Europe Economics

ATM Impact Study
Summary Findings

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Summary Findings

The PSR commissioned Europe Economics to conduct a study to look at whether and how potential changes in the LINK interchange fee might affect the future estate of free-to-use (FtU) ATMs in the UK, and the potential number of end users that could be affected. The work is motivated by the possibility of a reduced LINK interchange fee. This is the fee received by ATM deployers (from the card issuer) when a transaction takes place at one of their ATMs and is often the key revenue stream for FtU ATMs.

More specifically, we have sought to investigate the location of ATMs that are potentially at risk if low-volume ATMs were to close, and the quantity and location of potentially at-risk ATMs if unprofitable ATMs were to close. For the analysis of profitability, we have also considered various scenarios for future transaction volumes and interchange fee levels to see how changes in these factors might affect the quantity and location of those ATMs that are potentially at-risk.

The report is intended to be exploratory in nature and to advance the PSR's thinking on how a potential reduction in LINK interchange fee might affect the future estate of FtU ATMs. We have attempted to identify key caveats to the underlying analysis, which is based on in-house analysis of data provided by industry.

Context to this study

Cash remains an important instrument for payment in the UK, despite the increased popularity of other payment forms (e.g. debit cards and mobile payments). In 2016, it remained the most popular form of payment (accounting for 40 per cent of all consumer payments), with particular societal groups, such as those on lower incomes and the elderly, being particularly reliant on this payment form.

While the number of withdrawals has changed little over the last decade (with roughly the same number of withdrawals in 2016 as in 2006), the ATM estate is much larger. In particular, the number of FtU ATMs has grown by more than 50 per cent, and these account for the overwhelming majority of transactions. As of June 2017, there were 70,308 ATMs, 15,554 of which were pay-to-use (PtU), 17,434 FtU branch ATMs and 37,320 FtU non-branch ATMs.[1]

The prevalence of on-us transactions (i.e. where a cardholder withdraws cash from a machine operated by their own card issuer) has fallen in recent years, as the size of the independent ATM deployer (IAD) networks has grown at the expense of card issuer networks, and as the number of branch ATMs (and bank branches) continues to decline. The shift away from on-us transactions means that the number of transactions attracting an interchange fee on the LINK network has continued to grow, even as the overall number of withdrawals has plateaued and fallen.

[1] See LINK website: https://www.link.co.uk/about/statistics-and-trends/.

The level of interchange fees is calculated using a cost recovery methodology, where the interchange fee is calculated by dividing the total cost of operating ATMs by the number of transactions in that year. [2]There are four different interchange fees. These are to reflect the costs of different types of ATM (branch or non-branch) and different types of transaction (cash withdrawal or non-cash transaction).

Methodological approach

This study undertook both a volume and profitability analysis of potentially at-risk ATMs. At-risk ATMs are those FtU ATMs which, according to some metric, can be considered likely to cease operating – either by becoming pay-to-use ATMs or by being decommissioned entirely. Two different metrics were used to determine whether a FtU ATM is at-risk:

- The volume of cash withdrawals that take place at that ATM (the 'volume analysis').
- The estimated profitability (revenues less costs) of that ATM (the 'profitability analysis').

The assessments sought to identify the number of ATMs that were expected to become unprofitable (rather than estimating the expected number of ATMs to close).

Volume analysis

The volume analysis looked at the impacts of the lowest 10 or 20 per cent of ATMs by volume being decommissioned, separately for both branch and non-branch ATMs. The basic assumption is that an ATM would be at risk if it has a relatively low number of transactions per year. The choice of the bottom 10 per cent and 20 per cent of ATMs, when ordered by cash withdrawal volumes, is arbitrary. As such, rather than necessarily being 'at-risk', these are the ATMs that can be considered, in relative terms, to be most at-risk, on the assumption that volume is a good indicator of the at-risk nature of an ATM.

Profitability analysis

The profitability analysis estimated the costs and revenues of individual ATMs in order to estimate their profitability, and then evaluated the impact of unprofitable ATMs being decommissioned.

The profitability analysis was informed by:

- Interviews with ATM deployers, both banks and IADs.
- Data from LINK (and VocaLink) on ATM characteristics (including location) and withdrawal volumes.
- Aggregate ATM cost data from individual ATM deployers and certain ATM-level cost data (on cash handling and occupancy) from a range of IADs.

In undertaking the profitability analysis, we developed ATM-level models of cash and occupancy costs and estimated various profitability metrics to ascertain how many additional ATMs could potentially be at risk. The models used cross-sectional data on ATM-level costs in 2016 collected from a range of IADs, which collectively account for over 50 per cent of all non-branch ATMs.

[2] LINK (2017) "Introduction to the LINK Scheme", page 5.

