# TECHNOLOGY PAYMENT CARDS COMMUNICATION WITH BANKING INSTITUTIONS IN THE FIELD OF CASHLESS PAYMENT

**Zuzana Němcová, Jiří Dvořák**

***Abstract:*** *The aim is now used to describe the infrastructure of payment cards, ATMs, now used to describe the infrastructure of payment systems, mainly the payment cards and NFC technology and secure payment throw the internet. In this article, we examine a new technology application which is coming into its own around the world, in association with the revolution in wireless connectivity. Our findings are intended to guide in dealing with the economic aspects of mobile payments, and to help identify some important directions for the research.*

***Keywords:*** *Business processes, Economic analysis, Financial technology, Mobile payments, M-payments, Network externalities, Payment systems, Technology adoption.*

***JEL Classification:*** *C52, C67, L21, M 15.*

## Introduction

Credit cards have became today an unmistakable part of our lives. They represent a modern tool cashless payment system used mainly to pay consumption spending in the high street or online stores and cash withdrawals from ATMs. Payment systems in recent years experienced very dynamic growth, increased the number of holders of credit cards and places where they can pay. Payment card systems today can be found in several forms, each with its own rules and use. Banking institutions use this means of payment to increase its competitiveness, saving them costs and reduce risks that bring cash money. The future of credit cards promises even more applications and extensions. Already today, the majority of clients in developed countries prefer to pay by credit card rather than cash. Payments via the Internet is developing very quickly and just missing a small step to the introduction of cashless payments using mobile phones.

## 1 Statement of a problem

This paper examines the role perceived risk plays in the early adoption decision of new remote access technologies. We focus on the adoption decision from the perspective of the retail banking customer. The question is what would cause a retail customer to adopt contactless payments soon after its introduction. We find that when a technology is new, risk is likely to be heterogeneous and this heterogeneity leads to divergent optimal adoption strategies. The convenience and economic benefits of the new contactless payment technology are not limited to just cards. The secure payment element consisting of chip and antenna can be built into a variety of appliances, such as key fobs or personal electronic devices. This capability gives the issuing banks new ways to differentiate their products and target specific demographic groups with appealing forms. It also gives issuers a means to lower their new customer acquisition cost. (see Furst et al., 2000).

Global invasions cards meant significantly higher costs of IT for retailers, banks and card companies in recent years. The savings proposals have been relying on a solution, a robust system that can be implemented in several countries. However, the globalization is the price: the longer the decision-making processes often occurring, leading to the risk, that new systems will be implemented on time. Mobile payments or m-payment is any payment, where the mobile device used to initiate, verify and confirm the exchange of financial value in return for goods and services [3] and [14] 0.1 Alternative definitions of m-payment is that the type of electronic management of a payment transaction in which at least a payer uses mobile communication techniques in conjunction with mobile devices for initiation, approval, or make payments]. Mobile devices are mobile phones, PDAs, wireless tablets and other devices that can connect to the mobile telecommunications network and allow payments to [13] [12] and [8] .

Successful new technologies usually enable a convergence of some kind, and so will these new contactless payment form factors. Multiple applications, such as loyalty and reward programs, can be combined in a single-themed key fob with the payment token. The consumer would then have all this functionality available in a single device on a keychain or in a pocket, or possibly attached to a bracelet or necklace. There would be no need to always carry a purse or wallet – a convenience that joggers could certainly appreciate.

