PRIVATE & CONFIDENTIAL

CASH SUBSTITUTION:
ISSUES & IMPLICATIONS

PREPARED FOR

BY

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EXECUTIVE SUMMARY

In this paper the Author reviews the origins of much of the current thinking upon the cost of payment instruments and the cost of cash specifically. In particular the paper clarifies that "the cost of payments" is not the same as the "cost of cash", and the fact that the oft quoted statement that "payments can cost 3% of GDP" was specific to a particular point of time in the USA and not representative of most European payment systems. The high cost of manual paper-based and branch based payments is noted.

The Author also identifies that until recently most academic studies have focused upon the cost of payments to the banking industry alone, and that there is little mention of the Fiscal impact of cash substitution via the loss of Seignorage to the State. This paper calculates that Seignorage benefits to EU15 member States could be equivalent to 14% of the entire EU 2006 budget.

The paper explores the re-engineering of the payment system undertaken in two influential Nordic countries: Norway and Finland. While substantial reductions to the cost of payments have been achieved, it is noted that there has not been "a drastic move away from cash" as some commentators have mistakenly claimed. In Finland cash usage is growing as predicted by one of the more recent economic models, despite a programme of ATM closure lasting almost a decade. In Norway there has been a displacement of cash sourcing from ATMs to retailer cash back, with cash-back now more frequently used for cash sourcing than ATMs.

The Author examines the latest thinking upon payment costs from the central banks of The Netherlands & Belgium. In particular, the paper notes that both countries have identified two separate variable cost drivers: one related to the volume of transactions and one related to the value of transactions. The central banks have modelled the impact of very substantial migrations from cash to cards, and due to the low value nature of most cash transactions, the interaction of these cost drivers result in a variable cost saving of only around 0.02% of GDP. Clearly there are significant fixed cost increases to support such a migration which are not assessed.

The Author using the data from these studies models the holistic impact (i.e. including the fiscal impact) of such cash substitution: "The Net Societal Cost of Cash". In all cases considered, (even without considering the increase in fixed costs) "society as a whole" is financially disadvantaged by cash substitution.
When the Author extrapolates this substitution to EU15 level he notes that society as whole could be worse off by between €1Bn & €2.9Bn. In a recent document[1], the European Commission stated that SEPA payment products should be competitive with current "Best of Breed" payment products, which it defined as

"…the economically most efficient product / service design taking into account all stakeholders' costs and benefits and also future development needs"

The Author believes that this paper's exploration of the Net Societal Cost of Cash demonstrates that cash is already a "Best of Breed" product, and that a policy of cash substitution is therefore a retrograde step for the citizens of Europe.
Furthermore, as the paper identifies, with the commitment of all stakeholders to re-engineering programme, the cost-base of cash could be reduced by a further 20%.

[1] European Commission February 2006

The paper observes that credit cards are consistently identified as one of the most costly forms of payment by virtually all investigators. Utilising the Dutch data, the Author models at EU15 level the Net Societal Cost of Cash effects of one third of the higher value cash substitution contemplated by the DNB being by credit rather than debit cards. This results in society as a whole being worse off by between €5.2Bn and €7Bn and the variable cost of payments actually increasing by €1.9Bn. The Author notes however, that this may be a more profitable scenario for the commercial banks.

The paper explores the nature of payments. Cash is a payment "owned by" and generating revenue for the State, while all other payment mechanisms are "owned by" and generate revenues for the private sector. The Author believes this is central to some of the thinking emerging from organisations such as the EPC, and is obscuring the real "cost to society as a whole" while being a potential obstacle to tackling the re-engineering of the cash cycle that could significantly lower the cost-base of cash.

The paper also considers that the exciting vision of SEPA is about a lot more than cash v cards but this opportunity may be being obscured by such a focus. The Author notes that those economies most often quoted as in the vanguard of electronic payments have not actually experienced "a drastic move away from cash" but have massively reduced the usage of costly non cash paper based payments and branch-based transactions. Furthermore most B2B transactions are not cash based.

The Author believes that rather than trying to artificially force consumers to reduce cash usage, all key stakeholders within the cash cycle should be involved in re-examining and re-designing the inflow cash cycle utilising "Lean" thinking concepts first adopted in the manufacturing sector. Such a process could displace depositing transactions from the (expensive) branch counter to automated terminals and ensure that cash is only "counted once", while maintaining the overall integrity and security of the process. If the inflow cash cycle costs could be brought in line with the outflow cycle costs, based upon the data of the EPC Cash Working Group this could reduce the cost of cash for all stakeholders by some 20%

The paper concludes that when the fiscal impact of cash migration is considered alongside the latest understanding of the cost drivers of cash, there is in the Author's view, no justification for a market intervention to discourage the public from using such a highly popular payment method. This is particularly the case when the risk of substitution by payment means with higher unit costs (credit cards) is considered.

However the Author believes that if all stakeholders are to commit to a major re-engineering of the costs of cash, there needs to be a clear and unambiguous signal sent by the central banks and other regulators that they are committed to continuing to support cash (within the current consumer pricing regimes), in parallel with the development and evolution of new payment technologies, for as long as there is public demand.

The prize for a commitment to re-engineering by all parties could be considerable: an annual reduction of up to €10Bn to the cost of cash across Europe, without a precipitant fiscal impact upon Member States. Such a saving would actually exceed the potential SEPA savings for cash AND CHEQUES identified by the European Commission, without requiring substantial behavioural shifts by the public, and without risking further distraction and delay to the delivery of the key SEPA objectives.

PROLOGUE

THE COST OF CASH v THE COST OF PAYMENTS

In recent years there has been increasing interest in the "social cost" of various payment methods. In part this interest has been sparked by the view that in order to optimise the overall efficiency of the payments system, it is necessary for consumers to make informed choices based upon transparent pricing related to underlying cost. Humphrey, Pulley and Vesala identified that the cost of making payments could be as high as 3% of GDP, and identified paper-based payments as the main driver of this cost.

However, in this context, a number of misconceptions can arise when considering cash in comparison to other payment instruments:

- Cash and "paper-based payments" are not usually synonymous
- The cost to the banking sector does not represent the whole cost to society.

In the first case, the term paper-based payments includes cheques and paper Giro instructions. Indeed the seminal work by Humphrey, Pulley and Vesala[2] was entitled "The Check's in the Post…" and consequently reflected the exceptionally high usage of expensive cheques within the US clearing and settlement system, a situation which is atypical of European systems. It is simply not the case (as will be demonstrated) that the cost of cash to society can be as high as 3% of GDP.

In the second case, to capture the full cost / benefit to society of a payment instrument, it is necessary to include not only the costs of the commercial banking sector, but also those of the central bank and retailers. Uniquely, in the case of cash, the Author will argue that it is also necessary to reflect the fiscal benefit to the State of issuing currency, ("Seignorage benefit").

This paper restricts itself to the potential substitution of cash by card-based payment means. It may (or it may not be) the case that various European payment systems include a substantial proportion of costly non-cash paper-based payment instruments, and that this represents an opportunity for significant cost reduction. However for the purposes of this document such issues have been largely ignored and the Author has restricted himself primarily to the potential impact and implications of significant substitution of cash by cards within Europe.

[2] Humphrey, Pulley and Vesala 2000

SECTION 2: THE CHALLENGE FOR CASH SUBSTITUTES

Before considering the relative costs of cash versus potential substitutes, it is as well to consider some of the current key attributes of cash which any alternative would need to overcome if large scale cash substitution was to occur.

2.1 THE SCALE OF CASH AS A PAYMENT MEDIUM

One of the first challenges when considering cash is that as a result of the very nature of open circulation there is very limited information available: cash does not need an authorisation before settlement takes place nor does it leave a complete audit trail. In fact of course this is one of cash's attractions to consumers.

Nevertheless the ECB estimate that in 2004 there were some 120 Bn[3] transactions involving Euro banknotes. This figure of course considerably understates the total number of cash transactions as it excludes coin-only transactions. However, even excluding such coin-only transactions this figure is almost three times the total number of cashless transactions made within the Eurozone.

In Belgium a survey commissioned by the central bank in 2003[4] indicated that 81.3% of point of sale transactions were conducted with cash.

Even in Finland a country in the vanguard of the "electronification" of payment services, the central bank estimated in 2004[5]

"that over half of all purchases of daily consumer goods are still made with cash and small payments in particular are still paid primarily in cash"

Cash is simply the pre-eminent means of payment in transactional volume terms throughout Europe. The significance of this fact cannot be underestimated. To achieve a substantial displacement of cash by cards will require not simply a major behavioural change by consumers, but will require the payment networks to satisfactorily support a huge increase in transactional traffic that is disproportionate to the payment values involved. As will be discussed in later sections, card payment networks have a high element of "fixed" costs. However, fixed is actually a relative term in such a context, and it would be misleading to assume that the existing infrastructure could absorb such large increases in traffic, and maintain retailer-acceptable transaction processing times without significant investment.

[3] ECB Press Release 2004
[4] Quaden 2005
[5] Levo & Takala 2004

2.2 THE ATTRACTIVE FEATURES OF CASH FOR CONSUMERS

Cash has some unique features which are highly attractive to consumers:

- Certainty of acceptance
- Immediate settlement
- No infrastructure requirement
- Ease of use
- Ease of monitoring
- Anonymity
- State-underpinning

It is worth briefly considering each of these features in turn:

- CERTAINTY OF ACCEPTANCE

Consumers know that when they have "cash in their pockets" they will be able to buy goods and services: as legal tender there is no issue of whether a particular payment medium will be acceptable. Furthermore, since 2002 there has been a functioning SEPA for cash within the Eurozone.

- IMMEDIATE SETTLEMENT

When cash is exchanged for goods and services, there is no lag in the payee receiving value: the payee can immediately go and spend the cash received on other goods or services. In this respect cash is the fastest of settlement media: it is only when cash interacts with a bank account that the issue of value-dating arises.

- NO INFRASTRUCTURE REQUIREMENT

No technological infrastructure is required to make a cash payment – there are no scanners or card readers linked to computer networks. This is critical in enabling person-to-person payment (P2P) transactions to take place. Without cash, the only "low tech" alternative for P2P payments is a cheque. However a cheque is generally a poor substitute for cash as it involves an uncertain (from the recipient's perspective) clearing cycle and delayed settlement. Furthermore of course cheques are a much more expensive form of payment than cash.

P2P payments are often either dismissed or ignored when considering the payment system; however the Dutch National Forum on the Payments System, chaired by the DNB[6] recently estimated that such payments could account for 10% of all cash transactions in the Netherlands.

