On the War On Cash and its spoils

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Abstract: This paper brings together a number of recent studies for Belgium and the Netherlands to show that the War On Cash (WOC) is a cause worth fighting for. It builds on two central bank studies to show that the social cost of cash is substantial, and that society would benefit from a switch to debit cards and electronic purses. As for the most effective way of bringing about such a switch, evidence is presented according to which the introduction of cost-based pricing of payment instruments would have a bigger impact than simply raising the number of EFTPOS terminals.

Keywords: payment instruments; debit cards; electronic purses; efficiency; social cost of cash; cost-based pricing; Belgium; the Netherlands.


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1 Introduction: ‘cash stinks’

On a recent visit to Brussels Midi railway station, I could not help but notice several highly visible posters, all sporting a new slogan for MasterCard’s Maestro card, calling it ‘The New Cash’. The posters also contained different positioning messages including: “The end of the line for cash” and “The euro debate is now over”. I later found out that what I had seen was part of a cross-border marketing campaign targeting Eurostar travellers – with similar advertising at Waterloo International Station in London and the Gare du Nord in Paris. MasterCard UK also uses the new slogan on its website – and perhaps elsewhere too. As I am writing this, MasterCard UK’s Maestro webpages carry
an animated visual that alternately displays the following messages, in big white letters on a black background: “Cash is so last millennium”, ‘Cash stinks’, ‘Coins get lost’, and “There’s a reason machines spit out coins”.1

Slogans aside, card companies and banks in several parts of the world have clearly been waging a War On Cash (WOC). In the USA, the credit business is now so saturated that credit card companies are focussing on getting consumers to use cards for the so-called top-of-the-wallet purchases normally paid in cash in such places as convenience stores, gas stations, and fast-food chains (Godt, 2006). To that end, credit card networks no longer require signatures for purchases under USD 25 (Warner, 2006).2 Card companies are also offering merchants lower fees to attract low-end acceptance points, and issuers are increasingly rolling out contactless credit cards.3 In Europe, the European Payments Council hopes that the creation of the Single Euro Payments Area will result in greater payment card use. According to McKinsey,4 this could help European banks save EUR 50–100 billion per year.

This paper brings together a number of recent studies for Belgium and the Netherlands to show that the WOC is a cause worth fighting for. I will also argue that heavy weapons may be needed if the WOC is to be won. Concretely, Section 2 first builds on two central bank studies to show that the social cost of cash is substantial, and that society would benefit from a switch to debit cards and electronic purses. Section 3 then discusses a number of simulations regarding the future use of cash under alternative assumptions. It will be demonstrated that raising the number of EFTPOS terminals is an effective way to promote electronic payments. However, I will also present econometric evidence according to which the introduction of cost-based pricing of payment instruments would have an even bigger impact on the efficiency of our payment systems.

2 The (social) cost of cash

The social or societal cost of a payment instrument refers to the resources that society as a whole consumes in providing and using the service. It is computed by adding up the private costs of all stakeholders (consumers, merchants, commercial banks, the central bank, etc.), and eliminating any transfer payments – to avoid double counting. It is intuitively clear that the circulation of notes and coins is labour-intensive and thus costly. However, until recently, estimates of the social cost of cash were scarce and not very reliable. There were also hardly any consistent comparisons of the social cost of cash with that of electronic payment instruments. As far as the Netherlands and Belgium are concerned, this lack of hard evidence has been remedied by two recent studies led by the respective central banks (DNB, 2004; Steering Committee, 2005; National Bank of Belgium, 2006).5 Both studies focus on estimating the social cost of POS payments, i.e., excluding remote and P2P payments. Before discussing the results, let me point out that the payment systems of the Netherlands and Belgium are very similar: in both countries cheques have all but disappeared, debit cards are very popular, and they both have an e-purse scheme – called Proton in Belgium and Chipknip in the Netherlands (Van Hove, 2006a).