The potential for expansion of mobile contactless payments in the Czech Republic is high. "Towards the end of last year, domestic banks have issued nearly 9.3 million payment cards, which pay their holders at retailers shopping for more than 203 billion. Credit cards for consumers reduce risks arising from holding cash, and merchants in turn, helping to optimize operation. Contactless mobile payments are for commercial bank perspective, precisely because they are one of the ways our clients even more enjoyable by cashless payment and card payment volumes continue to increase, "said Sirus Zafar, Head of Cards Commercial Bank. The increasing number of retailers running contactless trials demonstrates that there is real potential in extending the EMV technology to run new applications such as contactless payments. Since EMV (Europay, MasterCard, Visa) – the global standard infrastructure behind Chip and PIN – has been in use in the UK since 2005, merchants are already equipped with Chip and PIN. Therefore, providing the right EMV framework is in place, it is a relatively seamless path to prepare for the acceptance of contactless cards. This offers a compelling business driver for contactless payments, since retailers can capitalize on their EMV investment and achieve significant increases in revenue with a modest investment. The major benefit for the retail sector is that businesses can enhance their business performance and customer satisfaction. Contactless payments reduce cash handling and operating costs and increase transaction speed to serve the customers. The technology allows the cardholder to tap their card at the point of sale, eliminating the need for PINs or online authorization. Aside from the practical benefits, trials have shown that contactless payments can lead to an increase in expenditure in-store. This is known as the halo effect, when there is uplift in the average transaction values when contactlesspayments are used in place of low value cash payments.Contactlesspayment is particularly attractive to retail segments where speed and convenience of payment are essential, for example fast food outlets and kiosks. By moving customers more quickly through the payment process it is an opportunity for merchants to increase differentiation and customer satisfaction in highly competitive retail markets. An additional benefit is eliminating cash shrinkage, reducing error when manually processing cash and the risk

of theft. Consumers have also shown enthusiasm in the uptake of contactless as they can enjoy a better shopping experience, benefiting from far speedier service. Not having to carry cash, which attracts the attention of thieves, is also a safer option. Consumers also benefit from the convenience of carrying one card for all payment needs, as the contactless component can sit on top of the debit/credit card. The public evidently support the idea of contactless payments, since they are more likely to use it over cash, according to a recent Visa study. The technology is based on near field communication (NFC) – a type of short range wireless technology that can be used to make contactless payments via a mobile handset. A chip in the mobile phone stores the data and performs the necessary processing and communications functions. The user can wave a phone set over a scanning device at a checkout or use a phone. To enable mobile payments technology only an extra layer of software functionality needs to be added to the existing EMV and contactless frameworks providing a cost effective approach independent of hardware. It will be a while until it will be determined whether mobile phones take on a much wider role, facilitating access to multiple applications to become the wallet for all consumers. However, an important aspect that has been over looked is the ability for retailers to take advantage of the new technology. Without the technology in retail stores the mobile phones will not be able to interact with the in-store equipment to facilitate payments, regardless of the number of mobile phones in consumers' hands. Even if mobile operators have the infrastructure in place, the retailers will need to accommodate the new technology.

## 2 Methods

Financial service providers have increasingly offered customers new remote access to such services, with Internet banking being the latest example. While Internet banking has been available for years, the early adoption by customers of this technology was disappointing to most. This paper examines the demand for remote access to banking accounts by consumers and finds that when the technology is new, the traditional risk return models including variables allowing for heterogeneous risk add power in modelling the adoption decision. Perceived risks in Internet banking are seen to be responsible for some of the hesitation to adopt. Ironically, older consumers are found to be less likely to adopt Internet banking regardless of their risk tolerances. However, younger consumers are found to be early adopters only when they have relatively high levels of risk tolerance. Therefore, we used a model for the whole Bernoulli random, concerned with probability, the analysis of random phenomena.Probability distribution, which takes value 1 with success probability p and value 0 with failure probability q=1-p. So if X is a random variable with this distribution, we have:

$$\Pr(X = 1) = 1 - \Pr(X = 0) = 1 - q = p. \tag{1}$$

The expected value of a Bernoulli random variable $X$ is $E(X) = p$, and its variance is

$$\operatorname{var}(X) = p(1 - p). \tag{2}$$

The above can be derived from the Bernoulli distribution as a special case of the Binomial distribution. Consumers are not certain of the outcome of their using a remote access account. The source of the uncertainty is twofold. First, the technology itself poses

