Who's afraid of the cashless society?
Belgian survey evidence

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1. Introduction

Recent years have seen a boom in research on payment systems. There is today a steady stream, if not a wave, of papers on topics such as interchange fees and large-value payment systems. Papers on payment behaviour, however, continue to come in trickles at best. In a paper written in 1997, Kennickell and Kwast stress that up to that point much of the discussion of new electronic payment instruments had revolved around potential public policy concerns or had focused on the supply side of the market. In contrast, they point out, "relatively little of the discussion ... ha[d] addressed the demand side of the market, or such questions as: What types of products are consumers likely to be actually *willing* to pay for? What are the *characteristics* of current and likely future purchasers of electronic products and services? How *quickly* will consumers adopt electronic technologies?" (Kennickell and Kwast, 1997, p. 1; emphasis in original).

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Kennickell and Kwast's observation is still valid today. The reason behind the relative neglect of the consumer side is also unchanged. The lack of research is primarily due to the scarcity of data, which typically have to be generated by means of (costly) surveys (o.c., p. 2; Boeschoten, 1998, p. 117). Researchers in the U.S. can exploit the extremely rich source of information that is the triennial Survey of Consumer Finances (SCF); see Avery et al. (1986), Duca and Whitesell (1995), Kennickell and Kwast (1997), Stavins (2001), Mester (2003), Hayashi and Klee (2003), and Klee (2005). The Dutch central bank also has a tradition of regularly conducting expenditure surveys that can be used to analyse the payment behaviour of households; see Mot and Cramer (1992), and Boeschoten (1992, 1998) and the references therein. The Austrian central bank, for its part, has been conducting a 'payment card survey' at quarterly intervals since 1996, and also commissioned a more detailed 'payment behaviour survey' in 1996 and again in 2000; see Mooslechner et al. (2002).

Efforts in other countries are typically of a one-off nature, as is ours. Concretely, we have benefited from the fact that in order to celebrate its 15th birthday in 2004, Banksys - the national EFTPOS operator in Belgium - decided to commission a unique, large-scale payments survey among 1,008 Belgian consumers. The present paper uses part of the data generated by this survey to explains the adoption and usage of debit cards, credit cards, electronic money, and retailer cards in terms of (1) respondents' socio-demographic and financial characteristics, (2) their propensity to adopt new technologies, and (3) supply-side factors. The same approach is also used to analyse respondents' willingness to embrace an all-electronic payments environment; in other words, their attitude toward the much-heralded cashless society.

The contribution of the paper is threefold. First, when it comes to electronic money, the setting of the survey is unique. Belgium is one of the very few countries with a (relatively) successful electronic purse scheme, called Proton (Van Hove, 2004, 2005) [1]. Earlier surveys on card-based e-money were either restricted to small-scale pilots – see Plouffe et al. (2001) for Canada, Westland (2002) for Hong Kong, Truman et al. (2003) for the U.S., Penz et al. (2004) for Austria, and M'Chirgui (2004) for France – or conducted in countries where e-purse usage at the retail Point of Sale is distinctly lower than in Belgium – see Mooslechner et al. (2002) for Austria, and Jonker (2005) for the Netherlands [2]. The problem with analysing payment behaviour in a trial setting is that the equipment is typically made available at a reduced price, or in some cases even given free. Such subsidies tend to bias consumers and merchants toward adoption. The problem with a high share of e-purse usage outside of the retail environment is that in some cases consumers

[1] An electronic purse is a chip card that can store prepaid value to be used for low-value payments at multiple retailers. See Van Hove, L., 1996-2005, "A selected bibliography on electronic purses (and electronic money)", web site <http://econ.vub.ac.be/cfec/purses.htm>.

[2] In the Netherlands, a recent survey by Millward Brown has confirmed that the Dutch see the local Chipknip electronic purse primarily as a universal parking card and only infrequently use it in shops (Source: "Nederland wil niet aan de Chipknip", *De Telegraaf*, April 14, 2005).

may not have a real choice. For example, in the Netherlands, a number of municipalities saw the introduction of the euro as the perfect moment to start collecting parking fees electronically and do away with cash payment and the associated vandalism. As of 1 January 2002, the use of the local Chipknip e-purse has become compulsory at all parking meters in the cities of Rotterdam and Nijmegen, and in Purmerend [3]. This explains why in a recent survey conducted by De Nederlandsche Bank (DNB), the Dutch central bank, the second most-cited reason for choosing to pay by e-purse at parking meters was simply "cash not accepted", with 23% of the responses (Jonker, 2005, Table 3, p. 11). To put things into perspective, in September 2004 - when the DNB survey was held - parking accounted for 31% of the total number of Chipknip payments [4] vs. only 13% for retail, 21% for vending, and 30% for 'catering' [5]. Catering refers primarily to cafeterias and restaurants in companies and schools. Some of these closed environments may also be cashless. Another example of 'forced' adoption are e-purses that started out as public transit cards and only later migrated to the retail sector, as the Octopus card in Hong Kong has done. As is explained in Van Hove (2005), commuters in Hong Kong had little choice but to use the Octopus card. A survey conducted in May/June 2001 among 507 Hong Kong residents found that 94.3% of the respondents owned an Octopus card, and that literally all cardholders used it (Paynter and Law, 2004). The majority (62.1%) of the respondents who did not own a card suggested that the major reason was "because they [did] not need to have one or rarely used the services supported by the system". The bottom line is simple: people use the Octopus card because they require the services. Since the bulk of Proton payments are conducted in the retail environment, such 'forced' adoption is no issue in our analysis.

A second contribution of the paper is that we have detailed controls for the effect of location. Controlling for location has been done earlier in U.S. studies on consumers' choice of payment instrument; see Stavins (2001), and Hayashi and Klee (2003). However, in both studies mentioned the only information on the geographic location of the respondents is their Census division. Our controls for location are less crude. We have ZIP codes for where respondents live, as well as ZIP codes for where they work. These ZIP codes allowed us to distinguish between richer and poorer communes, between urban regions and the countryside, etc. From separate sources - the Banksys database and the Belgian banks - we also have data on the number of POS terminals and ATMs per ZIP code. This allowed us to control more explicitly for supply-related factors.

Thirdly, we have also included in our analysis the propensity to adopt new technologies, in line with what has been done earlier - for other payment instruments - by Mantel (2000), Hayashi and

[3] Source: De Nederlandsche Bank, *Quarterly Bulletin*, March 2002, p. 25.

[4] In 2002, no less than half of these parking meter payments took place in the three cities with Chipknip-only parking (Source: De Nederlandsche Bank, Current developments in payments and securities transactions, *Quarterly Bulletin*, March 2003, p. 20).

[5] Source: Chipknip website at <http://www.chipknip.nl/>, visited on January 23, 2005.

Klee (2003), and Borzekowski and Kiser (2004). We have, among other things, constructed a 'technology index' based on respondents' use of PCs, the Internet, mobile phones, PDAs, and banking services via mobile phone. To the best of our knowledge, such an index has not yet been used in an analysis of the adoption of electronic money. In any case, the combination of demographic and financial characteristics, detailed supply-side factors, and new technology adoption in a single analysis is unique where e-money is concerned. In addition, with the exception of retailer cards, we are also able to gauge the impact of the cost of a payment instrument as perceived by consumers.

The remainder of this paper is structured as follows. Section 2 provides some background information on the Belgian payment system. Section 3 discusses the set-up of the survey and presents the data. Section 4 examines the results of our logit analyses. Section 5 compares our results with the existing literature, and Section 6 concludes.

2. Background on the Belgian payment system

If one uses the well-established distinction between giro countries, cheque countries, and cash countries, Belgium is a prime example of a giro country. Indeed, if one looks at the number of non-cash payments, the credit transfer is by far the most commonly used payment medium in Belgium. The use of cheques, which until 1992 were the second most frequently used cashless payment instrument, has been declining steadily as commercial banks gradually increased cheque fees. The death-blow came with the removal of the payment guarantee of the so-called eurocheque on 1 January 2002 [6]. Today, cheques have all but disappeared in Belgium (see below). As is the case for most countries, hard data on cash use in Belgium is not available. According to a study by De Grauwe et al. (1999), cash still accounted for 75% of retail payments in 1998, compared to a mere 9% for payment cards. Given the uptake in card usage documented below, the relative importance of cash payments is probably substantially lower today, although in terms of numbers cash is still believed to be the single most important means of payment at the POS.

Since our survey did not cover remote payments (see Section 3), Tables 1 and 2 only show data on the penetration and use of non-cash means of payment that can be used at the POS; that is, debit cards, credit cards, the Proton electronic purse, and cheques. Given that the Belgian population amounted to 10.3 million at end-2003, Table 1 shows a very high penetration of the Bancontact/Mister Cash debit card. Bancontact and Mister Cash are the names of the two ATM-EFTPOS networks - each of which was backed by different commercial banks - that merged in 1989 to form Banksys. As of that date, Banksys became the national EFTPOS operator, jointly

[6] In this system, merchants knew that all cheques would be honoured up to an amount of BEF 7,000 (roughly EUR 175), irrespective of whether the drawer's current account had sufficient cover.

owned by the majority of Belgian banks. The Belgian Post Office had a competing network, called Postomat, but this was much smaller and the network eventually disappeared in 2000. So, crucially, there is in Belgium today only one EFTPOS network and there are thus no interoperability problems whatsoever.

The Proton electronic purse saw the light of day on February 18, 1995. On that day, Banksys started a pilot in the cities of Louvain and Wavre. [The 30,000 Proton cards mentioned for 1995 in Table 1 were cards in circulation in these cities.] In May 1996, Banksys commenced expansion of the Proton network, making Belgium one of the first countries in the world where a reloadable intersector e-purse was launched on a nation-wide scale. By the end of 1997, the Proton infrastructure was in place in the 24 most important cities. One year later, the whole of Belgium was covered. Initially, the Proton card was only available as a stand-alone card. It was only at the turn of 1996-1997 that the Belgian banks started mounting the Proton application on their debit cards, which from that moment on where equipped with a chip. At first sight, Table 1 seems to show that the penetration of the Proton card approaches that of the Bancontact/Mister Cash debit card. However, as is stressed in Van Hove (2004, 2005) and as will be shown below, many Proton cards are in fact 'sleeping' cards. This is because from 1997 onwards, the Belgian banks simply sent account holders a combined debit/e-purse card when their old magstripe cards came up for renewal. Unsurprisingly, many of the unsolicited e-purses have remained unused. At end-2003, only some 2.1 out of the 8.8 million cards that carried a Proton application were in active use [7]. In July 2004, when our survey was held, the number of active Proton cards was close to 2 million – which corresponds to 20% of the Belgian population. In an international perspective, this is a high level; see Van Hove (2004, 2005). Finally, Table 1 shows that credit cards are far less common than debit cards in Belgium. Moreover, most cards with a credit function are of the delayed debit type. Consistent figures on retailer cards with a payment function are unavailable.

Table 2 presents data on non-cash payments in Belgium for the year 1995, and for 2000-2003. The top part shows the number of payments, the bottom part shows their value. In both parts, the left-hand panel gives absolute figures and the right-hand panel gives shares. Note that the shares do not sum up to 100 because we focus on payment media that can be used at the POS so that credit transfers, for example, are not included. This is particularly apparent in the bottom-right panel: in 2003, credit transfers accounted for no less than 98.8% of the total value of cashless transactions in Belgium. Starting with cheques, the volume figures in Table 2 illustrate nicely the gradual drop in their popularity, as well as the blow dealt – in 2002 – by the removal of the eurocheque guarantee. In terms of value, cheques have held their ground somewhat better because the small number of cheques that are still written – a theoretical average of 2.3 per Belgian per year – are for large-value

[7] Banksys considers a Proton card to be in active use when it has performed at least one transaction in the previous six months.

payments. As the bulk of these cheques are not written in shops, Table 2 demonstrates that debit cards are today the dominant non-cash payment medium at the POS. Table 2 also shows a substantial jump in e-purse usage between 2001 and 2002. This was due to the introduction of the physical euro on 1 January 2002. Unfamiliar as they were with the new coins and banknotes, no less than 700,000 Belgians joined the ranks of Proton users in January 2002 (Van Hove, 2004). However, as the 2003 figure in Table 2 already indicates – and as is documented in more detail in Van Hove (2005) – a large part of this 'euro effect' has since vanished. Finally, while the use of credit cards increased considerably between 1995 and 2000, their relative importance has remained fairly stable over the period 2000-2003. However, in recent years credit card usage has probably increased now that supermarkets have started accepting them.

