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Debit card interchange fees generally lead to cash-promoting cross-subsidisation

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Abstract

Cards and cash are competing payment instruments at point-of-sale. The two-sided market platform theory, based on general benefit assumptions, supports the use of multilateral interchange fees for card payments as a means of promoting the use of cards. However, analysis of the issue from the concrete processing cost viewpoint leads to the opposite conclusion: collection of debit card interchange fees by issuers results in subsidisation of cash and so actually promotes the use of cash instead of cards. Banks use card interchange revenues to cover cash distribution costs. For merchants, interchange fees increase payment costs and thus reduce the possibilities to pass through to customers the cost savings flowing from card efficiency. Moreover, because of high merchant fees due to high interchange fees, merchants are also more reluctant to accept payment cards. An MIF based on the tourist level approach will result in all parties being indifferent between cash and cards and thereby delay the realisation of the cost benefits of increased debit card usage. The resent actions of authorities to increase transparency and reduce cross-subsidisation seem to point in the right direction - towards more efficient resource allocation in payments.

Keywords: interchange fee, cross-subsidies in payments

JEL classification numbers: G14, G38, L14, L42, L51

Pankkikorttien siirtohinnat johtavat usein käteisen käyttöä tukevaan ristisubventioon

Suomen Pankin keskustelualoitteita 3/2011

Harry Leinonen
Rahapolitiikka- ja tutkimusosasto

Tiivistelmä

Käteinen ja kortit ovat ostostilanteessa kilpailevia maksuvälineitä. Kaksipuolisten markkina-alustojen teoria, joka perustuu yleisiin hyötyoletuksiin, tukee monenkeskisten siirtohintojen valitsemista korttien käytön edistämiseksi. Kuitenkin analyysi, joka perustuu konkreettisiin prosessointikustannuksiin, päätyy vastakkaiseen lopputulokseen: siirtohinnan asettaminen pankkikorttitapahtumille johtaa käteisen subventoimiseen ja sitä kautta käteisen – ei korttien – käytön edistämiseen. Pankit käyttävät korttien siirtohintatuottoja käteisen jakelukustannuksien kattamiseen. Kauppiaille siirtohinnat merkitsevät korotusta maksamisen kustannuksiin ja vähentävät siten kauppiaiden mahdollisuuksia siirtää korttien käytöstä syntyviä kustannussäästöjä asiakkailleen. Tämän lisäksi siirtohinnat lisäävät kauppiaiden korttitapahtumaveloituksia, mikä vähentää heidän kiinnostustaan hyväksyä korttimaksuja. Siirtohinta, joka perustuu ns. turistitasoon, johtaa kaikkien osapuolten välinpitämättömyyteen kortti- ja käteismaksun välillä ja viivyttää tätä kautta pankkikorttien käytön yleistymisestä saavutettavia hyötyjä.

Avainsanat: siirtohinnoittelu, ristisubventiot maksuissa

JEL-luokittelu: G14, G38, L14, L42, L51

Contents

1   Introduction

Consumers have to pay for purchases and merchants can accept different kinds of payment instruments. Merchants have an interest in finding a mutually suitable instrument because otherwise the purchase will not be made. The main task of any instrument is to transfer funds from payer to payee, but one instrument may be more suitable or efficient than another in a given situation. However, the payment instruments in use share an existing payment market volume; for instance, when card volumes increase the volumes of other instruments – most importantly cash – will decrease. The instrument selection and palette will not affect the total volume of payments made, which is determined by the budget constraints for consumption.

There is a variety of card products that can be used at point of sale instead of cash or cheque payments. These are generally categorised as debit cards or as one of two types of credit cards: charge cards and revolving credit cards. Today, debit cards are dominant in most national card payment markets.[1] The card technology as such is also used to enhance cash distribution via ATMs in order to replace over-the-counter cash withdrawals. The same card can be used at an ATM or at a point of sale. The card is basically a means of ensuring a customer's title to a money balance on an account in a more efficient and secure manner than of the alternatives, for example pass-books or cheques.

In most cases, the accounts of the payer and payee are with different service providers and the interbank (service-provider) cooperation makes it possible to transfer funds between different service providers. In the card system context, the payer's bank is called the "issuer" of the payment instrument and the payee's bank is the "acquirer". Account-based payments, eg card payments, are processed according to a four corner model as shown in figure 1. The issuing side in this framework comprises the payer and the issuer, the acquiring side the payee and the acquirer. The payers and payees select the payment instrument to be used, cash or card. In the card system context, the payer is called the "cardholder" and the shop/store accepting the card payment the "merchant". The issuer and acquirer negotiate on the interchange fee for card-based interbank (service-provider) payments, which can be positive (paid by acquirer to issuer), zero, or negative (paid by issuer to acquirer). A non-zero interchange fee does not affect the total processing costs but merely reallocates them among the service providers. As consumers/cardholders will pay all the charges/costs in the end (as card fees or card costs internalised in merchant prices), the interchange fees affect the side levying the consumer charges and the level of charges only when cross-subsidisation and widening of the profit margin distort the effects.

In contrast to card payments, cash carries no interbank interchange fee, although modern cash circulation generally adheres to the four corner model: in order to make a cash payment, the consumer/cardholder withdraws cash in advance from the banks/ATMs and the merchant deposits total daily cash receipts into bank accounts (seldom nowadays do they pay invoices or salaries with cash but instead use credit transfers or other bank account-based instruments).

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[1] See card payment statistics in BIS/CPSS Red Book and ECB/Blue Book

Issuing side   **Acquiring side**

Interchange
MIF-level?

Issuer   + ← zero → Acquirer
          -

Card fee   Merchant fee
                      (incl. MIF)

Card-   Merchant
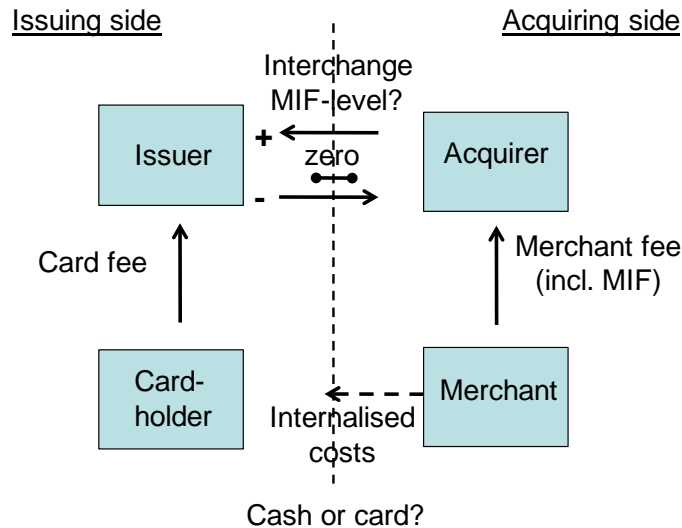holder

Internalised
costs

Cash or card?

Figure 1: The four corner model of card or cash payments

The main issues here seems to be
1. From the overall economic and competition viewpoint, what is the "optimal" level of card interchange fee?
2. What is the "optimal" mix of cash and card payments?
3. How does the non-transparency of costs affect instrument choices and interchange issues?
4. Are authority interventions necessary; if so, what tools should be used?

In the two-sided market platform literature, card payments have been seen as a more beneficial instrument than cash payments, and interchange fees are considered necessary for reallocating costs so as to promote efficient card usage (see eg Evans&Schmalensee, 2005). According to payment cost studies done by central banks, cash is generally efficient only for mini-size (coin-sized) purchases.[2]

The international card schemes (eg Visa and Mastercard) and some domestic ones use interchange fees for card payments that are paid by the acquirer to the issuer, which results in acquirers adding the interchange fees to their acquiring fees (merchant fees).[3] Authorities have taken an increasing interest in the determination of and reasoning behind interchange fees. Multilateral interchange fees (MIFs) in particular are set jointly by the issuers, which can be viewed as a system of cartel-type anti-competitive agreements. Several authorities have recently taken actions to reduce the level of interchange fees, eg Australia, the EU and (in the pipeline) the United States (for details, see section 5). During

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[2] See eg Banco de Portugal (2007) 'Retail Payment Instruments in Portugal: Costs and Benefits', July, Banco de Portugal, Lisbon pp 1-121 ; Bergman,Guiborg&Segendorf (2007) 'The Costs for Paying — Private and Social Costs of Cash and Cards', Sveriges Riksbank Working Paper Series No. 212 pp 1-37 , September; Brits&Winder(2005) 'Payments Are No Free Lunch', De Nederlandsche Bank, Occasional Studies, Vol. 3, No. 2, pp 1 - 44; Gresvik&Haare(2009) 'Costs in the Norwegian Payment System', Staff Memo No. 4, Norges Bank, Oslo pp 1-103; and National Bank of Belgium (2006) 'Cost, Advantages and Drawbacks of the Various Means of Payment', Economic Review, 2Q pp 1-8.

[3] See Weiner and Wright (2005) and Bradford (2008) for interchange schemes in different countries.

the underlying discussions, the card-systems and issuers have presented a variety of arguments in defence of interchange fees and authorities have argued for lower fees.

This article aims to
- show that debit card interchange fees paid by acquirers to issuers do not support card usage, but have in fact the opposite effect by subsidising cash and thereby promoting the excessive use of cash. In the current market setup, debit card interchange fees are used to transfer card benefit surpluses from the acquiring side to the issuing side, where these mainly result in cross-subsidies to cover cash withdrawal costs or increase issuer profits.
- point out that the lack of transparency of cost factors results in biased payment volumes: too little use of debit cards and excessive use of cash and credit cards, as compared to efficient customer choice under transparent and competitive pricing structures
- assess different authority interchange interventions and their possible effects on payment instrument efficiency.

