate the economic contribution of the vaping industry, defined as incorporating the following:

- Vaping retailers
- Other retailers, who sell vaping products (e.g. supermarkets or pharmacies)⁸
- Wholesalers selling vaping products
- Vaping manufacturers

In addition, we examine the indirect contributions made by the vaping industry to the wider economy through its supply-chain relationships with other sectors and the additional economic activity supported through employee spending. We also consider the wider spillover impacts of the vaping industry, including the impact on ex-smokers switching from smoking to vaping and the health benefits associated with the switch.

⁸ Note that we only consider to be in scope, the share of the economic activity of these organisations that is attributed to the sale of vaping products.

1.2 Structure of the report

The report is structured as follows:

- **Section 2** sets out the methodology of the report. This includes the methodology in calculating the direct impact of the vaping industry, as well as the indirect and induced economic footprint.
- **Section 3** provides our findings of the direct economic impact of the vaping industry, in terms of key financial metrics such as turnover, Gross Value Added (GVA), employment, employee compensation and tax contributions.
- **Section 4** extends this analysis to consider the aggregate economic footprint of the vaping industry, by the same metrics.
- **Section 5** outlines the estimated regional distribution of the economic contribution of the vaping industry.
- **Section 6** provides our analysis of the wider socio-economic benefits associated with the vaping industry.
- **Section 7** provides a conclusion to the report.

2. Methodology

This section outlines our methodology in estimating the economic impact of the vaping industry in the UK.

For the purposes of this report, we consider the UK vaping industry to comprise of multiple consumption avenues as well as elements of the industry supply chain (such as vaping product wholesalers and manufacturers). In terms of consumption avenues our analysis considers the contributions of vape shops (both online and brick and mortar), newsagents/corner shops, supermarkets, pharmacies, other online retailers (such as amazon) and other physical retailers (i.e., discount shops).

Our starting point was to identify the contributions directly made by the UK vape shops (both online and brick and mortar) to the UK economy, which we would use a foundation to estimate the contributions of other consumption streams to estimate the vaping industry. Our analysis considered four key performance indicators:

- **Turnover** – This represents the revenue generated by the vaping industry as defined above.
- **Gross Value Added (GVA)** – GVA contributions represent the ‘value-added’ to the economy by UK vape shops. It avoids double counting by subtracting intermediate consumption. GVA is also commonly known as income from production and is distributed in three directions – to employees, to shareholders and to government.
- **Employment** – Refers to the number of workers employed in the vaping industry. We typically present results as full-time equivalent (FTE) employees. FTE refers to the hours worked by one employee who is employed on a full-time basis and is used to standardise the hours worked by several part-time employees to one full-time worker. This is important for comparisons across industries or businesses, where the share of employees who work full-time varies.
- **Employee Compensation** – Refers to the total compensation paid to employees in return for work done. This includes wages, benefits and employer pension and tax liabilities.

To compute the impacts above, we relied on firm level financial data from the FAME database for UK vape shops as well as a consumer survey of UK vapers conducted by Opinium. The FAME database contained key information on yearly turnover, employment, employee compensation, operating profit, amortisation, and depreciation (which we used to calculate the four key performance indicators for UK vape shops). The consumer survey included questions on average spending on vaping products from 2017 to 2021, the proportion of spending on vape products through different avenues in 2017, 2020 and 2021 (i.e., the proportion spent on vape shops compared to supermarkets when purchasing vape products), as well as other demographic and consumer behaviour-related questions.

Given this information, we were able to measure turnover for the whole vaping industry by multiplying average yearly spending on vaping products by the total number of vapers obtained from the Office of National Statistics (ONS). To obtain the yearly figures for GVA, employment and employee compensation for the vaping industry, we used the yearly proportion of vape product spending on different avenues by vapers to attribute a representative portion of turnover to each avenue. Using the FAME data for vape shops, we could find the turnover to GVA, employment and compensation of employee ratios.

Using the ONS, Business Register and Employment Survey (BRES) and the Annual Business Survey (ABS) data for other spending avenues such as newsagents, supermarkets, online retailers etc, we calculated the corresponding turnover to GVA, employment and compensation of employee ratios for each spending avenue. Using these ratios, and the total turnover for each spending avenue, we estimated the level of GVA, employment and compensation of employees for each spending avenue. Totalling each spending avenue figure for each variable for each year, yielded the UK vaping industry direct impacts.

Aggregate footprint of the UK vaping industry

The wider footprint supported by the UK vaping industry is not constrained to these direct impacts alone. Our approach conceptualises two further impact layers:

- **Indirect impacts** – The UK vaping industry places demands on its supply chains, that feed into day-to-day operations. Further economic activity is supported when the vaping industry purchases goods and services from suppliers. This impact layer looks at the knock-on impact of upstream activity to show the wider impact of the expenditure of organisations within the industry, on the UK and regional economies. To accurately represent the economic footprint of the UK vaping industry, we consider some elements of the supply chain of vaping retailers, as part of the vaping industry itself such as the manufacture and wholesale of vaping products. As such, this portion of the supply chain has therefore been accounted for as direct impacts in the report and are excluded from the indirect impact figures to avoid double counting.
- **Induced impacts** – Economic activity supported when direct and indirect (supply chain) employees spend their earnings on goods and services in the wider UK economy, thus facilitating induced impacts that provide further layers of support.

Summing these direct, indirect, and induced impact layers allows us to estimate the aggregate footprint supported by the UK vaping industry.

To model the relationships that exist between these impact layers, we use bespoke input-output models. These models examine the structure of a firm or industry's supply-chain, allowing us to quantify the economic activity supported along them. In addition, by considering the typical distribution of household spending, the model allows us to calculate the output and employment associated with the induced impact layer.

Our modelling produces multipliers, which calculate the total footprint supported for a given level of direct contributions. By combining these multipliers with the calculated direct impacts, we form our estimates for the aggregate footprint supported by the UK vaping industry.

Regional multipliers

In addition to the national-level multipliers, we also compute regional estimates of the direct economic contributions made by the UK vaping industry. This breaks down the UK-wide direct impacts for the same key metrics: turnover, GVA, employment and employee compensation. To estimate these key metrics, we utilised the regional breakdown of the Opinium consumer survey to yield total yearly turnover figures for each region for the years 2017 to 2020. As with the national model, we utilised BRES, ABS and FAME data to estimate the regional turnover to GVA, employees and employee compensation ratios. From this we were able to estimate GVA, employees and employee compensation for each region.

The computed regional multipliers are based on the national multipliers but are adjusted to account for differences in the structure of the economy in different regions. The London economy for instance has a proportionally higher concentration of service industries, which means that the national multiplier is not fully applicable to operations that occur solely within

London. Given this, the regional multipliers augment the national multipliers, accounting for the different disaggregation of economic activity in specific regions.

Socio-economic spillover effects

Additionally, we estimated the socio-economic spillover effects associated with the use of vaping products. The primary investigation of these spillovers was exploring the substitution of individuals smoking, to instead using vaping products. To gauge the economic value of these substitution effects, we observed two metrics:

- The effect of increased public health from smokers switching to vaping, and the resulting net reduction in healthcare costs; and
- The decrease in absenteeism arising from smokers switching to vaping and the resulting increase in productivity.

In order to analyse both of these effects, we first had to establish the current productivity and healthcare cost of smoking for the UK. Using sources such as Action on Smoking and Health (ASH) and Public Health England, which detailed the productivity and healthcare costs for England specifically, we estimated the total healthcare cost of smoking for the UK, scaling up for the UK smoking population.

Once the value of healthcare costs and productivity loss due to smoking for the UK was established, we then estimated the total population of vapers who were ex-smokers in the UK using ONS data. With the population of UK vapers who were ex-smokers, alongside the total UK smoking population, we were then able to construct two population groups for analysis:

- The smoking and the ex-smoking vaper population as recorded by ONS in 2019 (the factual prior scenario).
- The ex-smoker vaping population (assumed to have never switched from smoking), giving a smoker population recorded by the ONS plus the ex-smoker population of vapers⁹ (the counterfactual scenario).

After establishing the two scenarios, we then needed to understand the healthcare and productivity costs for smokers and ex-smokers who vape, summarised in Table 1 below.

Table 1: Yearly healthcare and production costs of individual smokers and ex-smokers who vape, £, 2019

	Smoker	Ex-smoker
Yearly healthcare cost	£395	£192
Yearly productivity cost	£2,117	£1,304

Source: Opinium, ONS, ASH ready reckoner, Cebr analysis

For healthcare costs, we assumed vapers carry 5% of the healthcare costs attributable to vapers, in line with Public Health England which states use of e-cigarettes carry 95% harm associated with smoking.¹⁰ Given that ex-smokers still carry residual health risks despite

9 Whilst we assume the ex-smoking vaper population are all smokers in this scenario, we account for a background rate of smokers quitting, as the fraction of smokers who quit without switching to vaping products should remain consistent with the factual scenario.

10 Public Health England (2015) "E-cigarettes around 95% less Harmful than tobacco estimates"

switching to vaping, it was important to account for this when observing the health costs associated with being an ex-smoker who vapes. Given this, we reviewed the health literature and established that an ex-smoker, on average, carries 44% of the increased risk of all-cause mortality attributable to smokers.¹¹ Combining the underlying negative health consequences of vaping with the residual negative health effects of smoking and using the ASH ready reckoner¹² smoker healthcare costs, we estimated the healthcare cost of each ex-smoker who vapes, as well as the per smoker healthcare cost for 2019, which Table 1 reveals to be £192 and £395 respectively.

When estimating the total healthcare cost for both scenarios, we simply multiplied the per smoker healthcare cost by the estimated smoker populations in both scenarios. For the factual prior scenario, we also multiplied the ex-smoker who vapes by the per ex-smoker who vapes' healthcare cost. This gave the total healthcare costs in both scenarios for smokers and ex-smokers who vape in 2019, allowing us to compare the two figures. The difference between the two being the value of healthcare saving of smokers switching from vaping to smoking.

In order to estimate the productivity increase associated with smokers switching to vaping, we carried the health assumptions from the healthcare cost analysis and applied it to the ASH Ready Reckoner productivity cost of smokers. An additional layer of analysis was required however to factor in the cost of smokers and vapers taking breaks during the working day. Unfortunately, there is not sufficient evidence to quantify the cost of vaping breaks. As such, we have assumed that smokers and vapers take equal breaks from work, with each negatively impacting productivity. The potential for productivity savings when a smoker switches to vaping are therefore only realisable for the share of productivity savings not associated with smoking/vaping breaks.

Accounting for this, we then derived the per smoker productivity costs and the per ex-smoker who vapes' productivity costs for 2019, which Table 1 reveals to be £2,117 and £1,304 respectively. This provided the total productivity costs of smokers and ex-smokers who vape, allowing us to compare the two figures associated with both scenarios; the difference between them being the value of productivity associated with smokers switching from vaping.

Finally, in order to highlight the potential economic benefits of using vaping products as a smoking cessation tool, we constructed several 'what-if' scenarios. Within this, we assumed an additional fixed proportion of smokers switching to vaping and calculated the marginal increase in healthcare saving and production increases associated with this, utilising the same framework as the counterfactual assessment.

11 NCBI (2008) "Smoking and Smoking cessation in relation to Mortality"

12 The ASH Ready Reckoner is a tool made available by Action on Smoking and Health which allows users to calculate the costs of smoking to society

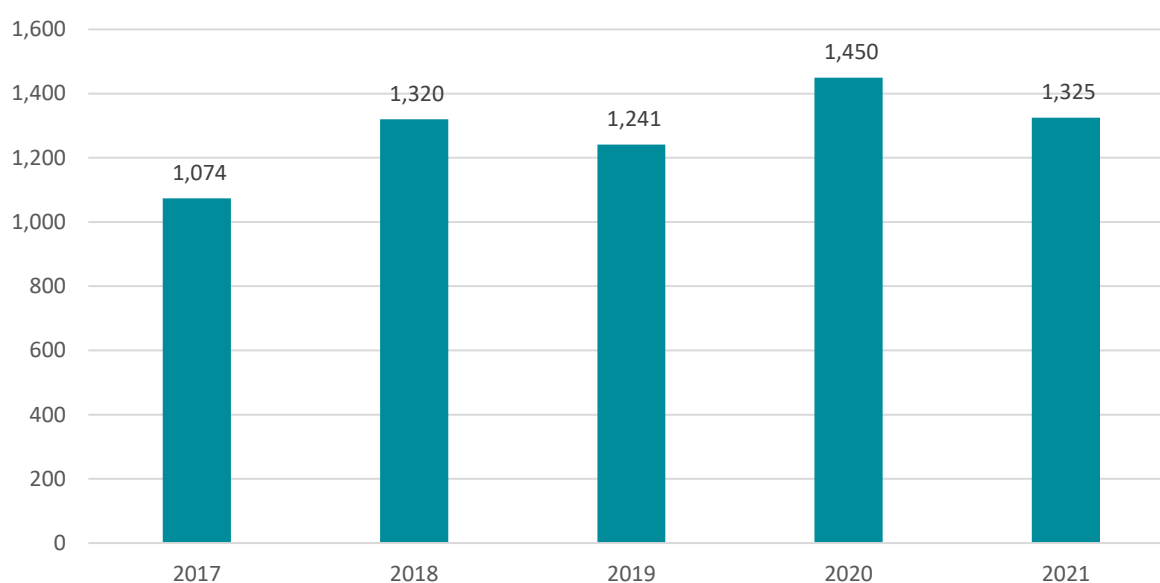
3. Direct economic impacts

This section details the direct impact of the vaping industry, at a national level. Our results are presented in terms of key economic indicators, namely: turnover, Gross Value Added (GVA), employment, employee compensation, and tax contributions.

3.1 Turnover

Figure 8 below illustrates the turnover for the vaping industry from 2017 to 2021. This turnover can be thought of as the total revenue generated by the vaping industry, considering the different avenues where individuals may buy vape products from (as illustrated in Figure 6 and Figure 7). In addition, this covers the turnover of vaping manufacturers and wholesalers.

Figure 8: Turnover for the UK vaping industry, £ million, 2021



Source: FAME, Opinium, ONS, Cebr analysis

From 2017 to 2021, vaping industry turnover increased by £251 million (23.4%), illustrating the growth that has occurred in the industry over the time period. However this overall trend does mask some year-on-year volatility notably the slight declines in turnover observed in 2019 and 2020.

In 2019, turnover for the vaping industry, decreased from £1,320 million to £1,241 million. It is likely that this decline was as a result of the EVALI crisis, as explained in Section 1.1 of the report. The EVALI crisis contributed to a decline in the number of vapers in 2019 (a fall from 3.2 million to 2.9 million), leading to the decrease in turnover observed in 2019. The argument that this decline is driven by a reduced number of vapers in 2019, is supported by the fact that the average monthly spend of vapers amongst those who continued to vape, remained relatively consistent.

From 2020 to 2021, turnover decreased from £1,450 million to £1,325 million. This is slightly more challenging to confidently identify a singular cause for, however we do note that the average spend per vaper decreased by approximately 18% from 2020 to 2021, directly impacting industry turnover, as observed. While we cannot be certain, a possible reason behind this may be the changing nature of vape products as cheaper alternatives enter the market. Also, it may be those vapers are using different avenues to purchase vape products.

As described in Figure 7, newsagents and supermarkets increased their share of the market over this period; if they are charging lower prices, compared to vape shops, this could partially then explain the decrease in turnover from 2020 to 2021.

To provide wider context to the relative size of the UK vaping industry's turnover contribution, Figure 9 illustrates a comparison of the 2020¹³ level of turnover for the UK vaping industry, alongside similarly sized industries.

Figure 9: Industry turnover for the UK vaping industry compared to similar sized industries, £ million, 2020



Source: FAME, Opinium, ONS, Cebr analysis

As illustrated, the UK vaping industry had a higher turnover than the retail sale of textiles; retail sale of books; retail sale via stalls and markets and fruit and vegetables in specialised stores. Whilst Figure 9 shows that turnover for the vaping industry is lower than the retail sale of newspapers and stationery, this demonstrates the size and contribution of the vaping industry to the UK economy.

