

AN ECONOMETRIC ANALYSIS OF POSTAL DELIVERY PRICING IN SCOTLAND

For the Scottish Government's Directorate of
Energy and Climate Change



April 2020



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A report prepared for the Scottish Government
by **Alma Economics**

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Executive Summary

Many people in Scotland currently face high postal delivery fees, long delivery times or outright refusal of service, especially in remote and rural areas. The Scottish Government has undertaken a range of actions to bring together key stakeholders, promote good practice in the parcel delivery sector and increase awareness of cases of unfair delivery pricing. It has also published an action plan detailing measures that need to be taken to effectively tackle the underlying causes that lead to discrimination against consumers in remote and rural areas in the country.

As part of these initiatives, the Scottish Government has commissioned Alma Economics to conduct an econometric analysis as a first step towards benchmarking when and where delivery charges are fair and unfair in Scotland.

Defining 'fairness' is a challenging undertaking. For this report, our team sought to provide an answer as to whether postal charges could be deemed unfair by using an econometric model to predict postal charges based on underlying geographic and parcel characteristics. The model allowed us to estimate the relative impact of each of these characteristics and the resulting postal charge.

Our approach generates new findings that strengthen the evidence base on postal delivery charges in remote and rural areas in Scotland. This evidence is valuable for realising actions 1 and 2 of the Scottish Government's action plan, namely the development of an interactive data hub to allow users to measure the fairness of delivery pricing to improve transparency and drive behavior change, and the development of the Scottish Parcel Delivery Map to better understand consumer experiences and target interventions.

This report presents results from our analysis, using 24,364 pricing quotes from six major delivery companies and 6,771 pricing quotes from seven national online retailers across all 1,029 postcode sectors in Scotland.¹ Shipping quotes were requested for small, medium and large parcel sizes as well a range of bulky consumer products.

We used an econometric model to estimate average prices and delivery availability after controlling for geographic and package characteristics that may influence how companies set their delivery policies. A second econometric model then considered the probability of refusal of delivery, again after controlling for geographic and package characteristics.

Descriptive statistics highlight that individuals in remote rural areas pay substantially higher prices than individuals in urban areas. The most prominent differences in prices and delivery probability are for next-day door-to-door deliveries where the price for islands is almost double than in the rest of the country and 75% more expensive in remote rural Scotland. According to the findings, the Highlands and Islands face the highest delivery prices on average among all regions and the lowest

¹ A postcode sector combines a postcode area, a postcode district and a single character indicating the location's inward code. It is separated with the outward code (postcode area and district) with a space. Examples of postcode sectors are SW1A 0 and WC2B 8.

delivery probability. Similarly, surcharges are concentrated in the councils of Moray, Argyll and Bute, Highland, Na h-Eileanan Siar, Orkney Islands and Shetland Islands.

The results of the econometric analysis are consistent with the findings from descriptive statistics. Postcodes in the Highlands and Islands face 21% higher postal charges on average compared to South Western Scotland and are 31% less likely to have access to home delivery services from online retailers compared to Eastern Scotland. Similarly, the councils of Na h-Eileanan Siar and the Shetland and Orkney Islands face average surcharges of at least 25% compared to Glasgow and have virtually no access to home delivery.

Overall, our results suggest that remoteness plays a more important role than rurality in explaining prices and the availability of delivery. However, when remoteness, rurality and council areas are explored together in the model, rurality and remoteness of a postcode sector seem to have a smaller impact on delivery charges than the wider council area. Finally, based on the predictions of our model, excessive charges are more prevalent in next-day, door-to-door delivery and across remote and rural areas.

Besides the quantitative analysis, this work also involved a qualitative component, with our team undertaking an extensive stakeholder consultation. We conducted 21 semi-structured interviews with postal operators, retailers, business associations, organisations and MPs which provided us with different insights into unfair delivery pricing and practices. Stakeholders also proposed solutions for improving consumer fairness, including the use of local providers, the introduction of pick-up and drop-off services, educating national couriers about the geographic particularities of Scotland as well as exercising increased pressure on the UK Government.

As part of the consultation, we analysed data on consumer complaints and reviewed cases of deliberate delivery surcharges. Our analysis suggests that the most common types of consumer complaints were about misleading advertising, drip pricing, failure or delay in delivery and substandard services.

Based on the quantitative findings and the stakeholder consultations the report concludes with policy recommendations and suggestions for further research. Policy recommendations include initiatives that improve information and transparency for consumers, ongoing monitoring to ensure that retailers and couriers comply with advertising and trading standards, the introductions of pick-up and drop-off services as well as carrot and stick approaches aiming to promote good practice among businesses.

This is a topic that would benefit from further research over time. Options include scaling up the data collection exercise and the repetition of the research at regular intervals. Additional research about the concept of fairness, the structure of the postal and retail market as well as the granularity of postcodes would also improve the evidence base on delivery charges in remote and rural areas in Scotland and allow the Scottish Government to formulate targeted interventions.

1. Introduction

Unfair delivery practices are a long-standing issue affecting people in Scotland, with the majority being in remote and rural areas of the country. Although delivery to those areas has additional costs, consumers in these areas have experienced unjustified surcharging, delays and refusal to deliver. In November 2018, the Scottish Government released an action plan. Two of the eight actions described in this key policy document were: (i) the development of an interactive data hub, and (ii) the development of the Scottish Parcel Delivery Map.

Aims and structure of the report

Alma Economics was commissioned by the Scottish Government to undertake an econometric analysis of postal delivery pricing in Scotland. As a first step, Alma Economics collected a novel, comprehensive dataset on delivery prices, area and company characteristics from the websites of delivery companies and retailers covering all 1,029 postcode sectors in Scotland, automating a “mystery shopper” approach using Selenium, an open-source web automation tool. An extensive stakeholder engagement exercise was also conducted through interviews with key representatives from umbrella bodies, national organisations, MSPs, couriers and retailers, providing a better understanding of their views and insights on different aspects relating to delivery charges in Scotland as well as examples of unjustified surcharges.

Following the data collection and stakeholder engagement exercises, our team estimated econometric models for parcel delivery prices and availability of online retailer home delivery as a function of a wide range of postcode sector and delivery characteristics. These models allowed us to identify the impact each factor has on delivery prices, then predict prices for a specific combination of parcel size, delivery options and postcode. Differences between delivery prices predicted by our model and actual prices quoted by delivery companies provided an indication for which postcodes face unfair prices. These results serve as a credible benchmarking of delivery pricing in different areas of Scotland that will enable the Scottish Government to develop an interactive data hub and the Scottish Parcel Delivery Map. However, our results are not definitive in terms of classifying a particular delivery price as fair or unfair – our model does not capture all relevant characteristics that delivery companies must consider when pricing the cost of delivery (such as labour and fuel costs), and observed surcharges could be justified due to factors that we do not include in our model.

The report is comprised of the following sections:

- **Section 2: Context**

Section 2 introduces the issue of unfair delivery charges in Scotland and discusses in detail drivers of high delivery costs, reasons for delivery surcharges, key consequences and general policy context.

- **Section 3: Stakeholder consultation**

Section 3 covers all aspects related to the stakeholder consultation. It includes information on interview participants and briefly discusses the topics covered during the semi-structured interviews. The section also focuses on case studies of unfair parcel delivery service, including unfair pricing, unjustified delays, refusal to deliver and misleading advertisements of the above.

- **Section 4: Methodology**

Section 4 explains the approach the Alma Economics team used for collecting data on postcodes, postal companies and retailers. It also provides information on the “mystery shopping” method employed to automate data collection; by writing a custom Python program for each retailer or delivery company we were able to request shipping quotes from websites and combine them into a database for further analysis. In addition, this section provides details on the econometric model specification. We estimated one primary model each for delivery companies and retailers, with a range of alternate specifications as robustness checks. Using different regressions, the econometric model was used to estimate the average delivery price for each postcode/address based on area and parcel characteristics.²

- **Section 5: Results and analysis**

The final section presents the findings of our research and report’s descriptive statistics and the results of our econometric analysis. A detailed discussion of the results is included, describing variation of prices across companies, parcel types, delivery times and type as well as geography.

In this report, we use the terms “delivery company”, “parcel operator” and “postal operator” interchangeably. In addition, the terms “delivery price”, “shipping quote” and “postal charge” all refer to the price charged by delivery companies to deliver a specific parcel or retailers to deliver a product ordered online to a particular postcode. This only refers to the base price of delivery and excludes any add-ons selected by the consumer.

² In this context, regression analysis is a statistical technique that is used to disentangle quantitatively how different drivers of delivery prices contribute to the total price. For example, the technique might identify that for a specific delivery, out of a £x delivery charge, £y can be attributed to geographic drivers, £z to the size of the item delivered, etc.

2. Context

Unfair delivery pricing in Scotland

According to the Scottish Affairs Committee, at least one million people in Scotland are subject to higher postal delivery fees, longer delivery times or refusal of service, a particularly acute problem for people living in the Highlands and Islands of Scotland.³ Royal Mail, the UK's Universal Service Provider, operates under the "one price goes anywhere" rule, delivering to more than 30 million addresses in the UK and charging the same price for each. However, many online businesses use private delivery companies, which are not subject to the same service obligations as Royal Mail.⁴

A report by Citizens Advice Scotland (CAS) found that individuals living in the North and North East of Scotland pay at least 30% more than consumers in the rest of the UK, while residents of the Scottish Islands have to pay 50% more on average.⁵ The report also found that higher prices were not only charged to rural areas but affected all addresses north of the central belt of the country, including urban areas such as Inverness and Aberdeen. According to the same report, heavier items incurred higher surcharges for consumers in the Highlands and Islands, with prices ranging from 13% higher for smaller parcels to 300% higher for parcels above 30kg. Moreover, in 2016 Ofcom interviewed five national delivery companies and found that out of all areas in the UK, only Northern Scotland and Northern Ireland faced surcharges.⁶

Consumers have noted a range of inequitable service experiences. For example, retailers and delivery companies often state that they offer free delivery across the UK except for remote and rural areas in Scotland. In addition, some companies have policies explicitly stating that they do not deliver to the Scottish Highlands or more remote parts of Scotland; if they do, consumers will be subject to higher prices.⁷

³ For example, see Scottish Affairs Committee (2017) Delivery charges in Scotland inquiry. <https://www.parliament.uk/business/committees/committees-a-z/commons-select/scottish-affairs-committee/inquiries/parliament-2017/delivery-charges-scotland-17-19/>

⁴ Royal Mail (2019) How we're regulated. <https://www.royalmailgroup.com/en/about-us/regulation/how-were-regulated/>

⁵ Citizens Advice Scotland (2017) The Postcode Penalty: Delivering Solutions. <https://www.cas.org.uk/system/files/publications/thepostcodepenalty-deliveringsolutions.pdf>

⁶ Ofcom (2016) Annual monitoring update on the postal market. https://www.ofcom.org.uk/_data/assets/pdf_file/0029/94961/2015-16-Annual-Report.pdf

⁷ MSE Forums (2018) Delivery fees in Scotland: tell MPs your stories. <https://forums.moneysavingexpert.com/showthread.php?p=73806947#post73806947>

Another common phenomenon that residents of the Highlands and the Islands experience are misleading advertisements about parcel delivery costs. Retailers sometimes advertise free UK-wide delivery, but customers are informed only upon reaching checkout that surcharges apply for their area. The Advertising Standards Authority (ASA) published a new Enforcement Notice on Advertised Delivery Restrictions and Surcharges for online and distance sellers in April 2018. Online retailers now need to clearly state any parcel delivery surcharges on product pages.⁸

Box 1: Timeline of progress and actions

This section lists the main policy activities regarding fair delivery pricing that have taken place since 2012.

November 2012: The then Minister for Business, Energy, Enterprise and Tourism, Fergus Ewing MSP, chaired the Parcel Delivery Summit in Inverness, bringing together a range of stakeholders across industry, government and regulators.

February 2013: A second Parcel Delivery Summit was organised in Edinburgh.

November 2013: The Scottish Government launched the Statement of Principles for parcel deliveries.

December 2017: Paul Wheelhouse MSP wrote to the UK Consumer Minister asking for UK Government action; and a Westminster Hall Debate was secured to discuss unfair delivery charges in Scotland.

February 2018: The UK Government's Scottish Affairs Committee held an evidence-gathering session on delivery charges.

April 2018: According to the Advertising Standards Authority's (ASA) new Enforcement Notice, online retailers now need to clearly state any parcel delivery surcharges on product pages.

June 2018:

- A Parcel Delivery Roundtable was hosted by Paul Wheelhouse MSP aiming to find sustainable solutions for all key stakeholders in the sector, including consumers, parcel delivery companies and online retailers.
- During the same month, the Consumer Protection Partnership (CPP) launched the website www.deliverylaw.uk, which brings together advice for consumers, businesses and specialists and support about misleading delivery charge advertising.

November 2018: One of the outcomes of the roundtable discussion in June was "Fairer deliveries for all: An action plan", a list of 8 actions aiming to reduce both unjustified delivery costs for people across Scotland and justified costs by trying to tackle some of the challenges of delivering to rural and remote areas in Scotland.

⁸ Advertising Standards Authority and Committees of Advertising Practice (2018) CAP issues enforcement notice on parcel deliveries and surcharges, <https://www.asa.org.uk/news/cap-issues-enforcement-notice-on-parcel-deliveries-and-surcharges.html>

Furthermore, ASA has received over 400 complaints since 2016 about unfair postal delivery pricing in Scotland, while MSPs and MPs such as Richard Lochhead, Drew Hendry and Michael Russell have also received numerous complaints from consumers. However, this potentially understates the true scope of the problem, as consumers do not always report incidents to the ASA, liaising instead with online retailers directly or paying excess charges without registering a complaint.⁹

Consequences of unfair delivery pricing

Unfair delivery pricing discriminates against individuals living in rural and remote areas and affects peoples' lives in several different ways:¹⁰

- **People in parts of Scotland are unable to take full advantage of the digital economy**

According to a recent survey of consumers living in postcodes identified by Ofcom as experiencing parcel delivery surcharging, increased convenience and choice and reduced costs are among the top reasons behind the attractiveness of online shopping. However, residents in remote areas are often excluded from the benefits of the digital economy. Instead, these individuals must pay much higher prices for deliveries despite experiencing lower incomes and higher costs of living compared to urban areas.

- **For small businesses in rural and remote areas, higher delivery charges can be a barrier to development**

The majority of the interviewees highlighted the negative impact of delivery surcharges and delays on small local businesses. As one respondent mentioned, running a business in a remote area is in and of itself a challenging undertaking. However, unfair surcharges and unreliable deliveries “is like closing the door to these businesses”. Interviewees stressed that small businesses face problems with both inbound and outbound deliveries, while most reports focus only on parcels sent to remote areas of Scotland. Businesses with an outward focus have to pay a much higher price to send products to their customers than businesses operating in large urban areas. This results in a competitive disadvantage that can ultimately disincentivise entrepreneurship and impact economic growth in certain communities.

For example, a woman with a small sewing business saw the demand for her products growing rapidly. However, the long delay in the delivery of the materials she needed acted as a barrier to the quicker development of her business. The same is true for certain industries such as tourism and fishing. Though both industries are growing steadily and present an important source of income for the Highlands and Islands, businesses in these sectors face substantially higher costs than those in other areas of the country.

⁹ Advertising Standards Authority and Committees of Advertising Practice (2018) Annual Report 2018. <https://www.asa.org.uk/uploads/assets/uploaded/563b3e3c-1013-4bc7-9c325d95c05eeeb7.pdf>

¹⁰ The Scottish Government (2018) Fairer parcel deliveries: Action plan. <https://www.gov.scot/publications/fairer-deliveries-action-plan/>

- **Vulnerable people may be adversely affected (such as people who rely on timely delivery of medical supplies)**

In addition to the economic consequences, unfair delivery pricing and delay in deliveries have important social consequences for people who depend on medicines and medical equipment. For example, an ill woman in Keith, Moray faced a £50.00 delivery charge for a mobility scooter, despite the website advertising free delivery across the UK.¹¹

Drivers of high delivery costs in remote areas

Delivery costs in remote and rural areas are higher for retailers and delivery companies due to challenges in accessing destinations (e.g. requiring a plane or boat), long distances for couriers to travel, and overall lower delivery volumes. This section discusses key drivers of high delivery costs in remote areas in Scotland based **on the findings from the desk-based research and stakeholder consultations.**

- **High fuel and labour costs**

The fuel costs incurred by delivery companies are higher due to the longer distances involved when traveling to remote and rural areas of Scotland. Similarly, labour costs tend to be higher since drivers have to work for longer hours to reach certain destinations.

- **Low parcel volumes**

Due to the low delivery volumes it is far costlier for couriers to reach certain destinations; traveling to a remote area to deliver one parcel is expected to cost considerably more than delivering 15 parcels to one single road in central London.

- **Reliance on ferries or airplanes**

Companies undertaking deliveries to Scotland often must transport parcels via ferry or plane. Contracting ferry companies and airlines presents additional costs for delivery companies which may be passed on as surcharges for consumers.

- **Working time regulations**

Several delivery companies noted that working time regulations drive higher delivery costs, as due to the long driving hours required to reach remote areas in Scotland companies had to use more than one driver to complete a job in order to comply with these directives.

- **Reliance on third-party companies**

Many delivery companies rely on third parties for parcel delivery. Due to the low parcel drop density in remote and rural areas, delivery companies often sub-contract services to third parties, usually local delivery companies, for the “last-mile”. According to a report by Ofcom, four out of the five largest delivery companies in the UK – Hermes, Parcelforce, DPD and Yodel – rely on third-party operators, and each

¹¹ The Scotsman (2017) MSPs condemn ‘rip-off’ parcel delivery charges for rural areas.
<https://www.scotsman.com/news/politics/spc-condemn-rip-off-parcel-delivery-charges-for-rural-areas-1-4632827>

of these four charged higher prices for delivery to the Highlands and Islands – the addition of an extra player, the sub-contractor in the supply chain, pushes costs up. Costs incurred by the main delivery companies varied significantly depending on the third-party provider used and area of the delivery, ranging from £2.32 to £4.56 per parcel.¹²

Reasons for deliberate delivery surcharges

Based on interviews, residents of the Highlands and Islands expect to pay more for deliveries and recognise that there are factors pushing costs upwards for delivery companies and retailers. However, consumers' experiences often include excessive surcharging, unjustified refusal of delivery and new conditions imposed towards the last steps of the online order. Potential reasons for this behaviour from retailers and carriers include:

- **Lack of transparency on price calculation**

There is often lack of transparency in the way prices are calculated, especially for surcharges for deliveries in remote rural areas such as the Highlands and the Islands.¹³ Both retailers and parcel operators operate on tight profit margins and may try to pass any additional costs on to consumers. However, retailers can take advantage of the lack of transparency surrounding price calculation to impose surcharges far higher than the actual delivery costs incurred in order to make profit. According to a 2016 report by Ofcom, the surcharge applied by each of the four delivery companies who use third-party operators for the Highlands and Islands was higher than the price paid to the third party by the companies.¹⁴

- **Exclusive contracts**

Prices in the postal delivery market are determined by retailers and delivery companies. Contracts between the two parties tend to be exclusive, meaning that a retailer is not allowed to use more than one carrier. In return, the parcel operator offers volume discounts that disincentivise the retailer from working with another courier. This sort of exclusive contract means that retailers cannot offer consumers a wider selection of couriers to choose from – which could potentially provide them access to preferential regional rates.¹⁵

¹² Ofcom (2016) Annual monitoring update on the postal market.

https://www.ofcom.org.uk/data/assets/pdf_file/0029/94961/2015-16-Annual-Report.pdf

¹³ Citizens Advice Scotland (2017) Parcel delivery operators views on rural parcel delivery in Scotland.

<https://www.cas.org.uk/system/files/publications/thepostcodepenaltytechnicalreport-industryinterviews.pdf>

¹⁴ Ofcom (2016) Annual monitoring update on the postal market

https://www.ofcom.org.uk/data/assets/pdf_file/0029/94961/2015-16-Annual-Report.pdf

¹⁵ Citizens Advice Scotland (2017) Parcel delivery operators views on rural parcel delivery in Scotland.

<https://www.cas.org.uk/system/files/publications/thepostcodepenaltytechnicalreport-industryinterviews.pdf>

- **Misapplication of postcode categorisation**

Current postcode mapping does not always accurately reflect location information, as it uses only the first two characters of the postcode and leads some urban areas to be mistakenly considered as rural. Due to mistakes from postcode software and the lack of the ability to manually change such categorisation once an order has been received, numerous consumers have been asked to pay substantially higher charges or have been denied delivery. This phenomenon is particularly common for addresses in the Paisley postcode area (postcodes starting with PA), the Inverness postcode area (postcodes starting with IV) and the Kirkwall postcode area (postcodes starting with KW).¹⁶ For example, a big terrain of the KW postcode is on the Orkney Islands. Given that postcode software generally does not take into account the full postcode, this can result in misjudgements in delivery charges. Similarly, though the Isle of Skye is connected to the mainland by road, there also appear to be surcharges due to the fact that it is an island.