The results are as follows. According to the study by the Dutch Central Bank, which relies on data for 2002, the overall social cost of POS payments in the Netherlands would be equivalent to EUR 2.9 billion per year, or 0.65% of Dutch GDP. The figure put
forward in the study led by the National Bank of Belgium – which essentially replicated the methodology used by De Nederlandsche Bank but relates to 2003 – is even higher, at least in relative terms (0.74% of GDP). Crucially, in both countries cash is responsible for the lion’s share – 73 and 75%, respectively – of the total social cost. In the Netherlands, the social cost of cash would amount to no less than 0.48% of GDP – or EUR 300 per family per year. The figure for Belgium is even higher: 0.58% of GDP. As an aside, a forthcoming study by the Bank of Finland estimates the cost of cash at only 0.1% of GDP.6

One could argue – and with reason – that it is only normal that in Belgium and the Netherlands the social cost of cash is higher than that of its electronic competitors, because even today the bulk of payments are still conducted by means of cash. For example, in 2003 cash would still have been used in no less than 81% of POS transactions in Belgium (Steering Committee, 2005). Crucially, however, the central bank studies show that the marginal social cost of cash is also higher. This is illustrated in Figure 1, which compares, for the two countries, the marginal social cost of cash (as a function of the transaction amount) with that of e-purses and debit cards. To be clear: we are looking here at the cost, for society, of making one additional payment of a certain size; fixed costs are thus not included. In other words, the implicit assumption is that the infrastructure is already available.

**Figure 1** Marginal social costs, the Netherlands and Belgium

A first observation is that the results for the two countries tally well, except for the e-purse. This is surprising because the Dutch banks have simply licensed Proton technology from Banksys – the Belgian EFTPOS operator – and rebranded it. However, the comparison across payment instruments is what matters here. Importantly, in both countries e-purses are more cost-efficient than cash, regardless of the amount of the transaction. In the Netherlands, one additional e-purse payment would cost society a mere 3 euro cents. Comparatively, one additional cash payment would cost a minimum of 11 euro cents – and this figure rises considerably in accordance with the amount to be paid. The conclusion is clear: society would benefit from a substitution of cash by e-purse
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payments. For Belgium, the conclusion is similar. It must be stressed, however, that while in Belgium the costs associated with the Proton e-purse are also always lower than those of cash, as soon as the transaction amount reaches EUR 53.74, Proton becomes more expensive for society than the debit card. On the other hand, the probability of consumers using an e-purse for higher-value transactions in situations where they can also pay by means of a debit card is small as it increases the risk of theft and loss, and necessitates frequent reloading of the card.

A comparison of the marginal cost of cash and debit cards shows that in both countries, cash is still more economical for small payments. But, because the cost of cash increases with the transaction amount, this is not the case for larger transactions. In the Netherlands, the switching point lies at EUR 11.63; in Belgium it lies at EUR 10.24. Again the message is that society would benefit from discouraging the use of cash, at least for transactions above the switching point.

Finally, the attentive reader may have noticed that credit cards do not appear in Figure 1. This is because they are even more expensive than cash – except for higher-value transactions, that is. Where Belgium is concerned, the line for credit cards would have an intercept of EUR 0.56 and a slope of 0.0009. As a result, it is only for amounts above EUR 60.88 that credit cards become cheaper than cash. But, in this region they are clearly outperformed by debit cards, because – as can be seen in Figure 1 – for debit cards the variable costs per euro of additional turnover are nil. If these figures are correct, the policy implication here is that credit cards should not be promoted. The incentives that credit card companies in the USA have recently started to provide – cf. the Introduction – thus appear misguided from the societal point of view. However, two qualifications are in order. First, costs are only one side of the coin. The benefits of payment instruments – such as ease of use and safety – must also be taken into account. Second, the cost picture may be different in other countries. As a matter of fact, Garcia Swartz et al. (2004) in their study concerning the USA, find that even for a transaction of as little as USD 11.52 – which is the average size of a cash transaction in the USA – the marginal social cost of credit cards is actually lower than that of cash. After adding benefits, Garcia Swartz et al. even find that for transactions of USD 54.24 (which is the average size of cheque transactions in the USA), the net social costs from using credit cards tend to be a little lower than those related to debit cards – although the difference is mainly accounted for by the value assigned to the ‘credit option’ associated with credit cards. In a recent study, Simes et al. (2006) transpose the methodology used by Garcia Swartz et al. to the case of Australia. In a conservative scenario that – unlike Garcia Swartz et al. – does not consider the value of the credit option, they find the differences between the net marginal social costs of credit and debit cards to be minor (AUD 0.15–0.19, depending on the amount of the transaction). If the credit option is included, the net social costs of credit and debit cards are very similar for small transaction sizes, but credit cards have lower net social costs as the transaction size increases.

