Acceptance and use of digital payments by consumers: an empirical analysis in Italy

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Abstract

Framing of the research. *Several governments have introduced policies to foster the usage of digital payments by consumers, with the goal of curbing tax evasion. Nevertheless, cash is still predominant. This raises questions about the factors that can promote the usage of digital payments by consumers.*

Purpose of the paper. *This paper aims at investigating the factors affecting the adoption of digital payments by Italian consumers, extending the unified theory of acceptance and use of technology in a consumer context (UTAUT2) with three constructs that are relevant when analyzing this topic, namely the role of government incentives, the concerns related to privacy, and the degree of aversion towards tax evasion.*

Methodology. *To empirically assess the proposed research model, we gathered data in Italy through a web-based survey and analyzed them using Partial Least Squares-Structural Equation Modeling.*

Results. *Findings confirm the UTAUT2 model, except for price value, which is found to be insignificant. Government incentives and tax evasion aversion have a significant positive impact on the behavioral intention to adopt digital payments, whereas privacy concerns have a significant negative effect.*

Research limitations. *The main limitation of this study concerns data gathering, as it was conducted using the Computer-Assisted Web Interviewing methodology, which targets consumers that are already familiar with digital instruments.*

Practical implications. *The paper highlights the factors that both digital payment providers and public institutions may leverage to foster the adoption of digital payments by consumers.*

Originality of the paper. *To the best of our knowledge, this study is unique as it examines the adoption of digital payments by Italian consumers, extending the framework to prepaid, credit, and debit cards, instead of considering mobile payments alone.*

Key words: *digital payments; consumer behavior; UTAUT2; Italy; government incentives*

1. Introduction

Digital payments are gaining popularity in both scientific and empirical domains. In fact, not only the usage of digital payments is growing worldwide (Worldpay from FIS, 2023), but also the number of articles analyzing the topic significantly increased over the past decade (see Appendix A). At

the same time, several governments have introduced policies to foster the adoption of digital payments by consumers, with the main goal of curbing tax evasion (Sung *et al.*, 2017). The underlying assumption is that cash payments enable sellers to easily hide the transaction history, thereby facilitating underreporting of revenues. In contrast, digital payments are traceable and make evasion more difficult to accomplish (Immordino and Russo, 2018) by increasing the perceived likelihood of detection (Madzharova, 2020). Moreover, digital payments enable innovative services (Zhang *et al.*, 2019) otherwise impossible to deliver (e.g. smart mobility services), and foster the diffusion of e-commerce (Gomez-Herrera *et al.*, 2014; International Chamber Of Commerce, 2020).

Despite all these potential benefits, cash is still predominant in most economies (Worldpay from FIS, 2023). For instance, in the euro area, cash accounted for a large part of the transactions at the Point Of Sale (POS) in 2021 - namely 59% in terms of number and 42% in terms of value of transactions (European Central Bank, 2022). The same is true for Italy: in 2021, cash accounted for 69% of total number of transactions at POS and 49% of their total value (European Central Bank, 2022).

For these reasons, it is interesting to investigate which factors drive or hinder the adoption and the usage of digital payments by consumers. To tackle this issue, literature largely exploited the unified theory of acceptance and use of technology in a consumer context (UTAUT2), formulated by Venkatesh *et al.* (2012). For instance, Morosan and DeFranco (2016) uses UTAUT2 to investigate the consumers' intention to use mobile payment in hotels in the United States, Al-Okaily *et al.* (2020) expand UTAUT2 to study the adoption of mobile payment in Jordan while Migliore *et al.* (2022) use a similar framework to compare mobile payment adoption in China and Italy. Actually, most of the studies applying UTATU2 to the payment industry are focused on mobile payment methods (Patil *et al.*, 2018). However, these methods represent just a fraction of digital payments, a category which includes card payments as well. This leaves an important gap to be filled since most of governmental policies target digital payments in general, i.e., they include credit or debit cards as well[1]. Therefore, research on the drivers to the adoption of digital payments could provide governments with useful insights on how these policies can be designed, if the framework is extended to include card payments as well.

