PSR Payment Systems Regulator

Consultation paper

Market review of UK-EEA cross-border interchange fees

Consultation on methodology for developing a price cap remedy

October 2025

MR22/2.8

We thank Professor Michael L. Katz (Professor Emeritus, Haas School of Business and Department of Economics, University of California, Berkeley) for his helpful comments.

We welcome your views on this consultation. If you would like to provide comments, please send these to us by **5pm on Friday 21 November 2025**.

You can email your comments to **cardfees@psr.org.uk** or write to us at:

Cross-border interchange fees market review
Payment Systems Regulator
12 Endeavour Square
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We will consider your comments when preparing our response to this consultation.

We will make all non-confidential responses to this consultation available for public inspection.

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Contents

1 Executive summary

Introduction

1.1 In the final report on our market review of UK-EEA cross-border interchange fees (IFs) between the UK and the European Economic Area (EEA), we concluded that IFs on UK-EEA card-not-present (CNP) outbound transactions had increased to unduly high levels.

1.2 We found that these increases had negatively affected merchants and, to the extent of pass-through, their customers. We estimated that, in 2022 and 2023, UK businesses paid an extra £150-200 million per year in IFs to EEA issuers, compared with what they would have paid if the outbound IFs had stayed at the previous levels. We also found no evidence of countervailing benefits or innovation to justify the IF increases (such as improved fraud prevention, or improved quality or efficiency of the card payments systems to the benefit of UK merchants).

1.3 We concluded that the only effective remedy to address the detriment would be a price cap on the multilateral IFs (MIFs) for UK-EEA CNP transactions, that is, payments to UK merchants generated with an EEA-issued card (also known as 'outbound' IFs).

1.4 We stated that a cap set at an appropriate level would be proportionate and consistent with supporting sustainable growth in the UK economy. Alternative actions related to UK-EEA CNP transactions, which would not directly cap outbound MIFs, would result in a continuous unnecessary cost to UK merchants and their customers, while a price cap remedy would mitigate the adverse impacts.

1.5 We said we would consult on the methodology for assessing an appropriate cap for outbound MIFs and that the outcome of that consultation would inform our next steps. **We are now seeking views from stakeholders, via this consultation, on our proposed methodology for taking this work forward.**

1.6 We consulted separately on whether to have a two-stage process and impose a first-stage, interim price cap while developing the longer-term cap. We have now decided not to proceed with a first stage cap; our reasons for this decision are set out in the statement of reasons we are publishing alongside this consultation.

1.7 Following the launch of that consultation, we were notified that Mastercard, Visa and Revolut had filed with the court their applications for judicial review of our proposal to impose a price cap. We are robustly defending the judicial review and consider it appropriate to continue with the work needed to give effect to the findings set out in our final report. This work is an important step forward in our regulatory role, ensuring we are able to respond more promptly following that judgment. In any event, we envisage that the analysis we propose to undertake to determine the appropriate level for UK-EEA interchange fees will also have relevance for the wider work of the PSR.

1.8 As a consultation on methodology, this document is technical. The main features of our proposal are summarised below.

Our proposed approach and rationale

1.9 We are planning to use the merchant indifference test (or MIT) as a starting point. The MIT explores the question of whether a merchant would refuse a card payment if he were certain that a customer who was about to pay at the cash register had an alternative means to pay. The test is passed if accepting the card does not increase the merchant's operating costs, therefore making the merchant indifferent between a card transaction and one using the alternative payment method.

1.10 Based on the results of the MIT and on evidence of the impact of IFs on issuers' incentives and on competition between payment methods, we will then reach a view on an appropriate cap.[1]

Applications and limitations of MITs

1.11 We have considered various methodologies for developing the price cap. Historically, the MIT has been widely applied by competition authorities and academic researchers. In particular, the European Commission conducted a MIT in 2015 to assess Mastercard and Visa's MIFs, gathering data on merchants' payment acceptance costs via a survey of large merchants in ten EU countries. The results were used to set the caps in the EU Interchange Fees Regulation (EU IFR) for domestic and intra-EEA transactions. We understand that the decisions on the caps set in the commitments accepted by the European Commission for inter-regional transactions in 2019 were also made with reference to the MIT.[2]

1.12 Among those that regulatory authorities have used to cap MIFs, the MIT is currently the most consistent with our statutory objective of ensuring payment systems are operated and developed in a way that takes account of, and promotes the interests of those who use, or are likely to use, them (in this case, cardholders and merchants). The MIT recognises the two-sided nature of this market and the need for the IF to be at an adequate level so that an efficient use of cards can jointly benefit consumers and merchants.

1.13 Nevertheless, we recognise some limitations of the MIT, especially when applied to cross-border CNP transactions, which we discuss in Chapter 2. Although we plan to use the results of the MIT to help us determine the level of the cap, we will make our assessment in the round, having regard to some issuer-side considerations alongside the outcome of the MIT. In particular, we will consider the effects of MIFs on issuers' incentives, on innovation in payment services, and on competition between payment methods.

1.14 We consider this aligns with our statutory objective of promoting effective competition, innovation and service users' interests.

Implementing the MIT

1.15 In implementing the MIT, we plan to use best practice, applying the principles we have derived from our review of how the MIT has been performed in the past, to the specific circumstances of the cross-border CNP.

1 See Figure 1, below (in Chapter 2 of this consultation document) for a summary of this approach.

2 https://ec.europa.eu/commission/presscorner/detail/el/ip_19_2311

Selecting relevant comparators

1.16 We will consider a number of principles to help us select suitable comparators:

- The same comparators can be used for debit and credit cards.
- Alternative means of payment should be available for consumers or easily implementable by merchants in the UK.
- Payments should be provided in a secure medium of exchange.
- The comparators' charges should not be affected by circularity, that is, should not depend on the schemes' present pricing.
- The comparators' charges should not be inflated by the exercise of market power by their providers.

1.17 On the basis of these principles, we propose to use only payments funded via bank transfers within the Single European Payment Area (SEPA) as the relevant comparators for the purposes of our study. This is consistent with the methodology applied by the EC for its 2019 Commitments for CNP inter-regional payments. As merchants and payment methods vary, we expect to obtain a range of possible MIT-based IFs.

Identifying the relevant costs

1.18 The MIT methodology is premised on the exclusion of the fixed costs that merchants face. However, test results can be very sensitive to the split between fixed and variable costs. As we aim for a cap that gives the right incentives in the long term, including potential changes in transaction volumes, we consider that the split should be based on a long-term horizon. Testing the sensitivity of the results can be done by assessing the fixed and variable cost split under different assumptions.

1.19 In the context of online UK-EEA cross-border transactions, the relevant cost components are more limited than in other types of transaction. This means some of the costs considered in other MIT studies are not relevant for our purposes. We propose some guiding principles to be followed when selecting the cost items to analyse:

- **Include relevant fees and special features,** such as any features that make the provision of payment services different (in terms of the costs and benefits accrued to the merchant).
- **Exclude equivalent and similar costs,** that is, costs that are the same for the different payment methods.
- **Ignore small costs,** if these are negligible (no significant impact on the results).

1.20 Based on these principles, Table 3 in Chapter 5 lists the cost categories we propose to consider.

Estimation methods

1.21 The MIT requires estimating the marginal costs of cards, and the alternative payment method(s), and the average transaction value. The choice of estimation method can affect the results of the test.

1.22 There are two approaches to estimating marginal costs – the arithmetic approach and the econometric approach. These are discussed in Chapter 6. For the reasons summarised there, we plan to use both, and then apply our judgement to determine an overall estimate.

1.23 There are two different methods for obtaining the transaction value at which to evaluate the MIT-based IF. The 'card-based' approach represents recent card purchases, whereas the 'retail-based' approach speculates on a future value of the market as one that includes all purchases (through cards and alternative payment methods). We propose to use both approaches, although in the context of UK-EEA CNP payments, the current prominence of card transactions makes it likely that both will yield very similar results. With each approach, we will use sensitivity analysis to assess the MIT results' robustness.

Data sources

1.24 In conducting the MIT, we will rely on data from different groups of stakeholders, such as card schemes, acquirers and merchants, and we expect to combine different datasets (see Table 4 and Table 5 in Chapter 7). The types of data we intend to collect will include information on merchants' transactions, fees paid, and the total value of this market. We will also request details on merchants' names so we can list merchants and acquirers to interview. A draft questionnaire, with indicative questions for merchants, is included at the end of this document.

1.25 On issuers' costs, we will develop an analysis like the one in Annex 2 of our final report, but expanded to cover more UK issuers, and focusing on direct card transaction costs.

Table 1: Our proposed approach to setting the Stage 2 cap

Aspect of the analysis	Preferred course of action	Additional considerations
Merchant indifference test		
Relevant comparators	Means of payments funded by SEPA bank transfers	If we identify multiple comparators, we are proposing using a weighted average of their costs
Categories of merchant costs for payment transactions via cards and alternative payment methods	Only variable costs will be included in the analysis, encompassing: • costs of service purchased by the merchants (e.g. acquiring-related costs) • back-office costs (e.g. costs related to frauds and chargebacks) • costs related to additional special features purchased	Excluded costs: • Fixed costs, as not relevant for setting the caps • Negligible costs and costs that are equivalent for cards and their comparators
Estimation method	We plan to use both the arithmetic and the econometric approaches	

Aspect of the analysis	Preferred course of action	Additional considerations
Data collection method	We will send: • formal information requests to card schemes and acquirers • questionnaires on costs to relevant merchants	Data collected at merchant level, including: • transactions made in the EEA-to-UK CNP payment channel • information on the relevant costs described above
Further analysis		
IF pass-through	We will consider the extent to which IFs are passed through as benefits to cardholders	
Issuer incentives to invest	We will consider the impact of IFs on issuer incentives to invest in issuing services	Based on an analysis of issuers' revenues, costs and recent investments
Competition between cards and other payment methods	We will consider the impact of IFs on competition between payment methods, including: • issuers' incentives to support innovative payment methods • payment methods providers' ability to compete for merchants	Based on an analysis of issuers' revenues and costs (to check whether profits on cards are so large to disincentivise support for alternative payment methods), and of merchants' fixed costs of adopting alternative payment methods

Structure of this document

1.26 This consultation focuses on the methodology we propose to adopt in identifying an appropriate level of MIF in the UK-EEA CNP outbound corridor. We set out:

- our proposed approach to setting a MIF cap (Chapter 2)
- implementing the MIT (Chapter 3)
- our proposed approach to selecting the comparator in a MIT (Chapter 4)
- our proposed approach to including different cost components (Chapter 5)
- potential approaches for deriving the MIT-based IF (Chapter 6)
- a summary of the data sources envisaged for undertaking a MIT and for our overall approach to a MIF cap (Chapter 7)
- a summary of consultation questions which we seek stakeholders' views on, and an indication of the next steps in our work (Chapter 8).

1.27 This document is supplemented by five annexes:

- Annex 1 – examples illustrating the logic of the MIT
- Annex 2 – a review of the literature relevant for the non-MIT part of our analysis
- Annex 3 – a summary of recent empirical papers using the MIT for assessing IFs
- Annex 4 – the formulas for deriving the MIT-based IF
- Annex 5 – indicative questions for the merchants' survey.

Who this applies to

1.28 This document is relevant to four-party card scheme operators, card issuers, card acquirers and merchants, as well as industry groups and trade bodies representing them.

1.29 Other stakeholders that may be interested include: other scheme operators, EEA-based card issuers and firms based in Gibraltar, Jersey, Guernsey and the Isle of Man.

How to respond

1.30 If you want to respond to this consultation, please do so by 5pm on Friday 21 November 2025. We welcome all feedback on the current views in this document, and highlight issues where we would particularly welcome stakeholder feedback and accompanying evidence. A full list of the consultation questions is in Chapter 8. You can email your responses to cardfees@psr.org.uk.

Next steps

1.31 This consultation is the first in a series of steps towards developing a price cap on UK-EEA cross-border CNP IFs. We will consider all submissions when assessing what our methodological approach should be. Following the consultation, we will undertake the analysis that will allow us to assess an appropriate level for UK-EEA outbound cross-border MIFs for CNP transactions. Once that is complete, and subject to the outcome of the judicial review proceedings, we will consider our next steps. We would publish a statutory consultation setting out the proposed level of any cap before taking a final decision on whether to impose a price cap.

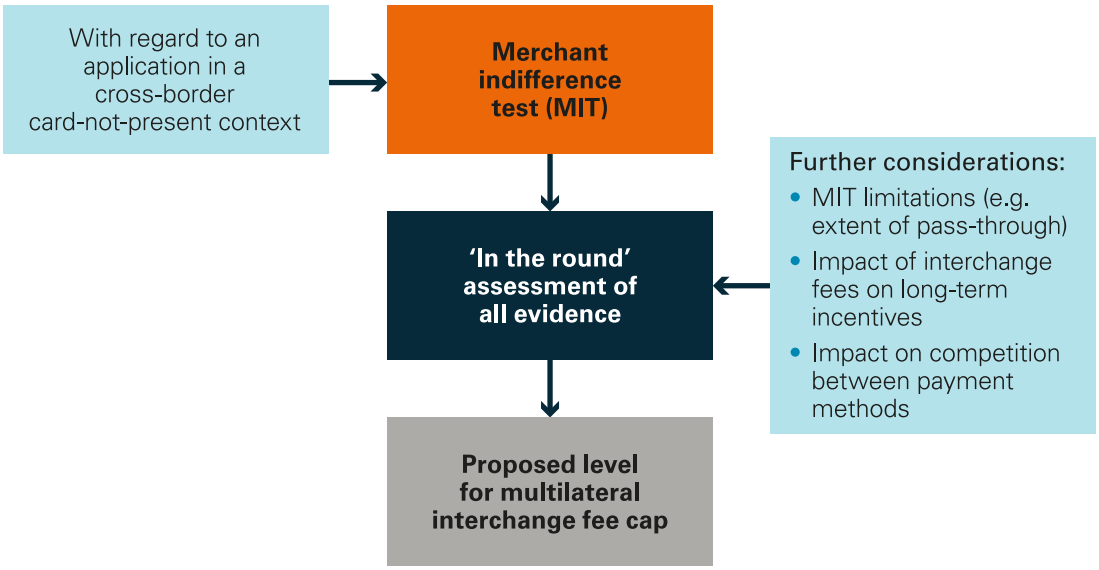
2 Our proposed approach to a MIF cap for cross-border CNP UK-EEA transactions

This chapter sets out our proposed approach to a multilateral interchange fee (MIF) cap for cross-border card-not-present (CNP) UK-EEA transactions. It explains why we consider the merchant indifference test (MIT) an appropriate starting point for the cap. It also outlines the limitations of the MIT and discusses how we plan to account for those by integrating the analysis with considerations on the impact of interchange fees (IFs) on long-term incentives and on competition between cards and other payment methods.

Introduction

2.1 This chapter outlines our proposed approach to developing a MIF cap. This is summarised in Figure 1.

Figure 1: Our proposed approach to a MIF cap



2.2 The chapter is structured in five sections:

- Background information on four-party schemes and the role of IFs.
- Review of past regulatory practice in regulating MIFs and the criteria we have followed in assessing the appropriate methodology for setting a cap.
- Outline of the MIT's logic and why we consider it an appropriate starting point for determining a MIF cap.
- Discussion of a MIT-based methodology's limits and how we will integrate the analysis by assessing the impact of IFs on long-term incentives and on competition between cards and other payment methods.
- Consideration of alternative approaches to setting a MIF cap and explaining why we propose not to follow them.

Four-party schemes and IFs

2.3 IFs take place in four-party payment card schemes.[3] This type of payment model describes a network where a card payment system operator (card schemes like Mastercard and Visa) coordinates four different players:[4]

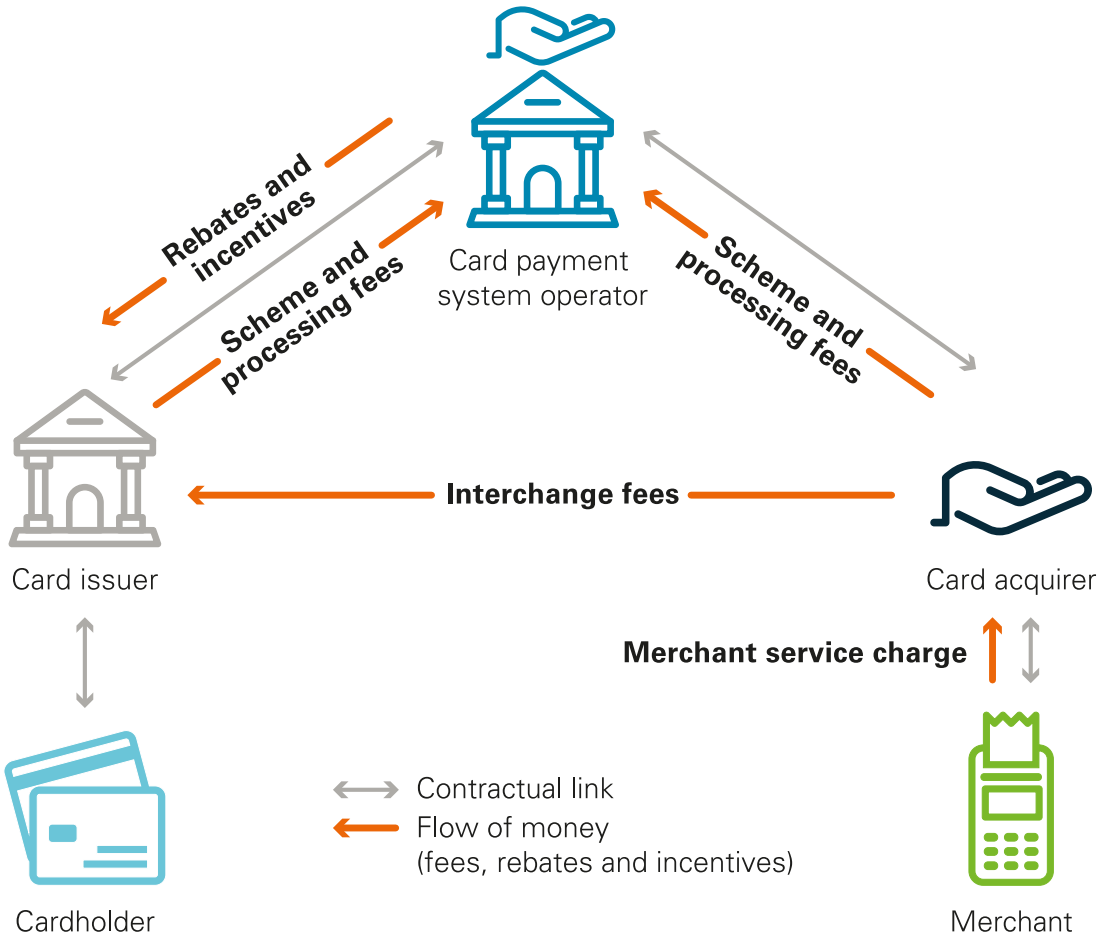
- **Cardholder:** an individual or entity that owns the card and initiates the payment.
- **Issuer:** a financial institution (usually a bank) that issues the card to the cardholder.
- **Acquirer:** a financial institution (a bank) that processes the payment on behalf of the merchant.
- **Merchant:** a business (or individual) receiving the payment.

2.4 Under this model, card schemes like Mastercard and Visa connect issuers and acquirers. At various stages, processing fees are charged. These include scheme and processing fees, IFs, and other fees charged by the acquirer, as shown in Figure 2. The entire process is made to ensure that the transfer of funds between the cardholder and the merchant is secure and efficient.