The main finding of the article is that the card market and interchange fee analysis needs to be expanded from the limited credit card company approach of the two-sided market platform model to a more general model in which banks provide, in parallel, both cash and card payment services relying on card technology. In this expanded perspective, the cost efficiency of alternative instruments becomes the determining factor. From the consumer and social viewpoints, the embedded and non-transparent pricing used in the two-sided market platform leads to a sub-optimal solution due to its limited scope. In particular, setting the interchange fee close to the "tourist test level" would result in almost total elimination of the development incentive. This paper concludes that maintaining a zero interchange fee and increasing the cost transparency would promote both competition and efficiency in retail payments, as compared to a situation with high positive interchange fees.

The structure of this article is as follows. First, the two-sided market platform is presented, followed by the cash subsidisation effects. Thirdly, the diverging results of the two models (lines of thought) are compared. Fourthly, different authority decisions on MIFs are compared, The paper ends with concluding remarks on the potential benefits of increased competition in payment services. An appendix provides a comparison of debit and credit card cost and pricing structures.

2   The two-sided market platform theory of interchange fees

The two-sided market platform theory for card payments has become the main academic rationale for MIFs. The earliest general reference is William Baxter's paper (1983). Since then, Jean-Charles Rochet, Jean Tirole, (eg 2003, 2004, 2006, 2007 and 2008) David Evans, Richard Schmalensee (eg 1995 and 2005) and Julian Wright (eg 2003, 2004a and 2004b) have published several articles on the topic.

The process setup in the two-sided card market theory is the so-called four corner model including issuer, acquirer, cardholder and merchant (see figure 1). There is an interchange fee paid by the acquirer to the issuer, which is included in the acquirer's merchant fee. The interchange fee transfers the merchant's benefits to the issuer so as to

reduce issuers' charges to cardholders. The merchants internalise the card costs, including MIFs, in their prices of goods and services, ie merchants do not transparently surcharge the MIF, as that would merely shift the card fee charging from issuer to merchant and thus eliminate the benefits of "two-sidedness" (see eg Rochet&Tirole 2004 and Frankel&Shampine 2006). The basic assumption of the two-sided card theory is that cardholders and society gain a benefit through more efficient payment processes when merchants pay the MIF.

The card, the payment services and additional services such as credits are seen as a common platform service, which is intended to attract both cardholders and merchants. Cash (and/or cheques) are seen as the benchmark compared to which the card services must be more attractive. According to this theory cards provide benefits (B) to cardholders and merchants, but they pay charges/costs (C) for the service. Using the notation[4] of David Evans and Richard Schmalensee (Evans&Schmalensee, 2005), we write that cards are efficient instruments when benefits exceed service provision costs:

(1) $$(B^c + B^m) \geq (C^c + C^m)$$

However, in order to attract both sides of the market (superscript c=cardholder and m=merchant), both need to experience a net benefit:

(2) $$(B^c - C^c) \geq 0 \ \text{ and } \ (B^m - C^m) \geq 0$$

The first condition is met in situations where cards are generally more efficient instruments than cash (cheques). However, if cardholders' costs would exceed their benefits, consumers would refrain from using cards and a potential social benefit would be lost. According to the two-sided market platform theory, an MIF could be introduced to transfer benefits from the merchant side to the cardholder side, in order to balance the benefits and meet the specific-benefit requirements of both sides. The balancing MIF would flow from the acquiring side to the issuing side, when the benefit shortage is on the issuing side, which seems to be the basic assumption of the academic articles.

(3) $$(B^c - C^c + MIF) \geq 0 \ \text{ and } \ (B^m - C^m - MIF) \geq 0$$

MIFs are usually set jointly by the service providers, by the issuers alone, or by issuers and acquirers. Because service providers cooperate in price setting, authorities have sometimes stepped in to determine "reasonable" MIF levels. The academic articles contain quite different views on how MIFs should be set, on what the optimal MIF could be, on what kind of method should be used for calculations, and even as to whether there exists an optimal MIF.

In his original article Baxter (1983, pp 585–586) found that interchange fees are both appropriate and desirable and that the authorities should let the markets determine the

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[4] Note that these equations are kept general and simple in order to illustrate the basic setup. The complexity increases rapidly for example when marginal costs, fixed costs and different kinds of charging structures and non-linear utility functions or different kinds of market imperfections are included.

equilibrating levels. He also predicted that debit and credit cards would carry different interchange fees, because of different ways of allocating charges.

Schmalensee (2002, pp 118–119) concluded that one need not criticise banks for collective determination of interchange fees and that interchange fees are determined by demand differences between issuers and acquirers. According to his analysis, the private value-maximising fee may be higher or lower than the output-optimizing fee. The welfare-maximizing fee is found to differ from the output-maximizing fee in the same direction as the profit-maximizing fee. In a later study Evans and Schmalensee (2005, pp 37–38) conclude that socially optimal prices in multi-sided industries depend on several factors such as price elasticities, indirect network effects, and marginal costs. These affect the socially optimal interchange fee, as do other factors such as shares of fixed and variable fees as well as competition among merchants, issuers, and acquirers and among alternative instruments such as cash and cheques. It will therefore be different from an interchange fee based solely on cost factors. They also find that theory alone does not allow us to say whether interchange fees would be higher, lower or equal to the socially optimal fee.

Rochet & Tirole (2007, p 28) find that an interchange fee set by issuers would probably exceed the short-term social optimum under certain circumstances: absence of platform competition, cardholder single-homing and merchant homogeneity, or if the fraction of cardholder benefits internalized by merchants exceeds the issuers' per-transaction markup. They also conclude that under platform competition and multi-homing, the market-based interchange fee is lower than the value that maximizes consumer surplus and social welfare.

In another article (2007) they propose the "Tourist Test" model[5] for determining the maximum MIF; it should not be so high as to render merchants indifferent between card and cash payments, that is

$$(4) \qquad (B^c - C^c + MIF^{m0b}) \geq 0 \ \text{ and } \ (B^m - C^m - MIF^{m0b}) = 0$$

The interchange according to the maximum Tourist Test (MIF^{m0b}) would transfer all net-benefits from the acquiring/merchant side to the issuing/cardholder side. It can therefore also be labelled the MIF resulting in merchant zero-level benefits, ie MIF^{m0b}, which will be notation used in the rest of this article.

In line with the merchants' zero-level MIF (Tourist Test), another interesting MIF level can be generated from this equation, which could be called the cardholder's zero-benefit level (MIF^{c0b}), that is

$$(5) \qquad (B^c - C^c + MIF^{c0b}) = 0 \ \text{ and } \ (B^m - C^m - MIF^{c0b}) \geq 0$$

At the cardholder's zero-benefit level, the issuer will cover its costs via the MIF and cardholder fees/costs to such an extent that card holders will be indifferent between cash and cards. At this MIF level, the net benefits remain with the acquiring side. If the MIF is

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[5] Rochet & Tirole (2007) p 7 "Definition: The merchant discount p_s passes the tourist test if and only if accepting the card does not increase the retailer's net operating cost". In equation (4) the sum of terms C^m and MIF^{m0b} equals the merchant discount, and merchant costs would increase when merchants' card benefits do not cover merchants' card costs.

lower than the zero-benefit MIF, cardholders will find cash to be a more attractive option. Note that in a very general setup this could also result in a negative MIF, so that the issuing side would transfer benefits to the acquiring side.

From this, it follows that the socially optimal interchange fee (MIF^{opt}) lies at or somewhere in between these extremes:

$$(6) \qquad MIF^{cOb} \leq \ MIF^{opt} \leq MIF^{m0b}$$

In theory it would suffice in a "homogenous" environment if both sides were to receive some small part of the benefits in order to "get everyone aboard". In a very general model the merchants and cardholders would be quite homogeneous groups of agents. The cardholders would use their entire budgets and select the more efficient instrument to pay for their consumption. For the cardholder it is an either-or decision, because the consumption volume is given and the basic issue is that of selecting one or the other instrument. Therefore we do not have the same type of elasticity relationship between price level and volumes as in standard pricing models. Both merchants and cardholders would decide to make/accept card payments when the MIF is between the zero-benefit extremes. The theoretical contributions do not indicate clearly which parameters would be required for establishing the MIF^{opt} or how market data should be collected for estimating the parameters. This will be more difficult in practice, as neither cardholders nor merchants comprise a homogeneous group of agents with identical benefit and cost structures.[6] Moreover, the parameter values, eg due to developments in costs, charges, convenience etc, would probably vary over time, which would imply varying MIF^{opt} values. There has been very little empirical research on the optimal level of benefit sharing between merchant and card holder. 'For this reason, the currently applied MIFs are usually simply the actual interchange fees (MIF^{act}), which are set jointly by the issuers, provided the authorities have not set ceilings on them. Finding the optimal MIF can also be approached from another perspective, based on increased transparency, as discussed in section 3.

According to the two-sided platform model, the issuing/cardholders' side and acquiring/merchants' side will share the net benefits such that the issuing side receives the share s and the merchants 1–s (where s can vary from 0 to 1 and 0 implies the use of MIF^{cOb} and 1 the use of MIF^{m0b})· ie

$$(7) \qquad \text{Issuing side net benefit} = s\,((\ B^c + B^m\ ) - (\ C^c + C^m\ ))$$

$$= s\,(MIF^{m0b} - MIF^{cOb})$$

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[6] In a heterogeneous environment the MIF^{m0b} and MIF^{cOb} points would vary for individual cardholders and merchants. The optimal value would then have a narrower range of variation. There could also be cross-over points between heterogeneous merchants and cardholders, that is $MIF^{m0b} < MIF^{cOb}$ indicating some combinations of individual cardholders and merchants would find cash to be preferable in all situations, while still other combinations would find cards preferable. In this kind of situation, the optimality will depend on the actual shape of the zero-benefit border-line distribution among individual cardholders and merchants. Symmetric distributions would result in the average becoming optimal. The differences in skewness would with non-symmetric distributions determine the shift away from the average value.