From a theoretical perspective, we resorted to UTAUT2 because it has been the preferred theoretical lens to investigate mobile payments, especially in recent years (Al-Okaily *et al.*, 2020; Migliore *et al.*, 2022; Morosan and DeFranco, 2016; Santosa *et al.*, 2021; Sivathanu, 2019; Slade *et al.*, 2014). Moreover, it is one of the most comprehensive Information Systems (IS) adoption theories.

However, UTAUT2 is formulated as a micro level theory, i.e., a theory focused on narrow constrained set of phenomena and constructs

[1] For instance, the Tax Incentives for Electronically Traceable Payments (TIETP) introduced in South Korea (Sung *et al.*, 2017); the Piano Italia Cashless introduced in Italy (see Section 3); the policies introduced in Greece with law 4446/2016 (Danchev *et al.*, 2020).

(Tamilmani *et al.*, 2021; Venkatesh *et al.*, 2016). As such, it lacks formulations of research models at the meso-level (Venkatesh *et al.*, 2016), allowing to explore the pivotal role of the context in which digital payments are accomplished by consumers. To fill this gap, we aim extending UTAUT2 with two contextual factors: (1) the role of government incentives, which provide monetary inducements for the adoption of digital payments and could therefore enhance their usage (as suggested by Sivathanu, 2019); (2) the degree of aversion towards tax evasion, which could encourage consumers to adopt digital payments (Immordino and Russo, 2018).

Also, we added a construct to measure a specific feature of the technology under investigation, namely the concerns related to privacy (Stewart and Segars, 2002; Zerbini *et al.*, 2022), which could prevent people from adopting a technology as it has been already demonstrate by similar studies (Soodan and Rana, 2020).

Our paper aims to extend UTAUT2 with the above-mentioned three factors, to better understand how to foster digital payments in general, without limiting the analysis to mobile payment only. In other words, the following research question is addressed: "Which are the drivers to consumers' adoption of digital payments in Italy?". We test our model in the Italian context because it is of particular interest, as the infrastructure for the acceptance of digital payments is well developed and aligned with the rest of the European Union (EU) while the actual usage by consumers is far below the EU average (European Central Bank, 2021) - See Section 3.

Our results confirm the UTAUT2 model, with the only exception of price value, which plays no role. Also, both government incentives and tax evasion aversion are drivers to the adoption of digital payments by consumers, while privacy concerns represent a barrier. Thus, our study highlights the factors that both digital payment providers and public institution can leverage in order to promote digital payments.

The reminder of the paper is organized as follows. Section 2 describes the theoretical background. Section 3 shows the empirical context. Section 4 summarizes the research model together with the hypotheses. In section 5 we present the research methodology. Section 6 and 7 provide, respectively, the main findings and discussion. Finally, Section 8 presents the limitations and suggestions for future research.

2. Theoretical background

Our analysis contributes to the field of research on the adoption of digital payments by consumers. In this paragraph, we first present the main theories on the acceptance of technologies. Then, we analyze the literature on digital payments.

2.1 Adoption theories

The individual acceptance and adoption of IS has been widely investigated over the past decades and a number of popular theoretical models have been developed and tested (Morosan and DeFranco, 2016;

Slade *et al.*, 2014; Venkatesh *et al.*, 2003). The most popular models are the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975), the Theory of Planned Behavior (TPB) (Ajzen, 1991), the Technology Acceptance Model (TAM) (Davis, 1985, 1989; Davis *et al.*, 1989), the Motivational Model (MM) (Davis *et al.*, 1992), the Combined TAM and TPB (C-TAM-TPB) (Taylor and Todd, 1995), the Model of PC Utilization (MPCU) (Thompson *et al.*, 1991), the Innovation Diffusion Theory (IDT) (Moore and Benbasat, 1991), and the Social Cognitive Theory (SCT) (Bandura, 1986).

Given the fragmentation of research on individual adoption of IS, Venkatesh *et al.* (2003) analyze the above-mentioned eight theories with the goal of formulating a unified theoretical model that could capture the essential elements of the models. As a result, the Unified Theory of Acceptance and Use of Technology (UTAUT) was formulated. Since UTAUT was initially developed for corporate settings, Venkatesh *et al.* (2012) proposed a revision of the theory to investigate technology adoption by consumers. The new theory, called UTAUT2, has become the preferred theoretical lens to investigate the adoption of digital and mobile payments (e.g. Al-Okaily *et al.*, 2020; Migliore *et al.*, 2022; Morosan and DeFranco, 2016; Santosa *et al.*, 2021; Sivathanu, 2019; Slade *et al.*, 2014).

