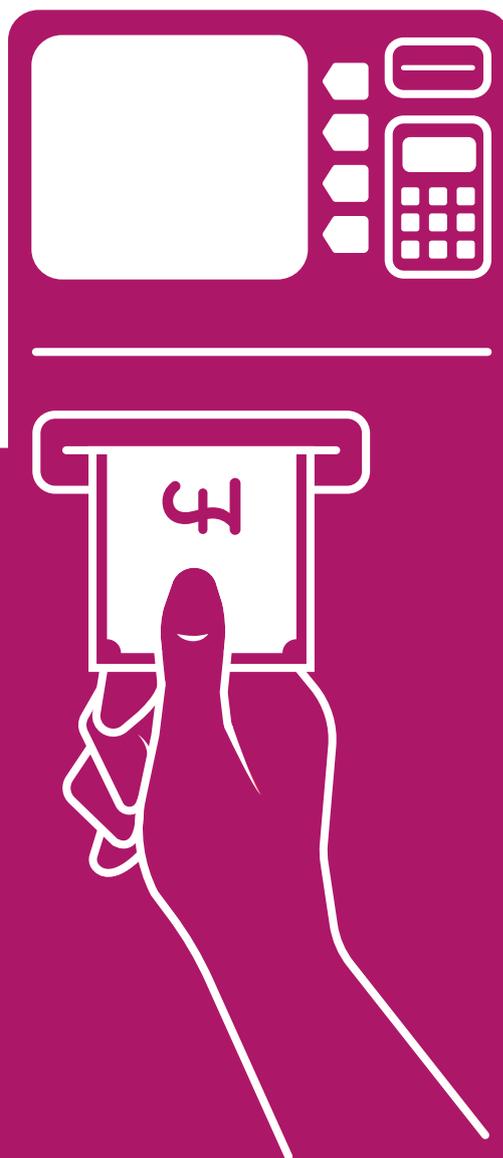


# GEOGRAPHIES OF ACCESS TO CASH

IDENTIFYING VULNERABLE  
COMMUNITIES IN A CASE STUDY OF  
SOUTH WALES



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## ABOUT THIS REPORT

This report was published in partnership by the University of Bristol's Personal Finance Research Centre and Inclusive Economy Initiative in January 2020.

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## CONTENTS

Executive Summary	4
1. Introduction: a changing cash landscape	8
2. Methodology	14
3. Findings: access to cash in South Wales	20
The geography of access to cash	24
Identifying particularly vulnerable areas	29
Case studies: similar access to cash, very different experiences	31
Are protected ATMs where they are most needed?	34
4. Conclusions and policy recommendations	38
Appendices	41

# EXECUTIVE SUMMARY



## EXECUTIVE SUMMARY

### *A changing cash landscape*

The UK is arguably in a period of ‘pre-cashlessness’ – where digital methods of payments are now used by most people, most of the time. There is little doubt that the use of cash has declined dramatically, but it is far from clear exactly how long such a period of ‘pre-cashlessness’ will last.

For now, there remain a range of consumers who depend on cash, as well as a number of situations in which cash continues to be the best option for consumers. Those with such characteristics or in such situations should be considered potentially vulnerable in the event they lose their access to cash.

Presently, however, the declining use of cash is putting pressure on the provision of cash infrastructure, especially within the ATM market. As we saw in our earlier report – a [case study of Bristol](#) published in May 2019<sup>1</sup> – deprived communities appear to be most negatively affected, with ATMs more frequently changing over time from free to fee-charging within the most deprived neighbourhoods of Bristol.

Given such effects and a lack of clarity about when – or if – the UK goes cashless, it is crucial that policy-makers and business take action now to guarantee good access to cash for UK consumers, at least for the foreseeable future.

### *This report*

This report builds on our earlier report in which we developed an index to measure geographical access to cash, using Bristol as a case study. The index – the Availability of Cash Index (‘AvCash Index’) – highlighted the uneven nature of cash access across the city of Bristol, showing the importance of taking a geographical perspective to the issue of financial inclusion.

Here, we build upon our work in Bristol, extending the Index in two ways:

1. We develop the Index to work across both urban *and* rural environments. To do this, we use a case study of a region in South Wales, from Port Talbot to Pontypridd, which incorporates both towns and rural landscapes.
2. We identify the most vulnerable areas – considering both their current ability to access cash and their residents’ ability to cope without such access. We do so through the construction of a measure of travel difficulty, indicating that a high proportion of residents in an area may find it difficult to travel far to access cash (or other essential services). This measure incorporates: levels of car ownership, disability, age, income and access to bus stops.

These two additions allow us to not only map geographical access to cash across our case study in South Wales, but also identify those neighbourhoods that may have the highest need for intervention; for example, via protected status in LINK’s Financial Inclusion programme.

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<sup>1</sup> Tischer, et al. (2019) ‘Mapping the availability of cash. A case study of Bristol’s financial infrastructure.’ Bristol: Personal Finance Research Centre. Available at: <http://www.bristol.ac.uk/media-library/sites/geography/pfrc/Mapping%20The%20Availability%20of%20Cash%20-%20Final%20report.pdf>

## *Key findings*

Across our case study in South Wales, we find a similar amount of cash infrastructure to that in the city of Bristol, even though our Welsh case study is over four times bigger in terms of area. This, of course, is to be expected in a more rural area; however, it does leave certain neighbourhoods with poor access to cash. In our South Wales case study (which covers the three county boroughs of Neath Port Talbot, Bridgend and Rhondda Cynon Taf), we find that:

- 16 per cent of neighbourhoods have no free ATM within 1km
- 71 per cent of neighbourhoods have no bank branch within 1km
- 17 per cent have no Post Office branch within 1km

Taken together, we see that over a quarter of neighbourhoods score less than 5 on the AvCash Index, which implies that they have particularly poor access to cash. The median score for the region meanwhile is 9.5 – considerably lower than the median score of 26.0 found in Bristol. Crucially, we also find significant differences between the results obtained here and more simplistic measures of access to cash which use administrative boundaries as the basis for analysis.

Looking at the geographical distribution of different types of cash infrastructure, as in Bristol, we find that Post Office branches are more evenly distributed across the region – highlighting their importance as a channel for accessing cash. We also note that nearly a quarter (23 per cent) of Post Offices in this region have no alternative free ATM within 1km should they close or should consumers be left unable to withdraw their money in this way.

We then look at neighbourhoods that are particularly vulnerable – those which have poor access to cash *and* a high proportion of residents who may struggle to travel further afield to access cash (or other essential services). This is particularly relevant in this area of South Wales because across the region a quarter of households (25 per cent) have no access to a car, while 26 per cent of residents have a life-limiting disability or illness. Our analysis shows that:

- Over a quarter (27 per cent) of neighbourhoods in our case study fall within the 20 per cent worst areas nationally for travel difficulty *and* have an AvCash Index score of less than 10.
- One-in-six (16 per cent of all neighbourhoods) fall into this category and have an AvCash Index score of less than five. These areas we classify as the ‘most vulnerable’ neighbourhoods.
- Similarly, 8 per cent of areas score poorly for travel difficulty and have no free ATM, while a further 12 per cent of areas have just one free ATM and high travel difficulty. These neighbourhoods are not solely rural; many are located on the outskirts of towns.
- However, 89 per cent of the ‘most vulnerable’ areas (47 of the 53 most vulnerable LSOAs) do not currently benefit from a ‘protected’ ATM, under LINK’s Financial Inclusion programme. Similarly, nearly two-thirds (65 per cent) of vulnerable areas with just one or two free ATMs within 1km do not have a protected ATM (41 out of 63 LSOAs).

Taken together, we find that over 100,000 people in this region live in vulnerable neighbourhoods – with limited access to cash and a high proportion of people likely to find it hard to travel far to access cash – that do not currently benefit from a protected ATM.

### *Policy implications*

Our evidence highlights the value of geographical approaches as a tool for identifying vulnerability in the event of loss of access to cash. Our results, however, demonstrate the importance both of avoiding simplistic measures of access to cash and of taking a community-centric approach to mapping, rather than one based on the cash infrastructure that already exists.

The research also suggests a need for vulnerability to be taken into account as part of LINK's protected ATM scheme and when communities request an ATM via LINK's recently announced Delivery Fund. Taking this further, the 'request an ATM' service could be proactively advertised to the most vulnerable neighbourhoods to avoid a situation in which those communities who 'shout the loudest' become those most likely to benefit.

Lastly, given our findings in relation to the geographical spread of the Post Office as a channel for accessing cash and the fact that for many communities this remains the only local option for doing so, we would welcome commitments from industry to protect consumers' ability to access cash in this way.

# 1. INTRODUCTION: A CHANGING CASH LANDSCAPE

*The use of cash is on the decline, and cash infrastructure is under pressure. In this period of 'pre-cashlessness' how can we guarantee continued access to cash for those who need it?*

The question of what happens to cash in our increasingly digital economy has become a prominent discussion point in media and policy-making. The statistics are well-known and paint a stark picture: while digital payments are on the up, the use of cash is on the decline. In 2008, cash represented 60 per cent of payments by volume; in 2018, this fell to 28 per cent.<sup>2</sup>

These headline figures, while striking, do not render the use of cash irrelevant, however, and do not mean that we will necessarily experience a mass shift to ‘cashlessness’ overnight. Indeed, based on current trends, UK Finance predicts that cash will still account for one-in-ten payments in 2028.<sup>3</sup> This forecast mirrors developments in Sweden and Canada, early adopters of electronic and digital payments – where cash payment volumes at first dropped sharply, but then stabilised, albeit at a relatively low level.<sup>4,5</sup> One might argue therefore that we currently exist in a state of ‘pre-cashlessness’ but it is unclear just how long such a state might last and if a cashless society ever materialises.

It is also important to note that the trend towards digital payments has not necessarily been uniform across the UK. While some areas may be all but cashless, others continue to use traditional payment methods in far greater numbers. Such geographies are important to consider, especially given a lack of digital infrastructure in certain rural areas.<sup>6</sup>

Any change as significant as this will affect everyone across society, positively and negatively. We should, however, pay particular attention to those members of society who are likely to be impacted *negatively* by the current developments. As many as 1.9 million people in the UK continue to ‘mainly use’ cash<sup>7</sup> and estimates suggest that up to 8 million would “struggle in a cashless society”.<sup>8</sup> And, while needs and preferences of course vary from individual to individual, there are a number of specific groups who are especially likely to depend on cash:

- those on low incomes;
- the ‘unbanked’ (those without access to a bank account);
- those in areas where card payments are less widely accepted (for example, rural areas where digital infrastructure is lacking);
- those with disabilities or health conditions that make the use of digital payments more challenging;
- those who rely on carers to buy things for them;
- older individuals, who on average are less likely to use digital payment methods;
- people who rely on begging to survive, or street vendors such as big issue sellers;
- and charities or community groups that depend on cash donations or cannot afford the costs associated with digital transactions.<sup>9,10</sup>

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<sup>2</sup> UK Finance (2019) ‘UK Cash and Cash Machines Summary 2019’. London: UK Finance. Available at: <https://www.ukfinance.org.uk/sites/default/files/uploads/pdf/UK%20Cash%20and%20Cash%20Machines%202019%20SUMMARY.pdf#overlay-context=>

<sup>3</sup> Ibid.

<sup>4</sup> Engert, W., Fung, B.S.C., and Segendorf, B. (2019) ‘A Tale of Two Countries: Cash Demand in Canada and Sweden.’ Ontario: Bank of Canada. Available at: <https://www.bankofcanada.ca/wp-content/uploads/2019/08/sdp2019-7.pdf>

<sup>5</sup> Sveriges Riksbank (2018) ‘Payment patterns in Sweden.’ Stockholm: Sveriges Riksbank. Available at:

<https://www.riksbank.se/globalassets/media/statistik/betalningsstatistik/2018/payments-patterns-in-sweden-2018.pdf>

<sup>6</sup> HM Treasury (2019) ‘Cash and digital payments in the new economy: summary of responses.’ London: HM Treasury. Available at:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/799548/CFE\\_-\\_Cash\\_Digital\\_Payments\\_Response\\_020519\\_vf\\_digicomms.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/799548/CFE_-_Cash_Digital_Payments_Response_020519_vf_digicomms.pdf)

<sup>7</sup> Ibid.