The issuing side's returns can be split into following components: the actual interchange fee received[7], MIF^{act}, cardholders' rebates, card processing costs C^c and issuers' profits ($\prod^i$). From the received MIF^{act} the issuer deducts the costs[8] and profits (equation 8) in a non-transparent way. The remainder will be any transparent rebates (R) to the cardholders. This has raised a debate as to what part of the benefits the issuers keep in order to increase their profits by reducing the potential rebates to cardholders. This would reduce the net benefits transferred to cardholders' in the form of rebates (R)[9]

$$(8) \qquad R = MIF^{act} - C^c - \prod{}^i$$

which can be written as

$$(9) \qquad MIF^{act} = R + C^c + \prod{}^i$$

If there is sufficient issuance competition in the market, the profit term $\prod^i$ should be zero or close to zero. If cardholders are not explicitly rebated by anything other than extra services and charge reductions included in issuers' costs (that is, zero issuer rebates), then the above equation reduces to

$$(10) \qquad\qquad MIF^{act} = C^c$$

This seems to be the reasoning behind some authorities' policy of capping interchange fees at the level of issuance costs in the absence of explicit cardholder rebates. Issuers should not be able, according to the legislation principles of competition, to cooperate in price setting so as to increase their profits. In theory, competition among merchants, acquirers and issuers will result in the full pass-through of benefits/costs to cardholders, but authority inventions are needed when market barriers limit competition.

There are very few empirical studies on payment system costs and benefits that help to determine the optimal interchange fee (MIF^{opt}) and assess how far from optimality the applied actual interchange levels (MIF^{act}) are. Garcia–Swartz et al (2006) presented calculations based largely on the Food Marketing Institute studies of 1998 and 2000. Some central banks in Europe[10] and the Reserve Bank of Australia (see section 5) have made payment cost assessments. Of these, only the Australian studies were intended to be used to support the fixing of interchange fees. The academic contributions all seem to be purely theoretical in the sense that they do not use actual figures or even provide exact calculation methods for interchange fees.

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[7] Superscript MIF^{act} is used to indicate that the employed and actual interchange fee can differ from any optimal fee, because it seems clearly difficult to determine what would be an optimal fee and in case of non-conflicting zero-benefit points, there would be range of MIFs acceptable to all stakeholders..

[8] These equations are based on the simple assumption that all issuer costs are covered by the MIF revenues alone. If issuers are also covering some costs via explicit card charges these can be included in the equation as net deductions of the issuers card costs or as gross revenues as a new factor. However, the basic competition legislation will remain the same, issuers should not cooperate on MIFs in order to increase their profits.

[9] In this context, rebates are separated from other card production costs of issuers, as these can be seen as transfers or additional services benefiting the card holder directly. The alternative would be to keep them as a part of issuing costs. The profit factor will remain the same irrespective of any separation of the rebate factor.

[10] See footnote 2

According to Rochet (2007, p13), "the regulation of interchange fees is a very hazardous exercise, since socially optimal interchange fees depend in a complex fashion on parameters that are extremely difficult to estimate empirically". Data collection is difficult because one immediately runs into problems regarding costs, eg in allocating costs to product lines. Adding to the difficulty: a lack of payment instrument-level cost accounting at banks, processing centres, merchants and consumers; difficulty in measuring various benefits in monetary units and in comparing products associated with different service levels and different services (eg credits); and difficulty in calculating averages and using them where there are huge institutional differences, which also change over time. Because of the hazards involved, it would be necessary to find a means of reducing the likelihood that actual MIFs will diverge widely from optimal MIFs. Currently actual interchange fees are set by self-regulatory bodies of the industry without the aid of (at least published) studies on the parameters used in actual interchange fee setting or relating to the above-described academic models. Self-regulation will probably entail service-provider bias, which could result in an MIF differing from the social optimum due to industry interests.

However, when authorities apply a cost-based cap on the MIF, they are in fact limiting the extra profits of issuers. They require that the profit factor in equation 9 is non-positive when the actual MIF is set by the market:

(11) $MIF^{act} \leq R + C^c$

In this setup the issuers are allowed to freely set the MIF, provided the aim is merely to cover the direct card processing costs and rebates. Any surplus over costs should be rebated to cardholders.

3   A cost-based approach to interchange fee subsidisation effects

In the two-sided market platform model, merchants are seen as the other side of the market, which covers the costs of the acquiring side, including those of the interchange. However, as with all merchant costs, the ultimate payers are the merchants' customers, via internalised markups on products and services. In the cost-based approach presented below, the total costs/charges ultimately paid by consumers/cardholders comprise the basis for efficiency analysis of payment instruments. There are cross-subsidisation effects due to "package pricing" on the issuing side and the average pricing convention (ie the zero surcharge/rebate policy) on the acquiring side. One might even question whether the payment service market is a truly two-sided, given that in the end there is only one paying customer in a single payment transaction. The consumer costs are embedded in a way which makes it difficult for consumers to make rational choices based on cost differences. The cross-subsidisation effects of MIFs have been analysed among others by Allan Frankel and Allan Shampine (2006), Adam Levitin (2008), Steven Semeraro (2009) and Scott Schuh, Oz Shy and Joanna Stavins (2010). Common to these studies is the focus on cross-subsidising by the merchants. Cross-subsidising on the issuing side between cash and cards seem to be a very rare research topic.

3.1 Cash cross-subsidies on the Issuing side

Banks provide customers with current accounts to which consumer salaries are paid (receiving salaries in cash or paycheques is becoming the exception). Customers spend by drawing on their accounts. Banks issue cards in order to make account withdrawals efficient, which can be done in two ways: a) drawing cash from an ATM to use it later in shops or b) making direct card purchases in shops (see figure 2).
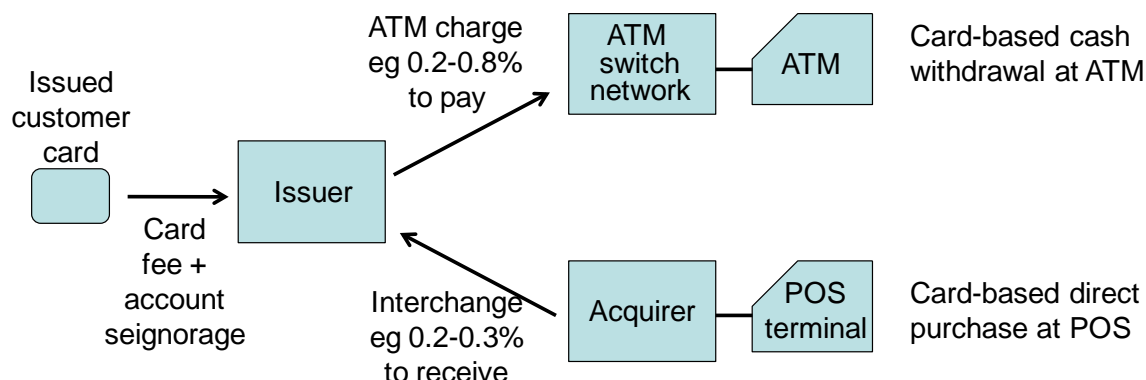

Figure 2: The two models for use of debit cards

When the issued cards are used in ATMs, the issuers will pay an ATM charge[11] (called ASF in this paper) to the ATM network, which is typically about 0.2–0.8% of the withdrawn amount.[12] When the same cards are used directly in shops, the issuers receive interchange fees from the acquirers, which, in the EU, would be no more than 0.2% for a debit card, based on the new DG Competition agreement between Visa and Mastercard (EU Commission 2007b and 2009 and Schwimann 2009). Card customers typically pay a fixed periodic fee for the card, irrespective of the amount and type of usage. Although some banks charge extra for the use of "foreign" ATMs, customers usually are not charged separately for most of their ATM withdrawals and very seldom for card payments in shops. Sometimes banks segment their card services by providing low-charge or free ATM-only cards and pricing separately dual functioning POS+ATM-cards. In addition to the possible

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[11] This kind of ATM service charge is in some analysis called ATM interchange fees, but this kind of terminology hides the basic differences between these factors. Provision of ATM services is an outsourcing activity, where the ATM-owner is providing withdrawal services directly to the issuer and the issuer's customer. There is only one alternative for covering the costs and only one customer involved. An ATM service is a one-sided market, with transparent or non-transparent customer charges. In the case of the EFTPOS MIF it is a case of transferring costs between two different customers involved and their service providers. An EFTPOS MIF different from zero will transfer funds from one of the customers to the other (in the first round of charging).

[12] The pricing models seem to vary considerably among networks and over time and include both flat and value-based parts as well as fixed participant and/or start up fees. However, most of the interbank charges and internal costs are non-public, and their ranges are based on the available figures from Finland, Norway, Portugal and Sweden. For details, see Takala& Virén (2008), Gresvik&Haare (2009), Banco de Portugal (2007) and Bergman, Guibourg&Segendorf (2007)

card fee, issuers receive a seignorage-type of revenue based on the interest level difference between the rate on a current account and the average for reinvestment of deposited funds.

The issuers' processing costs are the same in both alternatives, because the very same card can be used employing the same card system, and the transactions are booked on the same account using the same account system facilities. Even the transactions presented by the ATM network switch and the acquirer/card network follow the identical transaction routes and standards (usually the ISO 8583 format). The processing costs in the issuers' systems for these two card transaction are therefore practically the same.[13] The difference in issuers' costs depends on the MIF and ATM network charges.