To complete the picture, it is also interesting to mention a recent study that does not deal with social costs, but rather focuses on the private costs of Dutch banks. The study was commissioned by the Netherlands Bankers’ Association and De Nederlandsche Bank, and carried out by McKinsey & Company (2006). The study finds that in 2005, the banks in the Netherlands incurred an overall loss of EUR 23 million on their payments business. The banks incur losses on nearly all payment instruments, and in particular on POS payments. Cash generates a loss of no less than EUR 779 million, debit card
payments a loss of EUR 101 million, and the Chipknip e-purse a loss of EUR 18 million. Per transaction this gives a loss for the banks of 12 cents per Chipknip payment and 8 cents per debit card payment. That the overall loss is nevertheless limited to EUR 23 million is due to the fact that the income from outstanding balances on retail and corporate accounts is sizeable. The picture that emerges from the study is one where corporate payments (with a profit of EUR 708 million) subsidise retail payments (that generate a loss of EUR 642 million), and where balance sheet income dominates because direct charges for transactions are limited. In the introduction of the report, McKinsey points out that the absence of direct charges results in lower efficiency of the payment system:

“The lack of transparency, such as the invisible costs of cash, and the absence of appropriate incentives are not encouraging users of payment services to make optimum use of payment instruments with the lowest costs to society. This means that the costs to society for payment services are higher than necessary.” (McKinsey & Company, 2006, p.2)

In the epilogue of the report, McKinsey argues that the fee structure should be reconsidered and that such a review should “address both the division of costs between businesses and consumers, and the relationship between direct charges for transactions and balance sheet income” (McKinsey & Company, 2006, p.25). Taken together, I read this as a covert plea for the introduction of per-transaction cost-based fees, see below.

3 How to lower cash use

Let us now return to the social cost figures presented in Figure 1. The policy conclusion that De Nederlandsche Bank draws from these figures may be straightforward, but it is particularly brave for a central bank: the DNB argues that the use of debit cards and e-purses should be encouraged, at the expense of its own product, cash (DNB, 2004, p.57). The DNB has also made a rough simulation of the potential savings in social costs. Concretely, the DNB has calculated that a scenario in which 1500 million cash transactions were replaced by electronic payments (1000 million debit card and 500 million e-purse payments) would save EUR 106 million annually. In this scenario, the number of debit card payments would roughly double, while the number of e-purse payments would increase fivefold compared with 2003. The National Bank of Belgium, for its part, has computed the impact of a similar scenario (in which the number of debit card payments would rise equally strongly but the number of e-purse payments only half so), and comes up with a figure of EUR 58 million. Interestingly, the conclusion that the NBB draws from this is considerably more conservative than that of its Dutch counterpart: it argues that the cost savings are actually ‘relatively modest’ because they only amount to 0.02% of GDP (as is incidentally also the case in the Netherlands). This said, it should be pointed out that the two scenarios described here only take into account the impact on the variable costs. To the extent that the fixed costs are also affected, the total cost savings will be larger.