Policy context

In recent years, the Scottish Government has undertaken a range of actions to bring together key stakeholders, promote good practice in the parcel delivery sector and increase awareness on cases of unfair delivery pricing. These include organising a series of Summits and Roundtable discussions, launching a Statement of Principles for parcel deliveries and publishing an action plan. Box 1 includes a more detailed summary of the actions to date.

In November 2013, the Scottish Government launched the Statement of Principles for parcel deliveries. The principles were developed with input from retailers, consumers and service providers, aiming to set out best practice guidelines for retailers to provide delivery services that meet the needs of their customers. By July 2014, the Statement of Principles had been adopted across the UK.¹⁷ The principles are listed below:

- **Principle 1:** Online retailers should ensure that their delivery pricing policies do not discriminate against consumers on the basis of their location. The level of any necessary geographic surcharges applied should reflect the true additional cost of delivery.
- **Principle 2:** Online retailers should ensure that their delivery coverage policies do not discriminate against consumers on the basis of their location. They should provide the widest possible delivery coverage, refusing delivery only when this can be justified by objective criteria.
- **Principle 3:** Online retailers should ensure that consumers can easily access clear, timely and transparent delivery policy information at the earliest possible stage in the online buying process.

¹⁶ The Highland Times (2019) Business Minister visits IV-AB postcode boundary for delivery charge talks. <http://www.thehighlandtimes.com/news/2019/08/16/business-minister-visits-iv-ab-postcode-boundary-for-delivery-charge-talks/>

¹⁷ Department of Business, Innovation and Skills (2014) Statement of principles for parcel deliveries. <https://www.cas.org.uk/system/files/publications/2014%20UK%20Statement%20of%20Principles.pdf>

- **Principle 4:** Online retailers should aim to offer innovative delivery options that are responsive to the changing market and needs of their consumers. They should also provide consumers with transparent information about delivery options before they complete their order.
- **Principle 5:** Online retailers should provide consumers with other relevant delivery information that they hold at the time the order is completed and/or dispatched.

These principles were furthered through the introduction of a new enforcement notice by ASA, which stated that online retailers need to clearly state any parcel delivery surcharges on product pages.

One of the most influential policy documents to date has been “Fairer deliveries for all: An action plan”, released in November 2018, which listed key actions required to reduce unjustified delivery discrepancies for people across Scotland as well as justified discrepancies through tackling some of the challenges of delivering in rural and remote areas in Scotland. The action plan published by the Scottish Government is described below:¹⁸

Box 2: Summary overview of actions contained in Action Plan (2018)

1. Develop an interactive Data Hub: allowing users to identify whether a delivery price is fair or not, helping to improve transparency and drive behaviour change.
2. Develop a Scottish Parcel Delivery Map to understand consumer experiences and target interventions, allowing anyone to track discrepancies between and within areas and identify when delivery pricing is significantly different from a “fair” price.¹
3. Celebrate best practice by retailers and parcel delivery companies.
4. Work with the industry to explore how to increase the impact and reach of the Statement of Principles.
5. Make it easier for consumers to know and exercise their rights.
6. Improve the accuracy of postcode classification tools.
7. Establish the Improving Consumer Outcomes Fund to explore new approaches to tackling long-standing consumer issues, including misleading and unfair delivery charges in rural and remote areas of Scotland.
8. Shape UK Government action to further strengthen consumer protection to ensure fair and transparent delivery charges for Scottish consumers.

¹⁸ The Scottish Government (2018) Fairer parcel deliveries: Action Plan. <https://www.gov.scot/publications/fairer-deliveries-action-plan/>

3. Stakeholder consultation

Interviews

To gain a better understanding on the nature and prevalence of unfair delivery charges in remote and rural areas in Scotland, we conducted interviews with key stakeholders, including umbrella bodies, national organisations, MSPs, delivery companies and retailers. The Scottish Government, based on its established relations with the sector, advised us on organisations and companies that would be useful to contact. Our team conducted a total of 21 semi-structured interviews – the box below presents the participating bodies and individuals.

Box 3: List of interview participants

Umbrella bodies and national organisations

- Caithness Chamber of Commerce
- Citizens Advice Scotland
- Committees of Advertising Practice
- Competition and Markets Authority
- Federation of Small Businesses
- Highlands and Islands Enterprise
- Interactive Media in Retail Group
- Ofcom
- Resolver
- Scottish Grocers Federation
- Scottish Rural Action
- Trading Standards Scotland

Members of Parliament and Members of the Scottish Parliament

- Alasdair Allan MSP
- Drew Hendry MP
- Richard Lochhead MSP
- Liam McArthur MSP
- Michael Russell MSP

Delivery companies

- DPD
- Caledonian MacBrayne

Retailers

- eBay

Box 4: List of bodies that were invited to interviews but did not participate

Umbrella bodies and national organisations

- Advice Direct Scotland
- Scottish Retail Consortium

Delivery companies

- Menzies Distribution
- Hermes
- DX
- UPS

The interviews with delivery companies and/or retailers were important for collecting information on the following topics:

- How do companies decide on profit margins, and is this added to the product price, the delivery quote or both (in the case of retailers)?
- Does the delivery price reflect the quote given by the couriers/delivery companies or is an extra mark-up added to it?
- How do delivery companies determine the cost of any particular delivery?
- How prices are calculated by couriers or other delivery companies?
- Do couriers/delivery companies use the same pricing software (with different mark-ups)?
- What are operators' views on the issues examined in this project? Do they think it's more expensive to deliver to remote areas in Scotland or generally remote areas? What are the main additional costs for these areas? How do they price deliveries in those areas, if they deliver at all? How do they approach islands and remote areas (ferries/planes)?
- Have companies ever heard any complaints from their customers regarding delivery charges to remote/rural areas?
- What are delivery companies' existing policies, including contractual and legal obligations?

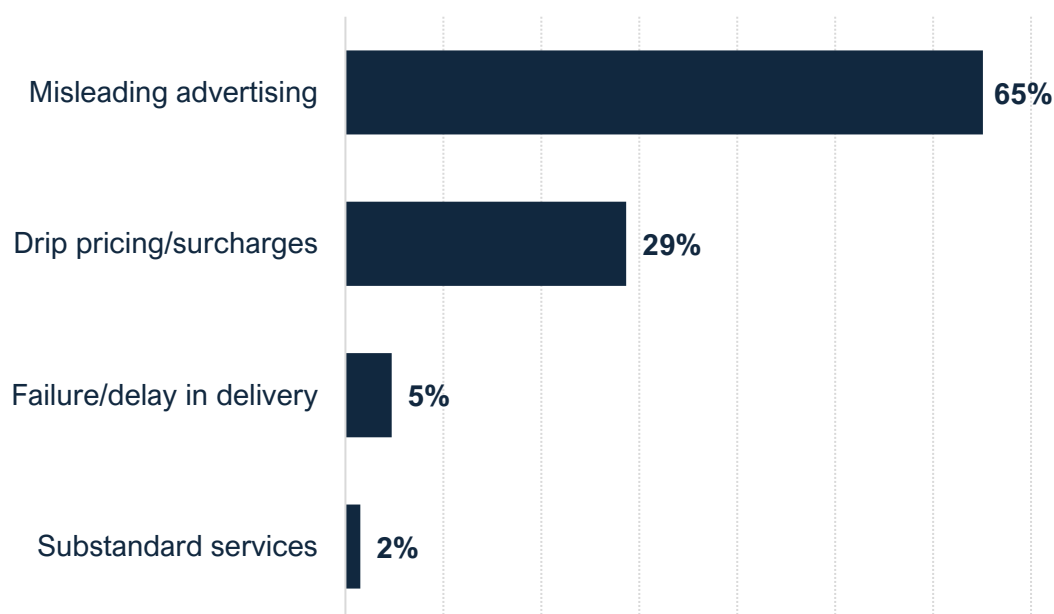
Interviews with key stakeholders, other than delivery companies and retailers, aimed to cover their views, experiences and knowledge on the topics above as well as examples of excessive surcharging, consumers' complaints and any information on trends in surcharging and potential solutions.

Case studies

This section focuses on examples of excessive delivery charging, unfair refusal of delivery, and cases where new conditions were imposed after an order is placed and paid. It reports statistics based on reported consumer complaints and discusses in more detail specific cases. Our team reviewed a total of 596 complaints, obtained through the following sources:

- Interviews with key stakeholders – the Highland Council (81 examples), Trading Standards Scotland and Caithness Chamber of Commerce (6 examples), Advice Direct Scotland (3 examples from the new [consumeradvice.scot](https://www.consumeradvice.scot) website); and
- Consumer complaints databases from MSPs – Richard Lochhead MSP (488 examples), Michael Russell MSP (15 examples) and Liam McArthur MSP (3 examples).

Chart 1: Most common types of complaints about parcel delivery in Scotland



Misleading advertising

As Chart 1 shows, 65% of the complaints reported focused on misleading advertising concerning deliveries in Scotland. This spans a range of cases, including: (1.) companies advertising free UK delivery but later applying charges to consumers who lived in remote areas in Scotland; and (2.) companies advertising mainland UK delivery but subsequently refusing to deliver to certain parts of the country. For example, a consumer in Cowal tried to buy a Wi-Fi router from a telecommunications company that claimed to offer free UK delivery. However, at checkout the customer had to pay £12.00 in delivery charges. Another consumer in Ardentenny tried to buy flowers from an online retailer that was also advertising free delivery across the country. When it came to placing the order, the customer was receiving error

messages but there was no explanation about what was causing the error. After spending a considerable time on the phone with the customer service team of the retailer, he found out that delivery to their area was not possible.

There are also cases of surcharges being imposed even after the order has been placed and the client has paid for the product. For example, the next day after a consumer had placed an order and paid for it, they received an email saying that there was a delivery charge for the particular postcode (although the client was initially informed that the 2-3 working days delivery option was free) and it was £9.90. Upon later inspection of the website, the increased costs were outlined on the traders' website, but the process of purchase was still not entirely clear, and the additional cost was brought to the consumer's attention after the order was finalised.

Box 5: In detail – misleading advertising and delay in delivery

In 2017, an Islay resident ordered a sofa from a retail company that normally charges £59.00 for delivery. After placing the order, the customer received a call from a customer team member of the retail company who advised her that as she was based on Islay, the delivery charge would be £260.00. The customer decided to use a local courier on Islay as they charged a substantially lower rate, at £120.00. However, when informing the retailer about her decision the company said that this would slow down the order process and, therefore, the customer would no longer be able to get the sofa in time for Christmas – even though delivery in time for Christmas was part of the retailer's advertising campaigning.

Given the customer's eagerness to get the sofa by Christmas she ended up paying the £260 charge. Yet, the retailer didn't deliver the order in time for Christmas despite saying it would arrive on the 21st December. Following the failure to deliver on the designated day, the customer called the company to find out the reason behind the delay. The retailer told her that the order had arrived in Glasgow and that the courier responsible for the delivery would be in touch. When the customer asked for the delivery charge to be reimbursed the company said that this was not possible due to it being an external cost and instead offered her back £90.00 in compensation. Later, it appeared that the retailer had used two couriers to get the sofa from Glasgow to Islay.

Drip pricing and surcharges

Twenty nine per cent of the 593 complaints filed by consumers concerned drip pricing and surcharges.¹⁹ For example, an Islay resident tried to buy a compost bin from a retailer who advertised free delivery. However, a week after she placed the order, she received an email asking her to pay £57.60. The customer cancelled the order and reported the incident to her constituency MP. When he raised the issue with the company, they said that due to GDPR regulations they were unable to discuss the case without permission from the customer. A similar case involved a resident of Mull who tried to buy a 65" TV and incurred delivery charges totalling £230.00 –amounting to 30% of the total item cost. When the customer contacted the company regarding the surcharge, they claimed that this was due to the need to use a specialist courier given the nature of the product. A third consumer in Islay who purchased a product from a third-party via an e-commerce platform was asked to pay £36.70 for delivery for a product worth £28.50. Finally, a client on the Isle of Skye was asked to pay £135 extra for delivery, while being initially informed that the cost would only be £35. As the additional cost was very high the client decided to use their own courier, who charged them only £16 for the delivery.

Box 6: In detail – drip pricing and surcharges

A resident of the Isle of Bute who runs a small online business saw the delivery charges from an important supplier increasing significantly. The business owner always faced higher delivery charges than her mainland competitors but recognised the additional costs involved when delivering to Bute and was willing to accept a higher charge for deliveries to her area.

However, a few months ago one of her suppliers advised that they would have to pass on the increase in delivery costs from a parcel operator. Prior to the increase she was paying delivery with a "Scottish Surcharge" of £13.50 and £2.70 for VAT, which equates to a total of £16.20 per box. This would now jump to £22.00 plus £4.40 for VAT plus £26.40 "per 10kg" box plus 74p per kg after that.

Following the update by her supplier the lady undertook her own research which showed that Bute, despite being relatively close to Glasgow, appears to be included in the same category as all Scottish Islands, the Isle of Man and the Channel Islands. More importantly she found that it would be considerably cheaper to send a parcel between 30 - 31kg abroad. The cost to send a 31kg parcel to Northern Ireland is £13.50, while the charge for sending a 30kg parcel to France, Netherlands, Germany, Belgium and Luxembourg is £18.50. Lastly, sending the same parcel to Denmark, Austria and Switzerland would cost her £21.50.

¹⁹ Drip pricing is a practice used by online retailers whereby only a part of a product's price is advertised at the beginning of the purchase process, with additional fees, taxes or charges – which may be unavoidable – being incrementally disclosed or "dripped" at the final stages of the purchase process.

Failure and delay in delivery

Five per cent of the incidences of unfair delivery charges and practices in our sample involved refusal or delay in delivery. For example, one resident in Caithness ordered a watch from Switzerland. While it took 24 hours for the product to arrive to Inverness, the parcel remained for 48 hours in the Inverness depot before it was delivered. Similarly, a consumer in Orkney purchased a dishwasher from a third-party on an e-commerce online platform claiming free UK-wide delivery. After the customer paid for the product, he received an email stating that the company does not deliver large items to his area. Another customer from Lochgilphead was refused delivery of a laptop battery after entering his address.

Substandard services

Two per cent of complaints reported incidents related to the provision of substandard services to remote and rural areas in Scotland. A Bute constituent bought a café kitchen from a catering company who assured all equipment would be under warranty. When the customer contacted the company about the dishwasher he purchased, he was advised that warranties did not cover islands. Likewise, a Mull constituent who tried to order from a retailer of dairy products found that some products were unavailable for delivery to islands. This is because most of the constituency postcodes sit within a 3-day delivery timeframe. Yet, a 3-4-day delivery timeframe for their chilled products is not acceptable from a food quality and safety perspective.

Proposed solutions

This section provides an overview of solutions suggested by stakeholders during interviews to address unfair delivery charges in remote and rural areas of Scotland.

Use local providers

A number of interviewees stressed the need to use local providers, especially for the “last-mile”. Local providers are familiar with local geographical particularities and can therefore provide a better service, ensuring that issues such as mistakes in postcode categorisation are avoided. The recent introduction of the Highland Parcels delivery service by Menzies Distribution is one example of a local solution that provides fairer parcel delivery pricing; the company introduced a service that allows residents in the Highlands and Islands to send any parcel for a single flat fee of £4.99.²⁰

Educate the parties involved about the geographical particularities

Stakeholders emphasised the importance of ensuring that retailers are aware of the geographical particularities of the region as well as the availability of alternatives for delivery. For example, Parcelforce and Royal Mail deliver UK-wide at the same cost.

²⁰ Post & Parcel (2018) Strong demand for Menzies Distribution Highland parcels

<https://postandparcel.info/99251/news/parcel/strong-demand-for-menzies-distribution-highland-parcels/>

Pick-up and drop-off services (PUDO)

Many participants underlined the importance of introducing more pick-up and drop-off points. Whereas this option makes economic sense for parcel operators – they can make multiple deliveries in one premise – consumer views varied; while some stakeholders argued that PUDO services provide increased convenience for some consumers – especially in islands where it is common for a resident to pick-up several parcels from a PUDO point and then deliver it to neighbouring residents – other argued that it takes time and money to drive to a central point to collect their parcels.

Government pressure

The majority of stakeholders stressed the need for the UK Government to intensify its efforts to tackle the issue of unfair delivery charges in Scotland. *A number of interviewees mentioned that it is important for companies that do not meet existing standards – such as adherence to the Enforcement Notice on Advertised Delivery Restrictions and Surcharges for online and distance sellers, published by the ASA in April 2018 – to be penalised.*

4. Methodology

This section describes the approach of our econometric analysis, covering data collection, model specification and estimation.

Our research covers a large share of postal delivery and online retail markets in Scotland and explores all postcode sectors in Scotland. Consequently, our overall results provide a good indicative picture of what drives delivery prices and how they vary across different postcode sectors in Scotland. However, it should be noted that our sample is not a true random sample of all deliveries to Scottish addresses and thus it does not provide a fully representative picture of delivery charges in Scotland. Similarly, while our model captures key factors affecting prices, including parcel characteristics, delivery speed, type of service, areas' rurality and remoteness and what company delivers each parcel, there are some interesting area and company characteristics that due to data restrictions were excluded, e.g. fuel costs, labour costs, and companies' business models.

Data collection

Our data collection process followed a four-step approach:

1. **Postcode selection:** We created a list of all 1,029 postcode sectors in Scotland, randomly selecting a full postcode for each of the postcode sectors. Postcodes that have been discontinued (per the Scottish Postcode Directory) were excluded from the selection process. We focused on the sector level in our analysis as preliminary analysis of data provided by Resolver indicated no variation across full postcodes within a single postcode sector.²¹
2. **Postal operator selection:** The selection of delivery companies included in our sample was informed by the market research exercise we undertook during phase 1 of the project to identify the biggest delivery operators across the UK (see Box 6, The UK delivery market).^{22,23} We focused on large national operators with widespread name recognition, as most individuals will rely on these companies to ship products on a regular basis and most retailers will contract these companies for product delivery. In addition, large firms were more likely to have a price quote service on their website as opposed to calling the operator or requesting a personalised quote via e-mail, which ensures prices do not depend on characteristics other than delivery location, speed or size.

²¹ For this dataset, Resolver collected shipping fees for five consumer goods across 46 online retailers. They focused their analysis on postcodes for which consumers submitted complaints about unfair postal charges in addition to surrounding postcodes.

²² Tamebay (2017) Amazon takes major slice out of UK delivery market. <https://tamebay.com/2017/08/amazon-takes-major-slice-uk-delivery-market.html>

²³ Post & Parcel (2018) Strong demand for Menzies Distribution Highland Parcels. <https://postandparcel.info/99251/news/parcel/strong-demand-for-menzies-distribution-highland-parcels/>

We included six delivery companies in our dataset: Parcel Force, My Hermes, DPD, TNT, Yodel and Menzies.²⁴ Menzies, in contrast to the other five operators, is a regional company that only delivers to postcodes in the Highlands and Islands and Aberdeenshire. These operators differ in the delivery options they offer to customers, outlined in Table 1.^{25,26}

Box 7: The UK delivery market

We undertook a market research exercise to identify the key couriers and delivery companies operating in the UK market. In terms of market share by parcel numbers, Royal Mail accounts for 47% of the UK market, followed by Hermes with 11% and Yodel with 8%.²² The remaining 34% is shared among the other UK couriers.²³

When considering total revenues, the landscape is slightly different; Royal Mail remains the market leader followed by DPD, UPS, DHL and TNT.

Top five biggest delivery companies in the UK, 2017 (share of total annual revenue)

Royal Mail – 35.0%

DPD – 12.0%

UPS – eight per cent

DHL – seven percent

TNT – six per cent

Alongside the delivery companies that operate UK-wide, there are some additional players important for the Scottish market such as Menzies and CalMac. Menzies is a delivery company used by national operators for last-mile deliveries in remote and rural areas in Scotland such as the Highlands and Islands. CalMac, on the other hand, is the major operator of ferry services between the mainland of Scotland and 22 islands on Scotland's west coast.

For each postal operator, we defined three different package sizes to request quotes for:

- a. Small parcel: length 45 cm, width 35 cm, depth 16 cm, weight 2 kg
- b. Medium parcel: length 61 cm, width 46 cm, depth 46 cm, weight 20 kg
- c. Large parcel: length 150 cm, width 50 cm, depth 50 cm, weight: 30 kg

²⁴ Details about the delivery companies' sample can be found in the Data samples section in the Annex.