3.2 Gross Value Added (GVA)

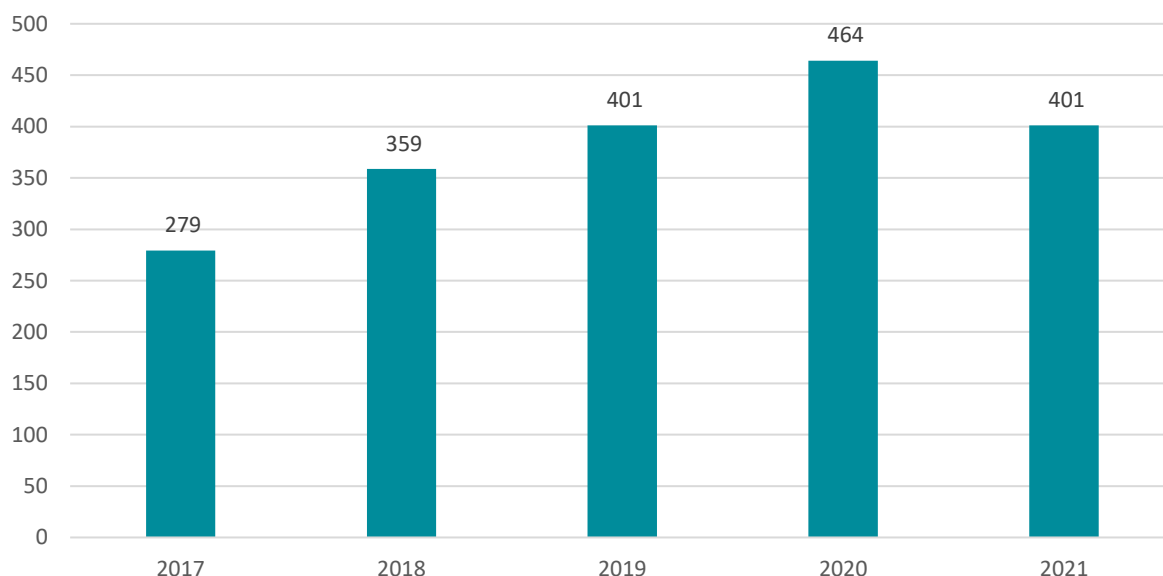
While the turnover values discussed in the previous section provide an indication of the size of the vaping industries operations, it would be conceptually wrong to simply interpret these figures as direct value-added contributions to the UK economy. A key example as to why this is the case is that part of the turnover raised is to cover utility costs and as such is paid to utility providers. As a result, this portion of turnover represents the value added to the economy by part of the supply chain of the vaping industry as opposed to the vaping industry itself.

To account for this, we use a concept of Gross Value Added (GVA) when considering the “value-added” of the vaping industry. Fundamentally, GVA represents the difference between

¹³ The most up-to-date version of the Annual Business Survey contains turnover data for other industries up to 2020, therefore for consistency we compare the 2020 vaping industry turnover instead of the equivalent 2021 figure.

total revenue and total intermediate expenditure. This intuitively represents the value-added by the vaping industry and is often considered the industry's contribution to UK GDP.

Figure 10: GVA for the UK vaping industry, £ million, 2021



Source: FAME, Opinium, ONS, Cebr analysis

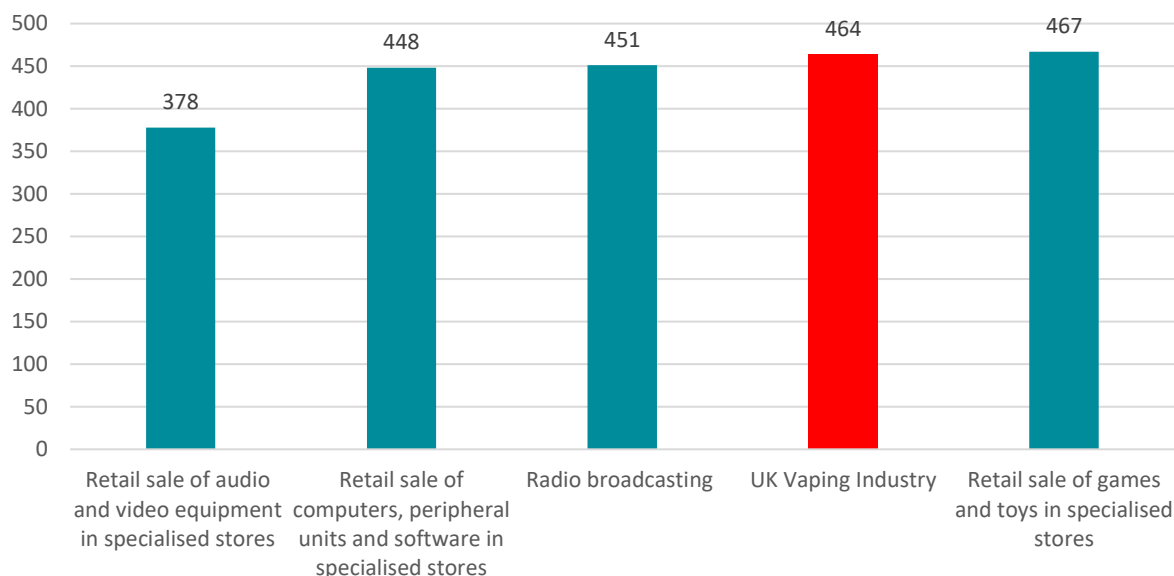
Figure 10 reveals the contribution of GVA by the vaping industry for years 2017 to 2021. Overall, as of 2021, the vaping industry contributed £401 million in GVA to the UK economy; a figure that increased by 44% since 2017. The total direct GVA contribution of the UK vaping industry consistently grew from 2017 to 2020. From 2020 to 2021, the level of GVA generated by the vaping industry returned to similar levels as in 2019.

In 2019, although there was the EVALI crisis as discussed above, operating profits were slightly higher than in 2018, resulting in a higher GVA, even though turnover for the vaping industry was lower. From 2020 to 2021, GVA decreased from 464 million to 401 million, similar to the decrease in size for turnover, as vapers tended to spend less than in previous years.

To provide wider context to the relative size of the UK vaping industry's GVA contribution, Figure 11 illustrates a comparison of 2020¹⁴ values of GVA for the UK vaping industry alongside similarly sized industries.

¹⁴ Similarly, the most up-to-date version of the Annual Business Survey contains GVA data for other industries up to 2020, therefore for consistency we again compare the 2020 vaping industry GVA instead of the equivalent 2021 figure.

Figure 11: Industry GVA for the UK vaping industry compared to similar sized industries, £ million, 2020



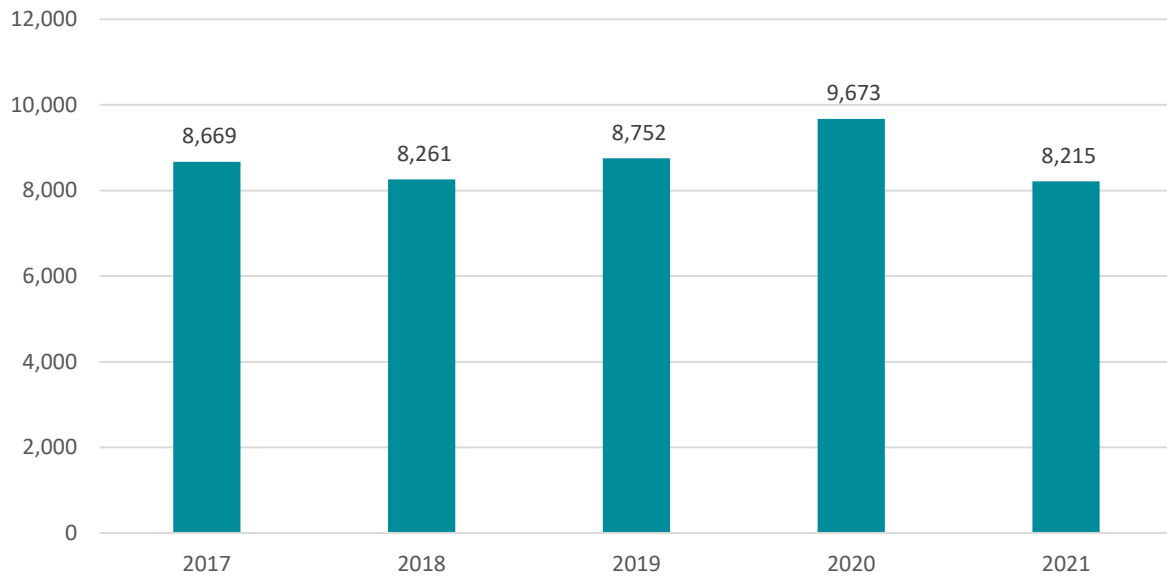
Source: FAME, Opinium, ONS, Cebr analysis

As illustrated, the UK vaping industry has a higher GVA value than retail sale of audio and video equipment; retail sale of computers; and radio broadcasting. Whilst Figure 11 shows that GVA for the vaping industry is lower than the retail sale of games and toys in specialised stores, this again demonstrates the size and contribution of the vaping industry to the UK economy.

3.3 Employment

Figure 12 below illustrates the employment contributions made by the vaping industry between the years 2017 to 2021. Our results below present the standardised full-time equivalent employees (FTEs).

Figure 12: Employment for the UK vaping industry, FTE, 2021

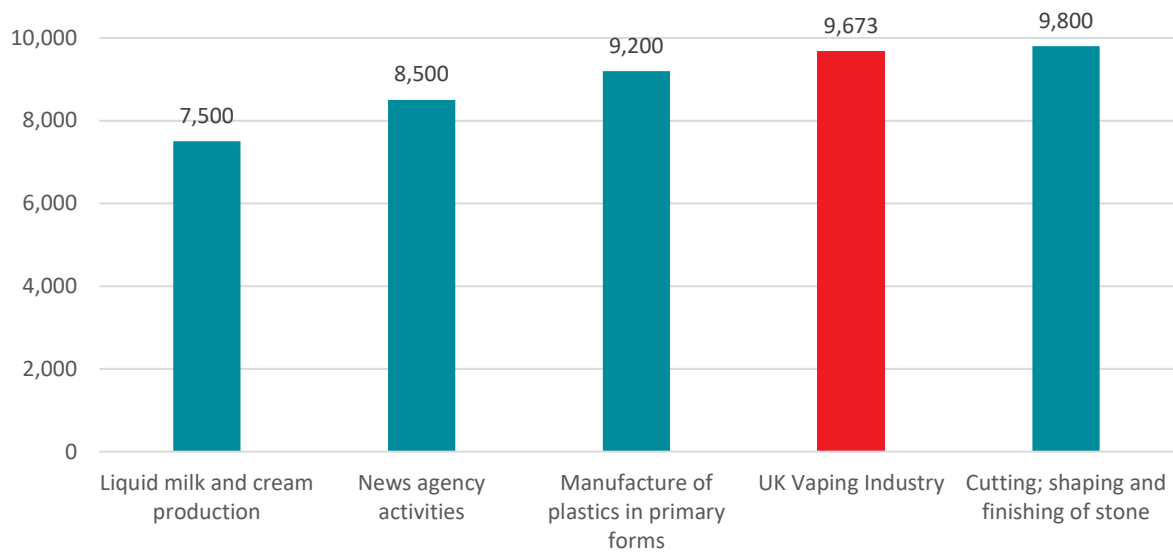


Source: FAME, Opinium, ONS, Cebr analysis

From Figure 12 above, the number of FTEs in the vaping industry has increased from 8,669 in 2017 to 9,673 in 2020; equivalent to a 11.6% increase over the period. However, employment declined from 2020 to 2021 to 8,215, which led to a 5.2% decline in FTEs over the entire period of 2017 to 2021. This contrasts with the growth in employment across the UK economy over the same period, with 1% growth in total employment from 2017 to 2021. The decline in employment may have resulted from consumers switching preferences, from purchasing vape products in vape stores to other avenues that sell vape products such as newsagents and supermarkets. This is further supported by analysing the turnover to employment ratio for vape shops and comparing it to newsagents and supermarkets. The turnover to employment ratio is approximately double for newsagents and supermarkets compared to vape shops. As individuals' preferences changed to newsagents and supermarkets, this may have resulted in the decline in employment. Additionally, as COVID-19 support for businesses ended in 2021, this may have further contributed to the decline in employment.

As per turnover and GVA, we also compare employment to wider industry SIC codes as shown by Figure 13 below.

Figure 13: Industry employment for the UK vaping industry compared to similar sized industries, £ million, 2020

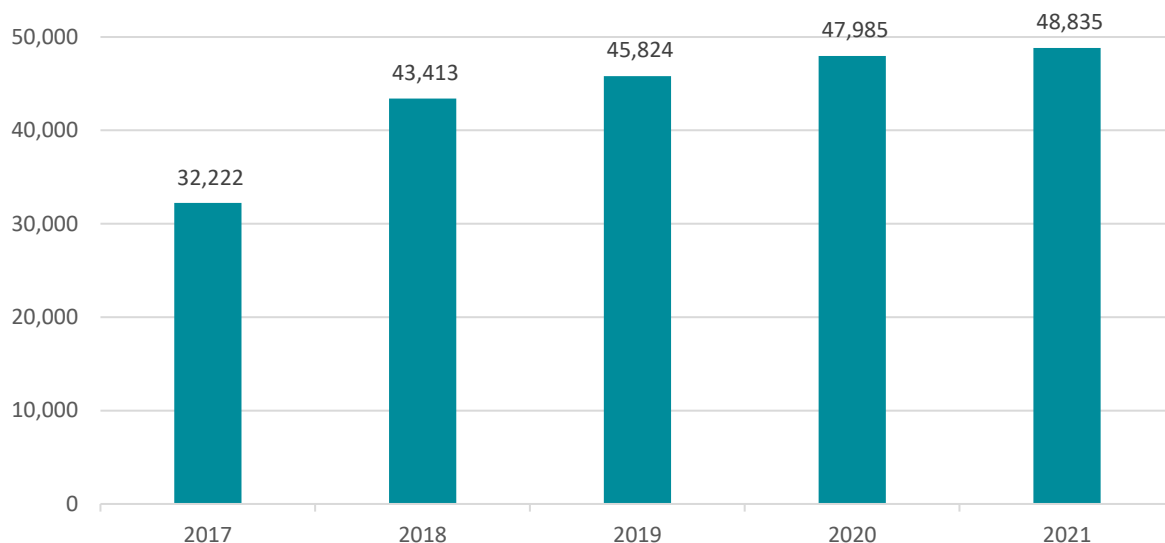


Source: FAME, Opinium, ONS, Cebr analysis

Employment in the UK vaping industry is a similarly sized industry to the cutting, shaping, and finishing of stone and is bigger than the manufacture of plastics in primary forms. It is also larger than liquid milk and cream production and news agency activities.

Considering the analysis above, we can provide further evidence into another variable – productivity. Measuring productivity can be a nuanced exercise but a standardised approach is to consider average output per worker. Per the analysis undertaken above, we can use GVA per FTE worker as a measure of productivity. The results over the assessed period can be seen in Figure 14 below.