Table 3 places Belgians' payment behaviour in an international perspective by looking at the number of transactions per capita in the countries listed in the CPSS 'Red Book' [8]. Starting again with cheques, the Table again shows their quasi-disappearance in Belgium, just as in Germany, the Netherlands, and Sweden. Table 3 also shows that while debit cards may be, as pointed out when discussing Table 2, the dominant non-cash payment medium at the POS in Belgium, their frequency of use is by no means exceptional internationally. Suffice it to refer to the figures for Canada, Sweden, and the Netherlands. This might be an indication of higher cash use in Belgium. Turning to e-purses, Belgium has the highest usage of all CPSS countries, barring Singapore. The entry for Singapore is not a typo. Rather, the high figure is due to the use of the ez-link card for public tranport and the use of the CashCard in the Electronic Road Pricing scheme - where it is compulsory. Finally, credit card use in Belgium is only a fraction of that in Anglo-Saxon countries.

3. The survey

As mentioned in the Introduction, on the occasion of its 15th birthday, Banksys commissioned a large-scale payments survey among Belgian consumers. The survey was conducted in July 2004. In total 1,008 respondents aged 15 and older were interviewed face-to-face in their homes during 30 to 40 minutes. Use was made of quota - on characteristics such as age, sex, education level, and language - in order to ensure that the sample was representative on a national scale. The field work was conducted by IPSOS Brussels; the scientific supervision was in the hands of the Centre for Work, Organisational and Economic Psychology (WOEPS), and the Centre for Economic, Monetary, and Financial Policy (ECON), both of the Vrije Universiteit Brussel (Free University of Brussels).

[8] Some caution is required when interpreting these figures as the definition of what constitutes a credit and a debit card may differ across countries. France and Germany are two salient cases.

In line with Banksys' core business, the survey focused on electronic means of payment used at the POS; namely, debit cards, credit cards, electronic purses, and (to a lesser extent) retailer cards. However, there were also a number of cash-related questions, as cash is probably still the dominant means of payment at the POS. As mentioned, cheques were not included in the survey because they have *de facto* almost disappeared (see Section 2).

On a first level, apart from the typical socio-demographic and financial characteristics, consumers were asked whether they had heard of the means of payment surveyed, whether they owned them, and, if so, how frequently they used them. On a second level, respondents were asked to score payment instruments on different criteria. Finally, there were also a number of future-oriented questions. The answers to the latter questions pointed out, for example, that 71% of users could live without their Bancontact/MisterCash debit card for one week at most. However, at the same time 67% of respondents indicated that even in an environment where literally all payments could be settled electronically, they would still continue to use (some) cash. In other words, while the majority of Belgians are keen debit card users, there is apparently still quite some resistance against the possible advent of the cashless society. In our logit analyses described in Section 4, we therefore wanted to find out which consumers own a specific electronic means of payment, which owners use it, which users use them frequently, and, finally, whether or not these 'segments' coincide with the demarcation between consumers who are 'afraid' of the cashless society and those who are not.

The model behind our logit analysis is similar to the one used – mostly implicitly – in the existing literature. Specifically, subject to appropriate budget and availability constraints, a consumer is assumed to adopt or use a payment instrument only if this increases her utility. As in Klee (2005, p. 9), it is assumed that utility is a function of income, age and other demographic characteristics. Following Mantel (2000) and Hayashi and Klee (2003), we also included new product adoption factors in our analysis, in line with the idea that some consumer segments are natural innovators and early adopters. Yet other papers emphasise that supply-side factors are also important. For example, the number of POS terminals may differ across regions. Given that payment card networks exhibit significant indirect network externalities - implying that the number of card users has a positive impact on the number of accepting merchants and *vice versa* - this is something that we have tried to control for. Other factors unfortunately remain unobserved. In Belgium, all banks offer the same debit card (Bancontact/Mister Cash) and electronic purse (Proton) in conjunction with a current account, as well as a comparable range of credit cards. There was thus no need to control for bank affiliation. However, not everyone may be offered a credit card. Also, several studies have shown that transaction characteristics also have an influence on payment choice [9].

[9] In a study for the Netherlands, Mot and Cramer (1992) control for the size of the payment, the type of commodity or service, and the place of purchase. Their results are not reported in this paper because they do not consider payment

However, since our survey was not set up as a budget survey, it did not ask respondents to report on individual transactions. Hence, we were unable to include transaction characteristics.

Table 4 provides an overview of all variables used. For ease of interpretation, the explanatory variables have been grouped into four broad categories: socio-demographic, financial, technology, and supply-side. The same categories are also used when reporting our results and when comparing them with those of earlier studies. In the category of *socio-demographic* variables, we questioned our respondents on the same aspects as earlier studies. Moreover, we added one aspect, namely language, since it is not impossible that cultural differences between the Dutch and French speaking part of Belgium have an influence on payment behaviour. In terms of financial characteristics, respondents were asked to indicate the class congruent with their *personal monthly income after taxes*. However, nearly 30% of our sample refused to answer. It thus appears that questions concerning the personal income level remain a sensitive issue in Belgium (see also Van Dam and Van den Bosch, 1997). Concerning *technology* use, respondents were asked to indicate – on a 6-point scale - their frequency of use of a mobile phone, a personal computer, the internet, a PDA and banking services via mobile phone. Based on this, we constructed a new variable by adding up the intensity-of-use responses across technologies (the range is thus between 5 and 30). This 'technology index' is meant to measure the degree of resistance to new technologies. However, in our analyses, we also wanted to determine the influence of separate technologies. To that end, we transformed the original (ordinal) intensity-of-use response format to a dummy-use format (see Table 4). Finally, there is the category of the *supply-side* variables. Inspired by earlier studies, we asked respondents for the ZIP code of their home as well as their place of work. Based on this, we were able to determine the corresponding region and province [10]. However, Stavins in her study for the U.S. explicitly regrets that "the only information on geographic location of the respondents is their Census division, *an area larger than that where network externalities are likely to exist"* (2001, p. 29; emphasis added). We therefore constructed several control variables for location that are less crude. Specifically, we were able to link the ZIP codes of our respondents to data on the median income level and density of communes available in databases from the Belgian National Institute for Statistics (see Table 4 for more details). Note that a commune typically has multiple ZIP codes. We were also able to compute the number of POS terminals and ATMs per ZIP code (based on information available in the Banksys database and obtained from the Belgian banks, respectively [11]). We also combined data from the databases mentioned to construct variables that measure the availability of ATMs (number of ATMs/km^2, number of ATMs/inhabitants).

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cards. This is because in 1987 debit cards did not yet exist in the Netherlands and credit card payments numbered less than 1% of the sample.

[10] The number of missing data for "Region work" and "Province work" is about 26%. At first sight, this may appear a rather large number, yet these missing data include respondents who are not working; cf. the variable 'employment': student (9.5%), unemployed (6.3%) and housewife/man (9.7%).

[11] Unfortunately, at this point in our analysis, the number of POS terminals refers to the total number of Bancontact/Mister Cash and Proton terminals per ZIP code. We still hope to find a way to separate these two types.

Besides the explanatory variables, Table 4 also outlines the predicted variables, i.e. the different types of *payment cards* and the *resistance to a cashless society*. Concerning the latter variable, we already mentioned that 67% of the respondents indicated that even in an environment where literally all payments could be settled electronically, they would still continue to use (some) cash. Concerning the former, the debit card is not only the best known (98%), but also the payment instrument with the highest penetration (89%) and use (86%) payment among our sample. Credit cards are also relatively well known (86%), but – in line with the statistics presented in Section 2 - their degree of penetration in terms of ownership (33%) and use (29%) is much lower. Still, credit cards are more popular than retailer cards, which appear to be known by 63% [12] of our sample, but owned and used by only some 15%. Finally, the reader will note that only 45% of the respondents indicated that they owned a Proton e-purse, whereas Table 1 shows that at end-2003 there were 8.8 million cards with a Proton application in circulation, corresponding to a theoretical penetration rate of some 85% of the Belgian population. In other words, e-purse ownership appears to be severely underestimated. Interestingly, a similar phenomenon has arisen in just about every survey on e-purses that we are aware of. In a survey conducted in Luxembourg in early 2001, 48% of respondents stated that they possessed a miniCASH e-purse (Colson and Havé, 2002, p. 11), whereas the (theoretical) penetration rate at that time was roughly 70%. In the 'payment card survey' commissioned by the Austrian central bank and conducted in the fourth quarter of 2001, ownership of the Quick e-purse was estimated to be 22%, whereas the actual figure was probably more than three times as high (Mooslechner et al., 2002, p. 96 and 98). The recent survey conducted by the Dutch central bank also suffers from the same problem (DNB, 2005; Jonker, 2005). The DNB points out that "in reality, the share of prepaid card owners in the Dutch population is about 2/3" (o.c., p. 56). Yet, only 55% of the respondents attested to having one. Both the Austrian and Dutch central bank think that the explanation lies in a lack of awareness; cf. "many consumers are unaware that their debit card can double as a prepaid card" (ibidem). However, in our survey, there is reason to assume that even consumers who were aware of the hybrid nature of their payment card may have answered 'no' when asked whether they owned a Proton e-purse. Indeed, in this specific case the concepts of 'ownership' and 'adoption' are vague. As explained in Section 2, Belgian banks have typically provided all their debit card holders with a card that also contains the Proton e-purse application. However, the latter application is only activated when the card is loaded a first time. It is also only upon activation that the annual fee (of up to 5 euro) for the use of Proton becomes due. To complicate matters further, some banks do not charge this annual fee for specific consumer segments. Also, many Belgians have a so-called package account that bundles current account management with the use of one or more payment

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The number of ATMs, for its part, only refers to the ATMs that are operated by Banksys and are open to all holders of a debit card. It does not include the so-called 'private' ATMs, self-service terminals owned by an individual bank that are typically located in the lobby of bank branches and can only be used by customers of that bank.

[12] We suspect that a substantial part of the respondents who indicated that they had heard of a retailer card in fact might have confused a retailer card that can be used for payments at the POS with a simple loyalty card issued by retailers.

cards. As a result, a consumer who knew that her debit card carried a Proton e-purse may nevertheless have denied 'owning' one because she had never activated it (and had thus never paid for it). At the same time, the holder of a package account may have answered 'yes' even though he too had never loaded his e-purse, simply because he knew that the e-purse application resided on his card and could be activated at any moment at no additional cost to him. The bottom line is that our results concerning e-purse ownership should be interpreted with caution. With hindsight, we should perhaps have asked respondents whether they had *activated* their Proton e-purse.

4. Results of logit analyses

In order to analyse several models composed of the explanatory and predicted variables mentioned in the previous Section (see also Table 4), we performed binary logit as well as ordinal logit regression analyses using the statistical package SPSS13. More specifically, when assessing which variables determine whether respondents know, possess and use a specific payment card, and whether they are 'afraid' of the cashless society, we made use of binary logit regression analyses. When assessing which variables determine the intensity of use (i.e. "type of user"), we made use of ordinal logit regression analyses.

To prepare our logit analyses, we first calculated the correlations among all explanatory variables as well as the correlations between the explanatory and predicted variables. Whereas a high correlation is desired in the latter case, this is not desirable in the former as it is an indication of multicollinearity. For our data-set, it turned out that some supply-side variables demonstrated multicollinearity: the number of POS terminals and ATMs were highly related to each other as well as to the number of ATMs/km^2 and the number of ATMs/inhabitants. As these variables are based on comparable measures (and were constructed as alternatives), a high correlation is only logical. We obviously avoided using them together in a single model. Furthermore, we also did not incorporate explanatory variables having a non-significant correlation with the predicted variables. In a second step, we performed a logit analysis for the remaining explanatory variables. Accordingly, we only used the significant ones to build the general models. To do so, we started with continuous explanatory variables followed by the ordinal and dummy ones. During this process, explanatory variables which became insignificant were eliminated from the model. Eventually, we obtained a model with a good fit (i.e., a significant chi square) and which only retained explanatory variables that have a significant effect on the predicted variable.

Tables 5 to Table 9 display the regression models for each predicted variable. For each variable we present two alternative models: a model I where we introduce the technologies separately, and a model II where we use our index of 'technology fear'. For all binary logit regression models (see above), we report the estimates and the standard errors of each explanatory variable as well as the

marginal effects. The latter coefficients are easier to interpret than the usual logit parameters (i.e., estimates) as they indicate the change of probabilities in percentage points upon a change of the explanatory variables by one unit. For the ordinal logit regression model (i.e., "type of user"), however, it is not necessary to calculate marginal effects as the estimates are easy to interpret. Moreover, it even appears unadvisable to calculate marginal effects for ordinal logit regression models as they complicate model-understanding (see e.g. Boes and Winkelmann, 2005).