risks of unauthorized access. And second, the consumer may be uncertain about their ability to use it. The nature of the uncertainty itself may differ depending on the remote access service being used. We assume now k distinct uncertain possibilities. Some of these outcomes only affect one service. The first outcome (j = 1) is what happens when all technologies work correctly. The object of this paper is to better understand the adoption decision from the consumer's standpoint. This section uses micro-economic theory of consumer utility maximization to model how consumers decide whether or not to adopt a new remote access technology. The technology itself poses risks of unauthorized access. The consumer may be uncertain about their ability to use it. The nature of the uncertainty itself may differ depending on the remote access service being used. We assume now distinct uncertain possibilities. Some of these outcomes only affect one service. We will assume that consumers derive utility from their traditional bank accounts according to the utility function f(x). Expected benefits from the bank account various remote banking technologies could be represented as follows:

$$U(x) = f(x) + \sum_{j=1}^{k} p_j \sum_{i}^{n} \delta_i h_{i_j}(x), \tag{3}$$

Further we assume that each consumer assigns a subjective probability (pj) to each possible outcome. These probabilities are based on publicly available information, and individual consumers' experience with similar technologies. Over time, these subjective probabilities would approach a homogeneous set of probabilities as more information is publicly disclosed, and as consumers have similar experiences with the technologies. For notational convenience, it is further assumed that all outcomes other than the first outcome (j > 1) result in lower utility, and that the disutility grows with the amount of money that is deposited in the remote accessible account (, ∀j > 1). Since the model focuses attention on expected utility, either a horrible outcome and/or a high probability of such adverse outcomes (i.e., personal information theft) could cause the expected utility to differ greatly from the utility under certainty.

$$\text{Maximize: } U(x) = f(x) + \sum_{j=1}^{k} p_j \sum_{i=1}^{n} \delta_i h_{i_j}(x)$$

$$\text{subject to: } \phi(\mathrm{x}) + \sum_{i=1}^{n} \delta_i \gamma_i(x) = m. \tag{4}$$

The base costs of the traditional account can be written as ϕ(x). Again we use a modular notation to describe the costs associated with the remote cost components as γn(x). These cost functions can add or subtract costs from the base cost function. Some examples of cost savings through remote banking include time savings for online banking over traditional accounts or lower transportation costs. In model, the risk premium is made up of the utility for adverse outcomes, h(x), and the subjective probability that those adverse outcomes occurred. [20] Adoption of remote banking, like Internet banking, will depend on the added utility of the consumer's perceived added utility, the cost of that technology and the risk premium. The risk premium is a composite construct, made up of consumer's risk aversion and the subjective probability for different adverse outcomes. Over time, the subjective

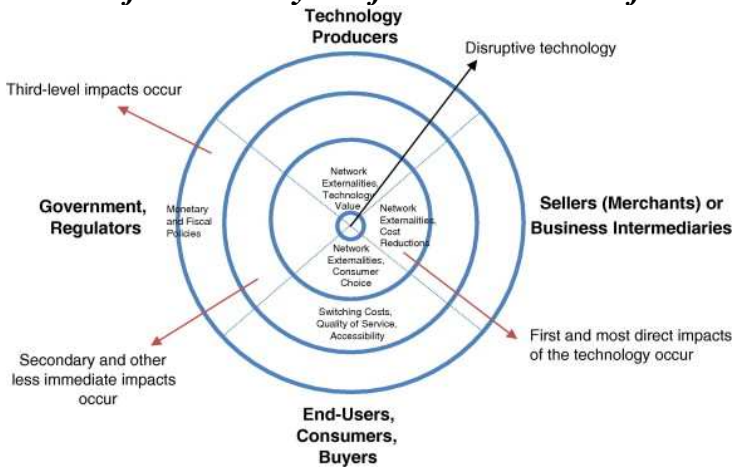
probability set among all consumers will likely tend to converge. But, at the early stage of introduction of a new technology, these subjective probabilities are likely to diverge widely.