- EASE OF USE

With no PIN numbers to memorise or keyboards to negotiate cash is the simplest of payment instruments.

[6] Survey on the Costs involved in POS Payment Products DNB 2004

- EASE OF MONITORING

While card-based systems can offer itemised billing, or in the case of credit cards, credit facilities, for those on a tight budget, the immediacy of cash is frequently perceived as the means to avoid over-indebtedness. 55% of respondents to the Dutch Hoofdbedrijfschap Detailhandel study in 2002 stated that they used cash when they wished to limit their expenditure[7].

- ANONYMITY

The situation is perhaps best summarised by the Belgian National Bank in 2005[8]:

"It is entirely legitimate for people to wish to maintain a degree of discretion regarding their payment operations. The problem of confidentiality is not limited to illegal activities but also concerns legal transactions which relate to a consumer's private life. To date, only cash guarantees total confidentiality and anonymity of transactions and provides complete assurance with regard to the protection of private life, as opposed to other forms of monetary transfer."

- STATE UNDERPINNING

Unlike other forms of payment, cash is backed not by a private enterprise, but by the State. In stable developed economies such as the countries of the EU this is a reassuring guarantee for consumers.

[7] Quaden 2005
[8] Quaden 2005

2.3 THE VALUE OF CURRENCY ISSUE TO THE STATE: SEIGNORAGE REVENUES

The very concept of fiat money results in a revenue stream for any State that issues money in the form of bank notes and coin. This revenue (Seignorage) arises because of the difference between what a banknote or coin in circulation costs (to make and maintain in circulation) and what value it represents (face value). For example a banknote may cost a few cents to make but its value could be up to €500.

Upon issue of cash the Central Bank immediately receives full face value, which it retains for all the time this cash is in circulation. The central bank can invest this sum & make a return upon what amounts to an interest-free loan that it receives for the total value of currency in circulation.

In practice, the Central Bank will have to replace banknotes repeatedly over time and there are also Central Bank operating costs to be covered. The actual Seignorage benefit is therefore

THE INTEREST EARNED UPON THE VALUE OF CASH IN CIRCULATION LESS THE CENTRAL BANK COSTS INCURRED TO SUSTAIN CASH IN CIRCULATION.

The net profits generated by the Central Bank in this way ultimately flow to the State Treasury.

The latest edition of the ECB Blue Book states that value of notes and coins "outside credit institutions" in the EU for 2003 was €465.6Bn or 5.0% of EU15 GDP.
Throughout this document we shall use two factors to estimate a range for Seignorage: a conservative 2.3% based upon short-term EU interest rates and a more realistic 3.5% based upon longer term bond market rates. This would give a range for Seignorage of between €10.2Bn and €15.8Bn for the EU15 in 2003 (since the volume of cash in circulation is (has been) relatively stable and predictable Seignorage should provide a basis for long term investments and therefore bond market rates are more likely to be applicable)

Some people mistakenly see Seignorage as some kind of windfall to the State. It is not, as the Bank of Canada states[9]

"Seigniorage revenue thus allows the federal government to finance a portion of its expenditures without having to collect taxes."

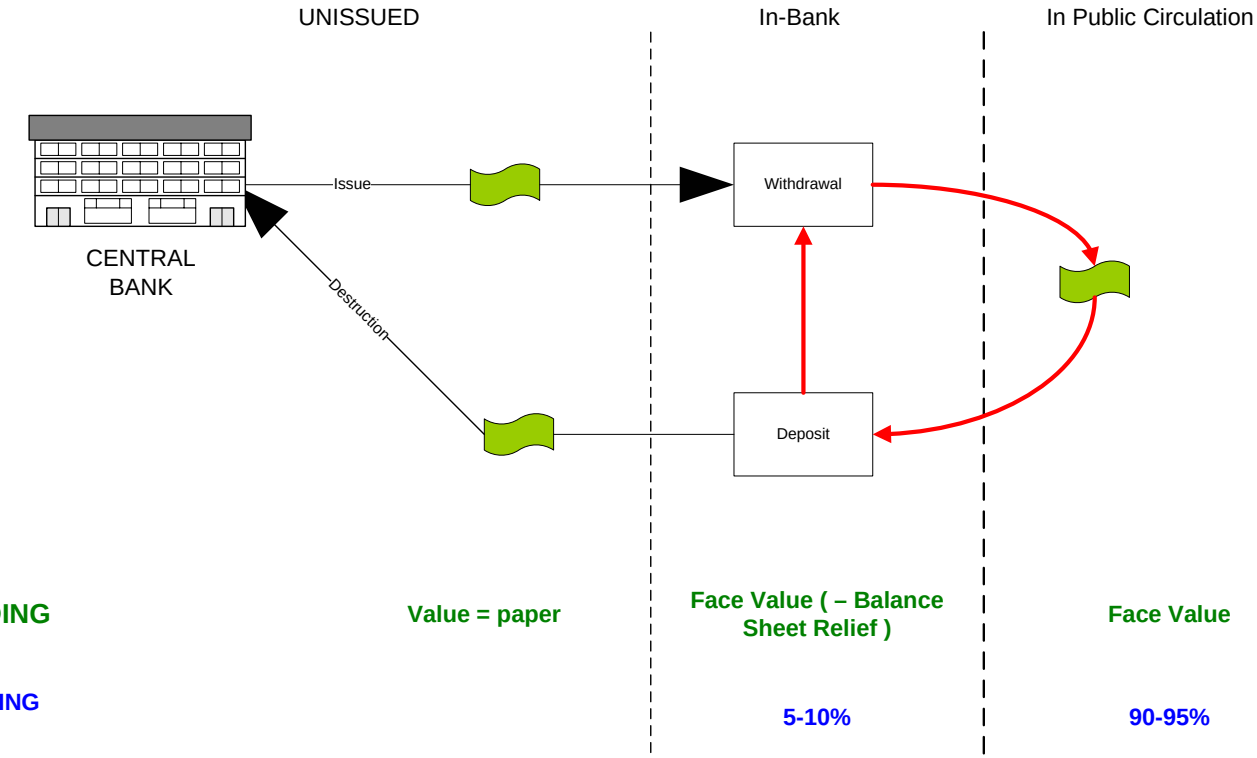
Seignorage revenues are an integral part of State income, and can actually be considered as the ultimate "stealth tax" as Seignorage is probably the most socially acceptable form of taxation available to governments. It is interesting to explore who actually pays this "Seignorage Tax". The schematic overleaf shows the UK Cash Cycle as an example:

Commercial Banks pay an element of the "Seigniorage Tax" by having cash on balance sheet. There is also currently an element of "tax relief" associated with this element of the Cash Cycle. However, the largest element of the tax is actually paid by the public at large, when the cash is on their "balance sheet", in wallets and tills or under mattresses. While the duration of the Cash Cycle will vary greatly from country to country, in ALL countries the Public Circulation is very substantially longer than the In-Bank duration.

[9] Bank of Canada Website: Fact Sheets "Seiniorage Revenue", Nov 2001

Who pays the “Seignorage Tax”?

THE CASH CYCLE



“VALUE” OF HOLDING	**Value = paper**	**Face Value (– Balance Sheet Relief)**	**Face Value**
DURATION OF HOLDING (% of “Tax” Paid)		**5-10%**	**90-95%**

The Public is thus the largest contributor to the Seignorage Tax. This actually represents the opportunity cost of owning non-interest bearing cash. However, since most people do not expect to earn interest upon the contents of their wallets, and since the individual values are relatively low we all readily pay it. Nevertheless the aggregated value is huge.

To put the scale of such "Seignorage tax" revenues in perspective, by the Author's most conservative measure, Seignorage is close to the total 2006 "Employment and Social Affairs" budget of the EU[10]. At a more realistic 3.5% Seignorage rate, it represents almost 13% of the entire EU budget.

NON CASH PAYMENTS HAVE NO STATE ISSUED TOKEN OF VALUE – THUS NO SEIGNORAGE IS GENERATED FROM SUCH PAYMENTS.

Most observers choose to ignore the impact upon Seignorage when considering the development of card–based alternatives. This is probably because despite the development of card payments, cash in circulation has grown in virtually all European countries. However if significant substitution of cash by cards was to occur this would not be a theoretical discussion. Governments throughout Europe would need to either raise taxes further, or reduce spending. Any politician would argue that any system that finances schools or hospitals in a socially acceptable manner provides a benefit to society. It is simply disingenuous to exclude Seignorage revenues from the debate upon the societal cost of payment methods. There are two ways this can be viewed, either:

- the cost of cash must reflect the "rebate" to society that Seignorage generates ("Net Societal Cost of Cash") or...
- the cost of card based payments must be increased to reflect the replacement of the lost Seignorage to the State.

Alternately, one must believe that the substitution of cash with cards (as opposed to the adoption of electronic payments which as we have noted earlier is not the same thing) will stimulate the economy sufficiently to generate sufficient growth in other fiscal areas to fully cover this loss of revenue to the State.

In the Author's view any other approach would amount to the State actually subsidising the substitution of cash (as the State would be forgoing Seignorage revenues that would need to be replaced in order to ensure the usage of cards).

The Riksbank[11] has stated that due to Seignorage, cash itself is definitely not subsidised

"the notion that cash is a subsidised means of payment is not uncommon in the central bank world. However, it ignores the fact that cash also generates income for the central bank and thereby the State since holding cash amounts to providing the central bank with an interest-free loan…..

The income the Riksbank has obtained by investing these interest free loans (Seignorage) has exceeded the Bank's costs for handling cash. So Swedish cash has not been subsidised"

[10] EU Budget on the Ground, EU Commission 2005
[11] Daltung & Ericson 2004

In this paper the Author uses the term "Net Societal Cost of Cash" to represent the holistic "cost of cash to society as a whole", i.e.

Net Societal Cost of Cash **= Sum of tangible Cash Cycle Costs – Seigniorage**

This approach is consistent with the recently stated view of the European Commission[12] that a "Best of Breed" payment product is:

"…the economically most efficient product / service design taking into account all stakeholders' costs and benefits and also future development needs"

[12] European Commission Feb 2006

SECTION 3: REVIEW OF THE COST OF PAYMENTS GENERALLY & THE COST OF CASH SPECIFICALLY

3.1 THE EARLY INVESTIGATION OF PAYMENT COSTS & THE MYTHOLOGY OF *"3% of GDP"*

In 1988/89 Norges Bank, the central bank of Norway began a programme of regularly gathering data from commercial banks upon the cost of various forms of payments. This was the first serious attempt to systematically and broadly gather such data.
At around the same time, in the USA a study by Humphrey & Berger (1990)[13] established that the cost of an electronic payment was around one third the cost of a cheque or paper Giro payment.