In the following subsections, the results of the logit analyses are presented. First, we outline the results for each type payment card, followed by an alternative look at the same results. Finally, we describe the logit models explaining the fear for a cashless society and as well as a number of additional results that are not displayed in the Tables, i.e. the influence of the (perceived) cost of the payment instruments.

4.1. Debit cards (see Table 5)

Concerning the socio-demographic variables, it appears that *age* has a negative influence in practically all logit models: older persons have heard less of the debit card, and they possess and use it less. If they use a debit card, they are a less intensive user. *Sex, education* and *household size* only have an influence on the use and intensity of use of the debit card: women, higher educated persons and persons living in larger families are more prone to use debit cards and to use them more intensively. Finally, *employment* mainly has an influence on the intensity of debit card use: students use it significantly less intensively compared to the other categories. It also has an influence on the possession of a debit card, but only in model I.

Income mainly has an influence on the (intensity of) use of a debit card, although it also influences the possession of a debit card in model II. In general, persons with a high income use debit cards more and also more intensively. An interesting finding here is that the result for respondents who refused to answer the income-question is similar to that for respondents with a higher income. This might indicate that higher income persons were more inclined to refuse to answer the income-question.

With regard to *technology*, it appears from model I that use of a mobile phone and the internet has a positive impact on the possession of a debit card. Furthermore, use of a debit card and its intensity of use are also influenced by the use of a mobile phone. Congruent with these results, model II shows that the technology index also has a major influence on the possession of a debit card, on its use and its intensity of use: persons showing a lower propensity to adopt new technologies are less likely to own and use a debit card. When they do use one, they are less frequent users.

Of all the *supply-side* variables used in our study, only two turned out to be influential. For one, the region where the respondent lives has an effect on debit card awareness: consumers living in Flanders have heard significantly less of the Bancontact/Mister Cash card. Furthermore, the number of ATMs/inhabitants in the commune where the respondent lives has a negative effect on the possession and use of a debit card: a larger number of ATMs/inhabitants corresponds with lower debit card ownership and use. The explanation might be that since most Banksys ATMs are integrated in the outside wall of a bank branch, the variable in a way also captures the availability of *human* tellers.

4.2. Credit cards (see Table 6)

As for the socio-demographic variables, only *language* and *education* have an influence on the awareness of credit cards: Dutch speaking persons have heard significantly less of credit cards as well as less educated persons. *Education* has an significant negative effect on credit card ownership, use and intensity of use. Finally, *employment* also has an effect: ownership and use of a credit card as well as a high intensity of credit card use is most common among managers and the self-employed and – rather surprisingly – also among retired persons.

Income has an influence on all predicted aspects of a credit card: in general, a higher income is correlated with a higher awareness of credit cards, credit card ownership, credit card use as well as intensity of use.

Overall, our *technology* variables appear to have no effect on whether respondents have heard of credit cards. However, use of the internet as well as our index for 'technology fear' do have an influence on credit card ownership, use and intensity of use: all these metrics are higher for internet-users and lower for persons showing a lower propensity to adopt new technologies. Finally, use of a personal computer and a PDA has a positive influence on the intensity of credit card use.

Again, most *supply-side* variables turned out to have no significant impact. Only the number of ATMs/inhabitants in the commune where the respondent lives has a negative influence on whether the respondent has heard of a credit card.

4.3. Electronic purses (see Table 7)

With regard to the socio-demographic variables, only *age* has an impact on all predicted aspects of the e-purse: older persons are significantly less aware of the existence of the e-purse. They also possess it less, use it less and if they used, they are less intensive users. *Education* mainly has an impact on e-purse use and its intensity of use, although it also has an influence on e-purse

ownership in model I. In general, a higher level of education is related to a higher and a more intense use of the e-purse.

Income has no impact on any of the predicted aspects of the e-purse, but our technology variables have: persons showing resistance to new technologies are less likely to own an e-purse; they are less likely to use it and typically use it less intensively. Also, use of a personal computer has a positive influence on e-purse awareness, while use of banking services via mobile phone has a positive influence on e-purse ownership and use.

Finally, concerning the *supply-side* variables, the province where the respondent lives has an effect on e-purse ownership: when compared to persons living in Hainaut, persons living in Flemish Brabant, Antwerp and Limburg more often own an e-purse. Finally, the number of ATMs/km^2 of the commune where the respondent lives shows a negative influence on e-purse ownership and use.

4.4. Retailer cards (see Table 8)

For the socio-demographic variables, *sex* mainly has an influence on the use of retailer cards and on its intensity of use: women use retailer cards more and more intensively. *Education* has a positive influence both on the awareness of retailer cards and on the intensity of use. *Employment* and *household size* have an impact on retailer card ownership, use and intensity of use: whereas our results for employment are not very clear-cut, it appears that a one person-family is more prone to own and use a retailer card as well as to use it more intensively.

Income only has a positive influence on the intensity of retailer card use, whereas *technology* has no influence on any of the predicted aspect of retailer cards.

Finally, unlike for other payment cards, several *supply-side* variables prove to have a significant influence. The province where the respondent lives has an influence on awareness, ownership and intensity of use: consumers living in the provinces situated in the Dutch speaking part of Belgium are in general less aware of the existence of retailer cards; they are also less likely to own and use one. Furthermore, the number of ATMs/inhabitants of the commune where the respondent lives has a negative influence on awareness. Finally, the number of ATMs/km^2 of the commune where the respondent lives has a negative impact on the intensity of retailer card use.

4.5. An alternative look at our results: Know, Possess, Use and Type of user

In the previous subsection, we presented our results payment instrument per payment instrument. In this heading, we interpret the same results but with a focus on the 'levels' in our analysis: awareness, adoption, use, and intensity of use:

Know: it is difficult to say which of the four categories of our explanatory variables has a major influence on awareness. The results vary from one payment instrument to another;

Possess: ownership of a payment card appears to be mainly determined by employment and income. Our technology index also has a large impact, whereas the impact of separate technologies is less clear-cut. The influence of supply-side variables varies;

Use: use appears to be mainly determined by education and to a lesser degree by sex and employment. Income also has an important influence. Again, the technology index has an important effect, whereas the impact of the separate technologies is again less clear-cut. Finally, the impact of the supply-side variables varies;

Type of user: the intensity of use of a payment instrument appears to be mainly determined by education, employment and income and to a lesser degree by age. For technology, the technology index again has a major influence on the intensity of use, and to a certain extent also the use of a mobile phone. Finally, for the supply side variables, again little can offered in terms of general remarks.

4.6. Resistance to the a cashless society and the cost of payment instruments

Table 9 displays the variables that best explain the resistance to a cashless society. Of the socio-demographic variables, only *employment* has an influence: particularly the self-employed are more resistant to the cashless society. *Income* appears to have no impact, while *technology* does: persons using a mobile phone are less resistant to a cashless society, while persons who have a resistance to new technologies are also more likely to cling to good old cash. Finally, of the *supply-side* variables, only the number of ATMs/km^2 of the commune where the respondent lives shows a negative influence, meaning that persons who live in a commune with a greater availability of ATMs have a lower resistance to a cashless society.

To end the overview of our results, we also briefly mention a number of results concerning the (perceived) cost of a payment instrument. As mentioned in section 3, in our survey respondents were asked to score payment instruments on different criteria by means of Likert scales. All

respondents had to do this for cash plus for one additional payment instrument, excluding retailer cards (based on quota). As a result, we only have values for the perceived cost of debit cards, credit cards and e-purses for roughly one third of our sample. Hence, we could not incorporate these explanatory variables in the above logit analyses for the total sample. The results are nevertheless of interest.

In general, the *cost of cash* has little influence. Only for the possession and use of a credit card there is an impact: persons who consider cash as expensive are less inclined to own and use a credit card. For *debit and credit cards*, we found no significant impact at all of their (perceived) cost. However, the *cost of the e-purse* has an influence on its possession and use: persons who consider an e-purse as expensive are significantly less prone to own and use it. Intensity of use though, seems not to be influenced by the cost of an e-purse. This makes sense because, as is explained in Section 3, there is only a fixed cost: an annual fee of up to 5 euro.

5. Comparison of results

This Section compares our results with those of earlier studies. In an attempt to do this in a systematic way, we have summarised both our results and those of other authors in three tables; one per payment instrument, see Tables 10, 11, and 12. In the Tables, explanatory variables are listed in the columns, subdivided in the four categories that have also been used in previous Sections. Horizontally, a distinction is made between ownership, use, and frequency of use of the respective payment instrument. Within each 'level', studies are listed chronologically (based on the year of the survey, as opposed to the year of publication of the paper). For each study, the first column indicates in a condensed manner the dependent variable (e.g., "owner (y/n)"), as well as the country and year of the survey (e.g., "AT, 2001" - for Austria, 2001). For the U.S., it is also indicated which of the studies make use of SCF data. This highlights that a number of studies use the same data set. The 1998 SCF data are even analysed in three distinct studies (Stavins, 2001; Hayashi and Klee, 2003; Klee, 2005). As will be shown below, some of the outcomes are nevertheless different [13]. The final column of our Tables gives the reference.

A number of caveats are in order concerning the Tables. First, the list of explanatory variables is not necessarily comprehensive. That is, the authors may have included additional variables in their regressions [14]. The tables only list those variables for which our regressions provide a point of comparison. Second, the studies are not always fully comparable. For example, the methods used

[13] Conversely, Klee (2005) is the only one to analyse adoption patterns through time. To that end, she uses data from the 1995, 1998 and 2001 waves of the SCF. She finds that "while the income and demographic characteristics that are correlated with use and holdings differs according to payment instrument, the characteristics that are correlated with each payment instrument are remarkably consistent over time, for a wide range of payment instruments" (o.c., p. 9).

[14] For example, Klee (2005) also includes the number of years the head of family worked for his or her current employer.

may differ. Most of the studies listed make use of either logit or probit analysis, but there are exceptions. Some rely on univariate correlations (HBD, 2002), some early studies even simply present descriptive results (Avery et al., 1986; Virén, 1994). The unit of observation may also differ. For example, the unit of observation in the American SCF is the household, in our survey it is the respondent. As a result, in the U.S. studies that rely on SCF data, 'sex' and 'age' refer to characteristics of the head of the household [15]. The analysis by Borzekowski and Kiser (2004) is even situated on the level of states in the U.S., so that their results should be interpreted as, for example, 'states with a higher share of Internet users show a higher frequency of use of debit cards' (see Table 10).

A third caveat is that a given concept, such as 'occupational status', may have been operationalised differently. In order to avoid ending up with completely unwieldy tables, such divergent operational variables have in several cases nevertheless been placed in the same column, at the cost of lower comparability. For example, the column that we have labeled 'employment' regroups results obtained for dummies on whether the respondent (or head of family) is self-employed, as well as results obtained for dummies that simply capture whether the respondent has a job or not. In the tables this is indicated in small print below the plus and minus signs. Other columns for which this approach was followed are 'technology' (where different studies test different innovations), and 'urban' (major city or not, rural/non-rural). Finally, the small print below the plus and minus signs is also used to clarify what the baseline is for the variable. For example, in the column labeled 'sex', a minus sign always indicates that women are less likely to adopt or use, but for the sake of clarity this is always repeated explicitly.

5.1. Debit cards

Starting our comparison with debit cards (in Table 10), it can first of all be noted that *sex* apparently has no significant impact on ownership. On this point our results for Belgium are in line with those for Austria and the Netherlands. However, the results concerning the link between sex and debit card use differ across countries. All U.S. studies find no impact, whereas Jonker (2005) for the Netherlands and the present paper for Belgium find that women have a higher probability of being a (frequent) user of debit cards [16]. Interestingly, in an older study for the Netherlands - which does not consider payment cards - Mot and Cramer (1992) notice that the strong univariate finding that women pay more in cash largely disappears in their multivariate analysis in which they control for the size and nature of the payment as well as the place of purchase. Mot and Cramer (o.c., p. 496) point out that women typically pay smaller amounts, pay more often in shops and have less full-

[15] Also, Hayashi and Klee (2003, p. 180, note 15) point out that if a household in the SCF has both a male and a female, it is coded as a male headed household.

[16] Virén (1994) finds the opposite, but this is an older study. It also relies on univariate correlations.

time jobs than men. These are all factors that encourage the use of cash, according to their logit analysis. Their conclusion is therefore that "it would seem that the influence of gender reflects the influence of the division of labour within households, in which women bear a smaller share of the paid and a larger share of the unpaid work, such as shopping" (ibidem) [17].