Figure 14: Productivity of the vaping industry in the UK, £, 2021



Source: FAME, Opinium, ONS, Cebr analysis

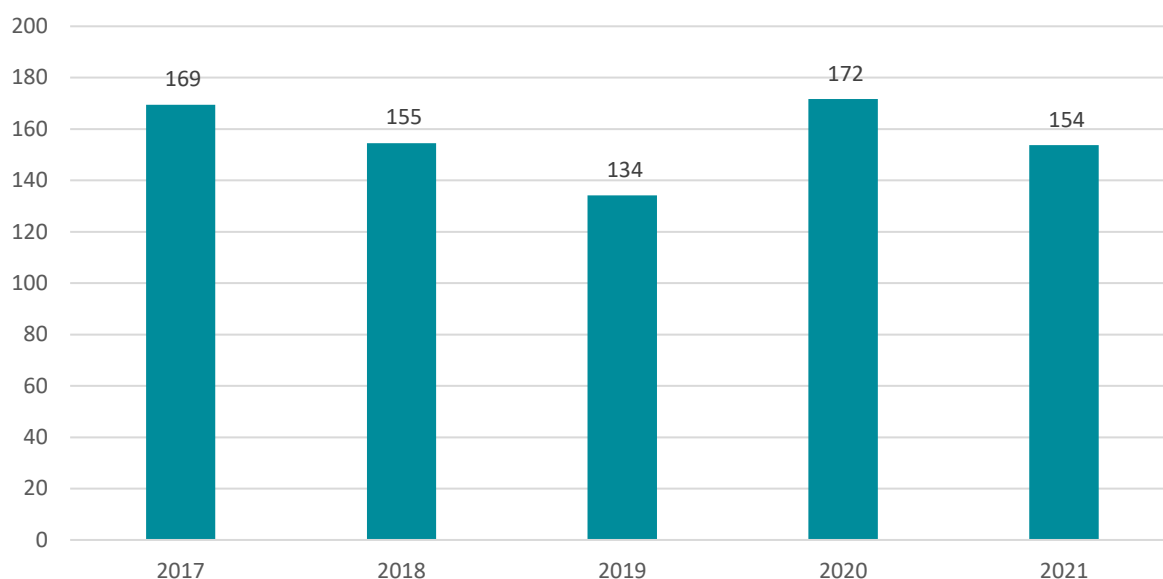
The above figure illustrates the average output per FTE worker in the vaping industry; a trend that is interesting given that FTEs decreased overall from 2017 to 2021. In 2017, output per FTE worker was £32,222 and this increased to £48,835 in 2021, representing a 51.6% growth in productivity over time. As such, whilst we observe that FTEs decreased overall from 2017 to 2021, output increased in the same period, showing that productivity increased, without the need for an increase in employment.

Overall, from 2017 to 2019, employment remained broadly steady, but productivity increased in the vaping industry as GVA increases. From 2019 to 2021, employment follows the trend for GVA and turnover, increasing in 2020 and then falling in 2021.

3.4 Compensation of employees

Employee compensation refers to the total costs associated with the employment of workers. It includes wages, pension costs, social security costs and any company provided employee benefits. The figure below illustrates the total amount paid in employee compensation by UK vaping industry

Figure 15: Compensation of employees for the UK vaping industry, £ million, 2021



Source: FAME, Opinium, ONS, Cebr analysis

Figure 15 reveals that over the period, total employee compensation declined from £169 million in 2017 to £154 million in 2021, equivalent to an 8.9% decline over the period. As FTEs have also decreased over the period by 5.2%, a perhaps more meaningful comparison is to consider the average compensation paid per FTE employee. From 2017 to 2021, the average compensation per employee in the vaping industry declined from £19,545 to £18,719, a 4.2% decline.

However, there are reasons to believe that employee compensation – and indeed compensation per employee – may not be the most meaningful variable without further context. The decline may be driven by more vape shops opening in the market; a trend discussed in Section 1. Our research found that when considering the UK's vape shops specifically, there was a very high number of sole traders. These individuals do not always draw salary in the traditional sense and the specific accounting for this may lead to distortions in the underlying data underpinning this analysis. As vape shops are often owned by sole traders, the average compensation may be lower than in other industries, particularly when starting up, while a growth in sole traders could contribute to a reported fall in compensation per employee.

To provide perspective into the broader sector, the median UK salary stood at £25,971, whilst the average UK salary for retail trade stood at £19,417.¹⁵

3.5 Tax contribution

The economic contribution of the vaping industry in the UK through tax revenues have been calculated in terms of the following tax heads for 2021:

- Income Tax;
- National Insurance Contributions (NICs) – both from employers and employees;
- Corporation Tax; and

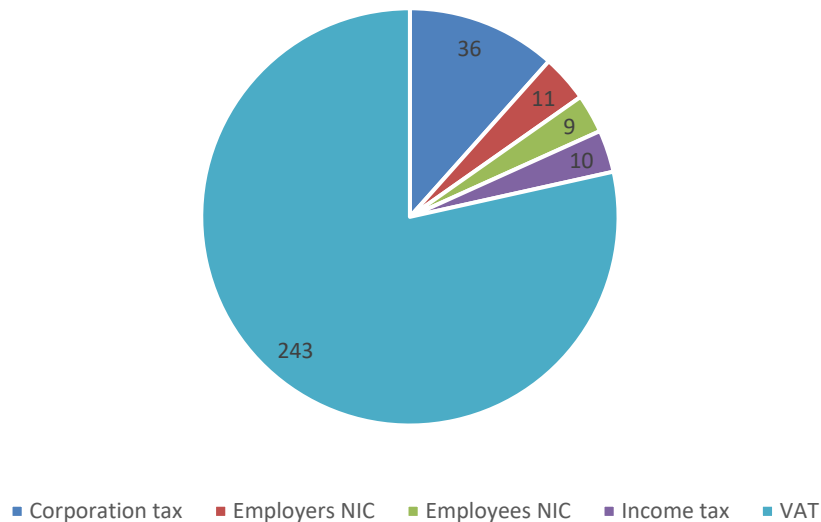
¹⁵ Calculated using the Annual Survey of Hours and Earnings, table 16.1a. Retail trade figure excludes trade of motor vehicles.

- Value Added Tax;

Personal taxes (i.e. Income Tax and NICs) have been calculated through an internal Cebr tax model which applies the respective tax rates¹⁶ to the estimated average salaries paid to employees from each region. Revenues from the other taxes listed above are directly taken from the data used to calculate the direct impacts.

The results of this analysis are shown in Figure 16.

Figure 16: Tax contribution of the vaping industry, £ million, 2021



Source: ONS, Cebr analysis

The total tax paid by the vaping industry in the UK was £310 million. Value added tax (VAT) represents **78.4% of total taxes** paid by the vaping industry, given that the rate is 20% and is applied to vaping products at a flat rate.

¹⁶ The rates and thresholds applied were sourced from HMRC.

4. Aggregate footprint of the Vaping Industry

4.1 Modelling overview

The wider economic footprint of the vaping industry goes beyond the direct impacts discussed in the prior section. This section identifies the aggregate footprint supported by considering two further impact layers:

- **Indirect impacts** – The activity supported through the supply chains that feed into day-to-day operations of the vaping sector. This focuses on the economic activity supported when the vaping sector purchases goods and services from suppliers. All of this supports significant further demand along supply-chains, and output and jobs amongst their suppliers. In turn, these suppliers place demands on their suppliers which supports further output and jobs. The indirect impact captures the revenue, GVA, employment and employee compensation supported along the supply-chains as a result of these operations.

In order to accurately represent the economic footprint of the UK vaping industry, we consider some elements of the supply chain as part of the vaping industry itself, such as the manufacture and wholesale of vaping products. The section of the supply chain has therefore already been accounted for as direct impacts and are excluded from the indirect impact figures to avoid double counting.

- **Induced impacts** – The workers who receive income and employment benefits through the direct (the employees who work in the vaping industry) and indirect (the suppliers to the sector and in turn their suppliers) channels spend their increased earnings on goods and services in the wider economy. This helps to further stimulate demand, supporting additional revenue, GVA, employment and employee compensation. The induced impact captures these wider-spending effects.

Summing these direct, indirect, and induced impact layers allows us to estimate the aggregate footprint supported by the vaping industry.

To compute these impacts, Cebr uses input-output (IO) modelling, to generate economic multipliers. This allows us to identify the key sectors of the economy from which vaping retailers in the vaping sector purchase their inputs.

The input-output model employed uses this supply-chain disaggregation to calculate the economic contributions supported along the supply-chains of the vaping sector. We then use typical employee-spending patterns to estimate the induced impact layer.

This section focuses purely on these impacts at a national level: more granular regional analysis follows in Section 5.

4.2 Turnover

The UK vaping industry was responsible for an estimated £1,325 million in turnover for the year 2021. Through our input-output modelling, we estimate that this direct turnover supports a further £920 million worth of turnover along the supply chains (the indirect effect). Furthermore, it is estimated that the increase in wider-spending that occurs when employees of the UK vaping industry (and the employees supported along the supply-chains) spend their earnings in the wider economy supports an additional £559 million (the induced effect).

Combining these direct, indirect, and induced impacts yields **an aggregate footprint of £2,804 million in turnover for the UK vaping industry**. This is further illustrated in Figure 17 below.

Figure 17: UK vaping industry turnover multiplier results, £ millions, 2021

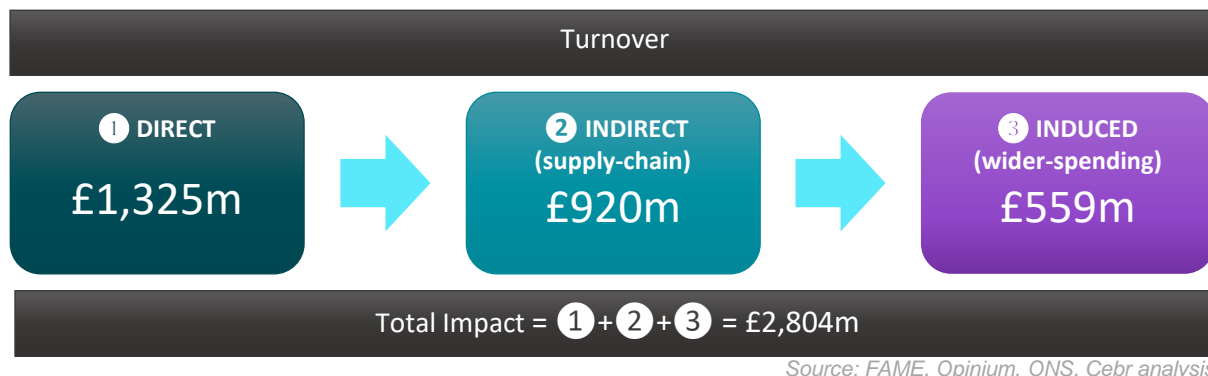


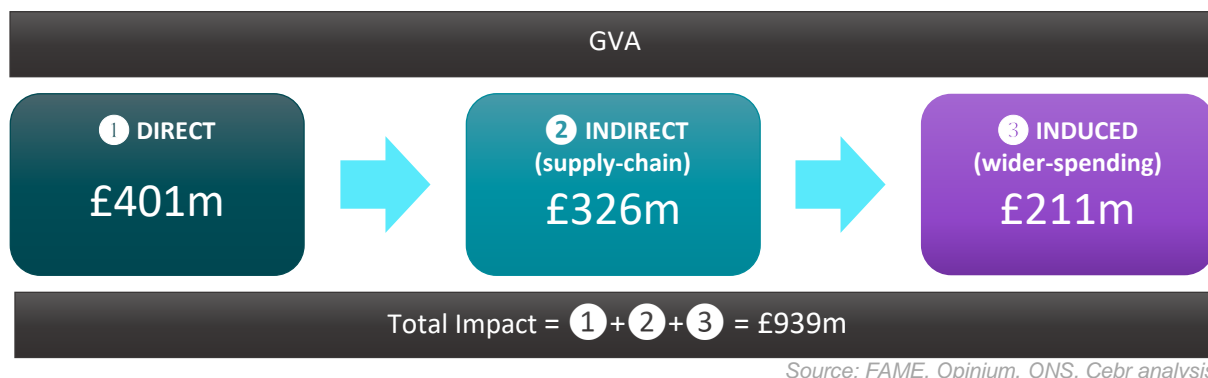
Figure 17 above should be interpreted as follows. For every £10 of turnover directly generated by the UK vaping industry, a further £6.94 of turnover is supported in firms along the vaping industry's supply chain. Furthermore, £4.22 of turnover is supported when individuals associated with the direct and indirect impact layers spend their earning in the wider economy. Combining the indirect and induced impact layer, we say that **for every £10 of turnover directly generated by the UK vaping industry, a further £11.16 worth of turnover is supported in the wider economy**.

4.3 Gross Value Added (GVA)

In 2021, the UK vaping industry directly generated £401 million in GVA contributions. It is estimated from the modelling that a further £326 million worth of GVA contributions are supported along the supply-chains (indirect effect) and £211 million is supported when employees in the UK vaping industry (and employees along their supply chains) spend their earnings in the wider economy. Combining the direct, indirect, and induced impact layers, it is estimated that the UK vaping industry supported **an aggregate economic footprint of £939 million worth of GVA** in the financial year ending 2021.

Figure 18 below illustrates our calculated GVA impacts for the UK vaping industry.

Figure 18: UK vaping industry GVA multiplier results, £ millions, 2021



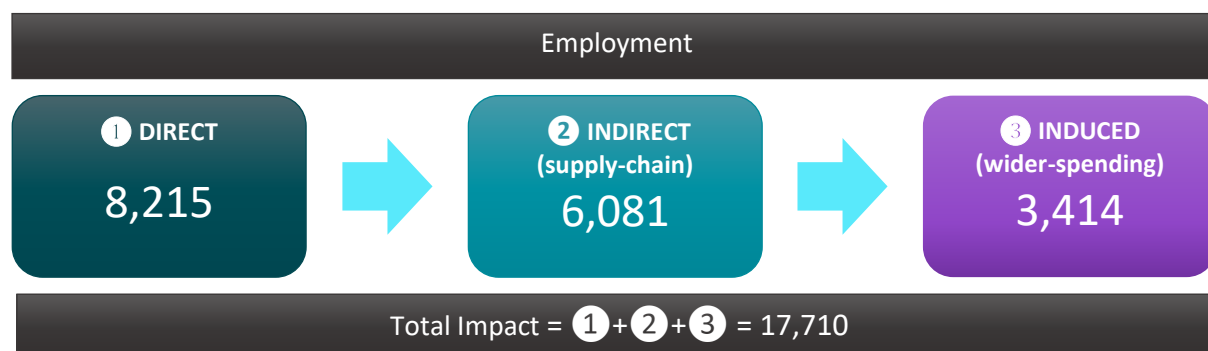
Once again, it is possible to generalise this result by considering the ratios between the direct, indirect, and induced impact layers. **For every £10 in GVA directly generated by the UK**

vaping industry, a further £13.39 is supported through the indirect and induced impact channels.

4.4 Employment

Figure 19 below illustrates our calculated employment multipliers for the UK vaping industry in 2021. Consistent with our reporting of the direct impacts, the employment number is given as FTEs.

Figure 19: UK vaping industry employment multiplier results, FTE, 2021



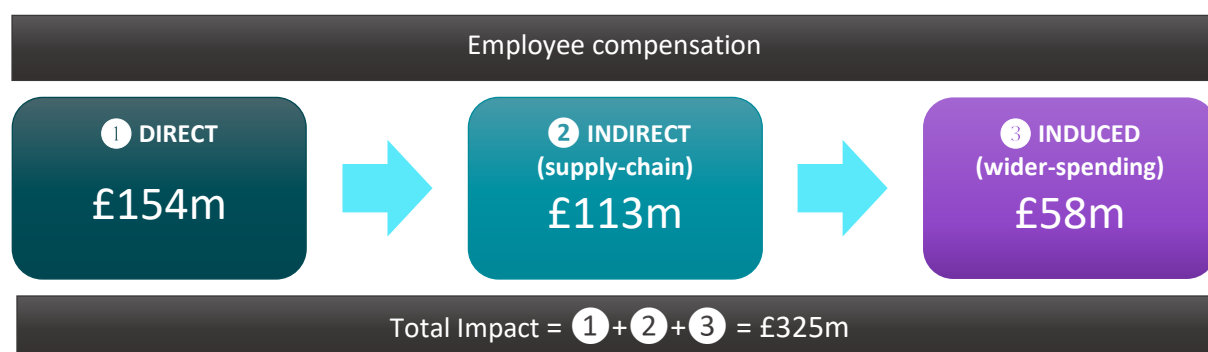
Source: FAME, Opinium, ONS, Cebr analysis

The modelling shows that for every 10 jobs directly generated by the UK vaping industry, a further 7.4 jobs are supported along their supply chains. Moreover, a further 4.2 are supported when employees associated with the direct and indirect impact layers spend their earnings in the wider economy. **By combining the indirect and induced impact layers, our modelling shows that for every 10 jobs directly generated by the UK vaping industry, a further 11.6 jobs are supported in the wider economy.** Overall, the indirect and induced impacts support 9,495 jobs in the wider economy. Overall, on an FTE basis 17,710 jobs are supported across the economy by the UK vaping industry.

4.5 Compensation of employees

Finally, we are interested in the aggregate compensation of employees supported by the UK vaping industry. In 2021 direct employee compensation paid to employees in the UK vaping industry was £154 million. The additional indirect and induced impacts are set out below, in Figure 20.