In a recent study, the DNB (2006) builds on its earlier enquiry into the cost of payments, and presents a number of more elaborate simulations. Looking back, it first points out that if consumers’ payment behaviour had been the same in 2004 as in 1990, the costs of retail payments in 2004 would have exceeded the actual costs
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(approx. EUR 2.9 billion) by nearly EUR 200 million. Put differently, between 1990 and 2004, the increase in the use of payment cards brought down the costs of POS payments in the Netherlands by some 6% (DNB, 2006, p.66). In an attempt to extrapolate this to the future, an error correction model is set up that explains the share of cash in the value of aggregate retail payments by such variables as the number of EFTPOS terminals, the number of ATMs, the interest level, and economic growth. The model is then used for projections to the year 2015. In a ‘base-line’ scenario, where current trends are simply extrapolated to the future, the estimated market share of cash (in value terms) is 43% in 2005, 32% in 2010 and 20% in 2015. As a result, the value of the total euro banknote circulation in the Netherlands would be 17% lower. The DNB points out that this “may yield savings to the tune of several hundreds of millions of euros” (DNB, 2006, p.68). It also points out that “in reality, the savings may turn out higher because of scale benefits and technological advances bringing down the costs of electronic retail payments further” (DNB, 2006, p.68) – developments that were not taken on board in the projection.

The DNB also uses its model to analyse how adjustments to the retail payments infrastructure could speed up cash substitution. Indeed, while in the baseline scenario cash payments would obviously also fall in number (by an estimated 20–30%) and the number of debit card and e-purse payments together would more than double, cash would still continue to be the most popular means of payment. The DNB, therefore, examines a package of two hypothetical measures. The first measure is designed to render cash less attractive by keeping the number of ATMs at the level of 2005 instead of raising it each year by 4% as assumed in the baseline scenario. The second measure presumes a higher growth rate for the number of EFTPOS terminals, at least during 2006–2008, so that at the end of the period, in 2015, the number of terminals is 16% higher when compared with the baseline. Combined, the two measures make for a share of cash (in value terms) that is 13% points below the 20% arrived at in the baseline projection. The bulk of this impact comes from the increase in the number of EFTPOS terminals rather than from the stabilisation of the number of ATMs.

The DNB concludes from this, and correctly so, that raising the number of EFTPOS terminals is an effective way to promote electronic payments. However, in terms of the warfare terminology used in this paper, the measures scrutinised by the DNB amount to fighting cash on the old battle line. In another recent study, De Grauwe et al. (2006) propose to open a new front in the WOC. Their starting point is that a pricing system based on the provision of some payment services below cost and others above cost – not unlike the cross-subsidisation in the Netherlands described at the end of Section 2 – is not a welfare maximising strategy; see also Van Hove (2002, 2004). In essence, this is because consumers receive no incentives to optimise their payment behaviour; see again the McKinsey report mentioned earlier. De Grauwe et al., therefore, advocate a switch to cost-based pricing of payment services, implying that prices for individual payment instruments are set proportionally to the underlying resource costs.

To simulate what the impact of the introduction of cost-based pricing policies would be, De Grauwe et al. first use panel data for 25 European countries over the period 1998–2003 to estimate a discrete choice model that explains the market shares of debit cards and cash. An important finding of this econometric analysis is that consumers appear to react in a significant way to changes in the cost of cash and cards. In other words, an increase in the price of cards leads to a significant decline in its usage. Similarly, an increase in the price of cash (as paid by consumers) leads to a significant
De Grauwe et al. find that the effects are quite large. In a panel of 19 European countries, the market share of cash (in volume) would decrease from 96% to 81%, and debit cards would jump from 4% to 19%. In value terms, the market share of cash would decrease from 78% to 38%, and debit cards would go from to 22% to 62%. Because this paper focuses on Belgium and the Netherlands, it is interesting to have a closer look at the individual results for these countries. According to the simulations, a switch to cost-based pricing would lower the market share of cash (in volume) from 96% to 81% in Belgium, and from 94% to 78% in the Netherlands, so that debit cards would jump from 4% to 19%, and from 6% to 22%, respectively. In other words, cost-based pricing would imply a decrease of about 15% points in the volume of cash transactions. Correspondingly, the use of debit cards would increase by a factor of 3–4. In value terms, the market share of cash would decrease from 73% to 34% in Belgium, and from 76% to 43% in the Netherlands. Although the results obtained by De Grauwe et al. are not completely comparable with those of the DNB (2006) discussed above, it is nevertheless interesting to point out that the drop by some 33% points in the market share of cash (in value) obtained by De Grauwe et al. for the Netherlands is significantly bigger than the drop by 13% points reported by the DNB as the result of their “ATM and EFTPOS scenario” (cf. DNB, 2006). In the latter case, the impact is also spread over the period 2006–2015.