Turning to *age*, it is striking that all U.S. studies find a significant negative impact, as do we for Belgium (except in one of the two models for ownership). For Austria, Mooslechner et al. (2002) also find a negative relationship between age and debit card ownership. This contrasts with the results for Finland and particularly the Netherlands. Jonker (2005, p. 12) points out that "age does not seem to play a role in choosing the debit card to pay with. In contrast to e-purses, debit cards have come into general use across all age groups". It is tempting to link the difference in results between the U.S., Belgium, and Austria on the one hand and Finland and the Netherlands on the other to differences in 'maturity' of the payment product. Indeed, debit cards are a relatively new phenomenon in the U.S. In Belgium, debit cards have been around for quite some time, but - as noted in Section 2 - their frequency of use is by no means exceptional in an international perspective, with 53.5 transactions per capita per year (see Table 3). This holds *a fortiori* for Austria, with a frequency of 19.5. This compares with figures of 71.2 for the Netherlands (see Table 3) and 79.6 for Finland [18]. The fact that in our regressions for Belgium the marginal effect of age is low can also be framed in this product life-cycle perspective.

At the level of debit card ownership, we find no significant impact of *education*, as does an earlier study for the Netherlands (HBD, 2002). Mooslechner et al. (2002), on the other hand, find a significant positive impact. At the levels of use and frequent use, the impact of education is straightforward: a high school or college degree increases the probability. There is only one study that finds no impact, namely Hayashi and Klee (2003). However, it has to be stressed that for this part of their study Hayashi and Klee do not use SCF data but a different sample of U.S. consumers "drawn primarily from users of the Internet" (o.c., p. 176) [19]. They also explicitly control for the propensity to adopt new technologies. It is interesting to note that in our regressions, the significance of the education variable drops when our index for 'technology fear' is included (in model II). The same is true in our regressions for e-purses (see Table 12). At the level of ownership, the variable is even no longer significant. This may be due to the fact that the technology index as a continuous variable interferes with education as an ordinal variable. The

[17] Af first sight, this explanation seems to clash with Jonker's finding that women have a lower probability of being a frequent e-purse user (see Table 12). However, the latter result may be due to the specific nature of Chipknip usage (see Section 1), with a predominance of payments for parking and in cafeterias of companies.

[18] All figures relate to 2003. The figures for Austria and Finland are not included in Table 3 and were calculated based on data taken from the ECB 'Blue Book', August 2005.

[19] Tellingly, about 70 per cent of the respondents in the sample used the Internet to purchase goods, while the national average at that time was only 19 per cent (o.c., p. 178).

former may also incorporate the latter as it is likely that higher educated persons have a lower resistance to new technologies.

In U.S. studies, *household size* - when included - has no impact on debit card use. We find for Belgium that the larger the household, the higher the probability that the respondent is a frequent user. Our results concerning the distinction between users and non-users are less clear-cut: households with 2 or 3 persons are more likely to be debit cards users than singles, but above that level the relationship breaks down. Concerning *occupational status,* Mooslechner et al. (2002) for Austria and Stavins (2001) for the U.S. find that having a job increases the probability of having, c.q. using a debit card. Klee (2005) finds that the self-employed in the U.S. are less likely to use a debit card. Our results for Belgium are less clear-cut: we find a positive correlation between having a job and owning a debit card in one of our models, but we find no significant impact on the probability of using the card, and hard-to-interpret results at the level of user types. However, in line with Jonker (2005) for the Netherlands we find that *students* are less likely to be frequent debit card users.

There is some variance in the results for *income*. At the level of ownership, Mooslechner et al. (2002) find no effect, as do we in one of our models. At the level of use as well as the level of frequent use, the majority of the studies, including ours, find a significant positive impact. There are, however, exceptions: Kennickell and Kwast (1997) and Stavins (2001) find no effect, Borzekowski and Kiser (2004) even find a negative effect. This diversity is all the more remarkable since, as pointed out at the beginning of this Section, some of the U.S. studies use the same data set. For one, Kennickell and Kwast (1997) and Klee (2005) both use 1995 SCF data (and rely on probit analysis). At first sight, the absence of a significant impact of income in the first study might be due to the fact that Kennickell and Kwast use a 1 per cent level of statistical significance. However, they stress that "none of the reported insignificant variables would be reclassified even if the significance level were increased to 10 percent" (o.c., p. 12, note 20). The difference in results might be due to a different set of explanatory variables. Specifically, Klee has a dummy for self-employed that is not present in the first study. Turning to the studies that use the 1998 SCF data, Stavins (2001) finds no significant impact of income, while Hayashi and Klee (2003) and Klee (2005) do. However, an important difference is that Stavins simply uses the respondent's annual household income, while Hayashi and Klee split up the observations into 5 categories, and Klee uses the log of family income. Finally, Borzekowski and Kiser (2004) argue that the "negative although not highly significant variable on per-capita income is consistent with higher-income consumers having more payment options, and, in particular, better access to credit" (o.c., p. 17). However, as pointed out earlier, their results should not be interpreted on an individual level. By using the per-capita income at the state level, Borzekowski and Kiser in fact simply make a distinction between richer and poorer states.

Turning to *technology*, our results for Belgium confirm Hayashi and Klee's (2003) earlier finding for the U.S. that a consumer's use of new technologies is a significant predictor of electronic payment use. The results of Borzekowski and Kiser go in the same direction but, again, have to be interpreted on the level of states. Finally, where the *supply-side* factors are concerned, it is striking that - unlike Stavins (2001) and Hayashi and Klee (2003) for the U.S., and Jonker (2005) for the Netherlands - none of our regressions indicate an impact of location (as measured by the province of residence). We do, however, find a significant impact of the availability of ATMs (see Section 4).

5.2. Credit cards

Table 11 tries to summarise the existing empirical evidence on credit card ownership, c.q. use. Starting again with *sex*, somewhat to our surprise, we find no significant impact in any or our regressions on any of the levels. Apart from Belgium, the general picture is that in the U.S. - at least in recent years - sex has no impact on either ownership or use of a credit card; see Stavins (2001) and Klee (2005). Outside of the U.S., studies typically find that women have a lower probability of owning/using/frequently using a credit card; see Mooslechner et al. (2002) for Austria/Virén (1994) for Finland/Jonker (2005) for the Netherlands.

Where the impact of *age* is concerned, it is again useful to make a distinction between the U.S. and other (i.e., European) countries. For the U.S., at the level of ownership, the earlier studies either find no clear-cut results or a positive link, with families with heads in the 55-64 and 65-74 categories having a higher probability of owning a credit card. In later years, this link is no longer significant; see the results obtained by Klee (2005) for 1998 and 2001. Where credit card use is concerned, Stavins (2001) finds a significant positive impact with 1998 data. For European countries, the results vary. Mooslechner et al. (2002) and Jonker (2005) find negative impact - for ownership in Austria and frequent use in the Netherlands, respectively. We find no significant impact at all, just like Virén (1994) for credit card use in Finland.

Turning to *education*, the results are even more straightforward than in the case of debit cards: the vast majority of studies find a positive impact. The exception is Jonker (2005) for the Netherlands. Jonker finds no significant link between an individual's level of education and whether that person is a frequent credit card user or not.

When included, U.S. studies find that *household size* has a negative impact on both credit card ownership and use. We find no such effects for Belgium. Predictably, most studies find that being part of the *labour force* is positively linked with owning and using a credit card. However, at the level of frequent use, Jonker (2005) finds no such link for the Netherlands. Our results are again

difficult to summarise because we have several categories (as opposed to a simple dummy variable) and also because 'student' is the reference (rather than 'unemployed'). However, overall we do find that occupational status has a significant impact. One level down, managers and the self-employed are the categories that are most likely to be heavy users of credit cards.

As noted above, the majority of the studies find a significant positive impact of income on (frequent) use of debit cards. There were, however, exceptions. For credit cards, there appears to be little doubt: there is a positive impact, no matter how measured, no matter what country and no matter what level, including ownership.

Finally, we again find a clear link between a consumer's use of *new technologies* and her use of payment cards. The results for the *supply-side* are also similar. The only differences are the additional evidence provided by Duca and Whitesell (1995) and Avery at al. (1986), and the fact that Jonker (2005) now does not find that the type of village, c.q. city has a significant impact.

5.2. Electronic purses

As becomes evident from Table 12, the body of empirical evidence on e-purses is still limited. However, the available studies by and large appear to go in the same direction: no significant result for *sex*, *occupational status* or *income*, a positive impact of the level of *education*, and a negative impact of *age*. However, the results obtained by Jonker (2005) are different on a number of points. Jonker's result for age is less dissimilar than the question mark in the table might indicate: she does find, for example, that people in the 25-34 age bracket are more often a frequent e-purse user than the elderly (the reference group). However, the question mark is there because for people in the youngest age group (15-24) she finds a negative (albeit not significant) coefficient. Jonker's results regarding sex and income are more dissimilar: she finds that men and people in the higher income categories are relatively intensive e-purse users. Perhaps this is related with the type of payments for which the Chipknip is predominantly used (see above).

6. Conclusions

A first important observation is that our results are robust, in three respects. For one, except perhaps in one case, all variables have the expected sign. Secondly, whether new technologies are considered separately (model I) or condensed in a technology index (model II) does not in the vast majority of cases affect the significance of the other variables [20]. Thirdly, our results are also consistent when analysed per type of payment instrument. For credit cards, the same factors

[20] There are only two exceptions: on the level of e-purse ownership the impact of education disappears in model II, and age and income have a significant impact on debit card ownership in model II, but not in model I.

(education, occupational status, income and propensity to adopt new technologies) prove to be important at the level of ownership, use as well as intensity of use. This is also true for e-purses, albeit with a different set of explanatory variables: age, education, and technology adoption prove significant on all three levels. Interestingly, for debit cards, we find the same set of variables for use and intensity of use (sex, age, education, income, and technology adoption), but the determinants of ownership are different (sex and education disappear altogether, age and income are only significant in one of the two models, and occupational status now plays a role, as does the availability of ATMs). It is tempting to link this with the fact that in Belgium debit cards are far more pervasive than credit cards and (activated) e-purses.

If one looks at our results per explanatory variable, a first finding is that *sex* is not a significant factor in any of our regressions for credit cards or e-purses, and also not at the level of awareness and ownership in the case of debit cards. However, women are more likely to be (frequent) users of debit cards. As pointed out in Section 5, this might reflect that women do a larger share of the shopping [21]. As expected, *age* has a negative impact in all our regressions for the e-purse (even at the level of awareness) and in most of our regressions for the debit card (not for awareness, and not in model I for ownership). On the other hand, somewhat surprisingly, we find no significant impact of age in our regressions for credit cards. Our results for *education* appear plausible. For the debit card or the e-purse, we mostly find no significant impact at the two 'lowest' levels of our analysis (awareness and ownership [22]); for the two 'higher' levels we find the expected positive impact. The latter is also true for all four levels in our credit card regressions. Unsurprisingly, occupational status matters for credit card ownership (as well as use and intensity of use). Our regressions indicate that it also matters for debit card ownership, but not for debit card use, nor at any of the levels in our e-purse regressions. Interestingly, the type of profession proves to be an important determinant of the degree of resistance against the cashless society, with the self-employed showing the highest preference for cash. There are also some less significant results for other categories. Where the self-employed are concerned, our finding probably reflects the fact that they still receive relatively large amounts of cash. Related to this, their fear for the cashless society might also be linked to tax evasion behaviour.

Moving from socio-demographic to financial characteristics, *income* always has the expected sign but its impact differs – in a logical way - across payment instruments. For credit cards, income proves important at almost all levels (even in one of the models for awareness). Income is already somewhat less important for debit cards, in the sense that awareness is not influenced, and

[21] This raises the question why this does not also appear in our regressions for the e-purse. However, debit cards and e-purse are used in different places (for example, supermarkets vs. newspaper shops or bakeries), and thus for different types of goods. Perhaps the work division between men and women is less marked for the type of payments for which e-purses can be used.

[22] Education has a significant impact on ownership in one of the two models for the e-purse.

ownership only in one of our two models. Finally, income has no significant impact in any of our regressions for the e-purse. The logic behind these results might be that the lower the average value of a typical payment for a payment instrument, the less important income becomes as a determinant of payment behaviour.