Our preferred cost model assumes that all own-fill ATMs are operated as efficiently as the most efficient ATM deployers in our sample and that merchant-fill sites continue to be merchant filled. (We also report results for a cost model that assumes out-of-sample deployers have costs that align with those of the least efficient IAD in our sample; and for a scenario where all merchant-fill sites become own-fill ATM sites.)

We distinguish between three different costs types in establishing profitability metrics for ATMs:

- Avoidable ATM costs – these are the costs immediately avoided when decommissioning an ATM. We consider only cash costs to be immediately avoidable on decommissioning an ATM. If an ATM's revenues do not cover the cost of cash then it makes sense (contracts and reputation permitting) to stop filling the ATM.
- Incremental ATM costs – these are the costs incurred in setting up and running an ATM. We consider both cash and occupancy costs as incremental costs (or only commission costs in the case of merchant-fill ATMs). If an ATM's revenues fail to cover these costs, then unless the merchant will agree more favourable terms it does not make sense to renew the contract when it expires (assuming it is not part of a multi-site agreement).
- Total ATMs costs – these are all costs associated with setting up and running an ATM, and the broader network that supports it, thus including various central costs in addition to the incremental costs described above. Central costs per ATM were calculated on a per-deployer basis using data from the LINK interchange fees study. On a site-by-site basis, this may not be decisive as any site generating in excess of incremental costs is helping to cover central costs. But if most of a deployer's sites are not covering total costs, it may be time to consider whether to re-structure the business or exit the industry.

The profitability analysis focuses solely on non-branch ATMs. In part this is because, if the 20 per cent of lowest volume branch ATMs were to close, very few would be likely to be at sites that are strongly isolated (see later explanation in 'Mapping the at-risk ATMs'). Moreover, to predict which branch ATMs are potentially at risk requires understanding the factors leading to the closure of bank branches, rather than identifying loss making branch ATMs, as closing an unprofitable branch ATM, but not the branch, may increase the bank's overall branch costs.

Key findings of the volume analysis

The volume analysis indicates that the country-distribution of at-risk ATMs is broadly in proportion to the country-distribution of all ATMs, with a large majority located in England.

Our analysis finds that a disproportionately high number of IAD-owned non-branch ATMs are potentially at-risk. In total, IADs own around two-thirds of the non-branch ATM estate. However, of the potentially at-risk non-branch ATMs identified, approximately 95 percent are IAD-owned. This is because IADs operate a disproportionately large share of low volume non-branch ATMs.

In contrast, the vast majority of at-risk branch ATMs are found to be bank-owned, though this is not surprising given that 97 per cent of branch ATMs are bank-owned.

Key findings of the profitability analysis

Cash costs

Cash costs are the costs of purchasing, delivering and handling cash. If an ATM has a high volume of transactions then, other things equal, we would expect this ATM to require refilling more frequently than an ATM with a low volume of transactions. This higher number of refills would drive higher cash costs.

The data available to us does indeed show volume of transactions as the key determinant of cash costs, but also that cash costs vary materially between IADs for a given transaction volume. We also found evidence of economies of scale in cash delivery and that ATMs located rurally and/or through-the-wall have higher cash costs.

Occupancy costs

Occupancy costs are the costs of renting the merchant space in which the ATM is located, including the cost of business rates on that space. Occupancy costs are typically fees paid by the ATM deployer to the merchant (site owner). The occupancy cost is usually in the form of a share of the ATM's revenue that the merchant (site owner) receives.

The occupancy cost at each site will depend on the bargaining strengths of the ATM deployer and the merchant. In some cases, the bargaining will have involved agreeing occupancy costs for multiple sites.

We found that occupancy costs tend to increase at a roughly constant rate as the volume of withdrawals increase. Our analysis also indicated that occupancy costs tended to be higher in areas with higher house prices. Several other variables capturing different ATM characteristics, e.g. the type of site (convenience store, leisure centre etc.) and the continuity of access (business hours only, extended hours etc.), were also found to have explanatory power.

Nevertheless, there remains considerable variation in the occupancy costs that our models could not explain. We suspect that there are factors affecting these costs for which we do not have data. While we can identify some candidates, e.g. differences in the share of revenue from cash withdrawals and non-cash withdrawals may affect the attractiveness of a site to a deployer, in practice we doubt it would be possible to identify and collect data for all the factors that might influence costs. Nor is it possible to know the magnitude of any bias the omission of these variables may cause.

Commission costs

Merchant-fill ATMs are sites where the ATM deployer pays a merchant commission to the site owner, in return for which the merchant both hosts the ATM and takes responsibility for re-filling cash. As such, under this arrangement the ATM deployer does not separately identify cash and occupancy costs but rather an overall commission cost.