It follows that the interchange fee and current card customer charging model cross-subsidise[14] cash withdrawals, when the service provision difference between cash withdrawals and card purchases are non-transparent to customers, that is cash services are not explicitly priced. The individual customers cannot detect the issuers' actual cost difference between these alternatives. This will, as in all cases of subsidisation, promote the use of the subsidised service. The higher the MIF, the larger the cross-subsidy for cash. As banks' cost accounting is non-transparent, it cannot be assessed as to the extent to which interchange revenues cover actual service costs and to which they boost issuers' total profits. The situation can be described as follows, where $\prod^i$ stands for issuer's profit margin and ASF for the ATM service fee, and v is the share of POS transactions in total volume, that is the sum of POS and ATM transactions:

$$(12) \qquad \prod^i = C^c + (MIF*v) - (ASF*(1-v))$$

Banks have card and account service costs C^c, independent of how the withdrawal volumes are distributed between POS and ATM transactions as the cardholder can use the same card in two different ways. The only variable cost factor is the ATM charge, ASF and the only variable revenue factor is the EFTPOS MIF. We can therefore use the same factor C^c for the fixed card costs associated both with card payments and ATM withdrawals, which is the central finding of the cost-based approach. This means that when cardholders increase their POS usage and correspondingly reduce their ATM usage (or over-the-counter cash withdrawals, which are even more costly to provide than ATM withdrawals). A marginal increase in v will increase banks' profits by MIF + ASF, as additional POS transactions result in a corresponding decrease in ATM transactions in value terms.[15] Based on the figures from figure 2 the gain from a change from ATM to POS would result in a profit

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[13] If banks segment their products, by issuing different cards for ATM-only and POS-only usage. this will increase their card costs. A common network of ATMs decreases the costs of ATM services and increases the service accessibility of customers compared to having every issuer/bank operate its own national or worldwide ATM network. However, from the issuers point of view the additional costs are compensated by higher total net revenues facilitated by segmentation

[14] This is the lowest common level of subsidisation as the common card is used for two different bank services; point-of-sale purchases and cash withdrawals, which are priced with different margins. However, there can also exist cross-subsidising higher in the product hierarchy for example the combined margin of these products as a product/service group level can be subsidised by other banking services or when highly profitable provide cross-subsidisation potential to other services.

[15] This simple outcome is true when the MIF and ASF are both strictly value-based. The relationship to profits becomes more complex when one or both of these have flat or other-type components, in which means that the average transaction values of POS and ATM transactions affect the outcome.

improvement of 0.4-1.1%, when nothing is reimbursed to customers. The total MIF revenue of issuers increases while the ATM network costs decrease.

Issuers often say that they reimburse card customers by having lower periodic card fees or react on authorities' proposed MIF cuts by stating that the result will be higher card fees for cardholders, which supports the observation of cash cross-subsidisation. The card costs and fees relate both to ATM and EFTPOS usage, as the card will be the very same in an efficient setup. However, this is a very complex case of cross-subsidisation. Banks very seldom charge separately for over the counter cash withdrawals, so these have been cross-subsidised from the low interest margins on current accounts. When bank cards and ATM withdrawals are introduced, the withdrawal costs decrease and therefore also the need for cross-subsidisation. When bank cards can be used directly at shops, the ATM withdrawal cost will be lower and the cross-subsidisation out of interest margins can be reduced in accord with the difference between ATM and EFTPOS costs.

It should also be noted that the described subsidisation effect depends on the size of the purchase transaction. Basically variable EFTPOS transaction costs are very marginal and are independent of transaction size, that is the processing costs for a transaction of EUR 1 are the same as those for a transaction of EUR 1 000. However, the costs for cash payments vary with the size of the payment, due to the manual and physical logistics. When one ATM withdrawal can be used to cover several smaller POS card payments, the issuer costs of one ATM withdrawal should be compared the internal booking costs of several POS purchases. There is therefore a break-even point in transaction size below which POS purchases become more costly than ATM withdrawals. This point depends on the compared ATM withdrawal and purchase sizes and the production cost structure, cost levels and horizon of analysis, in determining the extent to which the cost elements are variable, semi-variable or completely fixed. This break-even point is the lower, the larger the market share of card purchases, as the economies of scale effect would shift in favour of POS usage. The available cost studies are not sufficiently detailed to provide a clear break-even point from issuers viewpoint, but a cautious approximation of EUR 5–10 can be made based on the cost levels of 2003-2005, which means that the current approximation would be lower, due to general cost developments (relatively lower ICT and higher manual costs over time) and rapidly growing debit card volumes in relation to cash withdrawal volumes.[16]

This finding might support the convention of a minimum card purchase size, which obtains in some countries (seem still to be the case in UK and have been applied in Finland based on a joint bank decision before the Competition Authority deemed it to be anti-competitive) that the purchase size limit should be quite low for debit cards. However, the conclusion is not that straightforward, because when MIFs are used there would be some reason for diverting a part of the cash subsidy to the low-value card payment subsidy instead. An exact determination of the size limitation can therefore only be given case-by-case, based on the actual elements in question.

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[16] See studies referred to in footnote 2.

3.2   Cash cross-subsidies on the acquiring/merchant side

We assume that there are sufficiently many competing acquirers in the market to reduce the possibility of acquirers extracting monopoly or oligopoly benefits. This enables us to focus on the MIF issue; an analysis of acquiring monopoly/oligopoly analysis would belong to the general analysis of markets with limited competition. However, it is worth noting that limited competition in card transaction acquiring is quite common within national card processing structures (European Commission 2006 and 2007a).

In essence, acquirers include MIFs to be paid to the issuer in their merchant fees. They seldom affect the size of the MIF but do play an important role in enforcing non-surcharge rules on merchants. The results of the two-sided market model rely on merchant rebate/surcharge prohibitions. If the MIF effects were transparent to customers, the very basis of the two-sided card model would disappear as the cardholders would face the full bank charges, but just via two different routes.

The basic assumption here and in the two-sided market model is that card processing costs on the acquiring side are lower than corresponding cash service costs, ie the total of merchants' internal card costs and card acquirers' costs/charges are lower than merchants' cash costs and merchants' cash service providers' cost/charges. This is consistent with the two-sided market model assumption of merchants' net card benefits supporting a transfer of benefits via interchange fees. Moreover, it intuitively seems to be a robust assumption, because in the card alternative the merchant's till system reads the card and the customer approves the payment, after which the transaction continues in a low cost electronic process. The time required to make a payment at the till is roughly the same for cash and debit card payments.[17] Costs of EFTPOS devices for cards have become marginal compared to the cash costs of proving and transporting cash, including the required security measures. Whereas card acquirers can get by with a server application for electronic transaction clearing and settlement, cash operators need partly manual proving, sorting, fraud detecting and packing processes for physical cash, as well as transport systems. The logistics of physical cash are more costly than the electronic forwarding of card transactions. These intuition-based views are supported by the findings of central bank cost studies.[18]

When merchants, voluntarily or because of acquirer contracts, refrain from using rebates or surcharges to make payment cost differences transparent to customers, cross-subsidisation effects emerge, because the merchant will apply a general average payment markup on customer prices on goods and services, although there are different costs associated with the different instruments. Merchants need to cover their expenses and, when payment costs

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[17] The time studies made in Finland, Norway and Belgium provide findings according to which the time spent at point-of-sale for paying with cash and cards are closely the same, while debit card payments are somewhat slower in the Netherlands and Sweden. However, small, exact-sum payments are often faster with cash. The time necessary for debit card payments depends to some extent on several factors in the terminal setup eg stand alone versus integrated EFTPOS-terminal, magnetic stripe versus chip card reader, PIN versus signature verification, the speed of the receipt printer, general process design, customer familiarity with particular terminal etc. This explains probably most of the differences between the national studies. The studies are part of the cost studies referred to in footnote 2.

[18] See studies referred to in footnote 2.

are not differentiated, the remaining alternative is internalising via an average customer payment cost markup. The situation can be described by

$$(13) \qquad B^c = (B^m - C^m - MIF) * v$$

The cardholders' benefits on the acquiring side depend on merchants' net benefits, size of the MIF and the ratio of POS transactions to cash transactions. As the MIF increases, the benefits on the acquiring side decrease and disappear when the tourist test level is reached. The larger the share of POS transactions, the larger the benefits. The benefits will be shared among card and cash payers if there is no surcharging/rebating by the merchants. The merchant side benefits will be transferred in full to customers if there is sufficient price competition among merchants. This will result in subsidises to cash users.

