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**On the efficiency of
multilateral interchange
fees (MIFs)**

**- How to price cash and cards in order
to promote payment efficiency?**

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The opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the Bank of Finland.



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Abstract¹

The benefit and need for multilateral interchange fees are topical in many payment areas and especially for card payments where they are widely used. As MIFs are collectively decided by the industry, it is in the authorities' interest to ensure that the use of MIFs are beneficial to the general public. This article tries to provide a descriptive framework for establishing the upper and lower limit for an efficient MIF window for beneficial implementation and to point towards payment pricing conventions, which would promote efficient use of retail payment instruments. Cash is still widely used today and different kinds of subsidisations and hidden pricing mechanisms for both cash and cards hinder the correct cost/price signals to reach the end users. Even small cost savings per transactions and efficient choice of payment instrument will amount to large total savings due to the very large retail payment volumes. The right economic incentives would promote and speed up these changes towards more efficient payment habits.

¹ This is a slightly updated version of the paper with the same title originally published in GTNEWS in May 2007.

1 Introduction

A multilateral interchange fee is a commonly agreed interbank fee among all or a large group of service providers for interbank transfers of a given payment instrument (when a bilateral interchange fee, with the same effect is agreed only between a pair of service providers). MIFs are used especially in the card industry to transfer revenues/charges from the acquiring (merchant's) bank or institution to the issuing (cardholder's) bank or institution. Sometimes the MIF flow goes in the opposite direction, which can be interpreted as a negative MIF. MIFs have also been used with direct debit and cheque transactions in some countries.

Because the decision on MIF-pricing is made collectively between service providers in competition on the same market, this is a horizontal pricing decision among competitors. This implies according to general competition legislation basics that the service providers should prove that these kinds of cooperative decisions are to the benefit of the general public. A beneficial MIF should therefore improve the general efficiency of the payment market and thereby support the use of the more efficient payment instruments at the expense of less efficient ones and bring down the overall costs of paying in the economy. An MIF would not be needed with completely transparent payment pricing, as the customers would see the full costs of all payment instruments and thereby be in a good position to select the most efficient ones. Therefore the use of an MIF can only be efficient when it is used to correct misleading price signals on a market with heavily cross-subsidised payment services eg free or almost free cash services.

The aim of this paper is to try to provide a descriptive framework for analysing issues concerning MIFs and to find out under which circumstances and limits the use of an MIF might be of the benefit to the general public and how authorities could act to MIF usage and proposals. The following analysis will mainly focus on card payments versus cash payments, but can also be applied to the closely related direct debit MIFs. This requires analysis of cost structures, pricing conventions and subsidisation levels.

The MIF issue is dependent on pricing conventions, cost structures and distributions and the remaining article is therefore organised as follows: The transportation service nature and the transportation structures are presented in the next section. Section three analyses the cost structures in payments while the fourth section analyses the pricing structures. Section five presents merchants' possibilities to forward the merchant fees onwards to consumers.

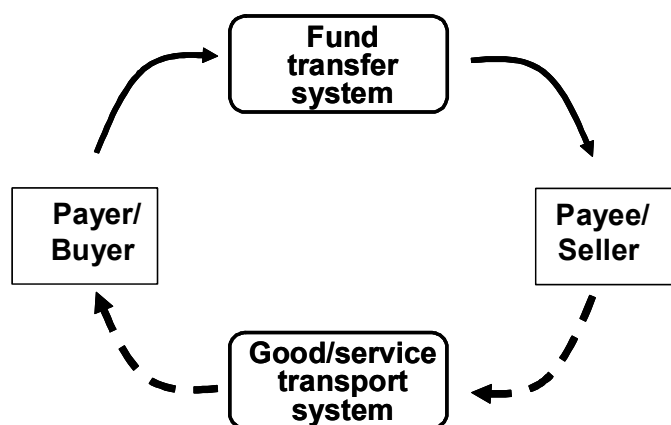
Section six contains the basic analysis of the MIF impact in different scenarios and section seven presents authority reactions especially on oversized MIFs. Section eight discusses the importance of transparent pricing in order to support efficiency before the short summary in section nine.

For reference, the general term 'bank' will be used to cover all kinds of issuing and acquiring institutions in the card payment industry. As a recommendation, colour output/screen increases the comprehensibility of the charts in the article considerably in comparison to grey-scale output.

2 Payment services are transportation services using fund transfer systems

Payments are essentially fund transfer services ie funds sent from the sender to the receiver. In an economic transaction the seller delivers the goods to the buyer and in exchange, the buyer delivers funds in some monetary form to the seller (when barter of goods/services is excluded). The buyer/payer and payee/seller mutually agree which of the available and commonly accepted transporting mechanisms they will use, both for the goods and the funds (see Chart 1). There can be a wide range of supported transportation alternatives eg simply handing over the goods, mailing, home delivery etc and different kinds of accepted payment instruments eg cash, cheques, cards, pay later with credit transfer etc. Cash as legal tender is the default payment instrument, if no other is agreeable by both parties. One of the main grounds for establishing legal tender was to create a generally acceptable and reliable means of payment.

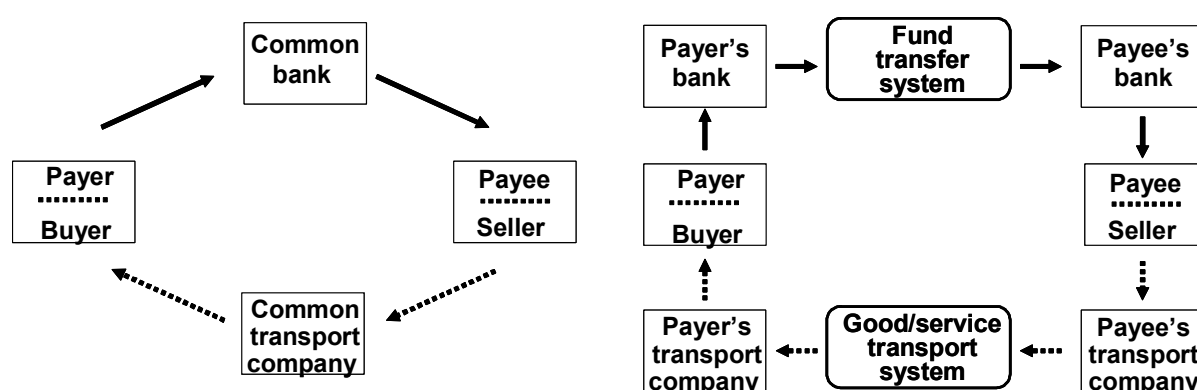
Chart 1. The two transportation legs of economic activities



There can be three or four party constructions on the both sides/legs of the transportation system. In the three-party constructions, the engaged customers use a common service provider and in the four-party case, the customers use their own service providers and these

are connected with each other via an inter-service provider network in order to provide an end-to-end reach for the customers eg two local telephone companies connected by the long-haul network. Typically in payments, credit transfer and debit card services operate using a four-party model, while some credit card services employ a three-party model. Chart 2 describes the alternatives, which are independent from each other for the two types of legs.