3 A four-party payment card scheme is a payment network consisting of many member banks which issue payment cards to cardholders and acquire card payments for merchants in competition with each other. By contrast, three-party payment card schemes like American Express and Diners Club traditionally provide issuing and acquiring services for their cards directly, without involving interactions between banks. Traditionally, both three-party and four-party schemes have decided to charge a large part of their fees on the merchant side. In the case of four-party schemes, this has often implied the imposition of IFs (see MR22/2.6, *Consultation paper: Market review of UK-EEA consumer cross-border interchange fees*, (December 2023)).

4 See Chapter 3 of MR22/2.7 *Market review of UK-EEA cross-border interchange fees final report* (December 2024).

Figure 2: Simplified structure of a four-party card payment system



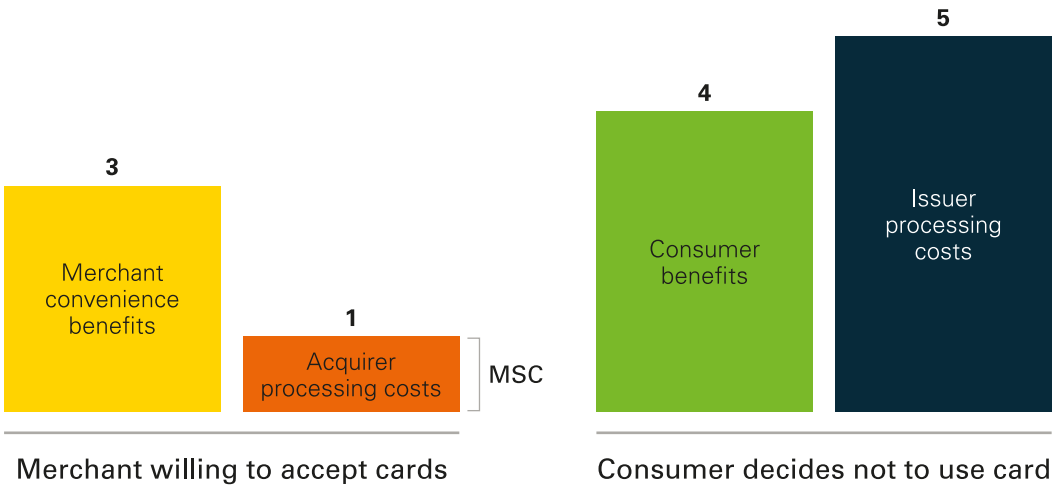
2.5 Key to this model is the money transfer in the form of the IF, which goes from the acquirer to the issuer. In the context of four-party schemes, IFs are seen as a tool to balance the costs between the two sides of the market, to ensure each side benefits sufficiently from using payment cards. IFs can increase the benefit for both merchants and cardholders if they incentivise an efficient use of cards.[5]

2.6 Four-party card schemes like Mastercard and Visa set a MIF, which is the default IF that applies in the absence of any other rate agreed between an issuer and an acquirer. In practice, such alternative agreements occur very rarely.

2.7 The rationale for using IFs has been described as a way to rebalance transaction costs between cardholders and merchants. An imbalance of benefits and costs between the two sides of the market may result in card transactions not taking place even if it would be socially efficient for this to happen. In the stylised example in Figure 3, the total benefit of using cards (compared to an alternative) exceeds the total costs – 7 versus 6. However, although merchants are willing to accept cards, as their convenience benefits exceed the fees they have to pay (the merchant service charge, or MSC), consumers are unwilling to use a card as card processing costs on the consumer/issuer side exceed benefits on the same side.

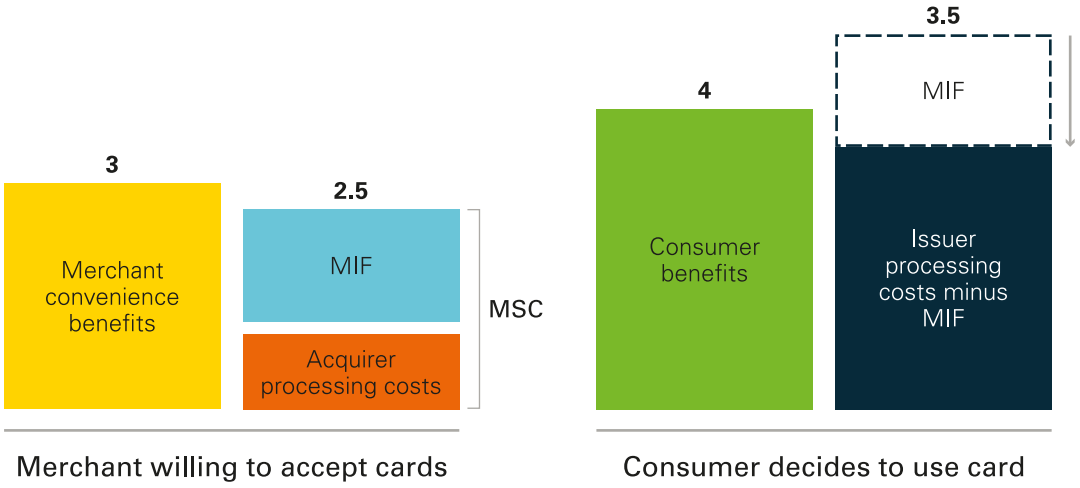
5 The efficiency rationale for IFs was first shown in a modern context in a paper by William Baxter; see Baxter, William F. (1983), 'Bank interchange of transactional paper: Legal and economic perspectives', *The Journal of Law and Economics*, 26(3):541-588.

Figure 3: Example of cost imbalance preventing socially efficient card transactions from taking place



2.8 In such a case, an IF can rebalance transaction-related costs so that both merchant and consumer are willing to accept and use cards. As shown in Figure 4, in the same stylised example, a MIF of 1.5 reduces net costs on the consumer side to 3.5, now lower than the consumer benefits of 4; it increases costs on the merchant side, which however still do not exceed the merchant's benefits.

Figure 4: Example of IFs rebalancing costs enabling a socially efficient use of cards



Regulating MIFs

2.9 The economic literature has long recognised that card schemes may have an incentive to set higher MIFs than the level that promotes the efficient use of cards, because merchants will accept cards even if the fees they pay – the MSC – are higher than their convenience benefits.[6]

2.10 Different jurisdictions have taken different approaches to regulating MIFs to lower their level (or prevent their increase). Some authorities, such as in the US,[7] focused on setting caps on IFs using an approach based on issuers' costs. The European Commission, which had also adopted such an approach,[8] later used the MIT as the basis for its 2015 regulatory intervention and in the context of negotiated commitments in 2019.[9]

2.11 We concluded in our final report that a price cap on outbound MIFs is the only effective potential action to address the detriment to service users we identified. Having shown that current IFs in this corridor are unduly high, we seek to identify an appropriate IF level, which ought to have a positive effect on innovation and competition compared to the current counterfactual. This in turn will have a positive impact on growth.

2.12 When considering an appropriate level for a cap on UK-EEA cross-border outbound MIFs we need to: (i) consider the most appropriate methodology and (ii) determine the basis for calculating the cap in practice.

2.13 Here we explain why we think the MIT is the most appropriate starting point for calculating a cap.[10] We also explain why some limitations of the MIT, especially when applied to a CNP context, leave scope for other considerations and for an 'in the round' assessment of all available evidence to determine the most appropriate level of the cap.

2.14 We base our assessment on our statutory objectives:[11]

- to ensure that payment systems are operated and developed in a way that considers and promotes the interests of those that use or are likely to use them (our 'service user' objective)
- to promote effective competition in the markets for payment systems and markets for services provided by payment systems in the interests of those who use, or are likely to use, services provided by payment systems, in particular between operators of

6 For reviews of the literature, see Verdier, Marianne (2011), 'Interchange Fees In Payment Card Systems: A Survey of the Literature', *Journal of Economic Surveys*, 25(2):273-297; and Rysman, Marc, and Wright, Julian (2014), 'The Economics of Payment Cards', *Review of Network Economics*, 13(3):303-353. Merchants' willingness to accept cards even if the fees they pay are higher than their convenience benefits is referred to in the literature as 'merchant internalisation'. While this can depend on the fear of losing customers to other merchants, merchant internalisation can be present even when merchants are monopolistic. In general, when a merchant accepts cards, it is improving the quality of the service it offers consumers; this increases consumers' willingness to pay, therefore allowing merchants to charge a higher price. The more surplus the merchant can offer consumers by accepting cards (and extract from them through pricing), the higher the fees that the merchant is willing to pay to do so.

7 See Durbin Amendment of the Dodd-Frank Act, 2010.

8 See Case No COMP/29.373 — Visa International.

9 We also note that, in July 2025, Visa agreed with the Swiss Competition Commission (COMCO) to lower its outbound interchange fees for Switzerland-EEA transactions.

10 How the cap can be calculated in practice is discussed in Chapter 3.

11 While the PSR's functions will be integrated within the FCA, we expect these objectives will continue to constitute the basis for the regulation of payment systems, as proposed in Chapter 3 of the government's consultation document, *A Streamlined Approach to Payment Systems Regulation*.

payment systems, payment services providers and infrastructure providers (our 'competition objective')

- to promote the development of and innovation in payment systems in the interests of those who use, or are likely to use, services provided by payment systems, in particular the infrastructure used to operate those systems (our 'innovation objective')

2.15 We are also mindful of the government's recommendations, coming out of the National Payments Vision, that there remains a need for proportionate, effective regulation that allows firms of all sizes to grow and creates a stable attractive environment, which encourages businesses to establish and expand in the UK,[12] and adequately protects consumers.

What is a merchant indifference test (MIT) and why should we use it?

2.16 To align with our 'service user' objective, a MIF cap should promote an efficient use of cards in cross-border CNP transactions, that is, a use that maximises overall benefits for both merchants and consumers. To the extent that it reduces the exercise of market power, it is also consistent with our competition objective.

2.17 The MIT, built on ideas first proposed by Joseph Farrell in 2006[13] and further developed by Jean-Charles Rochet and Jean Tirole in 2011[14], was designed to identify the IF level that, under some conditions, maximises the combined surplus of merchants and consumers (referred to in the literature as Total User Surplus (TUS)).

2.18 The MIT is based on the principle that, in order to achieve an efficient use of cards, when consumers choose between cards and an alternative payment method, they should have regard to the net convenience benefit that merchants derive from a card transaction instead of using the alternative.

2.19 If this happens, then consumers will choose to use a card rather than the alternative if, and only if, this choice is jointly beneficial to both consumer and merchant.[15] This therefore maximises TUS.

2.20 For this to happen, the IF should be set at a level equal to the merchant's net convenience benefit of cards over the alternative, therefore making the merchant indifferent between a card transaction and one using the alternative payment method. We refer to this IF level as the indifference IF (IIF).[16,17]

12 As the government has announced that the PSR's functions will be integrated within the FCA, we also note the FCA's secondary international competitiveness and growth objective.

13 Farrell, Joseph (2006), 'Efficiency and Competition between Payment Instruments', *Review of Network Economics*, 5:26-44.

14 Rochet, Jean-Charles, and Jean Tirole (2011), 'Must-take cards: Merchant discounts and avoided costs', *Journal of the European Economic Association*, 9:462-495.

15 This approach implicitly assumes that consumers rationally choose between alternative payment methods. We are conscious that consumer choices are often affected by behavioural biases. The MIT abstracts from it.

16 The IIF corresponds to the IF level at which a transaction undertaken when a consumer decides to use a card does not make the merchant worse off than if the consumer had used the alternative payment method instead. In other words, if a card is accepted, this does not increase the merchant's operating costs (hence renders a merchant indifferent between card and alternative payment method). Other studies have referred to the IIF as the 'MIT-MIF', or the 'Tourist Test interchange fee level'.

17 As a test, the MIT is said to be passed if the market IF is not higher than the IIF.

2.21 Annex 1 presents some examples that illustrate the logic of the MIT.

2.22 Using an IF that is compliant with the MIT has been described by the European Commission as 'inducing an equilibrated competition between payment instruments, which takes account not only of the benefits that cards provide for cardholders but also of the effect this choice has for merchants'.[18]

2.23 This underlying logic, which is consistent with our statutory objectives, is why we consider the MIT a good starting point for determining the cap.

2.24 As seen in paragraph 2.10, the European Commission has adopted a MIT methodology as the basis for its 2015 regulatory intervention (EU IFRs) and in the context of negotiated commitments.[19] The use of the MIT methodology by the European Commission in 2015 has resulted in the current MIF caps on UK domestic transactions being set on the basis of the MIT.

2.25 The use of a similar approach for UK-EEA cross-border transactions may therefore reduce the risk of unexpected distortions, which could be more likely if MIFs for different types of transactions were determined using very different approaches.

Limitations of the merchant indifference test and additional analyses

2.26 One of the PSR's statutory objectives is to promote the interests of users and likely users of payment systems. As stated in paragraph 2.17, the IIF is the optimal IF level to promote user interests only under specific conditions. This section reviews some of the limitations of the MIT and describes the analyses we envisage will complement our approach. Annex 2 reviews the literature on the issues in this section.

2.27 The impact of IFs critically depends on the degree of pass-through from issuers to cardholders. In Rochet and Tirole's (2011) model, the IIF maximises TUS only when issuers' margins do not depend on the IF level. This is the case if IFs are fully passed through to cardholders in the form of incremental benefits on a per-transaction basis, be it from cashbacks, card-issuing cost reductions, or otherwise. However, issuers told us that the additional revenue stream from increased IFs is not purposely reinvested for the benefit of cardholders (for example, into better anti-fraud systems).[20] If this is confirmed to be the case, IFs would not have the effect of lowering cardholders' marginal costs of a card transaction, and therefore would not change their incentives on whether to use their card. In general, the lower the pass-through of IFs into transaction-related benefits for cardholders, the lower the IF level that maximises total user surplus. As Rochet and Tirole (2011)[21] recognised, in the presence of partial pass-through from issuers to cardholders, the IF level that maximises total user surplus would be lower than the one implied by the MIT.

18 EC (2015), paragraph 71.

19 See EC, *Survey on merchants' costs of processing cash and card payments – Final results*, *March 2015*, Publications Office of the European Union, 2015. The MIT has also been applied in studies focused on specific countries, both in Europe and elsewhere. See Bolt et al. 2013, in relation to the Netherlands; Górka (2014), in relation to Poland; Arango-Arango et al. 2022, in relation to Colombia; Aurazo and Vega 2021, in relation to Peru (see Annex 2).

20 See MR22/2.6: *Market review of UK-EEA consumer cross-border interchange fees interim report*, Annex 2.

21 See also Rysman, Marc, and Wright, Julian (2014), 'The Economics of Payment Cards', *Review of Network Economics*, 13(3): 303-353.

2.28 Moreover, the MIT aims to maximise 'static' user surplus and fails to consider wider factors that shape cardholders' behaviour. In particular, when calculated at a specific moment in time, the MIT does not consider the long-term impact IFs may have on issuers' decisions, including on investments and innovation. The possible impact can be twofold:

- On the one hand, IFs can incentivise issuers to invest in their services, such as infrastructure and fraud prevention. While, as we discuss in paragraph 2.48, recovering costs is not essential to incentivising issuers to provide high-quality services, current and future issuing revenues and costs do affect their decisions. If there is evidence that the IF level implied by the MIT is too low to incentivise efficient investments in card issuing to the benefit of consumers, this may point towards allowing for a higher MIF.
- On the other hand, high IFs may mean that issuers have a significant interest in maintaining a status quo in which cards are by far the most used payment method for cross-border CNP transactions, and this prevents them from encouraging or supporting innovative, and potentially more efficient, payment mechanisms (such as account-to-account methods). In this way, high IFs could create barriers to entry for new payment providers. In the long run, this could result in lower TUS than would be the case in a more competitive payments market. Therefore, if there is evidence that the IF level implied by the MIT is sufficiently high to have such effect, a lower MIF may improve TUS in the long term.

2.29 Having regard to these dynamic considerations is consistent with our objectives to promote effective competition in the markets for payment systems, and to promote the development of and innovation in payment systems.

2.30 Finding the right balance between short-term (or static) and long-term (or dynamic) efficiency in the context of four-party payment schemes is a delicate exercise for which there is no formula available. Such balance also depends on how sensitive the use of cards is to the size of the IF. This is affected by two factors:

- the pass-through of IFs to cardholders, as discussed above
- cardholders' sensitivity to the benefits they receive – given the current prevalence of cards in UK cross-border transactions, it is reasonable to question whether the use of cards in the short term would materially change in response to a reduction in IFs or cardholder benefits

2.31 The less elastic the short-term choice of cards is, the more it is possible to move away from the MIT level (if dynamic efficiency warrants it) without significantly compromising static efficiency.

2.32 These considerations imply that the use of a MIT approach will not result in a purely mechanical exercise to setting a cap. We will assess all the evidence in considering whether IIFs are appropriate from a static point of view, based on how IF revenue is used by issuers in practice, but most importantly, in assessing whether such IFs would have unintended consequences on longer-term innovation, either in card payments or in alternative payment methods (APMs).

Issuers' costs and revenues

2.33 We consider that collecting information on issuers' costs might be useful to inform such an assessment. In particular, understanding issuers' incentives to invest and to promote cards versus other payment methods might benefit from comparing interchange fees with issuers' direct card transaction costs.[22] These would include costs associated with scheme and processing fees, foreign exchange-related costs, digital wallet-related costs, fraud-related costs, cashback costs and other vendor costs,[23] and, in the case of credit cards, the costs incurred in funding the interest-free period.

2.34 These costs would need to be assessed net of incentives and rebates that issuers receive from the schemes, where these are dependent on the volume or value of card transactions. As we found in the final report on the market review on scheme and processing fees, rebates and incentives are a key parameter of competition for issuers between Mastercard and Visa.[24] Although rebates may be associated with performance targets, evidence we analysed for that market review suggested that the value of rebates is generally not considered uncertain.[25] We therefore consider it appropriate for incentives to be netted out, unless we receive evidence that:

a. specific incentives were linked to activities that issuers must perform
b. those activities were indeed performed
c. they would not have been performed without such incentives

2.35 Issuers' incentives are also affected by transaction-related revenues. We therefore intend to collect revenue data. In addition to interchange fee revenue, issuers are likely to generate further revenue streams from their activities. The 2020 report on the application of the Interchange Fee Regulation prepared by EY for the European Commission[26] considered several categories of cardholder fees, including transaction fees, foreign currency fees and currency exchange fees.[27]

2.36 However, we do not believe that a dynamic analysis can be undertaken in purely quantitative terms and so a detailed cost analysis would not be proportionate.

Issuers' incentives to invest

2.37 As discussed in paragraph 2.28, issuers' investments can determine innovation and long-term user surplus. In the course of this market review, stakeholders referred to a wide range of outcomes that could be affected by issuers' investments, including speed, security, fraud protection, resilience, and consumer experience. We therefore plan to consider whether a cap set at the IIF level would damage issuers' incentives to invest.

22 We consider that indirect costs would be less relevant to such analysis, to the extent that these are associated to enabling card payments rather than being dependent on the volume of card transactions processed by the issuer.

23 These cost categories were considered in the final report, Annex 2, Table 11.

24 See Market review of card scheme and processing fees – final report, paragraph 5.41.

25 The years of the COVID-19 pandemic were exceptional, given the large decline in card transaction volumes.

26 Study on the application of the Interchange Fee Regulation. Available here.

27 See the note to Figure 56 in the EY report.

2.38 Issuers' incentive to invest in better services for cardholders can be affected by their expected revenue in two ways:

- Better service can attract more cardholders. In this case, the incentive to invest depends on the expected revenue from additional cardholders.
- Better service can increase per-cardholder volume of card transactions. In this case, the incentive to invest depends on the issuer's expected per-transaction revenue.