Figure 20: UK vaping industry compensation of employees multiplier results, £ millions, 2021



Source: FAME, Opinium, ONS, Cebr analysis

In addition to the direct impact, we estimate that the indirect and induced economic activity supported by the UK vaping industry, supports an additional £171 million of employee

compensation. **For every £10 in employee compensation directly generated by the UK vaping industry, a further £11.10 of compensation is supported through the indirect and induced impact channels.**

5. Regional footprint of the vaping industry

This section examines the regional economic impacts of the vaping industry, considering both direct and aggregate impacts, for turnover, GVA, employment, and compensation of employees. For this analysis, the years 2017 to 2020 are examined due to 2021 regional data not being available for all regions.

5.1 The direct turnover of the UK vaping industry by UK region

Table 2 reveals the yearly regional turnover contributions for the UK vaping industry. The region with the highest turnover contribution in 2017 is the North West with £163 million turnover. The North West remained the highest contributor to turnover in 2018 at 175.4 million, but was overtaken in 2019 by the South East region at £172 million, which was also the highest regional contributor of turnover in 2020 at £217 million. Notably, these mirror those regions with the highest number of physical vape shops.

The smallest regional contributor to turnover in 2017 was Northern Ireland at £35 million. This remained consistently the case across the four-year period with the exception of 2018, where the North East was below Northern Ireland by £4.4 million, at £35 million.

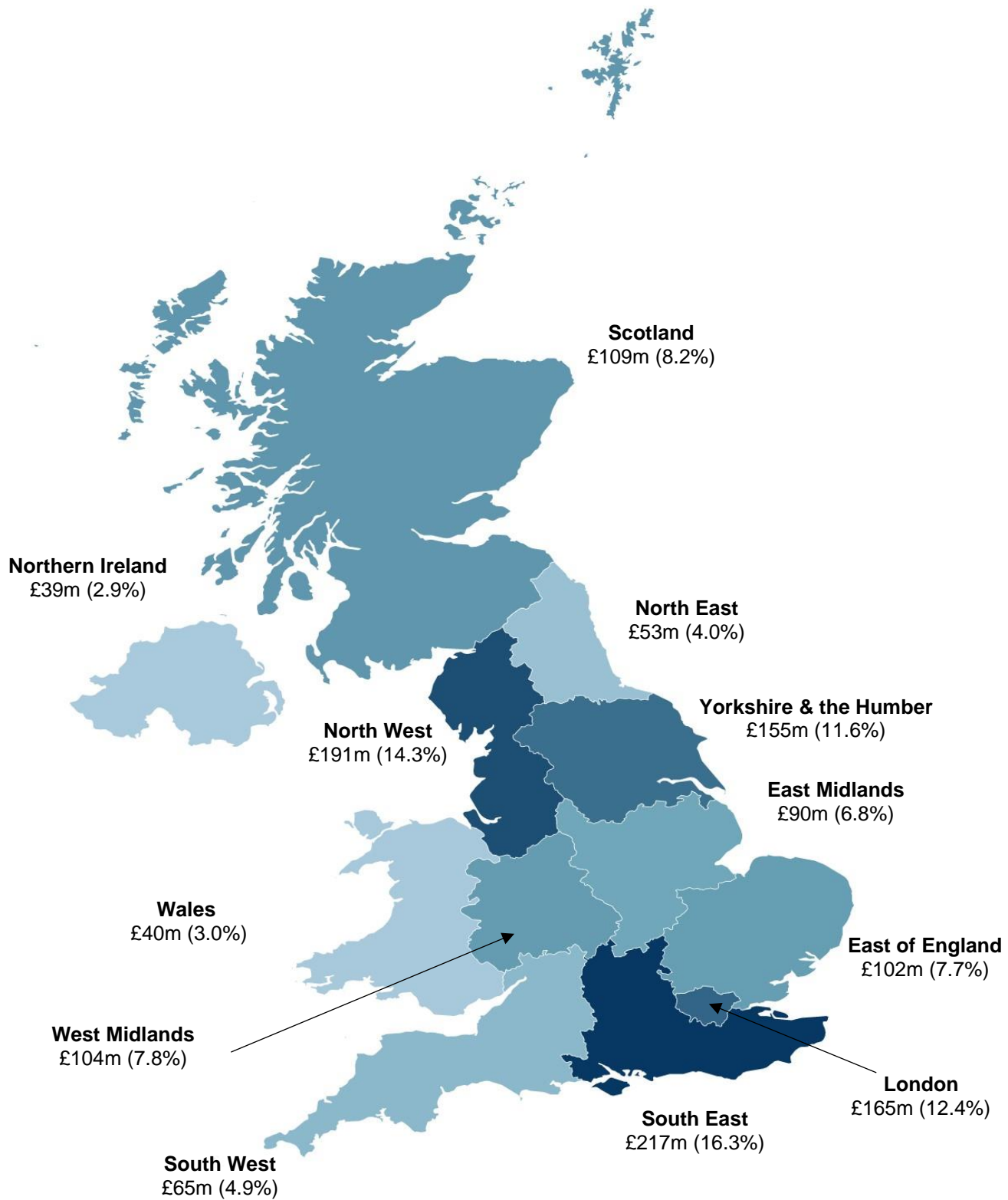
Table 2: Regional breakdown of turnover directly contributed by the UK vaping industry, £ million, 2017 - 2020

Region	Turnover (£m)			
	2017	2018	2019	2020
Scotland	75	108	105	109
Northern Ireland	35	39	32	39
North East	36	35	36	53
North West	163	175	167	191
Yorkshire and the Humber	117	131	125	155
East Midlands	66	96	84	90
West Midlands	57	90	82	104
Wales	54	54	39	40
East of England	100	120	100	102
London	79	121	134	165
South East	138	175	172	217
South West	64	65	63	65

Source: FAME, Opinium, ONS, Cebr analysis

The region which saw the highest growth in the vaping industry turnover over the four-year period was London, which increased from £79 million in 2017 to £165 million in 2021 (109%), followed by the West Midlands where turnover increased from £57 million to £104 million (83%).

Figure 21: Regional breakdown of Turnover directly contributed by the UK vaping industry, £ million, 2020

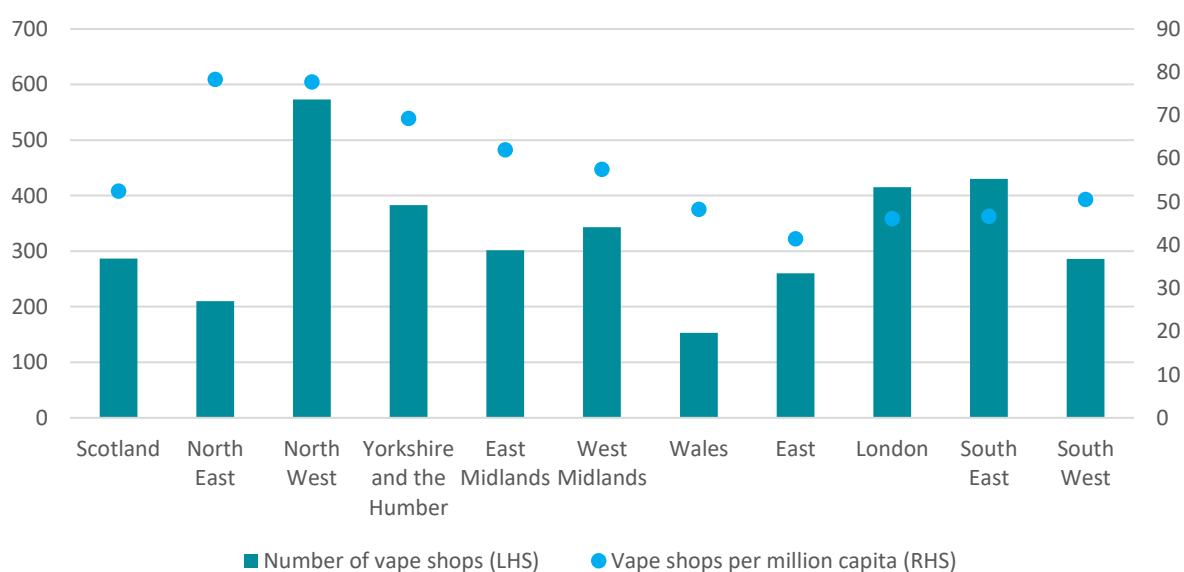


Source: FAME, Opinium, ONS, Cebr analysis

It is interesting to note that the regional proportion of UK turnover appears to correlate to the regional proportion of Vape shops in Great Britain for 2020.¹⁷

Figure 21 illustrates the regional breakdown of vape shops per million capita. From the figure, it is clear that the North West has a particular prevalence of vape shops, recording the highest count of individual shops at nearly 600, as well as having the second most vape shops per million people (77.8 shops per million people). Interestingly, the North East reports the highest level of vape shops per million capita (78.3 shops per million people), despite having the second lowest number of vape shops at 210. Conversely, the South East and London contains the second and third highest number of vape shops respectively, however they also respectively have the third and second lowest number of vape shops per million capita.

Figure 22: Number of vape shops per capita by region, 2020



Source: ONS, LDC, Cebr analysis

It is notable that the top three regions with the largest number of vape shops were North West (15.7%), South East (11.8%) and London (11.4%), as these were also the three greatest contributors to industry turnover (the South East at £217 million, or 16.3%, the North West at £191 million or 14.3% and London at £165 million, or 12.4%). The primary reason behind the South East contributing higher turnover than the North West despite having less vape shops, is that the population of vapers in the South East is higher overall. This correlation is notable, even in a market in which only a third of vaping products are purchased in physical vape shops.

5.2 The GVA of the UK vaping industry by UK region

Table 3 reveals the yearly regional GVA contributions for the UK vaping industry. The region with the highest individual GVA contribution in 2017 was the South East with £39 million directly generated. The South East remained the highest contributor to GVA throughout the

¹⁷ Note that LDC data used to count vape shops regionally excludes Northern Ireland.

four-year period contributing £53 million, £58 million, and £72 million for the years 2018, 2019 and 2020 respectively.

The smallest regional contributor to UK vaping industry GVA in 2017 was Northern Ireland at £9 million. In 2018 however, Northern Ireland overtook the South West by £0.2 million, with the South West contributing £10.5 million in GVA. In 2019, Northern Ireland was again the smallest GVA contributor to the UK vaping industry before it overtook the South West again in 2020.

Table 3: Regional breakdown of GVA directly contributed by the UK vaping industry, £ million, 2017 - 2020

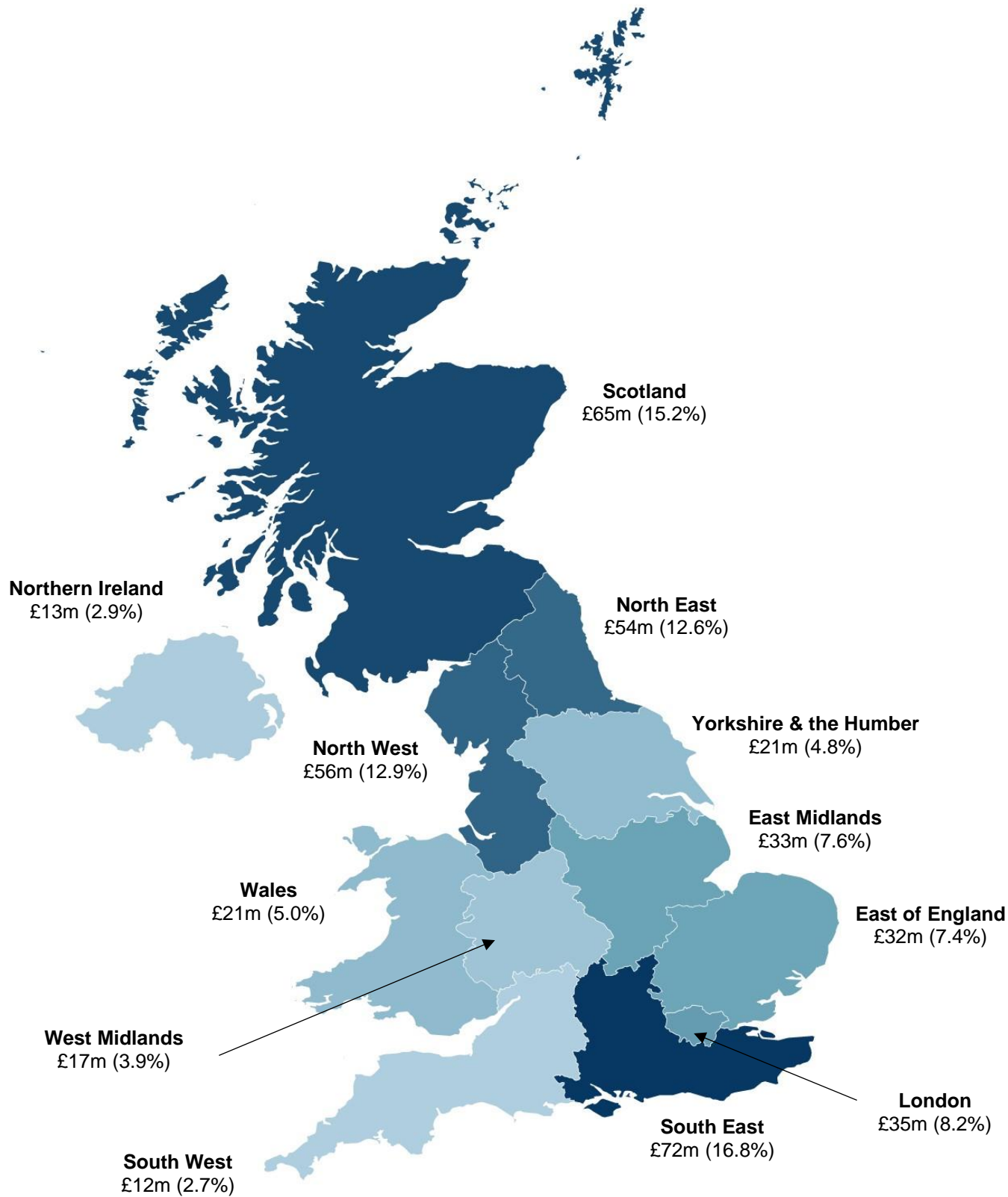
GVA (£m)				
Region	2017	2018	2019	2020
Scotland	27	44	54	65
Northern Ireland	9	11	10	13
North East	21	35	44	54
North West	23	35	49	56
Yorkshire and the Humber	19	19	18	21
East Midlands	20	30	25	33
West Midlands	18	18	16	17
Wales	19	20	22	21
East of England	30	31	28	32
London	21	28	36	35
South East	39	53	58	72
South West	11	11	11	12

Source: FAME, Opinium, ONS, Cebr analysis

The region which saw the highest growth in vaping industry GVA over the four-year period was the North East at 156% followed by Scotland at 139%. On the other hand, the West Midlands saw a decline in vaping industry GVA during the same period at -9%. The West Midlands was the only region which saw a decline in GVA over this period, while the second lowest regional growth rate in vaping industry GVA is the East of England, at 5% over the four-year period. Over the same period, the growth of GVA supported by the vaping industry across the UK, was 66.3%. Given this, it is perhaps initially unexpected that the West Midlands and East of England showed such low growth rates. However this was consistent with the low GVA growth in the wider retail industry over this period for the West Midlands (-12%) and East of England (-9%) according to the Annual Business Survey.

An inspection of the regional breakdown of GVA shown in Figure 23 yields similar results, with London (£35 million, 8.2%), Scotland (£65 million, 15.2%) and the South East (£72 million, 16.8%) having made the largest direct contributions to GVA in 2020. Combined, the three regions contributed £172 million; 40.2% of total UK vaping sector GVA. The smallest regional contributors to GVA in 2020 were Northern Ireland (£13 million, 2.9%) and the South West (£12 million, 2.7%). Compared to regional turnover, GVA appeared to be less correlated with the regional distribution of vape shops. In particular, London and the North West were home to a significant proportion of vape shops (11.4% and 15.7% respectively) despite contributing a far lower proportion of GVA (8.2% and 12.9% respectively), reflecting the wider retail industry trend of relatively low GVA for the respective regions.