Chart 2. Three party and four party models



In a competitive transportation system, the default option would be the four-party solutions, in which the payers and payees can bank with any bank and the fund transfer system connects the two service providers in the same way as inter-transport systems connect surface and electronic mail service providers for sending goods physically or electronically. The transportation route is sometimes shortcut in the four-party solutions, when the customers are by chance using the same service provider. The larger the market share of the service provider in a four-party scheme, the larger the opportunity for shortcutting.

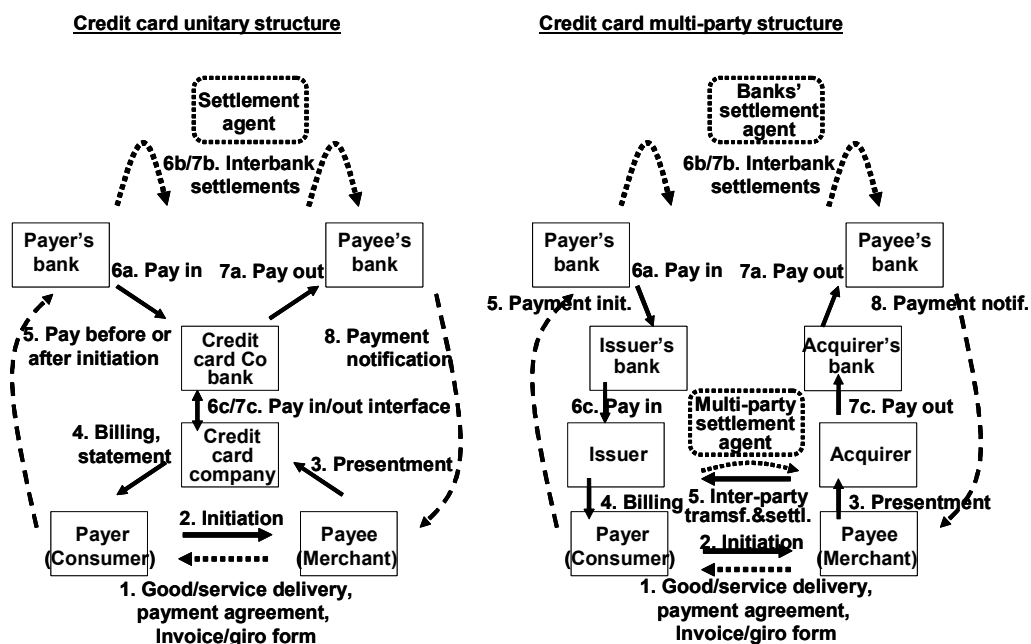
However, although some of the credit card services, typically Amex and Diners, which at first glance look like three-party models, they are in fact based on something that could be called a six-party model working in three different phases (see Chart 3). In the simple payment transportation of debit card payments among banks, there is a direct fund transfer between the payer's and payee's account. The three phases in the so called three-party credit card models, with an independent and separated credit card company are

1. the payments are booked between the merchant's receivable account and the payer's credit account within the credit card company

2. the receivables are paid (often some days later) to the merchant, generally as daily totals, via the banks' payment system using credit transfers. The merchant only then receives the final payment and can reuse the funds for his own payables
3. the cardholders pay their outstanding credit to the credit card company via the banking system using credit transfers or direct debits, generally after a given credit period of, on average, 45 days.

In these systems, the payments are completely effected only after these three phases, using one detailed level booking and two aggregated payment bookings via the banking system. The credit card schemes can show unitary structures as Diners and Amex, but also multi-party structures as within some national Visa and MasterCard systems, in which the acquiring and issuing companies use a clearing and settlement service among them. Due to the pay in and pay out phases, the fund transportation associated with credit cards are more complex than those of debit cards.

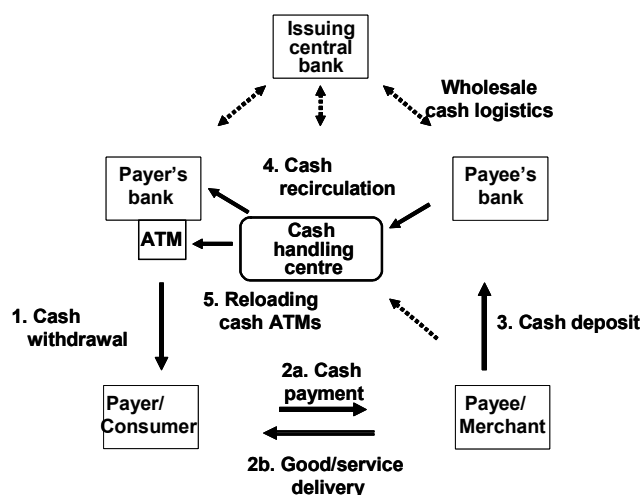
Chart 3. Complete payment processing in so-called unitary and multi-party credit card schemes



Over time, cash circulation has changed due to the introduction of ATMs as the most efficient cash dispensing mechanism. Today, it is close to the four-party model of card payments, because the majority of consumers withdraw cash from ATMs using different kinds of cards

and after payment at point of sale the cash is deposited directly by the merchants into their bank accounts. Cash circulation has become a closed one direction loop and has merely an intermediary role in the necessary transportation of funds (see Chart 4). Cash circulation requires several manual processes, while in the circulation of the more modern payment instruments such as cards, many of these processes have been automated via electronification. Electronic payment instruments are considered to be more efficient. Increased payment efficiency will thereby result in decreasing number of cash payments. However, in order for customers to respond positively to the increased efficiency, they should be able to observe the differences concretely as price/cost differences they face, but the wide cross-subsidisation in particular distorts the price signals for cash service costs.

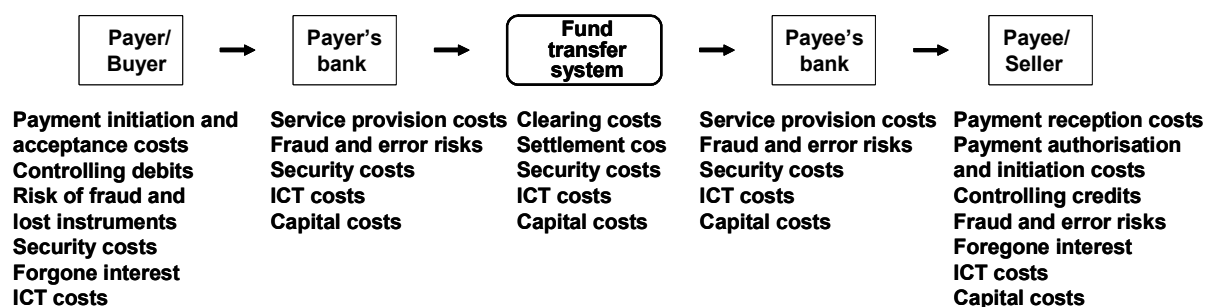
Chart 4. Modern cash circulation



3 Costs of transportation of funds

All parties in the transfer of funds chain incur costs for handling the payment transactions. These costs depend mainly on the technology used, the degree of automation, the speed of execution and the security levels. Different service types and payment instruments have different total costs. The distribution of the total costs varies between parties for the different payment instruments. The costs can also vary from customer to customer due to their circumstances, for example an electronic payment is relatively less costly for a customer who has all necessary ICT resources in place, compared to a case where the customer has to make special investments. The basic cost structure is described in Chart 5.