A later study by Wells just six years later (Wells 1996)[14] found that while such instruments were still substantially more expensive than electronic methods, there had been an efficiency improvement of some 50% as a result of new processing technology. Cheques and paper Giros were now around twice the cost of electronic methods. This value was broadly in line with a paper by Robinson and Flatraaker (1995)[15] of Norges Bank, based upon the Norwegian banking survey data.

In a 2000 paper entitled "*The Check's in the Mail: Why the United States Lags in the Adoption of Cost-Saving Electronic Payments*", Humphrey, Pulley and Vesala[16] applied this knowledge to the payment system of the USA as a whole:

"The United States spends over $225 billion a year just to make payments. This represents 3% of GDP or over $3000 annually for a family of four. While small-value cash payments are relatively cheap to make, the average cost of a noncash transaction – which includes check, credit card, debit card and other types of payments - is around $2.60."

In their 2001 paper, referencing the earlier paper, Humphrey, Kim & Vale[17] state:

"*The resource cost of a nation's payment system can account for 3% of GDP"*

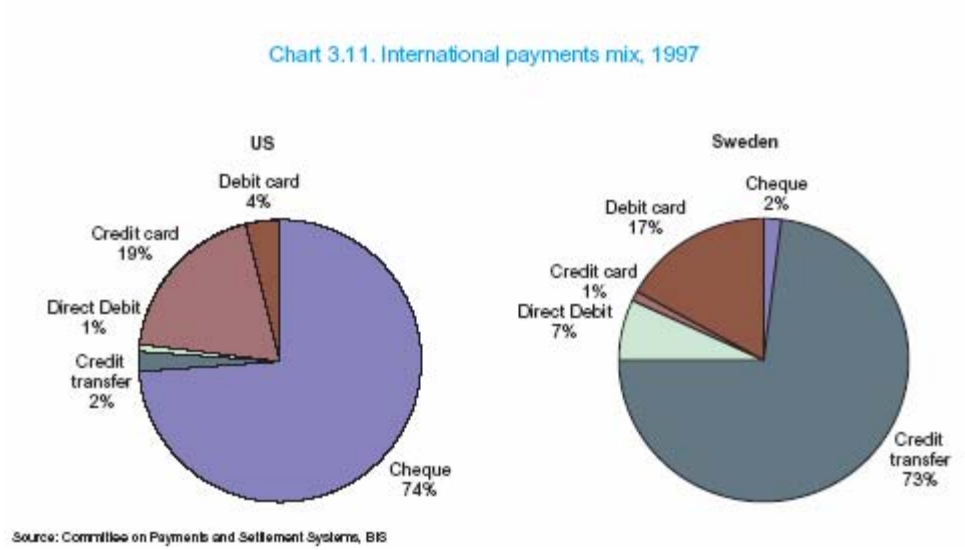
Unfortunately this statement has passed almost into legend, with its true origins lost in time. It is frequently used to imply that cash payments can cost 3% of GDP, or that 3% of GDP would be the typical gain by moving to electronic payments.

[13] Humphrey, David B, Berger, Allen N 1990
[14] Wells K E, 1996
[15] Robinson P, Flatraaker D 1995
[16] Humphrey DB, Pulley LB, Vesala JM 2000
[17] Humphrey DB, Kim Moshe, Vale Bent 2001

Actually several key points arise from this brief academic review:

- The 3% value is calculated upon the US payments system which had the highest usage of costly cheques in the developed world. Indeed in an earlier 1997 World Bank Paper, Humphrey, Keppler, and Montes-Negret[18] estimate that 1.5% of US GDP could be saved by migrating from cheques alone!
  Cruickshank[19] contrasted the payments profile of the US and Sweden during his UK investigation:

  FIGURE 1



- As identified by Wells (1996), the cost of a non electronic payment method can be dramatically affected by re-engineering the process design employed. This is especially relevant given the views of Levinsohn [20] that substantial cash cost reductions can be achieved by re-engineering the inflow cash cycle and minimising manual branch transactions.

- Clearly Humphrey, Pulley and Vesala in 2000 did not believe cash was the most significant problem to be addressed. This is broadly supported by the main thrust of the Norges Bank paper by Robinson and Flatraaker (1995) which emphasises the cost of manual form-based branch payments:

  "Manual transactions carried out in a bank branch or post office clearly have the highest costs per transaction. A giro cash payment, for instance entails costs of of roughly NOK 17.5 whereas a mail giro only costs around NOK 6.5. Costs for electronic giros are even lower. The use of cards for the payment of goods in shops and the withdrawal of cash from ATMs is considerably cheaper than payment by cheque or cash withdrawals at the counter from a bank."

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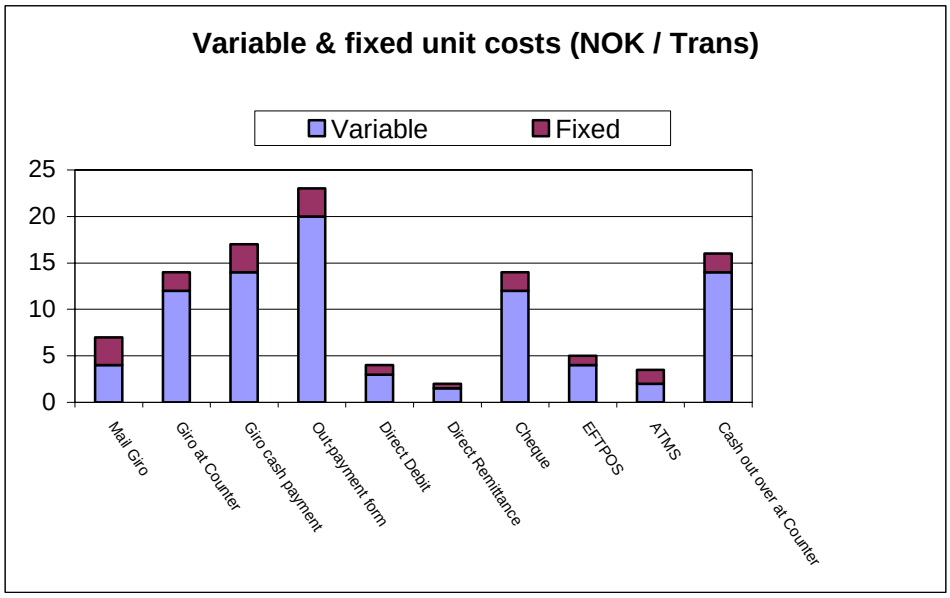
[18] Humphrey DB, Keppler RH, Montes-Negret F 1997
[19] Cruickshank 2000
[20] Levinsohn G, 2005

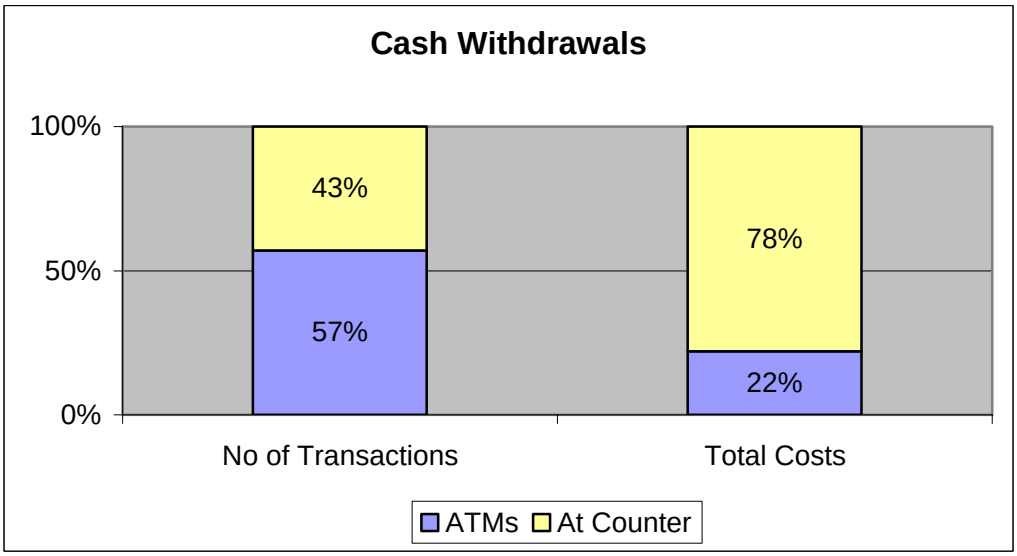
FIGURE 2



Source: Based upon Costs in the Payments System, Robinson & Flatraaker, Norges Bank Economic Review 1995

According to Robinson & Flatraaker, ATM costs are actually comparable to direct debits and cheaper than EFTPOS transactions. It is the paper (form-based) transactions and in-branch over-the-counter cash transactions that are expensive.

FIGURE 3



Source: Based upon Costs in the Payments System, Robinson & Flatraaker, Norges Bank Economic Review 1995

It is interesting to note that the evidence relating to the low cost of ATM transactions is not restricted to Norway: Cruickshank[21] in a later UK investigation, found very similar relative transactional unit costs based upon data supplied by the UK Association of Payment & Clearing Services (APACS).

- A weakness of the Robinson & Flatraaker study (indeed all the studies conducted until recently) is that it focused purely upon the costs of the commercial banks: the costs to the retailer and central bank were not considered.

- Furthermore, generally, no fiscal impact upon the State was considered. This may have been because the main focus of attention was upon the high cost non-cash paper-based transactions. In one paper the impact upon the State is very briefly considered:

  ***"Loss of Seigniorage revenues**. Many countries have sought to expand the use of non-cash payment instruments, both to facilitate the emergence and growth of financial markets and to improve the ability of firms to engage in trade and exchange. There is a hidden cost to this effort, albeit one that governments seem willing to incur. This cost is the loss of Seigniorage revenues from the issuing and use of cash in domestic transactions. If the price of non-cash payment instruments do not reflect their full cost, then the loss in Seigniorage revenues will be larger than otherwise would occur.* "

  Humphrey, Keppler & Montes-Negret, Cost Recovery & Pricing of Payment Services, Policy Research Working Paper, World Bank 1997

  This is a single paragraph in a document of 50 pages.

  It may be a little presumptuous to assume that this is a cost "that governments seem willing to incur", as there is little evidence to support this: the issue of Seignorage is arcane and obscure and has prompted negligible parliamentary debate in most countries, The most likely explanation for this political silence is that Seignorage revenues have continued to grow as cash in circulation has continued to grow in virtually all countries, despite the adoption of electronic payments. Consequently the scale of potential impact upon State revenues of wide-scale substitution has not been particularly evident to European politicians.