<sup>8</sup> Which? (2019) ‘Freedom to pay. Our way.’ [website] Available at: <https://campaigns.which.co.uk/freedom-to-pay/>

<sup>9</sup> HM Treasury (2019) ‘Cash and digital payments in the new economy: summary of responses.’ London: HM Treasury. Available at:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/799548/CFE\\_-\\_Cash\\_Digital\\_Payments\\_Response\\_020519\\_vf\\_digicomms.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/799548/CFE_-_Cash_Digital_Payments_Response_020519_vf_digicomms.pdf)

<sup>10</sup> Which? (2019) ‘Freedom to pay. Our way.’ [website] Available at: <https://campaigns.which.co.uk/freedom-to-pay/>

More generally, there have been concerns about the reliability of digital payments, with the consumer group *Which?* finding that one-in-seven consumers had been unable to pay by card at least once in 2018 due to technical glitches.<sup>11</sup> Prominent examples include those outages at TSB Bank and across the VISA network affecting millions of consumers.<sup>12</sup> The move towards smartphone payments too has been questioned, with battery life issues causing some consumers to inadvertently lose money.<sup>13</sup> Lastly, concerns have been raised about ‘the provision of a safe store of value in an (extreme) financial crisis’.<sup>14</sup>

Time and innovation may, of course, find solutions to these problems. But until such time, the crucial question is how can we protect access to cash for those who need it most?

## A CHANGING CASH LANDSCAPE

Cash infrastructure in the UK is at a key juncture. While the Access to Cash Review panel’s final report in March 2019 concluded that “*Britain is not ready to go cashless*”, there have been increasing pressures on ATM deployers which appear to be putting strain on the network.<sup>15</sup> Lower overall demand for cash among consumers, alongside a reduction in the interchange fees paid by banks to cash machine providers, seem to be driving business decisions which may not be in the best interests of consumers who continue to rely on cash.<sup>16,17</sup>

In May 2019, we published detailed analysis of the geography of access to cash in one of the UK’s largest cities: Bristol.<sup>18</sup> This report gathered data on the location of ATMs (both free and fee-charging); bank, credit union and Post Office branches; and cashback offered at major supermarkets – all of which informed the construction of an *Availability of Cash Index* (or ‘AvCash Index’ for short). In doing so, we found:

- uneven geographies of access to cash exist in Bristol, whereby cash infrastructure is mostly clustered in local economic centres. This leads to a situation in which, on average, those who live closest to such infrastructure are actually those least likely to need it.
- there are differences in the way that different types of cash infrastructure are geographically spread. Whereas bank branches tend to be heavily clustered, i.e. many branches in some areas and none or few in others, Post Office branches – due to their Universal Service

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<sup>11</sup> Which? (2019) ‘More than seven million people blocked from card payments by IT glitches.’ [website] Available at:

<https://www.which.co.uk/news/2019/06/more-than-seven-million-people-blocked-from-card-payments-by-it-glitches/>

<sup>12</sup> The Financial Times (2018) ‘BoE pushes banks to improve service in IT failures.’ [online newspaper article], 13<sup>th</sup> June 2018. Available at:

<https://www.ft.com/content/fe38f66e-6eec-11e8-92d3-6c13e5c92914>

<sup>13</sup> The Financial Times (2019) ‘How my iPhone landed me with a £476 fine and made me a criminal’. [online newspaper article], 10<sup>th</sup> October 2019. Available at: <https://www.ft.com/content/e8a177d4-dfae-11e9-9743-db5a370481bc>

<sup>14</sup> Engert, W., Fung, B.S.C., and Hendry, S. (2018) ‘Is a cashless society problematic?’ Ontario: Bank of Canada. Available at:

<https://www.bankofcanada.ca/wp-content/uploads/2018/10/sdp2018-12.pdf>

<sup>15</sup> Access to Cash Review (2019) ‘Access to Cash review. Final report.’ Available at: <https://www.accesstocash.org.uk/media/1087/final-report-final-web.pdf>

<sup>16</sup> Shaw, G. (2018) ‘Cash machines: Which? warns on communities hit with lack of ATMs’. Available at:

<https://www.which.co.uk/news/2018/01/cash-machines-which-warns-on-communities-hit-with-lack-of-atms/>

<sup>17</sup> Pymnts (2018) ‘UK Cash Points Close Ahead of ATM Interchange Fee Drop’. Available at:

<https://www.pymnts.com/news/banking/2018/uk-cash-atms-fees-link/>

<sup>18</sup> Tischer, D., Evans, J., & Davies, S. (2019) ‘Mapping the availability of cash. A case study of Bristol’s financial infrastructure.’ Bristol:

Personal Finance Research Centre. Available at: <https://www.bristol.ac.uk/media-library/sites/geography/pfrc/Mapping%20The%20Availability%20of%20Cash%20-%20Final%20report.pdf>

Obligation – are much more evenly spread. This may have important ramifications for access to cash in the future.

- deprivation, on its own, is not a strong predictor of access to cash – despite the fact that we find fee-charging ATMs are generally absent from the least deprived areas of Bristol. Rather we find significant differences between inner-city deprivation and deprived neighbourhoods on the outskirts of the city, with the former being much better-served than the latter.
- there are, however, differences in the ownership of ATMs between deprived and less deprived areas. Whereas more affluent areas have a higher proportion of bank-operated ATMs, in deprived neighbourhoods ATMs are more likely to be run by independent ATM deployers (IADs) – such as Cardtronics or Notemachine. This reflects a longer-term geographical trend which has seen banks withdraw from areas that are less well-off.<sup>19</sup>
- because of this, there are indications that deprived areas may be more likely to lose access to cash in the coming months or years. Comparing ATM data between October 2018 and March 2019, we found that the majority of ATMs which switched from free to fee-charging were located in neighbourhoods with higher levels of deprivation.

This last finding, that there is a growing tendency towards fee-charging ATMs in less affluent areas, was further explored by *Which?* in a report published in September 2019. Using a UK-wide dataset from LINK, they found that this pattern has indeed been replicated across the country: whereas the most wealthy areas saw 3.9 per cent of their ATMs close or become fee-charging between January 2018 and May 2019, this figure rises to 5.7 per cent of machines in the most deprived areas.

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**In our previous case study of Bristol, the majority of ATMs switching from free to fee-charging were located within more deprived areas.**

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This widespread proliferation of fee-based ATMs may cause problems in communities that are already vulnerable through lack of alternatives. Where other means of accessing cash exist (bank branches, or free ATMs) the introduction of fee-charging ATMs is of relatively little concern, but, elsewhere, the sole presence of fee-charging ATMs may put a strain on those communities as they are dependent on using these machines.

## **POLICY RESPONSE SO FAR**

The sector’s policy responses have thus far predominantly focused on two particular solutions: first, LINK’s Financial Inclusion programme – through which it grants certain ATMs ‘protected’ status; and second, the Community Access to Cash Initiative, launched by LINK and UK Finance in October 2019 – which allows communities to request an ATM and have it installed free-of-charge.

LINK’s Financial Inclusion programme seeks to “maintain free access to cash across the UK for as long as consumers need it” by protecting machines in vulnerable areas or where there is no alternative

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<sup>19</sup> Leyshon, A., French, S., and Signoretta, P. (2008) ‘Financial exclusion and the geography of bank and building society branch closure in Britain.’ *Transaction of the British Geographer*, 33, pp.447–465. Available at: <https://rgs-ibg.onlinelibrary.wiley.com/doi/pdf/10.1111/j.1475-5661.2008.00323.x>

nearby. This policy relies on incentivising providers, in particular Independent ATM Deployers, to offer free access to cash by paying a premium interchange fee for machines that have either *protected status* – based on an assessment of distance to the nearest alternative – or are considered *low volume* ATMs. For those with protected status, a maximum premium of 30p per transaction is given for machines with less than 1,500 withdrawals per month, while surcharges for ATMs with fewer than 600 transactions per month start at 43p and rise to £2.75 for ATMs with fewer than 200 transactions.<sup>20</sup>

In this report, we question the extent to which protected ATM status is being granted to ATMs in the right places. There is also a question – not tackled in this report – about whether the protected ATM system will continue to be sustainable in future. Indeed, further reductions in ATM and bank branches numbers may be likely to result in evermore ATMs being awarded protected status. This is already evident in the increase from 2,365 to 2,749 protected ATMs between August 2018 and August 2019.<sup>21,22</sup> There is a potential danger, therefore, that the reduction in infrastructure will not reduce the cost of the system but rather redistribute and concentrate costs in sustaining remote or less frequented ATMs. This may in turn incentivise IADs and banks to “game” the system to maximise the surcharge fees payable to them, which risks putting further strain on the overall viability of the UK’s cash infrastructure.

The more recent policy development came in October 2019 when LINK and UK Finance announced the new Community Access to Cash Initiative, part of which will allow a number of communities across the UK to request an ATM and have it installed free-of-charge (with LINK funding the cost of doing so).<sup>23,24</sup> This move, while generally welcomed, has been criticised for funding a relatively small number of ATMs (40-50) across the UK.<sup>25</sup> There are also questions about whether an application-based method will lead to the most equitable outcomes, and whether the criteria being used to judge applications will take into account all relevant factors, such as the ease with which local people can travel to access cash.

Indeed, one of the eligibility criteria for the Community Access to Cash Initiative – a lack of Post Office access – has already been cast into question as a result of a proposed move by Barclays Bank to no longer allow its customers to withdraw cash from the Post Office.<sup>26</sup> This decision was reversed following public outcry; however, questions remain about banks’ longer-term commitment to retaining the Post Office as an alternative source of cash.<sup>27</sup>

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<sup>20</sup> LINK (2019) ‘LINK Policy on Protected ATMs.’ Available at: [https://www.link.co.uk/media/1437/v-ops-management-method4-method4-change-2019-l083\\_19-protected-atm-policy-effective-17th-july-2019.pdf](https://www.link.co.uk/media/1437/v-ops-management-method4-method4-change-2019-l083_19-protected-atm-policy-effective-17th-july-2019.pdf)

<sup>21</sup> LINK (2018) ‘LINK Scheme ATM footprint report. August 2018 report.’ Available at: <https://www.link.co.uk/media/1434/atm-footprint-report-august-2018.pdf>

<sup>22</sup> LINK (2019) ‘LINK Scheme ATM footprint report. August 2019 report.’ Available at: <https://www.link.co.uk/media/1550/atm-footprint-report-august-2019.pdf>

<sup>23</sup> LINK (2019) ‘LINK sets up Delivery Fund so that all communities can get access to a free ATM.’ [website] Available at: <https://www.link.co.uk/about/news/link-community-support/>

<sup>24</sup> UK Finance (2019) ‘UK banking and finance industry update on local access to cash’. [website] Available at: <https://www.ukfinance.org.uk/press/press-releases/uk-banking-and-finance-industry-update-local-access-cash>

<sup>25</sup> BBC News (2019) ‘Request an ATM’ service to be launched.’ [online news article] 2<sup>nd</sup> October 2019. Available at: <https://www.bbc.co.uk/news/business-49894029>

<sup>26</sup> BBC News (2019) ‘Barclays blow to Post Office banking.’ [online news article] 8<sup>th</sup> October 2019. Available at: <https://www.bbc.co.uk/news/business-49971170>

<sup>27</sup> The Financial Times (2019) ‘Barclays U-turn on Post Office cash withdrawals.’ [online news article] 24<sup>th</sup> October 2019. Available at: <https://www.ft.com/content/bd2221f2-f684-11e9-a79c-bc9acae3b654>

## MAPPING TO IDENTIFY THE MOST VULNERABLE COMMUNITIES

It is vital that any policy discussion about access to cash in the future needs to be based on evidence about how well current provision is meeting consumers' needs, and how changes in this provision would impact on the most vulnerable, in order that their cash provision can be protected. Our overarching objective, therefore, is to help accurately and easily identify where cash provision needs to be protected.

Mapping existing infrastructures provides an empirically driven response to new policy demands. As we note in our Bristol case study (summarised above), our mapping reveals the uneven distribution of cash infrastructures: that it is clustered in local economic centres rather than reflecting the underlying needs of communities. The Index we constructed allowed easy comparison within Bristol of the equity of provision throughout the city.

In this report, we develop this Index further using a region of South Wales as a case study. We do so with two key aims:

1. First, that the AvCash index can be used nationally, specifically that it works equally well in rural *and* urban areas. Our method for the construction of the Index – counting the amount of cash infrastructure within a specified distance of a neighbourhood – relies on the notion of what is a 'fair' or 'reasonable' distance for someone to travel to access cash. The question therefore is: 'what does fair actually look like?'. Our initial index was based on the premise that, within a city, it is reasonable to expect to walk to an ATM and that 500m is a walkable distance. Clearly, this would not be feasible, or indeed expected, in rural areas, therefore we re-consider the distance used to construct the index to enable it to work equally effectively in rural, urban and other contexts.
2. Secondly, we build on the Index so as to identify the most vulnerable areas which have poor access to cash *and* a high proportion of residents who would struggle to travel further afield to access cash (or other essential services). We do so through the construction of a measure of travel difficulty, which incorporates local levels of car ownership, disability, age, income and access to bus stops. While being careful not to label 'all' (or 'no') residents in an area as potentially vulnerable, we argue that priority within policy-making should be given to those areas with higher levels of vulnerability.

We describe the full methodology in the following chapter. In short, by considering these factors together, and ensuring that results are replicable, we will be able to provide policy-makers with the relevant evidence to inform policy decisions to manage access to cash in the future. The Index allows us to identify vulnerable areas; areas where there are few, if any, ATMs and where residents are likely to find it difficult to travel to others further away.

