

# The Role of Competition in the Adoption of Mobile Payment among Merchants

FRANCESCO PISANI & JÜRGEN MOORMANN

**Abstract** Mobile payment has been predicted to become the “new normal” in the payments industry. However, such predictions have hardly been realized in the Euro area, since most payments at the point of sale (POS) are still conducted in cash. Mobile payment represents a specific case of multi-sided markets, where the functioning of the whole market relies on the interaction between several players – in this case at least two, i.e. merchants and consumers – on a common platform. As such, every innovation that is brought to this market has to be adopted by both sides in order to be widely diffused. For the successful dissemination of mobile payment, however, it is important that merchants are among the early adopters, as merchants are the ones who directly cover the costs of the system. Nevertheless, despite its importance, extant research on mobile payment has often neglected the role of merchants. Our research in progress is set to investigate the main features of competition that will eventually stimulate merchants’ adoption of mobile payment at the POS. Empirical evidence will be provided via a survey targeting merchants with at least one physical POS. The results are expected to contribute to the literature on mobile payment, as well as that on the diffusion of innovations and multi-sided markets.

**Keywords:** • Competition • Innovations • Merchants • Mobile Payment • Multi-sided Markets •

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## 1 Introduction

The "*use of a mobile device to initiate, authorize or confirm a financial transaction*" (Au & Kauffman, 2008, p. 141) was introduced in the late 1990s (Dahlberg et al., 2015) and since then it has accompanied the evolution of mobile phones. Mobile payment is expected to take on a central role in the payments industry. Nevertheless, the majority of payments at point of sale (POS) in the Euro area are still made in cash (Esselink & Hernández, 2017).

This low adoption of mobile payment is certainly not due to a lack of technological opportunities. In effect, a range of new technologies that seem suitable for facilitating this service already exists, especially considering innovations to be used at the POS, such as Near Field Communication and Quick Response codes. The low level of mobile payment adoption is, therefore, rather the result of other historical factors, such as (1) the absence of promising business models (Au & Kauffman, 2008; Ondrus et al., 2009; Pousttchi et al., 2009), (2) the main stakeholders' inability to cooperate (Oczan & Santos, 2015; Pousttchi et al., 2009), and (3) the failure to generate network externalities among the participants (Apanasevic, 2013; Au & Kauffmann, 2008; Diniz et al., 2011; Lao & Liu, 2011; Pousttchi, 2007).

Like other multi-sided markets, such as credit card payments, the use of mobile payment relies on direct interaction between distinct agents (in particular, merchants and consumers) on a platform. For the successful diffusion of mobile payment, however, it is not only necessary to generate network externalities among the parties involved; it is also important that merchants are among the early adopters, as they appear to be the most important group for the whole adoption process (Dahlberg et al. 2008; Ondrus & Lyytinen, 2011; Ondrus & Pigneur, 2007; van der Heijden, 2002). Merchants are thought to be the ones who will decide the future of the system, since in the payments industry merchants are usually the party who directly cover the costs of the system, which are eventually passed on to consumers.

Nevertheless, despite the importance of mobile payment, past research on the topic has often neglected the role of merchants, and knowledge about the merchants' adoption process is currently lacking (Dahlberg et al., 2015). Similarly, research on diffusion of innovations, as well as on multi-sided markets, has not provided dedicated insights about the aspects of competition that might play a role in the adoption of a new technology. The environmental context (Tornatzky & Fleischer, 1990), and in particular external pressure (Iacovou et al., 1995), has already been identified as a key factor stimulating the adoption of innovations. Nevertheless, environmental aspects represent only a minor factor influencing decision makers, as indicated in classical theories on the diffusion of innovations. In fact, further key factors need dedicated attention, especially when considering the role that the adoption of innovations can play in the creation of network externalities and the diffusion of innovations in multi-sided markets. Hence, our research in progress aims to contribute to this literature by analyzing the role that competition among merchants plays in the dissemination of mobile payment at the POS. Our research

project explicitly tries to answer the question: *What are the key aspects of competition that motivate the adoption of mobile payment among merchants?*

Empirical evidence will be provided via a survey conducted among merchants with at least one physical POS. We plan to focus on Germany because around 80% of the total number of transactions made by consumers are still conducted in cash in this country (Esselink & Hernández, 2017), making it a suitable setting to answer the research question at the center of this project. Because mobile payment still represents an innovation for most merchants in this country, our study analyzes a payment system before it has gained widespread diffusion. This represents a valuable case through which to investigate the potential motivations to adopt mobile payment. Our research aims to add evidence to the stream of literature related to the diffusion of innovations and to multi-sided markets, in which the development of network externalities among participants is a necessary milestone for successful adoption. In particular, the results will contribute to understanding of key aspects of mobile payment diffusion.