As already pointed out, whether *new technologies* are considered separately or together in an index does usually not affect the significance of the other variables. Also, in our regressions, if an individual technology gives a significant result in model I, so will the index in model II. Stronger still, we find significant effects in literally all our regressions, except – and this is in itself also interesting – for retailer cards. However, in model I the type of technology that gives significant results differs from one payment instrument to another. Perhaps we are reading too much into our results, but there seems to be a pattern in this. If one accepts that in Belgium today the e-purse is the most 'innovative' payment technology, followed by credit cards and then debit cards [23], and if one uses the degree of penetration of the other technologies as reported in Table 4 to rank them in descending order of innovativeness (PDA, mobile banking, internet, PC, mobile phone), then it is striking that mobile phone use gives a significant result for the debit card, Internet use for credit cards, and mobile banking for the e-purse. In other words, given that 89 per cent of our sample owns a debit card, and 81 per cent uses a mobile phone, it is tempting to conclude that the non-adopters and non-users of debit cards are a 'hard core' of consumers who either have no access to, are unable to handle or outright refuse to adopt just about any technological innovation. In the same line of reasoning, given that only 31 per cent of our sample uses an e-purse, it is not surprising that one needs a more innovative technology to separate the users from the majority of non-users. The fact that it is again the mobile phone that separates those who 'fear' the cashless society (33.2 per cent of our sample) from those who do not (66.8 per cent), also fits in this hypothesis.

Our results concerning the *supply-side* factors are so far somewhat disappointing: we basically only find significant results for the availability of Banksys ATMs in the municipality where the respondent lives (either measured per km^2 or per 1,000 inhabitants). For debit cards, we find that the higher this number of ATMs, the lower the probability that the respondent has a debit card. The explanation might be that since most Banksys ATMs are integrated in the outside wall of a bank branch, the variable in a way also captures the availability of *human* tellers. The fact that the availability of ATMs has no significant impact on debit card use (for payments, not for withdrawing cash) seems only normal. If anything, one would expect an impact of the number of POS terminals here. For credit cards, the availability of ATMs has no effect on either adoption or usage – which is again only logical. It does, however, have an impact on consumers' awareness of credit cards. Again the explanation might be that the variable captures the presence of banks more than anything else. Interestingly, for the e-purse, the number of ATMs does have an impact – and a negative one

[23] The argument here is that in Belgium it has taken credit cards longer to enter mainstream use.

– on both ownership and use. For this variable we had no a priori expectations concerning its sign since an ATM can be used both to load a Proton card and withdraw cash. The negative sign seems to indicate that the availability of cash dominates. Finally, we also find that the higher the number of Banksys ATMs, the lower the resistance against the cashless society. We have as yet no good explanation for this finding.

Instead of looking at our results per explanatory variable, as we have just done, it is also interesting to analyse them per 'level'. From this angle, it is interesting to repeat that for credit cards and the e-purse the set of factors that yield significant results - although different between the two payment instruments – is identical across the levels of ownership, use as well as intensity of use. In both cases, the factors that determine awareness are different from those at higher levels. For the debit card, we only find the same set of variables for use and intensity of use, not for ownership (nor awareness). If one focuses on the level of awareness, it is interesting that age plays a role for the debit card and the e-purse, but not for credit cards. Conversely, education, income and even supply-side factors matter for credit card awareness, but not for the debit card and the e-purse. PC users are also more aware of Proton than others.

Finally, if one compares our results with the existing literature, one can say that our results for the demographic and financial characteristics are mostly in line with the 'conventional wisdom' on the adoption of electronic payment instruments. There are, however, a number of exceptions. Our results furthermore confirm Hayashi and Klee's (2003) finding that the adoption of other new technologies is a significant predictor of electronic payment adoption and usage. One could even say that our results strengthen their finding because we are the first to demonstrate it for e-purses, as well as for the resistance against the cashless society. We also find a logical correlation between the innovativeness of the payment instrument and the predictor. This said, our results for the supply-side factors are somewhat disappointing so far, but we still hope to find ways to improve them.

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Table 1 – Number of payment cards in circulation (at year-end, in thousands)

	1995	2000	2001	2002	2003
Bancontact/Mister Cash debit cards	6,715	8,371	9,423	9,914	10,448
Proton cards	30	8,396	8,543	8,271	8,803
Credit cards	2,271	2,746	2,809	2,805	2,838

Sources: Belgian Bankers Association, Banksys.

Table 2 – Non-cash payments in Belgium

	1995	2000	2001	2002	2003	1995	2000	2001	2002	2003
	Number of payments (in millions)					*Share of payments*				
debit cards	184.5	379.7	432.1	505.3	542.8	16.7	27.0	27.6	29.4	31.6
credit cards	28.5	53.8	60.8	57.1	68.7	2.6	3.8	3.9	3.3	4.0
e-purses	0.7	51.3	60.5	120.8	107.1	0.1	3.6	3.9	7.0	6.2
cheques	117.1	70.7	60.1	28.9	23.7	10.6	5.0	3.8	1.7	1.4
	Value of payments (in billions of euro)					*Share of payments*				
debit cards	8.9	19.3	21.7	25.0	27.1	0.1	0.1	0.1	0.2	0.2
credit cards	2.2	5.5	6.6	6.1	7.3	0.0	0.0	0.0	0.0	0.1
e-purses	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cheques	304.6	86.8	98.8	99.3	86.4	3.3	0.5	0.6	0.7	0.6

Sources: CPSS, 'Red Book', various issues, complemented with Banksys data. The latter were used to split up the CPSS debit/credit card figures for 1995.

Table 3 – International comparison of payment media use, 2003
(number of transactions per inhabitant)

	debit cards	credit cards	e-purses	cheques
Belgium	53.2	6.6	10.3	2.3
Canada	81.7	51.7	nav	45.7
France	70.6	nav	0.3	63.9
Germany	20.2	7.1	0.5	1.6
Hong Kong	nav	nav	nav	18.3
Italy	10.5	6.4	neg	8.7
Japan	0.1	19.9	nav	1.3
Netherlands	71.2	2.7	6.7	neg
Singapore	25.3	nav	367	20.9
Sweden	74.6	9.9	neg	neg
Switzerland	33.1	11	2.6	64.6
United Kingdom	56.7	43.8	nav	91.1
United States	63.4	62.9	nav	126.1
CPSS average	**44.5**	**37.2**	**7.3**	**59.3**

Source: CPSS, *'Red Book'*, March 2005.

Table 4 – Variable definitions and summary statistics

Variable	Description	Percentage of total sample (n= 1,008)
Socio-demographic		
Sex		
Female	Equals 1 if respondent is male.	52.6
Male	Equals 2 if respondent is female.	47.4
Age		
15-25	Indicates respondent is between 15-25 years old.	14.5
26-35	Indicates respondent is between 26-35 years old.	18.4
36-45	Indicates respondent is between 36-45 years old.	17.5
46-55	Indicates respondent is between 46-55 years old.	17.7
56-65	Indicates respondent is between 56-65 years old.	12.7
66+	Indicates respondent is over 66 years old.	19.3
	Note: For our analyses we have used "Age" as a continuous variable which has a mean = 47.308 and St. Dev. = 17.802.	
Language		
Dutch	Indicates respondent's mother tongue is Dutch.	52.4
French	Indicates respondent's mother tongue is French.	47.6
Education	Indicates respondent's highest attained education level.	
Primary school		17.6
Lower secondary school		24.8
Higher secondary school		33.3
Higher education – non university		17.2
University degree		7.1
Household size		
1 person	Indicates respondent lives on his/her own.	22.3
2 persons	Indicates respondent lives in a family of 2 persons.	34.1
3 persons	Indicates respondent lives in a family of 3 persons.	16.2
4 persons	Indicates respondent lives in a family of 4 persons.	17.4
5+ persons	Indicates respondent lives in a family of 5 or more persons.	9.0
(Missing data)		(1.0)
Employment		
Student	Indicates respondent is a student.	9.5
Unemployed	Indicates respondent is unemployed.	6.3
Housewife/man	Indicates respondent is a housewife/man.	9.7
Retired	Indicates respondent is retired.	21.7
Blue-collar worker	Indicates respondent is a blue-collar worker.	11.6
White-collar worker	Indicates respondent is a white-collar worker.	22.7
Civil servant	Indicates respondent is a civil servant.	4.1
Management	Indicates respondent is a manager.	1.9
Liberal profession	Indicates respondent has a liberal profession.	1.0
Self-employed	Indicates respondent is self-employed.	8.5
Other	Indicates respondent has another employment than the ones mentioned above.	3.0

Table 4 – Variable definitions and summary statistics *(continued)*

Variable	Description	Percentage of total sample (n= 1,008)
Financial		
Monthly income after taxes		
< € 750	Indicates respondent has an income below € 750.	11.0
€ 750 - € 1500	Indicates respondent has an income between € 750 and € 1500.	29.6
€ 1500 - € 2250	Indicates respondent has an income between € 1500 and € 2250.	12.8
€ 2250 - € 3000	Indicates respondent has an income between € 2250 and € 3000.	4.0
> € 3000	Indicates respondent has an income over € 3000.	2.3
no income	Indicates respondent has no income.	6.6
refused to answer	Indicates respondent refused to answer the income question.	27.9
do not know	Indicates respondent does not know his/her income.	5.9
Technology		
Mobile phone	Equals 1 if respondent uses a mobile phone.	81.3
Personal computer	Equals 1 if respondent uses a personal computer.	58.4
Internet	Equals 1 if respondent uses the internet.	50.3
PDA	Equals 1 if respondent uses a personal digital assistant.	6.2
Banking services via mobile phone	Equals 1 if respondent uses banking services via mobile phone.	6.9
	Note: Based on the former items we have constructed a "Technology index" (indicating the degree of resistance for new technologies). To do so, we have used another response format, i.e. "frequency of use" instead of the dummy format presented here. As such, this variable has a mean = 21.102 and St. Dev. = 5.878.	
Supply-side		
Region home		
Flanders	Indicates respondent lives in Flanders.	52.5
Wallonia	Indicates respondent lives in Wallonia.	32.4
Brussels Capital Region	Indicates respondent lives in Brussels Capital Region.	13.4
(Missing data)		(1.7)
Region work		
Flanders	Indicates respondent works in Flanders.	39.0
Wallonia	Indicates respondent works in Wallonia.	23.1
Brussels Capital Region	Indicates respondent works in Brussels Capital Region	11.7
(Missing data)		(26.2)
Province home		
West-Flanders	Indicates respondent lives in West-Flanders.	14.5
East-Flanders	Indicates respondent lives in East-Flanders.	8.0
Brussels Capital Region	Indicates respondent lives in Brussels Capital Region.	13.4
Flemish Brabant	Indicates respondent lives in Flemish Brabant.	6.0
Antwerp	Indicates respondent lives in Antwerp.	10.1
Limburg	Indicates respondent lives in Limburg.	13.9
Walloon Brabant	Indicates respondent lives in Walloon Brabant.	0.2
Namur	Indicates respondent lives in Namur.	2.1
Liège	Indicates respondent lives in Liège.	12.5
Luxembourg	Indicates respondent lives in Luxembourg.	2.3
Hainaut	Indicates respondent lives in Hainaut.	15.4
(Missing data)		(1.7)

Table 4 – Variable definitions and summary statistics *(continued)*

Variable	Description	Percentage of total sample (n= 1,008)
Supply-side		
Province work		
West-Flanders	Indicates respondent works in West-Flanders.	11.3
East-Flanders	Indicates respondent works in East-Flanders.	5.8
Brussels Capital Region	Indicates respondent works in Brussels Capital Region.	11.7
Flemish Brabant	Indicates respondent works in Flemish Brabant.	4.0
Antwerp	Indicates respondent works in Antwerp.	9.0
Limburg	Indicates respondent works in Limburg.	8.9
Walloon Brabant	Indicates respondent works in Walloon Brabant.	0.1
Namur	Indicates respondent works in Namur.	1.5
Liège	Indicates respondent works in Liège.	9.8
Luxembourg	Indicates respondent works in Luxembourg.	1.5
Hainaut	Indicates respondent works in Hainaut.	10.2
(Missing data)		(26.2)
POS home	Indicates number of POS of ZIP-code where respondent lives	
	(Mean = 402.645; St. Dev. = 480.664)	
POS work	Indicates number of POS of ZIP-code where respondent works	
	(Mean = 580.451; St. Dev. = 607.664)	
ATMs home	Indicates number of Banksys ATMs of ZIP-code where respondent lives	
	(Mean = 4.181; St. Dev. = 5.539)	
ATMs work	Indicates number of Banksys ATMs of ZIP-code where respondent works	
	(Mean = 6.054; St. Dev. = 7.049)	
Median income level home (in €)	Indicates median income level of commune where respondent lives	
	(Mean = 11756.703; St. Dev. = 1777.961)	
Median income level work (in €)	Indicates median income level of commune where respondent works	
	(Mean = 11332.478; St. Dev. = 1679.285)	
Density home	Number of inhabitants per km^2 in commune where respondent lives	
	(Mean = 1131.320; St. Dev. = 2798.479)	
Density work	Number of inhabitants per km^2 in commune where respondent works	
	(Mean = 955.137; St. Dev. = 2215.841)	
Number of ATMs/km^2 home	Indicates number of Banksys ATMs/km^2 of commune where respondent lives	
	(Mean = 0.138; St. Dev. = 0.186)	
Number of ATMs/km^2 work	Indicates number of Banksys ATMs/km^2 of commune where respondent works	
	(Mean = 0.174; St. Dev. = 0.215)	
Number of ATMs/inhabitants home	Number of Banksys ATMs per 1,000 inhabitants in commune where respondent lives	
	(Mean = 2.920; St. Dev. = 3.577)	
Number of ATMs/inhabitants work	Number of Banksys ATMs per 1,000 inhabitants in commune where respondent works	
	(Mean = 4.661; St. Dev. = 5.623)	