Figure 23: Regional breakdown of GVA directly contributed by the UK vaping industry, £ million, 2020



Source: FAME, Opinium, ONS, Cebr analysis

5.3 The employment of the UK vaping industry by UK region

Table 4 reveals the yearly regional employment contributions for the UK vaping industry. The region with the highest individual FTE contribution in 2017 was the South East with 1,167 FTEs. The South East remained the highest contributor to employment in 2018 and 2019, contributing 1,047 and 1,156 FTEs respectively. In 2020, the South East was overtaken by Scotland at 1,341 FTEs.

The smallest regional contributor to UK vaping industry employment in 2017 was Northern Ireland at 283 FTEs. This remained the case for the rest of the four-year period with 248, 229 and 261 FTEs in 2018, 2019 and 2020 respectively.

Table 4: Regional breakdown of Employment (FTEs) directly contributed by the UK vaping industry, count, 2017 - 2020

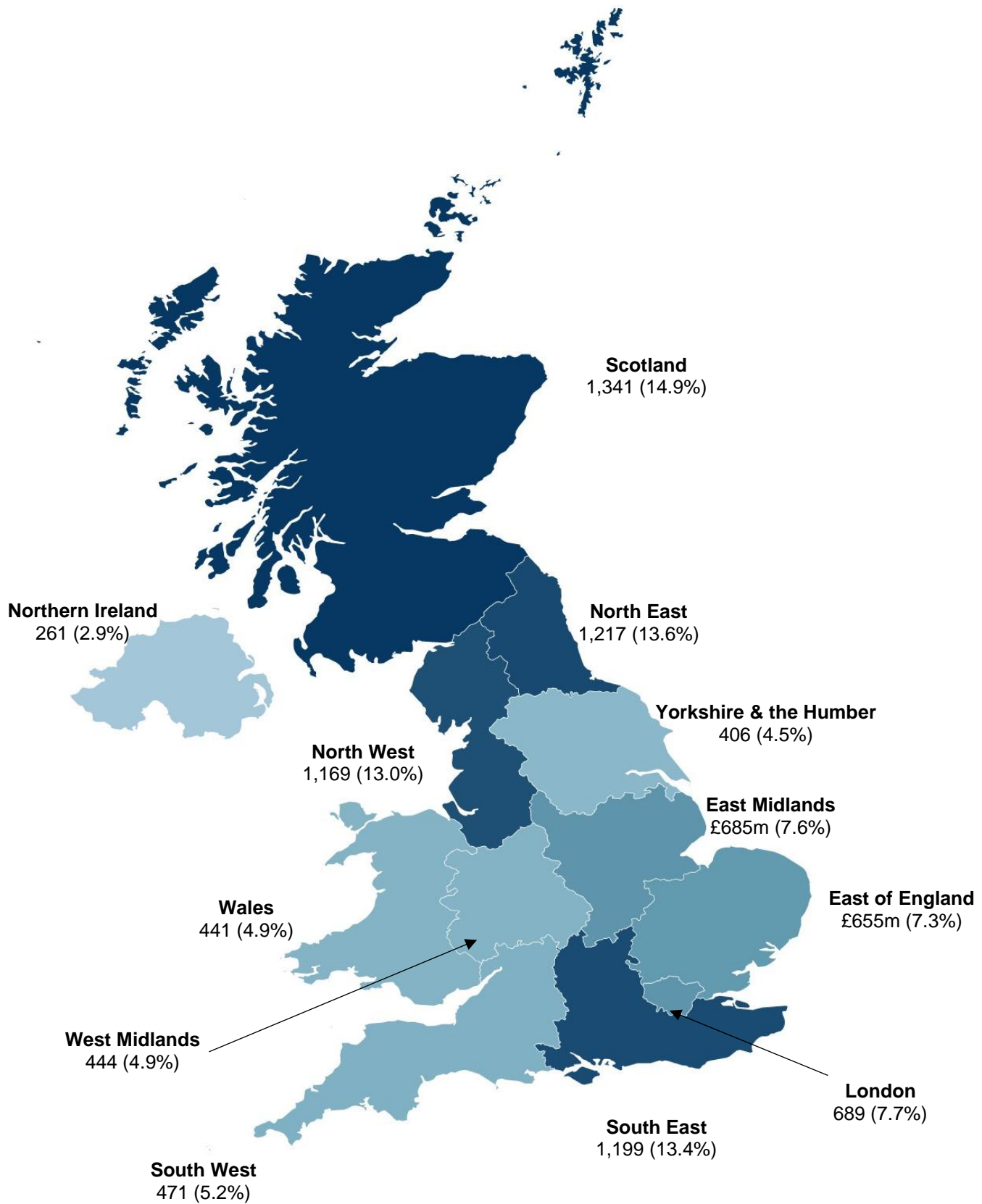
Employment (£m)				
Region	2017	2018	2019	2020
Scotland	789	919	1,083	1,341
Northern Ireland	283	248	229	261
North East	763	940	1,127	1,217
North West	708	785	914	1,169
Yorkshire and the Humber	614	452	489	406
East Midlands	606	694	600	685
West Midlands	570	445	478	444
Wales	646	489	446	441
East of England	767	637	544	655
London	511	550	517	689
South East	1,167	1,047	1,156	1,199
South West	622	462	541	471

Source: FAME, ONS, Cebr analysis

The region which saw the highest relative growth in vaping industry employment over the four-year period was Scotland at 70%, followed by the North West at 65%. On the other hand, multiple regions saw a decline in employment over the four-year period with Yorkshire and the Humber declining most significantly at 34%, followed closely by Wales at 32%.

When observing the regional breakdown of the vaping industry employment in 2020 shown in Figure 24, Scotland (1,341, 14.9%) was the highest employer, with the North East (1,217, 13.6%), the South East (1,199, 13.4%) and the North West (1,169, 13.0%) contributing a combined total of (4,926, 54.9%).

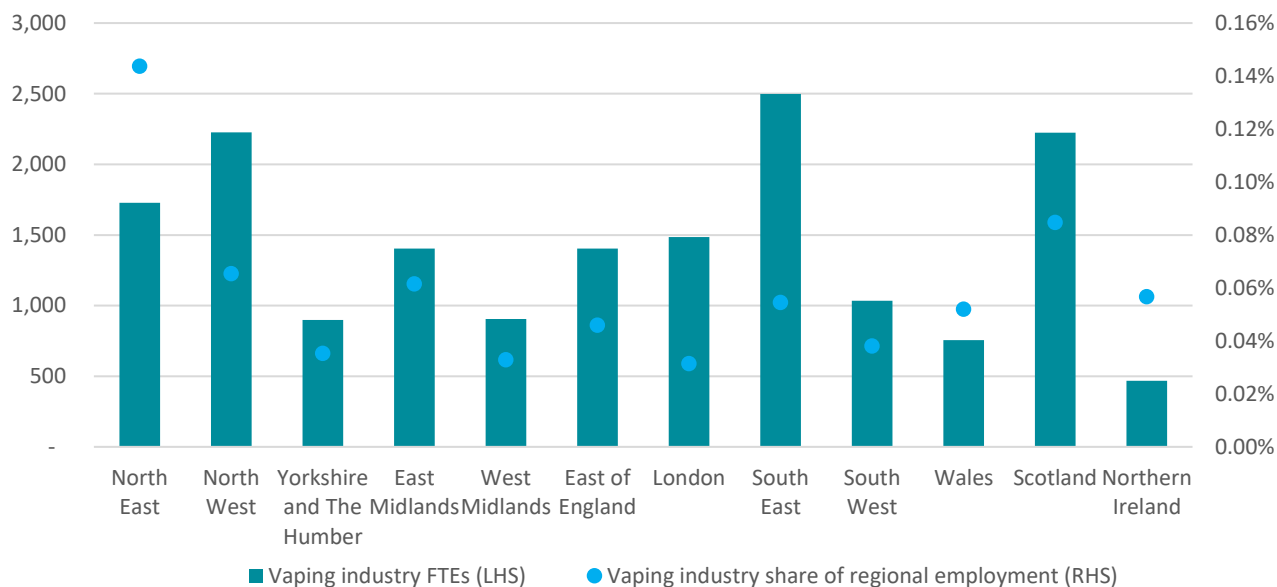
Figure 24: Regional breakdown of employment directly contributed by the UK vaping industry, FTE, 2020



Source: FAME, Opinium, Cebr analysis

At a regional level, while we can see that the vaping industry does provide employment opportunities across the UK, Figure 25 standardises for the relative wider level of employment in each region, to show the share of regional employment in each region, directly generated by the vaping industry.

Figure 25: Regional FTEs as a proportion of total regional employment, 2020

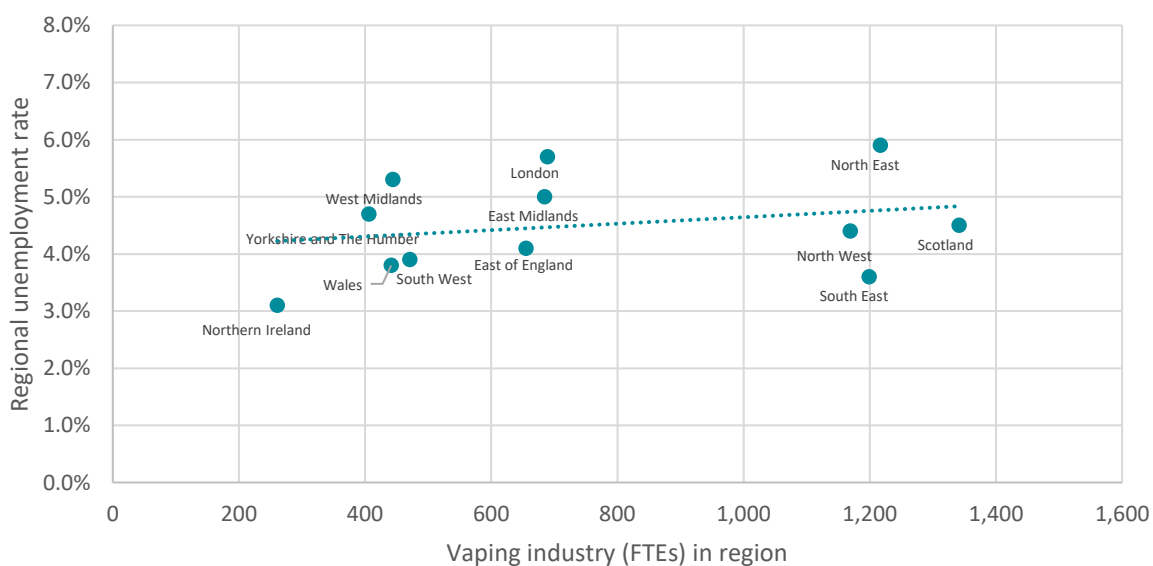


Source: FAME, Opinium, ONS, Cebr analysis

The vaping industry provides the largest share of employment (0.14% of total regional employment) in the North East region. This is well clear of the second highest region, Scotland, where the equivalent figure stands at 0.08%.

The North East is also the region where the unemployment rate was the highest (5.9%) in the UK in 2020. We can further analyse the employment trends supported by the vaping sector by analysing the regional unemployment rate to test whether the vaping industry directly supports employment in regions of high unemployment.

Figure 26: Regional unemployment rate and regional vaping industry employment, %, FTE, 2020.



Source: FAME, Opinium, ONS, Cebr analysis

As Figure 26 above shows, there is a positive relationship between regional unemployment rates and regional vaping industry employment. This supports the hypothesis that vaping sector employment is disproportionately important, in areas with otherwise lower labour market opportunities. In particular, the North East supports the second highest count of regional vaping industry FTEs (and highest in relative terms) whilst also having the highest regional unemployment rate. Conversely Northern Ireland has the lowest regional level of unemployment as well as the lowest support of vaping industry FTEs.

In order to understand the trends in further detail, we have analysed the data further, both at a constituency level and at a local authority level.

5.4 The vaping industry supporting employment in deprived communities at a local authority level

The vaping industry supports employment across all regions across the UK, however as will be seen, notably this particularly occurs in areas of high deprivation, or where employment opportunities are limited.

In analysing further trends, we consider the level of deprivation in each local authority using the Index of Multiple Deprivation (IMD), a nationally produced statistical release by the Ministry of Housing, Communities & Local Government (MHCLG). The 2019 Indices of Deprivation encompass a weighted range of 39 specific living conditions for an individual under seven broad categories. These are income, employment, health deprivation and disability, education and skills, crime, barriers to housing services and living environment.

The pattern for the vaping industry's distribution of employment, in regions of high unemployment, is somewhat repeated for areas of high deprivation, when analysing the data at a local authority level.

Table 5 reveals the top ten local authorities by vaping industry employment, with the local authorities' corresponding deprivation rank. Note that the higher the deprivation rank, the greater deprivation in a local authority, whilst the higher the employment rank, the greater number of vaping industry FTEs are in the local authority.¹⁸

¹⁸ For example, a local authority with a score of '10' for both variables, would be the 10th most deprived local authority and have the 10th most vaping industry employees.

Table 5: Vaping industry employment at local authority level compared to deprivation rank, FTE, IMD, 2020.

Local Authority	Vaping industry Employment Rank	Deprivation Rank (Out of 317)
Birmingham	1	7
Leeds	2	55
Manchester	3	6
Sheffield	4	57
Bolton	5	34
Bradford	6	13
Liverpool	7	3
Bournemouth, Christchurch and Poole	8	160
Cheshire East	9	216
Stockport	10	130

Source: FAME, Opinium, ONS, LDC, Cebr analysis

In England, the vaping industry employs the highest number of FTE employees in Birmingham, which is the seventh most deprived local authority, per the 2019 Indices of Deprivation. The vaping industry also employs the third highest number of FTE employees in Manchester, which is the sixth most deprived local authority, per the 2019 Indices of Deprivation. Furthermore, the third most deprived local authority in 2019, Liverpool, is ranked seventh in terms of vaping industry employment.

5.5 The compensation of employees of the UK vaping industry by UK region

Table 6 reveals the yearly regional COE contributions for the UK vaping industry. The region which had the highest individual COE contribution in 2017 is the South East at £24 million. The South East remained the highest contributor to COE throughout the four-year period contributing £21 million, £18 million, and £26 million for the years 2018, 2019 and 2020 respectively.

The smallest regional contributor to UK vaping industry COE in 2017 was Northern Ireland at £5 million. This remained the case for the rest of the four-year period with £5 million, £3 million and £5 million in 2018, 2019 and 2020 respectively.