The subsidisation levels at the extremes (only cash 0 and only cards 1) will be negligible, because when all customers pay cash the merchant's prices will only include embedded cash cost elements; the opposite is the case when they all use cards. Between the extremes, the card benefits increase with an increasing share of card customers, which reduces the merchants' payment markups (figure 3). To the left in the figures are the merchant costs for card payments and to the right those for cash. The consumer price level line between the extremes (100% card or cash usage) is drawn on the assumption of mostly volume-based card acquiring and cash charges, to show the price level and markup effect of different mixes of cash and card payments. Customer benefits will increase at the merchants with increased card usage. Sufficient competition is assumed among merchants, ie the general tax and cost reductions/increases will be reflected in customer prices. The card benefits will therefore be shared among all customers and some will be transferred to cash users due to cross-subsidisation.
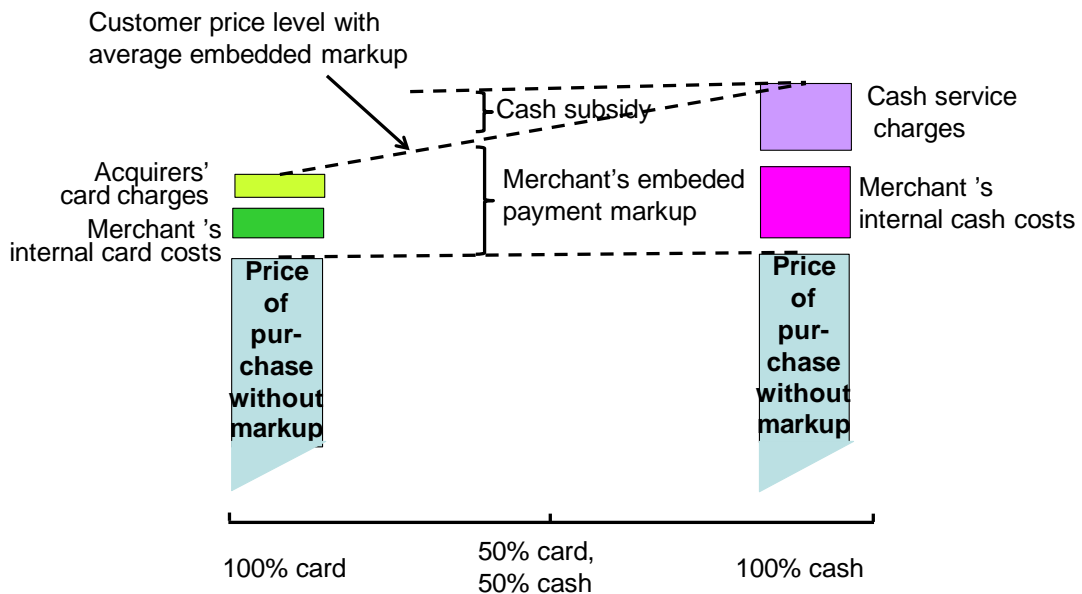

Figure 3: Price level and payment markups by merchants accepting debit cards without MIF and cash

When the issuers agree on an MIF it will be included in the acquirers' card charges to the merchants, because the acquirers are required to pay this fee to the issuers (or essentially it

is withdrawn from the settlements of issuers). This increases the merchant card charges, as shown in figure 4 and thereby also the merchant markups and the consumer price-levels compared to a zero-MIF situation. It will thereby reduce customers' card benefits at merchants. Issuers (banks) use the MIF to transfer the acquiring (merchant) side benefits of card technology to the issuing side.
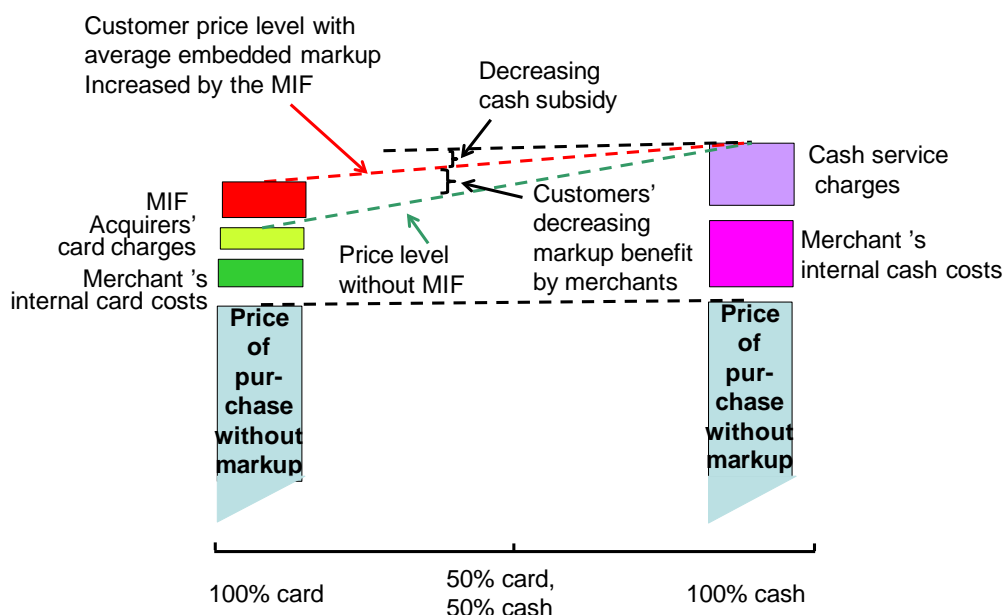

Figure 4: Price levels and payment markups at merchants accepting cards and cash, when issuers agree on a debit card MIF

Based on figure 4, it follows that there can be three general levels of MIF. The one in the figure features a low MIF, and debit card payments at least to some extent provide benefits on the acquiring/merchant side. The MIF may instead be very high. so that debit card payments are more costly than cash payments, and cash payers are forced to subsidise card payers at merchants. Such a high MIF would in most cases reduce merchants' incentive to accept cards. In the third alternative, the MIF raises card costs to the same level as for cash, the "tourist test level" (see Schwiman, 2009 and Rochet&Tirole, 2006).

The general conclusion that can be drawn from this analysis is that without an MIF, the card benefits on the acquiring/merchant side will be shared by debit card and cash users, which implies an embedded cross-subsidy to cash payers. A MIF will move part or all of the benefit (depending on its size) from the acquiring/merchant side to the issuing side. It will thereby increase the cross-subsidisation of cash on the issuing side if issuers evenly disperse MIF revenues among cash withdrawals and debit card purchases (see above section 3.1). The current market setup thereby provides cash with cross-subsidies also on the acquiring/merchant side, which promotes cash purchases as opposed to direct card purchases and thereby reduces the efficiency level of payments.

4   Comparison of approaches

4.1   The underlying differences

Common to both approaches is the idea that cards are more efficient for a large share of current consumer payments at merchants. However, there are major differences in the two approaches (two-sided versus cost-based), which are summarized in table 1.

	Two-sided approach	Cost-based approach
Company/industry structure	Credit card company provides only card payments; cash services are provided (partly for free) externally	Issuers provide account services (optionally with credit lines) and account withdrawals both via POS or ATM (debit cards and cash are competing services of the same service provider (bank)
Instrument usage	Card employed only for POS purchases from (credit) account	Cards employed as general account identification instruments and the same cards are used at ATMs and POS
MIF effects	MIF promotes cash usage by reducing issuers' card charges compared to free or low-cost cash option	MIF subsidises cash usage and eliminates rebate possibility on acquiring side.
Transparency	A no-surcharge rule is necessary to balance the MIF, ie discouraging surcharging on the acquiring side.	Cost-based surcharging/rebating by instrument type would increase price transparency, competition and cost awareness.
Service direction	The issuer provides a payment service via acquirer to merchant. Merchants benefit by accepting cards; so they should help to cover issuers' costs.	Merchants provide a service to issuers when cards replace inefficient cash withdrawals and cheques. Merchants automated also previous paper slips by investing in electronic EFTPOS terminals. Merchants provide services to issuers' customers. the cardholders.

Table 1: Main underlying differences between the two approaches

Using the simple notation employed earlier, the full benefit differences can be divided into following components:

(14) $\sum B^{net} = B^m - C^m + B^c - C^c = \prod^i + R + X$

where R is rebates to cardholders (payments) and X is cross-subsidies to cash payers (payments). It is perhaps more correct to state that the subsidies and rebates go to payment transactions, as most customers use cards and cash in parallel and depending on the payment situation the customer choice can be for the efficient or inefficient one. The larger the profit factor in equation 14, the smaller the customer benefit factor. The larger the X factor, the smaller the benefits to the benefit source, that is, card payments. The larger the visible cardholder rebate factor (R), the stronger the impact on cash replacement by cards.

4.2   The risk of completely eliminating the incentive for development

Based on the cost differences shown in figure 2, banks should have the incentive to promote debit card usage over cash. However, the picture changes when banks provide both issuing and acquiring services for cash and cards. When both cash and card acquiring services are provided by banks, merchants generally use the same bank for acquiring cash and cards. Banks will thus move to a reasonable balance between card and cash acquiring in relation to the total acquiring business. Their market shares in issuing and acquiring will determine the balance of incoming and outgoing volumes vis-à-vis other banks.

Considering first a well-balanced situation, the card payments are in balance (as much incoming as outgoing card purchases for each bank); and as regards cash, consumer withdrawals equal deposits by merchants. In this well-balanced situation the MIF net revenues will be zero. Banks' payment instrument profits will depend on their own issuing and acquiring fees minus production costs for cash and cards. Profits will thus depend on the margins on cash and cards. If the individual banks have priced their services according to costs, they will be indifferent to the choice of their customers. Because banks will have higher costs on the cash service side, they need to apply merchant fees that cover costs for both cash acquiring (merchant deposits) and cardholder withdrawals.

This kind of situation could results in "total development incentive removal. A well-balanced revenue situation removes banks' interest in promoting a given instrument, because both are equally profitable and they merely share a given fixed volume determined by consumers' total consumption budgets. If the MIFs are set in respect of merchants at the "tourist test-level" this will, by definition, remove merchants' incentive to promote card payments. The last stakeholders, the cardholders, will also be indifferent as they will not get transparent price signals. Their visible costs/charges for using cash or cards are identical. The only difference cardholders might experience is a possible convenience difference, ie ATM visits can be reduced by paying directly at shops. This situation can be described by following set of equations:

Merchants become indifferent when MIF is set at tourist test level:

$$(15) \qquad B^m - C^m - MIF^{mOb} = 0$$

Cardholders are indifferent, as they have the same fixed charge for POS and ATM usage, in which the benefits are embedded but invisible

$$(16) \qquad C^c (B^c) = \text{fixed}$$

Banks are indifferent when card and cash profit margins are equal, which implies that cash charges levied on merchants (C^m_{cash}) must cover ATM costs (ASF), revenues comparable to point-of-sale MIFs and cash acquiring costs (C^a_{cash}) over card acquiring costs (C^a_{card}), plus the cash share of common issuing costs (allocated on the basis of volume shares v)

$$(17) \quad C^m_{cash} = ASF + MIF + (C^a_{cash} - C^a_{card}) + C^c (1\text{-}v)$$

This level of merchant cash charges seems plausible in the current market setup, as cash acquirers need to cover their own costs; and since cardholders do not pay ASF costs these can only be charged to merchants (or via cross-subsidization from other services). The MIF component could be explained by the interests of both issuers and acquirers to level the profit margins among their products. When the dominant issuers are also acquirers they have an interest in setting cash service prices at this level, which will determine market pricing levels.