2.39 Especially in the case of debit cards, IFs can have a greater impact on issuers' incentives to invest in services that mainly affect per-cardholder transaction volumes, rather than consumers' choice of bank. This is because IFs are likely to constitute a much larger proportion of issuers' per-transaction revenue than of the revenue generated through the issuing banks' entire suite of products.[28]

2.40 Investments in speed, resilience and consumer experience are most likely to affect per-cardholder transaction volumes. These, however, are areas the card schemes themselves are particularly interested in, and where they often drive innovation through mandates. Provided that card issuing remains beneficial to issuers (considering both direct revenue and indirect benefits), if adopting certain standards and procedures is mandated, issuers would have an incentive to comply irrespective of the exact level of the IFs.

2.41 In the case of investments in fraud prevention, issuers have an incentive to invest irrespective of expected transaction-based revenue, as fraud results in costs for issuers. However, to the extent that better fraud prevention increases the use of cards, expected revenue may also affect incentives.

2.42 A full assessment of issuers' incentives to invest would therefore need to consider:

- the extent to which issuers' investments are affected by expected revenue
- the extent to which issuers' investments respond to card schemes' mandates or go beyond what is mandated

2.43 We consider that a formal assessment – using, for example, econometric techniques – would not be feasible as part of our project. However, a simpler analysis may still be informative about the risk that a cap on UK-EEA MIFs may affect issuers' incentives to invest. We therefore plan to:

- get information on the types of investments issuers have made in recent years (for example between 2022 and 2024), how much they have spent, and whether it was a response to scheme mandates
- understand what proportion of transaction-based revenue for EEA issuers is accounted for by IFs on UK-EEA CNP transactions, as most (if not all) of these investments would not be specific to the UK-EEA corridor

28 This may not necessarily be the case for credit cards, where is relatively more common for cardholders not to get any non-card service from their issuing bank.

Competition between payment methods

2.44 Another driver of innovation is competition between payment methods. In the course of this market review, stakeholders raised two types of concerns:

1. High IFs can 'lock in' cards, giving issuers little incentive to participate in APMs.
2. Low IFs can make it more difficult for APMs to make inroads into the market by offering better terms to merchants.

2.45 In the case of a cap on UK-EEA cross-border outbound MIFs, the first concern can materialise only if the following three conditions hold:

- The relevant APMs for UK-EEA transactions require the active participation of a consumer's bank in order to operate.
- Issuers' transaction-related profits from card transactions, calculated including the capped IFs, are significantly higher than what issuers could be expected to generate on APM-based transactions.
- The use of these APMs is not so widespread that consumers expect their bank to make them available.

2.46 We currently intend to assess the first and third condition from an analysis of the functioning and use of the specific APMs we will use as comparators for the MIT calculation. We consider this can be done using publicly available information or existing industry reports covering those APMs.

2.47 In relation to the second concern in paragraph 2.44, we note that a MIF cap based on the MIT methodology should not make the APMs used as comparators uncompetitive on the merchants' side, as the cap would make merchants indifferent between cards and APMs. However, in the presence of significant fixed costs of adoption, indifference at transaction level may not be enough to give merchants sufficient incentives to adopt those APMs. We therefore plan to assess whether facilitating greater adoption of these APMs by UK merchants would improve competition between payment methods to the benefit of UK merchants and their customers, and, if so whether the size of the fixed costs associated with these APMs would justify any departure from a MIT-based cap.

Approaches we do not propose to follow

2.48 We have considered leading alternatives to capping MIFs found in the economic literature and in use by other regulators. In particular, we are aware of recent international interest in IF regulation, specifically in New Zealand and Australia, and are closely monitoring developments in these other countries. However, we believe alternative approaches underperform in comparison to the MIT as a starting point to identify an appropriate level of IFs in the UK-EEA outbound payment corridor.

2.49 **MIF cap based on issuers' cost recovery:** This approach does not give cardholders incentives to make efficient choices between payment instruments.[29] It is inconsistent with the balancing role for the IF that has been emphasised by academics and policymakers (see paragraphs 2.5 to 2.8). We also note that cost recovery is not a necessary condition for incentivising issuers to enable card payments for their customers.[30] The provision of card payment services allows banks and building societies to attract customers and to provide ancillary services connected to personal current accounts (for example, access to ATMs and identity verification systems); banks also generate revenue from interest on credit card debt. For these reasons, we believe that issuers may be willing to accept IFs that are lower than the costs they face when providing card payment services.

2.50 **MIF set equal to 0:** While this approach has the virtue of simplicity, it does not give cardholders incentives to make efficient choices among payment instruments. It is also inconsistent with the balancing role for the IF that has been emphasised by academics and policymakers, as well as by the schemes (see paragraphs 2.5 to 2.8). If it forced schemes to operate in inefficient ways, it could also distort competition between Mastercard and Visa cards and other payment instruments.[31]

Summary

2.51 We consider that among the methodologies that regulatory authorities have used to cap MIFs, the MIT is the most consistent with our statutory objectives. This is because it aims to maximise the joint benefit of merchants and consumers, making it consistent with our objective of promoting the interests of the users of card schemes. Conversely, methodologies based on issuer cost recovery have less basis in economic theory.[32]

2.52 Nevertheless, the limitations of the MIT methodology discussed above suggest that we should also consider any unintended consequences that an IIF might have in the long term and try to balance static and dynamic considerations. As there is no formula available for that, the exercise will involve an 'in the round' assessment of all the evidence gathered, including in relation to issuers' costs and to the impact of IFs on issuers' long-term incentives and on competition between cards and APMs.

Question 1: Do you have any comments on our proposed analytical approach to assessing what an appropriate level for a cap on a MIF might be?

29 See the example illustrated in Figure 7 in Annex 1.

30 This is also recognised in past legal decisions – see for example the judgement of the General Court in 2012, which pointed out that an imbalance between issuing and acquiring cannot be assumed on the basis only of the costs borne by the issuing banks and omitting the revenues or other economic advantages they obtain from their card-issuing business.

31 We are aware that a MIF equal to 0 was used as the counterfactual in the recent CAT judgement on the merchant interchange fee umbrella proceedings. However, the judgement only related to whether MIFs infringe Article 101(1) Treaty on the Functioning of the European Union. It did not assess whether a positive MIF level can be justified under Article 101(3); this will be considered in a separate hearing. The judgement itself states that 'the IFR caps have apparently been set by reference to a level which might promote fair competition, including efficiency, innovation and market entry', (paragraph 302). We also note that the EC has used the MIT methodology 'as a benchmark or proxy for assessing compliance with Article 101(3)' (CASE AT.40049 – Mastercard II, paragraph 70).

32 At the interim report stage, some stakeholders (two issuers and one association) commented on the MIT not being the most appropriate methodology to impose enduring caps on UK-EEA outbound CNP interchange fees. We note that we are consulting on undertaking the MIT alongside other analysis and we will reflect on responses to this consultation to establish the most suitable approach.

3 Implementing the MIT

This chapter sets out the high-level concepts involved in a merchant indifference test (MIT). These help us form the principles we will use to operationalise the test in the context of card-not-present (CNP) UK-EEA outbound transactions. We also note the specificities of a CNP cross-border transaction and the challenges theses pose to applying the MIT.

Introduction

3.1 As discussed in paragraph 2.19, a MIT-based approach to interchange fees (IFs) aims at estimating the IF level that incentivises consumers to use cards if and only if it is efficient to do so. That is, when card use increases consumers' and merchants' joint surplus. This is achieved when the IF is set equal to the value that makes the merchant indifferent to either a card transaction or one using the alternative payment method. We refer to this as the indifference IF (IIF).

3.2 Estimating the IIF can be described in terms of a thought experiment. In this experiment, the merchant has a non-repeat customer standing at the till ready to make a purchase. (Such a customer can be thought of as a tourist, which is why the MIT is also referred to as the 'tourist test'). The customer can use their card or, if this is not accepted by the merchant, an alternative payment method, traditionally cash. It is assumed that they have enough cash for the transaction. The test involves calculating the IF that makes merchants indifferent to accepting either cash or cards (assuming they do not internalise any cardholder benefits of card payment). It is calculated as a difference between the costs to the merchant of accepting payment by cash and by cards, where the costs are assessed with reference to one additional purchase (marginal costs).

3.3 This chapter covers issues related to implementing the MIT, especially in the context of cross-border CNP payments.[33] It is structured as follows:

- First, we discuss the key elements of the MIT methodology that, although originally applied to in-person payments, remain applicable in the context of cross-border CNP payments.
- Second, we consider challenges specific to applying the MIT in a cross-border CNP context.

33 At the interim report stage, different stakeholders stated that the MIT methodology, even the one applied by the European Commission (EC) in 2015, presents limitations and may not be suitable for the purposes of this market review. We recognise the limitations and aim to develop our own methodology, which re-adapts the original framework to fit specifically the UK-EEA CNP space and to reflect the characteristics of such a market.

Lessons from past applications of the MIT

3.4 Assessing levels of IFs has received considerable attention. Competition authorities have closely monitored how the card payments market functions, and researchers from academia and other institutes have examined the issues in this market. Some recent papers have used MIT-based empirical approaches to assess prevailing IFs. Annex 3 discusses some of the most significant empirical papers. This section outlines the lessons from that literature and that we consider are applicable to the cross-border CNP context.

Key principles for applying the MIT

3.5 The test, as originally envisaged, was undertaken for transactions where the consumer was present, and considered the costs of payments through cards in comparison to payments made with cash. However, the main principles embedded in the test are useful to also assess the costs cards impose in other contexts, such as cross-border online purchases. In particular, the logic of the MIT (that is, correcting cardholders' incentives) continues to hold in a non-cash context, with the caveats discussed in paragraphs 3.15 to 3.18. The following subsections expand on these key principles.

Facing a 'tourist' customer

3.6 The test considers a 'tourist', or non-repeat customer, who does not need to be enticed nor will be expected to repeat their purchases in the future.[34]

3.7 This remains a key principle of the MIT irrespective of the transaction context. The 'tourist' concept is introduced to eliminate the effects of 'must-take' status of cards (whereby merchants are reluctant to reject cards because this could damage their competitive position).[35] By removing the role of cards in attracting or maintaining a merchant's customers, the thought experiment at the basis of the MIT considers a situation where merchants can refuse a payment method that is disadvantageous for them.[36]

No liquidity constraints – 'Enough cash in the pocket'

3.8 The thought experiment refers to an idealised customer with no liquidity constraints, able and willing to use the alternative payment method to complete the payment. For the purposes of the test, the hypothetical consumer does not face any constraints nor any need to incur additional costs for securing the alternative means of payment (in the literature, cash) to hand over at the till – it is assumed the consumer has 'enough cash in the pocket'. The thought experiment omits the view of the consumer and focuses instead on what the costs and benefits are for merchants, from their perspective only.[37]

34 See EC (2015).

35 See Fung et al. (2018).

36 Some researchers have expressed this principle referring to ex-ante and ex-post perspectives. In this context, the test would be in consonance with an ex-post perspective of merchants: once a cardholder is at the cash register, merchants are (figuratively) empowered to turn down the sale (they could turn off card terminals and induce cardholders to pay in cash if the merchant's costs of paying with cards were too high). This contrasts with an ex-ante point of view whereby merchants may want to consider increasing their market share at the expense of rivals (who do not accept cards) or facilitate purchases by those consumers that want to avoid the costs and risks of going to the bank to withdraw and hold the cash physically. See Farrell, Joseph (2006), 'Efficiency and Competition Between Payment Instruments', *Review of Network Economics*, 5:26-44.

37 See Bolt et al. (2013).

3.9 This remains a key principle for applying the MIT in any context: it is fundamental to the logic of the MIT that only costs and benefits to the merchants, and not those to the consumer, are included in the calculation of the IIF, as the aim of the IIF is to make the consumer internalise the merchant's costs and benefits of using card rather than the alternative payment method.

Avoidable costs only

3.10 As part of the test, it is assumed that merchants are well prepared to accept both cards and the alternative payments method. This implies that merchants have already incurred any fixed costs required to accept them. Hence, what matters to them is the additional costs they will be facing (when a customer enters the shop with both a card and the alternative payment method in their wallet). In other words, it is the additional (or marginal) costs associated with receiving an additional payment by either of those methods that matters for the purpose of the test.[38]

3.11 This principle remains valid in a CNP scenario: the IIF is meant to reflect the costs imposed and the benefits provided to the merchant by the decision of an individual consumer. These are by definition the marginal costs and benefits of an additional transaction.[39]

Average convenience benefit of heterogeneous merchants

3.12 The economic literature also considers how the MIT should be applied if the convenience benefits that merchants get from cards (compared to the cash) varies across merchants. In this case, as the MIF cannot vary based on the merchants' identity, cardholders cannot be made to exactly internalise the welfare of each merchant. The MIF that maximises total user surplus can be obtained through a MIT using the average convenience benefit among the merchants that accept cards.[40]

3.13 Again, this remains valid irrespective of the context in which the transaction takes place.[41]

Sensitivity to assumptions

3.14 A further lesson from past applications of the MIT is that results are sensitive to a range of assumptions and that uncertainties in the cost estimates should be taken into account when interpreting those results. This shows that any application of the MIT involves a degree of judgement.

Adapting the MIT for a CNP context

3.15 While the principles discussed above can be used to implement the MIT to cross-border CNP transactions, there are elements of past applications of the MIT that are not relevant to this context. We will need to adapt some features of the test, therefore, while remaining consistent with its aim and logic. This section discusses how we propose to do this.

38 See Bolt et al. (2013).

39 Chapter 5 discusses how these costs should be estimated.

40 See Rochet, Jean-Charles, and Jean Tirole (2011), 'Must-take cards: Merchant discounts and avoided costs', *Journal of the European Economic Association*, 9:462-495.

41 As discussed in paragraph 4.28, in the case of cross-border CNP transaction, merchant heterogeneity may interact with the heterogeneity of alternative payment methods.

3.16 The main challenge to applying the MIT to cross-border CNP transactions is selecting the appropriate alternative payment method(s). In most applications of the MIT, the alternative method was cash but clearly this would not be a good comparator as a consumer would not use it to pay for a cross-border remote transaction, even if the merchant did not accept cards.[42]

3.17 Cash had some important features that made it a good alternative payment method for the purposes of the test in a card-present environment:

a. **Default comparator:** Cash was widely available to consumers and could be considered the 'default' alternative to card payments.

b. **Non-biased comparator:** The cost of cash to merchants was not influenced by the cost of accepting card payments,[43] nor inflated by the exercise of market power by a payment operator.

3.18 In the case of cross-border CNP transactions, there is no obvious 'default' alternative to Mastercard or Visa cards (so no alternative satisfies feature (a) above), and several of the available alternatives do not satisfy feature (b). This creates some challenges to the implementation of the test.

3.19 Chapter 4 discusses how we plan to approach the selection of appropriate comparators. In particular, we consider two issues that did not emerge in traditional applications of the MIT:

- Assessing which of the available comparators satisfy the 'non-biased' condition in 3.17b.
- Determining how to deal with the case of multiple comparators that satisfy such condition.

Summary

3.20 The MIT estimates a merchant's net convenience benefit from a card payment when a non-repeat customer (a tourist, for the purposes of the test) with enough cash in their pocket stands at the till ready to make a purchase. Recent empirical studies provide relevant precedent on how the test can be applied in practice and the limitations of using it.

3.21 Although the methodology was originally conceived for comparing card and cash payments, its principles are implementable in the context of UK-EEA cross-border IFs for CNP transactions. But doing so involves surmounting challenges in selecting the appropriate comparators (discussed in greater detail in Chapter 4).

Question 2: Do you agree with the principles we propose using in the implementation of the test? Do you consider there are any reasons why these principles should not be used when applying a MIT in the cross-border CNP context?

Question 3: Are there further issues we should be considering when applying a MIT in the cross-border CNP context? If so, do you have information on how they have been met, or reasoned suggestions for how they could be met?

42 This aligns with the view of some issuer stakeholders, who stated, at the interim report stage, that cash is not a suitable comparator in a MIT study focused on CNP cross-border transactions.

43 These features were stressed by the European Commission, which observed that 'cash appears to be a natural comparator as it is legal tender and it is the most used alternative to cards (it makes up the largest proportion of non-card retail payments). Furthermore, cash has no MIF attached to its use'. European Commission, *Survey on merchants' costs of processing cash and card payments – Final results, March 2015*, Publications Office of the European Union, 2015, paragraph 75.

4 Proposed approach to comparators

The indifference interchange fee (IIF) is calculated as the difference between the average marginal cost incurred by the merchant when accepting a card payment (excluding any existing interchange fee) and the average marginal cost incurred by the merchant when accepting a payment made with the comparator(s). A merchant indifference test (MIT) study therefore typically starts by identifying the relevant comparator(s) for debit and credit cards. In this chapter, we explain our proposed approach to selecting the comparators to use in undertaking a MIT for cross-border card-not-present (CNP) UK-EEA outbound transactions.

Some lessons on comparators from previous studies

4.1 Previous MIT studies, which we referred to in Chapter 3, have consistently used cash as the alternative means of payment for the purpose of the test applied to face-to-face transactions. The European Commission (EC) identified the following reasons that made cash a suitable comparator:

- Cash is legal tender (it is recognised by law as a means to meet a financial obligation) and, at the time, was the most used alternative to cards for retail payments.
- 'Cash has no multilateral interchange fee attached to its use.'[44]

4.2 The EC made no distinction for debit and credit cards: cash was considered an adequate comparator for both types of cards. In the study by Górka (2014), in Poland, credit and debit cards were also treated jointly, because from the perspective of merchants' costs, such division was not perceived as relevant.[45]

4.3 There are a few lessons that can be learned from the comparators used in previous studies:

a. The same comparator(s) could, in principle, be used for both credit and debit cards. In fact, previous studies have not proposed different comparators for each type of card and have treated them jointly.

b. The alternative means of payment should be available for consumers or easily implementable by merchants.

c. Payments should be provided in a secure medium of exchange.[46]

44 See EC, *Survey on merchants' costs of processing cash and card payments – Final results*, *March 2015*, Publications Office of the European Union, 2015, paragraph 75.

45 See Górka (2014).

46 In the card-present space, with cash as comparator, the safety of the transaction was ensured via the use of currency issued by the central bank. In the CNP space, the security of the transaction could be ensured by the comparator being compliant with up-to-date encryption standards, for example.

d. The charges of alternative means of payment are not dependent on the schemes' present pricing. We discuss this requirement in greater detail below.

Avoiding biased comparators

4.4 There are two reasons why the cost of alternative payment methods may be correlated with those of Mastercard or Visa cards:

- First, alternative payment methods that want to compete with cards may have to provide a better offer to consumers, who make the choice between payment methods. This could require enticing cardholders with benefits that result in higher charges to the merchant. If payment methods with these characteristics are used as a benchmark in the MIT, it could result in an upward spiral of merchants' costs. The higher IFs resulting from the MIT may lead to better offers to consumers to use card schemes, which would in turn require the alternative payment schemes to further increase the charges to merchants to be able to improve **their** offer to consumers.[47]
- Second, in a context in which cards are the most commonly used payment method, an alternative payment provider, even if it had no need to entice consumers, may use the costs of cards to merchants as a benchmark and may have little incentive to price merchants much below the prevailing cost of cards. Using such payment methods as alternatives in the MIT would result in an IIF corresponding to the prevailing MIF, irrespective of what that value is.