## 3 Problem solving

The term electronic banking, or if e-banking, is now quite extensively used. But often incorrectly confused with the term e-commerce and e-business. The term e-business is the most general and is, in principle, the use of electronic solutions to streamline business (supply chain optimization, streamlining business processes, improve communication, etc.). E-commerce can be defined as electronic marketing, sale and purchase of goods and servicing of clients over the Internet. It is thus a subset of e-business, one of its possible Electronic banking then form a subset of e-commerce, because in principle it is only a service or channel through which services are delivered, but in the normal case does not include e-banking product sales. E-banking is an effective and efficient tool for servicing existing clients of financial institutions. E-banking can be done in many ways combines all of their electronic nature. At present, for such electronic negotiation between client and financial institution used primarily this technological interface: internet banking and banking via personal computer, mobile banking and WAP banking. This is to ensure a flexible, open and self-service channel, which a client can meet their everyday needs, whether it is a banking service or for information. Why do we have a credit card? Credit card authentication token, a subject that is somehow able to authenticate people say about him and it was really he and not someone else. Credit card is one of the most modern technologies, to address non-cash payments and access to ATMs. We have more types of credit cards, but nowadays is used as "smart" card, a card with a microprocessor that enables secure communication with other devices, and ATM. What will the future? In the future there will be the third generation of mobile interface and interactive television, without changing the fundamental objective of e-banking. These facts suggest that many consumers actually see the potential value of m-payments, however, they can still find the realized value is sufficiently significant [1] justify demand or register to m-payments. The difference between the potential value and values realized as seen consumer bodies can be attributed to several factors [4], including the lack of a specific business model, cost issues, consumer apathy, security, accessibility and lack of uniform standards [15] and [14]. Kreyer et al. [6] and [18] discuss the importance of having a standardized m-payment procedures for the adoption of consumer-friendly m-payments. Dahlberg et al. [8] and [9] take into consideration issues such as ease of use factors, usefulness, trust and important people, like other drivers of consumer adoption of m-payments. Karnouskos [3], Pousttchi [4] and [5] and Pousttchi and Schurig [7] offered a well-developed perspective on how m-payments based on their observations of the successful German and European experience in the past few years, the implementation and adoption of m- payments. Pousttchi [4] states, for example, that consumers and users should expect that M-Payments business processes are designed to strengthen consumer confidence and facilitate participation. In addition, a study on a sample of consumers in the United States, Dewan and Chen [8] indicates that while consumers recognize the potential benefits of M-Payments, expressed great concern about the safety and privacy. Furletti and Smith [9] Report on the scope of legal protection of electronic payment systems, users can rely on the United States. This article is the evaluation shows that we will take some time, the appropriate level of detail with respect to the legal practice of some payments,

other secondary or tertiary issue, which suggests that the extent of potential impacts of this technology.