The market is seldom in the perfect balance assumed above. If banks charge merchants less than cost for cash, this increases cross-subsidies to cash. If there is an imbalance between cash acquiring, the "long" cash banks (those with acquiring surplus) will gain benefits compared to the "short" banks, when most of the cash revenues stem from the acquiring side. The payment industry has also established different kinds of joint card acquiring companies, cash handling centers and ATM networks. These introduce monopoly entities into the process, which results in a common cost level for banks participating in these entities. This can therefore result in maintaining even more firmly the total development incentive removal situation, when costs/charges of given parts in the service chain can be fixed by service provider cooperation.

This total removal of development incentives seems to be a basic cause for the slow development of payment services. Compared to other industries, competing service providers set prices at cost and are therefore indifferent to customers' choices, but customers will get price signals which guide them towards effective choices.

5   Authority involvement in payment efficiency

The payment industry seems, from competition viewpoint, to include the typical problems of network industries. Network externalities readily result in one or a few dominant networks operating in limited competition. Interoperability requirements often result in dominant standards which may become barriers to development. Dominant network operators can employ pricing strategies that support their market position. Therefore

authorities seem to take a greater interest in the pricing policies of card payment services and especially interchange fee issues, as these are a form of pricing cooperation among competing service providers.

The main issues for authorities in respect of interchange fees seem to be following:

    a. An MIF maintaining positive incentives on both the issuing and acquiring side needs to be between MIF^{c0b} and MIF^{m0b}. Which would be the optimal MIF from the competition perspective and how should it be determined?

    b. In a situation with limited competition, issuers might jointly decide on an MIF that will boost their profits. Should authorities therefore cap the size of MIFs in order to limit their profit effects and which would be the best means?

    c. Four-party schemes employ explicit interchange fees while three party schemes can employ implicit pricing factors with effects resembling those of interchange fees. Is there a need for authorities to ensure a level-playing-field between 4-party and 3-party schemes regarding interchange fee regulations and which would be the suitable means?

    d. Current payment service pricing and interchange fee conventions are largely based on embedded and non-transparent pricing for end-users. To which extent would it be socially efficient, if authorities would enforce increased payment cost transparency and which would be suitable means for implementation?

There seems to be a growing concern among authorities that the card industry has set MIFs too high or has at least not lowered them in line with cost developments and that they therefore have a profit boosting effect. There is a marked long-term downward trend in ICT costs, which have reduced card transaction processing costs. Interest rates have been declining for many years in the large economies and credit risk analysis has improved. Increasing card transaction volumes also result in considerable economies of scale benefits due to a cost structure marked by a large share of fixed costs. The reduction in issuing cost (C_i) would advocate for a reduction in actual MIFs or an increase in rebates, in order to avoid a profit boosting effect in the card industry. Most of the parameters affecting MIF calculations are continuously changing and thus call for changes in MIFs and/or rebates.

The authorities in many countries have discussed card fees and systems and MIF issues with the banks, eg Australia, Canada, Chile, Colombia, Denmark, EU, Israel, Norway, Poland, Portugal, South Korea, Spain, Switzerland, Turkey and US.[19] Australia and EU have recently introduced specific interchange fee caps, and the US Federal Reserve has proposed, for public comment, a cap on debit card interchange fees.

In Australia the regulator (Reserve Bank of Australia) decided in 2006 to cap interchange fees based on issuers' and acquirers' costs. For credit cards, the main issuers were required to report on their processing costs, fraud and fraud prevention costs, authorisation costs and credit costs for interest-free periods. The benchmark cap for credit

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[19] Bradford (2008)

card interchange from acquirer to issuer was set to 0.50% based on the weighted average of reported costs. There have been two types of debit card schemes in Australia, a domestic EFTPOS (Electronic Fund Transfer at Point of Sale) system and an international scheme (Visa and MasterCArd) system. For EFTPOS debit ("domestic") transactions, the interchange flow in Australia went originally in the opposite direction, that is, from issuers to acquirers, compared to the international debit interchange from acquirer to issuer. The RBA requested the main EFTPOS acquirers to report their processing and switching costs for these transactions, and the lowest average costs will determine the interchange benchmark for EFTPOS transactions, which was set to AUD 0.05 per transaction in 2006. For the scheme debits ("international") the interchange fees were set at AUD 0.12 per transaction, on the basis of the main issuers' average processing and authorisation costs. The EFTPOS debit transaction cap was realigned with the scheme debits as from the start of 2010, resulting in a change in the interchange flow direction and interchange size. In summary, the Australian authority has employed a completely cost-based approach to cap multilateral interchange based on equation (10) in order to avoid profit boosting.[20]

In the European Union DG Competition assessed MasterCard's interchange fees in 2007 and found the multilateral intra-EEA fallback interchange fee for cross-border payments to infringe the competition legislation and so will impose a penalty if MasterCard continues to employ these.[21] In 2009 DG Competition and MasterCard settled on its undertaking to apply a weighted average cap of 0.30% for credit card MIF and 0.20% for debit card MIF, website publishing of MIFs, unblending and unbundling of merchant fees and services and permitting surcharging. DG Competition accepted the new calculation methodology of Mastercard, the called "avoided-cost test" or "tourist test". DG Competition also points out that an MIF must meet the conditions of Article 81(3) of the EC treaty, that is, "empirical proof that the MIF creates efficiencies that outweigh the restriction of competition, consumers get a fair share of those benefits, there are no less restrictive means of achieving the efficiencies and competition is not eliminated altogether." [22] DG-Competition makes MIF decisions on a case-by-case basis and is continuing its antitrust proceedings against Visa Europe independently of MasterCard's decisions.[23] In 2010, Visa and DG Competition settled on an average MIF for Debit transactions of 0.2%, also based on the "tourist test" methodology.[24] The European authority is thus content to cap at the level of the Tourist Test MIF.

In the US the Dodd-Frank Act[25] requires that interchange fees be "reasonable and proportional to the costs incurred by the issuer". The Board of Governors of the Federal Reserve System has therefore requested comments on a proposed new Regulation II, Debit Card Interchange Fees and Routing.[26] The proposal includes two alternatives for interchange fee capping: 1) a safe harbor amount of USD 0.07 per transaction or 2) a cost

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[20] See RBA Standard of Wholesale ('Interchange') Fees in designated Credit Card Systems and RBA Credit Card Benchmark Calculation. RBA (2006a, 2006b, 2006c and 2009)
[21] Commission Decision of 19 December 2007, COMP/34.579 MasterCard
[22] Press release Memo/09/143 1 April 2009
[23] Schwimann (2009) p. 244 and 247-248
[24] Visa Press release 26 April 2010, www.visaeurope.com/en/newsroom/news/articles/2010/
[25] Publ. L. No. 11-203, 124 Stat. 1376 (2010)
[26] Regulation II; Docket No. R-1404 RIN No 7100-AD63

based on actual issuing costs up to USD 0.12 per transaction. Any MIF below the safe harbor cap would be acceptable as such. For any MIF above the safe harbor cap, the issuers would have to provide cost information to support an MIF between the safe harbor and the absolute MIF cap. The Fed's approach also incorporates profit limiting, ie the selected MIF must be supported by cost information in order to avoid a profit boosting effect. The Fed has also used a flat transaction-based fee approach, which is closer to the actual processing cost structure than an ad valorem MIF. Providing two alternatives introduces an interesting flexibility factor from the industry point of view, as it enables the industry to introduce an MIF-level within certain limits based on costs. This proposal covers only debit card interchange fees.

These authorities have decided to cap the MIFs based on two quite different bases. The Australian and US policies focus on issuing costs in order to ensure that MIFs are not used to boost issuing profits, while the European focus is only on ensuring that sufficient merchant interest remains. The difference between these approaches can be written as

$$(18) \qquad \text{Regulatory difference} = \text{MIF}^{m0b} - C^c \;\; = \prod{}^i \quad \text{(with no rebate difference)}$$

The Australian and US versions will result in a lower MIF due to the cost-based cap. If there were differences in the rebates, these should be included in the equations, but for debit cards rebates are generally zero, and the credit card service costs are included in C_i. This would point to European competition authorities accepting extra profit margins in their MIF implementation policy. Another interesting difference in the regulatory outcome is that the costs included in the Australian debit card MIF calculations are quite limited, which results in a flat per transaction based MIF cap. The US cap also requires a flat fee. The European stance is based on merchant benefits and results in a value based debit card MIF cap. The value-based MIF will imply a cross-subsidisation compared to costs between small and large debit card payments. A value-based MIF will penalise large debit card payments and subsidise small value payments. A summary of the differences in MIF-levels and transferred MIFs in these alternatives can be found in table 2.