4.5 Estimating the IIF therefore requires using comparators that are priced independently from cards. This means that the comparators should not contain an IF (or other tariff) that is dependent on Mastercard and Visa's respective IF levels.[48] If that were not the case, the IF estimated through MIT would be artificially inflated by the current level of the MIF. We refer to this as 'circularity'.

4.6 We therefore propose to exclude methods which use Mastercard and Visa's card rails or other payment methods whose cost for merchants significantly depends on that of those cards.

4.7 A further requirement, which is not mentioned explicitly in previous studies but characterised the use of cash as a comparator in past MIT analyses, is that the relevant alternative means of payment should have costs to merchants that are not inflated by the exercise of market power by their providers.[49]

47 With lower card penetration than Mastercard or Visa, alternative payment methods would need to give higher rewards in order to attract cardholders. This competition for additional cardholders means that an increase in Mastercard and Visa IFs is likely to place competitive pressure on such alternatives to increase the level of transfer to cardholders even further to ensure they can still provide them with an attractive proposition. See MR22/2.7, *Market review of UK-EEA cross-border interchange fees: final report* (December 2024).

48 For the purpose of the MIT, it is not necessary that the alternative payment methods used as comparator(s) have no IFs attached to their price, as the EC (2015) suggested; this condition is not sufficient either. What matters is that their pricing (IF included, if any) is sufficiently independent from the cost of paying with Mastercard and Visa.

49 We also received comments at the interim report stage that the choice of a comparator for the CNP space requires an in-depth examination of all the available alternatives. We, however, do not agree with the claims that CP and CNP transactions must necessarily be looked at simultaneously. CP and CNP spaces present inherent differences, as payment methods available across the two channels are different, and so are merchant acceptance costs.

Our assessment of potential comparators

4.8 Mastercard and Visa (and their respective consultants) shared their view on the comparators to use for the proposed MIT study:

- Visa's economic advisors produced a MIT study on Visa's behalf, obtaining cost information for Visa cards and alternative payment methods from public sources, and submitted it to us before we published our interim report. In their MIT study, Visa's advisors used several comparators in the following categories: Buy Now Pay Later (BNPL), account-to-account payments, three-party card schemes and digital wallets. Visa's advisors said that the comparators considered represent alternatives to cards that are commonly used by EEA consumers when making payments at UK merchants.[50]
- Similarly, Mastercard's advisors said that the MIT study should encompass any alternative payment method that consumers use instead of cards, but exclude pure Single European Payment Area (SEPA) bank transfers. They said that, for CNP transactions, valid alternatives to cards would be PayPal (on bank transfers), account-to-account payments, American Express and BNPL.[51]

4.9 In this section, we assess the different categories of payment methods available for cross-border CNP transactions and assess their suitability based on the principles in the previous section. We consider:[52]

- pass-through digital wallets (such as Apple Pay, Google Pay)
- PayPal
- BNPL
- American Express
- payment methods funded via SEPA bank transfers

Pass-through digital wallets (such as Apple Pay, Google Pay)

4.10 As we noted in our final report,[53] Apple Pay and Google Pay currently simply provide an interface for card payments and, in the cross-border space, specifically for payments made using international cards such as Mastercard and Visa. As such, the cost to the merchant of such digital wallets is highly dependent on the price of Mastercard and Visa.

4.11 Using these digital wallets as comparators in a MIT would introduce a high degree of circularity in the calculation (see paragraph 4.5). We therefore do not propose to use these digital wallets as alternative payment methods for the purposes of the MIT.

50 See MR22/2.7, *Market review of UK-EEA cross-border interchange: fees final report* (December 2024), Annex 3.
51 See MR22/2.7, *Market review of UK-EEA cross-border interchange fees: final report* (December 2024), Annex 3.
52 We discuss in paragraph 3.16 why we do not consider cash a suitable comparator.
53 See MR22/2.7, *Market review of UK-EEA cross-border interchange fees: final report* (December 2024), paragraph 4.59.

PayPal

4.12 In the case of PayPal, while transactions can be funded through both cards and bank transfers, the fee merchants pay does not vary according to the funding method chosen by the consumer. The fee is therefore still dependent on those of Mastercard and Visa. This was made clear by PayPal's reaction to the schemes' increase in UK-EEA IFs, which PayPal decided to respond to by increasing the fees for UK-EEA cross-border payments from 0.5% to 1.29%. At the time, PayPal stated that this was due to the fact that it was incurring extra costs, such as the rise in Mastercard and Visa MIFs between the UK and the EEA.[54]

4.13 We therefore consider that the cost merchants currently pay for PayPal is not suitable for using as part of a MIT analysis. It may be possible, however, to remove the circularity by stripping PayPal's fees of the costs due to cards. We plan to explore whether this exercise is feasible in practice. In that case, PayPal payment services may represent a suitable alternative for benchmarking the card schemes' pricing.

BNPL

4.14 As regards BNPL providers, the largest ones operating in the UK make their BNPL propositions available only for UK residents. In addition, we note that payments made using one of these providers rely significantly on Mastercard and Visa cards (even for the functions 'Pay Later' and 'Pay in 3 Instalments'), the cost of which is ultimately reflected in the overall acceptance cost for merchants.[55] The cost of this payment method, therefore, is dependent on that of Mastercard and Visa.

4.15 Moreover, the fees charged by BNPL providers include a component related to credit financing. While a merchant may benefit from the increase in consumption that BNPL enables, this type of benefit should not be included in a MIT assessment. This has been referred to as an intertemporal form of 'business stealing'[56] (enticing customers' purchases from different moments in time). As such, it does not constitute a net benefit for merchants as a whole.[57]

4.16 For these reasons, we do not consider BNPL a suitable comparator for the purpose of the MIT.

American Express

4.17 As explained in paragraph 4.4, competition with cards on consumer enticements also makes a payment method unsuitable as a comparator. Three-party card schemes such as American Express compete with Mastercard and Visa on both the acquiring side and the issuing side to win cardholders and increase their card usage. Competition for additional cardholders means that an increase in Mastercard and Visa MIFs, if used by a card issuer to improve its card offering, is likely to place competitive pressure on American Express to increase its competitive card offerings to cardholders at some point, to ensure that it can still provide them with an attractive proposition. Conversely, a decrease in Mastercard and Visa MIFs is likely to prompt acquirers to agree lower merchant service fees with merchants, placing competitive pressure on American Express to decrease, at some point, the merchant

54 BBC News, *PayPal raises fees between UK and Europe* (9 September 2021).

55 Data submitted by a BNPL provider to the PSR shows that, in 2022, more than half of UK domestic transactions were made using cards.

56 See EC (2015), paragraph 74.

57 See paragraph 5.16 for an analogous argument made in the empirical literature in relation to the benefits of credit cards.

service fee it agrees with merchants to ensure that it can still provide an attractive proposition to merchants. This has been observed empirically.[58]

4.18 Since using American Express as comparator in a MIT would introduce a substantial degree of circularity in the calculation, we do not consider it a suitable comparator.[59]

Payment methods funded via SEPA bank transfers

4.19 The remaining payment methods alternative to Mastercard and Visa's cards that is available for UK-EEA cross-border transactions are those funded via bank transfers within the Single European Payment Area (SEPA). These include bank transfers and account-to-account solutions (payments for goods and services directly from the customer's banks to the merchant's bank during a payment process). These can possibly include PayPal, if its fees can be stripped of the component that depends on card fees.

4.20 Means of payments funded by SEPA bank transfers fulfil the criteria set out in paragraphs 4.3 and 4.7. In particular, we consider that such solutions are not 'must take' and their pricing is sufficiently independent from those of Mastercard and Visa.

4.21 Visa submitted that SEPA bank transfers are rarely used to make UK-EEA CNP transactions.[60] We recognise that, currently, these payment methods are not widely used by consumers and are not always accepted by UK merchants. However, we do not consider this feature makes them unsuitable for a MIT analysis. We recognise, however, that payment methods that would require unreasonably high implementation costs in order for merchants to adopt them may not be appropriate comparators. As part of our analysis, we plan to assess the feasibility of the use of these payment methods and their ease of implementation in the longer term (and in the context of avoidable costs and economies of scale of such alternatives).

4.22 Mastercard's advisors submitted that SEPA bank transfers do not offer consumer protection measures that are comparable to those of cards.[61] We do not consider that this precludes their use as a comparator if these are cardholder-side benefits. Under the MIT, consumers will appropriately account for differences in such benefits when making their payment choices. We also note that cash, which was used as the comparator in previous applications of the MIT in card present contexts, similarly provides no consumer protection benefits.

58 For example, a study in Australia (pages 6 to 9) suggested a degree of correlation between the schemes' price changes and those of American Express. The study found that though American Express is free from the regulatory constraints applied to four-party schemes, it has experienced significant indirect effects from the introduction of caps on Mastercard and Visa. American Express's average merchant service fee has fallen more than Visa's and Mastercard's since the first regulation on IFs in Australia. Another, very recent example is from New Zealand, where caps on debit cards introduced in 2022 led to a significant reduction of the IFs and the MSCs related to Mastercard and Visa cards. A New Zealand Commerce Commission document (Retail Payment System Consultation Paper, paragraph 4.73) notes that when caps were introduced, 'American Express reduced its merchant service fees upon the initial pricing standard coming into force in 2022.' It added: 'We would expect it [American Express] to further reduce its fees in response to any further regulation.'

59 See also MR22/2.7, *Market review of UK-EEA cross-border interchange fees: final report* (December 2024), paragraph 5.27.

60 See MR22/2.7, *Market review of UK-EEA cross-border interchange fees: final report* (December 2024), Annex 2, paragraph 2.177.

61 See MR22/2.7, *Market review of UK-EEA cross-border interchange fees: final report* (December 2024), Annex 3, paragraph 3.33.

The comparators we plan to use

4.23 Based on the assessment developed above, we propose using means of payment funded via SEPA bank transfers as the comparator for our MIT for UK-EEA cross-border transactions.

4.24 We note that this is consistent with the methodology applied by the EC for its 2019 Commitments ('Visa MIF' and 'MasterCard II') for CNP inter-regional payments (that is, payments outside the EEA).[62,63]

4.25 We recognise, however, the prospect of innovation in cross-border payments. New payment methods may become available in the future, such as central bank digital currencies (CBDCs) or stablecoins. The cost of existing payment methods may also change. We will therefore keep this under review.

Dealing with multiple comparators

4.26 The MIT was designed using a single alternative payment method. As seen in Chapter 3, in the case of cross-border CNP payments, there is no clear 'default' alternative. Even if we focus on means of payment funded via bank transfers SEPA, there might be multiple such payment methods available to UK merchants and EEA consumers.

4.27 As the logic of the MIT is to give consumers an incentive to efficiently use cards, the benchmarks adopted in the estimation should reflect the payment methods that consumers can be expected to use as alternatives to Mastercard and Visa cards, among 'non-biased' payment methods (see paragraph 3.17b).[64] When several such payment methods are available, and when their costs differ across merchants, in order to compute a single IIF we plan to use a weighted average of the costs of alternative payments instruments, where the weights depend on the relative use of each for UK-EEA cross-border transactions.

62 Paragraphs 80(b) and 79(b), of 'VISA MIF' and 'MasterCard II', respectively, both read as: 'for inter-regional CNP transactions cash could not be considered a valid alternative. Other alternatives, that are means of payments funded via bank transfers (which are outside the domestic payment systems of the EEA Contracting Parties and the Single European Payment Area, SEPA; "non-SEPA bank transfers"), were identified as plausible payment alternatives for the purposes of the MIT'. CASE AT.40049 – MasterCard II, Antitrust, European Commission (29 April 2019). CASE AT.39398 – Visa MIF, Antitrust, EC, (29 April 2019).

63 Mastercard submitted that the European Commission investigation that concluded with the 2019 Commitments had considered three-party schemes, cash, bank credit transfers and e-money transfers as alternative methods (see MR22/2.7, *Market review of UK-EEA cross-border interchange fees final report* (December 2024), Annex 2, paragraph 2.106). However, we consider that this is not consistent with the published description of the methodology. As stated in Chapter 3 of our final report, and in paragraph 80(b) of the 2019 Commitment Decision and footnote 45 of the same decision, the EC included only comparators that have no MIF attached to their use, and for inter-regional CNP transactions, it considered means of payments funded by bank transfers (non-SEPA bank transfers in that case). The MIT calculations are 'based purely on the costs of payments via [non-SEPA] bank transfers' (EC, CASE AT.39398 – Visa MIF, VISA 2019 Commitments decision (section 7.2.1, footnote 45)).

64 We therefore agree with the argument made by Visa that cards should not be compared only against those alternatives that are cheapest to the merchant (see MR22/2.7, *Market review of UK-EEA cross-border interchange fees final report* (December 2024), Annex 3, paragraph 3.25), although we do not agree with its list of relevant alternatives (as discussed in Chapter 4).

4.28 Finally, the heterogeneity of alternative payment methods may also interact with the heterogeneity of merchants (discussed in paragraph 3.12), and the cost of cards and of other payment methods also differ between merchants. The most likely alternative may also differ, according to the type of merchant (and consumer) involved. These variations, in addition to potential uncertainty over merchant cost estimates, mean that the MIT methodology is unlikely to result in a single, precise estimate of the IIF, and that computing an average IIF across merchants and across payment methods may therefore involve a degree of judgement.[65]

Summary

4.29 We propose a few principles to guide our selection of suitable comparators (see paragraphs 4.3 and 4.7). These are:

- The same comparators can be used for debit and for credit cards.
- Alternative means of payment should be available for consumers or easily implementable by merchants in the UK.
- Payments should be provided in a secure medium of exchange (currency).
- The comparators' charges should not be affected by circularity, that is, should not depend on the schemes' present pricing.
- The comparators' charges should not be inflated by the exercise of market power by their providers.

4.30 On the basis of these principles, we propose to use only payments funded via SEPA bank transfers (bank transfers and account-to-account solutions) as the relevant comparators for the purposes of our study. These may possibly include PayPal, if its fees can be stripped of the component that depends on card fees.

Question 4: Do you agree with the principles we propose using for selecting the comparators?

Question 5: Do you agree with the comparators we propose using for the MIT?

4.31 If we identify more than one relevant comparator, we plan to use a weighted average of their cost to merchants, where the weights depend on the relative use of each for UK-EEA cross-border transactions. However, as the heterogeneity of alternative payment methods may interact with the heterogeneity of merchants, there might be different reasonable ways of computing such average, which would lead to a range of possible IIFs.

Question 6: Do you agree with our proposed approach to dealing with multiple suitable comparators?

65 One issuer mentioned, at the interim report stage, that cross-country differences may make it more difficult to identify a unique value for the MIF that would make all merchants in the UK indifferent. Our proposed approach would allow accounting for heterogeneity or differences across merchants.

5 Proposed approach to merchant costs

In this chapter, we explain our proposed approach to establishing the nature (fixed or variable) of merchant costs for the analysis, and to including different cost components (the guiding principles to be used for selecting the cost categories and the proposed cost items).

Nature of costs: fixed versus variable

5.1 The avoidable costs principle behind the merchant indifference test (MIT) (see paragraphs 3.10 to 3.11) implies that only variable costs matter, because they are the costs directly associated with accepting a card payment. Fixed costs would be incurred even if the payment did not take place and so don't influence merchants' short-term decisions about a payment method. In other words, for the purpose of the test, only the additional (or marginal) costs associated with receiving an additional payment are to be taken into account.

5.2 This section:

- reviews how past MIT studies have approached the identification of marginal costs
- draws some lessons from the existing empirical literature
- outlines our proposed approach to identifying fixed and variable costs

How past MIT studies approached marginal costs

5.3 The concept of marginal cost is defined as the difference in the total costs of producing one additional unit of a product or service. In practice, it can be calculated by comparing the change in costs when one unit of production increases, or alternatively as a ratio of costs and additional units involved.[66]

66 To find marginal cost (MC) one can use the formula: MC = ΔC/ΔQ, where ΔC = change in production cost and ΔQ = change in quantity.

5.4 Embedded in the concept of marginal costs is the idea of the irrelevance of fixed costs: those costs that do not change with the units produced are irrelevant for the purpose of estimating marginal costs. What this has meant in practice is that the empirical studies have used estimates of variable costs to obtain measures of marginal costs[67] as any fixed costs will be cancelled out (see Chapter 6). This has implied a careful delineation of the fixed and variable costs for every payment method, understanding that fixed costs can be excluded.[68]

- **Fixed costs** relate to the cost items that are not affected by purchase transactions. They are costs that must be paid regardless of purchasing activity taking place. They might include the depreciation costs of a cash register or a payment terminal. Renting of cards payment terminals is considered fixed (Górka, 2014).
- **Variable costs** may depend on whether the transaction is carried out or not. Variable costs have been classified into transaction-related costs (they change with each transaction) and value-related costs (they change with the amount of each transaction). The time spent processing payments at the point of sale is mainly transaction-related, whereas payment fraud is value-related as it depends on the amount involved in the payment.

5.5 Different approaches have been used to assess the nature of costs. These have been based on merchants' perceptions, assumptions, previous literature, or data directly requested from each merchant relating to individual cost items. For example, the EC classified costs as fixed or variable based on merchants' responses under two scenarios (EC, 2015): assuming a change of one cash and one card transactions (scenario 1), and considering a 10% reduction in the number of cash transactions replaced by card payments over a three-to four-year period (scenario 2). In Colombia, Arango-Arango et al. (2022) used merchants' perceptions on the situation at present and under the scenario that 20% of cash volumes would be substituted by cards in a two- to three-year horizon. In Poland, Górka (2014) used merchants' declarations over one-year horizon.

5.6 Previous analyses have allowed splitting some costs into fixed or variable based on shares (for example, 50% fixed and 50% variable linked to number of transactions) which are estimated from field work or past studies. Costs were then aggregated, for each merchant, in terms of their nature: fixed (F), variable linked to number of transactions (VN) and variable linked to value of transactions (VV).

5.7 The studies have recognised that the exercises involved some degree of subjectivity and have undertaken sensitivity analysis, using different scenarios to test the impact of alternative allocations, to F, VN or VV. For example, assessing how the result changes if assuming cash back-office costs to be equally split between VN and VV, or to be entirely allocated to VV (Górka, 2014).

5.8 The EC has noted that classifying costs as fixed or variable may depend on the time horizon chosen. It stated that the calculation using merchants' stated cost changes in response to one unit change (scenario 1) represents an interpretation of the marginal cost concept in the short run. Costs assessed in response to a 10% change in the number of cash transactions in three to four years (scenario 2) would be more representative of a medium-run concept. The EC also stated that the change assumed in scenario 1 might be too small

67 Marginal costs refer to the costs of an additional transaction. Variable costs are those cost elements that vary with the volume or value of processed transactions.

68 This is equivalent to saying that the estimation should include only costs that take place when the payment is processed. Fixed costs and (to some extent) maintenance costs would be excluded, as they are expenses that take place even if no transactions are made at all.

to be accurately perceived by merchants, and consideration of scenario 2 might be preferable for reporting purposes. Finally, the use of a medium-run concept (scenario 2) is in line with the time horizon considered in other studies and with changing payment habits over recent years (Górka, 2014).