  However, when Professor Leo Van Hove, claims that

  "the war on cash is popular in Europe"

  during a Federal Reserve Bank of Chicago Conference (2005)[22] he may have difficulty explaining the loss of up to €16Bn of planned annual revenues to the cash-strapped governments of Europe (and their voters) if such a campaign is successful.

[21] Cruickshank 2000
[22] Chakravorti,S and Jankowsk C (2005)

3.2 THE REFINEMENT & EXPANSION OF THE NORGES BANK APPROACH

Norges Bank has continued to repeat and refine its payment costing approach, adopting an activity-based costing approach in 2001[23] albeit still almost exclusively with a focus upon the costs of the commercial banks alone. The central bank with the involvement of the competition authorities has actively facilitated what can be described as a series of "standard charges" for payment services by the commercial banking industry, while at the same time legislating to eliminate the "float" interest gains that the banks received via lags in the value-dating of customer accounts.

TABLE 1

Table 40: Prices in NOK for payment transactions, receipt of payments and cash withdrawals. Weighted averages for all banks

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Payment transactions										
Giros										
Electronic giro services										
Phone giro	:	2.02	2.45	2.33	2.31	2.38	2.45	2.44	2.38	2.14
Terminal payments over the Internet				1.98	2.03	1.91	1.89	1.86	1.85	1.88
Direct debit	:	:	:	:	:	:	:	:	2.09	2.09
Paper-based services										
Mail giro	2.88	3.76	3.88	4.04	4.25	4.84	5.14	5.67	6.36	6.53
Giro, account debits	9.98	10.14	12.73	13.30	15.28	16.92	18.59	25.10	26.01	30.19
Giro, cash payment	11.00	16.51	17.95	18.46	23.40	25.67	27.37	31.69	32.50	41.68
Payment cards										
Payment terminal (EFTPOS)	2.02	2.05	2.20	2.13	2.07	2.19	2.24	2.07	2.07	2.10
Cheques										
Personal cheques	8.40	8.50	9.79	10.72	12.30	15.00	20.07	20.70	21.13	20.67
Business cheques	9.23	9.28	9.82	10.46	12.31	15.13	22.05	22.79	23.94	24.03
Receipt of payments										
Giro										
Electronic giro services										
Direct debit	:	:	1.52	1.60	1.51	1.38	1.42	1.42	1.42	1.53
Paper-based giro services										
Cash withdrawals										
ATM withdrawals										
Own bank's ATMs outside business hours	2.91	2.93	3.31	3.49	3.79	3.78	4.28	3.76	3.69	3.89
Other banks' ATMs during business hours	1.65	1.87	1.95	2.25	2.19	2.64	4.00	3.89	4.09	4.72
Other banks' ATMs outside business hours	3.91	4.08	4.40	4.44	4.46	4.32	4.81	4.79	4.91	5.49

Source Norges Bank[24]

As can be seen, pricing for paper-based services such as cheques and paper giros has dramatically increased (by between 150-200+%) while electronic payments have in real terms fallen over the 10 year period (4% total increase over 10 years).

The effects of this have been to virtually eliminate cheques as a payment mechanism in Norway, while more than halving the use of paper-based giros. The beneficiaries of this behavioural shift have been the electronic instruments (giros and payment cards)

As can also be seen there have been significant increases in the costs of ATM use, varying between 34% & 180% over the 10 year period. Simultaneously there has been an explosion in the number of installed EFTPOS terminals: Norway has moved from being the laggard in this area, to the European country with the largest number of such terminals per inhabitant (20,000+ per million inhabitants)

[23] Gresvik & Owre 2003
[24] Review of Payments System 2004

Certainly the cost of payments (from a commercial bank perspective) have fallen substantially in Norway.
It is important to recognise however that there has not been some

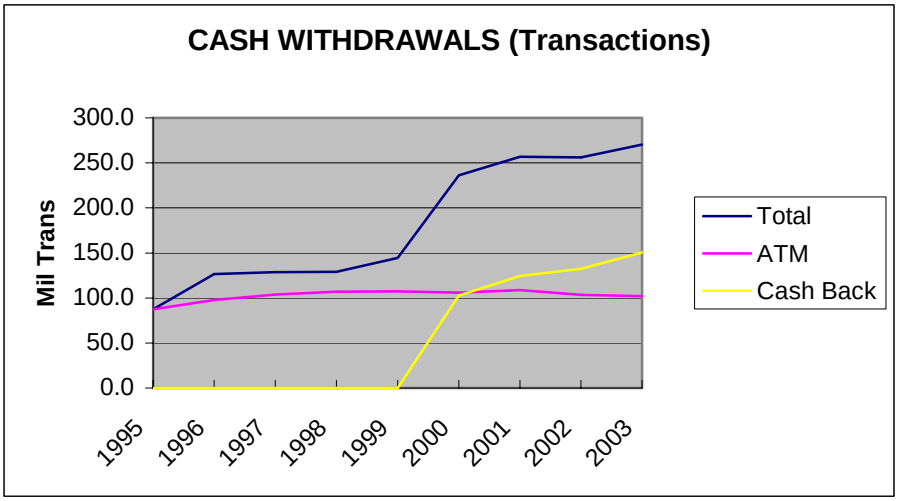
"drastic move away from cash towards other forms of payment"

as Mr Norbert Bielefeld of the EPC Cash Working Group was recently quoted as saying in the "European Voice" newspaper (November 2004).

Not surprisingly Norwegian consumers are influenced by price and the availability of alternatives, so ATM usage has flattened. If one is solely examining the impact upon the costs of the commercial banks, this can be perceived as a decline in cash usage.

However, consumers have, in the main, simply decided to source their cash elsewhere as retailer "cash-back", first introduced in 2000 has rocketed, and the volume of cash-back transactions now exceeds the total number of ATM transactions. In all total cash withdrawal transactions have increased by 239% over the 10 years.

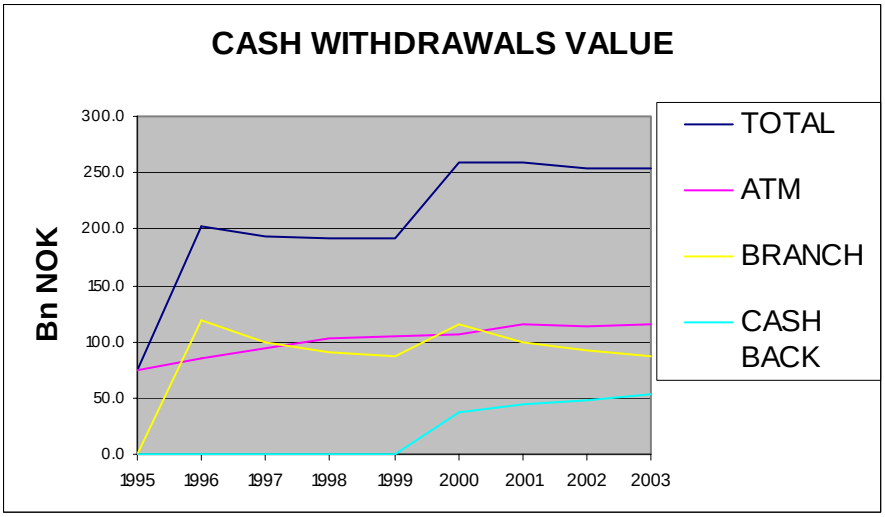
FIGURE 4



Source Data: Norges Bank

It is true that the total overall value of cash transactions has flattened.

FIGURE 5



Source Data: Norges Bank

However, Norges Bank notes that in 2004, outstanding cash holdings rose again for the first time since 2000.

None of this is intended to suggest that Norway has not been able to substantially lower the commercial bank cost base of payments. What this analysis does show however is that there has not been a substantial reduction in cash usage, and as will be discussed in more detail later, the Norwegian experience in many ways actually demonstrates the resilience of consumer demand for cash.

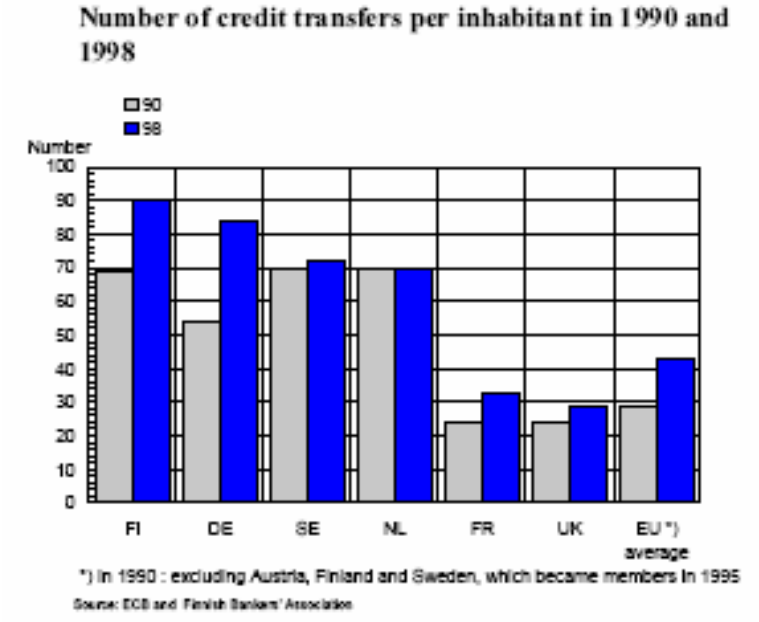
3.3 FINLAND

Finland has been at the forefront of the electronification of payments within the EU. Snellman[25] has reviewed the evolution of retail payments in Finland throughout the 1990s. He notes that Finland had some unique factors that paved the way for this growth in payments:

- As a result of an understanding reached between employers, employees and the banks Finns have had their salaries directly paid into banks since the 1960s.
- Heavy regulation of the banking sector until the mid 1980's meant that banks were highly profitable and competed upon service rather than price. Offering (the highly banked) Finns new electronic services free of charge was a means of differentiation and competition
- A history of interbank cooperation
- The financial crisis of the 1990s forced branch closures upon an already highly electronic infrastructure.

These factors have resulted in Finland having the highest card use within the EU and second only to Norway within Europe.