²⁵ STD refers to the normal, less-urgent delivery option (with delivery times varying by postal operator), while ND refers to next-day delivery.

²⁶ TNT only provides next-day, door-to-door delivery, while Menzies only provides standard door-to-door delivery.

Table 1: Sample parcel operators and services provided

Postal Operator	STD Drop-Off	STD Door-to-Door	ND Drop-Off	ND Door-to-Door
Parcel Force	2 days	2 days	Yes	Yes
My Hermes	2 working days	No	No	No
DPD	1-2 working days	No	No	Yes
TNT	No	No	No	Yes
Yodel	2 working days	2 working days	No	Yes
Menzies	No	3-5 working days	No	No

3. **Retailer selection:** Similar to delivery companies, we conducted market research to identify key retailers in the UK market (see Box 7, The UK retail market).^{27,28}

Box 8: The UK retail market

To ensure that the sample of companies we used for our analysis was a good representation of leading retailers in the UK we also undertook market research to identify the key players in the sector.

Based on data from GlobalData, the “Big Four” supermarkets – Tesco, Sainsbury’s, Asda and Morrisons – accounted for 30.3% of the total annual revenue generated by the sector in 2017. Amazon was in fifth position and Marks & Spencer and John Lewis PLC jointly occupied the sixth position. In the UK, online sales account for around 15% to 20% of total retail sales – with this figure predicted to rise as technology is becoming increasingly embedded in the lives of consumers. In the online retail market Amazon, Tesco and e-Bay are the top three players comprising around 33% of total retail sales. Other big retailers include Asos, Argos, John Lewis PLC and Next.

We focused on large retailers that deliver across the UK, as most individuals are likely to purchase products from stores and websites they recognise.

²⁷ Scottish FairTrade Forum (2018) Fair Trade Market in Scotland Report 2018. <http://www.scottishfairtradeforum.org.uk/assets/templates/sftf/images/Redacted%20Version%20Fair%20Trade%20Market%20Report%20April%202018.pdf>

²⁸ E-commerce News (Accessed 20th of July 2019) E-commerce in the UK. <https://ecommercenews.eu/ecommerce-in-europe/ecommerce-the-united-kingdom/>

However, to ensure that our sample has sufficient variation – due to the existence of multiple players in the UK retail sector – we also included a number of smaller retailers. We selected one of three products – a two-seater sofa, a 43-inch television or saucepan set – as these are large items that are the most challenging to deliver to remote areas, and thus have the greatest variation in ability to deliver, delivery times and shipping fees. For each retailer and postcode sector, we collected the price for regular shipping and home delivery (as opposed to click-and-collect).²⁹

Based on our market research our sample was comprised of three of the UK's key players; Argos, Asda and Sainsbury's. However, given the plethora of retail businesses operating in the UK – more than 390,000 – we also chose a number of smaller retailers such as ao.com, Furniture Village, Hughes, Ikea and Sonic Direct, to ensure sufficient variation. Table 2 lists the retailers and the corresponding products included in our sample.

Table 2: Sample retailers and products ordered for home delivery

Retailer	Product
Asda	Two-seater sofa
Furniture Village	Two-seater sofa
Ikea	Two-seater sofa
Argos	Two-seater sofa
Sainsbury's ³⁰	Saucepan set
Hughes	43-inch TV
ao.com	43-inch TV

We also collected data for retailers that were ultimately excluded from the analysis due to incomplete information available online. For example, some retailers displayed the message, “Deliveries to your postcode may incur a surcharge; as such, online checkout is not available. Please call for pricing and delivery times”, which does not provide information on the magnitude of the surcharge or possibility of delivery.

One important challenge with collecting price data from online retailers is that they might cross-subsidise shipping expenses by incorporating part of the shipping cost in the product price. This means that the shipping fee listed

²⁹ Details about retailer sample sizes can be found in Annex A.

³⁰ Due to the complex nature of Sainsbury's shipping pricing policies (prices vary dramatically by day of the week, delivery time and specific hour of the day), we only collected data for whether home delivery is available or not.

does not necessarily represent the cost of delivering the package. Since it is difficult to precisely identify to what extent retailers follow this practice, we collected data for both delivery companies and retailers and treated pricing data from retailers with great caution.

4. **Mystery shopping:** To collect pricing data from delivery companies and retailers, we automated a “mystery shopper” approach using Selenium, an open-source web automation tool. We wrote a custom Python program for each retailer or postal operator to request shipping quotes from websites and combine them into a database for further analysis. Most retailers require a delivery address before providing the user with a shipping price estimate, while delivery companies also require entering package weight and dimensions. Our program automated the process of entering parcel characteristics and addresses and extracted each price quoted. For postal operators, we used as a sender’s address the Alma Economics’ London office address and for parcel weight and dimensions, we used the categories specified in step 2 (Postal operator selection).³¹

Additional details on sample sizes for individual retailers and delivery companies can be found in Annex A.

Apart from prices, we collected data on postcode and carrier/retailer characteristics that were potential factors in per-parcel pricing models. Surveys of postal carriers to the Highlands and Islands have pointed to fuel costs and driver hours as one of the important contributors to higher costs. We cannot include these directly in our model due to the lack of available data, but we **can include urban-rural classification and population density as proxies**, respectively.³² Our full list of variables included as controls in our econometric models include:

1. **Population density:** This serves as a proxy for delivery volumes, as due to economies of scale we expect areas with more frequent deliveries to face lower postal charges. We collected this data at the postcode sector level from the 2011 Scotland Census, although no data was available for 87 postcodes for the following reasons:
 - a. The postcodes selected were introduced after 2011;
 - b. The postcode had a population of less than 20 households and/or 50 people; and
 - c. The postcode is only classified as part of Large User Postcodes.

³¹ Alma Economics’ London office is located at 24 Stoke Newington Road, N16 7XJ London, UK

³² In addition, even though fuel prices are often an important contributor to increased shipping costs to the Highlands and Islands, it may be misleading to include these in our analysis because drivers have flexibility in where they choose to fill their vehicles. For example, even though fuel costs on the islands may be higher than central Scotland, drivers may choose to fill up in Oban or Fort William before taking a ferry to the islands.

To address this, we developed and tested two specifications for our econometric model, one without the 87 missing postcodes and one that does not include population density.

2. **Islands:** To account for increased costs of shipping due to ferry or plane requirements, we include island dummy variables (using the island identifiers found in the Scotland Postal Directory).³³
3. **Urban-rural classification:** We obtained this data through the Scottish Government Urban Rural Classification. There are several different types of classifications based on level of detail, and our main classification used is eight-fold: postcode sectors are classified first as a settlement or geographic area, then segmented by population and drive time to settlement (for areas). A full definition of the different categories is presented in Annex C.

The process of collecting both postal charges and other drivers of shipping costs produces a dataset where the unit of observation is a delivery request for a specific parcel from a postcode in Scotland to a specific company or retailer.

Model specification

Background considerations

The aim of this work is to understand the main delivery cost drivers and the different factors contributing to the surcharges imposed in rural and remote areas of Scotland. As there is no available information on costs for either postal operators or retailers, we used delivery prices as a proxy. Each company has a profit margin which is added to the delivery cost to create the delivery price given to the consumer.³⁴ Consequently, the price is not expected to directly reflect the costs, but it is a credible indicator.

While postal operators' price is expected to mainly include the cost and a profit margin, for retailers the delivery price structure can be more complicated. More particularly, retailers often cross-subsidise delivery charges by incorporating part of the delivery costs in the product price. For example, many retailers offer free shipping to all postcodes for which delivery is available, although they do incur shipping costs.

Furthermore, all the retailers in our dataset offer the same delivery price everywhere.³⁵ That said, some retailers do not deliver to specific postcodes at all,

³³ National Records of Scotland (Accessed 20th of June 2019) 2019-1 Scottish Postcode Directory Files. <https://www.nrscotland.gov.uk/statistics-and-data/geography/our-products/scottish-postcode-directory/2019-1-scottish-postcode-directory-files>

³⁴ Although we were not able to collect information on profit margins from the interviews, our postal operators' data suggest that different companies follow different pricing methods, as the prices and the variation of prices across parcel and area characteristics are very different among companies.

³⁵ Apart from Sainsbury's for which we did not collect data for prices. More details on this are available in the Data collection section.

which offers an insight into whether retailers discriminate or not against specific areas in Scotland.

Taking the above considered into account, we decided to undertake two separate pieces of analysis:

1. Factors affecting postal operators' delivery prices
2. Factors affecting retailers' probability to offer delivery

Model specification and estimation

It is difficult to directly compare postal charges across different postcodes, as operators vary their offerings along several dimensions and many different factors drive differences in charges. To isolate price changes from differences in fuel costs, driving times and delivery volume, allowing for postcode sector comparisons on a like-for-like basis, we use an estimation method called hedonic pricing analysis. This approach is based on the premise that the value of a good or service (in this case, the price of shipping a good to specific Scotland addresses) is based on its characteristics. Using different regressions, our econometric model aims to estimate the average delivery price for each postcode/address based on area and parcel characteristics.

Our primary specification for delivery companies is outlined in Equation 1:

$$Price_{ijh} = \beta_0 + \sum \beta_1 X_{1i} + \sum \beta_2 X_{2ih} + \sum \beta_3 X_{3h} + u_{ijh}$$

with i representing each postcode sector, j each parcel size and h each postal operator/retailer. In this equation:

- $Price_{ijh}$ is the postal charge in pounds quoted by a postal operator h to deliver a package of size j to a randomly chosen postcode in postcode sector i .
- X_1 are area characteristics, including dummies for local authorities and postcode sectors, postcode sector population density, urban-rural classification and island dummies. These serve as a proxy for delivery volume or density; we expect economies of scale in more densely populated, urban postcodes as multiple parcel deliveries can be arranged through one journey, lowering the price of delivery for each parcel.
- X_2 are parcel characteristics, including parcel size, delivery time and location (drop-off or door-to-door).
- X_3 is a vector of dummy variables for each postal operator. This allows us to identify whether certain delivery companies charge higher postal charges on average compared to other companies, which may indicate higher mark-ups or greater inefficiencies.
- u_{ijh} is an error term that reflects unobserved pricing drivers for each observed price

The above model was estimated using ordinary least squares. Each coefficient (β) is an estimate of the impact of the area, parcel and company characteristics on postal charges. Using the dataset collected, we estimate several variants of this equation. Since there are very few postcodes for which operators refuse to deliver, we focus on price as our dependent variable.

Similarly, for retailers only, we estimate Equation 2:

$$Delivery_{ih} = \beta_0 + \sum \beta_1 X_{1i} + \sum \beta_2 X_{2ih} + \sum \beta_3 X_{3h} + u_{ih}$$

As explained above, there is no variation in prices across different postcode sectors for a specific retailer – retailers in our dataset charge the same shipping fee irrespective of delivery location but often exclude certain postcodes from online home delivery. Thus, we include a binary variable for availability of home delivery as our dependent variable: 1 if the retailer delivers to a postcode and 0 if home delivery is not available.

The resulting estimation is a linear probability model, which allows us to estimate the probability that retailers offer delivery to a specific postcode sector (as opposed to the average postal charge). These coefficients are straightforward to interpret – in this case, each β captures the marginal impact that each characteristic has on the probability of delivery availability for a certain postcode.

5. Results and analysis

Overview

Our econometric analysis was implemented in two stages. First, we analysed data collected for delivery companies, focusing primarily on postal charges as the companies in our dataset provided delivery across small, medium and large packages to the vast majority of postcode sectors. Second, we analysed online retailers, focusing on availability of home delivery as all retailers in our dataset charged a flat shipping fee irrespective of delivery location. This section presents our findings from the analyses described above. We explore the factors listed below and we present both descriptive statistics and the results of our econometric analysis.

- Parcel or product characteristics
- Variation among companies
- Delivery characteristics (delivery time and method)
- Postcode and area characteristics

Our results are broadly consistent with our discussions with key stakeholders: postcodes in the Highlands and Islands face higher shipping charges from delivery companies, while retailers offer limited or no home delivery options.

Our overall results provide a good indicative picture of what drives delivery prices and how these vary across different postcode sectors in Scotland. However, it should be noted that our sample does not provide a fully representative picture of the delivery charges in Scotland and our model, while it includes a lot of key factors affecting delivery pricing, does not capture all the underlying aspects of costing.

The full list of results for all the different specifications can be found in Annex D.

Box 9: Key takeaways

- Differences in shipping charges quoted by delivery companies exist across different postcode sectors. In particular, very remote small towns and very remote rural areas face shipping charges 23% higher than large urban areas on average. Price differences are greatest for next-day, door-to-door deliveries.
- After controlling for population density, delivery time, type of service and parcel size, postcodes in certain council areas (Na h-Eileanan Siar and the Shetland and Orkney Islands) face average surcharges of at least 25% compared to Glasgow.
- While most of Scotland is well-served by online retailers, very remote rural areas and small towns have extremely limited access to home delivery services. These areas are 66% and 71% less likely, respectively, to have access to home delivery services.
- After controlling for population density and product type, postcodes in certain council areas (Na h-Eileanan Siar, the Shetland and Orkney Islands) have virtually no access across the range of retailers in our dataset.
- Remoteness seems to have a larger impact on delivery prices and availability of delivery than rurality on its own.
- The effect of rurality and remoteness of a postcode sector seems to be less important than that of the wider council area, which indicates that delivery companies' pricing methods do not account as much for small area characteristics as the location of council areas.
- Our model captures one notion of unfairness, which is measured by the difference between the actual prices and the prices predicted by our model, controlling for the rurality and remoteness of each postcode sector.
- Next-day delivery options exhibited the highest gap between actual prices and those predicted by our model, with most of the areas affected being remote and rural.

Delivery companies

Descriptive statistics

This section presents the average delivery prices by different area, parcel and delivery service characteristics, as well as by postal operator. The averages discussed below represent the postal operators within our sample and provide useful insights on how prices vary across different areas of Scotland.

The average price and availability probability by parcel size are calculated by using price and delivery availability information relating to the companies that generally deliver the specific parcel size. For example, if a company does not deliver large parcels anywhere within the UK, then data relating to this company are not used when calculating the descriptive statistics of large parcels.

As explained in the previous chapter, our sample includes six delivery companies, though four do not deliver any large parcels (based on our definition of a large parcel as weighing 30kg). Average delivery prices vary substantially among the delivery companies in our sample, ranging from £3.40 for the cheapest small package delivery option to £55.65 for the most expensive large package.

Variation across delivery companies in our sample

Table 3 presents the average delivery price by parcel size and company and the average delivery availability probability. Prices for small parcels vary from £3.40 to £16.06, while prices for medium parcels from £7.51 to £24.65. The prices for larger parcels range from £36.57 to £55.75.³⁶ The average probability of delivery availability is very high among the delivery companies, with the lowest being 80% for medium parcels and 94% for small parcels.³⁷

Table 3: Average delivery price and probability of availability by parcel size and company

Company name		Parcel size	Average price	Average delivery availability probability
	Company 1	Medium	£10.22	100%
		Small	£10.23	100%
	Company 2	Medium	£7.51	96%
		Small	£3.40	96%
	Company 3	Large	£55.75	100%

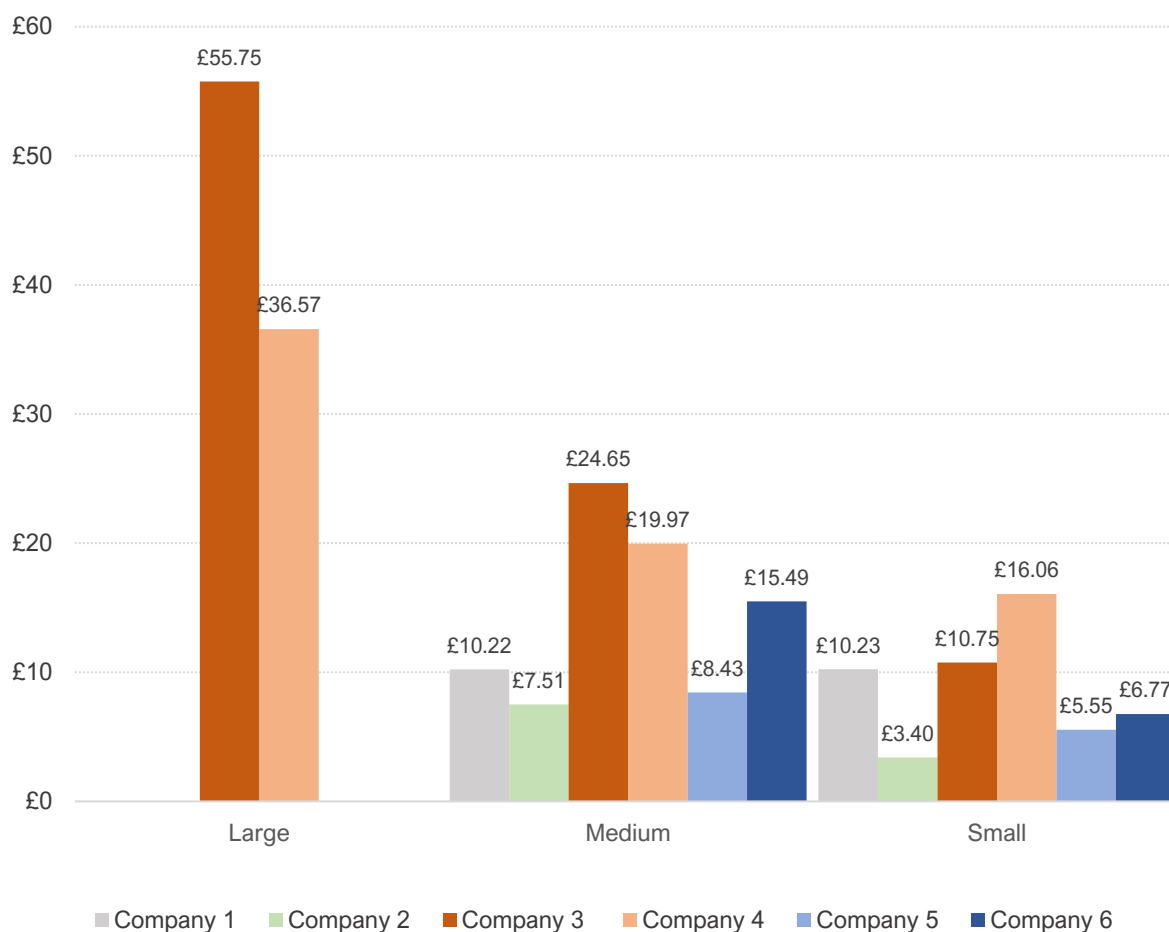
³⁶ These price ranges only refer to the specific companies within our sample and there is anecdotal evidence that other delivery companies may be charging outside these price ranges. For example, see examples of surcharges in the Case studies section of this report.

³⁷ Large parcels have high acceptance rate of delivery mainly because they are only being delivered by two delivery companies: Parcel Force, which delivers everywhere, and TNT.

		Medium	£24.65	100%
		Small	£10.75	100%
	Company 4	Large	£36.57	100%
		Medium	£19.97	100%
		Small	£16.06	100%
	Company 5	Medium	£8.43	80%
		Small	£5.55	100%
	Company 6	Medium	£15.49	98%
		Small	£6.77	94%

As Chart 2 indicates, the larger the parcel, the higher the average delivery price charged by each delivery company.

Chart 2: Average delivery price by parcel size and company



Prices also vary across delivery times and services. As Table 4 shows, standard deliveries and drop-off deliveries are consistently cheaper than next-day deliveries and door-to-door deliveries.

Table 4: Average delivery price and probability of availability by company, time and type of service

		Delivery time			
		Standard service		Next-day service	
Company name		Door-to-door	Shop drop-off	Door-to-door	Shop drop-off
	Company 1	£10.23			
	Company 2		£5.45		
	Company 3	£26.19	£28.68	£34.59	£32.05
	Company 4				£24.20
	Company 5	£6.99	£4.74	£7.62	
	Company 6		£5.99	£11.49	

Rurality and remoteness

The Scottish Government provides a standard definition of rural areas based on population size and distance from nearest settlement. These classifications vary in their level of detail, ranging from two-fold (urban and rural) to the most-detailed eight-fold categorisation. We include this estimate of rurality/proximity in our analysis to understand the different impacts these have on postal charges.

*Three-fold rural–urban classification*³⁸

This classification assigns each postcode to one of the following categories:

- Rest of Scotland
- Accessible rural
- Remote rural

The detailed definition of each category is reported in Annex C.