Lessons from the empirical literature

5.9 There are a few lessons to take from this review of how past MIT studies have approached fixed and variable costs. These are:

- The avoidable costs requirement of the MIT implies that only the costs related to the transactions are relevant. Fixed costs are therefore excluded in the analysis.
- The classification of costs as fixed or variable, and further separation of variable costs into transaction- and value-related costs, was based on judgement (the views from survey respondents) or 'best practice' (using past studies).
- Because of the sensitivity of the results to varying assumptions on cost allocations, scenario testing was used to check the robustness of the results.
- Different approaches were used to assess situations where the merchant could find less costly alternative payment solutions, depending on potential changes in transaction volumes. In most cases, a medium-term approach was used which considered a percentage change in transactions in one to four years. In one case, a short-run approach was reported, to assess sensitivity of the results.

Our proposed approach to fixed and variable costs

5.10 The empirical studies we have reviewed suggest that the results of the test can be very sensitive to the split being used (assessing or a priori characterisation of expenditure classes and categorising them into fixed and the different variable costs). Alternative methods which do not rely on ad hoc categorising of expenditure classes as either fixed or variable would seem superior, under suitable conditions. (See measurements derived from a total cost function estimation, in Chapter 6).

5.11 As seen in paragraph 5.8, the split between fixed and variable costs also depends on the time horizon considered. For example, some lumpy costs may be fixed in the short term, but can be considered variable over a longer horizon, as merchants adjust to changes in the volumes of transactions processed through cards and alternative payment methods. An indifference interchange fee (IIF) on which to base a cap should be set as to provide the right long-run incentives. This would imply classifying costs as fixed or variable based on a long-run perspective.[69] Nevertheless, to present a sensitivity analysis of the results, we plan to assess costs of different payment methods under different assumptions.

69 This approach has also been recommended in the economic literature; see Rysman, Marc, and Julian Wright (2014), 'The Economics of Payment Cards', *Review of Network Economics*, 13(3):303-353.

Relevant cost components

5.12 Comparing the costs of cards and of the comparator alternative means of payment requires identifying and quantifying the relevant costs incurred by merchants when receiving payments with the different instrument in question. As seen in paragraphs 3.10 to 3.11, this should be based on the principle of avoidable costs (hence establishing as relevant only those costs that would not be incurred by the merchants if they did not accept a transaction made with each of the payment methods).

5.13 This section:

- reviews the cost components considered in past MIT studies
- draws some lessons from the existing empirical literature
- outlines the cost components that we propose to consider in our MIT analysis

What cost components were considered in past MIT studies

5.14 Past empirical studies have considered a wide range of cost categories. Most exercises have started by including front-office costs (related to the time it takes for a merchant to complete the payment of a sale) and back-office costs (the time and costs spent on surrounding activities, such as depositing and withdrawing cash to and from a financial institution).

5.15 Back-office costs can be internalised, if undertaken by the employees or the merchant themselves, or may include services purchased from third parties. In the case of cash, these costs may relate to transporting it and to obtaining change to facilitate payments; in the case of cards, they will include all transaction fees. There are also other costs that may be related to fraud and theft for each payment method, and opportunity costs such as lost interest due to the time that monies are not in the bank earning interest. Some studies have also identified costs related to equipment. As the MIT estimates the level of interchange fee (IF) that makes merchants indifferent between cards and alternative payment methods, it is the net cost of transactions that needs to be computed. Therefore, any revenues the merchant receives from surcharges and rebates should also be accounted for.

5.16 Past studies have typically ignored other potential benefits of using cards. For example, empirical studies have disregarded the fact that credit cards can offer additional benefits to merchants by increasing consumers' ability to spend, thereby enabling sales that would not occur without the credit functionality. This is because it is not clear that the increase in aggregate consumption will be sustained over time (as consumers will need to pay the funds back in the future, and with interest). These benefits might also be perceived as an inter-temporal form of 'business stealing', and should therefore not be taken into account in the calculations. For example, the impact on the sector would be zero if any increase in sales derives from the sales from other businesses or from future time periods.[70] Other analysis identifies some costs as negligible, and discards them. (Górka, 2014 finds the losses from card fraud and from cash counterfeiting, theft, or robbery to be negligible).

70 In the context of the MIT thought experiment, conditional on a consumer making a purchase, the merchant does not care if the consumer borrowed money to do so. While the provision of credit may be beneficial to the consumer, this benefit would already be factored in the consumer's decision of which payment method to use.

5.17 Finally, as the purpose of the test is to compare the costs under the different payment methods, any costs that are common or not specific to the payment method can be ignored. For example, the EC states that the space occupied by the cashier or the device used to scan the articles at check-out are costs that are likely to be the same irrespective of the type of payment instruments accepted and used in the shop and can hence be dropped from the analysis (EC, 2015).

5.18 In summary, there are some key points to be noted from previous studies. These are:

- Front-office costs for each relevant payment method are based on measurements of the time it takes to process a payment transaction at the counter (for different payment methods). A cost estimate is subsequently computed using the time and number of payments multiplied by an estimate of the gross hourly wage of the shop attendant. These costs are significant in cash payments (less so in card payments).
- As the IIF is obtained as the difference of costs of alternative means of payment and cards, the costs of cards exclude the current market IF.
- Equivalent costs, costs that are similar across payment methods, and negligible costs can be discarded from the analysis (as they will not meaningfully impact the calculations).

5.19 Previous studies have looked at different cost components when comparing the costs of payments with cash and cards. These are summarised in Table 2.[71]

Table 2: Cost items used in previous studies: for cash and card payments

Cost category	Cash	Card
Front office	Cost-time of realising payment	Cost-time of realising payment
Back office	Tills preparation	Reconciliation
	Counting, reconciliation	Terminals security check
	Deposit/withdrawal	Fraud/chargeback applications
Services purchased	Transport of cash	Scheme and processing fees
	Obtaining change	Acquirer margin
	Insurance against losses for cash	
Other	Fraud and theft	Fraud
	Opportunity cost (money not in bank)	Opportunity cost (money not in bank)
		Surcharge (income)

Note: based on EC (2015), Fung et al. (2018), Arango-Arango et al. (2022), Bolt et al. (2013), Aurazo and Vega (2021) and Górka (2014).

71 One of the schemes, at the interim report stage, said that the MIT ignores merchants' benefits related to card usage. As can be seen from the table, the test considers merchants' costs and benefits too (this also applies to comparators, as their full cost should be taken into account in the MIT).

Lessons from the empirical literature

5.20 The selection of relevant costs for the purpose of our current exercise presents a new and very different situation to the decisions made in the past. In those studies, because cash was the comparator, it was understood that most of the costs originated from the process of manipulating and moving cash (providing change to the payment made at the cashier, or transporting cash from and to the bank), and the fees in the card payments.

5.21 In the context of UK-EEA cross-border transactions, where payments are made online, many of the steps are simply not needed. It is also worth noting that some of the costs that might arise are similar for the payment method and comparators we consider (equivalent costs can be excluded) and that some other costs may be simply negligible and can be discarded. However, when comparing payment methods, there may be some features that deserve special consideration. In the context of our study, these may relate to the different protection and coverage the payment methods provide (losses to the merchant from lost or incomplete payments due to failures in the trade, in the system or fraud), or the cost and features provided in conversion of foreign currencies.

5.22 We know that when selecting relevant costs we will need to carefully consider the comparators. The lessons from the literature on which cost items to include in our exercise are as follows:

- Ignore equivalent costs (costs that are the same for the different payment methods).
- Consider the special features related to the service the payment methods provide to the merchant – that is, the different protection and coverage they provide in terms of losses from lost or incomplete payments, or conversion of foreign exchange currencies. A difference in the speed that funds are made available to merchants may also have implications in terms of opportunity costs of the time funds are unavailable for.
- Ignore small costs if they are judged to be negligible (no significant impact on the results).
- Include any revenues as part of the analysis (this accounts for situations where surcharges to the consumer may be applied, for different payment methods).

Costs components we propose

5.23 Based on the above, these are the costs items we propose to consider:

- **Relevant fees for using the different payment methods.** These include scheme and processing fees and acquiring margins for card payments, and relevant fees and commissions for alternative payment methods.
- **Cost and conditions for additional services provided**. These may include different terms and conditions for currency conversion when using cards or alternative payment methods.
- **Time and cost of pursuing dispute resolutions (chargebacks).** These include the process and costs that merchants incur when transactions are disputed, including ultimate losses to the merchant from fraudulent transactions.
- **Opportunity costs from foregone interest**[72] **or costs from cash flow issues** in case funds are provided with delays or at different speeds between the different payment methods being analysed.

72 While Górka (2014) found these costs to be negligible, we want to test whether the results of that study are still valid.

5.24 Some of the costs used in previous studies are irrelevant for our exercise. These include the costs related to the time the merchant takes to process a payment, because these are similar for cards and alternative payment methods (and relatively small, which would make the costs negligible for the purpose of our exercise). We are also unaware of surcharges or other income being charged by merchants under different payment methods, so this is a cost component we do not propose to include in the analysis.

Summary

Fixed and variable costs

5.25 Our proposals in relation to the fixed and variable nature of costs are summarised as follows:

- **Fixed costs exempted:** The avoidable costs requirement of the MIT implies that only the costs related to the transactions are relevant. Fixed costs are therefore excluded in the analysis. This encompasses all costs that are not specifically related to the transaction, such as software costs and development, or maintenance costs (of the network).
- **Sensitive results:** Results of the test can be very sensitive to the split being used for fixed and variable costs. Alternative methods which do not rely on such separation would seem more robust (see econometric approaches, paragraphs 6.6 to 6.7).
- **Long-term horizon and sensitivities:** The split between fixed and variable costs should be based on a long-term horizon, as we aim for a cap that provides the right incentives in the long term. However, we suggest testing the sensitivity of the results by assessing the split between fixed and variable costs under different assumptions – for example, in response to a 10% simulated increase in the use of comparator(s) in the medium-term (that is, three to four years).

Cost components

5.26 These are the guiding principles we propose to follow when selecting the cost items for the analysis:

- **Include relevant fees and special features:** These include any features that make the provision of payment services different (in terms of the costs and benefits accrued to the merchant).
- **Exclude equivalent and similar costs:** Costs that are the same for the different payment methods can be ignored.
- **Ignore small costs:** Small costs can be ignored if these are judged to be negligible (no significant impact on the results).

5.27 Table 3 shows the cost items we propose to consider and those we plan to exclude from the MIT calculation, for each payment method.

Table 3: Cost items we will use for card and alternative payment methods (APMs)

Cost category	Cost item	
Services purchased	Scheme and processing fees	Cards
	Acquirer margin	Cards
	Foreign exchange costs conversion	Cards and APM
	Other fees and commissions	APM
Back office	Chargebacks and transaction disputes	Cards and APM
	Fraud	Cards and APM
Fixed costs	Software costs and development	Excluded
	Rent terminals	Excluded
	Maintenance costs	Excluded
Other	Cashflow and opportunity costs	Cards and APM
	Surcharge (income)	Negligible
	Cost-time of realising payment	Excluded as equivalent

Question 7: Do you agree with the proposal in relation to the fixed and variable nature of costs?

Question 8: Do you agree with the principles to be used for selecting the cost categories?

Question 9: Do you agree with the list of costs we propose including when undertaking the MIT?

6 Estimation methods

This chapter discusses the alternative approaches to estimating:

- the marginal costs of cards and of the alternative payment method(s), and
- the average transaction values, which are key inputs in calculating the IIF.

It then outlines which approaches we propose to use.

6.1 As explained in detail in Annex 4, the computation of the IIF requires two types of inputs:

- The marginal costs of cards and of the alternative payment method(s), which are split between transaction-related and value-related costs.
- The average transaction value.

6.2 This chapter discusses the alternative approaches to estimating each of these, and outlines which we propose to use. We will draw on the methodologies in EC (2015) and Arango-Arango et al. (2022). Although we have developed our discussion with reference to the comparator employed in previous studies (that is, cash), we will adopt alternative payment methods as comparators.

Estimating marginal costs

6.3 When a sample of merchants is used, there are two main ways to estimate the per-transaction and ad valorem costs associated with a transaction[73]: the arithmetic approach and the econometric approach.

Arithmetic approach

6.4 The arithmetic (or account) approach starts by classifying accounting costs categories as either fixed or variable and then aggregating them into the relevant components (per transaction or per value). The approach then uses a simple average of the costs' components for the merchants in the sample. This has typically been formulated using a linear cost function and considering a separate marginal cost equation for each merchant in the sample. Annex 4 presents the formulas that are used in this case.

6.5 In some instances, alternatives have been proposed to account for heterogeneity in the sample (EC, 2015). This has implied estimating different costs for clusters in the sample, by country, sector, merchant size, and constructing weighted averages. To limit the influence of outliers, medians may be used instead of simple means. In EC (2015), medians were calculated for different merchant classes and subsequently aggregated using weighted means.

73 These are the coefficients a^0, b^0, a^1 and b^1 in equation 3 in Annex 3.

Econometric approach

6.6 Correctly separating costs between fixed and variable is a crucial element in the arithmetic approach, and subject to a degree of judgement by merchants (EC, 2015). A significant advantage of the econometric approach is that the split between cost types does not need to be imposed a priori. Because the method uses a specification from a total cost function, encompassing fixed and different options for variable costs, the parameters do not need to be obtained or assumed from merchants' declarations or previous literature, as they can be derived from the data in the sample. Calculations can be based on a similar sample to the one used for the arithmetic approach, although a larger sample size will help improve the precision of the estimates. The econometric approach also tends to capture fixed and variable costs that are consistent with a longer-run perspective, which we consider appropriate for the purposes of a cap (see paragraph 5.11).

6.7 The econometric approach uses a total costs variable (the sum of all the cost items for each merchant), which is then regressed against a constant term, the number of transactions and the total value of transactions. The specification allows for identifying the constant term as fixed costs – those that do not vary by transactions.[74] Additional variables capture the effects of the number and the value of transactions on cost. A more detailed discussion is in Annex 4.

6.8 It also allows for different specifications. It is possible to use functional forms that take into account heterogeneity between merchants of different sizes or from different sectors, to estimate different equations for different groups of merchants (for example small and large merchants), to include additional variables (proportion of cash transactions, merchant's number of outlets, dummy variables for sector, city, and size), or to add terms that account for economies of scale or scope (Arango-Arango et al. 2022).

6.9 But the econometric approach has some drawbacks. Using cross-sectional estimates, as the EC did in its 2015 study, is likely to result in endogeneity problems because of omitted variables, if costs depend on unobserved merchant characteristics. This will make cost estimates less reliable. We may be able to overcome this issue by using a panel data approach but this would require collecting data on merchant costs over a period of several years, which will probably be unfeasible.

Our proposed approach

6.10 As discussed above, the arithmetic approach is subject to assumptions on the appropriate way of separating costs between fixed and variable. The econometric approach does not suffer from such limitation and requires fewer a priori assumptions (as the fixed component is obtained from the total cost equation). It also tends to capture fixed and variable costs that are consistent with a longer-run perspective, which we consider appropriate for the purposes of a cap (see paragraph 5.11). On the other hand, the econometric approach may suffer from significant endogeneity issues, which can make the estimates less reliable.

6.11 For these reasons, we are planning to use both the arithmetic and the econometric approaches. We therefore expect to obtain a range of values, depending on the estimation approach and on the specifications adopted to account for merchant heterogeneity. To obtain an overall estimate, we will apply our judgement based on how reliable the different estimates are and the implicit biases resulting from different modelling assumptions.

74 It hence needs to rely less on the assumptions for separation of the fixed and variable costs, and also between flat and ad valorem variable costs, as this will come from the estimations in the model.

Estimating average transaction values

6.12 The IIF needs to be evaluated at a specific value of the marginal transaction. Empirical studies typically approximate this with an average transaction value ($\bar{x}$, where the IIF is evaluated), although the way of constructing averages has differed: the card-based approach uses purchases made on card only; the retail-based approach uses all retail purchases, including all cash and card transactions.

6.13 Previous studies have noted that the retail-based approach has the advantage that it is not affected by the current split between cash and card purchases, while the card-based approach is affected by the consumers' and merchants' current decisions to use or accept cards, which are in turn affected by the current IF level. The card-based approach is therefore more likely to represent the historic allocation of cash and card use, while a retail-based approach is less likely to be affected by future changes in the allocation between payment methods. The card-based approach, on the other hand, reflects the lack of perfect substitution between cash and card payments, especially for some high-value transactions where cash may not be a relevant alternative in practice.[75]

6.14 The differences between the two approaches are likely to be much less substantial in the context of cross-border CNP transactions than in previous studies comparing the use of cards and cash. Given that cards are currently used for the vast majority of such transactions, the two approaches are likely to lead to very close estimates anyway.[76]

Summary

6.15 Estimating the IIF requires estimating the marginal costs of cards and of the alternative payment method(s), and the average transaction value.

6.16 There are two approaches to estimating marginal costs: the arithmetic approach and the econometric approach. For the reasons summarised in paragraph 6.10, we propose to use both approaches and apply our judgement to determine an overall estimate.

Question 10: Do you agree that we should use both the arithmetic and the econometric approach?

6.17 There are two methods – the card-based approach and the retail-based approach – for obtaining the transaction value at which the IIF should be evaluated. Both have advantages and disadvantages in theory and in practice, but the retail-based approach could be the best for our purposes even if in practice, and in the context of UK-EEA card-not-present payments, it may lead to similar results as the card-based approach.

Question 11: Do you agree with the use of a retail-based average as a more forward-looking approach? Which other measure would you suggest using?

75 As cash is typically used for lower-value payments, previous studies have found that averages based on the retail-based approach are lower than those of the card-based approach (EC 2015).

76 Alternatively, using different price structures (such as a two-part tariff involving a per-transaction and an ad valorem component) could be used to capture the heterogeneity across merchants.

7 Data sources

This chapter summarises the data sources we envisage using for the analysis supporting our proposed approach to a MIF cap.

7.1 Information on the payments market and costs required for the MIT study is not generally available from public sources. For the exercise, we envisage using data from[77]:

- card schemes
- acquirers
- merchants

7.2 To estimate the costs of using different payment methods across merchants, we will gather the necessary data at merchant level. We will work with the schemes and with acquirers to ensure that we can robustly collect suitable data across a sufficiently wide and suitable sample of merchants. We expect that data from different sources will also be useful to check consistency and validity.

7.3 Finally, we are planning to collect cost and investments information from issuers and some additional cost information from merchants, for the purpose of the analysis discussed in paragraphs 2.33 to 2.47.

7.4 We are mindful not to put unnecessary burden on firms through our data requests. We consider that the approach outlined in this chapter is proportionate and limited to requesting the data necessary to help us design the appropriate level of the cap.

Data sources for the MIT analysis

Card schemes

7.5 Mastercard and Visa are card schemes which connect issuers and acquirers when a payment is made by card. Because of the nature of their activity, schemes have records on the merchants and the traffic of payments they make. Whenever possible we will gather data from schemes at merchant level.[78]

77 We are also aware of the data challenges some stakeholders raised, at the interim report stage, and the fact that merchants may not have a full understanding of the costs and benefits associated with payment methods. We are planning to use more than one data source to address these challenges. This will enable us to cross-check the data provided by different groups of stakeholders.

78 In general, card schemes identify merchants accepting their cards using a unique merchant alphanumeric ID. However, larger merchants may have multiple IDs (for example because they have multiple business lines), or it may be the case that transactions made at the same merchants have different IDs, due to the nature of such transactions (like those made at airlines). In cases where it is not possible to associate one merchant with one alphanumeric ID, we will request the schemes provide figures at aggregate level, that is consolidating the data under all the different IDs associated with that merchant.