## 2 Theoretical Background

Since its inception, mobile payment has been perceived as an innovation capable of providing new customer experiences. Advantages such as enhanced purchasing processes, as well as better benefits for consumers, have often been proposed as key within this argument. As such, mobile payment has attracted the interest of many companies and become the object of large investments. For instance, large groups such as Otto Group and Deutsche Telekom have founded their own ventures in an attempt to expand into this market. However, contrary to expectations, mobile payment has yet to really take off in Germany.

Mobile payment can be identified as a particular example of a multi-sided market. A multi-sided market brings together agents from distinct groups via a common platform (Gazé & Vaubourg, 2011) where the exchange of products and services takes place. Consequently, the success of a multi-sided platform depends on direct interaction between the agents.

The concept of network externalities (or consumption externalities, as per the original terminology) has been used to identify the increase in benefit that an agent derives from other agents joining the network (Katz & Shapiro, 1985). Network externalities can be distinguished into direct and indirect, depending on whether the increased number of new joiners that bring additional value come from the same group as the agent, or from a complementary group (Katz & Shapiro, 1985). Consequently, fertilization of the interdependence between merchants and consumers is important for reaching a critical mass of mobile payment adopters (Ondrus et al., 2015) at which a typical multi-sided market becomes self-sustained and the propensity toward establishing a specific standard is increased (Clements, 2004; Mahler & Rogers, 1999).

Conversely, a lack of participants may undermine the market existence. In the past, the low number of merchants adopting mobile payment technology resulted in a lack of customers willing to use it, and vice versa (van der Heijden, 2002). The subsequent slowdown effect generated a circumstance defined as a wait-and-see status (Goldenberg et al., 2010), in which potential users wait for the early adopters who will eventually develop more demand for the product or service. This status can ultimately lead to an increasing number of users abandoning the system if they wait too long for others to join, and eventually the network disappears (Evans, 2009; Ondrus et al., 2015).

To overcome this standstill, a typical strategy adopted to further the dissemination of a new platform is to subsidize the product or service for one of the agent groups, and thus build a solid base that will make it attractive for the other side to join as well. This kind of strategy has been used by Diners Club, for instance, which gave its cardholders a card for free and let merchants indirectly bear the cost of it. Eventually, the large number of consumers adopting this card incentivized merchants to accept it in order to increase their customers' satisfaction. However, previous trials of mobile payment that followed a similar approach were ineffective, suggesting that there might be other reasons stimulating mobile payment adoption.

Generally, theories about the diffusion and adoption of innovations can be divided between those centered on consumers and those embracing a firm perspective. A model clearly focusing on the diffusion of innovations at firm level is the Technology Organization Environment (TOE) framework (Tornatzky & Fleischer, 1990). The TOE identifies the technological context, the organizational context, and the environmental context as those aspects of a firm that play a relevant role for the adoption of innovations (Tornatzky & Fleischer, 1990). The model has been enhanced over time, and further aspects have been introduced to the framework. For instance, Iacovou et al. (1995) added organizational readiness, external pressure toward adoption, and perceived benefits as the main factors influencing the adoption of innovations among small firms. In particular, external pressure includes pressure from trading partners and competitors.