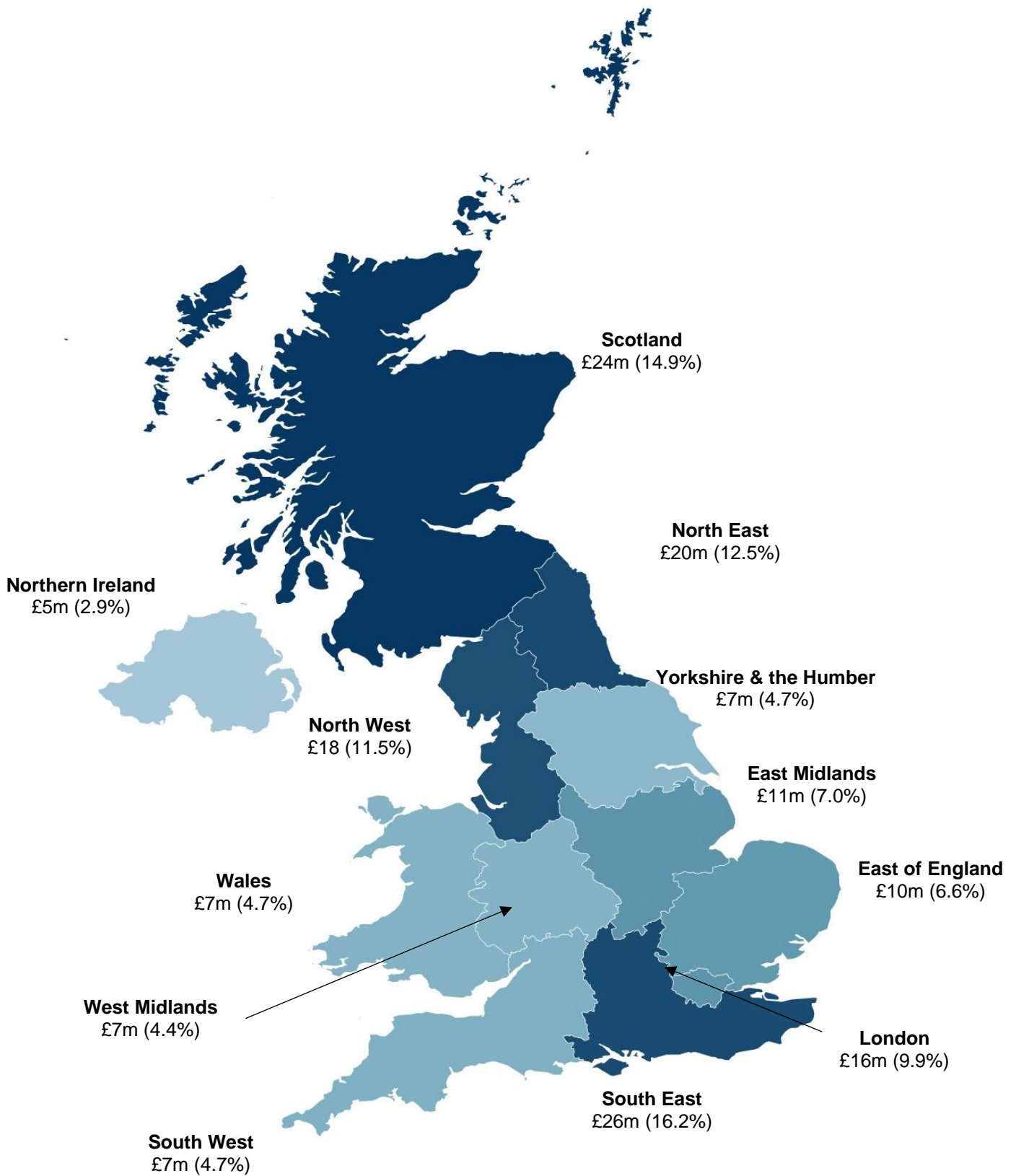
Table 6: Regional breakdown of COE directly contributed by the UK vaping industry, £ million, 2017 - 2020

Compensation of Employees (£m)				
Region	2017	2018	2019	2020
Scotland	15	17	16	24
Northern Ireland	5	5	3	5
North East	14	15	15	20
North West	13	14	14	18
Yorkshire and the Humber	11	8	7	7
East Midlands	11	12	9	11
West Midlands	10	8	6	7
Wales	12	8	6	7
East of England	15	12	10	10
London	13	13	12	16
South East	24	21	18	26
South West	12	8	7	7

Source: FAME, Opinium, ONS, Cebr analysis

The region which saw the highest growth in vaping industry employment over the four-year period was the Scotland at 61% followed by the North East at 42%. On the other hand, multiple regions saw a decline in employee compensation over the four-year period with the South West declining most significantly by 37%, followed closely by Wales declining by 36%. On a national level, COE in the vaping industry increased by 1.3% from 2017 to 2020, therefore the regional growth in employee compensation is mostly explained by changing regional employment figures. For example, Scotland's vaping industry employment grew at a comparably high rate (70%) over the same period, whilst the South West's employment declined (24.3%). Figure 27 further illustrates visually, the regional contributions of the vaping industry through compensation of employees.

Figure 27: Regional breakdown of compensation of employees directly contributed by the vaping industry, £ million, 2020



Source: Cebr analysis, FAME, Opinium, ONS, ABS

5.6 The aggregate regional economic impacts of the UK vaping industry

This final subsection examines the aggregate economic impact of the UK vaping Industry across each region for the four macroeconomic indicators covered in the previous subsections. Note that for this analysis we again observe the aggregate impacts of the UK vaping industry in 2020 as opposed to 2021, due to data availability.

The regional direct economic impacts as already estimated were combined with Cebr's regional economic impact models, to compute regional multipliers and ultimately the aggregate impacts presented in this section.

The aggregate economic impacts for business turnover and GVA by region

Per Section 3, it is estimated that a total of £1,325 million in turnover and £401 million in GVA was directly contributed by the UK vaping industry in 2021, and £2,804 million and £939 million respectively supported in aggregate across the UK regions. Table 7 shows the breakdown of direct and aggregate economic impacts for business turnover and GVA in 2020, alongside the sector multiplier for each region.

For turnover, the highest multipliers are associated with the Yorkshire and the Humber, the South West, and London at 2.16, 2.14 and 2.10 respectively. Likewise, for GVA, the highest multipliers are associated with the Yorkshire and the Humber, the South West, and London at 2.33, 2.31 and 2.28 respectively.

Table 7: Regional breakdown of business turnover and GVA supported by the UK vaping industry, £ million, 2020

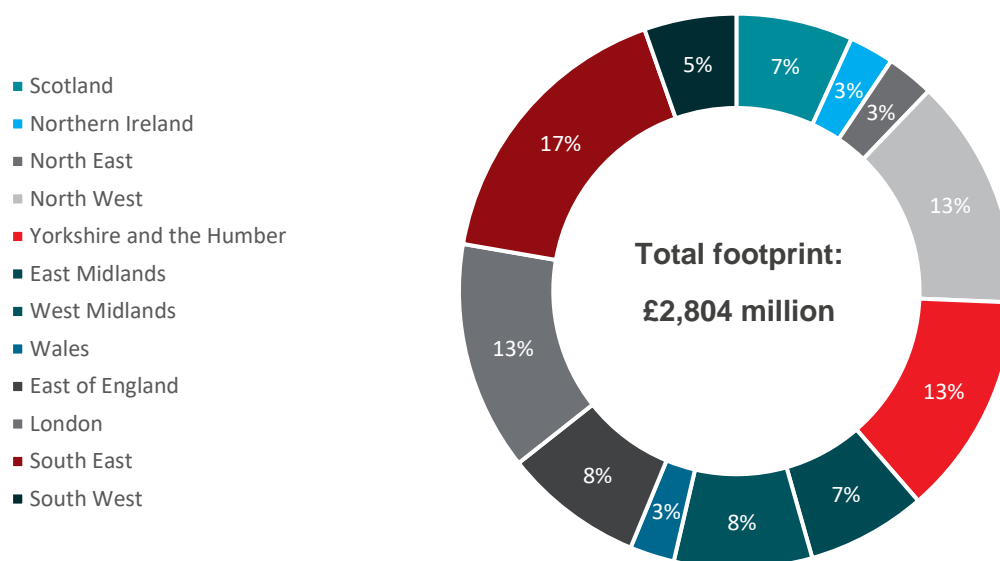
Region	Turnover (£ million)			GVA (£ million)		
	Direct Impact	Sector Multiplier	Aggregate impact	Direct Impact	Sector Multiplier	Aggregate impact
Scotland	118	1.62	185	71	1.70	182
Northern Ireland	43	1.73	71	14	1.83	37
North East	56	1.37	75	57	1.43	134
North West	213	1.80	366	62	1.93	169
Yorkshire and the Humber	174	2.16	353	23	2.33	72
East Midlands	102	1.97	189	37	2.10	106
West Midlands	117	1.98	218	19	2.11	54
Wales	44	1.67	71	24	1.75	61
East of England	115	2.04	221	36	2.21	106
London	181	2.10	363	39	2.28	119
South East	240	2.01	459	80	2.18	237
South West	72	2.14	146	13	2.31	40

Source: FAME, Opinium, ONS, Cebr analysis

The highest estimated aggregate turnover impact is in the South East at £459 million, despite having a lower multiplier than several other regions. This is because the South East also had the largest regional direct impact for turnover. The highest estimated aggregate GVA impact is also in the South East at £237 million. Again, this is despite having a lower multiplier than several other regions. This is because the South East also had the largest regional direct impact for GVA.

Figure 28 further highlights the distribution of the aggregate turnover impacts of the UK vaping industry, amongst each UK region. Four regions share 57% of the total aggregate turnover impact; the South East (17%), North West (14%), Yorkshire and the Humber (13%) and London (13%). The smallest aggregate impact share of the UK vaping industry is Northern Ireland (3%).

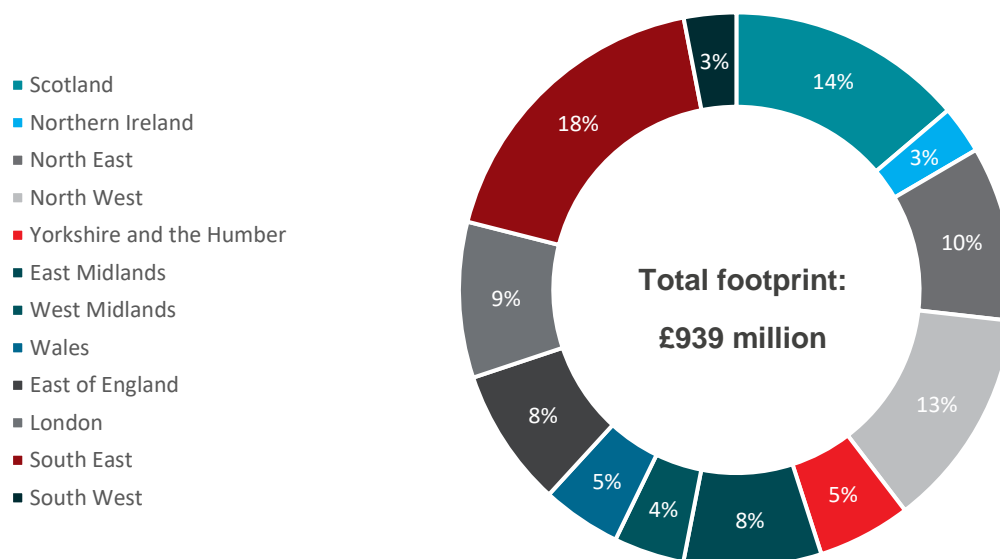
Figure 28: Regional vaping industry aggregate turnover proportions, %, 2020



Source: FAME, Opinium, ONS, Cebr analysis

Figure 29 highlights the distribution of aggregate GVA impacts of the UK vaping industry amongst each UK region. Four regions share 55% of the total aggregate GVA impact with South East (18%), Scotland (14%), North East (13%), South West (13%). The smallest aggregate impact share of the UK vaping industry is Northern Ireland (3%).

Figure 29: Regional vaping industry aggregate GVA proportions, %, 2020



Source: FAME, Opinium, ONS, Cebr analysis

The aggregate economic impacts for employment and the compensation of employees by region

Section 3 revealed the UK vaping industry contributed an aggregate 17,710 FTEs as well as £325 million in employee compensation. Table 8 below shows the 2020 breakdown of the aggregate economic impacts for employment and the compensation of employees, alongside the respective multipliers for each region.

For employment, the highest multipliers were 2.10 and 2.09 for Yorkshire and the Humber and the South West respectively. The lowest regional employment multipliers were estimated to be the North East and Scotland at 1.36 and 1.58 respectively. For compensation of employees the highest multipliers were estimated to be 2.07 and 2.03 for the Yorkshire and the Humber and London respectively. The lowest regional COE multipliers are found in the North East and Scotland at 1.34 and 1.55 respectively.

Table 8: Regional breakdown of Employment and COE supported by the UK vaping industry, £ million, 2020

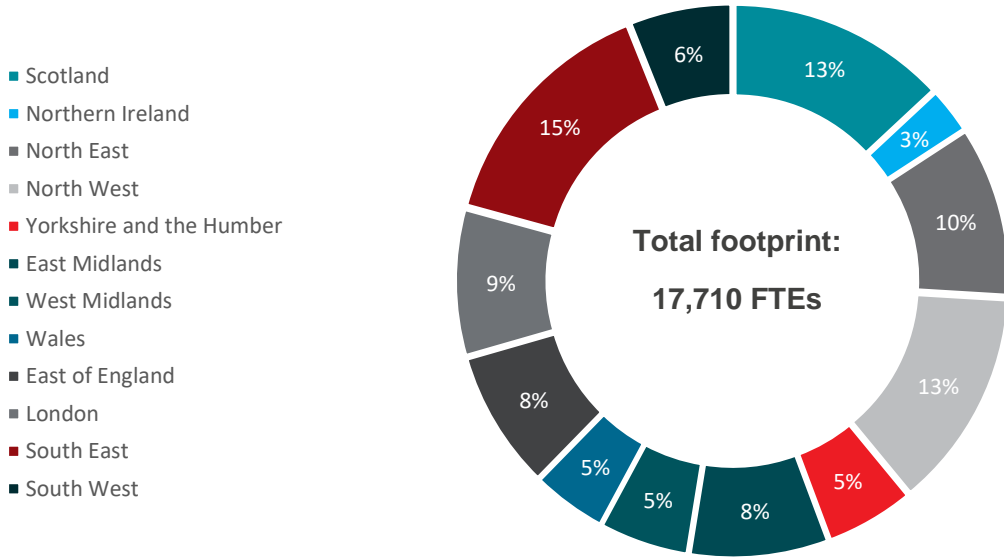
Region	Employment			Compensation of Employees (£ million)		
	Direct Impact	Sector Multiplier	Aggregate impact	Direct Impact	Sector Multiplier	Aggregate impact
Scotland	1,451	1.58	2,224	25	1.55	39
Northern Ireland	289	1.69	468	5	1.66	8
North East	1,294	1.36	1,729	21	1.34	28
North West	1,300	1.79	2,227	20	1.76	34
Yorkshire and the Humber	452	2.10	899	8	2.07	16
East Midlands	764	1.94	1,404	12	1.89	22
West Midlands	493	1.93	905	8	1.91	14
Wales	488	1.61	756	8	1.59	13
East of England	731	2.03	1,403	12	1.99	22
London	754	2.06	1,485	17	2.03	33
South East	1,325	1.98	2,498	28	1.94	52
South West	521	2.09	1,033	8	2.06	16

Source: FAME, Opinium, ONS, Cebr analysis

Given that Yorkshire and the Humber had the highest regional multipliers for both employment and employee compensation, the region made a greater aggregate contribution than the North Wales, despite a lower direct impact. The South East was the region with the largest aggregate impacts through employment with 2,498 FTEs, as well as the region with the greatest employee compensation at £52 million. The region with the lowest aggregate impact for employment and employee compensation was Northern Ireland at 468 and £8 million respectively.

Figure 34 highlights the distribution of aggregate employment impacts of the UK vaping industry amongst each UK region. Four regions share 51% of the total aggregate employment impact with South East (15%), Scotland (13%), North West (13%) and London (10%). The smallest aggregate impact share of the UK vaping industry is Northern Ireland (3%).

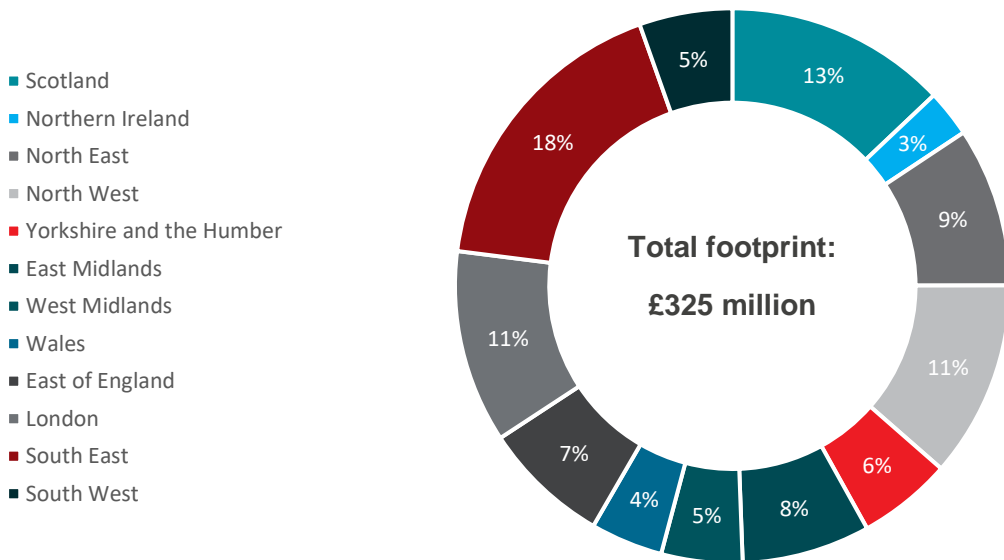
Figure 30: Regional vaping industry aggregate employment proportions, %, 2020



Source: FAME, Opinium, ONS, ABS, Cebr analysis

Figure 31 highlights the distribution of aggregate employee compensation impacts of the UK vaping industry amongst each UK region. Four regions shared 54% of the total aggregate employee compensation impact with the South East (18%), Scotland (13%), North West (12%) and London (11%). The smallest aggregate impact share of the UK vaping industry was Northern Ireland (3%).