FIGURE 6



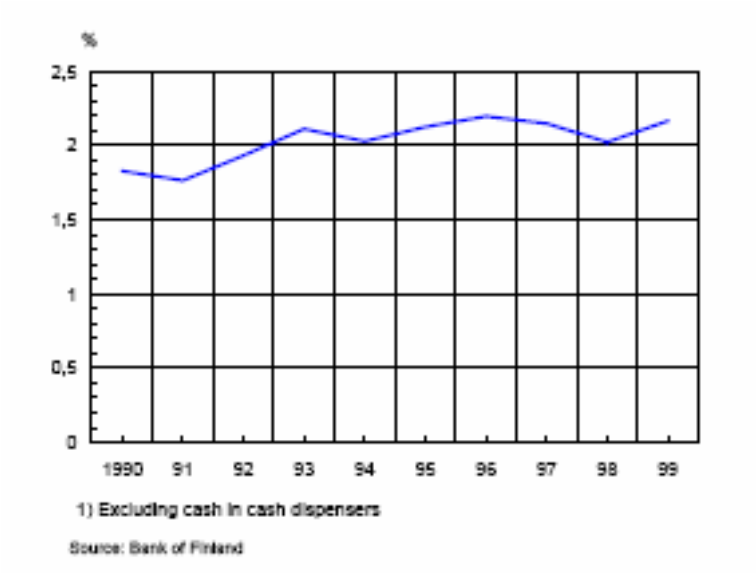
Nevertheless, Snellman notes that:

Although data on the use of cash are scarce, it can be stated that the share of cash payments in the total number of payments is still considerable. According to the Bank of Finland's 1992 survey of households' use of different payment methods, the share of cash payments in the total value of households' payments was 40%; whereas, for the number of payments, the ratio was 80%. Thus cash dominates other methods in small-value payments

[25] Snellman J 2000

Indeed cash in circulation has continued to grow throughout this period

FIGURE 7 **CASH OUTSIDE CREDIT INSTITUTIONS % of GDP**

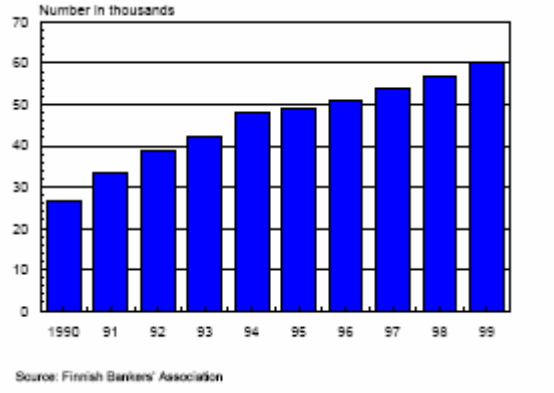


The Author would note, that this rise in cash usage has occurred despite a reduction of the number of installed ATMs (which in other countries has been growing significantly)

FIGURE 8 **Number of Cash Dispensing ATMS**

Combined with a more than doubling of the number of EFTPOS Terminals

FIGURE 9 **NUMBER OF EFTPOS TERMINALS**



Indeed the reduction in the number of ATMs has been a consistent trend in Finland since 1994. It is difficult to understand the market justification for such a policy when some comparisons are made between Finland and other European countries:

TABLE 2 ATM COMPARISONS ACROSS EUROPE

	No. of ATMs 2003	ATM Growth 1998-03	No. of ATMs per 1m of population	Average transaction level per ATM per month 03	Cash Preference % 2003	Growth in ATM transactions 1998-03
UK	46938	88% IAD	781	4331	45%	26%
Spain	51955	37%	1292	1850	62%	38%
France	40780	39%	678	3429	20%	60%
Germany	51560	13%	626	3478	48%	51%
Austria	6939	33%	849	2484	58%	31%
Belgium	7152	23%	695	2865	36%	15%
Holland	7556	15%	468	5791	34%	22%
Sweden	2691	9%	303	10893	33%	8%
Norway	2035	2%	445	4839	N/a	-5%
Denmark	2826	4%	522	3101	49%	-2%
Finland	**2001**	**-9%**	**385**	**9579**	**49%**	**-3.5%**

Source Data: BIS & Eurobarometer

As can be seen Finland, in contrast to other European countries, has reduced its ATM network by a further 9% since 1998 to the point where it has the fewest number of ATMs per 1M of population of any country except Sweden. Furthermore the demand for cash seems to be remarkably strong: Finland's ATM's are intensively used (only Sweden has more transactions per month) and Finns expressed a strong preference for cash (49%) when asked *"their preferred means of payment for an important purchase (over €100) in their own country"*[26]. This was even greater than the overall EU 15 average cash preference of 46%. 85% of Finns identified "ease" of use as the reason for this choice. It should also be noted that while Sweden has fewer ATMs per head and even higher intensity of usage, it has been significantly growing its ATM base during this period to correct this situation.

In fact Finn's preference for cash is increasing according to this survey data: in 2002 cash preference was 42% and credit & bank cards were the first choice for settlement. In the same 2003 survey Danes too identified cash as their first choice for payment.

Markose & Loke[27] have identified that Finland is not alone in experiencing a resurgence of cash demand: France & Canada have experienced an increase in the demand for cash via ATMs.

In fact Markose & Loke have developed a model that actually predicts that such early adopters of card based payment systems with a consequently high density of EFTPOS terminals will experience such effects when interest rates are relatively low.

[26] Standard Eurobarometer 205, 2004
[27] Markose & Loke 2003

Markose & Loke believe this is further evidence that cash via ATMs is competitive to card based substitutes. They conclude that:

"the major findings of this paper is that cash holds its own due to the competitive low costs, estimated by Tc#, in its provision relative to the EFTPOS card substitute. This result decisively rules against the position taken by those who predict the imminent demise of cash in transactions"

The Author would contend that the situation in Finland again demonstrates the resilience of cash demand by the public, even when as in this case, the ATM network has been in decline for almost a decade.

3.4 THE LATEST RESEARCH: THE NETHERLANDS & BELGIUM

As was noted earlier, the studies by both academics and central banks in the US, Norway, Sweden and Finland concentrated virtually exclusively upon the commercial bank cost of providing payments. Indeed, it was recognised by Guibourg & Segendorf (2004[28]) that the costs to other participants in the payment supply chain

"could be one important area for future research"

In 2003 the central bank of the Netherlands (DNB) lead precisely such a research project by establishing a "Working Group on the Costs of the Point Of Sale Payment System". This Working Group, which was lead by a DNB project team was very broadly based with representatives from the main commercial banks, Interpay, retailers and consumers. The Working Group itself supplied the base data and discussed the progress and findings of the research report with the DNB team. The Working Group published its findings in 2004 (National Forum on the Payments System 2004)[29]

Independently, following the announcement by one of the major Belgian banks at the end of 2003 about applying ATM withdrawal charges, the Belgian government concluded a gentleman's agreement with the Belgian Association of Banks to withhold charging, but that the National Bank of Belgium (NBB) would chair a round table forum involving all potential stakeholders upon the costs of the payment system. Work commenced in 2004, and the NBB published its findings in 2005 (Quaden 2005)[30]

Both national workgroups took a similar, but independent approach to the projects.

The Author regards the work of these two separate groups as critical to the current debate for the following reasons:

- These are very recent studies undertaken under the supervision of 2 Eurozone central banks, in an environment where direct cash charging is not established.

- The Work Groups include the key stakeholders in the supply chain and the studies attempt to define the costs of each stakeholder (although again no fiscal impact upon the State is considered)

- Crucially both teams identified two separate cost drivers operating upon any payment instrument:
  - The cost per additional transaction (volume)
  - The cost of increasing the amount spent (value)

  The interaction of these cost drivers is very significant if the ratio of fixed to variable costs is substantially different for two alternative instruments. This is the case with cash and cards: cards have a very high fixed cost element, with relatively lower variable costs, while cash is more equally balanced.

[28] Guibourg and Segendorf, 2004
[29] DNB 2004
[30] Quaden 2005

- Having established the costs for the stakeholders, both groups then simulated the effects of a significant migration from cash to debit cards & e purse. No simulation of the effect of credit cards was undertaken.

- Although not identical, both studies independently arrived at remarkably similar results

The total cost of payments established by the Dutch group was 0.65% of GDP while in Belgium (a year later), this was 0.74%.

In both cases, as the predominant settlement instrument (over 85% of transactions) cash accounted for the largest element of these costs at 0.48% of GDP in Holland and 0.58% of GDP in Belgium. In both countries debit cards accounted for 0.12% of GDP with credit cards at 0.04% and e-purse 0.02%.

However, as both papers proceed to demonstrate, to assume that cash substitution will generate the very large savings implied by the difference between these percentages is too simplistic. This is because of the very different effects of the interaction of the 2 cost drivers (transaction-linked and sales value-linked) for the different instruments. TABLE 3 overleaf shows how different these variable cost drivers are.

TABLE 3
Summary of the payment products: transactions, sales and costs – 2002

EUR millions

	Cash	Debit card	E-purse	Credit card	Total
Total nr of transactions (millions)	7,066	1,069	87	46	8,268
Total sales	66,263	47,177	236	5,300	118,976
Average transaction amount (EUR)	9.37	44.13	2.72	115.22	14.39
Total costs	2,122	520	81	165	2,888
Fixed	878	310	78	115	1,381
Variable – transaction-linked	789	203	3	37	1,032
Variable – sales-linked	455	7	0	13	475
Costs to the retail sector	1,157	252	13	11	1,433
Fixed	497	99	11	4	611
Variable – transaction-linked	417	153	2	6	578
Variable – sales-linked	243	0	0	1	244
Costs to the banks, Interpay and credit card companies	895	268	68	154	1,385
Fixed	351	211	67	111	740
Variable – transaction-linked	350	50	1	31	432
Variable – sales-linked	194	7	0	12	213
Costs to DNB/KNM	70	-	-	-	70
Fixed	30	-	-	-	30
Variable – transaction-linked	22	-	-	-	22
Variable – sales-linked	18	-	-	-	18

Source: DNB

The DNB simulated the effect of substituting 500 million cash transactions averaging €3 with payments of these sums by e_purse and a further 1 billion cash transactions averaging €20 being replaced with payments by debit card.
For the simulation only variable costs were considered as the increase in fixed costs to support such a substantial expansion (6 fold increase in e_purse transactions and a doubling of debit card transactions) was unknown.

The saving of (variable only) costs achieved was €106M or 0.02% of GDP.

When the NBB simulated the effect of substituting 250 million cash transactions averaging €5 being replaced with payments of these sums by e_purse and a further 500 million cash transactions averaging €20 being replaced with payments by debit card, the (variable cost only) saving as a % of GDP was virtually identical.