Chart 5. The basic cost structure



All payment instruments show this basic and very general cost structure, although the items and cost levels vary somewhat from instrument to instrument. The end result is always the same, in other words, the payer's account is debited and the payee's account is credited although the technical transaction flow in for example card payments and direct debits go in most cases from the payee to the payer within the banking system.

The payer incurs costs for initiating the payment and controlling the debit bookings while the payee incurs costs for receiving the payments and controlling the credit bookings. Depending on the terms of the payment instrument, payers face some risk of fraud and risks of lost instruments and may also have to invest in some added security features such as chip card readers. The payer will probably forego some interest, because funds have to be kept in liquid form compared to more favourable investments and interest will also be foregone for the processing period. Modern instruments require different types of ICT resources for

telecommunication and computing power such as broad-band communication or telephone lines. Electronic payments can often reduce payers' physical transportation needs and manual processes. In this model, different kinds of buyer convenience benefits for example less consumed time used for withdrawing cash from ATMs are converted to cost factors.

The payee incurs costs for receiving the payment and modern payments require ICT resources in different forms such as terminals and telecommunication. The payee has to control that expected credits are correctly booked and just as the payer, will also face fraud risks and forgone interests. The longer the float time, the more capital the payee will need to finance the outstanding payments.

The banks incur costs for providing, marketing and supporting the different payment services which they will recover via pricing. All payment instruments contain fraud and error risks, which are shared between the different parties according to the service agreements. Typically, there are service costs for initiating payments in payers' banks and costs for receiving payments in payees' banks. Paper-based instruments require more manual resources and other paper-related costs than electronic payments, which require more ITC resources, which are generally lower in cost per item, when volumes grow. Generally the total service provider costs decrease through increased automation, especially as ICT related costs shrink rapidly while the costs of manual resources increase. The fund-transfer system between banks has cost implications and the banks have agreed amongst themselves how these costs are shared such as ACH (Automated Clearing House) costs and central bank settlement transfer costs.

It is probably worth pointing out at this point, that the costs of any credit bundled together with a payment service, should be excluded from the payment costs. It is irrelevant for the processing of the funds transfer itself and the associated bookings, whether the payer account is a pure deposit account, a deposit account with overdraft facilities or a credit account of some type. The payer account will always be debited. It has also been stated that the card credits would bring more purchasing power to the consumers, but that will only happen when customers raise their average indebtedness level. A bundled payment and credit service is of interest only, when they together bring synergies that would decrease the costs/charges compared to acquiring them separately. Just for comparison a 10% per annum interest rate for consumer credit, would translate, without interest on interest, to a 45 day interest rate of 1.25 %. In order to focus the analysis on the payment function, the credit function of credit cards is unbundled and both credit and debit cards are viewed as general payment card services.

For all service providers in the payment chain described, including the seller, capital costs are the last item on the list of incurred costs. This is assumed to include a set return on own capital ie a reasonable profit margin. These costs are assumed to be long-term average costs, which can be used to determine the long-term payment instrument cost-benefits for the economy. At full-cost pricing, the charges to the payer would amount to the sum of all service provider costs (the direct charges of the issuing bank and the acquiring banks' merchant fees plus the merchants' own costs included in the merchant surcharges to the payer). When there is sufficient competition in the market and transparent pricing is applied, the customer payment charges would be close to this total.

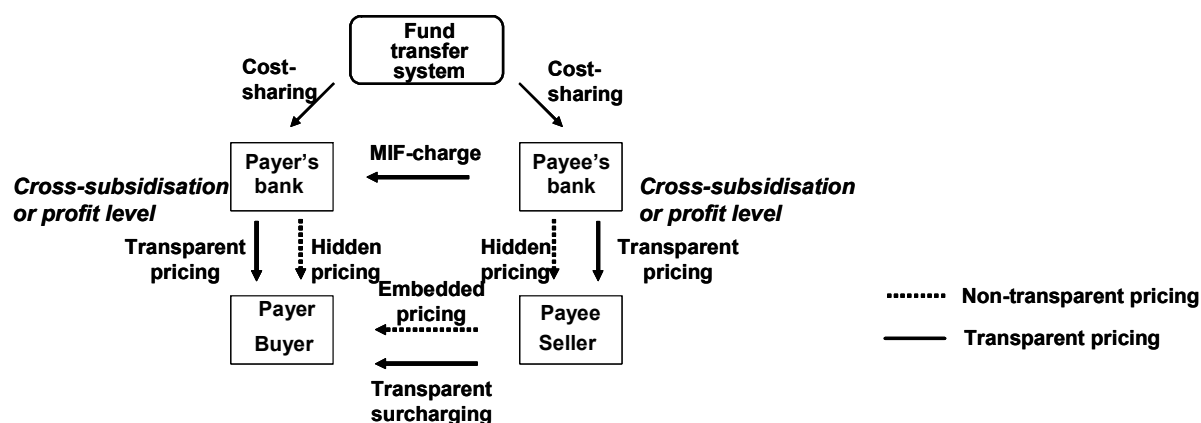
Although, these cost items seem easy to define, there are major difficulties in establishing their true and concrete amount. The exact costs will depend on the level of technology, straight-through-processing support, efficient standards, automated interfaces, volumes to cover fixed costs and processing structures/models. Costs will also vary across banks and customers due to their individual circumstances. The major part of these costs is independent of the value of the transfer meaning that the number of bits in the transaction value field does not affect the processing costs. Really high-value payments will require improved security, but the security requirements for standard consumer cash and card payments are basically the same over the whole range, which translates into concrete security investments servicing all payment sizes such as the EMV-chip on new cards.