Table 4 – Variable definitions and summary statistics *(continued)*

Variable	Description	Percentage of total sample (n= 1,008)
Payment instruments		
Debit card		
Know	Equals 1 if respondent has heard of debit card (BC/MC).	98.0
Possess	Equals 1 if respondent possesses debit card.	89.0
Use	Equals 1 if respondent uses debit card.	86.0
Type of user	Classifies the respondent based on intensity of debit card-use:	
Non users	Never	14.0
Light users	At most once a month	9.7
Medium users	Once a week or at least once within two weeks	51.1
Heavy users	Daily	25.2
Credit card		
Know	Equals 1 if respondent has heard of credit card (e.g. Visa, Mastercard, American Express, Diners).	86.5
Possess	Equals 1 if respondent possesses credit card.	33.0
Use	Equals 1 if respondent uses credit card.	29.4
Type of user	Classifies the respondent based on intensity of credit card-use:	
Non users	Never	70.6
Light users	At most once a month	18.3
Medium users	Once a week or at least once within two weeks	9.9
Heavy users	Daily	1.2
E-purse (Proton)		
Know	Equals 1 if respondent has heard of Proton.	88.8
Possess	Equals 1 if respondent possesses Proton.	44.6
Use	Equals 1 if respondent uses Proton.	31.4
Type of user	Classifies the respondent based on intensity of Proton-use:	
Non users	Never	68.8
Light users	At most once a month	10.4
Medium users	Once a week or at least once within two weeks	12.7
Heavy users	Daily	8.3
Retailer card		
Know	Equals 1 if respondent heard of retailer card (e.g. Delhaize Plus, Colruyt).	63.3
Possess	Equals 1 if respondent possesses retailer card.	15.8
Use	Equals 1 if respondent uses retailer card.	14.6
Type of user	Classifies the respondent based on intensity of retailer card-use:	
Non users	Never	85.4
Light users	At most once a month	3.5
Medium users	Once a week or at least once within two weeks	10.3
Heavy users	Daily	0.8
Resistance to cashless society		
Continues to use cash	Equals 1 if respondent continues to use cash even when he/she could pay electronically everywhere.	66.8

Table 5 – Logit analyses: Debit card

Variable	Debit card							
	Know		Possess		Use		Type of user	
Model I:	Estimate	ME	Estimate	ME	Estimate	ME	Estimate	
Technologies separately	(SE)		(SE)		(SE)		(SE)	
Sex								
Female					0.597***	0.069	0.394***	
					(0.210)		(0.136)	
Male					(reference)		(reference)	
Age	-0.054***	-0.001			-0.022***	-0.003	-0.014**	
	(0.017)				(0.008)		(0.007)	
Education					***			
Primary school					(reference)		-0.889***	
							(0.316)	
Lower secondary school					0.096	0.012	-0.661**	
					(0.279)		(0.291)	
Higher secondary school					0.767**	0.092	-0.014	
					(0.306)		(0.281)	
Higher educ. – non univ.					1.286***	0.154	0.436	
					(0.447)		(0.288)	
University degree					0.713	0.086	(reference)	
					(0.489)			
Employment			***					
Student			(reference)				-1.092**	
							(0.461)	
Unemployed			1.923***	0.192			-0.062	
			(0.634)				(0.442)	
Housewife/man			1.194**	0.119			-0.257	
			(0.477)				(0.425)	
Retired			0.878**	0.088			-0.302	
			(0.423)				(0.413)	
Blue-collar worker			0.994**	0.099			-0.089	
			(0.457)				(0.407)	
White-collar worker			2.229***	0.223			0.174	
			(0.512)				(0.387)	
Civil servant			1.192*	0.119			-0.237	
			(0.684)				(0.479)	
Management			1.067	0.107			-0.145	
			(1.067)				(0.594)	
Liberal profession			0.593	0.059			-0.289	
			(1.101)				(0.749)	
Self-employed			1.134**	0.113			-0.197	
			(0.503)				(0.427)	
Other			1.593**	0.159			(reference)	
			(0.816)					

Table 5 – Logit analyses: Debit card *(continued)*

Variable	Debit card						
	Know		Possess		Use		Type of user
Model I:	Estimate	ME	Estimate	ME	Estimate	ME	Estimate
Technologies separately	(SE)		(SE)		(SE)		(SE)
Household size					**		
1 person					(reference)		-0.449*
							(0.260)
2 persons					0.582**	0.070	0.013
					(0.253)		(0.244)
3 persons					1.112***	0.133	0.253
					(0.433)		(0.264)
4 persons					0.076	0.009	0.167
					(0.348)		(0.259)
5+ persons					0.205	0.025	(reference)
					(0.423)		
Monthly income after taxes					***		
< € 750					0.760*	0.091	0.869***
					(0.432)		(0.328)
€ 750 - € 1500					1.724***	0.207	1.155***
					(0.409)		(0.300°
€ 1500 - € 2250					1.694***	0.203	1.358***
					(0.478)		(0.327)
€ 2250 - € 3000					2.029**	0.243	1.186***
					(0.830)		(0.415)
> € 3000					0.637	0.076	0.315
					(0.745)		(0.506)
no income					0.155	0.019	0.619*
					(0.488)		(0.373)
refused to answer					1.528***	0.183	1.199***
					(0.407)		(0.294)
do not know					(reference)		(reference)
Mobile phone			-0.999***	-0.099	-0.935***	-0.112	-0.826***
(user is reference)			(0.250)		(0.249)		(0.180)
Internet			-0.890***	-0.089			
(user is reference)			(0.309)				
Region work	**						
Flanders	-1.847***	-0.037					
	(0.670)						
Wallonia	-1.309	-0.026					
	(0.831)						
Brussels Capital Region	(reference)						
Number of ATMs/inhabitants			-0.69***	-0.069	-0.111***	-0.013	
home			(0.026)		(0.025)		
Intercept	7.891***	0.158	2.003***	0.200	1.133*	0.14	
	(1.219)		(0.300)		(0.614)		
Pseudo R^2	0.028		0.080		0.143		0.228
Likelihood ratio	133.267		611.287		650.961		2056.904
No. of observations	1008		1008		1008		1008

Table 5 – Logit analyses: Debit card *(continued)*

Variable	Debit card							
	Know		Possess		Use		Type of user	
Model II :	Estimate	ME	Estimate	ME	Estimate	ME	Estimate	
Technology Index	(SE)		(SE)		(SE)		(SE)	
Household size					**			
1 person					(reference)		-0.498*	
							(0.260)	
2 persons					0.638**	0.077	-0.015	
					(0.250)		(0.244)	
3 persons					1.156***	0.139	0.211	
					(0.432)		(0.424)	
4 persons					0.070	0.008	0.089	
					(0.344)		(0.730)	
5+ persons					0.234	0.028	(reference)	
					(0.420)			
Monthly income after taxes			***		***			
< € 750			0.948**	0.095	0.707*	0.085	0.877***	
			(0.429)		(0.429)		(0.327)	
€ 750 - € 1500			1.699***	0.167	1.748***	0.210	1.232***	
			(0.394)		(0.407)		(0.299)	
€ 1500 - € 2250			1.941***	0.194	1.733***	0.208	1.373***	
			(0.499)		(0.477)		(0.326)	
€ 2250 - € 3000			1.844**	0.184	2.021**	0.243	1.141***	
			(0.806)		(0.831)		(0.415)	
> € 3000			1.807*	0.181	0.581	0.070	0.206	
			(1.807)		(0.749)		(0.507)	
no income			0.182	0.018	0.053	0.006	0.613*	
			(0.481)		(0.484)		(0.372)	
refused to answer			1.692***	0.169	1.485***	0.178	1.237***	
			(0.400)		(0.403)		(0.293)	
do not know			(reference)		(reference)		(reference)	
Technology Index			-0.066***	-0.007	-0.040*	-0.005	-0.065***	
			(0.025)		(0.025)		(0.015)	
Number of ATMs/inhabitants			-0.071***	-0.007	-0.104***	-0.012		
home			(0.026)		(0.025)			
Intercept			3.633***	0.363	1.810**	0.217		
			(0.538)		(0.737)			
Pseudo R^2			0.073		0.133		0.226	
Likelihood ratio			617.879		662.203		2103.678	
No. of observations			1008		1008		1008	

Note: Superscripts *, ** and *** indicate that the coefficient was significantly different from zero at the 10%, 5% and 1% level, respectively.

Table 6 – Logit analyses: Credit card

Variable	Credit card						
	Know		Possess		Use		Type of user
Model I:	Estimate	ME	Estimate	ME	Estimate	ME	Estimate
Technologies separately	(SE)		(SE)		(SE)		(SE)
Language	***						
Dutch	-0.626***	-0.073					
	(0.203)						
French	(reference)						
Education	***		***		***		
Primary school	-1.165**	-0.136	-1.923***	-0.444	-2.185***	-0.454	-2.010***
	(0.481)		(0.407)		(0.445)		(0.427)
Lower secondary school	-0.716	-0.084	-0.938***	-0.217	-1.010***	-0.210	-0.818***
	(0.478)		(0.335)		(0.344)		(0.317)
Higher secondary school	0.014	0.002	-0.686**	-0.158	-0.677**	-0.141	-0.501*
	(0.483)		(0.317)		(0.323)		(0.294)
Higher educ. – non univ.	0.266	0.031	0.032	0.007	-0.152	-0.032	0.030
	(0.544)		(0.324)		(0.327)		(0.288)
University degree	(reference)		(reference)		(reference)		(reference)
Employment			***		***		
Student			(reference)		(reference)		-1.670**
							(0.735)
Unemployed			1.189**	0.275	1.939***	0.403	0.339
			(0.523)		(0.644)		(0.592)
Housewife/man			1.657***	0.383	2.399***	0.499	0.855
			(0.488)		(0.622)		(0.557)
Retired			1.834***	0.424	2.430***	0.505	0.925*
			(0.484)		(0.618)		(0.526)
Blue-collar worker			1.015**	0.234	1.173*	0.244	-0.375
			(0.495)		(0.640)		(0.559)
White-collar worker			1.476***	0.341	2.117***	0.440	0.615
			(0.455)		(0.591)		(0.498)
Civil servant			1.065*	0.246	1.707**	0.355	0.258
			(0.555)		(0.673)		(0.579)
Management			3.062***	0.707	3.835***	0.798	1.514**
			(0.886)		(0.961)		(0.659)
Liberal profession			1.928**	0.445	2.911***	0.605	0.911
			(0.861)		(0.944)		(0.790)
Self-employed			2.487***	0.574	3.095***	0.644	1.408***
			(0.498)		(0.625)		(0.529)
Other			1.137*	0.263	1.451*	0.302	(reference)
			(0.624)		(0.755)		

Table 6 – Logit analyses: Credit card *(continued)*

Variable	Credit card						
	Know		Possess		Use		Type of user
Model I:	Estimate	ME	Estimate	ME	Estimate	ME	Estimate
Technologies separately	(SE)		(SE)		(SE)		(SE)
Monthly income after taxes	***		***		***		
< € 750	0.214	0.025	-0.517	-0.119	-0.196	-0.042	-0.121
	(0.471)		(0.463)		(0.511)		(0.494)
€ 750 - € 1500	0.578	0.068	0.257	0.059	0.654	0.136	0.630
	(0.424)		(0.379)		(0.417)		(0.399)
€ 1500 - € 2250	1.091**	0.128	0.881**	0.204	1.092**	0.227	1.033**
	(0.546)		(0.400)		(0.436)		(0.413)
€ 2250 - € 3000	0.796	0.093	1.178**	0.272	1.373***	0.286	1.167**
	(0.728)		(0.503)		(0.529)		(0.480)
> € 3000	19.053	2.229	0.956	0.221	0.784	0.163	1.103**
	(8488.001)		(0.644)		(0.621)		(0.540)
no income	-0.395	-0.047	-0.017	-0.004	-0.144	-0.030	-0.090
	(0.484)		(0.546)		(0.662)		(0.644)
refused to answer	-0.292	-0.034	0.205	0.047	0.539	0.112	0.640*
	(0.410)		(0.370)		(0.406)		(0.387)
do not know	(reference)		(reference)		(reference)		(reference)
Personal computer							-0.378*
(user is reference)							(0.281)
Internet			-0.721***	-0.167	-0.932***	-0.194	-0.541**
(user is reference)			(0.186)		(0.195)		(0.262)
PDA							-1.395***
(user is reference)							(0.288)
Number of ATMs/inhabitants	-0.074***	-0.009					
home	(0.024)						
Intercept	2.680***	0.314	-1.456**	-0.336	-2.363***	-0.492	
	(0.603)		(0.581)		(0.716)		
Pseudo R^2	0.074		0.214		0.237		0.263
Likelihood ratio	707.823		1035.970		947.477		685.396
No. of observations	1008		1008		1008		1008