This prompted the NBB to comment as follows (Quaden 2005):

"Such a saving is rather low, even if a comparison is made at overall cost level (0.74% of GDP). Only a shift to a "cashless society" could generate substantial savings. This, however, is a purely hypothetical scenario, given the fact that it is cash that the public most wishes to use. Furthermore, it must be remembered that, in the context of such a radical scenario, the fixed costs of electronic payment methods would greatly increase: considerable investment in infrastructure, particularly in increasing the number of terminals, would be entailed, which might nevertheless generate in their turn positive scale effects.

Whatever the case may be, as its market share shows, cash continues to be the public's firm favourite"

A further area of general agreement between the studies was that credit cards were by far the most expensive means of payment. As Brits & Winder (2005)[31] note in their DNB supplementary paper:

"The credit card is the most expensive instrument, irrespective of the transaction amount"

For this reason the credit card was excluded from the simulation models performed by both central banks.

[31] Brits & Winder 2005

SECTION 4: MODELLING THE POTENTIAL IMPACT OF CASH SUBSTITUTION

The European Payments Council Cash Working Group stated in its "Single European Cash Area (Draft) Framework (2005)"[32]:

> *"This by all means unsatisfactory situation at national level, if permitted to prevail any further within SEPA, will lead to dramatic consequences for the future of payment services, for 3 main reasons:*
>
> *The sheer cost of cash to society as a whole. This cost has been estimated at around EUR 50 billion p.a."*

This statement is simply incorrect, and illustrates the confusion that is frequently created in this area. The "cost to society as a whole" must surely take account of the revenue that the State receives for issuing currency. "Society as a whole" does not begin and end with the profit and loss account of the commercial banks, or even the costs of retailers and central banks. Statements such as the one above clearly suggest that "everyone would be better off" if cash was replaced by electronic substitutes. In fact it may be that "everyone will be worse off" if the fiscal impact of cash substitution is taken into account.

In this section, we explore the holistic impact of cash substitution to try and quantify whether "society as a whole" is actually better off or not (The Net Societal Cost of Cash). To do this we have considered a number of scenarios.

- SCENARIO 1 DNB Substitution Simulation
  This model uses the Dutch National Bank data and assumptions

- SCENARIO 2 NBB Substitution Simulation
  This model uses the National Bank of Belgium data and assumptions

- SCENARIO 3 EU15 LEVEL Simulation
  This model extrapolates the Dutch data and assumptions to EU15 level in 2004.

SCENARIO 3 is actually really like enlarging Holland to the size of the whole EU15. Clearly the EU is not exactly like Holland. Nevertheless by using the DNB data, the Author believes this is a conservative estimate as Holland has one of the most advanced (and hence low cost) electronic payment systems in the EU.

THE AUTHOR HAS ESTABLISHED A RANGE FOR SEIGNORAGE BASED UPON EU BASE INTEREST RATES (CONSERVATIVE) & EU LONG TERM BOND RATES (MORE REALISTIC)

In all cases, the Author has had to make some assumptions. For these purposes to estimate EU15 cash sales volume it has been assumed that this reflects the same % of GDP as Holland. Furthermore, as the ECB no longer publishes individual circulation data for eurozone members, it has been assumed that:

Cash in Circulation (CIC) Holland = Cash Sales Holland x (CIC EU / Cash Sales EU)
All other supporting data is taken from the ECB Blue Book 2005, and ECB Pocket Book 2005.

[32] CWG EPC 2005

TABLE 4 **SCENARIO 1**

CASH SUBSTITUTION NETHERLANDS 2002

Based upon a scenario envisaged in "Survey on the Costs involved in POS Payment Products" by the National Forum on the Payments System, Netherlands 2004

	Transactions M	Avg size €	Value €M		
Cash to Debit card	1000	20	20,000		
Cash to e Purse	500	3	1,500		
Cash Reduction	1500		21,500		
			32%		
Assumed EU Base Rate			2.3%		
Assumed EU Bond Rate			3.5%		
Cash In Circulation Reduction			6476		
Low range Seignorage Loss			**144**	to	**220**
% increase in NL Fiscal Deficit			1.7%	to	2.6%
Variable Cost Reduction			**106**		
% of GDP			0.024%		
NET SOCIETAL LOSS			**-€ 38M**	**to**	**-€114 M**

As can be seen under this scenario, “Society as a Whole” would actually be worse off by between €38M and €114M.
The State would loose between €144M to €220M of Seignorage revenues annually, which would represent an increase of between 1.7% to 2.6% of the 2002 Dutch Fiscal deficit. The commercial banks and retailers would experience a variable cost reduction of some €106M annually, but this of course excludes the significant infrastructure investment that would be necessary to support a further 1.5Bn of non-cash POS transactions.

TABLE 5 **SCENARIO 2**

CASH SUBSTITUTION BELGIUM 2003

Based upon a scenario envisaged in "Costs, advantages and disadvantages of different payment methods" by the National Bank of Belgium December 2005

	Transactions M	Avg size €	Value €M		
Cash to Debit card	500	20	10,000		
Cash to e Purse	250	5	1,250		
Cash Reduction	750		11,250		
			22%		
Assumed EU Base Rate			2.3%		
Assumed EU Bond Rate			3.5%		
Cash In Circulation Reduction			3769		
Seignorage Loss			**84**	to	**128**
% reduction in BE Fiscal Surplus			7.9%	to	12.0%
Variable Cost Reduction			**58**		
% of GDP			0.022%		
NET SOCIETAL LOSS			**-€ 26M**	**to**	**-€ 70 M**

As can be seen under this scenario, Belgian “Society as a Whole” would actually be worse off by between €26 and €70M.

The State would loose between €84M to €128M of Seignorage revenues annually, which would reduce the Fiscal surplus Belgium enjoyed in 2003 by between 7.9% & 12%.
The commercial banks and retailers would experience a variable cost reduction of some €58M annually, but this of course excludes the significant infrastructure investment that would be necessary to support a further 750M non-cash POS transactions.

TABLE 6: **SCENARIO 3**

CASH SUBSTITUTION EU15 2003: NL Extrapolation

Extrapolating the scenario"Survey on the Costs involved in POS Payment Products" by the National Forum on the Payments System, Netherlands to the whole EU15

	Transactions M	Avg size €	Value €M		
Cash to Debit card	20973	20	419,450		
Cash to e Purse	10486	3	31,459		
Cash Reduction	31459		450,909		
			32%		
Assumed EU Base Rate			2.3%		
Assumed EU Bond Rate			3.5%		
Cash In Circulation Reduction			151,067		
Seignorage Loss			**3,323**	to	**5,136**
% increase in EU15 Fiscal Deficit			1.2%	to	1.9%
Variable Cost Reduction			**2226**		
% of GDP			0.024%		
NET SOCIETAL LOSS			**-€ 1,098**	**to**	**-€ 2,910 M**

** For a migration to card-based payment on this scale, the fixed costs of cards will increase significantly*

*** The average transaction size across the whole EU is likely to be higher than in NL*

While this is really just an extrapolation of the Dutch situation, the scale of the numbers is staggering. This is a measure of how wrong the EPC's view of the benefits of cash substitution to "Society as a Whole" could be: Society as a whole could be between €1Bn and €3Bn worse off.

EU15 Member States would forgo between 3.3Bn & €5.1Bn in revenues – equivalent to the EU's combined 2006 budget for "Enlargement" and "Support for New EU Entrants" or in the higher case, slightly more than the Commission's own total budget for administration of the EU![33]

There are at least two further ways of putting this situation into context:

- Does a 0.024% increase in annual GDP represent a good outcome in relation to an annual State economic stimulus of €3.3Bn to €5Bn? Could this level of expenditure elsewhere achieve a greater effect upon growth?

Or alternatively…..

- If the commercial banks received the Seignorage benefit rather than the State would there still be the same interest in investing in cash substitution?

To the Author, based upon these simulations, it would seem that the appropriate response to both questions is "No".

[33] EU Commission 2005

SECTION 5: THE CHALLENGE OF UNPLANNED OUTCOMES: CONSUMER BEHAVIOUR IN THE REAL WORLD

One of the concerns when intervening in an established market must be whether the intervention will actually deliver the results planned or whether consumers will behave in ways not considered by the architects of the intervention.

5.1 RETAILER CASH BACK

It is not clear to the Author whether the possibility of retail "cash-back" transactions exceeding the frequency of ATM withdrawals was expected, considered or actually a planned outcome of the actions of commercial banks and Norges Bank in Norway. However it is clear that a set of circumstances were created which resulted not just in consumers taking new decisions about whether they should pay by cash or card, but also in consumers substantially changing their behaviour towards where they sourced their cash from. This has two potential consequences which need to be considered:

- Increased cash recycling without automated fitness sorting.

  For a country with its own national currency and a population of 5M people, the counterfeit risk of extending cash recycling without automated fitness sorting is probably very low. However for a Union of 450M people, containing a common currency area for 300M people, this may be quite another matter. Certainly the ECB has recently taken steps to regulate under what circumstances and how recycling should be undertaken[34]. However, these regulations were formulated in an environment where the primary source of cash for the public is an ATM or bank branch and not a retailer's till.

- The Role of the Commercial Bank and the cost of ATM operation.

  There is a real risk of creating an upward price spiral when activity based costing, ATM charging and substantial use of retailer cash back are combined. There is no evidence that this has been the case in Norway, but it must be a risk in any country where these factors converge:

  - As consumers migrate from ATMs to Retailer Cash Back, the unit costs of ATM operation increase (because of the fixed costs) which leads to…
  - Further pricing pressure upon ATM transactions, which leads to….
  - Further use of retailers rather than ATMs by consumers, which reinforces the cycle, and will lead to the closure of under-utilised ATMs

[34] ECB 2005 – Recycling of Euro Banknotes…

This highlights a further important point - the role of the commercial bank in the cash cycle. Central Banks use commercial banks as their point of entry for cash into the cash cycle: increasingly this means an ATM. For cash-back to be able to take place there must be cash in the cash cycle.