7.6 We plan to ask schemes for records of the names of the merchants using their services, their unique identification number, and the name of the acquirer serving them. We also plan to ask for data on merchants' transactions, fees, and data on transactions challenged by customers.

7.7 Details on merchants' names will be useful to design the scope of our analysis. From these records we will be able to establish a list of merchants and acquirers to interview. In addition to merchants' transactions, we also expect to be able to obtain from the schemes a total value of the market. These two pieces of information will allow us to understand market concentration, clearly delimiting those with significant volumes of transactions and those that have a more modest contribution on the total cross-border trade. We intend to focus on those merchants that represent a significant share of this market and will exclude those with very few trades or none.

7.8 In summary, we propose to ask card schemes for the following data:

- cards market data (volume and values)
- costs (card fees)
- chargebacks, transaction disputes and fraud (card volumes and costs)

7.9 We intend to ask for annual data for the most recent calendar year, at merchant level, and distinguished between debit and credit cards. Some of this data might not be available at this level of breakdown (we are aware that some fees are charged to acquirers in bulk). If this is the case, we would request that the data is provided at the acquirer level for such indicators.

Acquirers

7.10 Acquirers are the financial institutions that process the payment on behalf of the merchant. They have merchants' traffic information and data on all the costs incurred by them. We note, however, that some merchants may be under fixed or standard pricing contracts, also known as 'blended' contracts, whereby they pay a fixed and periodic fee for providing card-acquiring services. It is possible that under such contracts, the breakdown of the merchant service charge (in relation to its different components – IFs, service charge, acquirer margin or any other fees) is not readily available or accessible to them. The merchant service charge and its different components will, nonetheless, be available to each acquirer and this should constitute a good source of information for such data. As for the card schemes, we envisage requesting data from acquirers at merchant level.

7.11 Acquirers are also providing alternative payment methods for merchants for their transactions worldwide. We expect to obtain data on the fees for using such methods and other characteristics of their service, such as exchange rate and fraud blocking.

7.12 We also expect to obtain from acquirers market data on volumes and values of transactions, and data on chargebacks, transaction disputes and fraud (volumes and costs), for both cards and alternative payment methods.

7.13 We plan to contact a sample of acquirers and expect the responses to cover a very high proportion of the acquiring market. We will calculate exact figures for market coverage using data from schemes, as described above. We don't exclude the possibility of contacting other payment service providers as we progress this work.

7.14 In summary, we propose to ask acquirers for the following data, for both cards and alternative payment methods:

- market data (volumes and values)
- costs (fees and other)
- chargebacks, transaction disputes and fraud (volumes and costs)

For each acquirer, we propose to ask for data for the most recent year (2024) at the merchant level and distinguished between debit and credit cards.

Merchants

7.15 Merchants are the businesses taking payments, and the main actors of the MIT. Previous studies have relied on merchant surveys to estimate the time used in front- and back-office tasks (processing payments at the till and transporting cash to and from the bank) and the categorisation of fixed and variable costs. However, the studies used other sources when estimating the costs of using cards, such as public information available from schemes for the MIF and other scheme fees. Previous studies also noticed heterogeneity and extreme values and errors in the responses to the surveys, all of which implied the need of assumptions to obtain representative point estimates.

7.16 Compared to previous studies, our exercise needs a lot less data from merchants' responses. As the scope is on cross-border payments, the costs related to cash payments are not relevant. Much of the other merchant-level data, especially transaction volumes and values, and costs of fees and commissions of payment methods, can be obtained from schemes and acquirers, with the additional advantage that this data would be consolidated and homogenised in some way (in the records of each card scheme or in the records under each acquirer).

7.17 From merchants themselves, we plan to ask for estimates of the time and other costs merchants incur in processing challenged transactions – be it chargebacks, transaction disputes or losses from fraudulent transactions. Additional data on market transactions and other costs could be requested for the purpose of data checking and to compare with other sources of data. With the survey of merchants, we expect also to investigate whether there are other differences between the marginal costs of credit and debit cards and those of the comparators.

7.18 In summary, we propose to ask merchants for the data on time and costs for processing challenged transactions (chargebacks, transaction disputes or fraudulent transactions) for both cards and alternative payment methods. Market transactions and other costs could be requested for the purpose of data checking and to compare with other sources of data. We plan to request data for a sample of merchants, constructed using the schemes' data described above, and for at least the most recent year (2024).

Variables and sources of information

7.19 Table 4 and Table 5 below indicate the sources of information for each of the variables we consider relevant for the MIT analysis, in relation to cards and alternative payment methods respectively.

Table 4: Variables and sources of information: cards (cross-border at merchant level)

Variables	Source*
Transactions	
Number (units)	S A M
Total value (£000)	S A M
Costs for cards	
Interchange Fee (£000)	S A
Scheme and processing fees (£000)	S A
Other cards fees (£000)	A
Acquirer margin (£000)	A
Other costs (£000)	A
Merchant service charge (£000)	A
Chargebacks, transaction disputes (including fraudulent transactions)	
Total disputed: number (units) and amounts (£000)	S A M
Total lost (paid back to client): number (units) and amounts (£000)	S A M
Total costs (administrative fees associated with handling the dispute) (£000)	A M
Average time of processing one dispute (estimated, minutes)	A M
Unauthorised chargebacks, transaction disputes (fraudulent transactions)	
Total fraudulent transactions: number (units) and amounts (£000)	S A M
Transactions recovered (paid after dispute): number (units) and amounts (£000)	S A M
Total costs (total fees paid for processing fraudulent transactions) (£000)	A M
Average time of processing one fraudulent transaction (estimated, minutes)	A M

*Note: S – schemes; A – acquirers; M – merchants. Multiple sources will be used to cross-check and validate the data used.

Table 5: Variables and sources of information: alternative payment methods (cross border at merchant level)

Variables	Source*
Transactions	
Number (units)	A M
Total value (£000)	A M
Costs for alternative payment methods	
Fees and commissions (£000)	A M
Cost of currency conversion (£000)	A M
Other costs (£000)	A M
Chargebacks, transaction disputes (including fraudulent transactions)	
Total disputed: number (units) and amounts (£000)	A M
Total lost (paid back to client): number (units) and amounts (£000)	A M
Total costs (administrative fees associated with handling the dispute) (£000)	A M
Average time of processing one dispute (estimated, minutes)	A M
Unauthorised chargebacks, transaction disputes (fraudulent transactions)	
Total fraudulent transactions: number (units) and amounts (£000)	A M
Transactions recovered (paid after dispute): number (units) and amounts (£000)	A M
Total costs (total fees paid for processing fraudulent transactions) (£000)	A M
Average time of processing one fraudulent transaction (estimated, minutes)	A M

*Note: A – acquirers; M – merchants. Multiple sources will be used to cross-check and validate the data used.

Data for additional analysis

7.20 As part of the proposed approach to the analysis we set out in Chapter 2, we will consider the impact of IFs on issuers' incentives and on competition between cards and other payment methods. To do this, we will need to collect data on issuers' costs and on merchants' costs.

7.21 In particular, we are interested in the potential impact of IFs on issuers' incentives to enable or promote the use of payment methods alternatives to cards. This could lead to a reduction in the volume of card transactions, but it is very unlikely to replace cards altogether. Issuers' incentives, therefore, would be particularly affected by costs and revenues that vary with the volume and value of the card transactions they process, rather than by the costs associated with making card payments available to their customers.

7.22 In our final report, we included the analysis of the card-related costs faced by one issuer, distinguishing between direct and indirect costs.[79] For the purposes of our analysis, direct costs are the most relevant, as they are most likely to vary with the volume and value

79 See MR22/2.7, *Market review of UK-EEA cross-border interchange fees: final report* (December 2024), Annex 2, Table 11.

of card transactions. These include the scheme and processing fees charged by Mastercard and Visa, foreign exchange-related costs, digital-wallet related costs, fraud-related costs, cashback costs and other vendor costs. As issuers' incentives are affected by both costs and revenues related to card transactions, issuer costs should be assessed net of the incentives and rebates issuers receive from the schemes, to the extent that these are – explicitly or implicitly – linked to the volume or value of card transactions.

7.23 We are therefore planning to expand the analysis developed in the final report to include a larger sample of issuers. We intend to ask for cost data from EEA issuers, but we are also planning to request cost information from UK issuers and use this data as proxy for the costs faced by EEA issuers.

7.24 In addition to issuers' incentives to promote the use of alternative payment methods, we are also interested in their incentives to invest in their card issuing services. For this purpose, in addition to the cost data discussed above, we plan to ask for data on issuers' investments in their card issuing services. As investment values may vary significantly from year to year, we consider that the data will have to cover more than one year. We therefore plan to ask for information covering the last three years: 2022 to 2024.

7.25 Finally, to assess how a cap influences alternative payment methods providers' ability to compete for merchants, we are planning to ask merchants for information on the fixed costs of adopting alternative methods for cross-border transactions (see paragraph 2.47). This request can be included in the same merchant survey we will conduct for the MIT analysis.

Summary

7.26 For the purposes of our proposed MIT analysis, we expect to obtain data from different groups of stakeholders. We have selected different sources of information to obtain the best quality of data, and to keep the costs proportionate for stakeholders. We hence expect to combine different datasets, as set out in Table 4 and Table 5 above. We are also approaching different sources to cross-check and validate some of the data.

Question 12: Do you agree with the use of the indicators and data sources as set out in Table 4 and Table 5? If not, please provide your arguments and suggest alternative indicators and sources.

7.27 For our additional analysis, we plan to develop an issuer cost analysis like the one presented in Annex 3 of our final report, focusing on direct card transaction costs. We are also minded to collect data on issuers' investments in recent years and on merchants' fixed costs of adopting alternative payment methods. We plan to send information requests to the largest EEA issuers. If we can't obtain the necessary data from EEA issuers, we will ask for the same data from UK issuers and use this as a proxy for EEA data.

Question 13: Do you agree with the data we are proposing to use in our additional (non-MIT) analysis?

7.28 An initial draft of a merchant questionnaire is in Annex 5. This indicates the types of questions that we intend to ask merchants, but we will develop it further before we use it.

Question 14: Do you agree with the questionnaire we have drafted for merchants (Annex 5)? If not, please provide your arguments and suggest alternatives.

8 Summary and next steps

8.1 As set out in Chapter 2, we are planning to use the MIT as a basis for generating a range of rates. Based on the results of the MIT and on evidence on the impact of IFs on issuers' incentives, we will then reach a view on an appropriate cap by assessing the available evidence in the round.

8.2 In implementing the MIT, we plan to use best practice, following the principles derived from our review of past applications of the MIT, and applying them to the specific circumstances of the cross-border CNP context.

8.3 The steps needed to deliver our MIT methodology are summarised in Table 6.

Table 6: Steps for the PSR's UK-EEA cross-border merchant indifference test (see Chapters 4 and 5)

Stage	Task
Stage 1: Comparator	We will select of the relevant comparator. In this paper we have proposed this to be payments funded via bank transfers within the Single European Payment Area.
Stage 2: Data	The relevant data we need to obtain (for cards and alternative payment methods) would include: • **Transaction variables:** number and values of transactions, and number and values of transaction disputes. • **Cost variables:** Scheme and processing fees; acquirer margin; foreign exchange costs conversion; other fees and commissions; chargebacks and transaction disputes, and fraud.
Stage 3: Estimate parameters	We propose to estimate the parameters using two approaches. These are: • **The arithmetic approach:** Using averages and weighted averages of the costs components to obtain the coefficients of the costs equation as a cross-check to the econometric approach. • **The econometric approach:** Estimating the coefficients of the cost equation for each payment method and using the marginal cost estimates so obtained into the IIF equation.
Stage 4: Evaluate IIF	We propose estimating the average of transactions using the retail-based approach and using this into the IIF equation to obtain the IIF. The current MIF values would then be evaluated against the IIF obtained.
Stage 5: Sensitivity of results	We plan to check sensitivity of the analysis by obtaining the IIF using different representative transaction values. We propose using a retail-based average as a sensitivity. We also plan to test the results against alternative splits between fixed and variable costs.

8.4 In parallel to this MIT analysis, we are going to consider any unintended consequences of an IIF in the long term. Our assessment will be informed by an analysis of the impact of IFs on issuers' long-term incentives and on competition between cards and other payment methods. As set out in Chapter 2, we consider that collecting information on issuers' costs might be useful to inform such an assessment. In particular, understanding issuers' incentives to invest in issuing services and on promoting cards versus other payment methods might benefit from a comparison of IFs with issuers' direct card transaction costs. These would include costs associated with scheme and processing fees, foreign exchange-related costs, digital wallet-related costs, fraud-related costs, cashback costs and other vendor costs, which we also considered in our final report to the market review. These costs would need to be assessed net of incentives and rebates that issuers receive from the schemes, at least to the extent that these are dependent on the volume or value of card transactions. Additional data useful for our analysis includes data on issuers' investments in recent years and on merchants' fixed costs of adoption of alternative payment methods.

8.5 We consider that reaching a view on the appropriate level of the MIF will not be a purely mechanical exercise for the following reasons:

- First, the cost estimates needed to compute the MIT may be subject to a degree of uncertainty (see Chapter 6).
- Second, the MIT may lead to different results depending on the approach taken, for example, on how to weigh different merchants and alternative payment methods (as discussed in Chapter 3), or on how to estimate average transaction values (see Chapter 6).
- Third, from a static perspective, the MIF that maximises total user surplus could be lower than the IIF if the evidence indicates partial pass-through of IFs from issuers to cardholders (see Chapter 2).
- Finally, there is no formula for balancing static and dynamic considerations, which will therefore require considering the impact of IFs on issuers' incentives, as discussed in Chapter 2.

8.6 We will therefore reach a view on an appropriate cap by assessing the available evidence in the round.

Next steps

8.7 We are inviting comments on this document by 5pm on Friday 21 November 2025. We are asking for views on some very specific issues related to the methodology that we will use, summarised in the questions below.

8.8 We will consider all submissions and will incorporate the relevant points in our methodological approach. You can email your responses to the consultation questions to cardfees@psr.org.uk.

Consultation questions

8.9 These are the questions on which we are seeking stakeholder views:

Question 1: Do you have any comments on our proposed analytical approach to assessing what an appropriate level for a cap on a MIF might be?

Question 2: Do you agree with the principles we propose using in the implementation of the test? Do you consider there are any reasons why these principles should not be used when applying a MIT in the cross-border CNP context?

Question 3: Are there further issues we should be considering when applying a MIT in the cross-border CNP context? If so, do you have information on how they have been met, or reasoned suggestions for how they could be met?

Question 4: Do you agree with the principles we propose using for selecting the comparators?

Question 5: Do you agree with the comparators we propose using for the MIT?

Question 6: Do you agree with our proposed approach to dealing with multiple suitable comparators?

Question 7: Do you agree with the proposal in relation to the fixed and variable nature of costs?

Question 8: Do you agree with the principles to be used for selecting the cost categories?

Question 9: Do you agree with the list of costs we propose including when undertaking the MIT?

Question 10: Do you agree that we should use both the arithmetic and the econometric approach?

Question 11: Do you agree with the use of a 'retail-based' average as a more forward-looking approach? Which other measure would you suggest using?

Question 12: Do you agree with the use of the indicators and data sources as set out in Table 4 and Table 5? If not, please provide your arguments and suggest alternative indicators and sources.

Question 13: Do you agree with the data we are proposing to use in our additional (non-MIT) analysis?

Question 14: Do you agree with the questionnaire we have drafted for merchants (Annex 5)? If not, please provide your arguments and suggest alternatives.

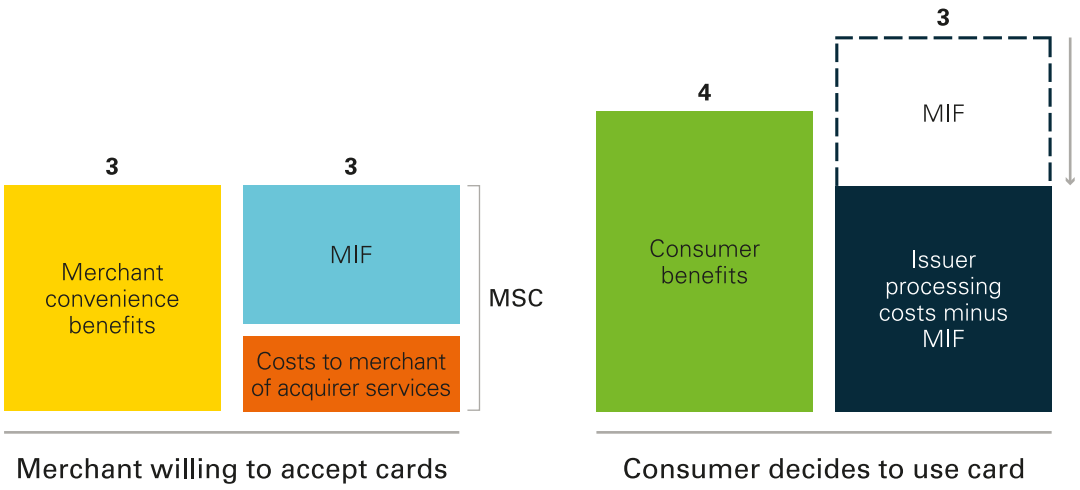
Annex 1
The logic of the MIT

This annex presents some examples that illustrate the logic of the merchant indifference test (MIT).

1.1 As seen in Chapter 2, paragraph 2.18, the merchant indifference test (MIT) methodology is based on the principle that, in order to achieve an efficient use of cards, when consumers choose between cards and an alternative payment method, they should have regard to the net convenience benefit that merchants derive from a card transaction instead of using the alternative. If this happens, then consumers will choose to use a card rather than the alternative if and only if this choice is jointly beneficial to both consumer and merchant, therefore maximising total user surplus (TUS). For this to happen, the multilateral interchange fee (MIF) should be set at a level equal to the merchant's net convenience benefit of cards over the alternative, therefore making the merchant indifferent between a card transaction and one using the alternative payment method.

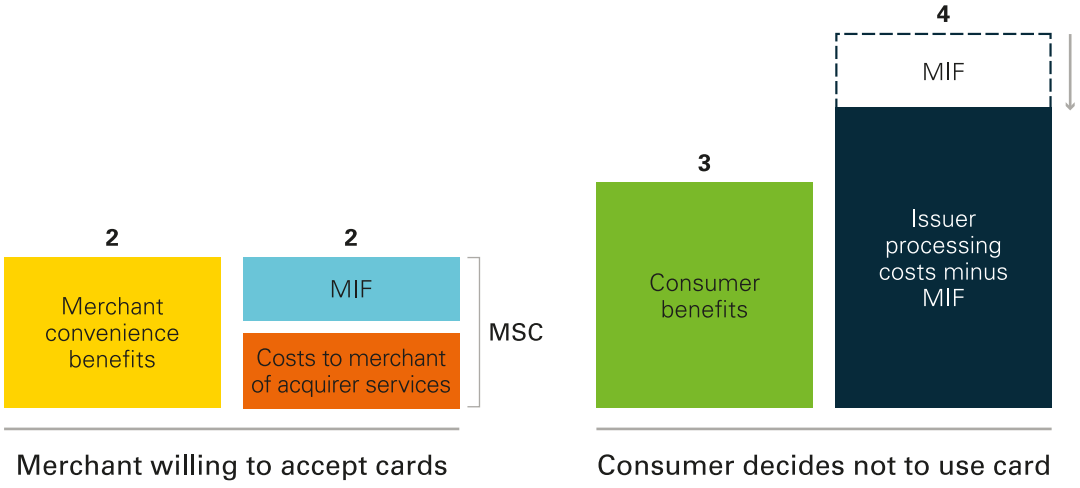
1.2 It is helpful to consider two hypothetical examples, shown in the two figures below. In Figure 5, the overall benefit of a card transaction compared to the alternative (seven – the sum of the yellow and green bars) is larger than the sum of the costs faced by merchant and consumer (six – the sum of the orange and black/white bars); the use of a card would therefore increase TUS. By setting a MIF equal to the merchant's net convenience benefits (benefits minus the cost of acquirer services), the consumer becomes willing to use a card, as its net costs (costs minus the MIF) are now lower than its benefits.