Finally, De Grauwe et al. use their estimates to analyse how the switch to cost-based pricing would affect resource costs. Because of a lack of data on the latter costs, they can reliably make this analysis for Belgium and the Netherlands only. De Grauwe et al. find that the introduction of cost-based pricing would lead to a reduction of resource costs of more than EUR 200 million in Belgium and about EUR 150 million in the Netherlands. Putting these numbers into perspective, for Belgium these cost savings correspond to 12% of the current resource costs of cash and debit cards together. The corresponding figure for the Netherlands is 6%. De Grauwe et al. stress that these cost savings should be seen as ‘static’ gains, i.e., they do not take into account the impact of economies of scale within the card payment system. In a crude calculation, De Grauwe et al. also extrapolate this analysis to their sample of 19 European countries by assuming that the cost structure of the payment systems in these countries is similar to Belgium and the Netherlands. In this way, they estimate the possible savings from the implementation of cost-based pricing as amounting to 0.14% of GDP, on average – which, they point out, “is not a negligible amount” (De Grauwe et al., 2006, p.37). To put these numbers into perspective, De Grauwe et al. estimate the current total resource costs of cash and cards in the sample of 19 countries to be equal to 1.22% of GDP. Another way of gauging this figure of 0.14% of GDP is to point out that in absolute terms it corresponds to approximately EUR 10 billion (De Grauwe et al., 2006, p.38).
4 Conclusion: pecunia electronica non olet

Obviously, the estimates discussed in this paper should not be taken to be accurate and should rather be regarded as providing an order of magnitude of the costs involved. However, together these studies form an increasingly strong body of evidence that the WOC is a worthy cause, in that the current social cost of cash is substantial and that the potential for sizeable cost savings is clearly there.

As to the question of just how this WOC can be won, it is useful to keep in mind that payment habits are notoriously slow to change. The experience with e-purses shows that guerrilla tactics work. In Austria, for example, the number of Quick e-purse transactions increased by 14% in 2005, and by 9.9% in 2006. This boost in Quick usage is reportedly primarily the result of the creation of Quick-only environments within companies – with Siemens a key addition in 2005. But, punching holes in the acceptance network of cash in this way takes time, a lot of time. The DNB simulations discussed in Section 3 show that raising the number of EFTPOS terminals is an effective way of promoting electronic payments. But, again this takes time and it is not something that card companies can control directly because it depends on adoption decisions by merchants. Improving the user-friendliness of payment cards – contactless comes to mind – should also help. However, as I have argued in more detail elsewhere (Van Hove, 2002, 2004), if one wants to avoid the WOC turning into trench warfare, more drastic weapons may be called for, in casu the introduction of cost-based pricing.

As I demonstrate in Van Hove (2006b), today in many countries the private and social costs of payment instruments are not aligned, in the sense that the payment instrument that is most expensive for society – cash – is perceived as the cheapest by consumers (and merchants). As Enge and Øwre (2006, p.170) stress, “when payment services are free, consumers do not receive clear signals about the costs of producing the services”. The introduction of cost-based pricing would change this, and the resulting higher fees for ATM withdrawals would at long last give consumers a clear financial incentive to switch to more efficient means of payment. The simulations by De Grauwe et al. indicate that the societal spoils of war could be substantial.

References


Notes

1In the USA, Visa went head-to-head with cash in December 2006, when the new installment of its ‘Life takes Visa’ campaign urged consumers to use their Visa card rather than cash when paying for purchases. Visa USA’s newest TV commercial – entitled ‘Lunch’ – shows customers moving extremely smoothly and swiftly through a busy deli – until someone … pays with cash (Source: Warner, 2006). The commercial can be found on YouTube at <http://www.youtube.com/watch?v=wVdfeSxJ2nM>.