This paper will analyse the costs on this general level under the assumption that card payments are more efficient for the society and in average to payers than cash payments at least above a given threshold, because going to an ATM machine and withdraw cash for one large payment will be more costly than just using the same payment card directly at the point of sale at the merchant. Although, there may be the case under this threshold, in which the same ATM withdrawal can be used for a large number of small payments and the costs of making this bunch of small cash payments would be more efficient than making the same bunch of individual small card payments. This view is supported by recent payment cost studies made by central banks, although it should be acknowledged that current biased cash and card price signals result in biased volumes leading to non-optimal average costs. (The central banks of Belgium, Netherlands, Norway and Sweden have made recent empirical studies on actual payment costs in their respective countries.) This threshold is probably volume dependent and increased card usage would probably lower this threshold as the fixed costs would be distributed on a large number of payments, while the average cash costs would increase of the same reason.

4 Pricing mechanisms of payment services

Payment services show a complex charging structure in which charges to cover fund transporting costs are transmitted in several steps via several service providers before they reach the end-customer (payer/buyer), who is ultimately paying for the funds transfers (see Chart 6). There is also a tradition of hidden costs or cross-subsidisation, which limits the price/cost transparency for the end-customer to select the cost efficient payment instrument for a particular payment.

Chart 6. Transparent, non-transparent and cross-subsidisation in payment charges



The fund transfer systems mostly function as industry utilities based on cost-sharing among participating banks. Some card branding infrastructures (eg Mastercard and Visa international) have recently turned or is in the process of turning into listed companies, which may change their pricing policies over time away from pure cost-sharing. In most cases the costs are probably shared neutrally among different payment instrument, when the same interbank system processes several different instruments in parallel (for example ACHs providing in parallel clearing of card, credit transfer and direct debit transactions). There are three general organisational models for cash centres; public utilities (mostly central banks), private utilities and private competing companies, which have different pricing (and subsidisation) policies for their cash handling costs.

Between the payer's and payee's bank can a so called "share"-convention be applied, which implies no interbank charges, but both banks cover their costs via their own charges from their customer (payer or payee). This convention is applied to SEPA credit transfers and in many debit card schemes. For credit card payments in particular and some direct debits, banks have agreed on a Multilateral Interchange Fee (MIF), which transfers a part of the payee's bank revenues to the payer's bank, in order to cover the payer's bank's payment instrument costs. There are different MIF rules in use such as pure ad valorem, pure fixed transaction fee or a mix of these and with different parameters. (The variations in MIF levels are substantial in the card industry according to the EU Commission Report on the retail banking sector inquiry.) MIF charges limit competition as customers are unable to bargain for this part of the service charges, which is set by competitors in cooperation. MIF charges are not applicable to interbank cash transfers. ATM networks generally charge the account keeping bank a service charge for using the ATM facilities and this may sometimes be labelled as an interchange fee when banks share their private ATM networks, but it is essentially a service fee for using 'outsourced' ATM services for serving one customer.

The payers' banks use different forms of transparent payment service charges for different instruments for example yearly or monthly fixed fees, transaction based fees or package fees for several instruments. Payer's banks' also use hidden pricing mechanisms among which float (defined as the non-interest bearing time due to processing time or extra value days to the bank) is the most frequently used. Float increases the interest benefits of the bank, while it reduces the interest benefits of the payer. The payers' bank charges can for some payment instruments be negative as they are paying net rewards to the payers. The relation between payers' banks' costs and revenues (including MIF revenues) result in a cross-subsidisation or profit level. When the charges are lower than the cost, the bank cross-subsidise the service from other revenues and in the opposite case profit margin of the bank increases. As a general observation, without supplying any strong evidence, it may be stated that banks have historically provided cash services using wide cross-subsidisation, while card payments have been charged for in different ways such as using MIFs and merchant fees and often with high margins especially for credit cards (see eg EU Commission Report on the retail banking sector inquiry).

The payee's bank charges the payee for card payments a fee, which is generally the merchant fee. This fee can constitute a mix of fixed, transaction and/or ad valorem fee (and also here the EU commission report shows large variations). As the payment handling costs for card payments are mainly transaction related, it would speak for transaction-based pricing

instead of value-based pricing. Payees face also hidden float charges, which can be considerably large due to lengthy crediting times, which in some countries can extend up to 7–14 days for credit card transactions, but is generally only a few days for debit card transactions. When there is an agreed MIF among the banks, the payees' bank have an interest in transferring it onwards to the merchants in order to reduce the cross-subsidisation effect, as the MIF is a cost item for the payee's bank. The payee's bank will, in the same way as the payer's bank, either cross-subsidise or make a profit of the payment services (according to the EU Commission report the acquiring banks are operating closer to cost, as these institutions have not been making considerable profits, which can be due to merchants' refusal to accept card instruments with too high a mark-up on the MIF). Traditionally payees were granted free cash deposit services. There are no Europe-wide studies on merchants' cash charges. However, these are probably also quite varying and have probably increased during the recent years resulting in decreased cross-subsidisation level on the merchant side as banks have started an informal "war on cash" project.

Lastly, the payee/seller charges the payer for the payee's payment costs (both the internal payee costs and the charges levied by the payee's bank). This can be done transparently by surcharging the payment costs on the prices of goods/services or by embedding the costs non-transparently in the prices of goods/services. As all goods/services will be paid in the end, the seller will never cross-subsidise payments from other services, but will only cross-subsidise among different payment instruments, when the average payment costs are embedded in the prices of the services/goods (see below for details).

In this general model, it is assumed that a long-term average charge and subsidisation level can be employed for calculating payment instrument benefits to the whole economy.

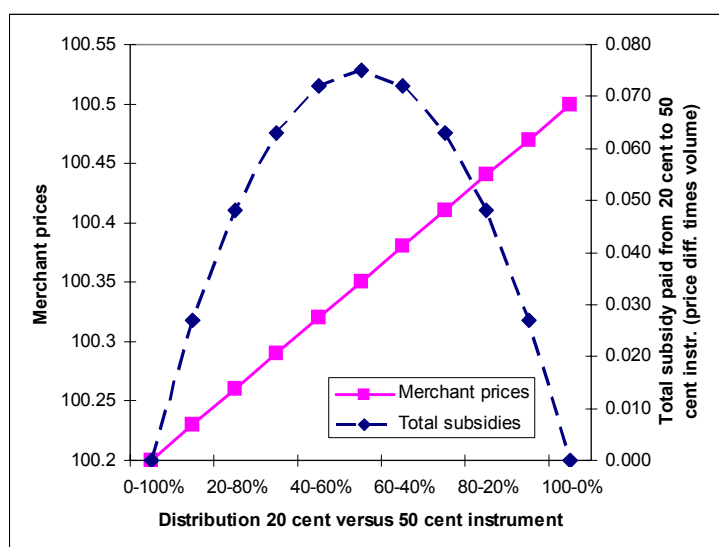
5 Transparent surcharging or embedded merchant payment costs

The basic principle in a consumer-to-merchant and customer-to-supplier relationship is that the consumers/customers pay eventually all the merchant transportation costs (both for the deliveries and payment funds) either separately priced via surcharges or embedded in the product prices of the merchant.