Figure 5: Effect of IIF when overall benefit of a card transaction is larger than the overall cost



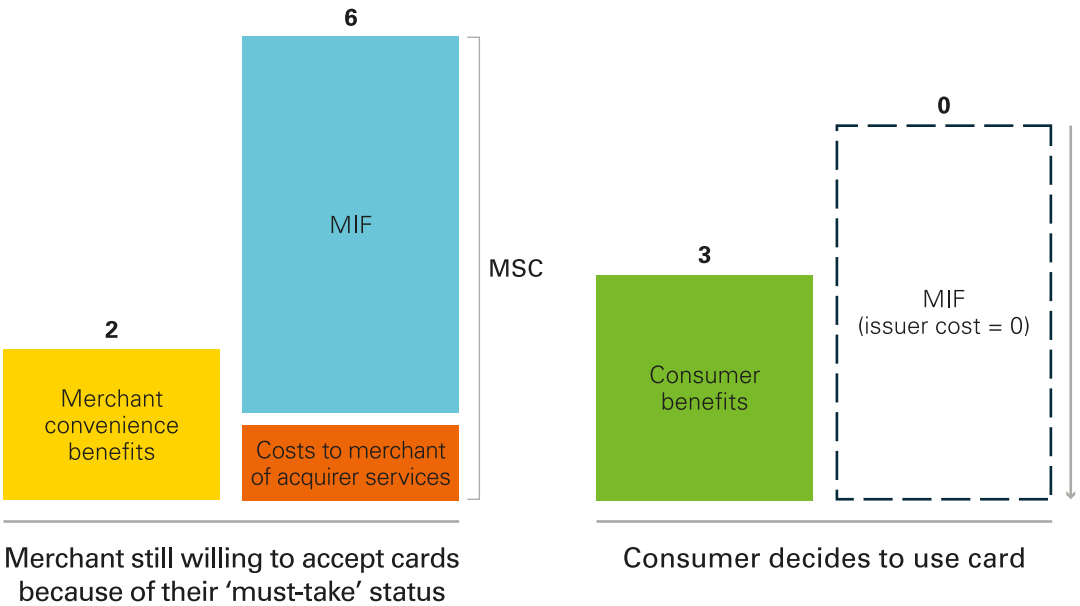
1.3 In Figure 6, the overall benefit of a card transaction compared to the alternative (five – the sum of the yellow and green bars) is lower than the sum of the costs faced by merchant and consumer (six – the sum of the orange and black/white bars); the use of a card would therefore reduce TUS. Setting a MIF equal to the merchant's net convenience benefits would still result in consumer net costs larger than its benefits. As a result, the consumer will choose the alternative payment method, as social efficiency would require.

Figure 6: Effect of IIF when overall benefit of a card transaction is smaller than the overall cost



1.4 The figures also make it clear that, in these scenarios, a MIF that achieves an efficient use of cards is independent of issuers' costs. In particular, in the example in Figure 6, if merchants feel obliged to accept card payments out of fear of losing customers, a MIF that allows the issuer to recover its card processing costs would result in cards being used even when doing so reduces the TUS (see Figure 7 below).

Figure 7: MIF equal to issuer cost



Annex 2
Review of the literature relevant for our proposed non-MIT analysis

This annex provides a review of the existing literature on the issues we discuss in Chapter 2, paragraphs 2.37 to 2.47.

Introduction

2.1 This note, based on a review of the academic literature and of documents published by regulatory authorities, summarises the existing literature on three issues related to interchange fees:

- The pass-through of interchange fees (IFs) on the issuing side, from issuers to cardholders
- The impact of IFs on issuers' incentives to invest in fraud prevention
- The impact of IFs on competition between cards and other payment systems

Pass-through of IFs on the issuing side

2.2 Pass-through of IFs on the issuing side refers to the extent to which they are reflected in the benefits that cardholders receive from issuers, and in the fees that they pay to them. The economic literature has studied the impact of changes in IFs on cardholders' fees and benefits with reference to IF regulation in Australia, the US and Spain.

2.3 Typically, issuers responded to IFs regulation by reducing cardholder benefits and increasing fees. Much of the fee increases took the form of a fixed fee, rather than per-transaction fees.

- Chang et al. (2005)[80], looking at the impact of the reduction on credit cards' IFs in Australia, found an 80-90% pass-through, with 50% in lower variable rewards and another 30-40% in higher fixed membership fees.[81]
- Kay et al. (2018)[82], who consider the impact of the Durbin Amendment in the US, found a 90% pass-through through increases in (fixed) deposit fees.

80 Chang, H., Evans, D.S. and Garcia Swartz, D.D., 2005. The effect of regulatory intervention in two-sided markets: 'An assessment of interchange-fee capping in Australia'. *Review of Network Economics*, *4*(4), pp.328-358.

81 The Australian intervention only affected IFs on credit cards. Pass-through results in Chang et al. 2005 are therefore limited to credit cards.

82 Kay, B.S., Manuszak, M.D. and Vojtech, C.M., 2018. Competition and complementarities in retail banking: Evidence from debit card interchange regulation. *Journal of Financial Intermediation*, *34*, pp.91-108.

- Manuszak and Wozniak (2017)[83] also study the impact of the Durbin Amendment in the US and find significant pass-through (although it is unclear what percentage this corresponds to) through decreasing the availability of free accounts, raising monthly fees, and increasing minimum balance requirements (all fixed fees).
- The analysis by Mukharlyamov and Sarin (2025)[84], who also consider the impact of the Durbin Amendment in the US, is the only one identified among the studies using a rigorous methodology that finds a low pass-through (14%). We note, however, that this is still a working paper and has not been published (and peer-reviewed) yet.

2.4 We could not identify any academic studies looking at issuer-side pass-through in a rigorous, quantitative way in relation to IF regulation in Europe. The European Commission (EC) (2013)[85] argued that pass-through on the issuing side was limited, concluding that 'there appears to be no convincing evidence of a direct link between capped interchange fees and increased cardholder fees in the countries where IFs have been the subject of regulatory intervention'. However, the evidence provided in support of this statement is not particularly strong. The Commission appears to have interpreted the results in Chang et al. (2005) as if they implied a 30-40% pass-through, and has referred to other, less rigorous studies. A 2020 report prepared by EY for the EC[86] states that, for stand-alone cards, after the introduction of the IF regulation there was no increase in 'total cardholder fee' for debit cards and a slight increase for credit cards. Total cardholder fees are defined as including annual cardholder fees, transaction fees, ATM withdrawal fees, foreign currency fees, currency exchange fees[87] and any remaining other cardholder fees. For cards delivered as part of a bank account package, the report found no evidence of systematic increases in retail banking prices. However, the report did not adopt a rigorous quantitative methodology.

2.5 Finally, the only study we have identified looking at the impact of IF regulation on quality features of cards or bank accounts is the EY same report, which however uses limited, qualitative evidence.

2.6 Overall, while it is often claimed that pass-through is higher on the acquiring side than on the issuing side, empirical evidence is far from clear in this regard. There has been limited rigorous analysis (none of which applied to the European case) and results have been inconsistent. It is worth noting that the EC, while arguing that issuing-side pass-through is low, did not use this result to argue for a MIF lower than the MIT-based level.

2.7 There seems to be more consensus on the fact that past reductions in IFs have been passed through by issuers in large part through increases in fixed, rather than variable, fees. While the Rochet and Tirole's model assumes that issuers do not charge fixed fees, it would be incorrect to simply discard this type of pass-through as it does affect cardholder's incentives to use their cards. The presence of fixed fees, however, changes the model substantially, introducing consumers' choices of whether to hold a card (which is not present in the Rochet and Tirole's model); the tariff that maximises total user surplus could therefore

83 Manuszak, M.D. and Wozniak, K., 2017. *The Impact of Price Controls in Two-sided Markets: Evidence from US Debit Card Interchange Fee Regulation*. Finance and Economics Discussion Series 2017-074. Washington: Board of Governors of the Federal Reserve System. Available here.

84 Mukharlyamov, V. and Sarin, N., 2025. Price regulation in two-sided markets: Empirical evidence from debit cards. Available at SSRN: https://ssrn.com/abstract=3328579.

85 EC, 2013. Impact assessment of the interchange fee regulation. Available here.

86 EY, 2020. Study on the application of the Interchange Fee Regulation. Available here.

87 It is unclear how EY defined foreign currency fees and currency exchange fees. The glossary in their report includes a different expression – **foreign transaction fees** – defined as fees assessed by the issuers for each payment transaction made in a foreign currency.

be significantly different from the one in the Rochet and Tirole's model. We are not aware of any academic paper expanding Rochet and Tirole's model to allow for two-part tariffs.[88]

2.8 Finally, a further argument made by New Zealand's Commerce Commission is that a rebalancing of fees towards separate charges for different banking services may in itself be efficiency enhancing, especially if there are separate markets for those services.

Issuers' incentives to invest in fraud prevention

2.9 Little has been written on issuers' incentives to invest in fraud prevention and how this is affected by the level of IFs. However, several regulatory authorities have made the point that issuers have an incentive to invest in fraud prevention irrespective of interchange revenue. For example:

- The US Regulation II implementing the Dodd-Frank Act states 'that issuers have a strong incentive to protect cardholders and reduce fraud independently of interchange fees, and that competition among issuers for cardholders suggested that protecting cardholders from fraud is good business practice for issuers'.[89]
- New Zealand's Commerce Commission stated that 'Issuers have an incentive to invest in fraud prevention, not only to reduce their own fraud losses, but also to maintain the reputation and integrity of their payment product, independent of interchange revenue'.[90]

2.10 We consider that, while it is true that issuers may have some incentive to invest in fraud prevention irrespective of the level of IFs, it may be incorrect to go as far as saying that such incentive is completely unaffected by the IF level. Considering first issuers' incentives keeping the volume of transactions per cardholder fixed:

- If the liability for fraud lies with the merchant, issuers have no incentive to invest, irrespective of the IF level (unless they bear some costs even when they are not liable).
- If the liability lies with the issuer and issuers absorb the costs of fraud, then they have an incentive to optimally invest in fraud prevention irrespective of the interchange revenue. Investment is proportional to the cost caused by fraud, not to the revenue generated by transactions.
- If the liability lies with the issuer but the issuer can charge the cardholder, then investment in fraud prevention depends on competition for cardholders:
  - Competition may limit issuers' incentive to charge cardholders, forcing issuers to absorb fraud costs (see above).
  - Competition may induce issuers to invest in fraud prevention as a way to offer a better quality of service. This incentive would depend on the expected revenue from a cardholder, but the effect of IFs may be small if issuers generate other types of revenues from new customers.

88 Bedre-Defolie and Calvano (2013) did develop a model with two-part tariffs, but their model does not incorporate merchant internalisation; as a result, IFs do not have an impact on retail prices. Bedre-Defolie, Ö. and Calvano, E., 2013. Pricing payment cards. *American Economic Journal: Microeconomics*, *5*(3), pp.206-231.

89 See Federal Register: Debit Card Interchange Fees and Routing.

90 Commerce Commission, 2024. Interchange fee regulation draft decision. Available here.

2.11 More generally, however, the risk of fraud may affect the volume of transactions per cardholder:

- The risk of fraud may affect cardholders' willingness to use their cards (especially online), so that transaction volumes increase if cardholders expect lower fraud rates.
- Similarly, higher risk of fraud may affect merchants' willingness to accept cards (if they are liable), so that transaction volumes increase if merchants expect lower fraud rates.

2.12 In this case, an issuer's incentive to invest in fraud prevention also depends on the expected incremental revenue from increased card transactions, and therefore on the IF.

Competition and barriers to entry

2.13 The impact of IFs on 'dynamic' competition between cards and other payment systems is not an issue formally addressed in the academic literature. Reports from regulatory authorities do cover this topic, making two arguments.

- The EC[91] stated that 'high MIFs also form barriers to entry for cheaper and more efficient schemes – not only card schemes but also other means of payment – that offer lower inter-bank fees and have difficulty convincing issuing banks' (page 99). New Zealand's Commerce Commission[92] made a similar point.
- On the other hand, New Zealand's Commerce Commission[93] also stated that setting the IF too low might hamper the uptake of open banking, as open banking payment products appear to be, in part, competing based on the lower cost to merchants.

2.14 As discussed in paragraphs 2.45 to 2.46 in Chapter 2, we recognise that when card schemes have a must-take status, and are therefore able to charge high fees on the acquiring side, high IFs can make it more difficult for innovative payment methods to grow their market presence as issuers have little incentive to participate. Our proposed approach to a MIF cap will remove these barriers. More generally, a MIF cap should be set at a level that does not hinder the adoption of equally or more efficient payment methods. As explained in paragraph 2.47, we consider that our proposed approach achieves this.

2.15 A further consideration is the role of IFs in competition between banks and, especially, the role they play in facilitating entry of neobanks or fintech.

- New Zealand's Commerce Commission explicitly considered competition from fintech. For example, their proposal to keep domestic prepaid payment products unregulated is motivated by the fact that these products often act as a gateway product for fintechs, new entrants and the underbanked. Not regulating these products is seen as supporting innovation and competition in the retail payment system.[94]
- Internal PSR analysis based on data from the Financial Conduct Authority's Strategic Review of Retail Banking has found that, in the UK, IF revenue is particularly significant for neobanks. IFs are therefore an important source of income for challenger banks, which are a source of competition, innovation and growth in the issuing market.

91 EC, 2013. Impact assessment of the interchange fee regulation. Available here.

92 New Zealand Commerce Commission, 2025. Interchange Fee Regulation for Mastercard and Visa Networks – Final Decision and Reasons Paper. Available here.

93 Ibid., paragraphs 2.32-2.34.

94 Commerce Commission, 2024. Interchange fee regulation draft decision. Available here.

Annex 3
Review of the empirical literature on the MIT

This annex provides a summary of recent empirical papers using the MIT for assessing IFs.

Introduction

3.1 Recent research has employed empirical approaches to evaluate current IFs by comparing them to estimates of indifference IFs, aligned with the principles of the MIT. The following paragraphs review some of the most significant empirical studies in this area. These are:

- European Commission (EC) (2015 and 2019) – EU 28 Member States
- Bolt et al. (2013) – the Netherlands
- Górka (2014) – Poland
- Fung et al. (2018) – Canada
- Aurazo and Vega (2021) – Peru
- Arango-Arango et al. (2022) – Colombia

EC (2015 and 2019) – EU 28 Member States

3.2 The European Commission (2015)[95] used a MIT to assess the MIFs set by Mastercard and Visa. The study was based on a survey of merchants and required cost data to be obtained from merchants' business records. As this implied a very resource intensive exercise (assistance in filling out the questionnaire was provided and checks on the data required), the sample was reduced to large merchants in ten EU countries only.[96] The components of acquirers' fees (including the prevailing MIF) were estimated from information provided by merchants and also using schemes' public information on IFs.

3.3 The EC recognised as crucial the split between cost components (fixed and variable costs, and further separating variable costs into those costs that vary with the number and value of transactions); it established fixed costs as not relevant and excluded these for the purpose of the test. As the definition of fixed costs depends on the time horizon chosen, different results were obtained depending on costs defined in the short term, the medium term (three to four years) and long term.[97]

95 EC (2015) Survey on merchants' costs of processing cash and card payments.

96 The EC recognised that participation in the survey was voluntary and that, because of that, some data could be biased (due to self-selection in the responses).

97 Short- and medium-term definitions were identified using survey responses. An econometric specification without such classification of costs was also used and this was recognised to be more in line with a long-term approach.

3.4 The evaluation of the MIT needs to be done around transaction average value. The EC did this using two different metrics: the 'card-based' approach, which uses the average of card transaction values, and the 'retail-based' approach, which uses the average of all transactions (cash and card).

3.5 The merchant indifference IF was calculated using the difference between average marginal costs of cash and cards. Additional calculations of the MIT were undertaken using cost functions estimated econometrically, as this allowed obtaining results less dependent on merchants' judgements (on the costs nature) and accounting for heterogeneity of merchants (in size, sector and countries).

3.6 The results showed that the prevailing costs of cards exceeded the cost of cash per transaction. This implied that prevailing MIFs were, on average, above the indifference threshold for the surveyed merchants. However, the EC warned that the results need to be considered with certain caveats, and should be seen as a first attempt to consistently apply the MIT. Finally, a few areas of improvement were identified, related to the evaluation of fees charged by acquirers (it is suggested obtaining these from the schemes and their members) and the costs related to small merchants (as this proved to be a difficult task in the exercise).

3.7 The results of the MIT were used to set the caps in the EU Interchange Fees Regulation (EU IFR, 2015) for domestic and intra-EEA transactions.

3.8 The caps set in the Commitments (2019) for inter-regional transactions (that is, for transactions concluded at merchants located in the EEA with consumer debit and credit cards issued by an issuer located outside the EEA) were also assessed in reference to the merchant indifference test.

3.9 In the Commitments (2019), the EC confirmed the need to use the MIT when assessing the levels. In paragraphs 70 and 71 of 'MasterCard II' and 'Visa MIF', respectively, it is stated that: 'When analysing MIF levels, regard should be had to the Merchant Indifference Test (MIT), a methodology originally developed in economic literature and then further developed by the Commission to assess efficient interchange fees. The Commission uses this methodology as a benchmark or proxy for assessing compliance with Article 101(3) of the Treaty so as to ensure that merchants benefit from card acceptance. This approach is reflected in the Commission's previous commitment decisions in determining ranges of MIFs that would likely benefit merchants'.[98]

Bolt et al. (2013) – the Netherlands

3.10 Bolt, Jonker and Plooij (2013)[99] investigate IFs in the Netherlands. Their calculations are based on the assumption that the cost function of each payment instrument is linear (the marginal cost is equal to the variable cost of a payment). The authors also acknowledge the difference between number- and value-related variable costs, but only consider costs related to the number of transactions for debit cards (in the Netherlands, the acquirer's commission is fixed and not a percentage of the transaction).

98 See CASE AT.40049 – MasterCard II, Antitrust, European Commission (29 April 2019); and CASE AT.39398 – Visa MIF, Antitrust, European Commission (29 April 2019). In footnotes, reference is made to the article jointly authored by Professor Jean-Charles Rochet and Jean Tirole, 'Must Take Cards and the Tourist Test', No 496, IDEI Working Papers from Institut d'Economie Industrielle (IDEI), Toulouse, and the EC's 2010 Visa decision and its 2014 Visa decision.

99 Bolt, Wilko, Nicole Jonker, and Mirjam Plooij (2013) 'Tourist test or tourist trap? Unintended consequences of debit card interchange fee regulation', *DNB Working Paper*, No. 405.

3.11 To separate fixed from variable costs, the authors used the responses from the merchants' survey. As the relative value of the estimated IF depends on the transaction size, the calculations are presented for different transaction value ranges (euros): 0-10; 10-20; 20-30; 30-40; 40-50; 50-100; 100+, and also for two average values for debit card transactions (in 2002 and 2009).