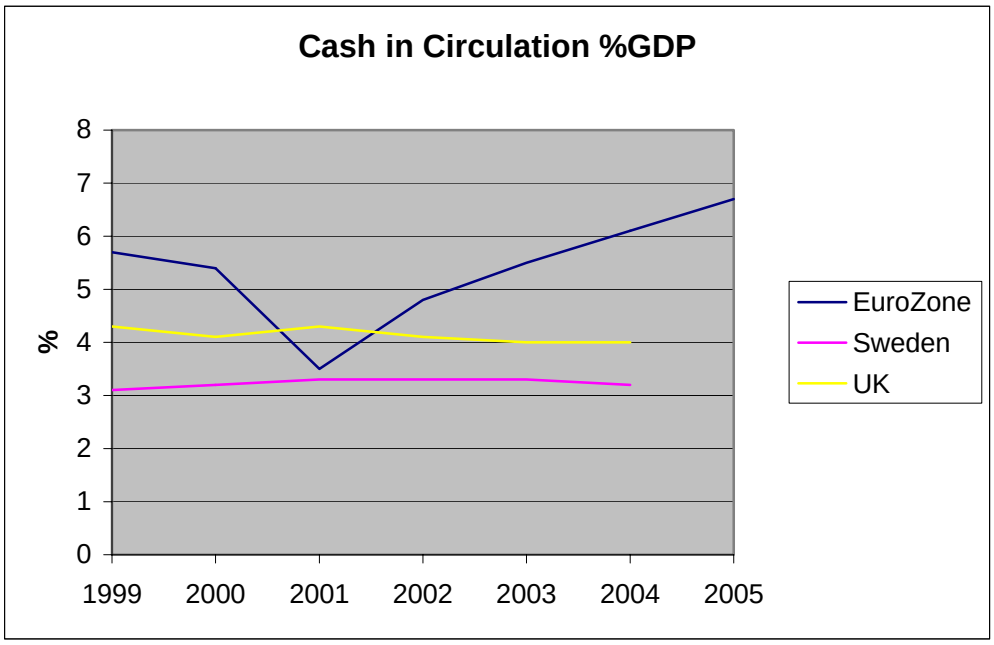
The ATM withdrawal transaction supports not a single, but multiple payments, while an EFTPOS card-based settlement transaction can only ever support a single payment.

It is important that new pricing mechanisms aimed at transparency do not actually create new blind-spots. From a commercial bank's perspective it is only interested in the single transaction that involves it – but from society's perspective, we should be interested in the cost / benefit ratio of all the transactions involved.

5.2 CASH SUBSTITUTION – EUROS FOR DOLLARS?

Figure 10 below charts the value of cash in circulation as a % of GDP. As can be seen the demand for Euros has been very different to the demand for UK Sterling or Swedish Krona. Clearly as would be expected the lead-in to Euro changeover had a highly depressive effect upon the value of cash in circulation within the Euro area. Nevertheless, since the Euro changeover cash has not simply recovered but is continuing to grow rapidly at rates beyond historic levels of usage.

Figure 10



Source Data: ECB Blue Book, ECB Currency Conference Presentation 2005, Bank of England, Riksbank

Undoubtedly this data shows yet again the resilience of demand for cash as a payment instrument. However, this alone is insufficient to fully explain the very high growth rate in a stagnated economic environment (relative to Sweden and the UK). Neither is it realistic to postulate that the "black economy" has boomed to the extent required to begin to explain such differences between EU members.

A more credible explanation is that the Euro may be substituting for the US dollar as the "hard currency" alternative to local currencies in Eastern Europe. Rubenstein[35] estimated in 1999 that:

> *"Most Russians, for example, prefer dollars over rubles. Some forty billion U.S. dollars are now held there."*

In the same paper, Rubenstein points out that external circulation of the currency is highly valuable to the US: generating an additional $10Bn per annum of Seignorage revenues (in 1999). It would be ironic, if just when the world may be starting to adopt the Euro as the currency of choice, such a position was undermined by the European banking sector creating artificial barriers to cash usage.

[35] Rubenstein 1999

5.3 CREDIT CARD v DEBIT CARD USE

It will be recalled that in all the studies considered, from a purely cost-of-payment perspective the credit card is substantially more expensive than any other means of payment. If the cost of a payment service to the banking and retail sectors was the only criteria for selecting an instrument then the overwhelming weight of academic evidence would suggest that a credit card should not be used unless no other means of payment was available.
Indeed the Dutch group excluded credit cards from their simulation models[36]

"because of the great difference in cost levels vis-à-vis the other three products"

and this methodology was later repeated by the NBB.

However, it is sensible to ask whether ignoring substitution by credit cards is reasonable, given the dramatic shift in payment methods considered by the DNB & NBB models.
Zinman (2004)[37] concluded that for his results:

> *"…they suggest that debit and credit are partial substitutes".*

The credit card industry is highly profitable and competitors make customers attractive offers such as no annual fees, low (or zero) introductory rates, loyalty schemes and cash-back offers to encourage selection of and spending on their cards. In such an environment it would seem highly likely that some consumers will choose to use a credit rather than a debit (or even e-purse) card. In fact the nature of current credit card arrangements can provide incentives for some consumers to use their credit cards. This was recognised in the recent UK Office of Fair Trading's Report into the multilateral interchange fees (MIF)charged by Mastercard UK Members Forum Ltd (MMF)[38]

> *"4.2 Certain consumers may have benefited from this transfer of money to the extent that issuers used some of their income from the MMF MIF to fund benefits such as reward points and interest-free credit on balances that are cleared at the end of the month. However, many consumers do not receive such benefits, but were forced, as a result of the MMF MIF agreement, to subsidise those who do. In particular, consumers on lower incomes or with a poor credit history may lack access to credit cards, but would still have had to bear some of the costs of the MMF MIF through higher retail prices charged by merchants that accepted MasterCard cards".*

For consumers who can afford not to carry a positive credit card balance, increasing financial awareness may result in a view that "why use a debit card and immediately debit my account when I can delay the payment and also possibly gain a reward?" (e.g. air miles, cash back etc).

It would seem sensible therefore to consider a final Scenario to reflect one possible cash substitution situation where both debit AND credit cards substitute for higher value cash transactions while ePurse substitutes for lower value transactions.

[36] DNB 2004
[37] Zinman 2004
[38] OFT 2005

Scenario 4 is identical to Scenario 3 in that it takes the DNB data and scales this to the whole EU15. It again assumes that 36.2Bn cash transactions are substituted, but it assumes that 30% of the higher value transaction migrate to credit rather than debit card. The same number of transactions are migrated to ePurse.

TABLE 7 **SCENARIO 4**

CASH SUBSTITUTION EU15 2003: Incl Credit Card "Leakage"

In this scenario again based upon the DNB model it is assumed that consumers use Credit Cards rather than Debit Cards for 30% of the higher value cash transactions displaced

	Transactions M	Avg size €	Value €M		
Cash to Debit card	14681	20	293,615		
Cash to Credit Card	6292	20	125,835		
Cash to e Purse	10486	3	31,459		
Cash Reduction	31459		450,909		
			32%		
Assumed EU Base Rate			2.3%		
Assumed EU Bond Rate			3.5%		
Cash In Circulation Reduction			151,067		
Seignorage Loss			**3,323**	to	**5,136**
% increase in EU15 Fiscal Deficit			1.2%	to	1.9%
Variable Cost INCREASE			**-1893**		
NET SOCIETAL LOSS			**-€5,217**	**to**	**-€7,030 M**

FOR VARIABLE COSTS TO INCREASE THERE ONLY NEEDS TO BE 16% "LEAKAGE" OF TRANSACTIONS TO CREDIT CARDS RATHER THAN DEBIT CARDS

** For a migration to card-based payment on this scale, the fixed costs of cards will increase significantly*

*** The average transaction size across the whole EU is likely to be higher than in NL*

The effect of this "leakage" from debit cards to credit cards is dramatic. While the EU15 Member States continue to forgo between €3.3Bn and €5Bn of Seignorage revenues, the variable only cost of payments has actually increased by close to €1.9Bn when compared to this expenditure continuing to be made with cash. Overall "society as a whole" is between €5 and €7Bn worse off.

It can be calculated that for this model there only needs to be a 16% or greater "leakage" of substitution to credit cards rather than debit cards for the overall variable cost of payments to increase.

In fact of course, as previously stated, there would also need to be substantial increases in fixed costs to support the infrastructure investments necessary for such a large scale migration from cash to cards.

SECTION 6: DISCUSSION

6.1 FLAWED ASSUMPTIONS

The Author would conclude that there have been some fundamentally flawed assumptions made in the current debate about the value to society of migrating from cash based to card based payments. The thought process of the advocates of the "war on cash" can be broadly summarised as:

- ***Payments can cost 3% of GDP***
  As we have seen this was the case in one economy (USA) which was not representative of the balance of European payments methods. The latest and most extensive investigations lead by the central banks of the Netherlands and Belgium have identified these costs at 0.65% and 0.74% of GDP.

- ***Cash is the most costly payment method***
  This is not actually true. Every payment costs study reviewed in this document has clearly identified credit cards as being the most expensive payment method. Of course credit cards offer a bundle of benefits to consumers, including an interest free period and in some cases cash-back incentives. Nevertheless from a simple cost of payments perspective credit cards are by far the most costly instrument.

- ***Since cash is the predominant means of payment, if there is a substantial substitution of cash, there will be proportionate and substantial reduction in costs.***
  The DNB and NBB have demonstrated this is not the case, because of the differing cost drivers of the various payment methods and the types of payments to be substituted. Their analysis suggests that even with a doubling of debit card usage and a 5-6 fold increase in epurse the variable cost saving (excluding any necessary increase in fixed costs) would be only 0.02% of GDP.

- **Governments *"seem willing to incur"* [39] substantially reduced Seignorage revenues as a price worth paying for a more efficient payments system**.
  This is a pivotal point and prompts consideration of several issues. The first is - has anyone actually told them the numbers involved? In this paper using the DNB data and substitution scenario, the Author has calculated that this could be a loss of some €144 to €220M to the Dutch public purse annually. By scaling these assumptions to the EU15 as a whole this could be a reduction of between €3.3Bn and €5Bn annually, or over 4% of the entire EU budget.

  The second issue is what is meant by a more efficient payment system. In this paper the Author has demonstrated (using the DNB / NBB data and assumptions) that when the drop in Seignorage is balanced against the reduction in variable costs, the gain to "society as a whole" is actually

[39] Humphrey, Keppler, Montes-Negret 1997

negative. This is not to say that the payments system cannot be made more efficient as will be discussed later.

- **Migration from cash to cards inevitably generates lower costs to the commercial banks and retailers**
  This assumes that the only migration which occurs is from cash to debit cards and epurse. This paper has demonstrated that a relatively small element of substitution (16%) between debit and credit cards can result in these costs actually increasing. Arguably this is the worst outcome of all for "society as a whole"[40] as the cost of the payment system has increased while at the same time the State has forgone the relevant Seignorage revenues.