***Fig. 1: A robust framework for the analysis of economic issues for disruptive technologies***




*Source: [6]*

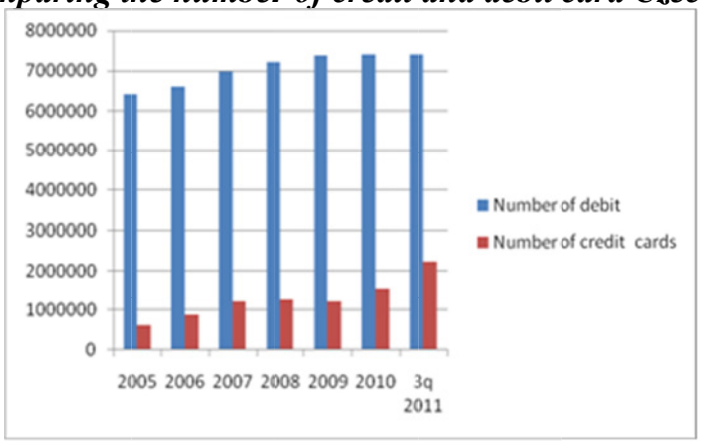
The question that remains to be answered now is: Will M-payments to replace cash and credit cards to become a universal means of payment? There is considerable evidence, we believe that it will, although it will take time. Whether we consider Europe, Asia and North America, the younger generation (especially children and other young people), will be the major adopters of m-payment, as they grow up to become a new generation of workers with increasing purchasing power. Even credit card companies realize the great potential for m-payments. This is evidenced by their active participation in many m-payment initiatives (such as Visa with NFC-based system). Moreover, even if m-payments can be based on credit card accounts in the future, we expect other electronic cash to m-payments. The number of ATMs installed has grown by 7.5%. The number of withdrawals from ATMs has increased by 4% and the volume of the selected cash has increased by 4.5%. The average amount withdrawn from an ATM was 3650 CZK. In terms of migration to ATM chip technology has achieved 100% CR. Gain in all ATM cards can be used with the chip.

***Tab. 1: Comparing the number of credit and debit cards***

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 3q 2011 |
|---|---|---|---|---|---|---|---|
| **Number of debit** | **6418446** | **6603621** | **6974147** | **7220667** | **7372327** | **7400919** | **7401554** |
| **Number of credit cards** | **614542** | **885266** | **1212401** | **1276714** | **1224814** | **1564430** | **2233438** |

*Source: Own processing*

***Fig. 2: Comparing the number of credit and debit card Czech Republic***



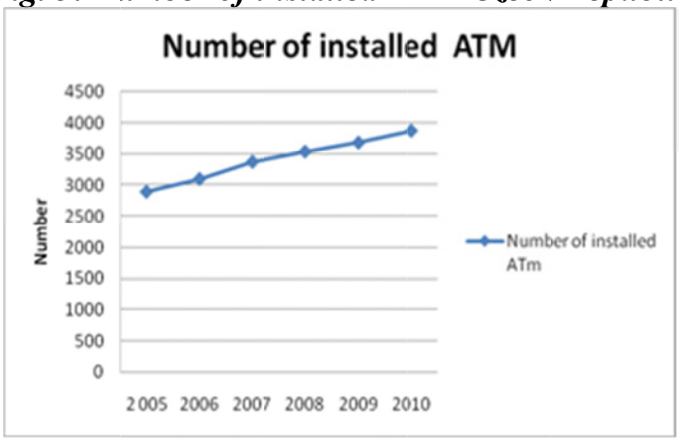

*Source: Own processing*

***Tab. 2: Number of installed ATM Czech Republic***

| | 2 005 | 2006 | 2007 | 2008 | 2009 | 2010 | 3q 2011 |
|---|---|---|---|---|---|---|---|
| **Number of installed ATM** | 2892 | 3096 | 3369 | 3534 | 3679 | 3868 | 4105 |

*Source: Own processing*

***Fig. 3: Number of installed ATM Czech Republic***




*Source: Own processing*

***Tab. 3: Number of transactions Czech Republic***

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|
| **number of transactions** | 133508321 | 145681337 | 152097961 | 162688149 | 166703439 | 168344160 |

*Source: Own processing*

In comparison, the number of outlets accepting cards by more than 5%, the number of online shops (e-shops) that accept cards increased by more than 33% year on year increased the number of sites offering cash back service by more than 17%. In terms of migration to chip technology, POS CR reached more than 98%. Home cardholders clearly prefer to use cards in stores at the expense of cash withdrawals from ATMs. Frequency of use of payment cards for direct payments in shops on the number of withdrawals from ATMs in Q2 2011 was higher by more than 55%. Financial volume of transactions directly cards in stores accounting for 40% of the total transaction cards. In comparison, the number