Take for example a supermarket offering disposable carrier bags. They come in different sizes and materials and the merchant can provide them free of charge or price them separately, according to size and type. This depends generally on the retail practice in the area and the type of retail unit. When these are priced separately ie surcharged, customers will have an incentive to economise on disposable bags in different ways and the opposite is true when bags are provided free of charge, ie embedded in the prices of goods. It would of course be in the interest of the bag industry and an individual bag factory to be able to enforce a no-surcharge rule on their bags in order to promote the use of disposable bags. If this were the case, it would be seen as abuse of market position; the merchants should, according to general rules of competition, be free to state their own prices and terms of delivery for the goods and services they provide, without interference or requirements either by manufacturers or wholesalers.

The traditional situation in the payment industry has been that the costs of cash payments have been embedded in the merchant prices. The acquirers of card payments often have a no-surcharge rule in their agreements, forbidding merchants from making a surcharge of the costs of the card. This results in merchants mostly embedding the payment costs in their prices of the goods/services. This will result in cross-subsidisation among payment instruments, when the costs of paying are different depending on the instrument choice (see Chart 7). The authorities have recently forced in some countries the acquirers to abandon no-surcharge rules from the merchant agreements.

Chart 7. Price and cross-subsidisation effects due to surcharge prohibition



In our simplified example we have two payment instruments with costs of, on average, 20 cents versus 50 cents per transaction for making transactions to a value of 100 euros. In order to cover costs, the merchant has to select the price of his goods/services along the straight line depending on the market share of the payment instruments. The higher the share of the more costly instrument, the higher the mark-up on goods must be. If the merchant has the feeling that he will make profits by having larger demand at lower costs, he can refuse the more expensive instrument and thereby sell at the price level 100.2 euros for goods selling at 100 euros without the payment mark-up. This is basically as the merchant assessing how much he will be losing in decreased volumes by not accepting the other instrument, which depends on the customer reactions in economic terms price elasticity. When the merchant has made a payment instrument limiting choice then the payer does not have a choice, but can only use one payment instrument at that merchant.

The merchant could also surcharge according to payment instrument costs, where it is not prohibited contractually, and will even then face some customer reactions resulting in decreased volumes as some customers may not be willing to pay if the payment itself is not free. Customers have been so used to hidden payment pricing that they may to some extent react to transparent pricing as if these were price increases. However, this kind of reaction shows the basic problem with hidden pricing as it points to individuals valuing more hidden pricing even though it would result in using the more costly instruments.

If merchants perceive in general that the more efficient instrument (the one with lower total costs) as the more costly for them (sum of merchant fees and internal costs) and therefore

limit its acceptability, then the current pricing conventions supports inefficiency. The volumes of inefficient instruments will be too high and the volumes of more efficient instruments too low.

The difference of 30 cents, for example, might not at first sight sound important. However, there are approximately 60 billion non-cash payments made yearly in the EU15 area. There are no exact figures for the number of cash payments, but they are on average at least double the volume of non-cash payments. Based on the experiences of low cash usage countries (for example the Nordic countries), the number of cash payments can easily be halved with the right economic incentives. Savings in the range of 10 cents per transaction for 60 billion cash payments turned into more efficient instruments would result in total savings of EUR 6 billion per year in the EU area. Unfortunately, these levels of saving potential get much less public attention than the robberies of cash-in-transit deliveries amounting to only to some millions in lost values. It would be important to get more attention to this potential in order to break the tradition of perceived free payment services, which maintain inefficient payment habits.

6 The impact of cross-subsidisation, embedded prices, MIFs and different cost structures

On the basis of the cost structure presented in Chart 5 and the pricing structure presented in Chart 6, different probable cost and pricing scenarios can be constructed. The actual costs, visible charges and total bank charges for different pairs of payment instruments are analysed. The analysis is constructed as a comparison between two instruments, which can be interpreted as cash and cards, but it can be generalised to apply to other pairs of instruments or even to several instruments.

Each chart in the following sub chapters shows bars representing the size of average per transaction costs and revenues assuming that the infrastructure is in place for both instruments. The difference in actual costs shows the benefits/cost savings to the economy, the difference in visible charges shows the incentive for payer choice and the difference in total charges shows the payment industry revenue differential. The situations in the figures are exaggerated for visibility, but the analysis will be general and will not depend on the actual size of the differences. The total costs for instruments 1 and 2 are the same in all scenarios, it is only the pricing conventions and the internal cost distributions that changes. Instrument 2 should be the one selected, when total costs are to be minimised.

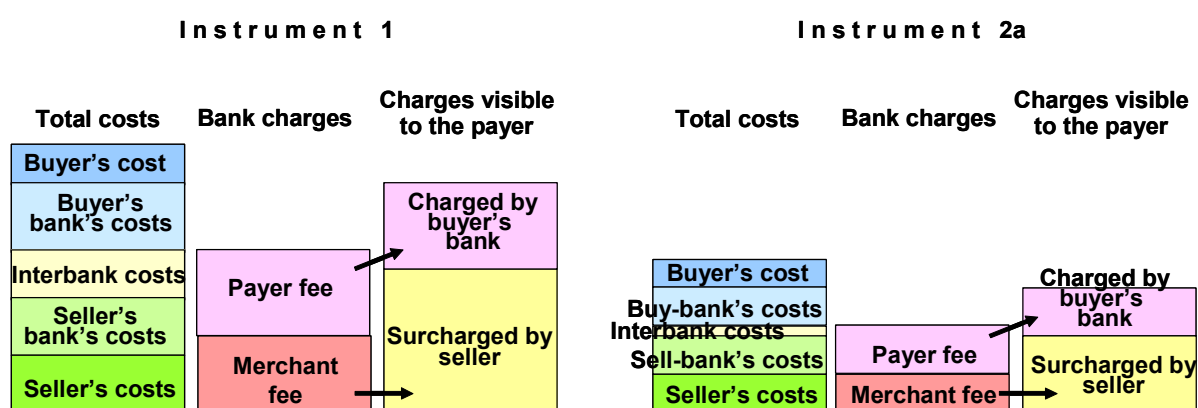
Four basic scenarios are analysed; 1) transparent cost-based pricing, 2) a win-win situation with subsidised prices, 3) a win-lose situation with subsidised prices and 4) an oversized MIF. These specific scenarios are selected to point out the impact of cost-structures and MIF-, pricing and subsidisation levels in different combinations. The win-win and win-lose situations refer to the stakeholders perceived value of the instrument. When everybody gains from the new instrument a win-win situation prevails and when the more efficient instrument is perceived as economically non-viable by one or more stakeholders, the a win-lose situations hinders the acceptance of the instrument due to the non-interest by one

party in the chain. It is in this particular situation the MIF could facilitate efficiency by increasing the interest for this party.