Table 6 – Logit analyses: Credit card *(continued)*

Variable	Credit card							
	Know		Possess		Use		Type of user	
Model II :	Estimate	ME	Estimate	ME	Estimate	ME	Estimate	
Technology Index	(SE)		(SE)		(SE)		(SE)	
Education			***		***			
Primary school			-1.861*	-0.430	-2.132*	-0.443	-2.002***	
			(0.409)		(0.447)		(0.423)	
Lower secondary school			-0.929*	-0.215	-1.022*	-0.213	-0.896***	
			(0.336)		(0.345)		(0.313)	
Higher secondary school			-0.695*	-0.161	-0.701*	-0.146	-0.616**	
			(0.318)		(0.324)		(0.289)	
Higher educ. – non univ.			0.057	0.013	-0.131	-0.027	-0.038	
			(0.326)		(0.329)		(0.285)	
University degree			(reference)		(reference)		(reference)	
Employment			***		***			
Student			(reference)		(reference)		-1.589**	
							(0.746)	
Unemployed			1.281**	0.296	2.043***	0.425	0.458	
			(0.526)		(0.647)		(0.598)	
Housewife/man			1.768***	0.408	2.508***	0.522	1.024*	
			(0.493)		(0.626)		(0.566)	
Retired			2.010***	0.464	2.607***	0.542	1.042**	
			(0.493)		(0.625)		(0.535)	
Blue-collar worker			1.082**	0.250	1.243*	0.259	-0.360	
			(0.498)		(0.642)		(0.570)	
White-collar worker			1.569***	0.362	2.223***	0.462	0.596	
			(0.458)		(0.593)		(0.511)	
Civil servant			1.161**	0.268	1.816***	0.378	0.313	
			(0.557)		(0.674)		(0.588)	
Management			3.057***	0.706	3.841***	0.799	1.668**	
			(0.887)		(0.962)		(0.665)	
Liberal profession			1.946**	0.450	2.945***	0.613	1.288*	
			(0.860)		(0.946)		(0.786)	
Self-employed			2.493***	0.576	3.089***	0.643	1.460***	
			(0.499)		(0.625)		(0.540)	
Other			1.300**	0.300	1.626**	0.338	(reference)	
			(0.633)		(0.763)			

Table 6 – Logit analyses: Credit card *(continued)*

Variable	Credit card							
	Know		Possess		Use		Type of user	
Model II :	Estimate	ME	Estimate	ME	Estimate	ME	Estimate	
Technology Index	(SE)		(SE)		(SE)		(SE)	
Monthly income after taxes			***		**			
< € 750			-0.469	-0.108	-0.121	-0.025	-0.143	
			(0.465)		(0.515)		(0.495)	
€ 750 - € 1500			0.285	0.066	0.678	0.141	0.609	
			(0.382)		(0.422)		(0.399)	
€ 1500 - € 2250			0.851**	0.197	1.076**	0.224	0.969**	
			(0.401)		(0.438)		(0.412)	
€ 2250 - € 3000			1.084**	0.250	1.281**	0.266	1.086**	
			(0.504)		(0.530)		(0.477)	
> € 3000			0.860	0.199	0.674	0.140	0.956*	
			(0.650)		(0.630)		(0.539)	
no income			0.040	0.009	-0.061	-0.013	-0.156	
			(0.549)		(0.665)		(0.647)	
refused to answer			0.251	0.058	0.614	0.128	0.647*	
			(0.373)		(0.411)		(0.387)	
do not know			(reference)		(reference)		(reference)	
Technology Index			-0.076***	-0.018	-0.093***	-0.019	-0.757***	
			(0.017)		(0.018)		(0.710)	
Intercept			-0.347	-0.080	-1.016	-0.211		
			(0.624)		(0.753)			
Pseudo R^2			0.218		0.240		0.255	
Likelihood ratio			1031.676		943.976		1202.014	
No. of observations			1008		1008		1008	

Note: Superscripts *, ** and *** indicate that the coefficient was significantly different from zero at the 10%, 5% and 1% level, respectively.

Table 7 – Logit analyses: E-purse

Variable	E-purse						
	Know		Possess		Use		Type of user
Model I:	Estimate	ME	Estimate	ME	Estimate	ME	Estimate
Technologies separately	(SE)		(SE)		(SE)		(SE)
Age	-0.021***	-0.002	-0.026***	-0.006	-0.024***	-0.005	-0.019***
	(0.007)		(0.004)		(0.005)		(0.005)
Education			***		***		
Primary school			-0.797***	-0.197	-1.174***	-0.254	-1.035***
			(0.317)		(0.331)		(0.317)
Lower secondary school			-0.665**	-0.164	-0.964***	-0.208	-0.854***
			(0.290)		(0.290)		(0.272)
Higher secondary school			-0.485**	-0.120	-0.581**	-0.125	-0.479*
			(0.280)		(0.275)		(0.256)
Higher educ. – non univ.			-0.030*	-0.007	-0.313*	-0.068	-0.227
			(0.305)		(0.295)		(0.273)
University degree			(reference)		(reference)		(reference)
Mobile phone							-0.513**
(user is reference)							(0.232)
Personal computer	-0.637***	-0.063					
(user is reference)	(0.245)						
Banking services via mobile			-0.879***	-0.217	-0.742***	-0.163	
phone (user is reference)			(0.290)		(0.262)		
Province home			***				
West-Flanders			-0.302	-0.075			
			(0.263)				
East-Flanders			0.142	0.035			
			(0.301)				
Brussels Capital Region			0.328	0.081			
			(0.270)				
Flemish Brabant			0.770**	0.190			
			(0.345)				
Antwerp			0.564**	0.139			
			(0.284)				
Limburg			0.693***	0.171			
			(0.256)				
Walloon Brabant			-	-			
			-				
Namur			0.152	0.038			
			(0.500)				
Liège			-0.139	-0.034			
			(0.274)				
Luxembourg			0.026	0.006			
			(0.485)				
Hainaut			(reference)				
Number of ATMs/km^2 home			-1.141**	-0.282	-0.965**	-0.208	
			(0.484)		(0.419)		
Intercept	3.464***	0.343	2.227***	0.550	1.758***	0.380	
	(0.337)		(0.460)		(0.400)		
Pseudo R^2	0.034		0.122		0.086		0.072
Likelihood ratio	661.950		1215.979		1125.579		838.638
No. of observations	1008		1008		1008		1008

Table 7 – Logit analyses: E-purse *(continued)*

Variable	E-purse						
	Know		Possess		Use		Type of user
Model II :	Estimate	ME	Estimate	ME	Estimate	ME	Estimate
Technology Index	(SE)		(SE)		(SE)		(SE)
Age	-0.020***	-0.002	-0.021***	-0.005	-0.018***	-0.004	-0.015***
	(0.007)		(0.005)		(0.005)		(0.005)
Education					**		
Primary school					-0.914***	-0.197	-0.829**
					(0.347)		(0.332)
Lower secondary school					-0.750**	-0.162	-0.662**
					(0.300)		(0.283)
Higher secondary school					-0.445	-0.096	-0.338
					(0.279)		(0.262)
Higher educ. – non univ.					-0.214	-0.046	-0.129
					(0.296)		(0.275)
University degree					(reference)		(reference)
Technology Index	-0.053**	-0.005	-0.053***	-0.013	-0.047***	-0.010	-0.043***
	(0.023)		(0.014)		(0.016)		(0.015)
Province home			**				
West-Flanders			(reference)				
East-Flanders			0.440	0.109			
			(0.299)				
Brussels Capital Region			0.578*	0.143			
			(0.296)				
Flemish Brabant			1.072***	0.265			
			(0.335)				
Antwerp			0.720***	0.178			
			(0.276)				
Limburg			1.012***	0.250			
			(0.258)				
Walloon Brabant			-	-			
			-				
Namur			0.603	0.149			
			(0.487)				
Liège			0.234	0.058			
			(0.269)				
Luxembourg			0.513	0.127			
			(0.470)				
Hainaut			0.425	0.105			
			(0.262)				
Number of ATMs/km^2 home			-1.209**	-0.299	-1.073**	-0.232	
			(0.476)		(0.420)		
Intercept	4.278***	0.424	1.525***	0.377	1.621***	0.350	
	(0.446)		(0.311)		(0.371)		
Pseudo R^2	0.033		0.110		0.086		0.075
Likelihood ratio	662.950		1228.950		1124.741		1736.980
No. of observations	1008		1008		1008		1008

Note: Superscripts *, ** and *** indicate that the coefficient was significantly different from zero at the 10%, 5% and 1% level, respectively.

Table 8 – Logit analyses: Retailer card

Variable	Retailer card						
	Know		Possess		Use		Type of user
Model I:	Estimate	ME	Estimate	ME	Estimate	ME	Estimate
Technologies separately	(SE)		(SE)		(SE)		(SE)
Sex							
Female					0.515**	0.064	0.484**
					(0.217)		(0.208)
Male					(reference)		(reference)
Education	***						
Primary school	-0.437	-0.101					-0.902*
	(0.314)						(0.485)
Lower secondary school	-0.409	-0.095					-0.479
	(0.301)						(0.427)
Higher secondary school	0.053	0.012					-0.239
	(0.295)						(0.404)
Higher educ. – non univ.	0.265	0.061					0.179
	(0.325)						(0.416)
University degree	(reference)						(reference)
Employment			***		***		
Student			(reference)		(reference)		-0.902
							(0.770)
Unemployed			0.895	0.119	1.315**	0.164	0.304
			(0.664)		(0.600)		(0.652)
Housewife/man			1.266**	0.168	1.148**	0.144	0.213
			(0.620)		(0.582)		(0.634)
Retired			0.558	0.074	0.782	0.091	-0.108
			(0.577)		(0.544)		(0.605)
Blue-collar worker			0.294	0.039	0.781	0.098	-0.037
			(0.644)		(0.586)		(0.635)
White-collar worker			1.810***	0.241	1.760***	0.220	0.475
			(0.532)		(0.504)		(0.575)
Civil servant			1.803***	0.240	1.015	0.127	-0.331
			(0.683)		(0.693)		(0.738)
Management			1.054	0.140	0.539	0.067	-1.363
			(1.204)		(1.172)		(1.208)
Liberal profession			-	-	-	-	-
			-		-		-
Self-employed			0.891	0.119	0.929	0.116	-0.393
			(0.644)		(0.606)		(0.666)
Other			1.029	0.137	0.732	0.092	(reference)
			(0.792)		(0.756)		

Table 8 – Logit analyses: Retailer card *(continued)*

Variable	Retailer card						
	Know		Possess		Use		Type of user
Model I:	Estimate	ME	Estimate	ME	Estimate	ME	Estimate
Technologies separately	(SE)		(SE)		(SE)		(SE)
Household size			**		*		
1 person			0.881*	0.117	0.994**	0?124	0.861*
			(0.480)		(0.431)		(0.423)
2 persons			-0.100	-0.013	0.340	0.043	0.177
			(0.479)		(0.427)		(0.418)
3 persons			0.418	0.056	0.536	0.0670	0.354
			(0.497)		(0.450)		(0.442)
4 persons			0.118	0.016	0.393	0.049	0.343
			(0.504)		(0.450)		(0.440)
5+ persons			(reference)		(reference)		(reference)
Monthly income after taxes							
< € 750							-0.239
							(0.530)
€ 750 - € 1500							-0.318
							(0.480)
€ 1500 - € 2250							-0.157
							(0.511)
€ 2250 - € 3000							-0.119
							(0.635)
> € 3000							-
							-
no income							-0.947
							(0.780)
refused to answer							-0.109
							(0.470)
do not know							(reference)