- ***The cost of cash is fixed immutable, and homogeneous.***
  A common theme throughout the literature is that in-branch payment transactions of any kind are considerably more expensive than out of branch transactions. In particular, as shown in FIGURE 2 ATMs have a relatively low unit cost of operation. The EPC Cash Working Group estimated that the incoming processing costs of cash are approximately twice those of the outflow processing cost.[41] This has lead Levinsohn[42] to propose that this cost difference is due to the "industrialisation" of the outflow cycle and especially the impact of automation via ATMs. He therefore proposes that a substantial reduction in the cost of cash could be achieved by re-engineering the inflow processes. Furthermore he also points to the cost reductions of some 20% achieved by commercial banks in the UK via outsourcing cash operations to the 3rd parties who can achieve economies of scale upon common platforms.

  It is relevant in this context to reflect upon the 50% efficiency improvement in cheque processing observed by Wells[43] following the process re-engineering undertaken by the US commercial banks between 1989 and 1996.

It is actually helpful to reflect for a moment upon the fundamental nature of the so called "payments market". Philosophically one can argue that there are actually two main types of payment.

- TYPE ONE. This payment is actually a form of instruction to one's bank to make a transfer between accounts: most payment instruments fall into this category from giros, via cheques to debit and credit cards.

  E_purse is simply a special case of a TYPE ONE payment: the user instructs his bank to debit his account with a sum of money (stored value on card) and then selects the timing of subsequent crediting instructions up to this amount.

- TYPE TWO. In this second type of payment the consumer physically exchanges State produced tokens of value directly for goods or services.

[40] "SECA" Draft CWG- EPC 2005
[41] CWG EPC 2003
[42] ESTA 2005
[43] Wells 1996

In the former case the product is designed by and owned by commercial banks, in the latter the product is actually designed and owned by the State and the commercial banks act as a sort of issuing agent for the State and occasional warehouse for the consumer. In both cases the owner of the product receives a revenue stream for the use of their product.
To the Author this would seem to be at the heart of the matter: it is completely within the control of the banks whether they seek to generate profits directly from TYPE ONE payments.
However, the banks receive no income from the State for acting as an agent of the State for facilitating TYPE TWO (Cash) payments.

As commercial organisations it is entirely legitimate for the banking industry to promote its most profitable product lines and to try and to minimise losses elsewhere.
This is probably now especially relevant as "specialist" banks, such as internet banks have emerged which may only compete in particular areas or via particular channels, and may therefore never handle physical cash.

Whether commercial banks that act as issuing agents should receive revenue from the State for this undertaking is entirely a matter between the State (via the central bank) and the commercial banks involved.

However there are at least three areas where the "war on cash" debate has become disingenuous:

- THE IMPRESSION THAT "SOCIETY AS A WHOLE" WILL BE BETTER OFF.
  This paper demonstrates that when the fiscal impact of Seignorage revenues is taken into account, "society as a whole" is always worse off If this is doubted, then the relevant question is whether the commercial banks would be interested in driving cash substitution if they received all of the Seignorage revenue themselves.

- TO REDUCE THE SEPA VISION TO A DEBATE ABOUT CASH v CARDS
  The vision of a SEPA is much broader and deeper than a simple debate about cash. After all most large businesses do not settle their bills with cash. Most higher value payments are settled by other means, and many of the most efficient countries in terms of payment systems have achieved this through re-engineering and differential pricing of these TYPE ONE payments.

  Countries such as Norway & Finland have been highly effective at lowering the cost of payments as a whole by replacing non-cash paper-based payments with electronic payment methods, and displacing branch-based across the counter transactions to automated terminals. (Although as noted the Author would have concerns as to the long term desirability of cash-back usage on the scale of Norway in larger economies with greater counterfeit risks.)

  When such a re-engineering effort is borderless, then businesses and individuals will benefit from a single market for payments that underpins a single market for goods and services.

- THE PROMOTION OF CREDIT CARDS
  If the EPC is concerned with minimising the cost of payments to society as a whole then credit cards should carry a health warning. This is not to say that they are not useful and attractive forms of payment in circumstances where short-term credit is required.

However where this is not the case, then in the words of the DNB

"from a cost efficiency point of view the credit card is never to be preferred for any transaction amount"

This paper has demonstrated that a relatively low level of substitution of cash to credit cards rather than debit cards in the DNB model can actually add to the overall variable costs of settlement despite very substantial migrations to debit cards and e purse.

Unfortunately, one cannot help but think that the cost base of payments is not the fundamental issue for the commercial banks: if the revenue stream grows faster than the cost base – that's good business.

This is the truly fundamental question: is the concern about profitability or cost?

Cash circulation will never generate the level of profitability of credit cards whatever pricing changes may be considered. If the banking industry believes that central banks and others may assist it in shifting public demand away from highly popular cash towards more profitable TYPE ONE payments, then there is no incentive to explore the fundamental re-engineering of the cash cycle which could reduce the cost of cash significantly.

6.2 THE OPPORTUNITY TO TRANSFORM THE COST OF CASH

The EPC Cash Working Group estimated the total cost of cash to the European Banking Industry in 2002 as some €32Bn some €32 Bn per annum, although as the group noted *"there are no scientifically exact figures in this field"*. The Group further estimated that the "incoming process costs" of the cash cycle were €21Bn while the "outgoing process costs" were €11Bn, i.e. the costs of supplying cash are half that of receipt.
Upon initial inspection this is a very odd situation as it implies that counting money in is twice as costly as counting money out. If one takes the view that these are not fundamentally different processes then there is by the EPC's own 2002 numbers a €10Bn opportunity to reduce the cost of cash to EU15 stakeholders by 20%.

Levinsohn has suggested that the reason for this substantial difference between inflow & outflow processing costs is the industrialisation of the outflow cash cycle primarily by ATMs. Certainly all the studies reviewed in this paper have concluded that the most costly payments (of whatever kind) are manual branch-based payments. ATMs have been highly successful in displacing the majority of cash sourcing transactions away from the counter to a terminal. Levinsohn proposes a re-engineering of the inflow cash cycle to capitalise upon this opportunity. The principles behind such a re-engineering project are explored in more detail below.

The back office cash processing activities that take place in a branch or retailer are remarkably primitive by the standards of most industrial operations. Even when dedicated "cash centres" have been established, there is remarkably little evidence of continuous flow, or automation. Frequently such centres have been established to provide sufficient volume to support high speed notesorting equipment. However while such equipment can be highly effective for this purpose, notesorters are frequently "islands" of automation with highly manual activities creating bottlenecks either side of the sorter. Indeed one can argue that while the development of cash centres provides an initial step-change in efficiency, the separation of front and back office ownership that results means that the cash centre becomes the "forgotten world and poor relation" with little consideration given to the impact front-office activities can have upon its performance. If in-branch and remote automated depositing solutions that provide virtually all of the capabilities of over-the counter transactions are to be developed, then if the cost base is to be truly re-engineered, it is vital that the overall process is optimised to avoid new inefficiencies and costs being created elsewhere in the cycle.

Womack & Jones[44] describe how many modern manufacturing and service industries have transformed the efficiency of their processes by adopting "Lean Processing" techniques first formulated in the automotive sector.

[44] Womack & Jones 1996

The Author would assert that within the current context these techniques consist of:

- Understanding the current end to end process as it truly is

- Identifying what are the value-adding process steps and which are non value adding waste

- Designing a revised and standardised end-to-end process that:
    - Eliminates as many non-value adding steps as possible
    - Ensures value adding steps are accurately performed once – and once only
    - Creates a continuous flow between process steps & ensures process steps have similar throughput rates to minimise bottlenecks and back-logs

Many people within the industry would claim "but cash is different!". In one respect cash is different – the intrinsic value of the product means that historically at virtually every hand-off between process steps or personnel the receiver has recounted the cash so that they do not incur any losses arising from a difference between stated and physical value. This is a huge waste of resources. It is the Author's view that such issues can be overcome by developing standardised tamper evident cassette technology at the very start of the process. Furthermore the falling cost of sensor technology means that consumer-operated depositing machines can cost-effectively be installed with detection capabilities that rival the large scale notesorters of the past. Thus it should be possible to develop consumer-operated depositing units that produce cassettes that can be directly fitted to a notesorter, so that the entire inflow cash cycle is closed to interference, and thus cash is only counted once, by the customer, utilising a machine.

The market for cash processing technology is small and the industry needs to provide a clear vision of what it aspires towards if suppliers are to consider such radical end-to-end solutions. This is why this paper advocates that such a vision needs to be jointly developed involving all the key stakeholders in the cash cycle so that the output is viable for all and owned by all. The objective should be to design a process which defines the key process steps and sequence and the required standard interfaces (in the broadest sense) between the process steps. This would still leave space for individual stakeholders to innovate and differentiate within a standardised overall framework. This is not a process that should involve the commercial stakeholders alone: the central banks needs to participate too, as decisions about note and coin design and circulation quality are highly relevant. The goal needs to be to define an optimal overall process, not a least cost solution for any one player. Within this context the concept of Net Societal Cost can be a highly effective measure.

It may also be the case that to support such operations there needs to be a consolidation of processing participants to provide economies of scale from a common platform. Levinsohn's comments concerning the cost savings of UK banks may be relevant in this context.

SECTION 7: CONCLUSIONS

In February 2006, the European Commission[45] stated that a "Best of Breed" payment product is:

"…the economically most efficient product / service design taking into account all stakeholders' costs and benefits and also future development needs"

The Author would conclude that the analysis in this paper clearly suggests that when the fiscal impact of cash migration is considered (Net Societal Cost) cash is already a *"Best of Breed"* payment product. Furthermore, when the Net Societal Cost is considered alongside the latest understanding of the cost drivers of cash, there is, in the Author's view, simply no justification for a market intervention to discourage the public from using such a highly popular payment method. This is particularly the case when the risk of some level of substitution by payment means with higher unit costs, e.g. credit cards, is considered.

This paper demonstrates that consumer demand for cash is highly resilient, even when charging mechanisms are introduced or ATM availability reduced.

Rather than focus upon rapid and large scale substitution of cash (for which it would seem the public's appetite is highly limited), this paper recommends a radical re-engineering of the cash cycle with the input of all stakeholders to displace depositing activities from branch counters while at the same time creating a lean and efficient end-to-end processing operation for the resulting cash. If the costs of the inflow cash cycle could be aligned with those of the outflow cash cycle, there is the potential to save up to €10Bn annually. Such a saving would actually exceed the potential SEPA savings for both cash AND CHEQUES identified by the European Commission, without requiring substantial behavioural shifts by the public, and without risking further distraction and delay to the delivery of the key SEPA objectives.

However, it is the Author's view that for all the stakeholders to fully commit to such a process there would need to be a clear and unambiguous signal from the central banks and other regulators that they are committed to continuing to support cash (within the current consumer pricing regimes), in parallel with the development and evolution of new payment technologies, for as long as there is public demand.

[45] European Commission Feb 2006

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