6.1 Scenario 1): transparent cost-based pricing without an MIF

The first introductory scenario is a straightforward transparent cost-based pricing situation. The seller/merchant surcharges the buyer his own payment costs plus the cost charged by his bank and the buyer's bank charge its costs directly to the buyer.

Chart 8. Scenario 1: Transparent cost-based pricing without an MIF



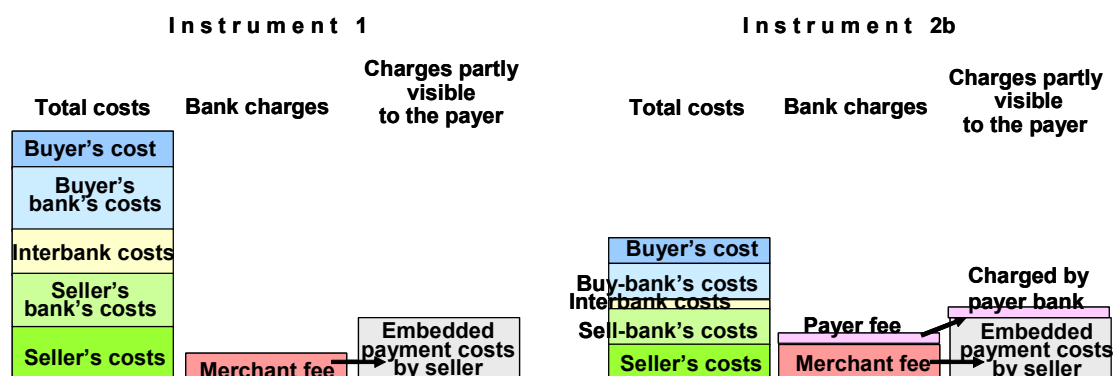
In this scenario the buyer will see all costs including his own and can make a decision based on the true costs and will clearly see, which instrument is the most beneficial. This example would point towards all customers starting to use instrument 2, but with real examples there will be different kinds of situations where the buyer's costs and seller's costs are different resulting in opposite choices. However, this will result in an optimal mix of card and cash payments based on their visible costs. When costs are completely transparent the buyer will have the economic incentive to select the most efficient instrument for all situations. All service providers will gain a reasonable profit (as capital costs were included in the listed cost items in Chart 5.)

6.2 Scenario 2): mostly bank subsidised payment costs in a win-win situation without MIF

In Scenario 2, banks subsidise heavily both cash and cards. The cost distribution in Scenario 2 is such that all stakeholders will have a win-win situation by selecting and supporting instrument 2b. A win-win situation is defined as a scenario in which all stakeholders will

experience lower costs for instrument 2. There is no MIF applied, but the SHARE option is used, which implies that the payer pays the payer bank's fees, if any, and the merchant pays the payee bank's merchant fee, if any.

Chart 9. Scenario 2: Mostly bank subsidised costs in a win-win situation without MIF



When banks subsidise and merchants embed their payment costs, the buyer will have a very limited view of the total costs. Banks subsidising costs implies that other customers than banks' payment customers will cover the payment costs. Embedded merchant pricing implies that merchant costs are averaged among payment instruments (as described in Chart 7). In order for the buyer to select the more efficient instrument the relation between the visible charges should remain in favour of the instrument with lower total cost. In scenario 2 the banks only charge the seller/merchant for the cost of instrument 1, which is often the case for cash. For instrument 2b they charge both a seller fee and a (small) payer fee in our example. In order for the more efficient instrument to be selected following conditions should be in place

1. the merchant fee for instrument 2 should be less than the seller's own cost difference between instrument 2 and 1 plus the seller/merchant fee for instrument 1, because then there is a cost saving gain at the seller's end of buyer costs ie the embedded cost level will not increase
2. the payer fee for instrument 2 should be less than the buyer's own cost difference between instrument 2 and 1 (and a possible payer fee for instrument 1).

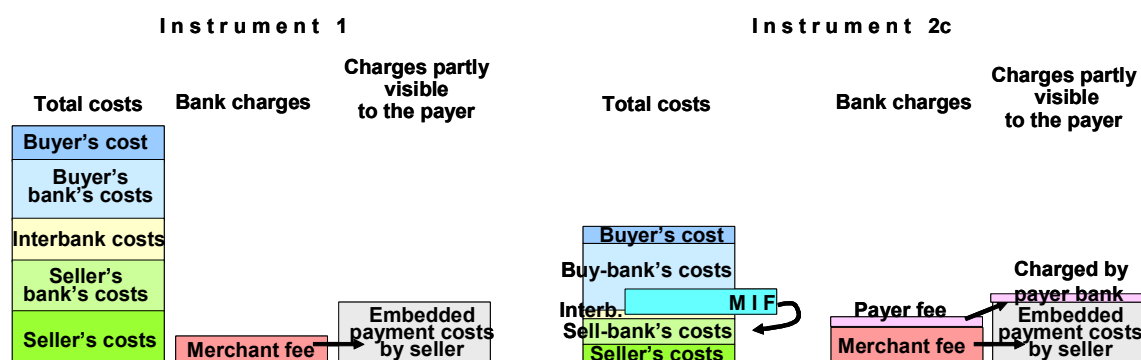
This scenario is probably close to the current cash versus debit card situation in those countries, where banks have priced debit cards carefully in comparison to cash so that all parties can gain from wider usage of debit cards. As banks are heavily cross-subsidising the costs of instrument 1, they will be better off with less costs, when customers use instrument

2b, although they will not make a profit out of payment instruments. The seller will be interested in accepting instrument 2b, when he is not forced to increase prices, but instead can lower prices due to lower average payment costs. If cash were not legal tender, the sellers/merchants might probably consider refusing this more expensive payment instrument more frequently, because they could reduce their price level. (There seems to be a slowly growing trend of cash refusal at payment points where cash is especially expensive or problematic as a payment instrument, which will increase with growing e/m-commerce markets.) The buyers will probably not see the embedded payment fees in the sellers' goods/services; however, it will not change their decisions as this factor is the same for both instruments. For an efficient buyer choice, it is sufficient that the payer fee is not larger than the cost difference between the buyer's costs. In this scenario the customers will be able to make an efficient choice without a MIF to balance costs.

6.3 Scenario 3): mostly bank subsidised payment costs in a win-lose situation with MIF

Also in Scenario 3) three banks subsidise heavily both cash and cards. In scenario 3 the total costs of instrument 2c are still the same as for instruments 2a and 2b, so it operates at the same level of cost efficiency. However, the internal cost distribution between stakeholders is different, generating a win-lose situation compared to instrument 1 for one stakeholder. A win-lose situation is defined as a Scenario, in which although there is an overall cost-benefit for instrument 2, there is an internal cost distribution, which makes it more expensive for one or more stakeholder groups to process instrument 2 compared to instrument 1 when reviewing just the costs of a specific stakeholder group. In this example the buyer's bank's costs are much higher for 2c than for 2b, while the acquiring bank's and merchant's costs are lower. This creates a win-lose situation for the payers' banks, which is compensated by the introduction of a MIF, in order to create an interest among all stakeholders to support the more efficient instrument.