³⁸ Details about the Scottish Government three-fold classification can be found in the Scottish Government Urban Rural Classification section in the Annex

Chart 3 and Table 5 show that while prices charged for accessible rural postcodes do not vary significantly from prices in the rest of Scotland, remote rural postcodes face much higher prices. More specifically, for large parcels, individuals in remote rural areas pay 17% higher for delivery, while the prices for medium and small parcels are 26% higher and 46% higher, respectively. The lowest probability of delivery availability rate is 83%, for medium parcels in remote and rural areas.³⁹

Table 5: Average delivery price and probability of availability by parcel size and rurality classification

Rurality classification	Parcel size	Mean price	Average delivery availability probability
Rest of Scotland	Large	£50.29	100%
	Medium	£17.21	98%
	Small	£8.03	99%
Accessible rural	Large	£51.02	100%
	Medium	£17.39	98%
	Small	£8.14	99%
Remote rural	Large	£58.76	100%
	Medium	£21.68	83%
	Small	£11.75	96%

Chart 3: Average delivery price by parcel size and rurality classification



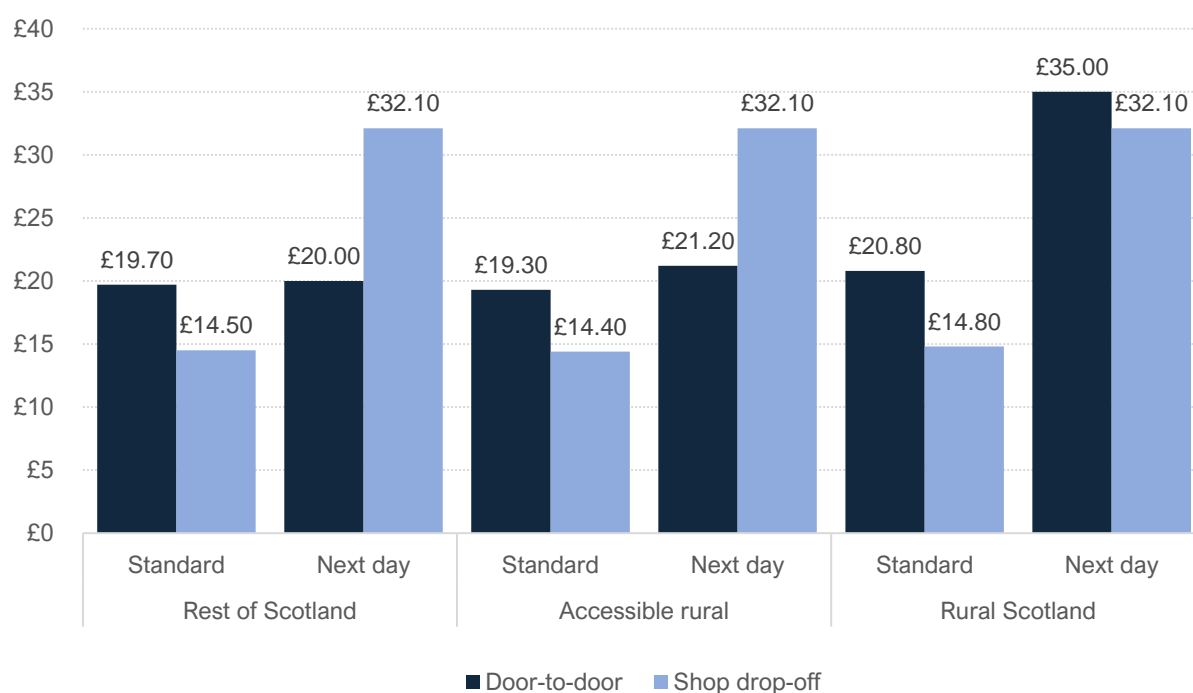
³⁹ Large parcels have high acceptance rate of delivery mainly because they are only being delivered by two delivery companies: Parcel Force, which delivers everywhere, and TNT.

Table 6 and Chart 4 show average prices by delivery time and type of service. Interestingly, prices do not seem to vary significantly between areas, apart from next-day door-to-door delivery, which is 75% more expensive in remote rural Scotland than in the rest of the country.

Table 6: Average delivery price and probability of availability by time, type and rurality classification

		Type of delivery			
		Door-to-door		Shop drop-off	
Rurality classification	Delivery time	Average price	Average delivery availability probability	Average price	Average delivery availability probability
Rest of Scotland	Standard	£19.70	99%	£14.52	98%
	Next day	£20.04	99%	£32.06	100%
Accessible rural	Standard	£19.34	99%	£14.41	99%
	Next day	£21.21	99%	£32.06	100%
Rural Scotland	Standard	£20.85	87%	£14.78	95%
	Next day	£34.99	89%	£32.06	100%

Chart 4: Average delivery price by time, type and rurality classification



Eight-fold rural-urban classification⁴⁰

This classification assigns each postcode to one of the following categories

- Large urban areas
- Other urban areas
- Accessible small towns
- Remote small towns
- Very remote small towns
- Accessible rural
- Remote rural
- Very remote rural

The detailed definition of each category is reported in Annex C.

Chart 5 and Table 7 show that postcodes in urban areas, accessible small towns and accessible rural areas face similar postal charges, with remote small towns and remote rural having slightly higher prices for larger parcels. On the other hand, very remote small towns and very remote rural areas are charged significantly higher prices, varying from 22% (large parcels) to 68% (small parcels) higher compared to large urban areas. The probability of delivery availability is higher than 90% everywhere apart from very remote small towns and very remote rural areas, where it is 79% for medium parcels. Out of the six postal operators in our sample, only two deliver large parcels, and thus the descriptive statistics are calculated based on only those two companies.

Table 7: Average delivery price and probability of delivery availability by parcel size and rurality classification

Rurality classification	Parcel size					
	Large		Medium		Small	
	Average price	Average delivery availability probability	Average price	Average delivery availability probability	Average price	Average delivery availability probability
Large Urban Areas	£49.79	100%	£16.84	99%	£7.75	99%
Other Urban Areas	£49.78	100%	£17.17	98%	£8.00	99%
Accessible Small Towns	£50.78	100%	£17.28	99%	£8.01	99%

⁴⁰ Details about the Scottish Government eight-fold classification can be found in the Scottish Government Urban Rural Classification section in the Annex

Remote Small Towns	£53.26	100%	£18.15	95%	£8.55	97%
Very Remote Small Towns	£60.89	100%	£23.71	78%	£13.22	96%
Accessible Rural	£51.01	100%	£17.38	98%	£8.14	99%
Remote Rural	£55.77	100%	£19.40	91%	£9.78	98%
Very Remote Rural	£60.58	100%	£23.17	79%	£13.05	93%

Chart 5: Average delivery price by parcel size and rurality classification

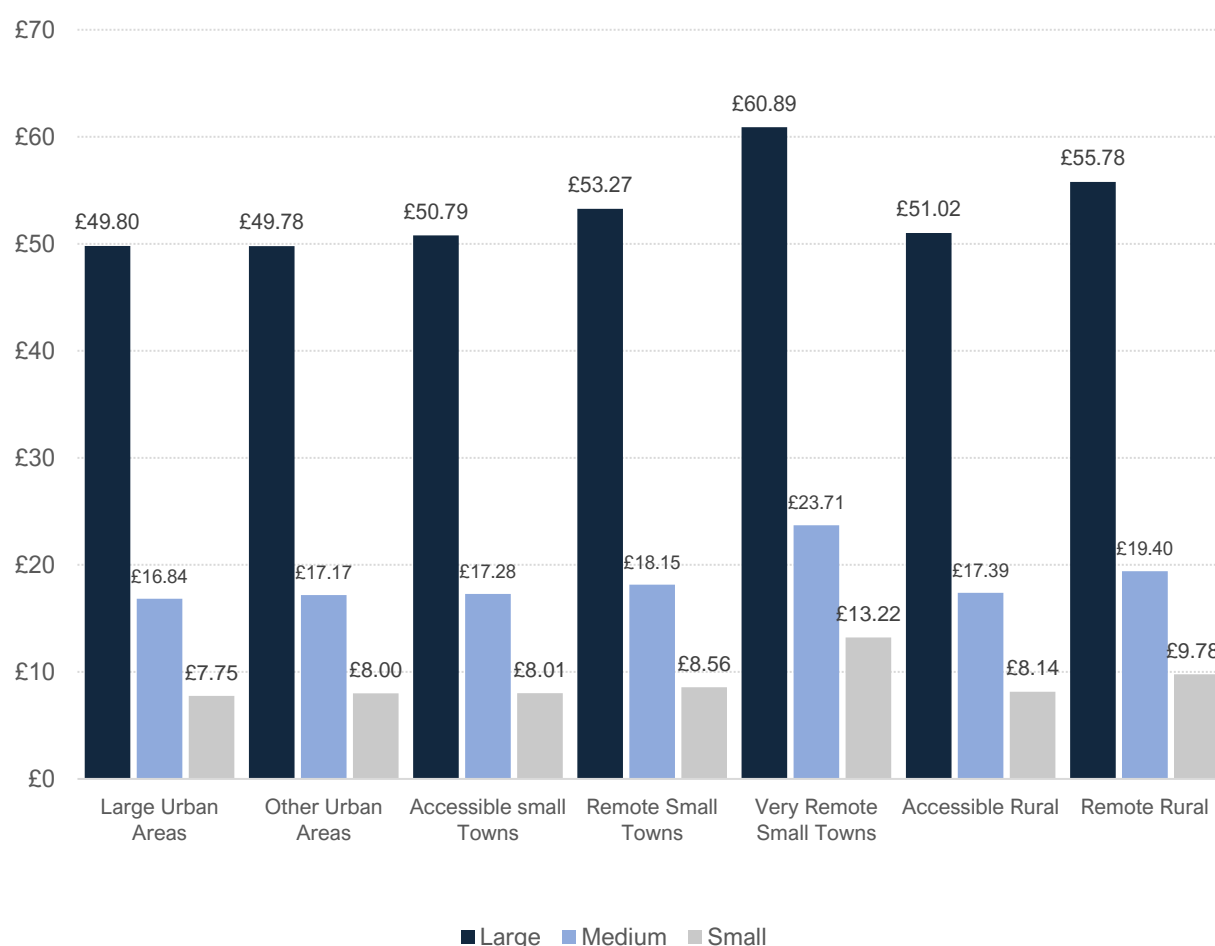


Table 8 shows that the differences in prices between very remote areas and the rest of Scotland is much more prominent for next-day door-to-door deliveries.

Table 8: Average delivery price and probability of availability by time and type of service

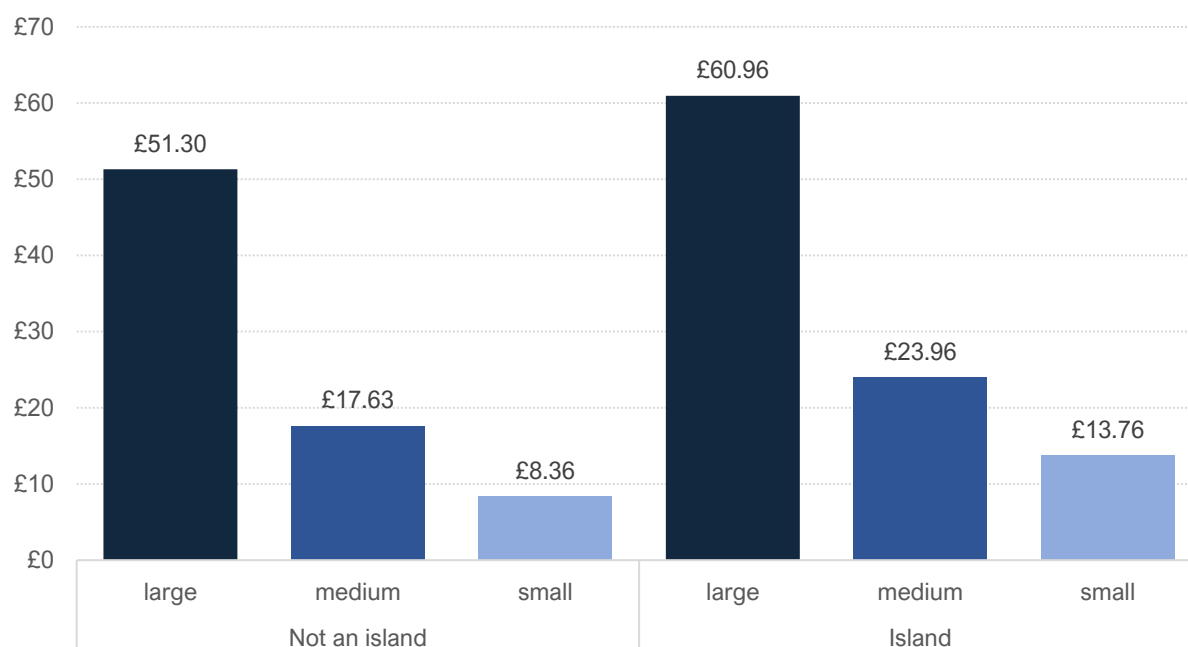
Rurality classification	Delivery time	Type of delivery			
		Door-to-door		Shop drop-off	
		Average price	Average delivery availability probability	Average price	Average delivery availability probability
Large urban areas	Standard	£19.60	99%	£14.44	98%
	Next day	£19.09	99%	£32.06	100%
Other urban areas	Standard	£19.76	99%	£14.54	99%
	Next day	£19.67	99%	£32.06	100%
Accessible small towns	Standard	£19.61	87%	£14.47	95%
	Next day	£20.53	89%	£32.06	100%
Remote small towns	Standard	£19.08	97%	£14.92	93%
	Next day	£23.78	98%	£32.06	100%
Very remote small towns	Standard	£21.96	83%	£15.17	92%
	Next day	£39.14	88%	£32.06	100%
Accessible rural	Standard	£19.33	98%	£32.06	100%
	Next day	£21.21	99%	£14.41	99%
Remote rural	Standard	£19.53	93%	£32.06	100%
	Next day	£28.45	95%	£14.51	97%
Very remote rural	Standard	£21.71	84%	£14.96	93%
	Next day	£39.34	86%	£32.00	100%

Islands

Scottish islands are anecdotally among the areas facing the greatest problems of surcharges and refusal to deliver. As Chart 6 and Table 9 show, prices are consistently higher in islands compared to the rest of Scotland, with small parcels being charged 64% higher than in other areas, and medium and large parcels 36% and 18% higher respectively. Probability to deliver is slightly lower in islands for small parcels, but 77% for medium parcels compared to 97% in the rest of Scotland.

Table 9: Average delivery price and probability of availability by parcel size and geographic location

Geographic location	Parcel size	Average price	Average delivery availability probability
Not an island	Large	£51.30	100%
	Medium	£17.63	97%
	Small	£8.36	99%
Island	Large	£60.95	100%
	Medium	£23.96	77%
	Small	£13.76	91%

Chart 6: Average delivery price by parcel size and geographic location

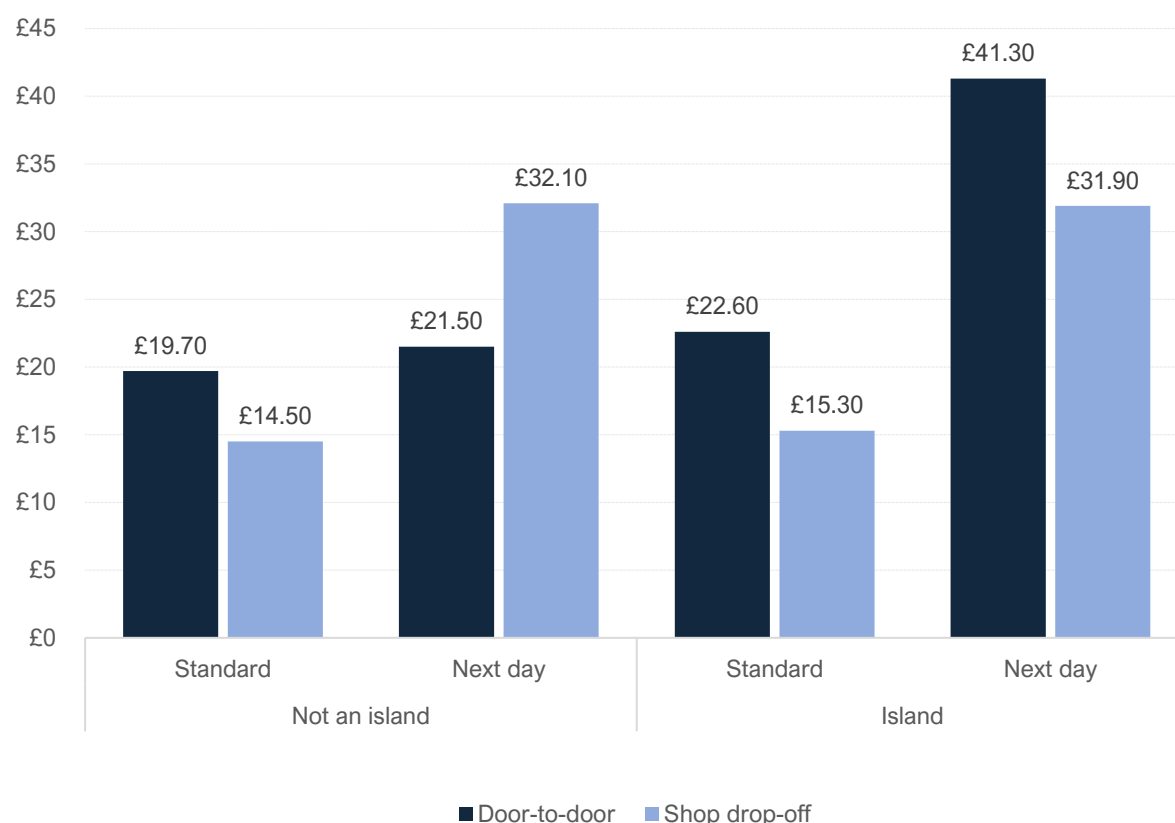
As Table 10 and Chart 7 show, the most prominent differences in price and delivery probability are for next-day door-to-door deliveries where the price for islands is almost double than in the rest of the country. The rest of the combinations of delivery times and types have much lower differences.

Table 10: Average delivery price and probability of availability by time, type and geographic location

		Type of delivery			
		Door-to-door		Shop drop-off	
Geographic location	Delivery time	Average price	Average delivery availability probability	Average price	Average delivery availability probability
Not an island	Standard	£19.67	97%	£14.51	98%
	Next day	£21.53	99%	£32.06	100%
Island	Standard	£22.56	83%	£15.26	90%
	Next day	£41.27	83%	£31.96	100%

Chart 7: Average delivery price by time, type and geographic location

Regions



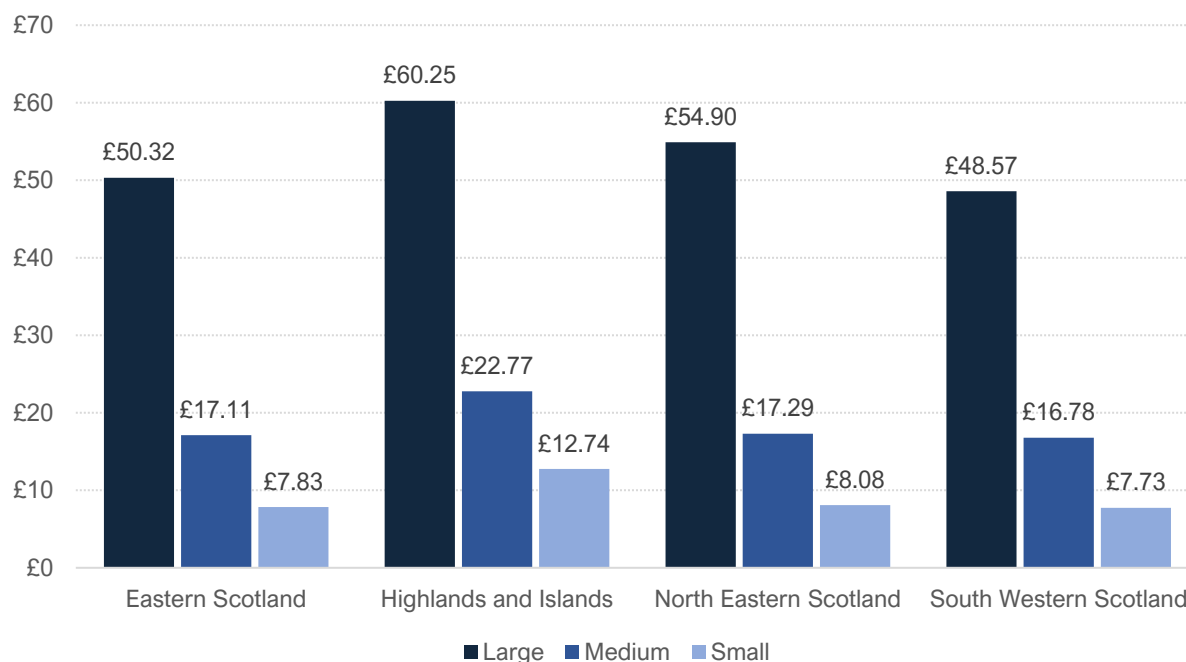
Our review of existing research and stakeholder interviews suggest that surcharges may be more common in the Highlands and Islands rather than other regions of

Scotland.⁴¹ Chart 8 and Table 11 show the price and probability to deliver variation across different regions in our data. The Highlands and Islands face the highest delivery prices on average among all regions and all parcel sizes and the lowest delivery probability (although still quite high). North Eastern Scotland has the second higher prices, while Eastern and South Western Scotland have the lowest average prices.

