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- 2. Host Card Emulation (HCE): Coming soon to your door?**

1. More on the ECB's card report

In the April edition of our newsletter we have reported already on the issues touched upon in the ECB's report on card payments¹ and commented on the general strategic outlook, including competition issues and interchange fees. But there are many more issues worth commenting. In particular:

- the appropriate methodology for setting interchange fees
- the separation of scheme and processing
- application selection at the POS

Our Comment

“Separation of scheme management from processing” is one of the issues that have been pushed by both, the EU Commission and the Eurosystem, for a long time. As the Eurosystem points out, this issue will be addressed in the proposed regulation on interchange fees for card-based payments. Unfortunately, in the text proposed by the EU Commission it remains somewhat obscure what the precise meaning of this idea is.² In this respect, the card report is of little help. The Eurosystem simply re-iterates that the separation of card schemes from card payment processing is a core element in SEPA for Cards (p. 41/42). Separation should consist of “operational separation, information separation, financial/accounting separation, commercial separation and ideally also legal separation.” Furthermore, clearing and settlement also seems to be included in the list (p. 40): “The underlying assumption is that card issuers and acquirers should be free to choose their processors and clearing and settlement service providers.” This last statement is difficult to interpret. On the one hand, it could be argued that processors are carrying out the function of

¹ ECB: Card payments in Europe – a renewed focus on SEPA for cards, April 2014.

² The Article 7 in: European Commission: Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on interchange fees for card-based payment transactions, Brussels, 24.7.2013, COM(2013) 550 final.

“clearing and settlement service providers”. On behalf of issuers and acquirers, processors are submitting transactions to the scheme clearing and settlement agents. Thus, in this respect, current practise seems to be acceptable. However, the idea could also be that there should be different clearing and settlement agents – supposedly linked by some mechanism to exchange transactions between themselves. A blueprint that comes to mind is the SCT Scheme-Compliant Clearing and Settlement Mechanisms (CSMs).³ If the aim is competition in clearing and settlement, current processing architectures would have to change substantially. In particular, for the international schemes this might pose severe problems.

The Eurosystem also takes on the thorny issue of interchange fees. In the report it states that “interchange fees (if any) should be used primarily as a means of reflecting the costs which are directly related to the processing of the payment transaction (e.g. costs of acceptance, switching, authorisation and/or security measures).” (p. 45) Thus, the Eurosystem favours a cost-based approach – an approach based on certain costs of providing card payments. This is somewhat astonishing because the European Commission subscribes to the Tourist Test (or “avoided costs”) methodology. The Tourist Test looks at the costs of the best available alternative means of payment. At the POS this would be the costs of cash. Since the Eurosystem openly proposes a different methodology in its card report, it does not seem far-fetched to infer that it is not happy with Tourist Test. The Eurosystem is not the only institution who has been looking for an alternative to the Tourist Test. The German Competition Authority (Bundeskartellamt) champions bilateral negotiations between banks (banking groups) and large retailers or groups of retailers.⁴ Thus, at the moment European regulators are using or proposing to use no less than three different methodologies for the setting of interchange fees. To be sure, the Eurosystem is not directly responsible for regulating interchange fees. But its opinion should have some weight also for the other regulators.

Another difficult problem that the Eurosystem addresses is the choice of payment instrument at the checkout (p. 52). The Eurosystem wants customer and merchant to “agree jointly on the conditions of payment, including the payment instrument and card scheme or brand”. Moreover “cardholders should have a say in the ranking of brands on the chip on co-branded cards and card payment acceptors in the ranking of brands in the terminal.” The issue of

³ See EPC website for further information. <http://www.europeanpaymentscouncil.eu/index.cfm/sepa-credit-transfer/sct-scheme-compliant-clearing-and-settlement-mechanisms-csms/>

⁴ See „German Competition Authority favours bilateral negotiations on card fees“ in the July 2013 edition of this newsletter

“who chooses the brand” is highly contested between merchants and issuers. It has important strategic implications and it comes with a lot of practical problems. The Eurosystem acknowledges the existence of practical problems but does not really offer a clue how to solve them.

2. Host Card Emulation (HCE): Coming soon to your door?

For quite some time contactless payments (using Near Field Communication “NFC”) have been a big issue. Contactless has not only sparked hopes that cards may finally win the “war on cash”. NFC has also been one of the drivers of a second m-payment wave.⁵ The reasons are straight-forward. First, payment applications can also be stored on a mobile phone and, second, an increasing number of mobile phones have been equipped with NFC. Thus, a phone can perform the same functions as a card. Moreover, a phone can provide additional functions, in particular, a mobile phone equipped with the necessary software (“app”) may allow a user to communicate with the card (to carry out balance enquires, view transactions data, ...).

So far, implementation has been restricted by the lack of contactless acceptance points. But with the spread of NFC terminals, this obstacle is losing significance. However, there are other impediments. Mobile payments require the co-operation of mobile network operators (MNOs) and banks. This has been a conflict-prone issue in the early 2000s and the same is true today. A straight-forward way to allow for mobile NFC payments would be to implement the payment application in the SE (secure element) of the SIM card or in the embedded SE of the phone. However, the SE is under the control of MNOs. Thus, banks would be dependent on MNOs. Moreover, since the customers of a bank are using different MNOs, a bank would have to deal with all MNOs in a particular country.