Figure 31: Regional vaping industry aggregate COE proportions, %, 2020



Source: FAME, Opinium, ONS, Cebr analysis

6. Wider socio-economic spillover benefits



The total healthcare saving due to smokers switching to vaping in the UK is estimated to be over £320 million in 2019. A further £300 million in productivity gains can be associated with workers switching from smoking to vaping.

Whilst the aggregate and regional economic impacts of the vaping industry previously discussed are important to consider, there are further impacts that the vaping industry has on society.

Specifically, the following section details the wider socio-economic benefits associated with the vaping industry. The spillover effects of consumer and worker socio-economic outcomes supported by the vaping industry are difficult to quantify economically, nonetheless attaching a monetary value to these outcomes is important in understanding their unique benefit.

In this section we explore the following channels through which the vaping industry makes a broader socio-economic contribution to the UK:

- 1) The reduction in healthcare costs associated with consumers switching from smoking to vaping;
- 2) The increase in total productivity associated with workers switching from smoking cigarettes to vaping; and
- 3) The consumer behaviour of vapers as a tool for smoking cessation.

The first two channels are discussed through an initial review of the literature comparing the health-related costs associated with smoking and vaping as well as reviewing quantifications of these healthcare costs and productivity losses to the UK.

Furthermore, drawing on this research as well as using government and survey data, we create various scenarios to quantify the healthcare saving and productivity increase facilitated by the substitution of consumers switching from smoking to vaping. In doing so, we created a counterfactual scenario, whereby we analyse further scenarios to illustrate potential healthcare and productivity savings associated with switching from smoking to vaping.

Finally, for the third channel, we analysed the survey data and explored consumer behaviour, including the motivation to start vaping and the rate at which vapers have been able to substitute away from smoking to vaping.

6.1 The healthcare saving associated with switching from smoking to vaping

The negative health effects of smoking and vaping

Smoking is associated with many healthcare issues including heart and blood circulation issues such as heart attacks and strokes, as well as lung damage leading to pulmonary disease and pneumonia.¹⁹ Overall, among those who currently smoke, 64% of deaths were attributable to cigarette smoking with a rate of 28% of deaths among former smokers.²⁰

Smoking is one of the biggest causes of death and illness in the UK:²¹ for example, smoking causes seven out of every ten cases of lung cancer²² In turn there is a high cost associated with providing healthcare to current and former smokers.

Public Health England quantified the total cost of smoking to the NHS in England to be £2.6 billion in 2015.²³ This accounted for primary care costs (i.e., GP visits) and secondary care costs (i.e., hospital visits)²⁴ associated with smoking. Action on Smoking and Health (ASH) extended this analysis for 2019, finding that healthcare costs associated with smoking in England totalled £2.4 billion. Given that the rate of smokers in Great Britain has declined by 11.2% from 2015 to 2019, but that inflation would likely increase the monetary value of these costs in nominal terms, this is roughly consistent with the 8% decline in healthcare costs associated with smoking, over the same period.

In 2018, Public Health England (PHE) published an independent evidence review, concluding that e-cigarettes are around 95% less harmful than smoking.²⁵ Furthermore, almost all e-cigarette users were either current or ex-smokers at the time of publishing.²⁶ This is broadly consistent with our survey data, where 87.1% of respondents were either current smokers or ex-smokers. E-cigarettes have proven to be a popular aid to quit smoking, with up to 68% who utilise e-cigarettes alongside local Stop Smoking services to quit smoking, successfully quitting from 2020 to 2021.²⁷

Given Public Health England's view on the reduced harm of using vaping products compared to smoking, and the rising trend of smokers using e-cigarettes as a cessation aid, the following section aims to quantify the healthcare cost savings associated with smokers switching to vaping, utilising the underlying literature as a basis for modelling assumptions.

As vaping products have not been in the market for a long period, there is still ongoing research into the effects of vaping on health, particularly in the long run. Considering this, in our analysis, we utilise the PHE estimate (e-cigarette usage is approximately 95% less harmful

19 NHS.co.uk (2018) "What are the health risks of smoking?"

20 NCBI (2008) "Smoking and Smoking cessation in relation to Mortality"

21 <https://www.nhs.uk/common-health-questions/lifestyle/what-are-the-health-risks-of-smoking/>

22 <https://www.nhs.uk/common-health-questions/lifestyle/what-are-the-health-risks-of-smoking/>

23 Public Health England (2017) "Cost of Smoking to NHS England"

24 Public Health England (2017) "Cost of Smoking to NHS England"

25 Public Health England (2015) "E-cigarettes around 95% less Harmful than tobacco estimates"

26 Public Health England (2015) "E-cigarettes around 95% less Harmful than tobacco estimates"

27 Department for Health and Social care (2021) "E-cigarettes could be prescribed on the NHS"

than smoking) as an accepted government estimate, however we acknowledge that there are still ambiguities in this area.

The healthcare cost-saving from individuals switching from smoking to vaping

As mentioned above, there are healthcare cost savings from individuals switching from smoking to vaping and in this section, we aim to quantify the impact of switching and the resulting savings that may occur. The methodology utilised to quantify this and the results, are outlined below.

In determining the amount of healthcare cost savings associated with smokers switching to vaping, it is important to understand the total cost of smoking in the UK. For the purposes of this analysis, we apply the ASH Ready Reckoner figure of £2.4 billion for England in 2019 and scale it up proportionally to the UK smoking population. As such, we estimate that the total healthcare costs associated with the UK to be £2.7 billion in 2019.

For the purposes of the analysis, we create a counterfactual scenario where the number of vapers, who are now ex-smokers are presumed to have never made the switch from smoking to vaping. This allows us to compare and quantify the impact switching from smoking to vaping has had on ex-smokers.

According to the ONS, the number of vapers who are ex-smokers is 1.6 million in 2019. Whilst the use of e-cigarettes such as vapes are associated with less negative health effects than cigarettes, it would be inaccurate to suggest a vaper who is an ex-smoker does not retain some extra healthcare costs, given that they previously smoked. This is because vaping has at least 5% of the level of harm which smoking has²⁸, and there are residual negative health effects of being an ex-smoker. Controlling for these factors, we estimate an individual vaper who is an ex-smoker to cost an approximate average of £193 in healthcare costs for 2019, compared to a cigarette smoker at around £395 in 2019. **This can also be interpreted that an individual who makes the switch from smoking cigarettes to vaping results in an annual health care cost-saving of £202 on average.** **The additional healthcare saving potential of more individuals switching from smoking to vaping**

Table 9 below reveals the total amount of healthcare costs saved through individuals

Total healthcare costs	Cost of smokers	Cost of smokers if vapers never switched	Total healthcare saving due to smokers switching to vaping
£ millions	2,723	3,045	322

substituting smoking consumption for vaping consumption. As previously stated, smoking contributed to a total of £2.7 billion in healthcare costs. In the counterfactual scenario, we assume that the 1.6 million vapers who are ex-smokers never made the switch, and when modelling this scenario, the total cost of smoking would have been approximately £3.0 billion in 2019. **Therefore, this suggests that the total healthcare saving due to smokers switching to vaping was over £300 million in 2019.**

28 Public Health England (2015) "E-cigarettes around 95% less Harmful than tobacco estimates"

The additional healthcare saving potential of more individuals switching from smoking to vaping

Table 9: The healthcare saving associated with smokers switching to vaping, £ millions, 2019

Total healthcare costs	Cost of smokers	Cost of smokers if vapers never switched	Total healthcare saving due to smokers switching to vaping
£ millions	2,723	3,045	322

Source: ASH, ONS, Cebr analysis

Above, we have quantified the healthcare saving associated with consumers switching from smoking to vaping and have demonstrated some of the current spillover benefits associated with the vaping industry. However, it is interesting to analyse potential future scenarios to examine the efficacy of the vaping industry as a tool to reduce national healthcare costs in the future. In light of this, we have calculated the healthcare saving corresponding to various potential scenarios if individuals further switch from smoking to vaping, indicating the vaping industry's ability to reduce healthcare costs associated with smoking.²⁹ **Error! Not a valid bookmark self-reference.** reveals the total amount of healthcare saving using the same methodology for the results in Table 10 but modelling potential future scenarios. These scenarios being: if a further 1% of smokers switch to vaping, if a further 10% of smokers switch to vaping and if a further 50% of smokers switch to vaping.

Table 10: Healthcare saving in potential future scenarios, £ millions

Potential future healthcare saving	If 1% of 2020 smokers switched to vaping	If 10% of 2020 smokers switched to vaping	If 50% of 2020 smokers switched to vaping
Net saving from vaping (£ millions)	14	140	698

Source: ASH, ONS, Cebr analysis

The potential net healthcare saving if 1%, 10% and 50% of smokers switch to vaping is £14 million, £140 million, and £698 million respectively. Although the scenarios presented above

²⁹ Note that the number of smokers switching to vaping in these scenarios are not forecasts, and results should not be interpreted as if they are. Rather, these are indicatively modelled scenarios, to provide a theoretical idea of the benefits, under a broad range of scenarios.

are estimates, it demonstrates the positive effect that switching from smoking to vaping may have on healthcare costs in the future across the UK.

6.2 The productivity increase associated with switching from smoking to vaping

The effect of smoking on productivity

The productivity costs associated with smoking manifest in multiple ways. Firstly, early deaths because of smoking-related illness influences output in the workforce as there is a loss in potential workers, which is further explained below.

As previously stated, 64% of cigarette smokers die from smoking-related diseases. Given the increase in mortality spurred by smoking cigarettes, more individuals die younger and therefore do not participate in the economy, resulting in a productivity loss. Given the relatively lower levels of harm associated with vaping, smokers who switch to vaping may be less likely to die and therefore more likely to continue contributing to the economy.

Following on from the increased mortality associated with smoking cigarettes causing early deaths, is the increase in absenteeism experienced by smokers because of smoking related health complications.³⁰ Given this higher degree of absenteeism in smokers in the form of sick days, this directly leads to a loss in production. Furthermore, individuals who smoke are more likely to suffer from work impairment (a substantial and long-term negative effect on their ability to do normal daily activities) and therefore partake in presenteeism. Given that these avenues of production losses are associated with increased health risks discussed in the previous section, it follows that where smokers make the switch to using e-cigarettes, an increase in individual productivity may be observed.

Another substantial avenue in which smoking decreases productivity is through the amount of time spent taking smoking breaks during working hours.³¹ According to a survey of employed smokers carried out by OnePoll for the British Heart Foundation (BHF), individuals who smoke take nearly forty minutes of smoking breaks during working hours each day. Given that (depending on the workplace) vaping similarly can require individuals to step outside the workplace and take a vaping break, there is not enough evidence to suggest that individuals who vape take less breaks than individuals who smoke. As such, to be conservative, for the purposes of this analysis, we have assumed that there is no benefit associated in reducing the number of breaks, given that vaping may require an individual to similarly vape outside the workplace.

Quantifying the productivity losses associated with smoking has been done multiple times, with some estimates attempting to incorporate all facets of productivity losses and others focusing on specific avenues such as the cost of smoking breaks. An estimate from a 2006 study suggests the value of “current”, “former” and “never” smokers missed days of work and unproductive time at work was \$4,430, \$3,246, and \$2,623 respectively. Cebr estimated in 2014 that smoking breaks alone cost £1,815 and £447 for full-time and part-time workers respectively.

³⁰ NCBI (2017) “Benefits of quitting smoking on work productivity and activity impairment in the United States, European Union and China”

³¹ NCBI (2017) “Benefits of quitting smoking on work productivity and activity impairment in the United States, European Union and China”

The ASH Ready Reckoner estimates a total productivity loss due to smoking at £13.2 billion, accounting for increased likelihood to become ill whilst at work, the reduced average wage of smokers and the increased likelihood of smokers to die whilst still being of working age.³² This built on previous versions of the Ready Reckoner, which had estimated the cost of smoking breaks as £8.9 billion, with the cost of smoking breaks specifically valued at £3.3 billion.³³ While different sources for smoking rates provide slightly different figures, we utilise the ONS' estimate for the smoking population, based on Annual Population Survey data, which puts the number of smokers over the age of 18 in the UK at approximately 6.9 million.³⁴

The production increase resulting from workers switching from smoking to vaping

In estimating the potential productivity increase resulting from workers switching from smoking to vaping, we use a similar methodology as in the previous section when calculating healthcare savings. The ASH Ready Reckoner attributes £13.2 billion in productivity lost in England due to the smoking of cigarettes, resulting from absenteeism, presenteeism and mortality among other variables associated with smoking. When scaling up for the UK smoking population, we estimate £14.6 billion in total productivity costs for 2019 associated with smoking.

Consistent with our method for calculating healthcare saving associated with smokers switching to vaping, we provide a counterfactual scenario where vapers never made the change from smoking. Furthermore, we continue with our assumptions of the relative harm of vaping at 5% of the total harm caused by cigarettes, as well as the residual negative health effects experienced by ex-smokers.

As referenced, the 2019 version of the ASH Ready Reckoner, puts the cost of smoking breaks at £3.3 billion, when solely considering the UK. Scaling to the UK smoking population puts this at approximately £3.7 billion. Considering the total smoking population, this implies a cost of smoking breaks of just over £530 per smoker. We assume that for the purposes of this analysis that vapers take the same number of smoke-breaks as smokers and therefore do not factor this into the total productivity saving of a vaper.³⁵ Productivity savings associated with smokers switching to vaping are therefore a function of the productivity losses associated with smoking that are not associated with smoking breaks.

Assuming no productivity gains associated with smoke breaks being substituted for vape breaks, we estimate a vaper who is an ex-smoker to cost an average of £1,304 in 2019, compared to a smoker at £2,117 in 2019. **This can also be interpreted that an individual**

³² ASH Ready Reckoner (2022) "Smoking costs society £17 Billion".

³³ ASH Ready Reckoner (2019) "Local Costs of Tobacco Tool".

³⁴ ONS (2020) "Adult Smoking habits in the UK: 2019".

³⁵ Methodologically, we acknowledge the imperfection of utilising two sets of figures from different version of the ASH Ready Reckoner, within our calculations. However our view is that this is the best way of reflecting the strengths of both the older and more recent version of the tool. The 2019 version of the Ready Reckoner provides the specific cost of smoking breaks, which the updated version does not. However within their methodological guidance, ASH set out that the 'the old ready reckoner was a much less comprehensive measure of productivity costs than the new ready reckoner' (see [the linked methodological note](#)). We therefore utilise the *total value* of the cost of smoking in the updated analysis, while in the absence of better information assuming that the *value specifically attributed to smoking breaks* holds from the previous analysis.

who makes the switch from smoking cigarettes to vaping results in an approximate productivity saving of £813 on average.^{Error! Reference source not found.} reveals the total value of productivity gains through workers substituting smoking consumption for vaping consumption.

Table 11: The production increase associated with smokers switching to vaping, £ million, 2019

Total productivity value	Productivity loss of smokers	Productivity loss of smokers if vapers never switched	Net productivity gain due to smokers switching to vaping
£ million saving	14,610	15,915	1,296

Source: ASH, ONS, Cebr analysis

As previously stated, smoking contributed to a total of £14.6 billion in productivity loss. In the counterfactual, we assume that the 1.6 million vapers who are ex-smokers never made the switch; the total cost of smoking would therefore be £15.9 billion in 2019. **Therefore, this reveals that the total productivity gains due to smokers switching to vaping was nearly £1.3 billion in 2019.**

The potential increase in production as workers switch from smoking to vaping

In the same approach to quantifying healthcare saving associated with consumers switching from smoking to vaping, observing potential future scenarios of workers switching from smoking to vaping illustrates the efficacy of the vaping industry as a tool to increase national productivity. Given this, we have calculated the productivity increase corresponding to further switching from smoking to vaping, indicating the vaping industry's ability to reduce the loss in productivity associated with smoking.