Table 11: Average delivery price and probability of availability by parcel size and region

Region	Average price	Average delivery availability probability	Average price	Average delivery availability probability	Average price	Average delivery availability probability
Eastern Scotland	£50.31	100%	£17.11	99%	£7.83	99%
Highlands and Islands	£60.25	100%	£22.77	80%	£12.74	94%
North Eastern Scotland	£54.90	100%	£17.28	100%	£8.08	100%
South Western Scotland	£48.57	100%	£16.78	99%	£7.72	99%

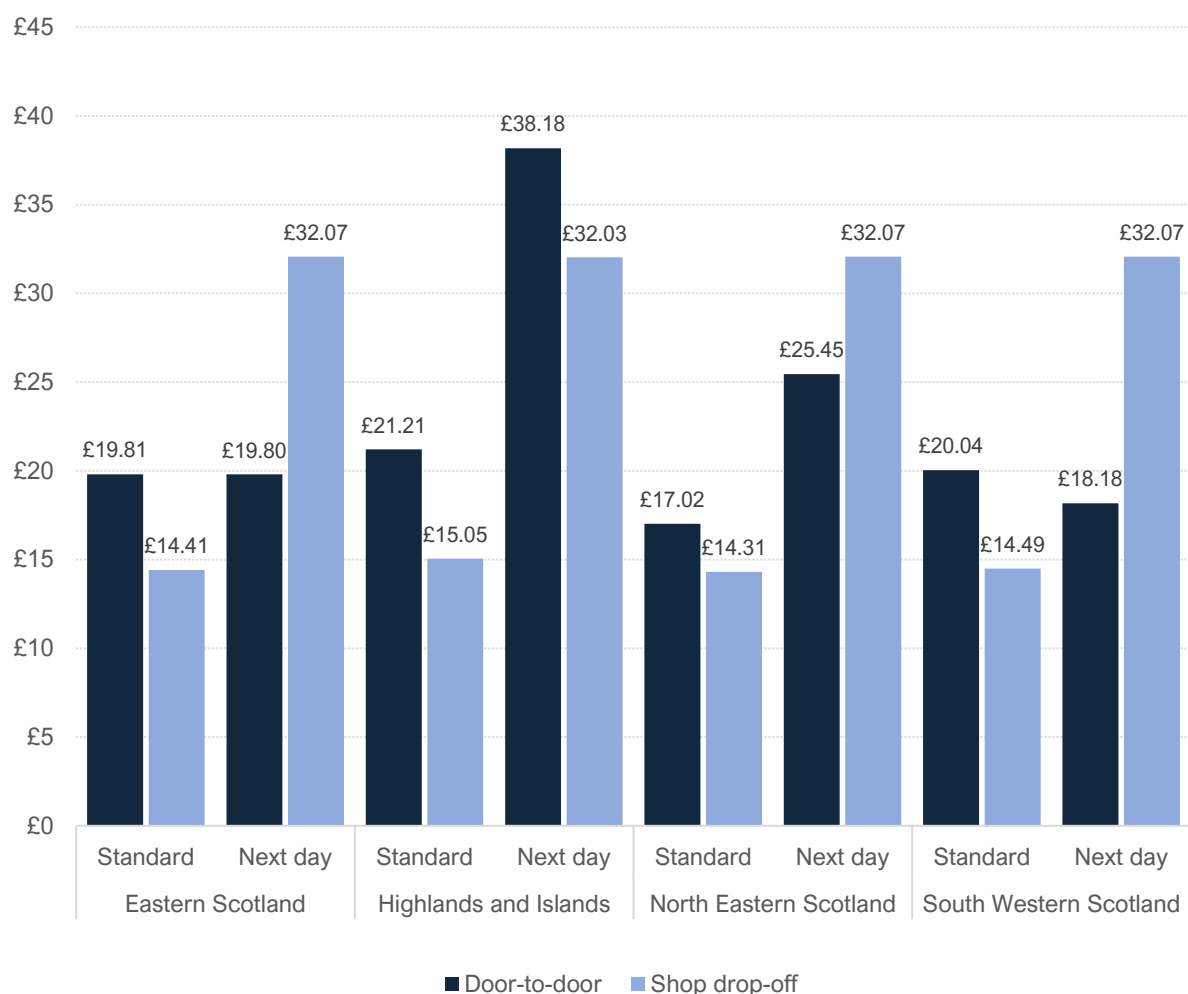
⁴¹ Details about the Scottish regions can be found in the Scotland Region Classification section in the Annex

Chart 8: Average delivery price by parcel size and region

Consistent with all the previous results, Chart 9 and Table 12 show that the differences between the Highlands and Islands and other regions are much more prominent when the delivery is for next-day and door-to-door.

Table 12: Average delivery price and probability of availability by time, type of service and region

Region	Delivery time	Type of delivery			
		Door-to-door		Shop drop-off	
		Average price	Average delivery availability probability	Average price	Average delivery availability probability
Eastern Scotland	Standard	£19.81	99%	£14.41	98%
	Next day	£19.85	99%	£32.06	100%
Highlands and islands	Standard	£21.21	85%	£15.05	92%
	Next day	£38.18	87%	£32.03	100%
North Eastern Scotland	Standard	£17.01	100%	£14.31	100%
	Next day	£25.45	100%	£32.06	100%
Western Scotland	Standard	£20.04	99%	£14.48	98%
	Next day	£18.17	99%	£32.06	100%

Chart 9: Average delivery price by time, type of service and region

Council areas

Delivery companies may require surcharges on delivery for specific council areas within a region rather than a region as a whole; if a region has several council areas that are predominantly rural, they may face surcharges whereas urban council areas within the region may not. Tables 13, 14 and 15 show the price and probability to deliver variation across the 32 councils in Scotland by parcel size. The majority of council areas face similar postal charges, but the councils of Moray, Argyll and Bute, Highland, Na h-Eileanan Siar, Orkney Islands and Shetland Islands have significantly higher average prices than the rest of the country. For small parcels, Shetland Islands' average price is 84% higher than the lowest average price in the country. For medium and large parcels, the difference is 46% and 28% respectively. The delivery probability is slightly lower in the areas mentioned above for small parcels, although still higher than 90%. However, for medium parcels the probability falls to 78%-80% in those councils. Out of the six postal operators in our sample, only two deliver large parcels, and thus the descriptive statistics are calculated based on only those two companies.

Table 13: Average delivery price and probability of availability for large parcels by council area

Council Areas	Parcel size	Average price	Average delivery availability probability
Highland	Large	£60.93	100%
Na h-Eileanan Siar	Large	£60.89	100%
Orkney Islands	Large	£60.89	100%
Shetland Islands	Large	£60.89	100%
Argyll and Bute	Large	£59.54	100%
Moray	Large	£58.53	100%
Aberdeenshire	Large	£54.93	100%
Aberdeen City	Large	£54.86	100%
East Lothian	Large	£53.84	100%
Dumfries and Galloway	Large	£53.81	100%
Angus	Large	£53.62	100%
West Lothian	Large	£52.68	100%
City of Edinburgh	Large	£51.44	100%
Midlothian	Large	£51.24	100%
Stirling	Large	£51.24	100%
Dundee City	Large	£51.07	100%
Scottish Borders	Large	£48.87	100%
North Ayrshire	Large	£48.58	100%
Falkirk	Large	£48.19	100%
Fife	Large	£48.06	100%
Perth and Kinross	Large	£48.00	100%
Clackmannanshire	Large	£47.79	100%
East Ayrshire	Large	£47.79	100%
East Dunbartonshire	Large	£47.79	100%
East Renfrewshire	Large	£47.79	100%
Glasgow City	Large	£47.79	100%
Inverclyde	Large	£47.79	100%
North Lanarkshire	Large	£47.79	100%
Renfrewshire	Large	£47.79	100%
South Ayrshire	Large	£47.79	100%
South Lanarkshire	Large	£47.79	100%
West Dunbartonshire	Large	£47.79	100%

Table 14: Average delivery price and probability of availability for medium parcels by council area

Council Areas	Parcel size	Average price	Average delivery availability probability
Na h-Eileanan Siar	Medium	£24.23	79%
Shetland Islands	Medium	£24.20	80%
Orkney Islands	Medium	£24.01	78%
Highland	Medium	£23.04	80%
Argyll and Bute	Medium	£22.87	78%
Moray	Medium	£20.24	88%
Stirling	Medium	£17.85	98%
Scottish Borders	Medium	£17.43	99%
Angus	Medium	£17.39	100%
Aberdeenshire	Medium	£17.30	100%
Aberdeen City	Medium	£17.27	100%
Dumfries and Galloway	Medium	£17.24	99%
East Lothian	Medium	£17.19	99%
West Lothian	Medium	£17.17	99%
Perth and Kinross	Medium	£17.16	98%
North Ayrshire	Medium	£17.05	98%
Midlothian	Medium	£17.04	100%
Dundee City	Medium	£17.00	100%
Fife	Medium	£16.97	100%
City of Edinburgh	Medium	£16.97	100%
Renfrewshire	Medium	£16.80	97%
East Renfrewshire	Medium	£16.77	98%
North Lanarkshire	Medium	£16.73	99%
Falkirk	Medium	£16.73	99%
South Lanarkshire	Medium	£16.71	100%
East Dunbartonshire	Medium	£16.66	99%
Glasgow City	Medium	£16.66	99%
Clackmannanshire	Medium	£16.61	100%
East Ayrshire	Medium	£16.61	100%
Inverclyde	Medium	£16.61	100%
South Ayrshire	Medium	£16.61	100%
West Dunbartonshire	Medium	£16.61	100%

Table 15: Average delivery price and probability of availability for small parcels by council area

Council Areas	Parcel size	Average price	Average delivery availability probability
Shetland Islands	Small	£14.07	95%
Orkney Islands	Small	£13.75	93%
Na h-Eileanan Siar	Small	£13.48	97%
Highland	Small	£13.08	94%
Argyll and Bute	Small	£12.75	93%
Moray	Small	£10.55	94%
Stirling	Small	£8.82	100%
Aberdeenshire	Small	£8.08	100%
Aberdeen City	Small	£8.08	100%
Angus	Small	£8.00	100%
North Ayrshire	Small	£7.98	99%
Dumfries and Galloway	Small	£7.82	99%
East Lothian	Small	£7.81	99%
Scottish Borders	Small	£7.80	99%
West Lothian	Small	£7.80	99%
Midlothian	Small	£7.78	100%
Dundee City	Small	£7.76	100%
City of Edinburgh	Small	£7.75	100%
Renfrewshire	Small	£7.74	96%
Fife	Small	£7.74	100%
Perth and Kinross	Small	£7.74	100%
East Renfrewshire	Small	£7.72	99%
North Lanarkshire	Small	£7.71	99%
Falkirk	Small	£7.70	100%
South Lanarkshire	Small	£7.69	100%
Glasgow City	Small	£7.68	100%
East Dunbartonshire	Small	£7.68	100%
Clackmannanshire	Small	£7.66	100%
East Ayrshire	Small	£7.66	100%
Inverclyde	Small	£7.66	100%
South Ayrshire	Small	£7.66	100%
West Dunbartonshire	Small	£7.66	100%

The Highlands and Islands face the highest delivery prices on average among all regions and all parcel sizes and the lowest delivery probability (although still quite high). North Eastern Scotland has the second higher prices, while Eastern and South Western Scotland have the lowest average prices.

Econometric results

In this section we present the results from estimating Equation 1, which is presented in the Model specification section of this report. The main contribution of this analysis, in contrast to the descriptive statistics presented above, is that it shows the effect of regional characteristics, once the impact of parcel size, delivery type, speed and companies are removed.

We report results on delivery company postal charges for our two main specifications: the first controls for the Scottish Government eight-fold urban/rural classification (the most granular definition of rurality/remoteness available), and the second controls for specific council areas. As discussed earlier, for each specification we use a linear model controlling for delivery time, type of service, parcel size and the company doing the delivery.

Our full set of econometric results, including robustness checks that include island dummies, regions and the Scottish Government three-fold urban-rural classification, can be found in Annex D.

Rurality and remoteness

For this specification, we estimate the impact of levels of rurality and remoteness on price controlling for type of delivery (door-to-door or shop drop-off), delivery time (next-day or standard), parcel size (small, medium, large) and delivery companies.⁴² Consequently, the results below can be interpreted as the effect of rurality and remoteness when all other factors are held constant.

We use large urban areas as our reference category – thus, the results reported below are in comparison with this category.⁴³ Population density was excluded in this regression, as this indicator is correlated with our detailed rural/urban indicators and including both would lead to inaccurate estimates of the impacts of rurality and remoteness.

According to the Scottish Government's definitions, whether an area is considered urban or rural depends on the population of the settlements, while remoteness depends on the drive time to a settlement of 10,000 or more. The results presented on Table 16 show that whether an area is considered urban, small town, or rural does not affect significantly the delivery charges. However, when an area is remote or very remote, then the delivery prices are significantly higher than large urban areas ranging from five per cent, for remote small towns, to 23% for very remote small towns and rural areas. This suggests that remoteness, when defined by

⁴² For details on what each category of rurality and remoteness means look at Annex C. In this specification we use the Scottish Government eight-fold Urban Rural Classification specified in Annex Table C2.

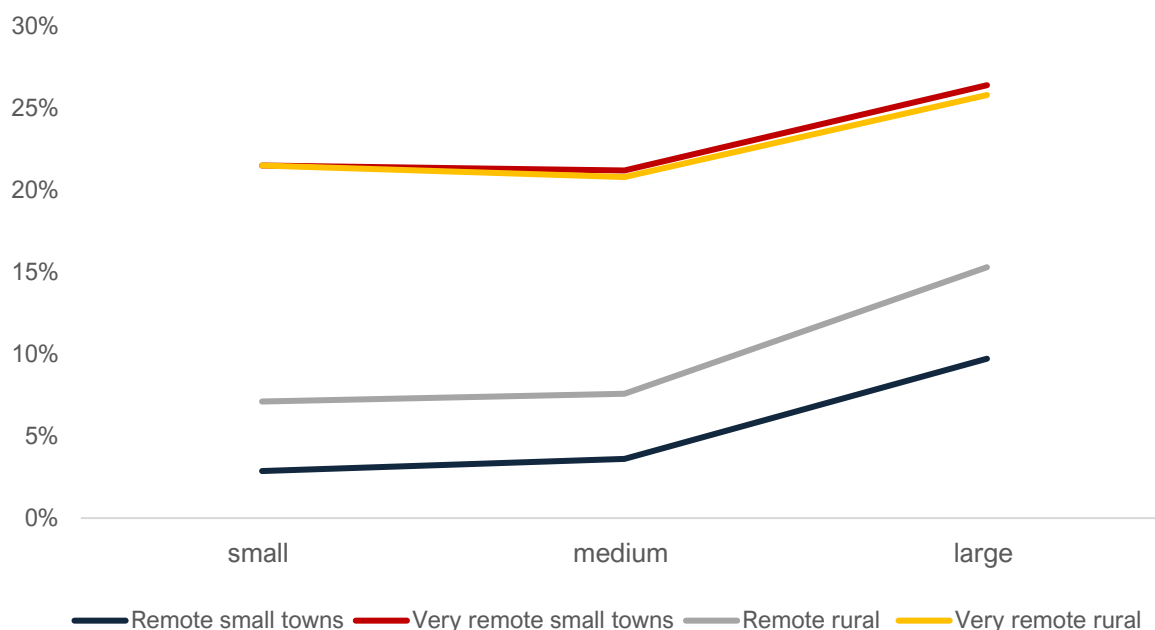
⁴³ The full results of this regression can be found in Annex Table D1 (column 2).

distance from settlements of 10,000 people or more, is a more important driver of surcharge than rurality on its own.

Table 16: Impact of rurality and remoteness on delivery company prices

Variable	Effect
<ul style="list-style-type: none"> • Smaller urban areas • Accessible small towns • Accessible rural areas 	No significant difference from prices in large urban areas.
<ul style="list-style-type: none"> • Remote small towns 	Remote small towns face prices five per cent higher than large urban areas.
<ul style="list-style-type: none"> • Remote rural areas 	Remote rural areas face prices nine per cent higher than large urban areas.
<ul style="list-style-type: none"> • Very remote rural areas • Very remote small towns 	Very remote small towns and very remote rural areas face prices 23% higher than large urban areas on average.

One issue that frequently came up in the interviews is that the surcharge and refusal problems are more common among large parcels. We examined this by estimating the above regression separately for each parcel size. Chart 10 shows the different impacts of rurality by parcel size. The impact of rurality on price seemed to be more prominent for large parcels. Very remote rural areas and small towns are being charged 22% higher for small parcels but 26% higher than large urban areas for large parcels compared to large urban areas. Similarly, remote rural areas are being charged seven per cent higher prices for small parcels but 15% higher for large parcels compared to large urban areas. For remote small towns, the impact on prices increases from three per cent to 10%.

Chart 10: Increase in price by rurality of delivery area compared to large urban, by parcel size

Council areas

For this specification, we estimate the impact of living in each council area in Scotland on prices controlling for rurality and remoteness of each sector postcode, for type of delivery (door-to-door or shop drop-off), delivery time (next-day or standard), parcel size (small, medium, large) and delivery company.⁴⁴ We used the Glasgow council area as our reference category – thus, all results reported below directly compare postal charges in Glasgow to postal charges in each respective council area.

Table 17 provides evidence that surcharges seem to be concentrated in specific councils located in Highlands and Islands and North Eastern Scotland. In particular, living in Argyll and Bute, Highland, Orkney Islands, Na h-Eileanan Siar and Shetland Islands is associated with a surcharge of at least 19%.

An interesting result is that when controlling for both the council areas and the remoteness and rurality of a specific postcode sector, the impact of being in a very remote postcode sector drops from 23% (as shown in Table 16) to only six per cent (as shown in Table 17).⁴⁵ In other words, the impact of rurality or remoteness of a postcode sector is less important than the house's wider council, if someone lives in one of the council areas being affected by surcharging. This is an indication that delivery companies' pricing methods do not account as much for small area characteristics as the location of council areas.

⁴⁴ The full results of this regression can be found in the Annex Table D2 (column 2).