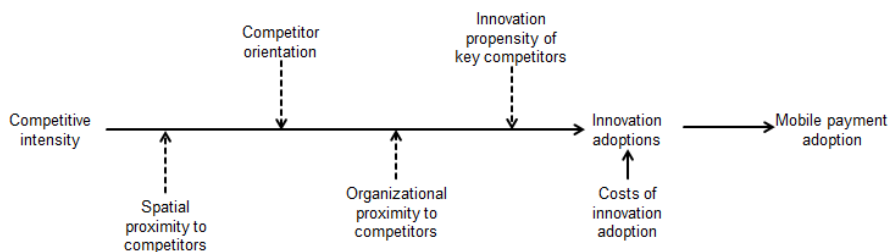
Nevertheless, the influence that the behavior of competitors has on a decision maker represents only a minor factor in the above-mentioned theories concerning the diffusion of innovations. This study provides an important opportunity to generate further knowledge on the topic. Moreover, given the peculiarities of mobile payment as a multi-sided market, the setting of this study adds a distinct perspective. Since the first publications focusing on multi-sided markets or platforms, literature on this topic has advanced. However, there are still aspects, such as competition, that need to be explored. Furthermore, with the increasing role of the “platform economy” and the dominance of platforms including Airbnb, Uber, etc. this research aims to address a topic that has highly important implications.

The classical literature (on micro economics) has tended to propose competition as the main factor forcing companies to reduce their surplus and eventually pass it on to consumers. Furthermore, a blind observer might even believe that competition is the force

shaping companies' behavior. Nevertheless, the role of competition can be less intuitive than expected (Dufwenberg & Gneezy, 2000). For instance, whether competition will provide incentives for managers to perform better is still a matter of debate in the literature (Karuna, 2007). Likewise, it remains unclear whether competition stimulates investments (Yang et al., 2015). Yet, as for other kinds of innovation (Iacovou et al., 1995), we hypothesize that external pressure exercised by competitors will stimulate decision makers to embrace mobile payment. We then try to expand this concept in order to better define which aspects of competition might be important for the adoption of mobile payment.

### 3 Methodology

Via a thorough analysis of previous studies focusing on competition, we identified the most relevant theories that could be applied in our setting. We then developed a specific questionnaire that we tested via interviews and an initial online survey among a small sample of merchants. The main aspects of competition addressed in the questionnaire were intensity of competition, competitors' orientation, competitors' innovation propensity, spatial proximity, and organizational proximity to competitors. While intensity of competition is used as an independent variable impacting the adoption of mobile payment, the other factors are used as moderators of this relationship. This implies, in addition to the central hypothesis that a more competitive environment will stimulate the adoption of mobile payment, that competitors' propensity to innovate, being acquainted with competitors' moves, having shops in similar locations, and perceiving competitors as similar organizations to one another will positively moderate this impact. In addition, the costs of introducing mobile payment are included as a further moderating variable, since costs often represent a critical motive in investment decisions. The questionnaire ended with questions on the merchants' background information. Answers to the questions were based on a seven-point Likert scale ranging from *strongly disagree* to *strongly agree*. The model used for this research is illustrated in Figure 1.



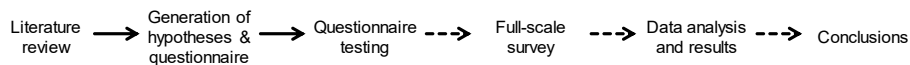
**Figure 14: Model used for developing the questionnaire**

To test the suitability of the questionnaire, first, interviews were conducted with merchants having a physical POS in Germany. Second, a test was conducted among 26 merchants responding to the questionnaire via an online tool. The results of both were used to refine the questionnaire and eliminate any misunderstandings of the text. In the

next step of our project, the survey will be mailed to a representative number of merchants with a physical POS in Germany.

#### 4 Conclusions

Mobile payment has long been predicted to revolutionize the payments industry. Nevertheless, in Germany and in most other European countries, the majority of payments at the POS are still conducted in cash. Mobile payment represents a specific example of a platform for a multi-sided market in which merchants and consumers are expected to interact. Importantly, however, the success of a platform depends on the network externalities that can be created among and between the different sides. Since merchants have been identified as the main agents determining the diffusion of mobile payment, this research aims to contribute to the literature on mobile payment through an analysis of specific aspects of competition that are hypothesized to impact the adoption of mobile payment among merchants. Figure 2 describes the status of this project and the course of action that will be taken until completion.



**Figure 15: Steps of the research project**

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