We developed a separate merchant-commission model, having regard to the same independent variables considered when building the occupancy-cost model. The expected relationships hold, with merchant commissions higher where ATM volumes or property prices are higher.

Profitability

Our profitability analysis shows that, even under the status quo (i.e. with no change in volume and interchange fees), a number of non-branch ATMs may be potentially at-risk. This holds regardless of the profitability measure used, although there is significant variation. These at-risk ATMs may be ATMs that the deployer is already monitoring closely and may plan to decommission in the near future if its profitability does not improve. Alternatively, there are a number of reasons why the deployer might have no immediate plans to decommission them: they are part of a multi-site contract; the ATM deployer plans to renegotiate the contract with the site owner to attain a lower occupancy cost; the one-off cost of decommissioning is too high; and factors other than profitability may matter.

The table below summarises the number of ATMs at-risk under the different profitability metrics, as well as the percentage of the total FtU non-branch ATM estate this equates to.

Number of currently at-risk non-branch FtU ATMs given different profitability metrics

Profitability metric	ATMs at-risk:	
	Number	As % of all FtU non-branch ATMs
Revenue – avoidable cost	112	0.3%
Revenue – incremental cost	1,308	4%

Source: Europe Economics' analysis. Total number of FtU non-branch ATMs at time of analysis is 35,716.

The geographical distribution of at-risks ATMs is broadly in line with the geographical distribution of all ATMs and population (across England, Northern Ireland, Scotland and Wales).

IADs owns about two thirds of all non-branch ATMs, yet we find that approximately 95 per cent of non-branch at-risk ATMs are IAD-owned. Based on our analysis, it would therefore appear that IADs are operating more marginal ATM sites. This is consistent with the finding of the volume analysis.

Profitability analysis under different future scenarios

We also investigated the impact of possible future scenarios on the anticipated profitability of individual ATMs. In particular, we consider the potential impact of 10 and 20 per cent falls in interchange fees (in line with the potential changes currently under consideration by LINK), and different scenarios for the level of transaction volumes, as well as the interaction of the two. We assess these as if they were to occur as one-off 'overnight' changes, rather than through phased decreases over time (i.e. we do not model the dynamics of the change). In investigating these scenarios, we also assume that a change in transaction volumes has no impact on the interchange fee (or vice versa).

The analysis undertaken assumes no feedback loop between withdrawal volumes and interchange fees (i.e. that as the volume of transactions changes the interchange fee would also change for a given total cost of the ATM network).

We found that the impact of reductions in interchange fees on the total number of at-risk non-branch ATMs is likely to be small relative to the total size of the non-branch ATM estate in the case of avoidable or incremental costs (around 1 per cent and 6 per cent respectively). As under the status quo, we found that most of the additional at-risk ATMs are likely to belong to IADs.

We also found that the viability of individual ATM sites is likely to be affected more by a given percentage fall in interchange fees than an equivalent percentage fall in transaction volume. For example, a 10 per cent fall in interchange fees leaves more ATMs at-risk than a 35 per cent fall in transaction volumes (when measuring profitability as revenue less incremental costs).

Our analysis suggests that if the transaction volume falls by 10 per cent over the coming years, then a 20 per cent fall in interchange fees could result in an additional 794 ATMs (2.2 per cent of all FtU non-branch ATMs) being unable to cover their cash and occupancy costs (as seen in the table below).

Additional at-risk ATMs with falls in both interchange fee and volume

	Avoidable costs	Incremental costs
20% fall in interchange fees only	137 (0.4%)	728 (2.0%)
10% fall in volume only	14 (0.04%)	83 (0.2%)
20% fall in interchange fees and 10% fall in volume	166 (0.5%)	877 (2.5%)
Extra sites at risk in low-volume scenario because interchange fees fall	152 (0.4%)	794 (2.2%)

Source: Europe Economics' analysis. Percentages in brackets represent the percentage of all FtU non-branch ATMs affected.

Our analysis also suggests, however, that the business cases for existing deployers may be at risk, even if many of their ATM sites continue to cover incremental costs. In a potential scenario where withdrawal volumes were down 10 per cent and interchange fees 20 per cent lower than today, we estimate that just closing sites unable to cover incremental costs (cash and occupancy costs) may not be enough for a deployer to have a profitable business. The remaining sites would not generate sufficient revenues from interchange fees to also cover central (overhead) costs. The shortfall might exceed 50 per cent of central (overhead) costs

Mapping the at-risk ATMs

Having identified the potentially at-risk ATMs we then mapped the location of these ATMs to understand to what extent they are isolated from other not-at-risk FtU ATMs. It is those at-risk FtU ATMs which are not located near to other FtU ATMs which arguably present the greatest cause for concern when thinking about consumer welfare.