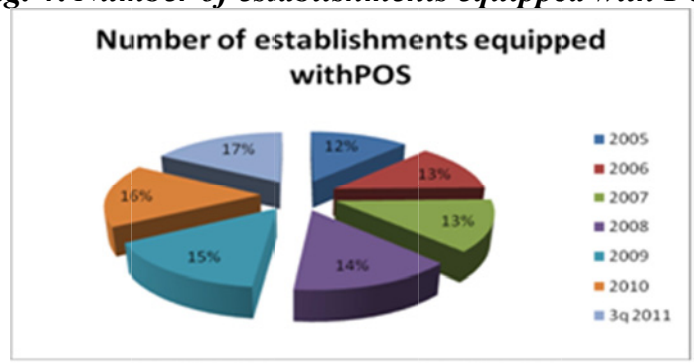
of transactions in the trading places by more than 27%, the number of cash withdrawals from ATMs rose by 12%. The average amount paid directly to the card was 962 CZK, average cash withdrawal was 3650 CZK.

***Tab. 4: Number of establishments equipped with POS***

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 3q 2011 |
|---|---|---|---|---|---|---|---|
| **Number of establishments equipped with POS** | 42909 | 43875 | 45539 | 49928 | 53375 | 57637 | 58883 |

*Source: Own processing*

***Fig. 4: Number of establishments equipped with POS***




*Source: Own processing*

The number of online shops accepting cards on June 30, 2011 amounted to 3 350 e-commerce.

- Number of e-commerce: 3350,
- number of transactions in Q2 2011: 1283255,
- volume of in Q2 2011: 1,480,069,000 CZK.

Number of internet payments from card grew by 97%, paid by credit card purchase volume grew by 70%. The average amount paid by credit card online store in CZK was 1153. The data source was a Commercial bank. To examine the influence of perceived risk of a new technology with an old technology, we examine two different remote access methods, phone-banking and Internet banking. The theory described in the last section implies that Internet banking adoption is a function of utility added by adoption of remote banking services, a budget constraint (the added cost of using the new technology), and the risk premium. It was assumed that those gaining the most utility from Internet banking would be those who had the most complex banking relationship. The survey did not explicitly address the cost of the online service, the e-banking service, or any phone-banking charges. Thus, the models estimated below ignore these explicit costs (or assumes them to be zero). Since in our opinion, these explicit costs were initially set very low by banks to encourage Internet banking adoption, we believe that this assumption is not too costly.

The study indicated instruction model, which indicates models using a set of indicator variables for the risk aversion variable, and using the numbers as described above. Using a full-reduced framework, there was no loss in prediction power using just the number as

input (treating the risk aversion variable as a continuous variable). Therefore, for parsimony, we use the reported measure for all models in the analysis section.

## 4 Discussion

Use of the model is to assess the suitability of contactless payments also their risk. We use the variable to indicate if other financial service is accessed via the Internet (labeled Familiarity in the tabular results presented below). The question of risk aversion was asked in the survey as respondents were asked "Which of the statements on this page comes closest to the amount of financial risk that you and your (spouse/partner) are willing to take when you save or make investments?" Then each subject was shown a card with the following options:

1. Take the number of debit and credit cards,
2. contactless payment transactions,
3. the average financial risk caused by the payment,
4. not willing to take any risks.

The base model used to estimate early adoption of payment transactions is the following:

$$\pi = \frac{e^A}{1+e^A},$$

$$A = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \sum_{i=6}^{10} \beta_i d_{i-5} + \beta_{11} g + \beta_{12} X_6, \quad (5)$$