To test our approach we construct our Index for the three county boroughs of Neath Port Talbot, Bridgend and Rhondda Cynon Taf in South Wales – a part of the country with an interesting mix of urban and rural landscapes that also contains areas with high levels of deprivation, low car ownership and high levels of disability.

# 2.

## METHODOLOGY

*This report builds upon a method of measuring access to cash developed for a case study of Bristol. Here, we evolve our data analysis to enable the identification of areas which may be particularly vulnerable if they lose local access to cash.*

The data collection and analysis presented in this report largely replicates that of our earlier study of Bristol, published in May 2019. We have, however, evolved the methodology so as to provide a more effective measure of access to cash in rural, as well as urban, areas. Box 1 gives an overview of the methodology used to construct the AvCash Index, while below we explain the process in more detail. Later in this section we explain how and why it was necessary to adapt the Index for use in more rural settings.

## DATA COLLECTION

While other research looking at access to cash focuses predominantly on one type of cash infrastructure – ATMs – we were keen to develop a measure of access to cash which accounts for the wider variety of ways in which people can access cash in the UK. Such an all-encompassing approach allows for a fuller understanding of cash access issues, yet it is telling that at present there is no single dedicated public map displaying all types of cash outlets – something that was highlighted by UK Finance in September 2019 as an issue which the industry needs to resolve.<sup>28</sup>

For the county boroughs of Bridgend, Neath Port Talbot and Rhondda Cynon Taf we therefore collected location data for each of the following types of cash infrastructure: ATMs (free and fee-charging); bank and building society branches; Post Office branches; credit union branches; and supermarkets that offer their customers cashback. Data was gathered from the most relevant respective sources of information about each type of infrastructure (for a full list of data sources please see Appendix 2). For all pieces of infrastructure we collected postcode data which could then be converted to geographical co-ordinates for use in a Geographical Information System (GIS). The focus of our data collection was on postcodes within the three county boroughs of interest; however, data were also gathered for any infrastructure close to the external border of these areas, which would be likely to have an effect on local neighbourhoods' ability to access cash. All data were collected in July 2019.

While the above method of data collection provides a detailed localised view of access to cash, it has some limitations. First, the ATM data collected gives the number of 'ATM sites', rather than the number of ATMs *per se*. In places where there are two or more ATMs provided by the same ATM deployer with the same address, this is counted as just one ATM within our dataset. While this is not ideal, we are however more interested in areas with an absence of access to cash, rather than an excess. Furthermore, any future wider-scale research may be able to make use of data provided directly by LINK, which does not have this limitation. A second limitation is that the data collected on 'cashback' is unlikely to be complete due to a lack of a central database of outlets that offer cashback. While we capture major supermarkets that provide this service, we are not able to account for smaller outlets, such as community-owned shops.

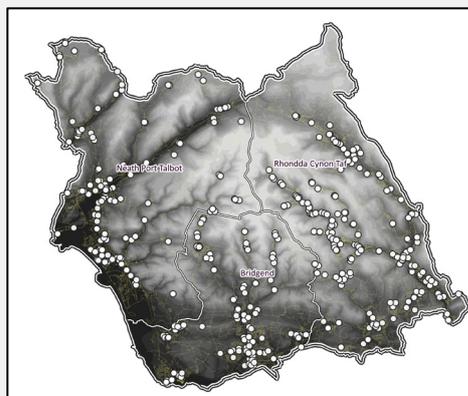
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<sup>28</sup> UK Finance (2019) 'UK banking and finance industry update on local access to cash.' [website] Available at: <https://www.ukfinance.org.uk/press/press-releases/uk-banking-and-finance-industry-update-local-access-cash>

## Box 1 - Methodology for constructing the AvCash Index in South Wales

### 1) Collect data & map range of cash infrastructure across South Wales

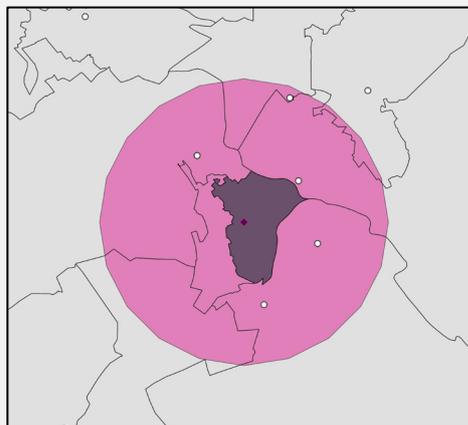
- Free ATMs
- Bank & building society branches
- Post Office branches
- Fee-charging ATMs
- Supermarkets that offer cashback
- Credit Union branches



### 2) Count all infrastructure within 1km of the centre of each neighbourhood

We find the centre (weighted by population) of every neighbourhood or 'Lower Layer Super Output Area (LSOA)' in the region and draw a circle with a radius of 1km out from it.

We then count how many of each type of infrastructure fall within this circle.



### 3) Calculate AvCash Index score for each neighbourhood in the region

Once we know how many of each type of infrastructure are within 1km of the centre of each neighbourhood we calculate an Index score for each place.

We do this by multiplying each infrastructure count by a set score per unit, depending on the cost and accessibility of withdrawing cash from that type of infrastructure. For more on the rationale behind this scoring, see Appendix 3.

Type of infrastructure	Score per unit
Free ATMs	3
Post Offices	2
Bank / building society branches	1
Credit unions	1
Cashback providers	0.5
Fee-charging ATMs	-0.5

## DATA ANALYSIS

Having collected and mapped the data, in order to rank areas in terms of their access to cash it is then necessary to count the number of each type of cash infrastructure accessible from each neighbourhood in the region. We do so at Lower Layer Super Output Area (LSOA) level – a geographical unit containing between 400 and 1,200 households<sup>29</sup>, of which there are a total of 333 in Neath Port Talbot, Bridgend and Rhondda Cynon Taf. Throughout this report, we use ‘LSOA’ and ‘neighbourhood’ interchangeably.

One possible method would be to simply overlay LSOA borders onto our map of cash infrastructure and count how many of each type of infrastructure fall within each LSOA’s boundaries. Such a method means that an ATM, for example, can only be counted once. While this method yields useful results at a large-scale level, it fails to reflect the ‘on the ground’ realities necessary to understand cash access for policy purposes. In most circumstances, residents are able to move freely across LSOA borders, so someone living close to the edge of one LSOA may easily be able to access cash infrastructure in a neighbouring area.

For this reason, we instead draw a radius from the centre of each LSOA, count the various cash infrastructure that fall within this radius and then multiply these by the scoring system given in Box 1 to give a total score for each neighbourhood. The radius approach means that a neighbourhood’s ranking is not solely dependent on the cash infrastructure that happens to fall within its own (fairly arbitrary) borders, but also on that which is located in other proximate neighbourhoods. Additionally, rather than the geographic centre, we base our analyses on the population-weighted centre<sup>30</sup> of each LSOA, which better reflects the distribution of residential households within the area.

### **Adapting the Index to a rural setting – what is a ‘fair’ distance to travel to access cash?**

The question that arises with this method – counting the amount of cash infrastructure within a specified distance of a neighbourhood – is what is a ‘fair’ or ‘reasonable’ distance for someone to travel to access cash?

When originally constructing the AvCash Index for Bristol, a highly urbanised environment, we used a distance of 500m – a distance considered by the research team to be the maximum one might expect someone to walk to access cash in such an environment. However, in less densely populated areas, such as the current case study within South Wales, a 500m radius works less well; some ATMs and other cash infrastructure are left uncounted, due to the increasing distances between LSOA centres. The result therefore is that larger, less densely populated LSOAs were scoring poorly, despite qualitative examination showing this to not necessarily be the case.

Furthermore, in the absence of more in-depth research to answer this question, one might posit that residents in urban and rural neighbourhoods also have different needs – and therefore concepts of fairness – when it comes to accessing essential services. While 500m in an urban context may be considered a fairly significant distance to walk; in a rural environment, this could be perceived as relatively less sizeable. We therefore trialled various methods of constructing the AvCash Index,

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<sup>29</sup> Office for National Statistics (2019) ‘Census geography’. [website] Available at: <https://www.ons.gov.uk/methodology/geography/ukgeographies/censusgeography>

<sup>30</sup> Office for National Statistics (2016) ‘Output Areas (December 2011) Population Weighted Centroids’. [dataset]. Available at: [http://geoportal.statistics.gov.uk/datasets/ba64f679c85f4563bfff7fad79ae57b1\\_0](http://geoportal.statistics.gov.uk/datasets/ba64f679c85f4563bfff7fad79ae57b1_0)

altering an area's radius / catchment area depending on either how rural or urban it is, or how densely populated. The results of these trials are presented in Appendix 4.

There was, however, an assumption in these trials that people in rural areas will both expect to travel further and actually be *able* to travel further. This is based predominantly on the idea that levels of car ownership tend to be higher in rural areas – which while generally true, is not true universally.

We therefore developed a final model of the Index that tackled this assumption. This model has two distinct differences to our earlier Bristol model: first, to account for the generally larger distances involved in rural areas, we expanded the radius for inclusion to 1km, regardless of whether an area is rural or urban<sup>31</sup>; and second, following construction of the Index, we essentially add a new layer to the analysis, which incorporates the difficulty that local residents are likely to experience in travelling to access cash. Together, the first element of this allows us to objectively assess which areas have poor local access to cash, while the second element allows us to then highlight in which areas this lack of access is more likely to cause problems for residents.

### **Assessing likely travel difficulty**

As mentioned above, we complement the AvCash Index with a measure that accounts for the difficulty that residents are likely to experience when travelling to access not just cash but any (physical) essential service.

While there are many possible ways of measuring travel difficulty<sup>32</sup>, the measure we constructed is based on five components, as outlined in Table 1. In simple terms, we are generating a score for each LSOA based on the proportion of residents who live there who may struggle to travel far to access services (based on levels of car ownership, their age, levels of disability, and average income); and the availability of public transport (bus stops).

To construct this measure we rank all 34,753 LSOAs in England and Wales from 'best' to 'worst' on each of the five components and group them into deciles. For each component, the first decile – the 'best' – scores 1, while the tenth decile – the 'worst' – scores 10. The decile scores for each of the five components are then added together, producing a score for each LSOA ranging from a theoretical 'best' of 5 to a 'worst' score of 50. Whereas a score of 5 would represent an area with a high average income, low average age, high levels of car ownership, low levels of disability and nearby access to bus stops, a score of 50 would represent the opposite.

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<sup>31</sup> A reasonable alternative to the radius approach we use is to measure the distances between the centre of a neighbourhood and the nearest X number of ATMs, etc. As shown in Appendix 4, this was an approach we also trialed and found that it gives broadly similar results to our final Index. It is an approach, however, that is arguably less transparent and less interpretable in a policy context.

<sup>32</sup> One could consider many things, including: the walkability of neighbourhoods based on the connectedness of streets, the availability of pavements and pedestrian crossings; the availability of other methods of public transport, e.g. train, bike lanes; average travel time to other local centres; congestion / traffic problems; or other population characteristics, including the prevalence of mental health problems, the number of 'oldest old'. Such measures may all have merit, but it was beyond the scope of this research to consider everything.

**Table 1 – The five components of our travel difficulty measure**

Component	Data source
Car or van access	2011 Census data. <sup>33</sup> Percentage of households in LSOA with no car or van access.
Population age	2011 Census data. Median age of residents in the LSOA.
Life-limiting disability	2011 Census data. Percentage of residents in the LSOA with a long-term health problem or disability that limits day-to-day activities.
Household income	Office for National Statistics: Small area income estimates for middle layer super output areas, England and Wales (2015/16 financial year) <sup>34</sup> . Average net annual (equivalised) household income, after housing costs.
Bus stop availability	Analysis of ‘National Public Transport Access Nodes (NaPTAN)’ (July 2019). <sup>35</sup> Calculation of the mean distance from each LSOA population-weighted centre to the nearest five bus stops. <sup>36</sup>

Lastly, to focus on those areas whose residents are most likely to experience problems with travelling to access cash, we highlight those that fall into the 20% ‘worst’ areas nationally for travel difficulty. The aim, therefore, is to differentiate between areas with similar levels of – or lack of – access to cash but with qualitatively different experiences in terms of how this affects local people. This helps answer the question of the extent to which the closure of the final cashpoint in an area is likely to damage the community at-large.

For example, a relatively wealthy commuter hub with a young population and high car ownership may experience comparatively less difficulty, on average, in accessing cash as part of their daily routines if needs be. In contrast, an older, low-income community with higher levels of disability and low car ownership may be more likely to suffer detriment if, for example, the last cash infrastructure in the village breaks down.

It should be noted, of course, that the measure here represents an *average* for an entire neighbourhood and should not be interpreted as meaning that *everyone* in a poorly-scoring neighbourhood will struggle to travel to access services. Likewise, there may still be a significant number of people in a well-scoring area who will struggle. The score simply reflects a quantitative assessment of the relative likelihood of problems in different neighbourhoods, as an indicative tool for policy-makers and those determining where best to focus their limited resources.