Host Card Emulation (HCE) gets around this problem.⁶ With the availability of phones with an NFC interface directly connected to the operating system (OS) of the phone, HCE can be

⁵ The first wave had its boom and bust roughly in parallel with the dotcom boom and bust. See Krueger, Malte (2001): The Future of M-payments – Business Options and Policy Issues -, Background Paper No. 2, Electronic Payment Systems Observatory, Institute for Prospective Technological Studies, Sevilla. <http://ftp.jrc.es/EURdoc/eur19934en.pdf>

⁶ More infos on HCE can be found on the Android website (<https://developer.android.com/guide/topics/connectivity/nfc/hce.html>) and in: HCE and SIM Secure Element: It's not black and white. A Discussion Paper from Consult Hyperion, June 2014 (http://www.chyp.com/assets/uploads/Documents/2014/06/HCE_and_SIM_Secure_Element.pdf).

used to side step the necessity of an SE in the phone by “putting the SE in the cloud”. This is made possible by the latest versions of Android (Android KitKat 4.4). Mobile phone holders may download a payment app that will store the payment credentials and manage the communication with contactless terminals. For payment terminals the phone looks just like a contactless smart card.

Obviously, storing credentials in the SE is more secure than storing them in the unprotected memory of the phone. Permanent payment credentials would not be save enough in the phone’s memory. Thus, HCE requires an adjustment of the security architecture. Use of tokens would be a possibility. In order to be able to carry out a transaction even if the phone is offline, a new token would have to be stored on the phone ahead of the transaction.

Both; Visa and MasterCard have strongly endorsed tokenization. Therefore, it does not come as a surprise that both card schemes have also been quick to endorse HCE. In press releases, they have announced that they are soon going to publish specifications for HCE transactions.⁷

Our comment

While HCE may be a way to cut-out MNOs it involves a new player that may also be difficult to deal with, the providers of mobile operating systems, in particular Google, the provider of Android. Android is mostly free and open source. Still, Google is a powerful player with vast resources and its own ambitions in the world of payments. HCE would make the card industry less dependent on MNOs but more dependent on Google and the likes. Moreover, the position of wallet providers such as Google, Amazon and PayPal may be strengthened.

The success of HCE at the POS cannot be taken for granted because HCE may have its drawbacks in terms of user experience. Since permanent payment credentials cannot be safely stored on the phone, payments can only be carried out if a token has been stored in advance. Therefore, whenever connectivity is a problem, payment may temporarily impossible. Moreover, even if Android currently is the clear market leader, full market coverage would require that other mobile OS providers would also be on board. Thus, HCE would have to be working well with different operating systems, each potentially out in the

⁷ See press releases from 19 February 2014. <http://investor.visa.com/news/news-details/2014/Visa-to-Enable-Secure-Cloud-Based-Mobile-Payments/default.aspx> and <http://newsroom.mastercard.com/press-releases/mastercard-to-use-host-card-emulation-hce-for-nfc-based-mobile-payments/>

market with various releases. Making sure that the result will be robust and convenient for users may be quite a challenge.

Meanwhile the SIM-based model is making progress. In the US, a number of MNOs (AT&T, T-Mobile and Verizon) have united to create ISIS.⁸ ISIS is a payment app that can be stored on the SIM-card. It allows phone users to add credit cards from participating banks (American Express, Chase, Wells Fargo) to the payment app and then use the phone like a contactless card.

In Europe, the emergence of hub Trusted Service Managers (TSM) may make it easier for MNOs and banks to co-operate. In Poland, MasterCard-owned Trevica⁹ allows banks to upload payment applications to the phones of various MNOs. This model is currently exported to other European countries.¹⁰ Thus, the SIM-based approach is also advancing.

And the regulators? In its card report, the ECB also discusses the possible use of mobile phones at the POS. Apparently, it only contemplates the use of a chip card as secure element: "..., the chip simply moves from the plastic card to another carrier medium, i.e. the mobile telephone."¹¹ Thus, HCE does not even seem to be on the regulator's radar. Given the strong commitment to steer the industry to secure solutions, it will be interesting to see, what regulators will have to say about HCE.

Contactless will succeed if it is fast and convenient. Maybe HCE-based mobile payments will be able to deliver. But given the complexities of the processes involved one wonders whether this model is suited for payments made by "tap" or "wave". In the end, the winning model of contactless m-payments may be the reduced size plastic card glued to the back of the phone.¹²

⁸ <https://www.paywithisis.com/>

⁹ <http://www.trevica.pl/>

¹⁰ See: Partnership creates a 'one stop shop' for banks and mobile operators to speed development of NFC payments offering to their customers (<http://newsroom.mastercard.com/press-releases/deutsche-telekom-telefonica-deutschland-vodafone-and-mastercard-join-forces-to-simplify-mobile-payments/>)

¹¹ ECB: Card payments in Europe – a renewed focus on SEPA for cards, April 2014, p. 29.

¹² But to be honest, while writing these lines the (Germany based) author of this article is still waiting for an opportunity to carry out a contactless card payment.

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