Where π = Bernoulli probability of using Internet banking, $X_1$ = number of savings accounts held by household members, $X_2$ = number of checking accounts held by household members, $X_3$ = amount in savings and checking accounts, $X_4$ = reported age of the "head of household", $X_5$ = natural log of reported income, di = dummy variables for level of education, g = 1 if subject uses another form of Internet financial services, 0 otherwise, $X_6$ = response to the risk aversion question in the survey (1, 2, 3, or 4 – increasing levels of risk aversion). We use the risk aversion variable to proxy for utility function shape. As mentioned before, the variability in subjective probabilities is expected to be a function of age, education, familiarity with the remote access channel, and possibly income. We also add interaction terms to the base model which allow risk aversion to interact with the subjective probability variables. We use the risk aversion variable to proxy for utility function shape. As mentioned before, the variability in subjective probabilities is expected to be a function of age, education, familiarity with the remote access channel, and possibly income (since the more one earns, the more likely it is that one has purchased a computer). We therefore separately interact these variables with the consumer's measure of risk aversion. They used data provided by CSO. The output is a refutation or confirmation of possible risks. On the basis of conditional probabilities, the coefficients that will respond to the frequency. To find the maximum likelihood estimator of the probability contactless payments if the customer uses the service, the conditional probability contactless banking:

$$P(I \mid F) = \frac{P_{11}}{P_{11} + P_{21}}, \quad (6)$$

where :I = uses contactless banking, F = uses e-banking, P11 = probability of use of contactless e-banking, e-banking, P21 = probability of untapped contactless payments.

P11 and P21 are estimated in the multinomial logit described in the section using maximum likelihood. Therefore, this estimate is a maximum likelihood estimator of the conditional probability. Note that P11 and P21 can be expressed as equations from the multinomial logistic regression as follows:

$$P_{11} = \frac{e^{L_{11}}}{1 + e^{L_{11}} + e^{L_{12}} + e^{L_{21}}},$$
$$P_{21} = \frac{e^{L_{21}}}{1 + e^{L_{11}} + e^{L_{12}} + e^{L_{21}}},$$
(7)

where $L_{ij}$ = linear combination described in the last section to estimate the joint probabilities.

Combining those definitions into Eq yields the following relationship:

$$P(I \mid A) = \frac{e^{L_{11}}}{e^{L_{11}} + e^{L_{21}}}.$$
(8)

Further simplification of the terms yields the following:

$$\text{logit}\left(\frac{P_{11}}{P_{11} + P_{21}}\right) = \ln\left(\frac{P_{11}/(P_{11} + P_{21})}{P_{21}/(P_{11} + P_{21})}\right) \ln\left(\frac{\frac{e^{L_{11}}}{1 + e^{L_{11}} + e^{L_{12}} + e^{L_{21}}}}{\frac{e^{L_{21}}}{1 + e^{L_{11}} + e^{L_{12}} + e^{L_{21}}}}\right) = L_{11} - L_{21}.$$
(9)

Therefore, the maximum likelihood estimate of coefficients for the conditional probability of Internet banking given contactless payments usage is just the difference between the coefficients of the P11 and P21. Since these new coefficients are estimated by merely subtracting one estimate from another, the variance or each estimate can be estimated from the covariance matrix:

$$s_{c_i}^2 = s_{1_i}^2 + s_{2_i}^2 - 2s_{12_i},$$
(10)

where $s_{c_i}^2$ = variance estimate of conditional coefficient $i$, $s_{1_i}^2$ = variance estimate of $P_{11}$ coefficient $i$, $s_{2_i}^2$ = variance estimate of $P_{21}$ coefficient $i$, $s_{12i}$ = covariance estimate of coefficient $i$.

These new coefficients no longer estimate the influence of those variables on the marginal probability, but on the conditional probability of adopting Internet banking, given the customer is a phone-bank user. The same procedure can be used to estimate the conditional probability of phone-banking given Internet banking. The estimate is simply L11 − L12, with a similar derivation. Using this procedure, we should be able to determine the sensitivity of consumers to perceived risks in moving back and forth, or comparing the relative effect of perceived risk to the two channels of banking services. Pratt showed that the distinguishing feature among risk premiums was the individual's utility structure. He approximated the risk premium using a second-order Taylor series expansion. The only difference between the risk premiums of two people was a measure he called risk aversion, and was a measure of the shape of the individuals' utility functions. Result from the model is that risk aversion, which is either downward sloping or flat in the bi-variate and multinomial logit models, may actually be upward sloping in a broader context. In other

words, as some consumers' risk aversion increases, they may be more likely to adopt Internet banking.