Table 8 – Logit analyses: Retailer card *(continued)*

Variable	Retailer card						
	Know		Possess		Use		Type of user
Model I:	Estimate	ME	Estimate	ME	Estimate	ME	Estimate
Technologies separately	(SE)		(SE)		(SE)		(SE)
Province home	***		***		***		
West-Flanders	-0.470*	-0.109	1.683***	0.224	0.891***	0.111	
	(0.273)		(0.434)		(0.286)		
East-Flanders	-1.058***	-0.245	-0.648	-0.086	-1.837***	-0.230	
	(0.303)		(0.718)		(0.633)		
Brussels Capital Region	0.007	0.002	0.890**	0.118	0.104	0.013	
	(0.284)		(0.430)		(0.304)		
Flemish Brabant	-1.090***	-0.253	-0.108	-0.014	-0.883*	-0.010	
	(0.331)		(0.623)		(0.524)		
Antwerp	-1.265***	-0.293	-0.881	-0.117	-1.074**	-0.134	
	(0.285)		(0.628)		(0.432)		
Limburg	-1.336***	-0.310	-1.673**	-0.223	-	-	
	(0.272)		(0.702)		-		
Walloon Brabant	-1.561	-0.504	-	-	-	-	
	(1.446)		-		-		
Namur	-0.778	-0.180	0.835	0.111	-0.482	-0.060	
	(0.510)		(0.886)		(0.790)		
Liège	-0.078	-0.018	0.252	0.034	-0.579	-0.072	
	(0.290)		(0.492)		(0.359)		
Luxembourg	-0.466	-0.108	-0.461	-0.061	-1.517	-0.190	
	(0.501)		(1.119)		(1.057)		
Hainaut	(reference)		(reference)		(reference)		
Number of ATMs/km^2 home							1.243***
							(0.854)
Number of ATMs/inhabitants home	-0.103***	-0.024					
	(0.023)						
Intercept	1.594	0.370	-2.071***	-0.275	-3.379***	-0.422	
	(0.334)		(0.711)		(0.625)		
Pseudo R^2	0.101		0.164		0.145		0.200
Likelihood ratio	1191.311		509.111		657.587		775.489
No. of observations	1008		1008		1008		1008

Note: Superscripts *, ** and *** indicate that the coefficient was significantly different from zero at the 10%, 5% and 1% level, respectively.

Table 9 – Logit analyses: Resistance to cashless society

Variable	Resistance to cashless society		
Model I:	Estimate	Standard Error: SE	Marginal effect: ME
Technologies separately			
Employment	***		
Student	(reference)		
Unemployed	0.758**	0.361	0.168
Housewife/man	0.503	0.318	0.111
Retired	0.474*	0.474	0.105
Blue-collar worker	0.751**	0.303	0.166
White-collar worker	0.084**	0.251	0.019
Civil servant	-0.243	0.392	-0.054
Management	-0.257	0.519	-0.057
Liberal profession	1.985*	1.076	0.439
Self-employed	1.091***	0.345	0.241
Other	-0.149	0.429	-0.033
Mobile phone (user is reference)	0.704***	0.215	0.156
Number of ATMs/km^2 home	-1.093 ***	0.377	-0.242
Intercept	0.379*	0.221	0.084
Pseudo R^2	0.059		
Likelihood ratio	1186.150		
No. of observations	1008		
Model II :	Estimate	Standard Error: SE	Marginal effect: ME
Technology Index			
Employment	***		
Student	(reference)		
Unemployed	0.624*	0.366	0.138
Housewife/man	0.309	0.336	0.068
Retired	0.246	0.301	0.054
Blue-collar worker	0.550*	0.310	0.069
White-collar worker	-0.023	0.253	-0.005
Civil servant	-0.280	0.394	-0.062
Management	-0.216	0.521	-0.048
Liberal profession	1.970*	1.082	0.442
Self-employed	1.052***	0.346	0.233
Other	-0.324	0.437	-0.072
Technology Index	0.047***	0.015	0.010
Number of ATMs/km^2 home	-1.130***	0.377	-0.250
Intercept	-0.338	0.330	0.075
Pseudo R^2	0.057		
Likelihood ratio	1188.133		
No. of observations	1008		

Note: Superscripts *, ** and *** indicate that the coefficient was significantly different from zero at the 10%, 5% and 1% level, respectively.

Table 10 – Determinants of debit card ownership, c.q. use

	socio-demographic							financial	technology		supply-side		
	sex	age	edu-cation	household size	employ-ment	student	retired	income	techno-logy 1	techno-logy 2	urban	location	
owner (y/n) AT, 2001	0	- **	+ **	/	+ ** has job	/	/	0	/	/	+ ** size muni-cipality	/	Mooslechner et al. (2002)
owner (y/n) NL, 2002	0	0	0	/	/	/	/	/	/	/	/	/	HBD (2002)
owner (y/n) model I BE, 2004	0	0	0	0	+ ***	- ***	/	0	+ *** GSM and Internet use	/	/	0 province	this paper
model II	0	- ***	0	0	0	0	/	+ ***	/	- *** technology fear	/	0 province	
user (y/n) FI, 1992	- female less	0	/	/	/	0	/	/	/	/	/	/	Virén (1994)
user (y/n) US, 1995, SCF	/	- **	+ **	/	/	/	/	0	/	/	/	/	Kennickell and Kwast (1997)
user (y/n) US, 1995, SCF	0	- ***	+ *** college	0	0 self-employed	/	0	+ **	/	/	/	/	Klee (2005)
user (y/n) US, 1998, SCF	0	- **	+ ** high school, college	0	- ** self-employed	/	- **	+ **	/	/	/	/	Klee (2005)
user (y/n) US, 1998, SCF	0	-	+	0	+ employed	/	/	0	/	/	/	census division	Stavins (2001)

Table 10 – Determinants of debit card ownership, c.q. use *(continued)*

	socio-demographic							financial	technology		supply-side		
	sex	age	edu-cation	household size	employ-ment	student	retired	income	techno-logy 1	techno-logy 2	urban	location	
user (y/n) US, 1998, SCF	0	- **	+ **	/	/	/	/	+ **	+ ** direct deposit	/	/	census division	Hayashi and Klee (2003)
user (y/n) US, 2001, SCF	0	- **	+ ** college	0	- ** self-employed	/	- **	+ **	/	/	/	/	Klee (2005)
user (y/n) US, 2001	0	- **	0	/	/	/	/	+ **	+ ** direct deposit	+ ** Internet purchase	/	census division	Hayashi and Klee (2003)
user (y/n) model I BE, 2004	+ *** female more	- ***	+ ***	? **	0	0	/	+ ***	+ *** GSM use	/	/	0 province	this paper
model II	+ *** female more	- ***	+ **	? **	0	0	/	+ ***	/	- * technology fear	/	0 province	
frequency of use US, 1986-2002	/	? *** 45-64 most	+ ***	/	/	/	/	- *	+ *** Internet use	0 computer ownership	/	/	Borzekowski and Kiser (2004)
frequent user (y/n) NL, 2004	+ ** female more	0	+ **	/	0	- **	/	+ ** low income less	/	/	- ** major city	province	Jonker (2005)
type of user model I BE, 2004	+ *** female more	- **	+ ***	+ ***	? **	- **	/	+ ***	+ *** GSM use	/	/	0 province	this paper
model II	+ *** female more	- ***	+ **	+ **	? ***	- ***	/	+ ***	/	- *** technology fear	/	0 province	

Note: Plus and minus signs indicate that the coefficient was positive and significant, c.q. negative and significant. A zero shows no effect. A question mark indicates that the impact was not consistent across categories. Superscripts *, ** and *** indicate that the coefficient was significantly different from zero at the 10%, 5% and 1% level, respectively.

Table 11 – Determinants of credit card ownership, c.q. use

	socio-demographic							financial	technology		supply-side		
	sex	age	edu-cation	household size	employ-ment	student	retired	income	techno-logy 1	techno-logy 2	urban	location	
owner (y/n) US, 1983	- *** female less	+ *** 55-64 more	+ *** high school, college	- ***	+ *** has job	/	/	+ ***	/	/	+ *** non-rural	/	Duca and Whitesell (1995)
owner (y/n) US, 1984, SCF	/	?	+	/	+ in labour force	/	/	+	/	/	+	/	Avery et al. (1986)
owner (y/n) US, 1995, SCF	+ ** female more	+ ** 55-64, 65-74 more	+ ** high school, college	- **	0 self-employed	/	0	+ **	/	/	/	/	Klee (2005)
owner (y/n) US, 1998, SCF	0	0	+ ** high school, college	- **	0 self-employed	/	0	+ **	/	/	/	/	Klee (2005)
owner (y/n) US, 2001, SCF	0	0	+ ** high school, college	- **	0 self-employed	/	0	+ **	/	/	/	/	Klee (2005)
owner (y/n) AT, 2001	- ** female less	- **	+ **	/	+ ** has job	/	/	+ **	/	/	+ ** size muni-cipality	/	Mooslechner et al. (2002)
owner (y/n) NL, 2002	- female less	? 18-24 less, 55+ more	+ high school, college	/	/	/	/	/	/	/	/	/	HBD (2002)
owner (y/n) BE, 2004 model I	0	0	+ ***	0	? ***	- ***	/	+ ***	+ *** Internet use	/	/	0 province	this paper
model II	0	0	+ ***	0	? ***	- ***	/	+ ***	/	- *** technology fear	/	0 province	

Table 11 – Determinants of credit card ownership, c.q. use *(continued)*

	socio-demographic							financial	technology		supply-side		
	sex	age	edu-cation	household size	employ-ment	student	retired	income	techno-logy 1	techno-logy 2	urban	location	
user (y/n) US, 1984, SCF	/	?	+	/	+ in labour force	/	/	+	/	/	+	/	Avery et al. (1986)
user (y/n) FI, 1992	- female less	0	/	/	0	/	/	/	/	/	/	/	Virén (1994)
user (y/n) US, 1998, SCF	0	+	+	-	+ employed	/	/	+	/	/	/	census division	Stavins (2001)
user (y/n) model I BE, 2004	0	0	+ ***	0	? ***	- ***	/	+ ***	+ *** Internet use	/	/	0 province	this paper
model II	0	0	+ ***	0	? ***	- ***	/	+ **	/	- *** technology fear	/	0 province	
frequent user (y/n) NL, 2004	- ** female less	- **	0	/	0	0	/	+ **	/	/	0	province	Jonker (2005)
type of user model I BE, 2004	0	0	+ ***	0	? **	- **	/	+ ***	+ PC*, Internet**, PDA***	/	/	0 province	this paper
model II	0	0	+ ***	0	? **	- **	/	+ **	/ - *** technology fear		/	0 province	

Note: Plus and minus signs indicate that the coefficient was positive and significant, c.q. negative and significant. A zero shows no effect. A question mark indicates that the impact was not consistent across categories. Superscripts *, ** and *** indicate that the coefficient was significantly different from zero at the 10%, 5% and 1% level, respectively.

Table 12 – Determinants of e-purse ownership, c.q. use

	socio-demographic							financial	technology		supply-side		
	sex	age	edu-cation	household size	employ-ment	student	retired	income	techno-logy 1	techno-logy 2	urban	location	
owner (y/n) AT, 2001	0	- **	+ **	/	0	/	/	0	/	/	0 size muni-cipality	/	Mooslechner et al. (2002)
owner (y/n) NL, 2002	0	- 55+ less	+	/	/	/	/	/	/	/	/	/	HBD (2002)
owner (y/n) BE, 2004 model I	0	- ***	+ ***	0	0	0	/	0	+ *** banking via GSM	/	/	province	this paper
model II	0	- ***	0	0	0	0	/	0	/	- *** technology fear	/	province	
user (y/n) BE, 2004 model I	0	- ***	+ ***	0	0	0	/	0	+ *** banking via GSM	/	/	0 province	this paper
model II	0	- ***	+ **	0	0	0	/	0	/	- *** technology fear	/	0 province	
frequent user (y/n) NL, 2004	- ** female less	? ** 25-34 more	+ **	/	0	0	/	+ ** low income less	/	/	0	province	Jonker (2005)
type of user BE, 2004 model I	0	- ***	+ ***	0	0	0	/	0	+ *** GSM use	/	/	0 province	this paper
model II	0	- ***	+ **	0	0	0	/	0	/	- *** technology fear	/	0 province	

Note: Plus and minus signs indicate that the coefficient was positive and significant, c.q. negative and significant. A zero shows no effect. A question mark indicates that the impact was not consistent across categories. Superscripts *, ** and *** indicate that the coefficient was significantly different from zero at the 10%, 5% and 1% level, respectively.