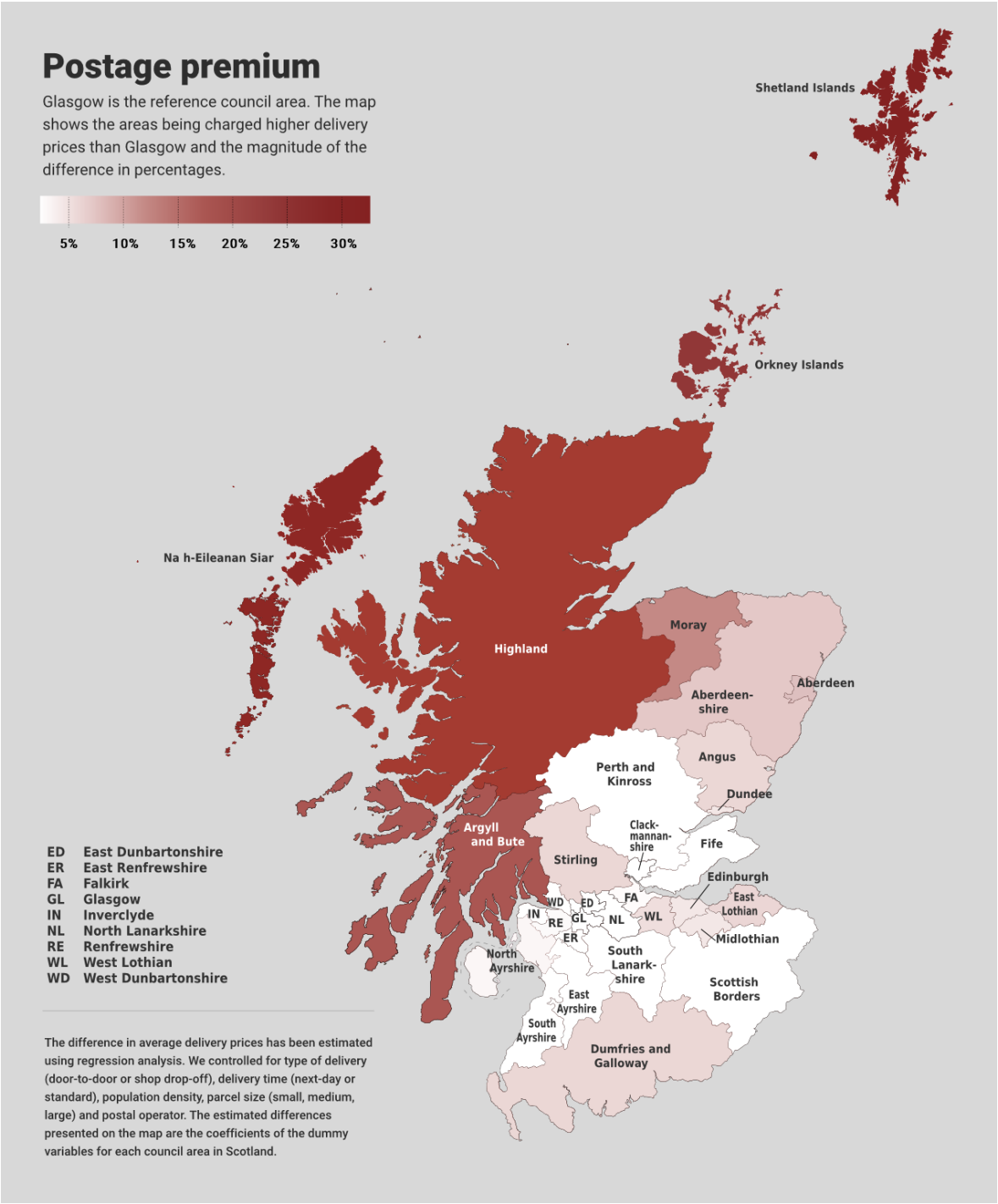
⁴⁵ The full results of the specification that includes only remoteness and rurality can be found in the Annex Table D1, Regression 2.

Table 17: Impact of council areas on delivery company prices

Variable	Effect
Perth and Kinross, East Ayrshire, South Ayrshire, Clackmannanshire, South Lanarkshire, East Renfrewshire, Fife, East Dunbartonshire, West Dunbartonshire, North Lanarkshire, Scottish Borders, Inverclyde, Falkirk, Renfrewshire, North Ayrshire	No significant difference than Glasgow
Dundee City, City of Edinburgh	Three per cent higher prices than Glasgow
Midlothian, West Lothian	Four per cent higher prices than Glasgow
Dumfries and Galloway, East Lothian, Stirling	Five per cent higher prices than Glasgow
Angus	Six per cent higher prices than Glasgow
Aberdeen City, Aberdeenshire	Seven per cent higher prices than Glasgow
Moray	16% higher prices than Glasgow
Argyll and Bute	19% higher prices than Glasgow
Highland	20% higher prices than Glasgow
Orkney Islands	22% higher prices than Glasgow
Na h-Eileanan Siar	23% higher prices than Glasgow
Shetland Islands	26% higher prices than Glasgow

For robustness, we estimated an additional specification where rurality and remoteness indicators were removed, and population density was added in the model.⁴⁶ The estimated impact of council areas on price did not change much, with the coefficients of the areas with the highest surcharges, namely, Argyll and Bute, Highland, Orkney Islands, Na h-Eileanan Siar and Shetland Islands, being increased but by only two-four per cent. The results of this estimation are presented on Map 1.

Map 1



⁴⁶ The full results of this regression can be found in the Annex Table D2, column 1.

Comparing predicted and actual postal charges

Identifying precisely what constitutes an “unfair” versus “fair” postal charge is a challenging question, as definitions of fairness vary dramatically across consumers, delivery companies and policymakers. Due to the more remote nature of the Highlands and Islands and other areas of rural Scotland, any deliveries made to these areas require additional fuel, labour and maintenance costs, and this makes it difficult for delivery companies to charge uniform prices across the entirety of Scotland.

One possible approach to identifying which postcodes face postal charges that could be deemed unfair is using our linear model estimated by OLS to predict postal charges based on underlying geographic and parcel characteristics. Our model allows us to estimate the relative impact of each of these characteristics and the resulting postal charge. Thus, for any given postcode, we can multiply the coefficient on each of our control variables by the given values for geographic and parcel characteristics to calculate a predicted postal charge. By calculating predicted values for all postcodes in our dataset, taking into account parcel size, speed of delivery, rurality and remoteness (as a proxy for fuel/driver costs) and differences in delivery companies, we can identify which postcodes face postal charges that could be deemed unfair, as these postcodes would have the greatest difference between actual postal charges and postal charges predicted by our model.

It is important to note that significant differences between actual postal charges and postal charges predicted by our model do not provide conclusive evidence that a specific postal charge is unfair. Our model does not capture all relevant characteristics that delivery companies must consider when pricing the cost of delivery – as discussed earlier, we do not directly account for fuel or labour costs, and remoteness and rurality are imperfect proxies for these. In addition, the different business models and logistics operations organised by each of the delivery companies in our dataset may cause some characteristics to be weighted more heavily than others (for example, the presence of a large number of smaller storage and sorting facilities may decrease the cost of delivery, but increase overhead and labour expenses). Since we do not have access to direct cost data, we cannot take into account these characteristics as well. Our model estimates provide one perspective on unfair postal charges that do not form a complete picture in and of themselves.

For small parcels on door-to-door, standard deliveries, there are large differences between actual and predicted postal charges. The ZE postcode area has a 51% difference, followed by HS (26%), AB (22%), DD (21%) and G (19%). These differences are much greater for next-day delivery options: the IV postcode area has the greatest difference at 158%, with KW, ZE and HS at 128% and PA and PH at 64% and 60%, respectively.

Postcode surcharges tend to be quite small for medium parcels on door-to-door, standard: the ZE postcode area has the greatest difference between actual and predicted postal charges at eight per cent, with G, EH, ML and KY facing surcharges of around one-two per cent.⁴⁷ However, similarly to small parcels if individuals would like to request next-day delivery of medium parcels they face significantly higher

⁴⁷ The following postcodes in the Glasgow (G) postcode area are classified as rural: G53, G61, G63, G64, G65, G67, G71, G76, G77, G78, G82, G83

surcharges: the IV postcode area is penalised the most with a 64% difference between actual and predicted postal charges, followed by KW, ZE and HS at 46% and PA and PH at 19%.

In general, this analysis provides additional evidence that excessive charging exists for postcodes in more rural areas of Scotland, in particular for next-day deliveries.

Table 18: Postal Surcharges for Door-to-Door Deliveries, Selected Postcode Areas in the Highlands and Islands⁴⁸

Postcode Area	Parcel Size	Delivery speed	Surcharge ⁴⁹
HS	Small	Standard	26%
		Next-day	129%
	Medium	Standard	-3%
		Next-day	46%
IV	Small	Standard	11%
		Next-day	158%
	Medium	Standard	-8%
		Next-day	64%
KW	Small	Standard	5%
		Next-day	129%
	Medium	Standard	-15%
		Next-day	46%
PA	Small	Standard	18%
		Next-day	65%
	Medium	Standard	-4%
		Next-day	20%
PH	Small	Standard	12%
		Next-day	60%
	Medium	Standard	-6%
		Next-day	18%
ZE	Small	Standard	51%
		Next-day	129%
	Medium	Standard	8%
		Next-day	46%

⁴⁸ We define surcharges as the difference between actual and predicted postal charges. Even though the AB and G postcode areas include some postcodes within the Highlands and Islands region, we exclude these areas because they include many urban postcodes, meaning average differences between actual and predicted postal charges across the whole postcode area may not be representative of these rural postcodes.

⁴⁹ If the value under “Surcharge” is negative, the average price quoted by delivery companies in our dataset is less than the predicted price. This may occur because some delivery routes may be cross-subsidised by others.

Areas affected by excessive surcharges

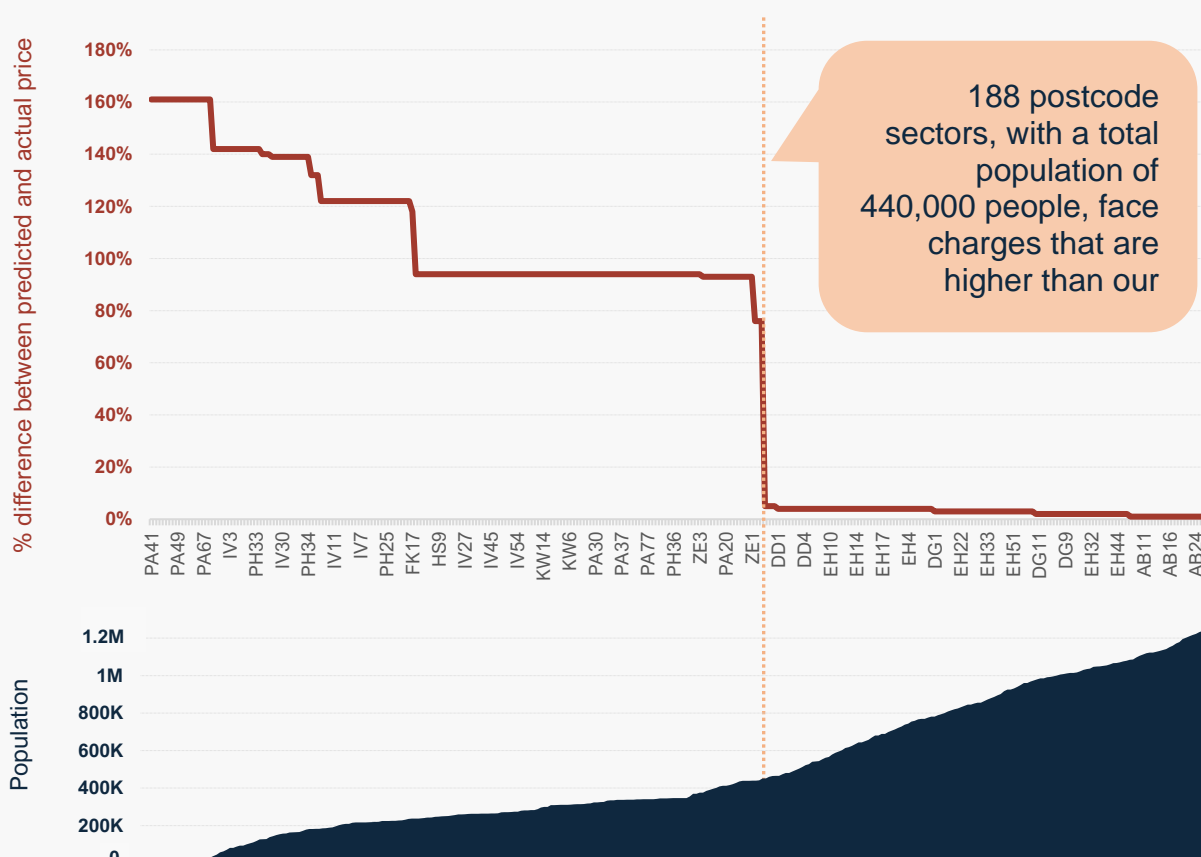
As explained above, our model provides an indicative estimate of the prevalence and location of excessive delivery charges. This section provides an insight on where these charges are more prevalent and how many areas and people are affected.

As there are many different combinations between delivery speed, delivery type and parcel size, we present an illustrative example of one combination.

Example: Next-day, door-to-door delivery of small parcels

The difference between predicted and actual delivery prices is close to zero for the majority of postcodes, but quite large and positive for a relatively small number of them. More specifically, there are 188 postcodes in Scotland that face prices that are higher than the price our model predicts by 75% or more. This corresponds to 18% of the 1,029 postcode sectors in our dataset, with a combined population of approximately 440,000 people – just over eight per cent of the population as recorded in the 2011 census.

Chart 11: Percentage difference between model's predictions and actual delivery prices; next-day, door-to-door delivery of small parcels



The x axis of the chart includes the 324 Scottish postcode sectors (out of a total of 1,029) for which the actual price charged exceeds the price predicted by our model. These are ranked in descending order based on the % price difference between predicted and actual price, with postcode sectors towards the left exhibiting a higher % difference in price compared to postcodes further to the right. Note that due to space constraints not all postcodes on the x axis are labelled, with only a few shown for indicative purposes. The bottom half of the chart displays the cumulative population in the postcode sectors covered.

As Chart 12 shows, out of these 188 postcode sectors, 60% are classified as “very remote rural” with a further 15% classified as “remote rural”.

Chart 12: Rurality and remoteness in areas facing excessive delivery charges

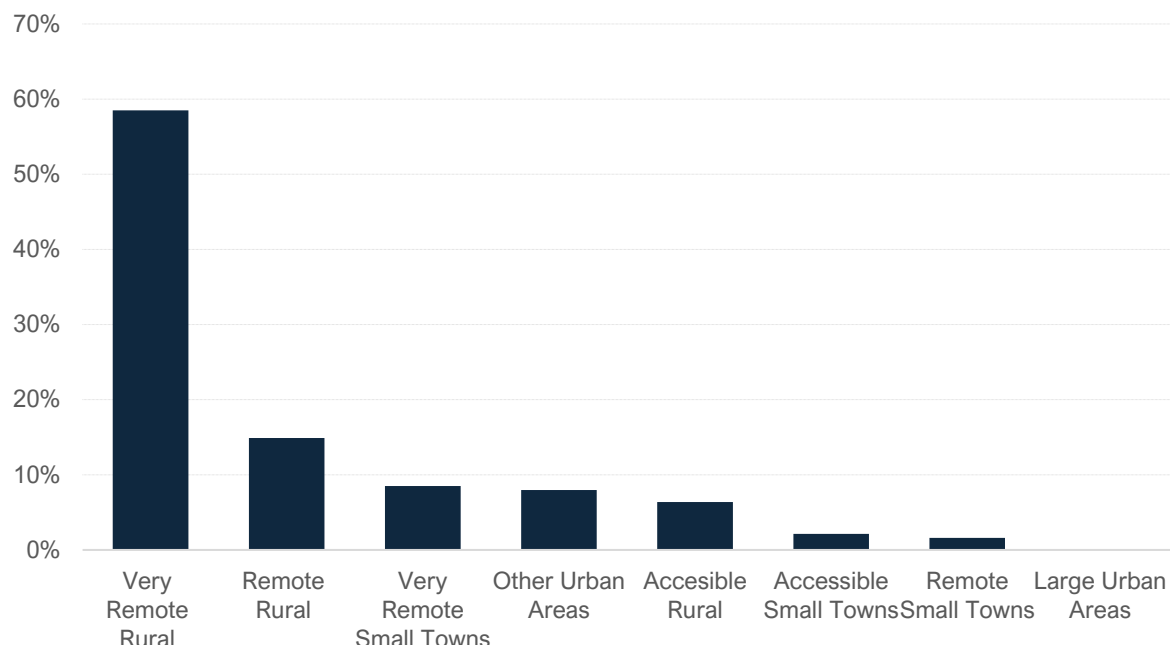
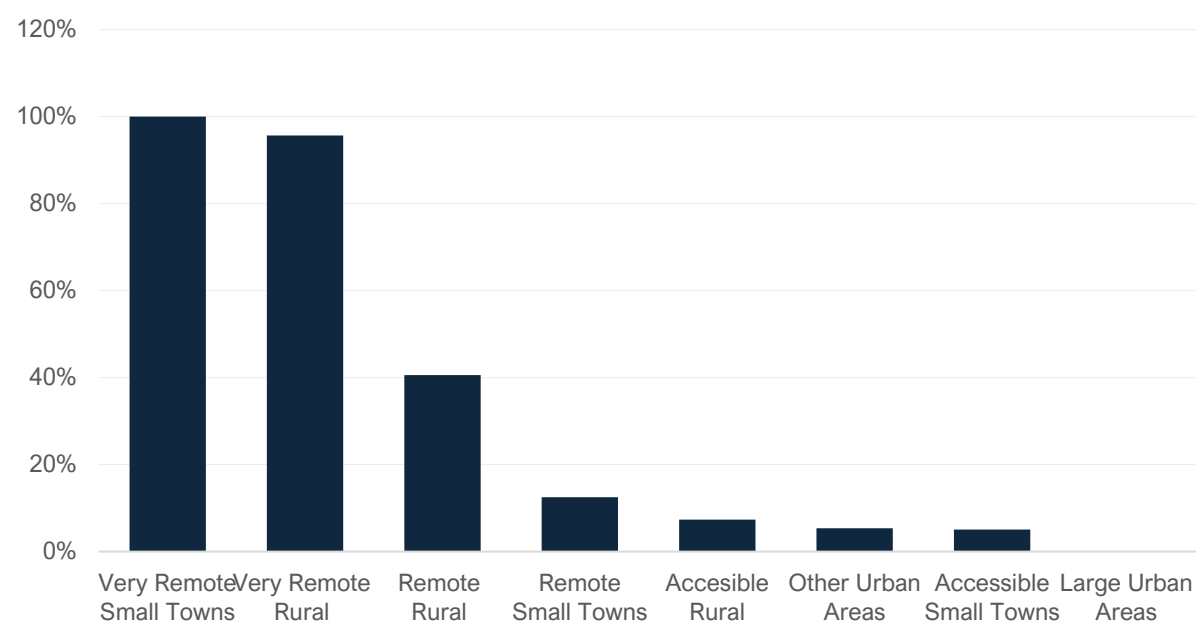


Chart 13 shows that almost every postcode sector in Scotland classified as ‘very remote small towns’ (16 out of 16) and ‘very remote rural’ (110 out of 115) faces prices that are 50% or higher than our model’s prediction.

Chart 13: Postcode sectors facing excessive delivery charges as a percentage of all postcode sectors at each level of rurality and remoteness.



Other combinations of delivery service and parcel characteristics

Another common combination used by consumers and retailers is the next-day, door-to-door delivery of medium parcels. 79 postcode sectors face prices that are higher by 50% or more compared to our model's prediction, together accounting for eight per cent of all postcode sectors in Scotland and corresponding to approximately 227,000 people (4.3% of the country's population). 58% of those postcodes are either remote or very remote rural areas – for reference, across Scotland only about 18% of all postcode sectors are classified as being in “remote” or “very remote” rural areas.

Standard service had lower prevalence and levels of differences between the actual and predicted prices. More specifically, for standard service small parcels the maximum price difference was 38%, and disadvantaged postcodes included many urban and accessible areas rather than being solely concentrated on rural and remote areas.

Overall, next-day delivery options exhibited the highest gap between actual prices and those predicted by our model, with most of the areas affected being remote and rural. Excessive charges associated to standard service affect a smaller share of the Scottish population, including many in urban and accessible areas.

Retailers

The retailers in our dataset charge identical shipping fees for delivery addresses in all postcodes, irrespective of location. However, for certain postcodes not all retailers allowed us to order products online, either indicating that delivery was not available or first requiring a phone call to a customer service number to discuss specific options. Thus, our variable of interest is the probability that retailers provide home delivery to a specific postcode. This is modelled as a binary variable: 1 if a retailer provides home delivery to a specific postcode and 0 if not. We use a linear probability model to estimate the marginal impact of population density, type of product and geographical characteristics on a retailer's decision to provide home delivery.