## Conclusion

The aim of this study was to describe the infrastructure used today cashless payment systems and M-Payments and map the entire filling. These systems are based on electronic money will present many problems, however. The use of central bank notes will diminish and monetary policies and their management will need to be changed. We expect that central banks will have less control over their national money supplies, electronic forms of money because it is difficult to measure, control and monitoring. Finally, because electronic cash is not considered legal tender, we expect that the complexity of issues related to ensuring the clearing and settlement of payments Mcreates on the speed with which the intro duction and dissemination occur. Overall, the m-payment has a bright future around the world, but there will be many challenges before widespread adoption occurs. Economic analysis offers the potential to understand the various m-payment-related phenomena on the basis of electronic payment initiatives of the past, but also based on other technologies that cause similar problems to their key stakeholders. There have been a number of contactless trials within the UK retail industry, but we are yet to see mass adoption. Customers and retailers alike are questioning when, or even if, contactlesspayments will become a reality. The long term benefits for retailers and their customers have been clearly highlighted, but it is still unclear for many within the retail industry if this outweighs the short term upgrade costs. In order to deploy contactlesspayments, even though they have upgraded to EMV, retailers have to invest in the necessary hardware. In addition to this financial burden, banks currently charge higher transaction fees for cards than for cash. In order for contactless to be an established form of payment the current costs that retailers are subjected to need to be reviewed, otherwise contactless will not be a feasible option for many retailers, especially for smaller retailers who cannot swallow the initial set-up fees. There is also reluctance among retailers to embark on another technology upgrade, following the recent migration to Chip and PIN three years ago. Financial institutions need to engage with the retail industry to support their contactless proposition – making them aware of the financial benefits they can utilise from their initial EMV investment. A number of retailers are also concerned about the lack of hardware choice available. Currently there are few integrated POS devices for retailers that combine Chip and PIN and contactlesspayments. Security is also regarded as an issue for consumers, who had to make the initial change from a signature to just a pin, and now with contactless many regard that there are no security barriers in place. There is confusion about whether the technology can be tampered with and whether, fraud takes place, there are infinite funds available on the card. Before consumers will have confidence in contactless payments they need to be educated that fraudsters will not be able to take unlimited amounts nor are they able to hack into personal details. MasterCard's PayPass and Visa's Wave and Pay are at the forefront of showing how contactless cards can be used to deal with small payments in the Czech and retailers are starting to realize the strong business case that contactless payments will deliver. Although it will be a number of years until contactless payment becomes widespread in the Czech and even longer for mobile phone technology, the recent launches show the potential of the additional functions available to banks and retailers from their existing EMV infrastructure. In the short term these developments will signal the start of seeing contactless transactions being used more broadly throughout the UK

and ultimately in the long run the end of cash. Study shows risk model assembly. This model is based on the use of statistical values and mathematical equations. With further data collection will provide guidance on how to avoid the risk of contactless payments. It also shows the application of rapid and broken. Further studies will be gathering data available with the extension technology.

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**Contact Address**

**Ing. Zuzana Němcová, Ph.D.**
Vysoké učení technické v Brně, Fakulta podnikatelská
Kolejní 2906/4
612 00 Brno
E-mail: nemcova@fbm.vutbr.cz
Phone number: +420 541 143 718

**prof. Ing. Jiří Dvořák, DrSc.**
University of Pardubice, Faculty of Economics and Administration, Institute of System Engineering and Informatics
Studentská 95, Pardubice, 532 10, Czech Republic
E-mail: Jiri.Dvorak@upce.cz

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