Chart 10. Scenario 3: Mostly subsidised costs in a win-lose situation with MIF



The costs of the buyer's bank would increase if there would not be any compensating revenues and it would not be interested in investing in a cost increasing service. If the buyer's bank would increase the payer fee in order to compensate the increased costs, the payers/buyers would not be interested in a service with higher visible costs. An MIF could in this kind of situation redistribute the costs so that a win-win situation would emerge. The MIF will transfer some of the revenues/benefits from the acquiring side to the issuing side in order to level out the unbalanced internal cost distribution.

Following conditions can thereby be deduced for an efficient use of an MIF

- there is a market practice of embedded pricing and cross-subsidisation
- there are competing instruments with clear differences in total costs (ie working on different technology levels)
- the cost structure among the stake-holders contains a win-lose situation for the more efficient instrument
- the size of the MIF is sufficient but not excessive to correct the win-lose situation to a win-win situation
- the conditions for efficient pricing of scenario 2 are also met.

Based on these conditions the maximum and minimum limits for an efficient MIF can be set. In order for the buyer's bank and the buyer to be as well off compared to instrument one, the minimum MIF should at least cover the difference of the net differences in costs and fees between these instruments ie for the buyer's bank the costs minus revenues for instrument 1 should be lower or equal to the costs minus revenues and minus MIF for instrument 2. This can also be expressed as an MIF, which will reduce or maintain the current cross-

subsidisation level within the buyers' banks. The maximum MIF should not be so high that it raises the embedded price level paid by the buyer at the merchant side ie the seller costs and seller/merchant fee for instrument 2 should not become higher than the sum of seller costs and merchant fees for instrument 1 and without increasing the subsidisation level within the seller's bank. Everyone needs to be a bit better off than before in order to be interested in instrument 2.

An efficient MIF level is dependent on several factors and it can be generally concluded that the lower the subsidisation level is the lower will the probability be for a win-lose situation to emerge. The efficient cost-level correcting MIF level will also decrease and will eventually disappear with lower subsidisation levels.

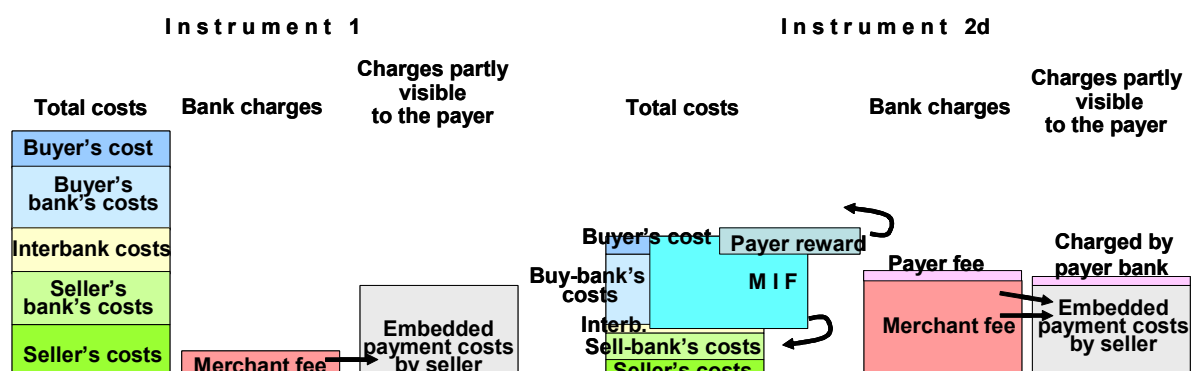
Scenario 3 described just one possible win-lose situation. There could also be others: too large buyer costs, too large seller costs or too large seller's bank's costs. However, for all of these situations an MIF construction is possible in order to create a win-win situation with embedded prices in order to promote the more cost-efficient instrument.

When we have a win-lose situation for a more efficient payment instrument and the MIF is below the efficient MIF window, some of the stakeholder will not have an interest in investing or using the generally more efficient instrument. It will not come to the market or its use will be limited, which will have a general negative cost impact for the economy. It would therefore be in the public interest, that the authorities use various means to ensure that in this case with heavy subsidisation the MIF is established within its efficiency window in order to promote payment efficiency.

6.4 Scenario 4): the impact of an oversized MIF

However, we can also have the situation with an oversized MIF as in Scenario 4, which creates a win-lose situation. The MIF is in the example much higher than the payer's banks' costs resulting in super normal profits for the issuing banks based upon a collective decision on an oversized MIF. In these situations the MIF is counterproductive and will limit the use of the more efficient instrument (see Chart 11).

Chart 11. Scenario 4: Oversized MIF limiting the use of the more efficient instrument



In the case of the oversized MIF the merchants need to increase the embedded payment costs because the sum of merchant fees and the sellers' costs are higher for the more efficient instrument. The MIF may be so high that it starts to create extra large profits for the buyers' banks. The payer banks have an interest in increasing the MIF as much as possible, which is easy in a low competition environment (eg monopoly and oligopoly) with coordinated horizontal price agreements among competitors in MIF decisions. The larger the hidden pricing, the easier it will be to introduce higher MIFs.

Out of the excess MIF rewards the buyers' banks can also provide payer rewards for using the cards, resulting even in a net benefit of using cards. The rewards can be in different forms of extra services like free credit, free insurance services and different bonus point schemes, which are unconnected to the transportation service of payments. The higher the rewards paid, the higher the MIF needs to be to cover these rewards. These rewards are used to increase payers' interest to use specific cards and thereby promote the use of high-MIF cards in particular and also to put network pressure on merchants to accept these high merchant fee cards. The higher the rewards, the higher the share of cross-subsidisation from instrument 1 users to the instrument 2 users will become and the overall payment cost mark-up on goods and services.

In the situation in Chart 11, the MIF of instrument 2d is moderately oversized. Because of the hidden prices of both cash and cards, the actual situation could in some cases be even more distorted and with an MIF so high that the total banks charges for the more efficient instrument surpasses to total costs of the less efficient instrument 1.

7 Authority reactions to perceived oversized MIFs

When the MIF is oversized, it would be in the public interest that authorities limit the horizontal price agreement possibility and abuse of pricing power and bring down the MIF, within its efficiency window. This would be important in order to promote expanded card payments and general payment efficiency.