3.12 The paper presents the results of two alternative specifications for the fee and costs structures: using an ad valorem IF (instead of fixed); and using a different division of costs items into fixed, variable transaction-linked and variable sales-linked. The results indicate that the estimated IFs depend on the average transaction size (and are higher in larger transaction values). The authors also indicate that using the MIT methodology may lead to an IF that exceeds the internal cost of a debit card payment borne by banks. Moreover, the study compares the results of the estimated IF for 2002 and 2009 and shows that this increased for all transaction sizes considered in the study.

3.13 The study reports that the results obtained are sensitive to changes in variable costs for cash and debit card payments. Comparing 2009 with 2002 data, the authors find that the costs for cash payments increased during the period, whilst costs for debit card payments decreased. Both factors, according to the authors, have exerted upward pressure on the level of the estimated IF.

Górka (2014) – Poland

3.14 Górka (2014)[100] calculated the IF consistent with the MIT in Poland. Data was obtained using a standardised questionnaire on merchants' private costs. The study includes a description of the strategy used in the survey, which included three stages: (1) preparation, involving extensive stakeholder consultation and identification of the appropriate respondents to the questionnaire (senior officers responsible for decisions on acceptance of payments methods and related issues); (2) interviews with merchants (requiring several contacts to obtain all answers and/ or fill out the missing data); (3) checking and working out the outcomes (validation, statistical description and analysis).

3.15 The study starts by identifying the relevant costs of each payment instrument. It included nine types of what the study calls 'pecuniary cost' (charges and tariffs, opportunity costs related to foregone interest, financial losses as a result of fraud, counterfeiting or theft) and four 'non-pecuniary costs' (related to labour time in front and back office tasks). Non-pecuniary costs are converted into monetary terms by multiplying labour time with an average hourly gross wage rate. At a second stage, based on survey responses, the author considers some of the costs negligible; these are discarded from the rest of the analysis. Values for the different fees required in the test were estimated using survey data and other sources (study by the National Bank of Poland).

3.16 Costs were evaluated in terms of their nature: fixed, variable linked to number of transactions and variable linked to value of transactions (on this basis, card payment terminal renting was considered fixed and subsequently excluded). For items whose nature it might be difficult to define, the classification was made using merchants' declarations and different cost studies (a one-year time horizon was used to determine fixed costs). The analysis was then undertaken using scenarios for different splits of cost typologies. Finally, credit and debit

100 Górka, Jakub (2014) 'Merchant indifference test application – A case for revising interchange fee level in Poland', in *The usage, costs and benefits of cash – Conference Volume*, 75-152.

cards were treated jointly, 'because from the perspective of merchants this division was not relevant in the cost context and because it was hardly possible'.

3.17 The results of the study concluded that IFs in Poland should have been lower: below 0.2% of transaction value or even brought down to zero (depending on the transaction value). The study also warns that that calculations are sensitive to the parameters used for the cost components, the average used, and the cost for withdrawal and deposit of cash. Moreover, the authors recognise that cash was extensively used in Poland and that this can make the costs of cash particularly low (in comparison to cards). Finally, calculations relied on data provided by merchants, and had to use a number of assumptions. Therefore, according to the authors, the results need to be interpreted as indicative and illustrative but not as definitive numbers.

Fung et al. (2018) – Canada

3.18 Fung, Huynh, Nield, and Welte (2018)[101] undertook a MIT for small and medium merchants in Canada. A survey of merchants is used, and the test is assessed using the difference between the marginal cost of cash and the marginal cost of credit cards. A two-part marginal cost function is assumed for both payment methods, hence recognising a flat fee per transaction and an ad valorem component (so that the cost is allowed to be proportional to the transaction value).

3.19 The methodology used relies on dividing the total costs into fixed and variable costs, and assumptions from previous studies were used to allocate costs into different relevant categories (fixed costs, and costs that vary with the volume and the value of transactions). The authors noted that the calculation of the MIT results depends on the transaction value used, and hence present results for different transaction values ($20, $50 and $100). To assess the sensitivity of the results, alternative scenarios were considered with different allocation into fixed and variable cash-handling costs.

3.20 The results in the paper show that calculations can present a wide range of estimates. The study therefore recognises that results can be very sensitive depending on the assumptions used. The study also discusses a number of caveats when undertaking the test, which are related to data and specification issues (in particular non-response in the survey), the nature of multi-sided markets, and the evolution of the payment landscape (which may have implications on future costs of the different payment methods).

Aurazo and Vega (2021) – Peru

3.21 Aurazo and Vega (2021)[102] estimate the MIT in Peru using a sample of 1,063 small merchants, located in the country's seven most important cities. The survey contains information on four types of costs: front office (time it takes for a merchant to complete a sale), back-office (associated with depositing and withdrawing cash from a financial institution), fraud associated with cash (counterfeit bills), and retail taxes. Costs related to rental of card terminals are not taken into account, as business practice is to not charge such fees.

101 Fung, Ben, Kim P. Huynh, Kerry Nield, and Angelika Welte (2018) 'Merchant acceptance of cash and credit cards at the point of sale', *Journal of Payments Strategy & Systems* 12(2):150-165.

102 Aurazo, Jose, and Milton Vega (2021). 'Card acceptance by small merchants: An application of the tourist test to Peru', *Review of Network Economics* 20(2):101-137.

3.22 Again, assumptions are needed on the distribution between transaction-related and value-related costs. To check the robustness of the IF calculated, two additional scenarios are considered to account for a different split of the front and back office costs.

3.23 The IFs' estimates are derived from marginal cost functions, which depend on the transaction value. The paper notes that the calculated IF depends on the transaction value used and proposes a different way of constructing averages. The authors claim that this confers their approach certain advantages over the standard approach, most noticeably that it avoids making the results dependent on transaction volumes or the distribution of merchants' costs.

3.24 The calculations presented in the paper indicate that the level of IF should be lower in order to promote merchant acceptance at the point of sale. Finally, the paper considers the relevance of IFs in less-developed markets, like Peru, and how public policies aimed at promoting digital payments are crucial for increasing digital payment adoption among the low-income population. Establishing an IF framework that favours card payment acceptance should be considered as part of a potential strategy.

Arango-Arango et al. (2022) – Colombia

3.25 Arango-Arango, Betancourt-García and Restrepo-Bernal (2022)[103] apply the MIT to merchants in Colombia, using a survey on private costs that merchants incur for accepting each payment method (with a sample of 867 merchants located in urban areas of 15 municipalities). Information on costs relate to front- and back-office costs and include questions about the labour costs associated with payment processing (the time it takes to process and finalise a transaction at the cash register), third-party services (cash handling services or card-processing fees), fraud, sales' surcharges, and discounts; data on fees and on the merchant service charge is based on public information. The fixed and variable nature of costs is assessed using two scenarios: in a short-term scenario all equipment costs are considered fixed; in the medium-term scenario the assessment was based on merchants' responses when considering a hypothetical situation where 20% of cash transactions would be replaced by cards within a two- to three-year horizon. As the results vary with the transaction value, the authors report estimations based on the average of total purchases and of purchases made with card.

3.26 The study describes two approaches to the test: an arithmetic and an econometric approach, as was done previously by the EC (2015). However, it recognised that the econometric approach has the advantage of avoiding the accounting assumption (fixing the split between different cost types) and the linearity assumption (no flexibility to account for economies of scale or scope). The analysis was therefore centred on an econometric approach, using a specification that allows for quadratic terms for sales volumes and sales values (to account for economies of scale), and included other interaction terms (to account for economies of scope) and specific variables for some other merchants' characteristics. The arithmetic approach was used for comparison purposes only.

3.27 The estimates in the paper show that the IFs in Colombia were far above the rate calculated using the MIT. The results also recognised the presence of increasing scale effects in payments by cards, so another of the findings was that future reductions in cash usage may lead to an increase in the estimated IF. As in other papers, the study recognises that the estimations presented should be taken just as guidance given a number of caveats (in particular the sensitivity of the results to underlying assumptions and the wide variance of the results across merchants).

103 Arango-Arango, Carlos A., Yanneth Rocío Betancourt-García, and Manuela Restrepo-Bernal (2022) 'An application of the tourist test to Colombian merchants', *Latin American Journal of Central Banking*, 3(4).

Annex 4
Estimating the IIF

This annex presents the formulas for the estimation of the IIF, including those related to both the arithmetic approach and the econometric approach to the estimation of marginal costs. The annex draws on the methodology described in EC (2015) and Arango-Arango et al. (2022).

Calculating the IIF

Total cost function

4.1 A cost function can be used to represent the total cost incurred by a business, given a certain quantity of goods or services produced. In the context of the test, costs functions are used to represent the costs, to merchants, of using each of the payments (cards and the alternative) when handling payments.

4.2 Simplifying assumptions are frequently imposed.[104] Hence, in its most generic and simple form, a payments' cost function (C) can be defined as the sum of fixed (F) and variable costs (V). This is: $C = F + V$.

4.3 In many studies variable costs are separated into transaction- and value-related costs, which implies that these can be expressed as a per-transaction flat fee and an ad valorem fee (a fee that depends on the value of the transaction). Hence, the total variable costs can be written as aN (the unit price per transaction, a, times the number of transactions, N), plus bX (the unit price per value of transaction, b, times the value of the transactions, X), yielding:

$$C = F + aN + bX, \qquad (1)$$

where:

- F is the fixed costs
- a is the unit price per transaction (for the flat fee component)
- N is the number of transactions
- b is the unit price per value of transaction (for the ad valorem component)
- X is the value of the transactions.

104 This implies a linear cost function (costs depend on a constant relationship between cost and output level) and assuming that costs are separable into fixed and variable components.

Marginal cost function

4.4 However, the test is not based on total cost, but on the comparison between the marginal costs (MC) of the different payment methods (this represents the cost of one additional unit being purchased). For cost functions that are linear in the number and value of transactions, the marginal cost of any payment instrument is simply[105]:

$MC = a + bx$, (2)

where:

- a and b are defined as in (1), and
- x represents the additional transaction (in monetary units).

4.5 It is important to note that fixed costs simply disappear from these equations when assessing marginal costs (which is consistent with the concept that merchant indifference IF calculations are based on variable costs only). It is also worth noting that the marginal cost depends on the value of the additional transaction (hence, there is a different MC for each value of x).

The indifference IF (IIF)

4.6 Finally, the merchant indifference fee or indifference IF (IIF) can be calculated as the difference between the marginal cost of payment method 1 (MC^1), i.e. cards, and that of the alternative payment method 0 (MC^0), as a proportion of the transaction value. Hence, $IIF = (MC^0 - MC^1)/x$ (the calculations are done excluding the current IF from the costs).[106]

4.7 We have noted that marginal costs are not constant but depend on the value of the transaction (x). To make the test operational, empirical studies have calculated the IIF around a measure of a representative transaction, which has been taken as an average value of transactions in the sector ($\bar{x}$). Hence, making use of equation (2), the IIF has been expressed as:

$$IIF = \frac{MC^0 - MC^1}{\bar{x}} = \frac{(a^0 - a^1)}{\bar{x}} + (b^0 - b^1), \quad (3)$$

where

- a^0 and b^0 are, respectively, the constant and ad valorem coefficients for payment method 0,
- a^1 and b^1 are, respectively, the constant and ad valorem coefficients for payment method 1, and
- $\bar{x}$ is an average value of transactions where the IIF is evaluated.

105 Note that the additional cost of a marginal unit x, can be obtained as $C(x) = C(X + x) - C(X)$, which using equation (1) yields $MC = [F + a(N + 1) + b(X + x)] - [F + aN + bX] = a + bx$.

106 The formula only holds if IFs are fully passed through from acquirers to merchants. In our interim report, we found evidence of almost full pass-through: it is so by definition under IC+/IC++ contracts (in which acquirers automatically pass any IF charge on to merchants and which account for 80% of transaction value), and the evidence indicates full pass-through also for most merchants that offer blended contracts. See MR22/2.7, *Market review of UK-EEA cross-border interchange fees: final report* (December 2024), paragraph 6.12.

Estimating marginal costs

The arithmetic approach

4.8 The arithmetic (or account) approach starts by classifying accounting costs categories as either fixed or variable and then aggregating them into the relevant components (per transaction or per value). The approach then uses a simple average of the costs' components for the merchants in the sample. The approach has been typically formulated using a linear cost function, implying a marginal cost function as in equation (2) above, and considering a separate marginal cost equation for each merchant in the sample:

$MC_i = a_i + b_i x_i$, for merchant $i = 1 \dots N$. (4)

4.9 To obtain sample estimates average and volume-weighted average across merchants (for the constant and ad valorem components) are used:

- $\hat{a} = \frac{1}{N}\sum_{i=1}^{N} a_i$ and
- $\hat{b} = \sum_{i=1}^{N} w_i b_i$, with $w_i = \frac{x_i}{\sum_{i=1}^{N} x_i}$.

4.10 And so

$$IIF = \frac{MC^0 - MC^1}{\bar{x}} = \frac{(\hat{a}^0 - \hat{a}^1)}{\bar{x}} + (\hat{b}^0 - \hat{b}^1). \quad (5)$$

The econometric approach

4.11 The econometric approach uses a total costs variable (the sum of all the cost items for each merchant), which is then regressed against a constant term, the number of transactions and the total value of transactions. The specification allows for identifying the constant term as fixed costs (by definition, costs that are not subject to variation by transactions).[107] Additional variables are added to capture the effects of the number and the value of transactions on cost.

4.12 The econometric approach hence starts from a total cost function (not a marginal one) such as the one in (1), and introduces a slight variation to allow for the inclusion of an error term (ε). Separate equations are proposed for cards and alternative payment methods using the following specification:

$C_i = \varphi + aN_i + bX_i + \varepsilon_i$, for merchant $i = 1 \dots N$,

where:

- C_i is the sum of all cost items for merchant i
- φ is the parameter for the constant term (assumed constant across merchants and representing fixed costs)
- N_i and X_i are, respectively, the number and value of the transactions for merchant i
- a and b are, respectively, parameters for the flat fee and an ad valorem components
- ε_i is an error term.

107 It hence needs to rely less on the assumptions for separation of the fixed and variable costs, and also between flat and ad valorem variable costs, as this will come from the estimations in the model.

4.13 Estimates for φ, a and b are then obtained using ordinary least squares (OLS) techniques (obtaining $\hat{a}$ and $\hat{b}$) and are then used to derive an IIF using a marginal cost specification, in a similar fashion as in (4): $IIF = (MC^0 - MC^1)/\bar{x} = (\hat{a}^0 - \hat{a}^1)/\bar{x} + \left(\hat{b}^0 - \hat{b}^1\right)$, where the parameters for $\hat{a}$ and $\hat{b}$ are obtained from OLS estimation.

4.14 It is also possible to use other functional forms, which offer more flexibility and permit to take into account other sources of heterogeneity between merchants of different sizes or from different sectors. For instance, size heterogeneity (derived from larger transaction values) can be further modelled with an extra quadratic term, with a corresponding parameter c (the rest of parameters follow from above):

$C_i = \varphi + aN_i + bX_i + cX_i^2 + \varepsilon_i$, for merchant $i = 1 \ldots N$.

4.15 In case the processing of transactions by a payment instrument is characterised by decreasing returns to scale, the coefficient c is positive, which implies that the marginal cost for that payment instrument is an increasing function of the merchant size. Using a different functional form would require including the additional parameters in the marginal cost calculations used to derive the IIF.

4.16 The econometric approach also allows for other specifications. This includes estimating different equations for different groups of merchants (small and large merchants (see EC 2015), or allowing for additional variables (proportion of cash transactions, merchant's number of outlets, dummy variables for sector, city, and size) and interaction terms (squared terms and products of variables) which allow to account for economies of scale or scope (Arango-Arango et al., 2022).

Annex 5
Merchant questionnaire

These are some indicative questions we may ask merchants, though we may change some of the wording after consultation.

[INTRODUCTION TO THE QUESTIONNAIRE]
[Explain which costs are included (variable costs) and how to account for fixed costs]
[for the purpose of the exercise]

1. Merchant characteristics

Sector: please select the sector you operate in (main revenue-generating activity, in 2024).

- Travel
- Hospitality
- Entertainment
- Retail
- Financial services
- Other (please specify) _____

Size: Please provide the annual gross revenue from ALL retail sales (including VAT and other taxes or duties) in 2024. _____ (£ thousand).

2. Transactions: Please provide details on distance-selling transactions in the UK-EEA corridor, for debit, credit cards and alternative payment methods (APMs).[108] Please provide data for 2024.

Transactions	Debit cards	Credit cards	APMs
Number of transactions.			
Total value of transactions (£ thousand).			
Total costs* (£ thousand).			

* Total costs of processing transactions (merchant service charge in the case of cards, or equivalent costs in the case of APM).

108 Information from acquirers will include the list of APMs that each merchant is using. The following tables could be pre-populated based on that information, allowing respondents to add further columns if needed.

3. Disputed transactions (chargebacks*): Please provide details on total disputed transactions (including fraudulent transactions) in distance-selling transactions in the UK-EEA corridor. Please provide data for 2024.

Note*: When customers dispute a transaction, this can result in businesses needing to return funds. This is known as a chargeback. When a chargeback occurs, businesses are often charged a fee to cover the administrative costs associated with handling the dispute.

Chargebacks (including fraudulent transactions)	Debit cards	Credit cards	APMs
Number of chargebacks.			
Chargeback amounts disputed (£ thousand).			
Number of chargebacks lost or given back to client			
Total amount of chargebacks lost or given back to client (£ thousand).			
Total costs (administrative fees associated with handling the dispute) (£ thousand).			
Average time spent processing one chargeback (minutes).			

4. Unauthorised chargebacks (fraudulent transactions): Please provide details on fraudulent transactions in distance-selling in the UK-EEA corridor. Please provide data for 2024.

[THIS IS A SAFETY QUESTION TO CROSS CHECK THE DATA.]
[IT COULD BE ELIMINATED AS IT SHOULD BE INCLUDED IN 3.]

Unauthorised chargebacks (fraudulent transactions)	Debit cards	Credit cards	APMs
Number of fraudulent transactions.			
Fraudulent transactions amounts disputed (£ thousand).			
Number of fraudulent transactions recovered (transactions paid to you after dispute)			
Total amount of fraudulent transactions recovered (amounts paid to you after dispute) (£ thousand).			
Total costs (total fees paid for processing fraudulent transactions) (£ thousand).			
Average time spent processing one fraudulent transactions (minutes).			

5. **Foreign and international costs: Please provide details on foreign or other international costs in distance-selling in the UK-EEA corridor. Please provide data for 2024.**

Foreign	Debit cards	Credit cards	APMs
Total cost of currency conversion (£ thousand).			
Other international costs (£ thousand). Please specify _____			

6. **Other (please specify). Please provide details of other costs in distance-selling in the UK-EEA corridor. Please provide data for 2024.**

Please include, if relevant, any costs associated with delays in the provision of funds (due to cash flow issues and/or lost interest in cases where funds are provided with delays).

Other (please specify)	Debit cards	Credit cards	APMs
(£ thousand)			
(£ thousand)			
(£ thousand)			
(£ thousand)			

7. **Please provide the fixed costs you face for APMs.**

Implementation costs	APMs
Set-up one-off (£ thousand)	
Monthly expenses (£ thousand/month)	
Support (£ thousand/month)	
Training required (£ thousand/year)	
Staff time to implement solution (hours/year)	
Other (please specify) _____	

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