<sup>33</sup> Office for National Statistics. ‘2011 Census Data on Nomis.’ Available at: <https://www.nomisweb.co.uk/census/2011>

<sup>34</sup> Office for National Statistics (2018) ‘Small area income estimates for middle layer super output areas, England and Wales.’ Available at: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/smallareaincomeestimatesformiddlelayersuperoutputareaseotlandandwales>

<sup>35</sup> Department for Transport (2019) ‘National Public Transport Access Nodes (NaPTAN).’ Available at: <https://data.gov.uk/dataset/ff93ffc1-6656-47d8-9155-85ea0b8f2251/national-public-transport-access-nodes-naptan>

<sup>36</sup> Please note that availability of a bus stop does not necessarily indicate that this bus stop is well-served by buses.

# 3.

## **FINDINGS: ACCESS TO CASH IN SOUTH WALES**

*Through our case study in South Wales, we explore how our methodology can be used to improve our identification of areas most vulnerable in the event of declining cash access.*

As discussed in the previous section, we have enhanced the AvCash Index so that it now: 1) incorporates the mapping of more rural regions, as well as urban areas; and 2) identifies areas most vulnerable in the event of declining physical cash infrastructure, due to the relative inability of local people to travel far to access cash.

In this section, we present the results for our new methodology, with reference to a case study in South Wales – which encompasses the county boroughs of Neath Port Talbot, Bridgend and Rhondda Cynon Taf. We begin by presenting the geographical distribution of cash infrastructure in this region, before showing how we can use this in combination with our measure of travel difficulty to identify those neighbourhoods with a high proportion of residents who may struggle to access cash, especially if ATMs and other cash infrastructure disappear over time.

## OUR CASE STUDY: PORT TALBOT TO PONTYPRIDD

We focus our analysis on three county boroughs in South Wales: Neath Port Talbot, Bridgend and Rhondda Cynon Taf. This region runs from Port Talbot in the west to Pontypridd in the east, covering a total area of 1,132 square kilometres and with a total population of around 0.5 million people. For comparison, our previous case study of Bristol had a similar population but an area of just 235 square kilometres.

In terms of overall amount, the case study within South Wales has slightly more cash infrastructure in total than Bristol, as shown by Table 2; however, Bristol covers an area nearly four times smaller. Per square-kilometre the South Wales case study is therefore considerably less well-served by cash infrastructure. This, of course, is to be expected in a more rural area which is less densely populated, but it does highlight the relative nature of access to cash across the country.

Interestingly, we find in our South Wales case study that fee-charging ATMs represent a higher percentage of all ATMs here (33 per cent) than in Bristol (23 per cent). Meanwhile, the total number of Post Office branches in this region almost (but not quite) accounts for the fact that it is much larger than Bristol; whereas the increase in the number of bank branches is only very slight – leaving just 0.05 branches per km<sup>2</sup> in South Wales, compared with 0.20 branches per km<sup>2</sup> in Bristol.

**Table 2 – Comparing cash infrastructure in our case studies of S. Wales & Bristol**

	South Wales (NPT, B & RCT)		Bristol	
	Total Number	(per km <sup>2</sup> )	Total Number	(per km <sup>2</sup> )
Free ATMs	284	(0.25)	257	(1.09)
Fee-charging ATMs	140	(0.12)	77	(0.32)
Post Offices	124	(0.11)	45	(0.19)
Bank branches	62	(0.05)	47	(0.20)
Cashback providers	89	(0.08)	70	(0.30)
Credit union branches	21	(0.02)	7	(0.03)

## The importance of not confining analysis to LSOA boundaries

Our findings also highlight the importance of adopting an analytic approach which is not limited to (often arbitrary) neighbourhood boundaries on a map. Here, using our South Wales case study, we compare the difference in results between two approaches to counting an area's access to cash infrastructure:

1. Counting only infrastructure that falls within a neighbourhood's administrative boundaries
2. Counting infrastructure that falls within a 1km radius of the population-weighted centre of a neighbourhood. This – our preferred approach – may also capture cash infrastructure that falls *outside* of a neighbourhood's administrative borders but which residents of that neighbourhood may still be able to access relatively easily.

While the latter approach is based on Euclidean distance – that is a straight line or 'as the crow flies' distance – and could be improved through more computationally-intensive analyses which incorporate road/footpath networks, travel time and physical geography, it is certainly preferable to simple measures which ignore the fact that the administrative borders of neighbourhoods within the UK are generally straightforward to traverse.

This is evident from the fact that the first approach (administrative boundaries) identifies that 56 per cent of the 333 LSOAs within the region do not have a free ATM, whereas this reduces dramatically to just 16 per cent using the second approach (counting within a 1km radius). As shown in Table 3, the magnitude of difference also holds when looking at Post Offices and bank branches. In all three cases, there appears a risk of overstating the problem of access to cash in neighbourhoods when using simple boundary-based measures. This is due to the fact that the administrative boundary approach allows infrastructure to be counted only once, when in reality the same ATM can be shared by the residents of multiple different areas. In order to target solutions more effectively (and cost-effectively), this approach is therefore something that policy-makers need to avoid.

Using the second approach (counting within a 1km radius), we find a similar proportion of neighbourhoods without a free ATM (16 per cent) or Post Office (17 per cent) within 1km. In the case of bank branches, however, as many as 71 per cent of neighbourhoods in this region do not have a bank branch within 1km.

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**71% of neighbourhoods in this region have no bank branch within 1km, and 16% have no free ATM within 1km**

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**Table 3 – Comparing different approaches for measuring access to cash. Percentage of neighbourhoods in South Wales case study with access to different numbers of each type of cash infrastructure.**

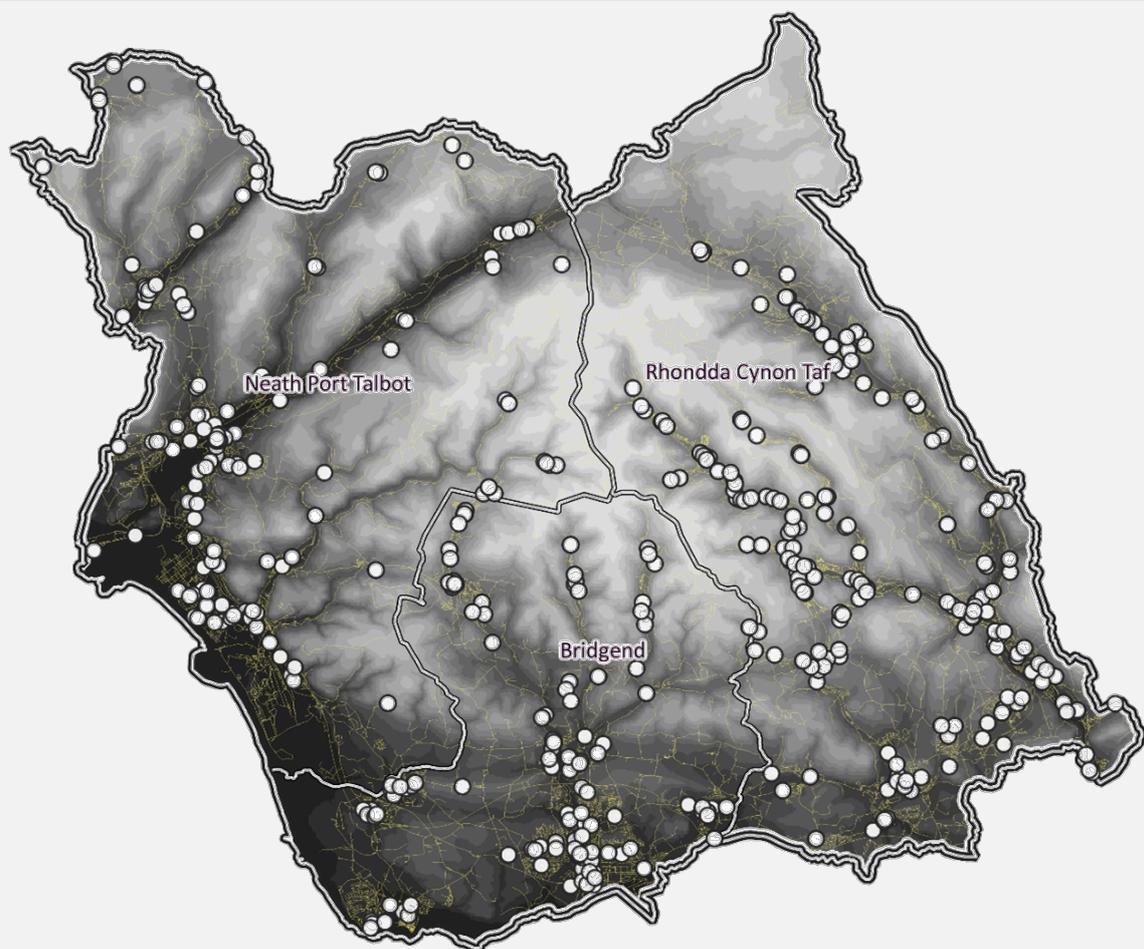
Infrastructure type	Count of infrastructure	Approach 1: Counting infrastructure that falls within LSOA boundary	Approach 2: Counting infrastructure within 1km of LSOA centre
		% of neighbourhoods	% of neighbourhoods
Free ATMs	None	56%	16%
	One	24%	21%
	Two or more	20%	64%
Post Offices	None	65%	17%
	One	32%	57%
	Two or more	2%	26%
Bank branches	None	90%	71%
	One	7%	15%
	Two or more	3%	14%
Fee-charging ATMs	None	68%	36%
	One	24%	24%
	Two or more	8%	40%
Supermarkets that offer cashback	None	79%	40%
	One	17%	29%
	Two or more	4%	31%
Credit Unions	None	94%	83%
	One	6%	15%
	Two or more	0%	2%

## The geography of cash infrastructure

Turning to the geographical distribution of cash infrastructure throughout the region, Map 1 presents the sites of all types of cash infrastructure in the area. As can be seen, this is a rugged landscape with more low-lying land towards the south and west coast and a large number of valleys running towards the north – along which most human settlements and therefore cash infrastructures are located.

### Map 1 - The location of all cash infrastructure in the region.

(Darker areas represent more low-lying land, while lighter areas are higher. Each dot represents the site of cash infrastructure, of any type.)

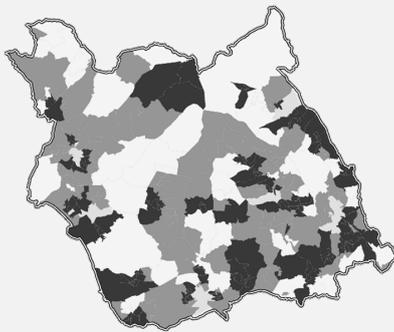


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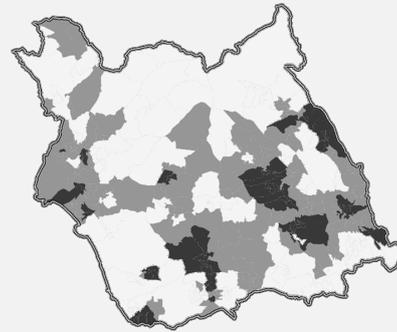
Maps 2-5 break this down based on type of cash infrastructure, giving the amount of infrastructure that lies within 1km of an LSOA's population-weighted centre. As can be seen, despite the fact that 16 per cent of neighbourhoods have no free ATM within 1km, free ATMs are reasonably common. Using nearest neighbour analysis<sup>37</sup>, however, it is apparent that they are more highly clustered than any other type of cash infrastructure, especially in highstreets and similar areas of economic activity. Fee-charging ATMs are less common and also slightly less clustered, whereas banks are considerably less common but still highly clustered, predominantly grouping in larger towns. Post Offices, on the other hand, are relatively less clustered, providing coverage across much of the region. This matches our finding for Bristol and most likely reflects the access criteria that the Post Office is subject to (unlike providers of other types of cash infrastructure).<sup>38</sup>

### Box 2 – Number of each type of cash infrastructure within 1km of LSOA centre

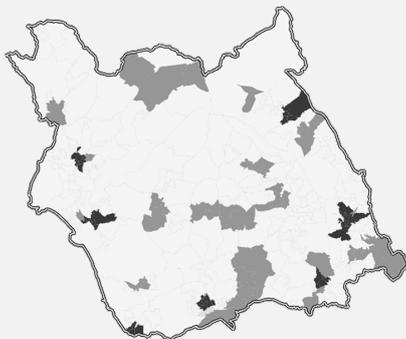
**Map 2 - Free ATMs**



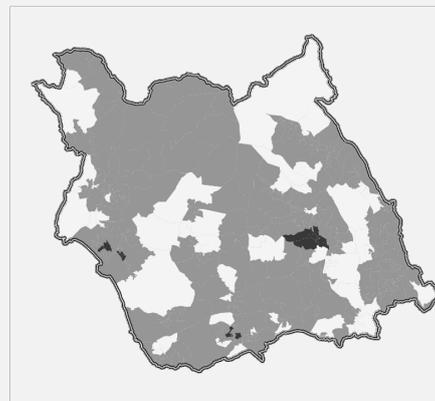
**Map 3 - Fee-charging ATMs**



**Map 4 - Bank branches**



**Map 5 - Post Offices**



Nearest neighbour scores as follows:

- Free ATMs = 0.34 (highly clustered)
- Fee ATMs = 0.52 (quite clustered)
- Bank branches = 0.42 (highly clustered)
- Post Offices = 0.83 (less clustered)

Legend:



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<sup>37</sup> Nearest neighbour analysis looks at the average distance between each free ATM (for example) and the next closest free ATM. It then compares this to the expected average distance in a random spatial distribution. The formula produces a statistic ranging from 0 (highly clustered) to 1 (random) to 2.15 (highly uniform).