	Transactions 2008			Interchange fees			Debit card usage	
	Number	Value	Ave size	per trans.	per value	total	Trans./year	Value/year
	(billions)	(billions)			%	(millions)	per inhab.	per inhab.
Australia (AUD)	1.7	110	65	**0.12**	0.19	204	79	5 116
(EUR rate 1.7)		*65*	*38*	*0.07*		*120*		*3010*
EU 16 (for FR all trans. categorised as debit)	22	1160	53	0.11	**0.20**	2 320	56	2 937
		1160	*53*	*0.11*		*2320*		*2937*
US safe harbor (USD)	34	1340	39	**0.07**	0.18	2 380	112	4 406
(EUR rate 1.3)		*1031*	*30*	*0.05*		*1831*		*3390*
US max cap (USD)	34	1340	39	**0.12**	0.30	4 080	112	4 406
(EUR)				*0.09*		*3138*		*3390*

Table 2: Comparison of different MIF regulations based on 2008 figures[27]

Although the Australian and US flat MIFs have been set separately, these are quite close to each other, with the Australian as an average of the US proposal (based on the selected exchange rates). The European value-based MIF limit will result in a higher calculated average fee (EUR 0.11) than the Australian and US fees, based on current volumes. In a per value comparison, all MIF limits are very close to each other except for the US max cap, which is clearly higher. Because the card market sizes do not differ widely for the US Safe Harbor and EU16, the interchange fee totals are not far apart. This is partly due to the average card transaction size being clearly higher in EU16. The card usage in value per capita does not differ greatlyacross the regions, but the number of transactions is clearly less in EU16, due to higher average size of transactions.

Although the regulating authorities have applied different arguments, the overall stance seems to be that MIF limitations are currently set according to issuers' cost levels, in order to limit possibilities for profit boosting. However, from the competition point of view, there is another interesting MIF level, that is, the zero-level. With MIFs set to zero, the acquiring side will set charges independently of the issuing side and card transactions would therefore be processed at par in the payment networks. At-par acquiring would create pressure for more transparent cardholder pricing and would reduce cross-subsidisation effects. Issuers often warn that cutting MIFs would result in higher card fees and therefore in less use of cards and more use of cash. However, the outcome will probably be the opposite, because if banks would promote the use of cash it would increase their overall costs due to more expensive cash distribution. Compared to any other MIF value, the zero value has the advantage of simplicity. It will not require any interservice provider invoicing or analyses/debates on the exact calculation rules for the MIFs. It would completely remove issuers' profit boosting possibilities and a large part of the cross-subsidisation possibility on the issuing side.

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[27] Table 2 contain data from 2008 as 2009 figures are not yet available from all regions. The volumes have most probably grown in all countries resulting in higher calculative MIF totals. The EU-16 figures are derived by assuming that all French debit and deferred debit transactions are from MIF point of view under the debit MIF scheme (in France the acquiring process is the same for immediate and deferred debit and payment extension time is short. In order to compare values in different currencies exchange rates of 1.7 EUR/AUD and 1.3 EUR/USD is used.

6   Concluding remarks

Competition has been one of the main drivers for improved efficiency and development in most industries. However, in the payment industry in particular price competition seems almost completely absent in the current market setup, and one could even say that the existing limited price structures are often anti-competitive. Efficiency and development would require more price competition among issuers, acquirers, network providers and instruments. A situation with almost complete removal of development incentives will postpone the achievable social benefits of more efficient payment technology.

A non-transparent MIF embedded in products and services purchased by consumers will, in the case of zero direct rebates to cardholders, mean extra profits for issuers or cross-subsidies to cash payers in payment situations where cards are more cost efficient than cash (that is in most payment situations beyond a low initial threshold of a few euros). In markets with sufficient competition, the cost reductions experienced by issuers, acquirers and merchants would be channelled to customers showing a clear cost difference, thus inducing cardholders to choose between ATMs and EFTPOS terminals according to their preferences, including the economic difference. In order to promote efficiency in the payments market authorities need to open the market to increased competition, which would imply requiring open access to payment networks and interoperable standards from the processing technical point of view.

Regulating MIFs downwards will increase competition between payment instruments and reduce cross-subsidisation between cash and cards as well as reduce issuers' possibilities to extract extra profits from the acquiring side. Reducing MIFs to exactly zero would provide increased simplicity in card processing and reduce both profit boosting and cross-subsidisation possibilities/interest. It would be in line with the norm for other instruments[28] on most markets and end the discussions on how to establish a given MIF level.

The payment industry has largely eliminated the development incentives for cards by maintaining high interchange fees, which result in a too little use of cards compared to their relative cost efficiency in relation to other older instruments, cash and cheques. Authorities have started to intervene, which seems to be necessary in order to speed up developments in payments and provide benefits to the whole economy. The two-sided market model is based on non-transparency and cross-subsidisation, which distort the price/cost information visible to cardholders and merchants. The resent authority interventions in card markets, setting ceilings on MIFs and abolishing no-surcharge rules, have been aimed at increasing price transparency and thereby price competition. It seems difficult – from both the theoretical and empirical viewpoints – to defend increased and prolonged cross-subsidisation given the goal of more efficient resource allocation in payments or in any other markets.

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[28] For example the at-par check redemption in US and credit transfer and direct debit exchange using the "share" option in EU after 2012.

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Appendix

Credit cards versus cash and debit cards

A credit card is a bundled product with payment service and credit service. Debit and credit cards are identical as to payment features: technically similar cards, same kinds of terminals, and same types of acquiring and issuing processing. Card purchases are debited from the cardholder's account and credited to the merchant. From the transaction-processing viewpoint, debit and credit cards are alike and independent of whether the card account is on the debit or credit side. Today the same physical card often refers to two different accounts, using co-branding techniques, where the cardholder selects at point of sale the applicable account for each payment (see below for details).

The main difference regarding the credit facility relates to the payer of the credit costs. When a card customer uses a debit card with overdraft facility or a pure revolving credit card, he pays the credit cost, which does not affect the MIF or merchant fee. When a credit card purchase carries an interest-free credit period, typically one month, for the cardholder, who is covered by higher interchange fees/merchant fees[29], the credit costs will be embedded in the merchant's consumer price (via a higher MIF) and cross-subsidised by those who do not use credit. Such cards are often termed cards with the delayed debit function. The difference in who bears the costs is apparent when two identical purchases are compared: one where the credit card with a delayed debit function is used directly in a non-surcharging shop for payment and one where the cardholder first goes to an ATM to withdraw cash from a credit card account and then uses the cash at the merchant. In the first case, the credit/delayed costs are shared by all merchant customers, due to the higher credit card MIF, and in the later case the cardholder will pay an explicit transparent higher ATM withdrawal fee (often partly ad valorem and partly fixed) that covers the credit costs.

In a non-surcharging setup, debit cards always cross-subsidise credit cards with delayed debit, because the payment function and payment costs are identical, so some of the credit costs will be transferred to debit card users. In a cash versus credit comparison, the result will depend on the levels of credit and cash costs. Credit cards with high MIF/merchant fee will in most cases be cross-subsidised by cash users, which partly explains the reluctance of low-margin merchants to accept such cards, as price-increasing extra services would result in higher prices compared to other non-accepting competitors. In the opposite case, where merchants' cash costs are higher than credit costs' for low-cost credit cards, the cash payers will benefit from cross-subsidising.

One point often raised about MIFs for credit cards with delayed debit option is that merchants will be able to sell more because customers can spend on credit. However, this is only true if the average consumer credit level continuously rises and for each period it would only apply to the increases. Each purchase this month will result in an equal decrease in purchasing power the next month when the delayed debit for the credit card bill falls due, so the credit card with delayed debit can at best merely bring forward the purchase by one month on average.

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[29] Credit cards typically carry higher merchant fees and MIFs than debit cards. See Weiner&Writhgt (2005) and European Commission DG Competition decision on MasterCard and Visa interchange fees.

In the European card payment statistics, card payments are categorised as debit card payments, credit card payments, or a category that includes deferred debit/credit transactions. Figures 5a, 5b and 5c show the developments in these groups in Europe during the last 10 years for individual countries and on average for these countries.[30]
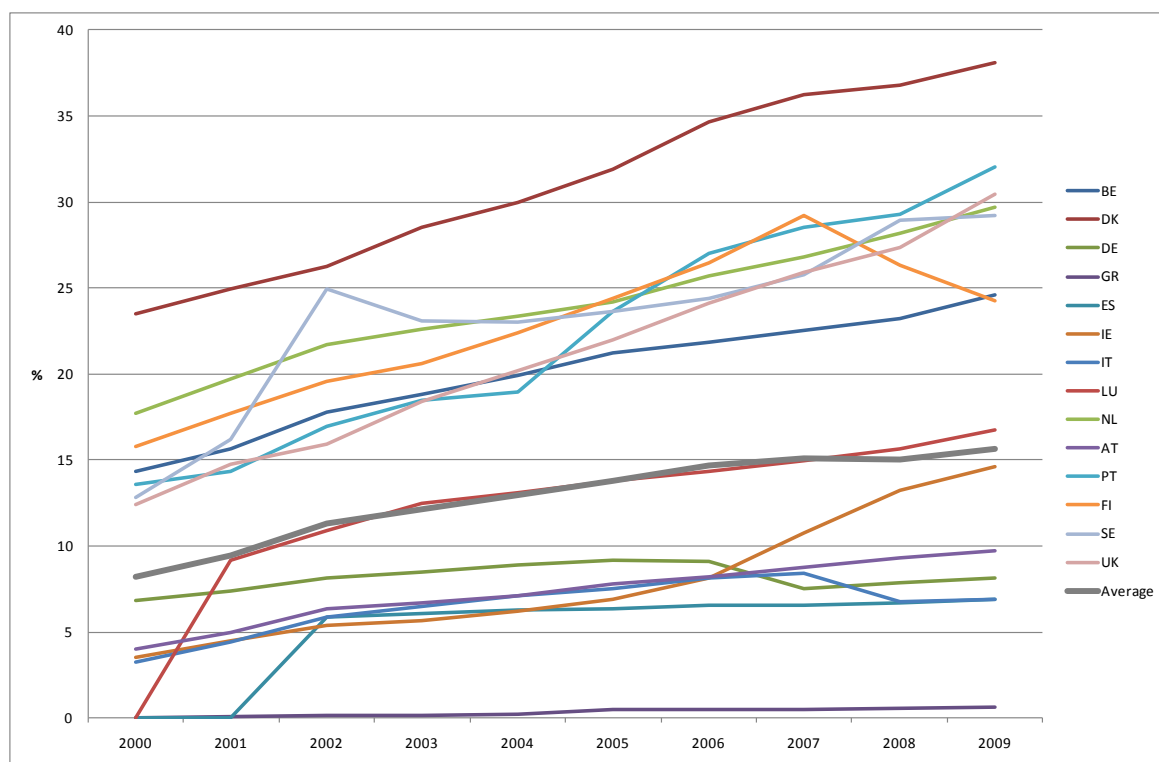

Figure 5a: Debit card purchases as share of private consumption

Debit card purchases are clearly more popular than deferred debit/credit or credit card purchases. In the top countries they accounted for more than 30% of total private consumption in 2009 and the average was about 16% of consumption. The average yearly growth in consumption share over the period studied was 7.4%. The differences between the countries are strikingly large.