Error! Reference source not found. reveals the total amount of production gain using the same methodology for the results in **Error! Reference source not found.** but factoring in potential future scenarios. These scenarios being: if a further 1% of smokers switch to vaping; if a further 10% of smokers switch to vaping; and if a further 50% of smokers switch to vaping.

Table 12: The production increase in potential future scenarios, £ millions

Potential future productivity gains	If 1% of 2020 smokers switched to vaping	If 10% of 2020 smokers switched to vaping	If 50% of 2020 smokers switched to vaping
Net productivity gain from vaping (£ millions)	65	647	3,326

Source: ASH, ONS, Cebr analysis

The potential net production gain if 1%, 10% and 50% of smokers switch to vaping is £65 million, £647 million, and £3,326 million respectively. Although the scenarios presented above are only indicative, it again demonstrates the positive effect that switching from smoking to vaping may have on productivity in the future across the UK.

6.3 Vaper behaviour

To supplement the above analysis on the wider economic spillovers of the vaping industry, Cebr commissioned a survey of 1,064 adult vapers, across a representative sample of the UK vaping population. Amongst the 1,065 adult vapers surveyed, 46.9% were cigarette smokers, whilst 47.2% were ex-smokers, suggesting that roughly half those who smoked when they

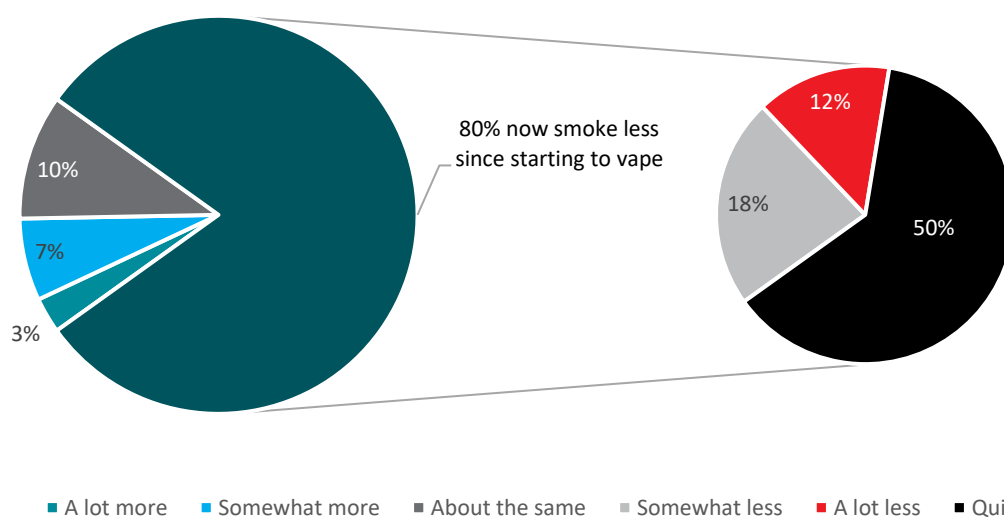
began vaping have now quit. Given this high rate of smoking cessation amongst vapers, it is important to examine the key characteristics of these individuals to understand the varying effects vaping is having on specific demographics.

Therefore, this section focuses on the survey results which illustrate the substitution effect from smoking to vaping as well as other consumer trends. Furthermore, in this section we highlight the diverging outcomes based off key characteristics of the survey respondents, such as age, smoking history, and motivation to start vaping.

Vapers who are also smokers' change in smoking habits

Focusing on the sample of vapers who are smokers, Figure 32 details the breakdown of those who have changed their smoking habits after starting to use e-cigarettes. Of this sample, 60.3% have reduced the amount they smoke cigarettes overall, while 36.7% smoke "somewhat less" and 23.6% smoke "a lot less". Conversely, 19.2% of vapers who smoke have increased their level of smoking by "a lot more" (5.8%) and "somewhat more" (13.4%), leaving the proportion of vapers who smoke that have maintained their level of smoking since starting to vape at 20.4%.

Figure 32: Change in smoking habits of vapers, %, 2021

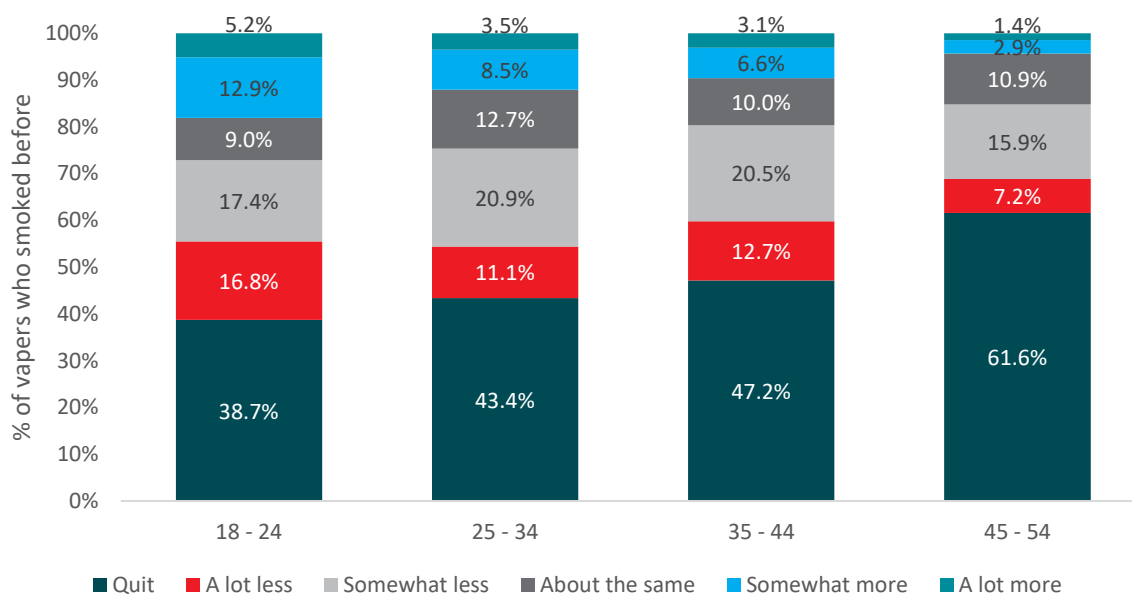


Source: Opinium, Cebr analysis

The trend underlying these results is relatively consistent across age groups as detailed in Figure 33, where most vapers who smoke in all age groups reduce the amount they smoke or quit entirely. The age group which saw the highest level of reduction are those aged 55 and above, where 15.9% smoke "somewhat less", 7.2% smoke "a lot less" and 61.6% quit smoking. We note however, those in the lowest age bracket, 18 to 24-year-olds, reduced their smoking by a lower proportion with 17.4% and 16.8% smoking "somewhat less" and "a lot less" respectively, whilst only 38.7% quit smoking.

Conversely, 18 to 24-year-olds were the age bracket of vapers with the highest proportion of smokers who increased their level of smoking "a lot more" (2.9%) and "somewhat more" (6.7%). This trend remains consistent across all age groups, where the older the age group, the higher the proportion of vapers who smoke that have reduced their level of smoking and vice versa. Note that for all age groups, most vapers who smoke have either quit or reduced the amount they smoke to some extent.

Figure 33: Change in smoking habits of vapers by age, %, 2021



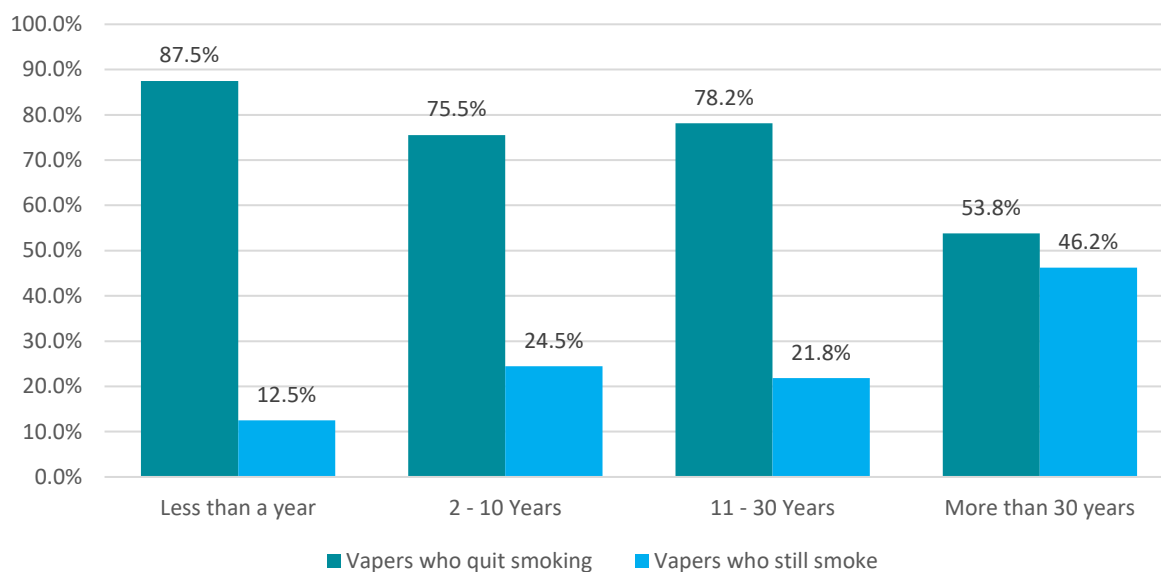
Source: Opinium, Cebr analysis

Vapers who have quit smoking

As previously mentioned, amongst the survey of vapers there is a significant number of individuals who have completely quit smoking (47.9%). Figure 34 illustrates the breakdown of vapers who smoke and have quit smoking whilst vaping. Vapers who had smoked for “less than a year” were extremely likely to quit smoking entirely, with 87.5% quitting and 12.5% continuing to smoke.

When observing vapers who had smoked for a longer period than a year, the likelihood of smoking cessation is lower, where 75.5% and 78.2% of vapers who smoked for “2 to 10 years” and “11 to 30 years” respectively, quit smoking entirely. Finally, 53.8% of vapers who had smoked for “More than 30 years” quit smoking. Therefore, despite the decreased likelihood of vapers who were long-term smokers quitting, overall, the majority of vapers who smoke(d) quit regardless of the length of time they smoked.

Figure 34: The proportion of vaper's who quit smoking by previous smoking duration, %, 2021



Source: Opinium, Cebr analysis

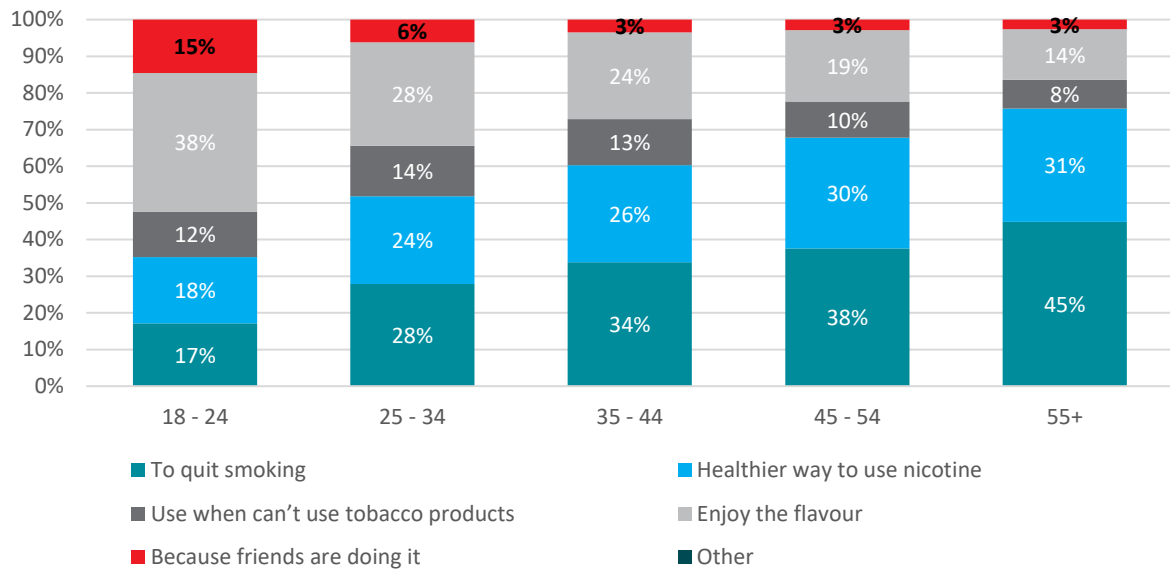
The motivation to start vaping

Within the sample of vapers, individuals report varying motivations to start vaping. Figure 35 below illustrates the most common responses amongst each age group. Note that as age increases, the motivation to start using vaping products changes consistently. Individuals aged between 18 and 24 most commonly cite “enjoy the flavour” as a motivator to use vaping products at 38% and “because friends are doing it” is the second most common motivation at 15%. Note that the proportion of these two motivations consistently decline as age increases with just 14% and 3% of those aged 55 and over, using vaping products “because friends are doing it” or that they “enjoy the flavour” respectively.

Conversely, vapers aged over 55 cited most “to quit smoking” and “healthier way to use nicotine” as a motivator to use vaping products at 45% and 31% respectively. In opposite fashion, these motivators decline when observing younger age groups, where 18% and 17% of 18 to 24-year-olds cite “to quit smoking” and “healthy way to use nicotine” as a motivator to use vaping products.

The notable exception to this pattern is the proportion of individuals who cite “use when can’t use tobacco products”, where we observe an increase in proportion from 18–24-year-olds to 25 to 34-year-olds who cite this as a motivator. However, this proportion begins to consistently decline with age, with 8% of those aged 55 and above citing this motivator.

Figure 35: The motivation to start using vaping products, proportion of responses by age group, % 2021



Source: Opinium, Cebr analysis

7. Conclusion

This report has assessed the economic contributions made by the UK vaping industry. We find that in 2021, **the UK vaping industry directly contributed:**

- **£1,325m in turnover**
- **£401m in Gross Value Added**
- **8,215 FTE jobs**
- **£154m in employee compensation**
- **£310m in Exchequer contributions**

The contributions made by the UK vaping industry are not constrained to these direct impacts alone. Further demand is supported along the supply-chains (induced impacts) and when employees spend their earnings in the wider economy (indirect impacts).

We estimate that once these additional impact layers are considered, **the UK vaping industry supported the following aggregate economic footprint in 2021:**

- **£2,804m in Turnover**
- **£939m in Gross Value Added**
- **17,710 FTE jobs**
- **£325m in employee compensation**

From a regional perspective, the direct economic contribution of the UK vaping industry varies significantly:

- **The largest contributing region for Turnover was the South East (£217 million).** The smallest regional contributor to vaping industry turnover in 2020 is Northern Ireland (£39 million).
- The largest contributing region for GVA being London (£35 million). The smallest regional contributor to GVA in 2020 was Northern Ireland (£13 million)
- In terms of direct employment contributions, **Scotland (1,341 FTEs) is the highest vaping industry employer.** Consistently with turnover and GVA, Northern Ireland was a minor contributor to vaping industry employment (261 FTEs)
- The South East has the highest direct contribution of employee compensation (£26 million). Northern Ireland yields the lowest compensation of employees in the vaping industry (£5 million)

In turn, the regional aggregate footprint is as follows:

- **The South East contributes the highest level of turnover, GVA, Employment and COE on aggregate** (£459 million, £237 million, 2,498 FTEs, £52 million respectively)
- Northern Ireland contributes the lowest level of turnover, GVA, employment and COE on aggregate (£37 million, £13 million, 468 FTEs, £8 million respectively)

The UK vaping industry also contributes to the national economy through further socio-economic spillover effects. This is primarily through the health and productivity outcomes for individuals who switched from smoking to vaping. **The economic values of these spillover effects are as follows:**

- **The total saving in healthcare costs as a result of smokers switching to vaping in 2019 was £322 million.** Furthermore, the total increase in productive output as a result of smokers switching to vaping in the first scenario in 2019 was £1.3 billion.
- The average healthcare and productivity cost per smoker in 2019 was £395 and £2,117 respectively.
- **The average healthcare saving for each individual ex-smoker who vapes is £202 and the associated productivity saving is £813 in 2019.**