<sup>38</sup> The PO access criteria can be found at: [http://corporate.postoffice.co.uk/sites/default/files/networkreport2019\\_FINAL\\_190210.pdf](http://corporate.postoffice.co.uk/sites/default/files/networkreport2019_FINAL_190210.pdf)

### Box 3 – Post Office branches as a means of accessing cash

As shown in Box 2 and previously in our case study of Bristol, Post Offices tend to offer a method of accessing cash that is more evenly-spread across the country than other methods, such as ATMs. We find that 83 per cent of neighbourhoods in our South Wales case study have at least one Post Office branch within 1km, demonstrating the high geographical accessibility of this channel.

Importantly, Post Offices also provide the security of a branch from which to withdraw money for those who are concerned about crime. Unlike bank branches, however, it is possible for the customers of a wide range of banks/building societies to access their money within a Post Office.

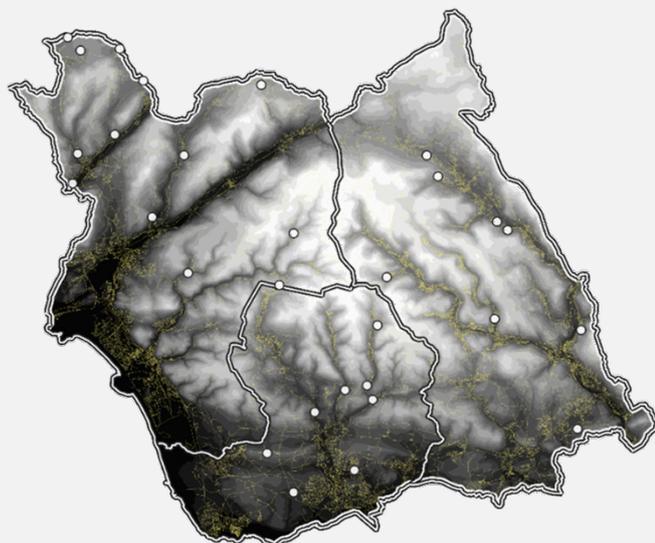
This benefit, however, is not guaranteed. As previously mentioned, in October 2019, Barclays announced that it would no longer be allowing its customers to withdraw money from the Post Office. After strong public reaction, this decision was reversed; however, it does raise questions about the commitment of banks to protecting the Post Office as a means for accessing cash in future.

Analysis of our data for South Wales shows that moves such as that proposed by Barclays could be problematic for those living in certain neighbourhoods. We find that, of the 124 Post Office branches within our case study region, 29 (equivalent to 23 per cent) do not have an alternative free ATM within 1km – as shown in the map below. Of these, 9 branches (7 per cent of the total) have no alternative within 2km.

As an example, Crynant Post Office has no alternative free ATM for 4.4km – which may be problematic for the one-fifth of households (20 per cent) in this neighbourhood who have no access to a car or van.

While it is, of course, unclear just how many customers in such areas would be affected should a given bank prevent its customers from accessing their money via the Post Office, this does raise issues in terms of the sustainability of access to cash in future. Commitments from the industry to ensure this channel of accessing cash is protected in the coming years would therefore be very welcome.

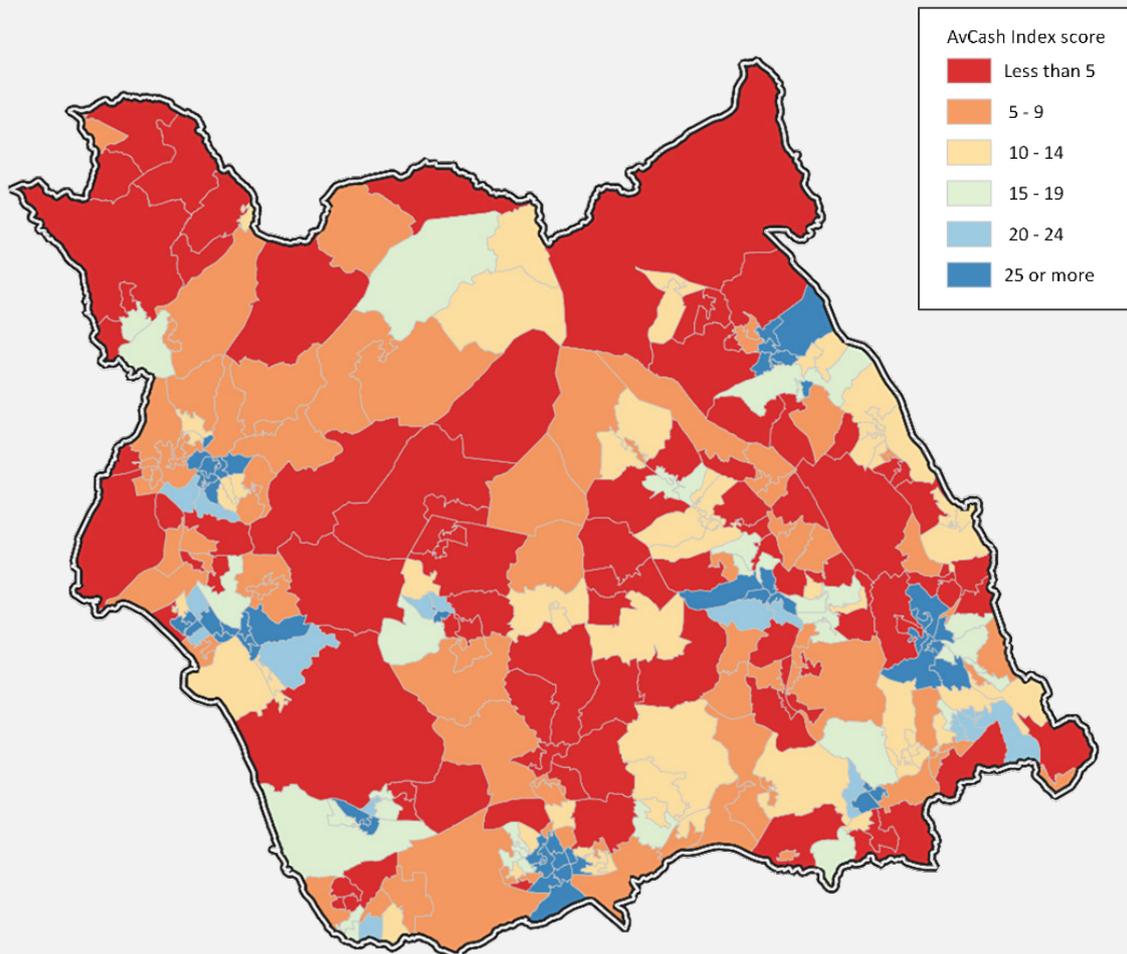
**29 Post Office branches, out of 124 in our case study region, have no alternative free ATM within 1km:**



Bringing together data on the range of types of cash infrastructure, we construct our AvCash Index for all of the neighbourhoods in this region (shown in Map 6). As described in the previous methodology section, the Index is calculated by counting the number of each type of cash infrastructure within 1km of a neighbourhood’s population-weighted centre and then multiplying it by a corresponding score, depending on the ‘value’ that that particular type of cash infrastructure brings in terms of access to cash (with free ATMs scoring the highest – the rationale for which is given in Appendix 3). The resulting scores are then summed to give an overall score per neighbourhood.

**Map 6 – The AvCash Index, for neighbourhoods across our South Wales case study**

(Areas in red and orange have relatively poor access to cash, while those in blue have ample availability of cash infrastructure.)



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As shown in Table 4, this region of South Wales – as expected – scores poorly compared to Bristol in terms of access to cash. Whereas Bristol has a median AvCash Index of 26.0, our Welsh case study has a median of just 9.5 (equivalent to three free ATMs and a supermarket within 1km, for example). Indeed, the 25<sup>th</sup> percentile – the bottom quarter of neighbourhoods – scores only 4.5. This is a concern, as we would argue that any area scoring below 5 on the Index at least warrants further investigation. The worst scoring neighbourhood is in the village of Ystrad, where there are four fee-

charging ATMs within close proximity but no other cash infrastructure, giving it a score of minus two. The relatively nearby settlement of Gelli does have free access to cash; but we do not know whether Ystrad residents will be willing or able to travel there. Whilst this is not a ‘cash desert’ *per se*, access to cash here does come at a cost.

**Table 4 – Descriptive statistics for the AvCash Index.  
Comparison of South Wales case study and Bristol case study.**

	South Wales (NPT, B & RCT)	Bristol
Minimum	-2.0	1.5
25 <sup>th</sup> Percentile	4.5	14.5
Median	9.5	26.0
Mean	13.5	37.7
75 <sup>th</sup> Percentile	16.5	49.5
Maximum	75.5	157.0

Visual comparison using same legend

Breaking the Index down based on the socio-demographic characteristics of neighbourhoods in our South Wales case study, we find four characteristics that are significantly correlated with higher AvCash Index scores – all of which are arguably associated with ‘urban-ness’:

- Smaller LSOAs (area in m<sup>2</sup>)
- More densely populated LSOAs
- LSOAs with a lower proportion of residents from a white ethnic background
- LSOAs with a higher proportion of households without car or van access

Deprivation rank, meanwhile, among other characteristics<sup>39</sup>, was not found to have a significant association with the AvCash Index score.

<sup>39</sup> We also looked at: total resident population; bus stops; household income; age; disability; students; education; and ratio between the number of people who work in the area and the number who live there.

## IDENTIFYING PARTICULARLY VULNERABLE AREAS

Having highlighted those areas with poor access to cash – in Map 6 – we turn now to identify those areas in which this is most likely to cause a problem, by comparing our data on cash infrastructure with data suggestive of the likely difficulty that residents may face in travelling far to access cash. As described in the previous methodology section, this ‘travel difficulty’ measure takes into account car ownership, bus stop availability, income, age and disability, so as to estimate which areas contain the highest proportion of people that are likely to struggle to travel to access cash (or any other essential service).

The part of South Wales that we used as a case study is one in which many people may struggle to travel far to access essential services. Not only is it an area with a challenging terrain, it also has a relatively high proportion of households with no access to a car or van (25 per cent of households on average per neighbourhood, compared to an average of 23 per cent nationally for Wales<sup>40</sup>). In addition, on average, 26 per cent of residents have a disability or long-term illness that limits their day-to-day activities.

Indeed, of the 333 neighbourhoods in this region, 186 (56 per cent) fall within the worst 20 per cent nationally (across England and Wales) in terms of the difficulty that residents are likely to experience when travelling to access services.

### Areas with poor access to cash and high travel difficulty

To identify particularly vulnerable areas, we therefore look for those which have both poor access to cash and which score poorly in terms of likely travel difficulty.

This shows that 90 of the 333 neighbourhoods in the region (27 per cent) fall within the worst 20 per cent nationally in terms of travel difficulty *and* have an AvCash Index score of less than 10. Of these, 53 neighbourhoods (16 per cent of all LSOAs) score less than 5 on the Index. These areas are particularly vulnerable.

We can also disaggregate the five components of the travel difficulty measure. This shows, for example, that 40 per cent of LSOAs in the region score less than 10 on the AvCash Index and also fall within the quintile with the highest level of disability/illness in the country; while just 6 per cent of LSOAs in the region score equally poorly on the AvCash Index and are in the bottom 20 per cent of neighbourhoods in terms of car access. The difference between the two most likely lies in the fact that low car ownership is generally – but certainly not exclusively – associated with urban living and

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**On average, over a quarter (25%) of households in each neighbourhood in this region have no access to a car, while 26% of residents have a life-limiting disability or illness. Travelling to access cash may be a challenge for such residents.**

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<sup>40</sup> It should be noted that this national average also includes heavily urban areas, such as Cardiff and Swansea, parts of which have extremely low levels of car ownership and therefore substantially increase this average. Our case study area therefore has a lower rate of car access than one would expect, especially given its relatively rural nature.

therefore usually with better access to cash infrastructure. People with disabilities, however, tend to live across a wide variety of environments in this region, so are less likely to live in areas with decent access to cash.