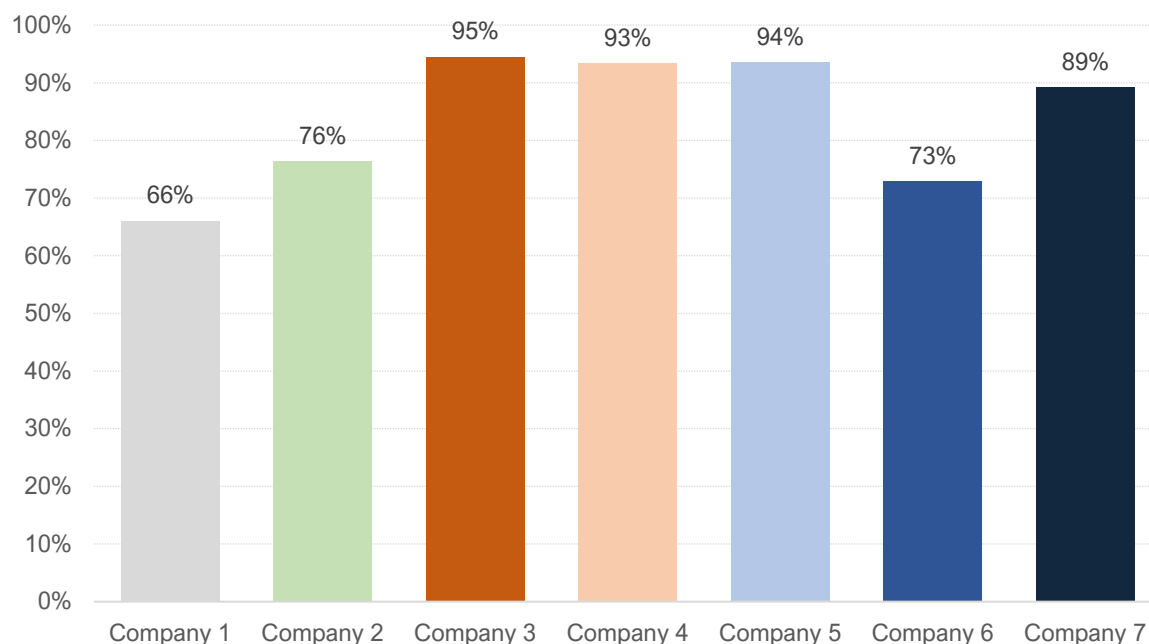
Descriptive statistics

This section presents the average probability of home delivery availability in different areas and by different retailers. The averages discussed below represent the retailers within our sample.

Variation across retailers

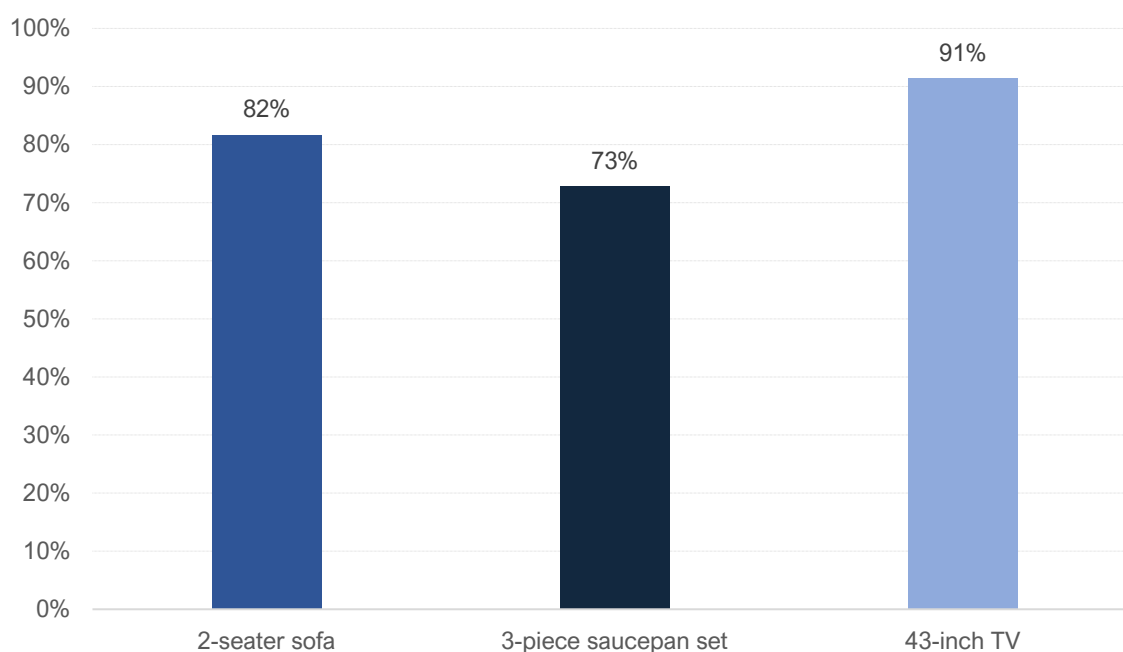
There is significant variation across retailers in their willingness to provide home delivery options, ranging from 66% to 95% (Chart 11).

Chart 14: Average probability of home delivery availability by retailer



As can be seen from Chart 12, the three products in our dataset all require large packages, but retailers' ability to deliver differ across all three, with the 43-inch TV the most likely at 91.5% and 3-piece saucepan set the least likely at 72.9%.

Chart 15: Average probability of home delivery availability by product type

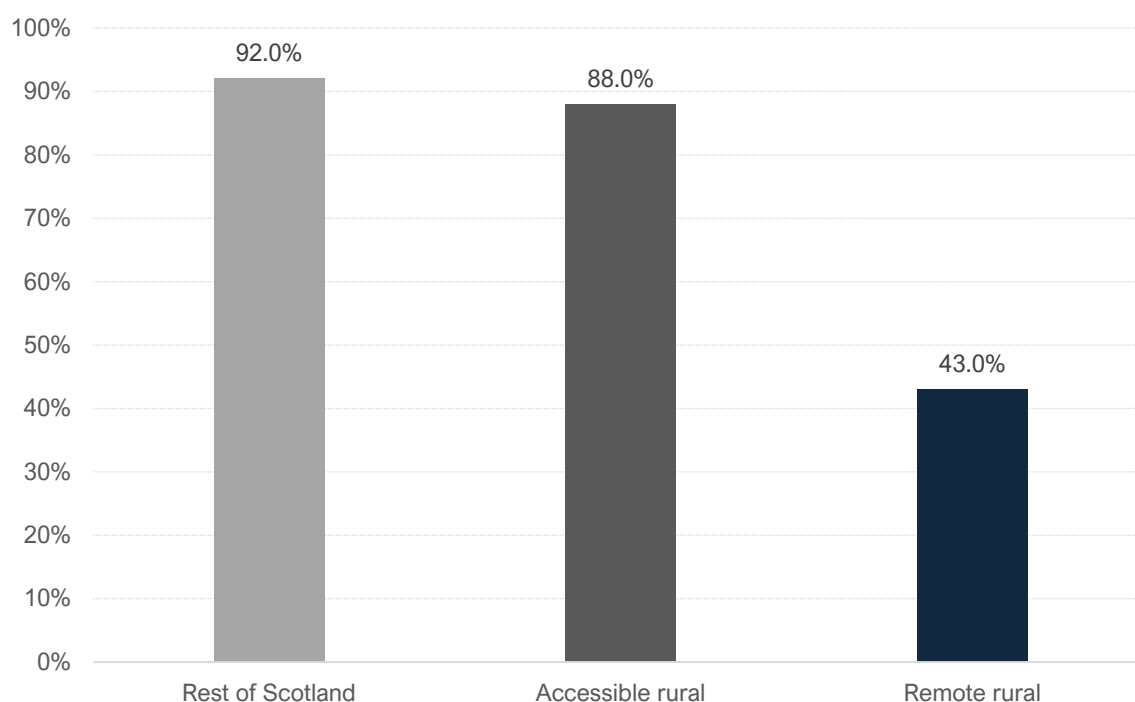


Rurality and remoteness

Three-fold classification

Chart 13 shows that individuals who live in accessible rural areas are nearly as likely to have home delivery as an option when ordering from retailers as the rest of Scotland (88% compared to 92%). However, many who live in remote rural areas do not have this option, as the probability of home delivery availability is just 43%, less than half the probability for the rest of Scotland.

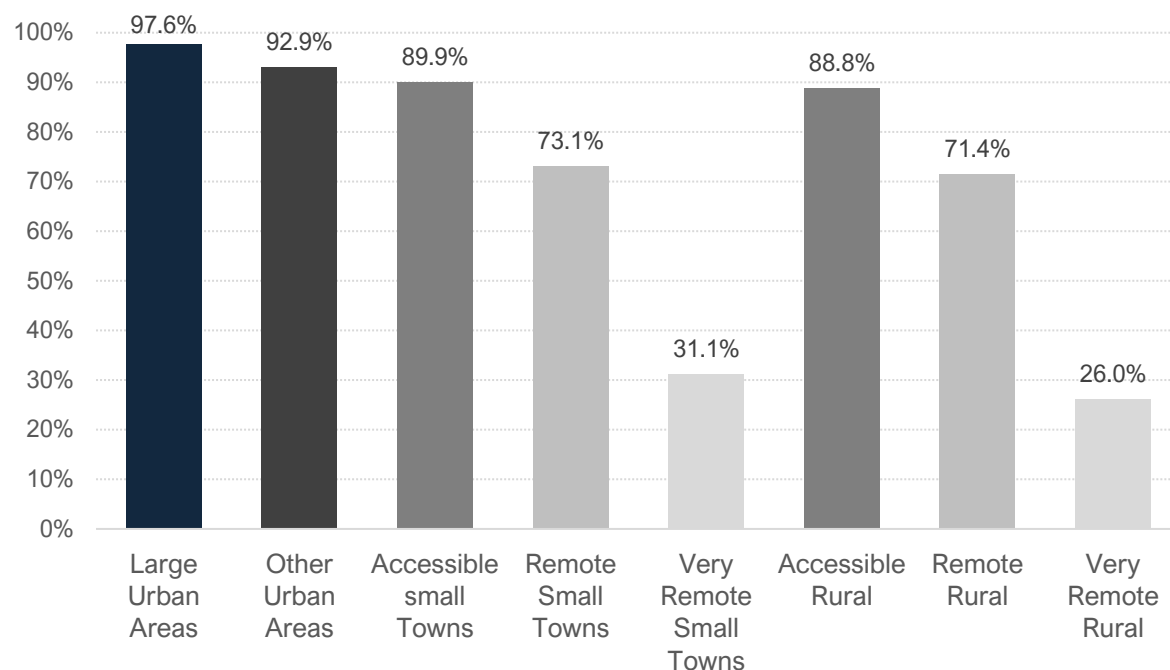
Chart 16: Average probability of home delivery availability by three-fold rurality classification



Eight-fold classification

Chart 14 shows that urban areas and accessible small towns/rural areas largely have access to home delivery from online retailers, with each having a probability of just under 90% or higher. However, the probability of home delivery is less than 75% for remote small towns/rural areas and is significantly lower for very remote areas, falling to 26% for very remote rural areas.

Chart 17: Average probability of home delivery availability by eight-fold rurality classification



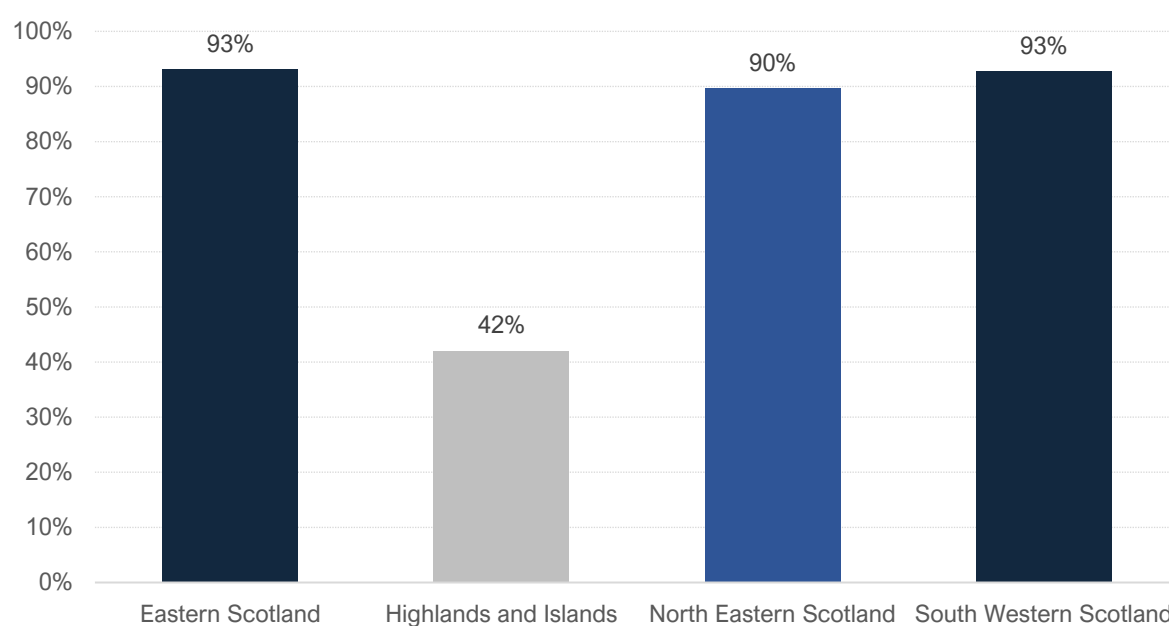
Islands

Home delivery is largely non-existent for postcodes located on islands, with the probability of availability less than 4% (compared to 88% for the Scottish mainland).

Regions

The probability of home delivery availability is largely similar across postcode sectors in Eastern, North Eastern and South Western Scotland, at around 90% or higher.

Chart 18: Average probability of home delivery availability by region



Council areas

The majority of council areas have at least an 85% probability of home delivery availability from online retailers. However, home delivery is significantly less common in regions in the Highlands and Islands: the Highland council area has a 52% probability of home delivery availability, with Argyll and Bute at 29% probability. Home delivery is highly uncommon to the islands, as the probability of home delivery availability is three per cent for Na h-Eileanan Siar and no retailers included in our dataset will deliver to the Orkney or Shetland Islands.

Table 19: Average probability of home delivery availability by council area

Council area	Average delivery availability probability
Aberdeen City	99%
Falkirk	99%
Glasgow City	99%
East Dunbartonshire	99%
West Dunbartonshire	98%
Dundee City	98%
South Lanarkshire	98%
Midlothian	97%
East Ayrshire	97%
Fife	96%
East Renfrewshire	96%
City of Edinburgh	95%
West Lothian	95%
Renfrewshire	94%
Inverclyde	94%
North Lanarkshire	93%
South Ayrshire	93%
Clackmannanshire	93%
Angus	93%
Stirling	92%
North Ayrshire	90%
Perth and Kinross	88%
East Lothian	85%
Scottish Borders	85%
Aberdeenshire	84%
Moray	73%
Dumfries and Galloway	62%
Highland	52%
Argyll and Bute	29%
Na h-Eileanan Siar	3%
Orkney Islands	0%
Shetland Islands	0%

Econometric results

In this section we present the results from estimating Equation 2, which is presented in the Model specification section of this report. The purpose of this analysis is to estimate the impact of different area characteristics on the probability of home delivery availability from online retailers. The main contribution of this analysis, as compared to the descriptive statistics presented above, is that it shows the effect of the variables of interest, once the effects of parcel size, delivery type and time and specific retailers are removed.

We report results on probability of home delivery availability from online retailers for our two main specifications: the first controls for the Scottish Government eight-fold urban/rural classification (the most granular definition of rurality/remoteness available), and the second controls for specific council areas. As discussed earlier, for each specification we use a linear probability model.

Our full set of econometric results, including robustness checks that include island dummies, regions and the Scottish Government three-fold urban-rural classification, can be found in Annex D.

Rurality and remoteness

For this specification, we estimate the impact of levels of rurality and remoteness on the probability of home delivery availability controlling for type of delivery (door-to-door or shop drop-off), delivery time (next-day or standard), parcel size (small, medium, large) and delivery companies.⁵⁰ Consequently, the results below can be interpreted as the effect of rurality and remoteness with all other variables held constant.

As with delivery companies we use large urban areas as our reference category – thus, the results reported below are in comparison with this category. Population density was excluded in this regression, as this indicator is correlated with our detailed rural/urban indicators.⁵¹

The results below indicate that individuals living in remote areas, either small towns or rural areas generally do not have the option of home delivery when ordering from online retailers. Postcodes in very remote small towns are 24% less likely to have home delivery available for retail products, while this percentage is 26% for very remote rural areas. The probability of home delivery availability is even smaller for very remote small towns (66% less likely) and rural areas (71%).

⁵⁰ For details on what each category of rurality and remoteness means look at Annex C. In this specification we use the Scottish Government eight-fold Urban Rural Classification specified in Annex Table C2.

⁵¹ The full results of regression 7 can be found in the Detailed Estimation Results section of the Annex, under Table 3 (column 2).

Table 20: Impact of rurality and remoteness on availability of home delivery from online retailers

Other urban areas	Other urban areas are four per cent less likely to have home delivery available for retail products.
Accessible small towns	Accessible small towns are seven per cent less likely to have home delivery available for retail products.
Remote small towns	Remote small towns are 24% less likely to have home delivery available for retail products.
Very remote small towns	Very remote small towns are 66% less likely to have home delivery available for retail products.
Accessible rural areas	Accessible rural areas are eight per cent less likely to have home delivery available for retail products.
Remote rural areas	Remote rural areas are 26% less likely to have home delivery available for retail products.
Very remote rural areas	Very remote rural areas are 71% less likely to have home delivery available for retail products.

Council areas

For this specification, we estimate the impact of living in each council area in Scotland on probability of delivery availability on population density of sector postcodes, delivery prices, controlling for type of delivery (door-to-door or shop drop-off), delivery time (next-day or standard), parcel size (small, medium, large) and delivery companies. As with delivery companies, we used the Glasgow council area as our reference category.⁵²

Absence of home delivery availability generally seems to be concentrated in specific councils primarily located in Highlands and Islands. In particular, living in Argyll and Bute, Highland, Orkney Islands, Na h-Eileanan Siar and Shetland Islands is associated with at least a 45% decrease in probability of home delivery availability.

⁵² The full results of this regression can be found in Annex Table D4 (column 1).

Table 21: Impact of council areas on availability of home delivery from online retailers

Variable	Effect
Aberdeen City, Clackmannanshire, East Ayrshire, East Dunbartonshire, East Renfrewshire, Falkirk, Fife, Inverclyde, Midlothian, Renfrewshire, South Ayrshire, South Lanarkshire, West Dunbartonshire, West Lothian	No significant difference than Glasgow
City of Edinburgh	Three per cent less likely for home delivery to be available
North Lanarkshire	Four per cent less likely for home delivery to be available
Angus, Stirling	Six per cent less likely for home delivery to be available
North Ayrshire	Seven per cent less likely for home delivery to be available
Perth and Kinross	11% less likely for home delivery to be available
Aberdeenshire	13% less likely for home delivery to be available
East Lothian, Scottish Borders	14% less likely for home delivery to be available
Moray	24% less likely for home delivery to be available
Dumfries and Galloway	37% less likely for home delivery to be available
Highland	46% less likely for home delivery to be available
Argyll and Bute	70% less likely for home delivery to be available
Na h-Eileanan Siar	94% less likely for home delivery to be available
Orkney Islands	97% less likely for home delivery to be available
Shetland Islands	99% less likely for home delivery to be available

6. Next steps

Policy recommendations

Government pressure

Consumer fairness – including addressing unfair delivery charges – is a priority for the Scottish Government. This is demonstrated by the detailed action plan for fairer deliveries as well as by the Government's latest Programme for Scotland (2019-2020) which highlights the continued efforts to reduce unjust delivery pricing and practices.^{53,54} Though the Scottish Government has proved its commitment to effectively tackle issues related to unfair deliveries in remote and rural areas in Scotland, more needs to be done by the UK Government. The Scottish Government should exercise additional pressure to the UK Government to ensure that additional actions are taken e.g. sector-wide regulations or softer measures aiming to improve transparency and increase consumer fairness – this suggestion is consistent with action 8 of the action plan.⁵⁵

Improve information and transparency in the sector

An overarching aim of the Scottish Government should be improving information dissemination and transparency in the sector. By providing consumers and businesses in Scotland with quality information about delivery charges and policies that are considered fair, consumers will be able to make more informed decisions. This is important, as our findings highlight that there are significant differences in the prices charged by different delivery companies. This recommendation is directly related to action 1 of the Scottish Government's action plan about creating an interactive data hub to allow users to measure the fairness of delivery pricing to improve transparency and drive behaviour change.⁵⁶

As outlined by action 5 of the action plan, the Scottish Government should seek to provide better information about channels consumers can use to make complaints or request advice and support for dealing with delivery charges and practices they believe to be unfair.⁵⁷ In June 2018 a one-stop shop website (www.deliverylaw.uk) was launched aiming to provide consumers and businesses with support and advice about misleading delivery charge advertising. Given that such initiatives can provide consumers with valuable information the Scottish Government should promote these solutions by using multiple channels (e.g. governmental websites, social media and post). By adopting a multi-channel approach, it will be able to target more effectively different demographics across the country.

⁵³ The Scottish Government (2018) Fairer parcel deliveries: Action plan. <https://www.gov.scot/publications/fairer-deliveries-action-plan/>

⁵⁴ Scottish Government (2019) Protecting Scotland's Future: The Government's Programme for Scotland 2019-2020. <https://www.gov.scot/publications/protecting-scotlands-future-governments-programme-scotland-2019-20/pages/4/>

⁵⁵ Action 8 states the following: "We will shape UK Government action to further strengthen consumer protection to ensure fair and transparent delivery charges for Scottish consumers".