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[30] The origin of the statistical data is the Statistical Data Warehouse of ECB (Blue Book). Not all countries were included due to lack of data or changes in the data categorization during the period. The statistics comprise mainly bank-based data, and eg different kinds of merchant-chain credit cards etc are not included in the data. As reporting in some of the countries began only in the middle of the analyzed period, their impact on growth calculations is limited to the latter part of the period.
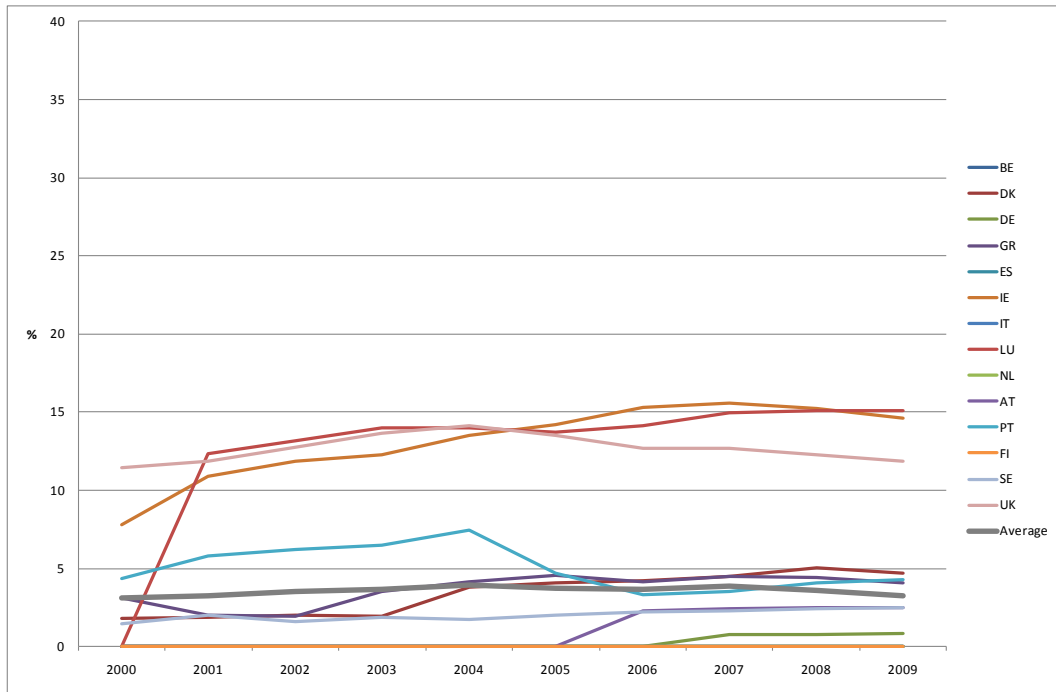
Figure 5b: Credit card purchases as share of private consumption

Credit card[31] purchases using cards provided by banks are especially popular in three countries (IE, LU and UK, where they accounted for 10–15% of total private consumption in 2009, compared to the figures for the other countries, which are all below 5%. The average share is about 3% of consumption. The average growth over the period studied was 5.1%.

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[31] The credit cards included in these statistics (issued by banks) are such that the cardholder pays the interest on the credit. Credit cards issued by merchants, chain store etc are not included, as information on merchant fees and possible MIFs is not available.
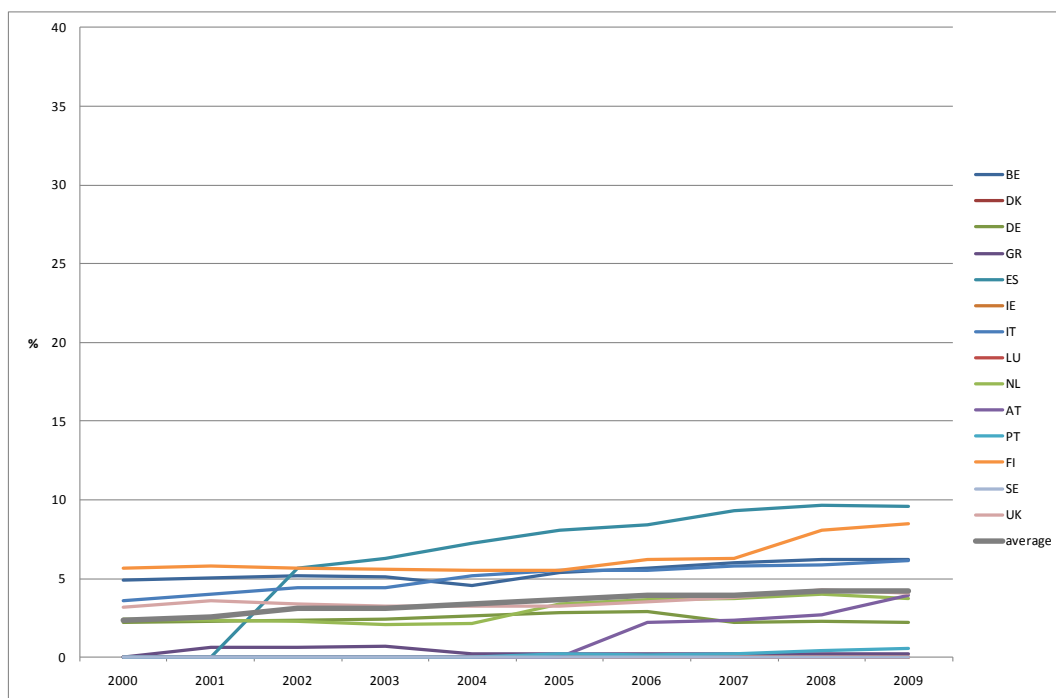
Figure 5c: Deferred debit and credit card purchases as share of private consumption

The share of private consumption via deferred debit/credit[32] purchases does not exceed 10% in any country, and the average is about 4%. The yearly growth in share of private consumption has been 6.8%.

Debit card purchases clearly dominate all types of credit purchases, and their share of private consumption is increasing more rapidly. The difference in developments between interest-free deferred credit/debit and interest-bearing credit purchases is considerable small. Based on the statistics, neither form of credit seems to be a driving force for moving from cash to card payments.

The yearly growth in the consumption share corresponds to a monthly rate of 0.5%. The cost of this growth (assuming it is due to free credit) can be viewed as the MIF difference between debit and deferred credit/debit, ie 0.1%, in the future in Europe. It has usually been larger in the past. However, this added MIF fee has to be paid every month for the total deferred credit/debit volume in order to revolve the credit. In order for the extra sales of 0.5% to have a general price-reducing effect and thereby result in consumer benefits, the merchant margins need to be quite wide. The positive effect depends also on the extent to which the interest-free credit usage has resulted in real growth and the extent to which it has replaced cash payments or debit card payments, eg via multi-homing (see next section).

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[32] A deferred debit/credit card is defined as a card that includes a free interest period (typically one month) before the credit has to be settled or moves to revolving credit, for which the cardholder pays interest for additional credit periods.

Multi-homing has been used to describe a situation in which the cardholder can optionally use several cards or payment instruments. It is usually assumed that the payer selects his most advantageous option. Based on SEPA developments, multi-homing will increase in the form of built-in dual function cards (co-branded cards) that include in the same card links to two different card accounts – a debit account and a credit account (probably in most cases delayed debit/credit). The cardholder can at point of sale select the account. The cardholder's choice then determines the merchant fee for to the purchase, debit or credit card fee, and the MIF.

Combining two previously physically separate cards into a single card and separating the logical difference by a key-stroke decision at the point-of-sale-terminal makes multi-homing easier for customers.[33] These promote banks' interests in increased credit card usage covered by a higher MIF.

In the current business model setup, without surcharging, such built-in multi-homing will hide the cost difference on the acquiring side from the cardholders and will only show the delayed debit and other benefits on the issuer side (versus the other function on the same card). Individual cardholders in such a setup have an interest in being cross-subsidised by other payers.

Changing from current cards to built-in multi-homing cards would reduce the costs of physical cards, but this likely has very little impact on the overall use of cards. Card transactions will be booked on different accounts under different MIFs and service rules. The effect on the total use of cards and cash will be largely unaffected, but cardholders will be induced to select the credit options, because of the seemingly free credit option.

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[33] Banks at least in Finland have parameterised the credit card option as the default selection, ie cardholders have to make an extra key stroke in order to select the debit card payment and thereby the low MIF and low merchant fee option.

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