We can also consider availability of free ATMs within 1km. This allows us to identify the 28 neighbourhoods (8 per cent of all in the region) which have no free ATM and high travel difficulty, with a further 41 neighbourhoods (12 per cent) having just one free ATM and high travel difficulty.

These areas are highlighted below in Map 7 and illustrate that this is not a problem restricted solely to rural areas; neighbourhoods on the outskirts of urban areas are also often particularly vulnerable.

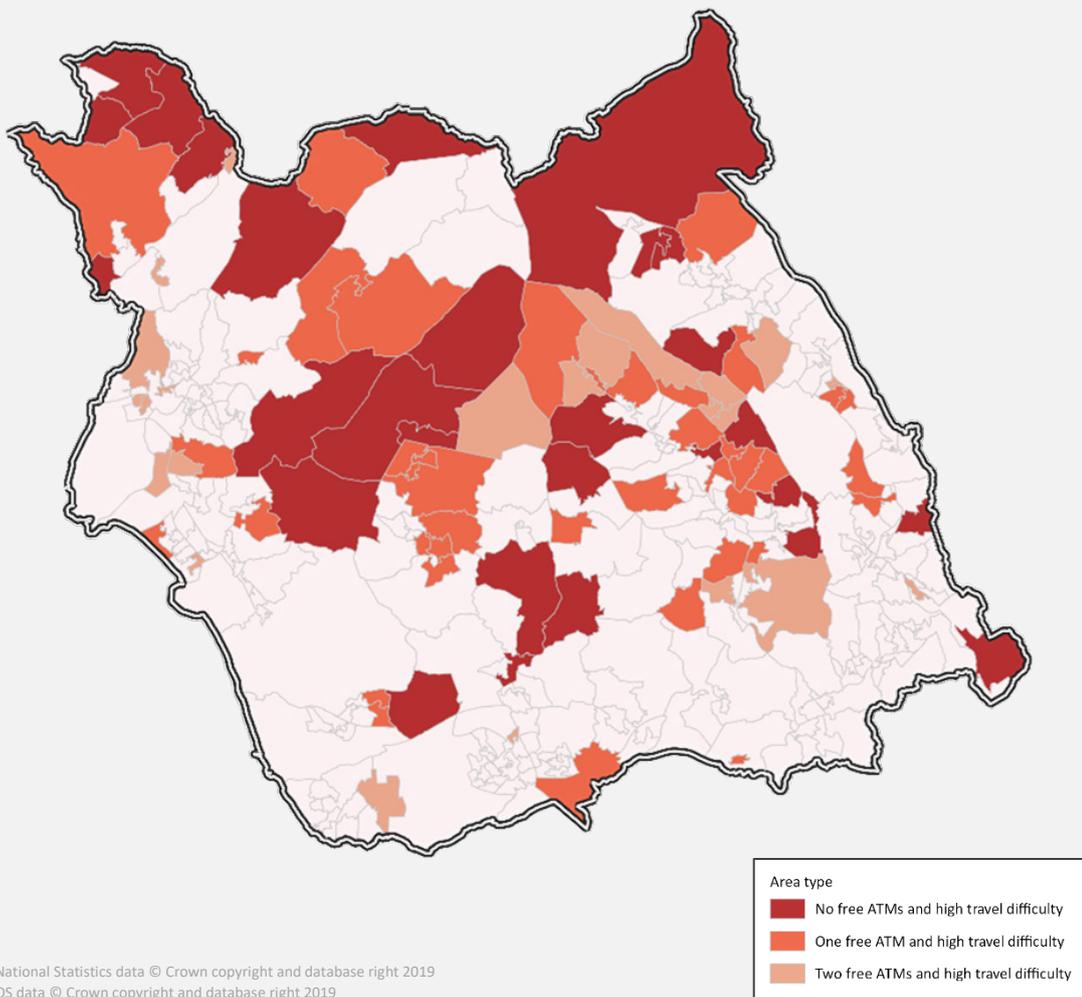
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**Over a quarter (27%) of LSOAs in this region score poorly for both access to cash *and* travel difficulty.**

**Similarly, around 20% of areas score poorly for travel difficulty *and* have no or just one free ATM within 1km.**

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**Map 7 – Areas with a low number of free ATMs within 1km and high travel difficulty.**

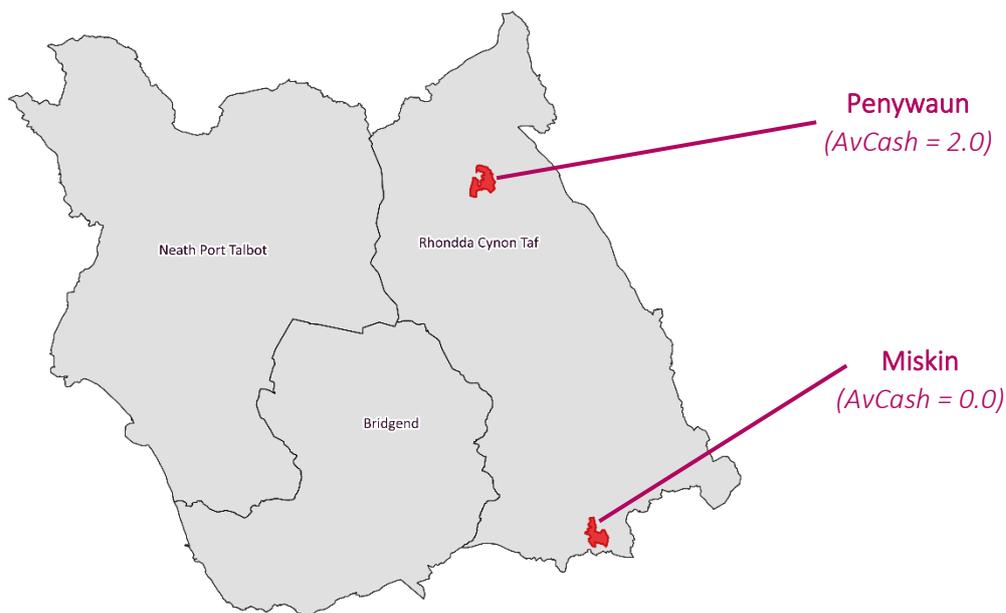


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## Case studies: similar access to cash, very different experiences

To illustrate the importance of considering travel difficulty when looking at access to cash, we have produced two case studies of places that have similar AvCash Index scores but, in reality, vastly different experiences of access to cash. By exploring these places in greater depth, we can start to unpick some of the ways in which the locality, and local population characteristics, can impact on what 'access to cash' may actually feel like for the people who live there.

We have chosen two areas from the region: Penywaun and Miskin (the locations of which are shown below). Both are small settlements on the suburban fringe, and neither has an ATM (free or surcharging) within 1 kilometre. Their geographical locations and the profile of their residents are markedly different, however.



### Case study 1 – Penywaun / Pen-y-waun (AvCash Score = 2.0, and high travel difficulty)

Penywaun / Pen-y-waun is a small village, of around 1,500 residents, high in the Rhondda Cynon Valley. Part of 'the valleys,' this area is typified by its linear development, aligning with the area's natural geography. This topography brings its own issues in terms of accessing cash (and possibly other services), as neighbouring facilities are only accessible in two directions, increasing the distances that residents have to travel.

Penywaun is almost as far north as you can go in the Cynon Valley – only the village of Hirwaun is more northerly. This geographical isolation is compounded by the surrounding road system: the A4509, which is the main road from Aberdare to Hirwaun, runs at the bottom of the village, but this road also curves round to cut Penywaun off from Aberdare. Penywaun is also geographically cut off from Hirwaun by the A465 Heads of the Valleys Road.

The village consists primarily of post-war housing stock, with little economic activity. The Post Office is next to a general store and a café, and there are one or two other businesses nearby. *(Continued on next page...)*

## Case study 1 (continued) – Penywaun / Pen-y-waun

Penywaun scores very highly on the index of multiple deprivation - it is the 9th most deprived LSOA in the whole of Wales. Average house prices are £79,000, way below the Welsh average of £164,000. Half of households in Penywaun (50 per cent) do not have access to a car and nearly a third (31 per cent) have some form of life limiting illness or disability. Overall, many residents will be restricted in their ability to get around easily, and therefore to access facilities outside of Penywaun.

The nearest place to access cash is Penywaun Post Office, which is open weekdays from 9am to 5.30 pm and until 12pm on Saturday. While these opening hours are reasonable, Barclays' recent – albeit now reversed – plans to prevent its customers from accessing cash at the Post Office highlights the potential vulnerability of communities such as Penywaun, where this is the only local way to access cash.

### **Penywaun Post Office – the only accessible source of cash locally**



The nearest ATMs to Penywaun are over 1.5 miles away, which is a good half hour walk each way for someone with reasonable fitness. To access cash from an ATM, Penywaun residents need to travel to Aberdare or Hirwaun, and it is a fair assumption that half of them would need to do this by public transport as they have no access to a car.

There are at least four buses per hour from Aberdare to Hirwaun, which stop on the outskirts of Penywaun. While this is a positive in terms of local access to cash, there is still the cost of public transport and it does not bode well for the Penywaun economy – having travelled to Hirwaun or Aberdare to access cash, there is a strong likelihood of people spending their cash there rather than in the local shops in Penywaun.

## Case study 2 – Miskin (AvCash Score = 0, lower travel difficulty).

Miskin, just north of the M4, is a similar-sized settlement to Penywaun, with around 2,000 residents. Like Penywaun, it scores poorly on our AvCash Index, but – based on our assessment of travel difficulty – the experience of accessing cash is likely to be very different for Miskin residents who are generally more affluent and have high levels of car ownership. The average house price here is around £300,000, putting it considerably above the Welsh average and certainly above Penywaun.

There are, in fact, fewer facilities in Miskin than Penywaun. The Miskin Arms could be seen as the focal point of the village, and there are no ATMs or shops in Miskin itself. The nearest shops and ATMs are in Pontyclun (just over 1 mile away), or slightly further in Talbot Green (2 miles).

### Miskin Arms in Miskin



The biggest difference between Miskin and Penywaun, however, is the ease with which residents can travel around. Only 3 per cent of households in Miskin do not have access to car and fewer than 10 per cent have a life-limiting illness or disability. Overall, it is one of the least deprived LSOAs in Wales. There are good road links to both Pontyclun and Talbot Green, and the easy proximity to the M4 suggests this may be a ‘commuter’ town, where residents could commute for work to Cardiff, Bridgend or even Swansea. In other words, the lack of infrastructure is unlikely to be problematic in Miskin, as most people can easily access what they need elsewhere.

Once at Pontyclun or Talbot Green, there are multiple ATMs (and other facilities), so Miskin seems to have low vulnerability to reduced access to cash. Aside from the nearest ATMs, Miskin commuters may have access to cash near their place of work.

There is also some access locally to public transport. The bus route 122 which goes from Cardiff to Tonypany stops outside the Miskin Arms, linking Miskin with both Pontyclun and Talbot Green once or twice an hour. While the bus services in Miskin are less frequent than in Penywaun, there also seems to be lower need in Miskin.

What is clear from these case studies is that the experience of access to cash is not solely dependent on the amount of cash infrastructure within an area but also on the ease with which local residents can cope without or find alternative ways of accessing cash.

We should, of course, also be wary of assuming that, because the vast majority of people in a given area are unlikely to have much difficulty travelling to access cash, *all* people in that area are unlikely to experience difficulties. Policy-makers therefore should use such a mapping approach with a certain element of caution, perhaps using it first to identify those areas most in-need and offer them additional support, before opening up such support to any other communities who raise concerns.

These case studies illustrate the value of our enhanced Index which combines a measure of vulnerability (travel difficulty) with access to cash. We believe this approach could be used to better target policy interventions. The 'Community Access to Cash Initiative', for example, currently relies on communities applying for support from LINK. While this is a welcome move, the risk is that communities who would benefit from the scheme do not apply to it. Measures such as our enhanced AvCash Index could help ensure that the initiative helps vulnerable communities who need it most, rather than those who 'shout the loudest'.