⁵⁶ Action 1 states the following: "We will develop an interactive data hub to allow users to measure the fairness of delivery pricing to improve transparency and drive behaviour change".

⁵⁷ Action 5 states the following: "We will make it easier for consumers to know and exercise their rights".

Pick-up and drop-off services (PUDO)

The introduction of more pick-up and drop-off points can provide consumers in remote and rural areas with more choice. This proposition is welcomed by postal operators as it is one that makes economic sense for businesses – it allows couriers to make multiple deliveries in one premise. Yet, there are some drawbacks to PUDOs, namely fuel and time costs consumers would have to incur to reach a PUDO point – given that in remote areas a corner shop or supermarket may be located far away from a person's residence. Though more PUDOs should be introduced in rural and remote areas of the country it must be noted that this proposition alone cannot provide a complete solution to the problem of excessive delivery charges.

Rigorous monitoring and compliance controls

It is important that enforcement bodies ensure that monitoring and compliance controls remain rigorous after the initial period when an enforcement notice or new standards are introduced. For example, following the Enforcement notice on Advertised Delivery Restrictions and Surcharges issued by the ASA in 2018, a large number of retailers that were contacted by the Authority were willing to make changes to comply with the new standards. To ensure that new players entering the market as well as existing players are aware of and comply with standards, authorities (e.g. the ASA and the Competition and Markets Authority) should continue to perform pre-planned controls but also to respond to salient cases.

Enforcement bodies such as Trading Standards Scotland, the Society of Chief Officers of Trading Standards in Scotland (SCOTSS) and the ASA should also work together with business associations, chambers of commerce, enterprise networks and MPs to improve information exchange between bodies – e.g. report on case studies about consumer experiences in specific areas and types of unfair practices they have experienced. This way, authorities will be able to identify whether any immediate actions are necessary and, therefore, formulate better and more targeted interventions and monitoring processes.

Carrot and stick approaches

In line with action 3 of the action plan, it would be key to recognise and promote retailers and delivery companies with good practices across Scotland.⁵⁸ For example, the Scottish Government could introduce a scheme that protects consumer and businesses from unfair delivery practices and charges. The scheme would set out good practice guidance and principles for fair deliveries. Retailers and postal operators would have the option to voluntarily sign-up to the scheme. Participating companies could be mentioned in the Scottish Government's data hub as well as on the webpages of local and regional consumer and business associations.

Similarly, it would be important to penalise companies that continuously violate standards and enforcement notices and are unwilling to cooperate with authorities. Penalising these companies would set an example about unacceptable and

⁵⁸ Action 5 states the following: "We will make it easier for consumers to know and exercise their rights".

intolerable practices and would, therefore, incentivise other companies to comply with trading and advertising standards.

Suggestions for further research

This section provides suggestions for further research that can improve the evidence base about unfair delivery pricing and practices in Scotland.

- **Increase the scale of data collection**

Due to limited time, our team collected information relating to six postal operators and seven retailers. In future research, it would be worth to try to collect data for a bigger number of companies in the postal and retail sector as well as different types of products and parcel sizes – this would further improve the representativeness of the sample and the quality of the results.

- **Provide ongoing monitoring**

Another key suggestion would be to repeat the present exercise in regular intervals in the future. Providing recurring monitoring would allow the Scottish Government to keep up to date with quality evidence and effectively track developments related to unfair delivery charges in remote and rural areas in Scotland.

- **Further investigation into the postal and retail market**

As highlighted earlier in this report, there is often a lack of transparency about price calculation among retailers and postal operators. It would be worth carrying out additional research to determine how prices are calculated within this market, with a focus on exploring additional factors that result in surcharges. An example is the investigation of exclusive contracts between retailers and couriers – a factor that reportedly reduces consumer choice and increases the costs incurred by customers.

- **Research into the granularity of postcodes**

Further research should shed light into the granularity of postcode sectors, particularly those that exhibit a high degree of heterogeneity. This can help improve the accuracy of postcode software tools as well as inform other approaches used by couriers when determining the cost of a delivery in a specific area.

- **Further investigation into how fairness should be defined**

Defining “fairness” is a very challenging undertaking. In this report our approach was to identify which postcodes face postal charges that could be deemed unfair by using our linear model to predict postal charges based on underlying geographic and parcel characteristics. The model allowed us to estimate the relative impact of each of these characteristics and the resulting postal charge. Yet, the differences between actual postal charges and postal charges predicted by our model cannot be used as conclusive evidence about whether a specific postal charge is unfair or not, partly due to the fact that what constitutes an “unfair” charge involves a value judgement.

7. Conclusion

Consumer fairness is a priority for the Scottish Government. One of the key issues affecting consumers in Scotland right now is unfair delivery pricing and practices in remote and rural areas of the country.

The Scottish Government has formulated a detailed action plan aiming to tackle the underlying causes that lead to unfair treatment of consumers. Among the key actions detailed in the plan is the development of an interactive data hub that will allow users to measure the fairness of delivery pricing to improve transparency and drive behaviour change and the development of the Scottish Parcel Delivery Map to understand consumer experiences and target interventions.

As part of the efforts to reduce unjust delivery practices, the Scottish Government commissioned Alma Economics to undertake econometric analysis as a first step towards determining when and where delivery charges are fair and unfair in Scotland.

We collected 24,364 pricing quotes from six major delivery companies and 6,771 pricing quotes from seven national online retailers across all 1,029 postcode sectors of Scotland.⁵⁹ Shipping quotes were requested for small, medium and large parcel sizes as well a range of bulky consumer products. We then used a linear model with company fixed effects to estimate average prices and delivery availability, controlling for package and geography characteristics that may influence how companies set their delivery policies.

The model allowed us to estimate the relative impact of each of these characteristics and the resulting postal charge. To determine whether a postal charge is unfair or not we compared the actual postal charges with the postal charges predicted by our model; the higher the difference between the actual and predicted value, the higher the degree of discrimination that consumers are experiencing.

In geographic terms, our analysis showed that postcodes in the Highlands and Islands face 21% higher postal charges on average compared to South Western Scotland, with certain council areas such as Na h-Eileanan Siar and the Shetland and Orkney Islands facing average surcharges of at least 25% compared to Glasgow. Similarly, postcodes in the Highlands and Islands are 31% less likely to have access to home delivery services from online retailers compared to Eastern Scotland, with the council areas of Na h-Eileanan Siar, the Shetland and Orkney Islands having virtually no access across the range of retailers in our dataset.

Our results suggest that remoteness plays a more important role than rurality in explaining prices and the availability of delivery. However, when remoteness, rurality and council areas are explored together in the model, rurality and remoteness of a postcode sector seem to have a smaller impact on the delivery charges than the

⁵⁹ A postcode sector combines a postcode area, a postcode district and a single character indicating the location's inward code. It is separated with the outward code (postcode area and district) with a space. Examples of postcode sectors are SW1A 0 and WC2B 8.

wider council area. Finally, based on the predictions of our model, excessive charges are more prevalent in next-day, door-to-door delivery.

Defining “fairness” is a challenging undertaking. For this report, our team sought to provide an answer as to whether postal charges could be deemed unfair by using an econometric model to predict postal charges based on underlying geographic and parcel characteristics. The model allowed us to estimate the relative impact of each of these characteristics and the resulting postal charge.

The findings from our model provide robust results that strengthened the evidence base on unfair delivery pricing in Scotland and will be used by the Scottish Government for the development of an interactive data hub and the Scottish Parcel Delivery Map. Yet, it should be noted that the differences between the actual postal charges and the postal charges predicted by the model cannot be used as conclusive evidence about whether a specific postal charge is unfair or not. This is because we have not controlled for key factors such as fuel and labour costs and also due to the fact that defining “fairness” encompasses a value judgement.

Future research can further explore the notion of consumer fairness in the context of deliveries in remote and rural areas in Scotland. Moreover, though the sample used for our research was informed by a market research exercise and was representative of a large share of the postal and retail markets in Scotland, a bigger data collection exercise in the future would increase the representativeness of the sample and further improve the accuracy of the results. Additional research into the large heterogeneity within specific areas, as well as investigation into the structure of the postal and retail market would also be critical for informing evidence-based policies to ensure that all Scottish residents have access to fair and transparent delivery charges.

Annex A: Data Sample Sizes

Annex Table A1: Sample sizes for delivery companies by parcel size

Delivery company	Small	Medium	Large
Parcel Force	1,029	1,028	1,028
My Hermes	1,028	1,028	
DPD	1,029	1,029	
TNT	1,029	1,027	1,028
Menzies ⁶⁰	585	585	
Yodel	1,025	1,026	

Note: Only TNT and Parcelforce allow delivery of “large” packages based on Royal Mail classification; all other companies have a limit of less than 30kg.

Annex Table A2: Sample sizes for retailers by parcel size

Retailer	Sample Size
Sainsbury's	1,028
ao.com	903
Argos	1,028
Asda	1,028
Hughes	1,028
Furniture Village	708
IKEA	1,028

⁶⁰ As discussed in the main text, Menzies only delivers to the Highlands and Islands or Aberdeenshire, with all other postcodes in Scotland excluded.

Annex B: Scotland Region Classifications

Annex Table B1: NUTS 2 and 3 statistical regions of Scotland

NUTS 2	NUTS 3
Eastern Scotland	Angus and Dundee
	Clackmannanshire and Fife
	East Lothian and Midlothian
	Scottish Borders
	Edinburgh
	Falkirk
	Perth and Kinross, Stirling
	West Lothian
South Western Scotland	East Dunbartonshire, West Dunbartonshire, Helensburgh and Lomond
	Dumfries and Galloway
	East and North Ayrshire
	Glasgow
	Inverclyde, East Renfrewshire, Renfrewshire
	North Lanarkshire
	South Ayrshire
	South Lanarkshire
North Eastern Scotland	Aberdeen, Aberdeenshire
Highlands and Islands	Caithness and Sutherland, Ross and Cromarty
	Inverness, Nairn, Moray, Badenoch and Strathspey
	Lochaber, Skye and Lochalsh, Arran and Cumbrae, Argyll and Bute
	Eilean Siar
	Orkney Islands
	Shetland Islands

Annex C: Scottish Government Urban-Rural Classification

Annex Table C1: Scottish Government three-fold Urban Rural Classification

Classification	Definition
Rest of Scotland	Settlements of 3,000 or more people
Accessible Rural	Areas with a population of less than 3,000 people and within 30-minute drive of a settlement of 10,000 or more.
Remote Rural	Areas with a population of less than 3,000 people and with a drive time of over 30 minutes to a settlement of 10,000 or more.

Annex Table C2: Scottish Government eight-fold Urban Rural Classification

Classification	Definition
Large Urban Areas	Settlements of 125,000 or more people
Other Urban Areas	Settlements of 10,000 to 124,999 people.
Accessible Small Towns	Settlements of 3,000 and 9,999 people and within 30 minutes' drive of a settlement of 10,000 or more.
Remote Small Towns	Settlements of between 3,000 and 9,999 people and with a drive time of over 30 minutes to a settlement of 10,000 or more.
Very Remote Small Towns	Settlements of 3,000 and 9,999 people and with a drive time of over 60 minutes to a settlement of 10,000 or more.
Accessible Rural	Areas with a population of less than 3,000 people, and within a 30 minutes' drive time of a settlement of 10,000 or more.
Remote Rural	Areas with a population of less than 3,000 people, and with a drive time of over 30 minutes but less than 60 minutes to a settlement of 10,000 or more.
Very Remote Rural	Areas with a population of less than 3,000 people, and with a drive time of over 60 minutes to a settlement of 10,000 or more.

Annex D: Detailed Estimation Results**Annex Table D1: Regression results for postal operator delivery prices⁶¹**

	(1)	(2)	(3)	(4)
	Delivery price	Delivery price	Delivery price	Delivery price
Population density	-0.01*** (-7.49)		-0.01*** (16.85)	-0.00*** (-3.39)
Door-to-door delivery	0.09*** (17.45)	0.09*** (18.54)	0.09*** (17.52)	0.09*** (18.06)
Next-day delivery	0.16*** (31.73)	0.15*** (33.11)	0.16*** (31.77)	0.16*** (32.28)
Accessible Rural (UR3)	-0.02** (-2.68)			
Remote Rural (UR3)	0.11*** (12.02)			
Large parcels	1.59*** (264.58)	1.59*** (276.66)	1.59*** (264.86)	1.59*** (267.79)
Medium parcels	0.65*** (136.34)	0.65*** (142.20)	0.65*** (136.50)	0.65*** (138.04)
Other urban areas (UR8)		0.00 (0.78)		
Accessible small towns (UR8)		0.01 (1.71)		
Remote small towns (UR8)		0.05*** (3.40)		
Very remote small towns (UR8)		0.23*** (12.95)		
Accessible rural (UR8)		0.02** (2.82)		
Remote rural (UR8)		0.09*** (10.42)		
Very remote rural (UR8)		0.23*** (30.11)		
Island			0.18*** (17.97)	
Eastern Scotland				0.01** (2.83)
Highlands and Islands				0.21*** (28.46)

⁶¹ Regression 1 uses population density and the Scottish Government three-fold urban rural classification to control for rurality and remoteness, while regression 2 uses the more detailed eight-fold classification while excluding population density due to multicollinearity. Regression 3 uses island dummies to examine the impact of islands on postal charges, while regression 4 uses region dummies to examine the impact of regions (with South Western Scotland as the reference region).

North Eastern Scotland				0.06*** (7.70)
Constant	2.22*** (363.44)	2.18*** (380.18)	2.23*** (439.00)	2.18*** (367.96)
Observations	24,364	26,468	24,364	24,364
R²	0.85	0.85	0.85	0.85

Notes: *t*-statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Company dummies included

Annex Table D2: Regression results for delivery companies and delivery prices, including council areas

	(1)	(2)
	Delivery price	Delivery price
Door-to-door delivery	0.09*** (18.11)	0.09*** (18.96)
Next-day delivery	0.15*** (32.23)	0.155*** (33.57)
Population Density	-0.00* (-2.12)	
Other urban areas (UR8)		-0.00 (-0.14)
Accessible small towns (UR8)		0.01 (0.57)
Remote small towns (UR8)		-0.00 (-0.09)
Very remote small towns (UR8)		0.05* (2.01)
Accessible rural (UR8)		0.00 (-0.30)
Remote rural (UR8)		0.01 (0.99)
Very remote rural (UR8)		0.06*** (3.93)
Aberdeen City	0.07*** (5.31)	0.07*** (5.44)
Aberdeenshire	0.06*** (5.16)	0.07*** (4.81)
Angus	0.04** (2.80)	0.06*** (3.42)
Argyll and Bute	0.21** (15.38)	0.19*** (10.92)

City of Edinburgh	0.03** (3.24)	0.03*** (3.52)
Clackmannanshire	-0.01 (-0.23)	0.00 (-0.04)
Dumfries and Galloway	0.04** (2.82)	0.05** (3.09)
Dundee City	0.03 (1.76)	0.03* (2.19)
East Ayrshire	-0.01 (-0.54)	0.00 (-0.01)
East Dunbartonshire	-0.00 (-0.25)	0.00 (0.01)
East Lothian	0.05** (2.79)	0.05** (2.98)
East Renfrewshire	-0.00 (-0.21)	-0.00 (-0.04)
Falkirk	0.00 (0.07)	0.01 (0.36)
Fife	-0.00 (-0.36)	0.00 (0.17)
Highland	0.22*** (17.94)	0.20*** (13.24)
Inverclyde	-0.00 (-0.15)	0.00 (0.02)
Midlothian	0.03 (1.81)	0.04 (1.96)
Moray	0.15*** (8.96)	0.16*** (8.62)
Na h-Eileanan Siar	0.27*** (11.73)	0.23*** (8.83)
North Ayrshire	0.01 (0.52)	0.01 (0.60)
North Lanarkshire	-0.00 (-0.25)	0.00 (0.01)
Orkney Islands	0.25*** (6.33)	0.22*** (5.67)
Perth and Kinross	-0.01 (-0.81)	-0.01 (-0.37)
Renfrewshire	0.00 (0.23)	0.01 (0.52)
Scottish Borders	-0.00 (-0.18)	0.01 (0.50)
Shetland Islands	0.30*** (7.63)	0.26*** (6.99)

South Ayrshire	-0.01 (-0.37)	0.00 (0.02)
South Lanarkshire	0.00 (-0.35)	0.00 (0.07)
Stirling	0.04* (2.47)	0.05* (2.57)
West Dunbartonshire	-0.00 (-0.19)	0.00 (0.06)
West Lothian	0.03* (2.27)	0.04* (2.51)
Large parcels	1.59*** (268.11)	1.59*** (279.08)
Medium parcels	0.65*** (138.21)	0.65*** (143.47)
Constant	2.17*** (239.97)	2.16*** (289.50)
Observations	24,364	26,468
Adjusted R^2	0.85	0.85

Notes: t -statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Company dummies included

Annex Table D3: Regression results for online retailers and probability of home delivery availability⁶²

	(1)	(2)	(3)	(4)
	Delivery probability	Delivery probability	Delivery probability	Delivery probability
Accessible Rural (UR3)	-0.03** (-3.27)			
Remote Rural (UR3)	-0.49*** (-49.33)			
Two-seater sofa	0.04** (2.84)	-0.14*** (-10.80)	0.03* (2.40)	0.02 (1.53)
Three-piece saucepan set	-0.17*** (-11.97)	-0.17*** (-13.54)	-0.11*** (-8.96)	-0.11*** (-8.35)
Other urban areas (UR8)		-0.04*** (-4.54)		
Accessible small towns (UR8)		-0.07*** (-5.23)		
Remote small towns (UR8)		-0.24*** (-10.37)		
Very remote small towns (UR8)		-0.66*** (-23.72)		
Accessible rural (UR8)		-0.08*** (-7.76)		
Remote rural (UR8)		-0.26*** (-17.78)		
Very remote rural (UR8)		-0.71*** (-58.97)		
Population density			0.05*** (33.97)	0.03*** (20.87)
Island			-0.69*** (-46.52)	
Highlands and Islands				-0.39*** (-33.77)
North Eastern Scotland				-0.03 (-1.94)

⁶² Regression 1 uses population density and the Scottish Government three-fold urban rural classification to control for rurality and remoteness, while regression 2 uses the more detailed eight-fold classification while excluding population density due to multicollinearity. Regression 3 uses island dummies to examine the impact of islands on postal charges, while regression 4 uses region dummies to examine the impact of regions (with Eastern Scotland as the reference region).

South Western Scotland				-0.03*** (-4.16)
Constant	0.99*** (93.88)	1.04*** (96.30)	0.90*** (98.26)	0.96*** (87.52)
Observations	6771	6771	6201	6201
R²	0.33	0.44	0.48	0.41

Notes: *t*-statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Company dummies included

Annex Table D4: Regression results for online retailers and probability of home delivery availability, including council areas**(1)**

	Delivery probability
Aberdeen City	0.02 (1.00)
Aberdeenshire	-0.13*** (-7.21)
Angus	-0.06 (-2.25)
Argyll and Bute	-0.70*** (-40.64)
City of Edinburgh	-0.03* (-2.13)
Clackmannanshire	-0.06 (-1.53)
Dumfries and Galloway	-0.37*** (-18.50)
Dundee City	-0.00 (-0.03)
East Ayrshire	-0.01 (-0.26)
East Dunbartonshire	-0.00 (-0.08)
East Lothian	-0.14*** (-5.16)
East Renfrewshire	-0.03 (-1.03)
Falkirk	0.01 (-0.22)
Fife	-0.01 (-0.74)
Highland	-0.46*** (-30.11)
Inverclyde	-0.04 (-1.15)
Midlothian	-0.01 (-0.47)
Moray	-0.24*** (-9.09)

Na h-Eileanan Siar	-0.94*** (-26.54)
North Ayrshire	-0.07** (-3.27)
North Lanarkshire	-0.04* (-2.23)
Orkney Islands	-0.97*** (-16.82)
Perth and Kinross	-0.11*** (-4.99)
Renfrewshire	-0.04 (-1.93)
Scottish Borders	-0.14*** (-6.50)
Shetland Islands	-0.99*** (-18.43)
South Ayrshire	-0.04 (-1.37)
South Lanarkshire	-0.01 (-0.28)
Stirling	-0.06* (-2.40)
West Dunbartonshire	-0.01 (-0.23)
West Lothian	-0.04 (-1.74)
Two-seater sofa	0.03** (-2.60)
Three-piece saucepan set	-0.17*** (-13.64)
Constant	1.05*** (-78.6)
Observations	6771
Adjusted R^2	0.45

Notes: t -statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Company dummies included



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