We categorised ATMs into three groups:

- strongly isolated at-risk ATMs – at-risk ATMs for which there are no other nearby FtU ATMs that are not at risk;

- weakly isolated at-risk ATMs – at-risk ATMs for which there is only one nearby FtU ATM which is not at risk; or
- non-isolated at-risk ATMs – at-risk ATMs for which there are at least two nearby FtU ATMs which are not at risk.

We analysed the results for different definitions of 'nearby', namely: 500m, 1,000m and 1,500m distances both on an 'as the crow flies' basis and on a walkable routes basis.

Volume analysis

Using the results of the volume analysis, we find that the overwhelming majority of isolated potentially at-risk FtU ATMs are non-branch FtU ATMs. Indeed, almost none of the low volume branch ATMs are geographically isolated (i.e. there is typically another nearby FtU ATM that could be used in the event that these branch ATMs closed down). Be that as it may, banks told us that the decision on whether or not to keep a branch ATM open is more likely to be linked to the overall decision of whether or not to keep operating the branch.

Our analysis finds that of the lowest quintile of non-branch ATMs at-risk of closure, 431 are strongly isolated (1.2 per cent of all FtU non-branch ATMs), when defined as no other not at-risk ATM operating within 1,500m as the crow flies.

We find that the proportion of isolated at-risk non-branch ATMs by country is broadly in line with the population share of that country, with the majority of isolated at-risk non-branch ATMs located in urban areas and clusters found in major cities (London, Birmingham, Manchester, Glasgow, Belfast etc.).

Profitability analysis

Using the incremental cost measure of profitability, we found that under the status quo 307 at-risk ATMs (0.9 per cent of all FtU non-branch ATMs) would be strongly isolated and an additional 246 (0.7 per cent) would be weakly isolated. Together, this accounts for just over 1.5 per cent of all non-branch ATMs or 48 per cent of all non-branch at-risk ATMs.

If we assume a 20% fall in interchange fees and 10 per cent fall in volumes, the estimates suggest an additional 877 at-risk ATMs (2.5 per cent of all FtU non-branch ATMs). Of these 357 ATMs (1.0 per cent) would be strongly isolated, and 148 (0.4 per cent) would be weakly isolated.

At-risk ATMs are generally located in line with population density, but are more likely to be isolated if located in more rural counties. A fall in the interchange fee by 20 per cent and a 10 per cent fall in volumes would affect ATMs across most of the country, with some rural counties losing a larger proportion of their ATMs.

Our analysis indicates that rural ATMs are more likely to be at risk and geographically isolated than their share of the national network would imply. Rural ATMs currently represent 13 per cent of the total non-branch estate, but would represent 42 per cent of strongly isolated ATMs (and 26 per cent of weakly isolated ATMs) following a 10 per cent fall in volume and 20 per cent fall in interchange fees.

Analysing demographic impacts

The final stage of analysis assesses the expected user impact of isolated at-risk ATMs being decommissioned, by analysing the demographics of areas in which the isolated at-risk ATMs are located. We estimated the affected populations if all strongly isolated at-risk non-branch ATMs in a given scenario were to be decommissioned. To do so we summed the populations of all Census Output Areas which fell within a 500m catchment area of such ATMs.

We find that less than 1.5 per cent of the total residential or working population would likely be affected by the predicted closures (on an incremental cost basis), with a much lower percentage if the focus is on at-risk ATMs based on those unable to cover the costs of filling the site with cash. Neither does the evidence suggest that vulnerable populations would be disproportionately affected. In fact, less than 0.5 per cent of the total elderly population or those living in deprived areas would likely be affected by the closure of isolated at-risk ATMs.

Important caveats to the findings

There are some important caveats to this study that should be borne in mind when interpreting the results. In particular, the analysis does not consider certain 'second-order' effects. By this we mean that the model does not account for how any initial change in the structure of the ATM network (and, in particular, the location of ATMs) would affect the ATM network moving forward, for example:

- If a given ATM closes, the transaction volumes from that ATM may to some extent be redistributed amongst other nearby ATMs.
- If a number of ATMs of a given operator close in a certain area, then the overall cash cost model may change, as it may no longer be cost efficient to continue filling the ATMs independently (the deployer may instead look to third party providers).
- If the profitability of an ATM diminishes due to a fall in transaction volumes and/or interchange fees, then an ATM deployer may be able to renegotiate their contract with the site owner in order to lower occupancy costs. This may be possible because the current market price may not represent the minimum price the site owner is willing to accept to host an ATM.

The above feedback effects are not captured in our modelling. It is also difficult to understand the qualitative implications of these caveats for the results, since these effects can work in competing directions such that the net effect on the results is unclear.