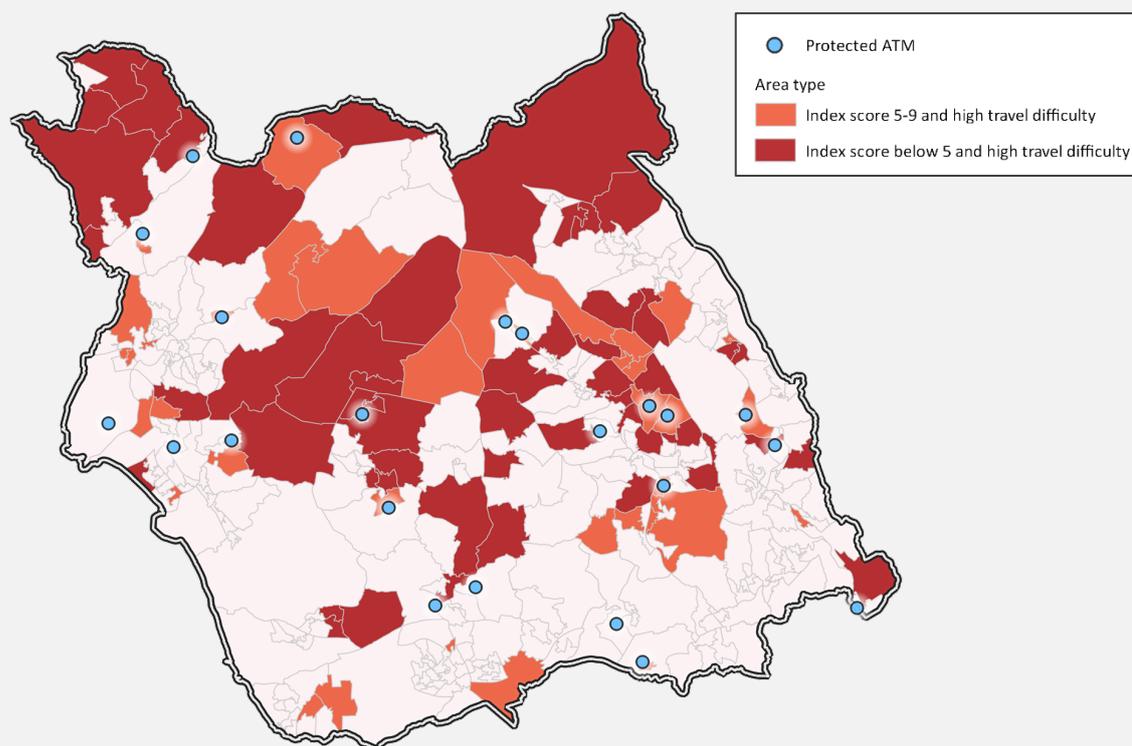
## **ARE PROTECTED ATMS WHERE THEY ARE MOST NEEDED?**

Under LINK's Financial Inclusion programme, at the time of analysis, there were 22 protected ATMs in our South Wales case study region. ATM deployers who operate protected ATMs receive higher fees, thereby allowing the most needed ATMs to remain open, even if they would usually be less profitable to run. The question, however, is whether enough ATMs are currently being protected and, if not, which others should be protected?

In Maps 8 and 9, we show the location of protected ATMs in the region overlaid with a map of the most vulnerable areas (as defined in the previous section), which score poorly for both access to cash *and* travel difficulty. If protected ATMs were placed in those areas which most need them, we would expect the vast majority of them to lie within the red and orange areas on the map, as opposed to the lighter coloured areas. It is evident, however, that this is not the case. While it should be noted that an area may be non-vulnerable because it already has a protected ATM (and so should retain it), there remains a question about why so many of the most vulnerable areas (according to our Index) are not benefitting from a protected ATM.

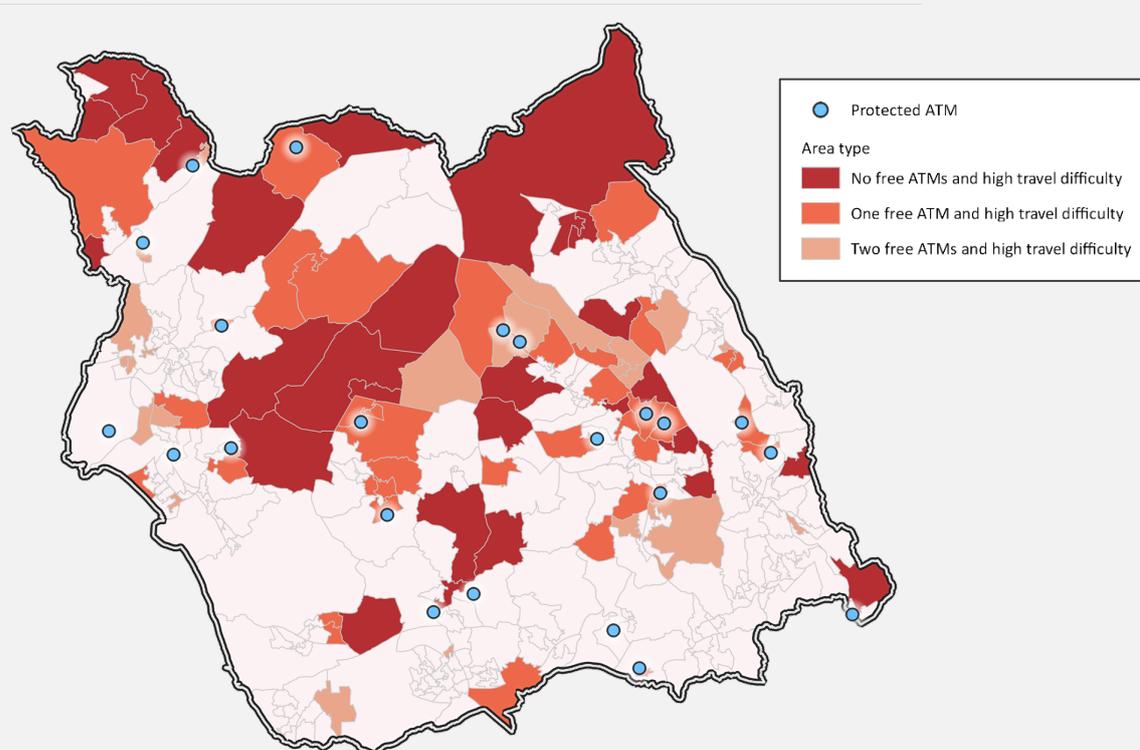
In Tables 5 and 6, we give the number of areas that are vulnerable and do or do not have a protected ATM. This shows that just 11 per cent of the most vulnerable areas (AvCash Index score less than 5 and high travel difficulty) currently have a protected ATM within 1km (6 out of 53 LSOAs). In 28 neighbourhoods this appears to be because there are simply no free ATMs in the area to protect, despite a high number of residents who may struggle to travel to access cash – this raises questions about the fact that protected ATM status depends on the current existence of ATMs, rather than the actual needs of communities (which may currently be under-served). In other cases – such as those that are orange in Map 9 – a free ATM exists but is not currently protected. As we discuss in our conclusions, this may be the result of the fact that the protected ATM scheme considers an ATM isolated if it is not within 1km of another ATM, whereas our methodology takes a community-based perspective, highlighting those ATMs which are the only ATM within 1km of a community in-need.

Map 8 – Areas with a low AvCash Index score and high travel difficulty, with location of protected ATMs.



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Map 9 – Areas with a low number of free ATMs within and high travel difficulty, with location of protected ATMs.



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**Table 5 – Percentage of neighbourhoods with a protected ATM within 1km, by AvCash Index score and travel difficulty measure.**

	Most vulnerable areas AvCash Index less than 5 and high travel difficulty	Quite vulnerable areas AvCash Index between 5 and 10 and high travel difficulty	Less vulnerable areas AvCash above 10 or no travel difficulty
<b>Do not have a protected ATM within 1km</b>	47 areas 89% of most vulnerable areas	24 areas 65% of quite vulnerable areas	216 areas 89% of less vulnerable areas
<b>Have a protected ATM within 1km</b>	6 areas 11% of most vulnerable areas	13 areas 35% of quite vulnerable areas	27 areas 11% of less vulnerable areas
<i>Column total</i>	<i>53 areas</i>	<i>37 areas</i>	<i>243 areas</i>

**Table 6 – Percentage of neighbourhoods with a protected ATM within 1km, by free ATM availability and travel difficulty measure.**

	Most vulnerable areas No free ATMs within 1km and high travel difficulty	Quite vulnerable areas 1-2 free ATMs within 1km and high travel difficulty	Less vulnerable areas More than 2 free ATMs or no travel difficulty
<b>Do not have a protected ATM within 1km</b>	28 areas 100% of most vulnerable areas	41 areas 65% of quite vulnerable areas	218 areas 90% of less vulnerable areas
<b>Have a protected ATM within 1km</b>	0 areas 0% of most vulnerable areas	22 areas 35% of quite vulnerable areas	24 areas 10% of less vulnerable areas
<i>Column total</i>	<i>28 areas</i>	<i>63 areas</i>	<i>242 areas</i>

We might assume that vulnerable areas currently without a protected ATM are rural with limited populations; however, this is not the case. While nearly three-quarters (74 per cent) of the population in this region live in areas that are less vulnerable, over 100,000 people live in areas that are both vulnerable and do not currently have a protected ATM (20 per cent of the region's total population). Even focusing only on those areas that are most vulnerable (scoring less than 5 on the AvCash Index), these are still home to over 35,000 people (7 per cent of the region's total).

The likely number of individuals who are actually vulnerable to detriment because of this will of course be lower, as not everyone in these areas will struggle if they have to travel some distance to access cash. The point, however, is that there is still a considerable way to go if we are to ensure that local access to cash is guaranteed for all who need it.

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**Over 100,000 people in this region live in vulnerable neighbourhoods – with limited access to cash and a high proportion of people likely to find it hard to travel far to access cash – that do not currently benefit from a protected ATM.**

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**Table 7 – Total population of neighbourhoods, based on access to cash vulnerability and whether they have a protected ATM.**

		No. of areas	Total population	Total no. of households
<b>Do not have a protected ATM within 1km</b>	Most vulnerable	47	68,567	29,451
	Quite vulnerable	24	35,846	15,971
	Less vulnerable	216	336,599	142,295
<b>Have a protected ATM within 1km</b>	Most vulnerable	6	8,276	3,471
	Quite vulnerable	13	20,319	8,838
	Less vulnerable	27	43,793	18,545
<i>Totals</i>		313	513,400	218,571

*Population data from 2011 Census.*

# 4. CONCLUSIONS AND POLICY IMPLICATIONS

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In this report we have demonstrated a new way to identify those communities that are most vulnerable in terms of their access to cash, based not just on the availability of – or, more appropriately, lack of – nearby cash infrastructure but also based on the likely ability of local residents to cope without such access.

In doing so, we identify a number of implications for policy-makers:

1. **Geographical mapping approaches are a valuable tool for identifying vulnerability** – we have shown that mapping can be a useful tool in the fight against financial exclusion. The way in which such mapping is conducted, however, is of significance. We recommend that it:
  - a. incorporates the wide **variety of ways in which people can access cash**, rather than relying solely on data about one type of cash infrastructure (for example, ATMs). This is something that UK Finance have recognised in seeking to build a consumer-facing map of all types of channels through which consumers can access cash.<sup>41</sup>
  - b. is **not limited by arbitrary boundaries**; for example, the boundaries between most LSOAs or postcode districts. In most cases, administrative boundaries do not represent physical boundaries ‘on the ground’ for local people, meaning that it makes little sense to restrict counts of cash infrastructure to these boundaries. As we have demonstrated in this report, such approaches tend to over-estimate the problems faced by communities; whereas the radius approach we employ to construct the Index is arguably more realistic and practically useful.
  - c. takes a **community-based perspective to mapping** gaps in infrastructure, rather than an infrastructure-based perspective. By this we mean that it is important not just to see which ATMs have no other ATMs within a given distance, but to consider which neighbourhoods have no ATMs within a given distance. The former, when used to identify possible ATMs to protect, only results in preserving the status quo – rather than identifying those areas which have already lost their infrastructure.
2. **Different business models lead to different outcomes for consumers** – as highlighted previously in our case study of Bristol, different types of organisation appear to take different approaches to service provision, leading to differences in the geographical spread of cash infrastructure. In particular, we find that Post Office branches – due most likely to their network access criteria set by the Government – are more evenly spread than other methods of accessing cash. Assets such as these within local communities should be protected; however, the planned decision by Barclays to prevent customers from withdrawing cash from the Post Office suggests that such services are not guaranteed as we move forward. Policy-makers should do what they can to prevent such moves from happening, or should at least otherwise ensure that an alternative is provided. Commitments from the financial services sector not to disturb such existing arrangements would also be welcome.
3. **Vulnerability should be considered when communities request an ATM** – our analysis shows that two communities with similarly low levels of access to cash may have very different levels of resilience in the event they lose this access. It also shows that more could be done to ensure that the least resilient communities are supported. However LINK’s Delivery Fund, which allows communities to request an ATM, may instead benefit those areas that are better organised or more well-resourced. More vulnerable communities, on the other hand, may

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<sup>41</sup> UK Finance (2019) ‘UK banking and finance industry update on local access to cash’. [website] Available at: <https://www.ukfinance.org.uk/press/press-releases/uk-banking-and-finance-industry-update-local-access-cash>

lack the resources or knowledge to apply, or may be otherwise disenfranchised from the political process of community activism. As such, it could be useful to consider a measure of vulnerability – based on travel difficulty, for example – as part of the assessment criteria when communities apply for an ATM. To take this one step further, the scheme could be advertised or offered more pro-actively to those communities which appear statistically vulnerable.