Authorities will face different kinds of cost methodological problems, when trying to establish the efficient MIF window eg

- What are the instrument 1 (cash) and the instrument 2 (cards) costs of the different stakeholders, should average or best practise costs be used, which are the calculation time-frames for investment cost depreciations and which kind of typical payment situations should be included in the calculations?
- What are the current visible bank charges for instrument 1 and instrument 2 (weighted average or lowest price) and their possible subsidisation levels?
- Which cost, subsidisation and pricing estimates should be used in a multi-country environment as the SEPA region?
- Does a win-win situation or a win-lose situation exist, that needs to be corrected?

Very thorough analysis and data collection is required in order to establish the analytically correct efficient windows for a given market situation and this can also change over time with cost and pricing developments. However, the problem could also be approached with more rough calculations:

- a. When it can be established with marginal calculations for each stake holder group that instrument 2 is more efficient, then there exists from the outset a win-win situation and therefore the MIF can be forbidden as a competition restrictive horizontal price agreement among competitors. (This seems to be the current competition authority views in Poland for Visa and MasterCard MIFs).
- b. When the payment industry (or payment services) providing instrument 2 (cards) shows oversized profits compared to a free competition situation, it points towards

the industry maintaining an excessive MIF level and the authorities can via public pressure and moral suasion try to get the industry itself to bring down the MIF level. (This seems to be the current general situation in EU according to the EU commission report.)

- c. When there seems to be indirect proof (eg MIFs larger than cash costs, excess card profits and limited acceptance of cards) for an excessive MIF, the authorities can approach the situation by a step-wise reduction requirement towards the efficient MIF, in order to find out when the reductions have the desired effects on the indirect factors and on the use/acceptance of instrument 2 (cards) in relation to instrument 1 (cash). (This seems to be the current situation in Australia).
- d. The authorities could also request that the industry provide the necessary convincing calculations and proof for a win-lose situation and the efficiency window to support any proposal for MIF introduction ie provide proof that a horizontal price agreement on MIF has a net benefit to the economy, which is larger than the drawbacks of decreased (price) competition.
- e. The authorities could promote and require increased transparent pricing, which would reduce the competition problems with hidden pricing. (This seems to be the current authority policy in Norway.)

8 Embedded versus transparent prices

The basic problem resulting in MIF issues are network effects and non-transparent pricing. For a long time cash has been the dominant payment method, with no instruments competing at a completely different level of efficiency. Embedding the payment costs has therefore been convenient. However, when new much more efficient electronic instruments have emerged for instance electronic card payments and as these improve further, transparent pricing would be the best way to promote these and reduce the volume of inefficient cash payments. The more visible the efficiency difference is to payment instrument holders, the faster they will change their payment habits. This can clearly be seen in the case of Norway.

Transparent pricing would also solve the problem of internal cost distributions in three-party models versus MIFs in four-party models. When the MIF requires special external decisions and rules in four-party models, three-party models can get the same effect just by increasing their merchant fees. This may trigger current four-party models to change their current structures to three-party models in order to maintain their MIF benefits, if MIFs were forbidden, which speaks for selecting generally visible pricing and open competition as the authority means to promote development. Forbidding no-surcharge rules in merchant agreements could open up the competition, because when merchants would have and probably also use the possibility to surcharge high merchant fees, the negative effects on embedded merchant prices would diminish and the price signals to card holders would become clearer. (Some experiences of this can be found in Denmark.) Transparent surcharging would imply a neutral merchant stance towards different payment instruments and give the payers free choice, depending on their assessments and desires.

The reluctance to move to transparent pricing seems to be due to the expected consumer reactions and the current payment industry benefits from hidden pricing. However, there is no free lunch for consumers and as pointed out even small marginal cost savings will bring large total savings, when the payment volumes are so large. The most efficient long-term objective would be to gradually introduce transparent pricing also for payment services and to maintain pricing transparency, at least until we have reached a completely the new stable

level for the dominant electronic payment instrument. This would probably be a very efficient strategy also in the war on cash.

9 Summary

The multilateral interchange fee (MIF) is a complex issue, which in some special cases with hidden prices, cross-subsidisation and a win-lose cost distribution, can have a positive effect for the economy. However, it can also be abused in order to generate extraordinary industry profits via horizontal price agreements among competitors. An MIF outside its efficiency window will result in inefficient payment instrument choice and biased volumes, compared to open competition with transparent pricing. Because of the very large volumes in the payment industry even small savings in the range of some cents will create yearly total savings amounting to billions of euro. Increased competition and clear price signals would provide an efficient way to these savings. A joint effort by the relevant authorities would probably speed up the process towards efficient payment habits considerably. Increased competition both among service providers and among payment instruments would also increase efficiency and development speed.

References

Banque Nationale de Belgique (2005) **Coûts, avantages et inconvénients des différents moyens de paiement (Costs, advantages and drawbacks of the various means of payment)**. [Http://nbb.be/doc/TS/Publications/Brochures/MoyenPaiement.pdf](http://nbb.be/doc/TS/Publications/Brochures/MoyenPaiement.pdf).

Bergman, M A (2003) **Payment system efficiency and pro-competitive regulation**. Penning- och valutapolitik 4/2003.

Brits, H – Winder, C (2005) **Payments are no free lunch**. DNB Occasional Studies, Vol.3 No 2. De Nederlandsche Bank.

Enge A (2006) **A retrospective on the introduction of prices in the Norwegian payment system**, Norges Bank, Economic Bulletin 4/06 (Vol 77)

European Commission (2006) **Interim Report I, Payment Cards**. Sector Inquiry under Article 17 Regulation 1/2003 on retail banking.

European Commission (2007) **Report on the retail banking sector inquiry** – Inquiry into the European retail banking sector pursuant to Article 17 of Regulation 1/2003. Competition reports.

Gresvik, O – Oewre, GF (2003) **Costs and Income in the Norwegian Payment System 2001**. An Application of the Activity Based Costing framework. Working Paper, Norges Bank Financial Infrastructure and Payment Systems Department.

Guibourg, G – Segendorf, B (2004) **Do Prices Reflect Costs?** A study of the price- and cost structure of retail payment services in the Swedish banking sector 2002. Working paper series, 172. Sveriges Riksbank.

van Hove Leo (2004) **Cost-based pricing of payment instruments: the state of the debate**, De Economist Netherlands Economic Review, Vol. 152 Nr 1, March 2004 pp 79-100

Humphrey, D – Willeson, M – Lindblom, T – Bergendahl, G (2003) **What does it Cost to Make a Payment?** Review of Network Economics, Vol. 2. Issue 2, pp. 159-174.

Macfarlane, I J **Gresham's Law of Payments**. Talk by Governor of the Reserve Bank of Australia, to the AIBF Industry Forum. 23 March 2005

OECD **Competition and increased efficiency for retail payment cards**, Background paper by secretariat, June 2006

Office of competition and consumer protection in Poland: **Press release on Decision on determining the interchange fee in Visa and MasterCard system**, January 2007