2Visa’s ‘No Signature Required’ programme waives the signature requirement for transactions of less than USD 25 in 17 merchant categories, including quick service restaurants and taxis (Source: Warner, 2006).

3And the push appears to be working: Visa USA reported recently that its volume on purchases less than USD 25 in targeted small ticket segments totalled USD 27.3 billion in the first six months of 2006, an increase of 17% over the same period in 2005 (Source: Visa USA, More and more consumers use Visa to make small purchases, press release, 24 August, 2006 <http://www.usa.visa.com/about_visa/press_resources/news/press_releases/nr330.html>). A recent survey by Ipsos Insight for Peppercoin revealed that more than 67 million Americans had used a credit or debit card for a purchase of less than USD 5 in the month prior to the survey (Source: Peppercoin press release, 28 November, 2006 <http://www.peppercoin.com/press/pressreleases/2006/1126.shtml>).


5Interestingly, the Bank of Finland also has a study in the pipeline (cf. infra), and the Reserve Bank of Australia recently announced that it will in 2007 undertake “a comprehensive study of the resource costs involved in different methods of payment, including cash” (Source: Reserve Bank of Australia, 2007/08 review of payment system reforms, media release, 11 December, 2006 <http://www.rba.gov.au/MediaReleases/2006/mr_06_13.html>).
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6Source: Bank of Finland, Cost of cash, forthcoming, as mentioned in Mooslechner et al. (2006, p.112). This is probably due in no small part to the fact that Finland has always had the lowest currency/GDP ratio in the EU: in 2000 it was 2.2%, compared with 4.2% in the Netherlands and 4.8% in Belgium (Source: ECB, Blue Book Addendum incorporating 2001 figures, September 2003, p.9). Note that I have used pre-euro figures because since the introduction of the euro only the so-called logistical currency in circulation is known for euro zone countries. This is defined as the difference between the value of banknotes issued in a given country and the banknotes removed from circulation in the same country, and will typically fail to give a correct picture of the actual amount of currency in circulation within the country. Moreover, I have reframed from using figures for 2001, the final pre-euro year, because these figures are distorted as a result of significant dishoarding in the run-up to the euro.

7If payment by debit card is not possible, then from the point of view of society, payment by e-purse is to be preferred over cash.

8This issue is aggravated by the fact that there is an upper limit to the amount that can be stored on the card. For Proton this is 125 euro.

9This amount does not include a loss of EUR 89 million on credit card and cross-border payments.

10Note that this decline in the demand for banknotes is less than proportional compared to the decrease by approximately 55% in the share of cash in retail sales. This is because it is assumed that the denominations of EUR 100–500 are hoarded and not used for transactions, so that the demand for these denominations is not affected.

11Cf. also Enge and Øwre:

“Norges Bank has traditionally promoted the principles that the party that chooses the payment service should also pay for it, and that services that are costly to produce should be priced higher than services that are less expensive to produce. However, this does not mean that all services should be priced so as to fully cover the production costs of the individual service. Nor does it exclude the possibility of pricing one or more services higher than their production costs.” (Enge and Øwre, 2006, p.170)

12For the Netherlands they use the study by the DNB and for Belgium they rely on an earlier study – De Grauwe et al. (1999), with estimates for 1998 – rather than on the more recent study by the NBB (2006).

13Source: Europay Austria.

14They also point out that “the negative consequences are limited if only the most efficient payment services are free” (Enge and Øwre, 2006). However, the central bank studies discussed in Section 2 clearly show the relative inefficiency of cash.

15The alternative would obviously be to offer discounts to consumers who pay electronically – if the business case allows it. A recent article in The Economist reports that “some Japanese merchants have already begun to offer discounts to people using electronic cash. Others will follow” (Source: “The end of the cash era”, The Economist, 17 February, 2007, p.11).