4. **An expansion of LINK's Protected ATM scheme?** – The current system for protecting ATMs is based on the distance from a given free ATM to the next, rather than the distance from a given *community* to the nearest free ATM. As mentioned above, the current approach simply preserves the status quo, whereas taking a community-based perspective allows us to 'plug the existing gaps' in provision as well. As such, the priority – which may somewhat be tackled by LINK's Delivery Fund – should be on those communities which are most vulnerable and currently have no free ATM. From there, however, there may also need to be an expansion of the protected ATM scheme to cover any free ATM which is the only free ATM within 1km of any vulnerable community – regardless of whether that ATM has a second ATM within 1km of itself (because this second ATM is arguably too far from the community to be within reasonable walking distance). Shifting the perspective to that of the community would arguably make a big difference in terms of outcomes for consumers.
5. **A longer-term system rethink may still be necessary** – while short-term action might curb the worst aspects of financial exclusion, system-wide intervention may be necessary to ensure access to cash can be sustained at a lower cost to providers and users. As part of this, the current system of surcharges and premiums could be redrawn, which may include a redistribution of interchange fees; for example, one that focuses not just on low volume or protected ATMs, but also provides a further progressive reduction in interchange rates for especially high-volume machines. Our Index scores, coupled with transaction volume data, could identify machines that are highly profitable at current interchange rates but are not vital to ensure access to cash locally. Hence, a reduction in interchange fees commensurate with increasing transaction volume could provide an effective means to free up resources which can then be re-allocated to fund free access to cash in vulnerable communities.

Further research may be necessary to consider these implications in more detail. Policy-makers need a clearer vision of what 'good' access to cash actually means to different communities and especially to those individuals currently most dependent on it. This 'lived experience' aspect is crucial to understand; how, for example, are consumers able to cope in the event that they lose access to cash? What formal and informal solutions might they currently be using? Importantly too, we need to understand how access to cash impacts on not just individuals but also businesses and how it contributes to local economic resilience. There is also a need to understand the longer-term pressures facing the system, which may involve critically re-thinking the status of cash infrastructure as a market, and exploring to what extent it should move towards an essential utility. Our research, however, provides a robust methodology from which to consider an evidence-based, nationwide strategy on cash provision.

# APPENDICES

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## APPENDIX 1 – GIS DATA SOURCES

Boundary shapefiles at Local Authority District, Ward, MSOA & LSOA scale:

*Office for National Statistics (2011). 2011 Census: boundary data (England and Wales) [data collection]. UK Data Service. SN:5819 UKBORDERS: Digitised Boundary Data, 1840- and Postcode Directories, 1980-.*

See: <http://discover.ukdataservice.ac.uk/catalogue/?sn=5819&type=Data%20catalogue>,

Retrieved from <http://census.ukdataservice.ac.uk/get-data/boundary-data.aspx>.

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LSOA Population Weighted Centroids:

*Office for National Statistics (2016) 'Output Areas (December 2011) Population Weighted Centroids'. [dataset]. Available at:*

[https://geoportal.statistics.gov.uk/datasets/ba64f679c85f4563bfff7fad79ae57b1\\_0](https://geoportal.statistics.gov.uk/datasets/ba64f679c85f4563bfff7fad79ae57b1_0)

Road network map:

*OS Open Roads [SHAPE geospatial data], Scale 1:25000, Tiles: sn,so,ss,st, Updated: 9 October 2018, Ordnance Survey (GB), Using: EDINA Digimap Ordnance Survey Service, <https://digimap.edina.ac.uk>, Downloaded: 2019-07-18 12:51:37.457*

Digital Terrain Model for Wales:

*Blackwood, Carol. (2017). Wales Land-Form PANORAMA® DTM, [Dataset]. EDINA. Available at: <https://doi.org/10.7488/ds/1757>.*

*Land-Form PANORAMA® DTM from Ordnance Survey Open Data, mosaiced and clipped to a country boundary (derived from OS Open Boundary data) using ArcGIS. 1:50,000 scale DTM. Digital Terrain Model. This dataset was first accessioned in the EDINA ShareGeo Open repository on 2010-07-27 and migrated to Edinburgh DataShare on 2017-02-21.*

QGIS Software:

*QGIS Development Team (2019). QGIS Geographic Information System. Open Source Geospatial Foundation Project. See: <http://qgis.osgeo.org>*

## APPENDIX 2 – DATA SOURCES USED TO CONSTRUCT THE AVCASH INDEX

Infrastructure type	Data source	Notes
ATMs	LINK	Both free and fee-charging ATMs listed
Bank branches <sup>42</sup>	Allied Irish Bank	
	Barclays	
	Co-operative Bank	
	Danske Bank	
	Halifax	
	HSBC	
	Lloyds Bank	
	Metro Bank	
	Nationwide	
	NatWest	
	RBS	
	Santander	
	Tesco Bank	Current account servicing available at Tesco Extra branches
Credit Unions	Bridgend Lifesavers Credit Union	
	Celtic Credit Union	
	Dragonsavers Credit Union	
	Llynfi Valley Credit Union	
Post Office	Post Office	
Supermarkets that provide cashback <sup>43</sup>	Aldi	Offer cashback in all stores (£5 to £75)
	Asda	Offer cashback in all stores
	Co-op	Offer cashback in all stores
	Iceland	Offer cashback in all stores
	Lidl	Offer cashback in all stores (up to £50)
	Morrisons	Offer cashback in all stores
	Sainsburys	Branch-dependent (treated as cashback provider unless ATM already there)
	SPAR	Offer cashback in all stores
	Tesco	Branch-dependent (treated as cashback provider unless ATM already there)
Waitrose	Branch-dependent (treated as cashback provider unless ATM already there)	

<sup>42</sup> Data collected for largest current account providers who participate in the Current Account Switch Service (CASS), as per BACS July 2018 dashboard: [https://www.bacs.co.uk/DocumentLibrary/CASS\\_dashboard\\_-\\_published\\_25\\_Jul\\_18.pdf](https://www.bacs.co.uk/DocumentLibrary/CASS_dashboard_-_published_25_Jul_18.pdf)

<sup>43</sup> The research team phoned the central customer service team of each supermarket to find out whether they offered cashback to their customers.

## APPENDIX 3 – RATIONALE FOR SCORING SYSTEM USED

Having determined how many of each type of cash infrastructure were within 1km of a neighbourhood's centre, it was necessary to weight these results in such a way so as to reflect the extent to which each type of cash infrastructure improves 'access to cash' for those living in that neighbourhood.

As such, we developed a scoring system, which was designed to offer a simple and intuitive way to estimate the ability of people within each neighbourhood to access cash. The scores are based primarily on two factors:

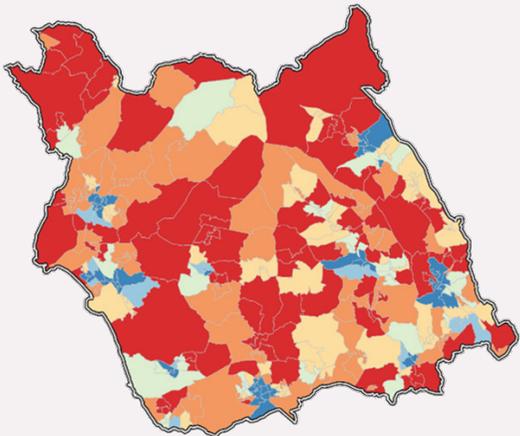
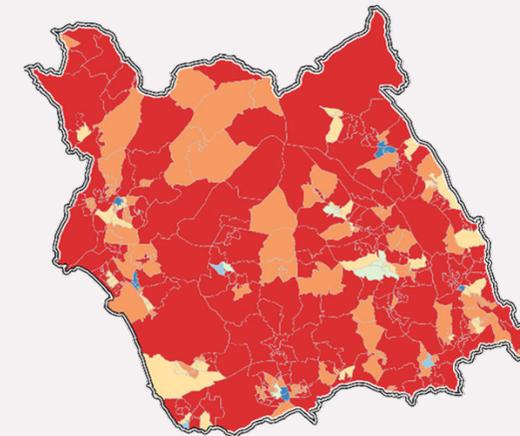
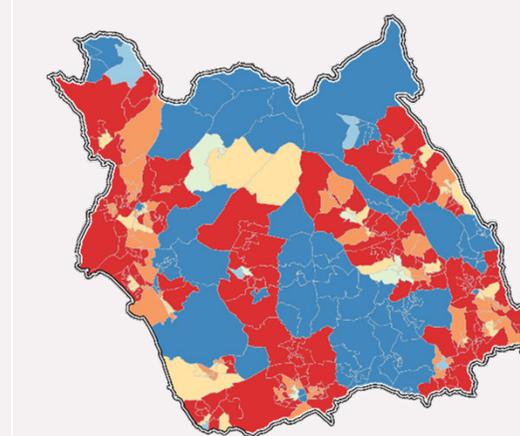
1. the **cost** of accessing cash - whereby free methods are deemed considerably 'better' for access to cash than those where customers are charged a fee or where access to cash is conditional on a separate purchase; and
2. the **availability** of access. This was defined based on the ability to access money:
  - a. at any time (based on the premise that ATMS are more likely to be accessible throughout the night)
  - b. and regardless of whether you are an account-holder of that particular financial institution. Post Offices therefore score more highly than bank branches because a wide range of bank customers can access funds from their account at a Post Office.

Scores – per each individual unit of cash infrastructure, e.g. each free ATM – were therefore given as follows:

Type of infrastructure	Scoring (per unit)	Rationale for scoring
Free ATMs	3	Free to use; most likely to be 24h access on street; withdrawals allowed for customers of any account provider
Post Offices	2	Free to use; limited opening hours; withdrawals allowed for customers of a wide range of account providers
Bank / building society branches	1	Free to use; limited opening hours; withdrawals in-branch only allowed for customers
Credit unions	1	Free to use; limited opening hours; withdrawals only allowed for customers
Cashback providers	0.5	'Free' withdrawal dependent on other purchase(s)
Fee-charging ATMs	-0.5	Charge to withdraw money

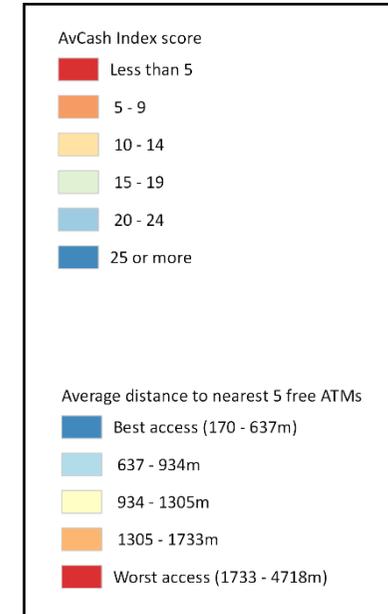
Scores are assigned per unit and therefore do not take into account possible diminishing returns of additional cash infrastructure once a certain amount is provided; however, given our interest is in observing areas with an absence of cash infrastructure (rather than an excess), this is deemed not to be problematic.

## APPENDIX 4 – ALTERNATIVE WAYS OF CONSTRUCTING AVCASH INDEX, COUNTING INFRASTRUCTURE WITHIN DIFFERENT RADII

	1 - Version used in the report (1km radius for all LSOAs)	2 - Version used in previous report for Bristol (500m radius for all LSOAs)	3 - Treat rural & urban differently (500m radius for urban, 3 mile for rural)
<b>Map:</b>			
<b>Minimum:</b>	-2.0	-2.5	-2.5
<b>Median:</b>	9.5	3.0	5.0
<b>Maximum:</b>	75.5	44.0	131.5
<b>Comments:</b>	This was deemed a straightforward objective measure of easy access to cash infrastructure, which was more suitable than the 500m approach used in our previous Bristol case study (2).	A 500m Index clearly scores all areas poorly, except for those which are very urban.	Clearly, this scores rural areas more highly. Rather than basing our analysis on the assumption that those in more rural areas would expect to travel further, we constructed a 'travel difficulty' score to try and quantify this.

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	4 - Radii increases with LSOA size (Smallest 50% of LSOAs in England and Wales have radius of 500m, scaled up to 3 miles for the 10% largest LSOAs)	5 - Mean distance to the nearest 5 free ATMs from the LSOA's population weighted centre
<b>Map:</b>		
<b>Minimum:</b>	-1.0	170m
<b>Median:</b>	19.5	1096m
<b>Maximum:</b>	212.0	4718m
<b>Comments:</b>	While this is more nuanced than the binary rural-urban approach (3), again it is based on an assumption that those in larger, and therefore less densely populated, LSOAs will be able to travel further to access cash, which is not necessarily the case.	Compared to approach 1, this provides an equally, if not more, objective measure of access to free ATMs. However, as the results are very similar and approach 1 is arguably more intuitive / easy to understand, that was the approach we opted for.







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