UTAUT2 identifies seven factors that are expected to influence the behavioral intention to adopt a technology and its actual usage. These factors are performance expectancy, effort expectancy, social influence, facilitating conditions, price value, hedonic motivation, and habits. The first four factors were included in the original formulation of the theory (UTAUT). More specifically, performance expectancy is defined as "the degree to which using a technology will provide benefits to consumers in performing certain activities" (Venkatesh *et al.*, 2012, p. 159); effort expectancy indicates "the degree of ease associated with consumers' use of technology" (Venkatesh *et al.*, 2012, p. 159); social influence refers to "the extent to which consumers perceive that important others (e.g. family and friends) believe they should use a particular technology" (Venkatesh *et al.*, 2012, p. 159); facilitating conditions are the "consumers' perceptions of the resources and support available to perform a behavior" (Venkatesh *et al.*, 2012, p. 159).

The last three factors, instead, have been added by the authors in the new formulation of 2012, where hedonic motivation is defined as "the fun or pleasure derived from using a technology" (Venkatesh *et al.*, 2012, p. 161); price value is measured as "consumers' cognitive tradeoff between the perceived benefits of the applications and the monetary cost for using them" (Venkatesh *et al.*, 2012, p. 161); habits are defined as a self-reported perception, i.e., "the extent to which an individual believes the behavior to be automatic" (Venkatesh *et al.*, 2012, p. 161).

Moreover, as pointed out by Tamilmani *et al.* (2021) and Venkatesh *et al.* (2016), the UTAUT2 is formulated with "consumers" as focal point, meaning that it is focused on a narrow constrained set of phenomena. In other words, it is formulated at the micro-level. As a consequence, both Tamilmani *et al.* (2021) and Venkatesh *et al.* (2016) suggest that the theory could be enriched by adding contextual factors at a higher level

of hierarchy, i.e. to add factors that allow a meso-level formulation. For this reason, we added two variables that reflect the context of the Italian payment industry and that can have, ultimately, an impact on consumers' behavior. These factors are the role of government incentives (or subsidies) and tax evasion aversion (see Section 4.2 for further discussion).

Finally, UTAUT2 does not include a variable that has becoming more and more important with the diffusion of new digital technology, namely the concerns for one's privacy. Since 2012, when UTAUT2 was first developed, the diffusion of new digital technologies has dramatically increased (OECD, 2020). With the emergence of data-rich technologies, e.g., the Internet of Things, big data analytics, and artificial intelligence as well as changes in the data-sharing behavior of consumers, the amount of personal data generated and shared has increased (OECD, 2020). At the same time, because of high-profile data breaches, individuals are becoming increasingly aware and concerned about digital risks (OECD, 2020). As a consequence, the need to safeguard one's privacy has become pressing to the extent that it could be a deterrent to the adoption of a technology (OECD, 2017; Soodan and Rana, 2020). For these reasons, we believe that adding the factor privacy concern will improve the explanatory power of UTAUT2.

2.2 Digital payment methods

Digital payments are defined as transactions made for the purchase of goods or services made by digital means only (Sahi *et al.*, 2021; Sivathanu, 2019). More specifically, we include in this definition payment cards, which are defined by the European Central Bank (ECB)[2] as "payment instruments, which are based on the rules of a card scheme, used to withdraw or place cash and/or enable a transfer of value at the request of the payer (via the payee) or the payee in respect of an end-user account linked to the card", i.e., instruments that enable holders to pay sellers directly at the point of sale (in-store payments) or over the internet (e-commerce). Payment cards can be credit cards, debit cards, or prepaid cards (e-money). The definition of digital payments also includes mobile payment, which is defined by the ECB[3] as "a payment where a mobile device is used at least for the initiation of the payment order and potentially also for the transfer of funds". The definition does not include either cheques, since they are paper-based instruments, or bank transfer and direct debits, since their usage is comparably low in B2C transactions (European Central Bank, 2020).

Dahlberg *et al.* (2008) and Dahlberg *et al.* (2015) review the literature on mobile payment. The former analyze the literature published from 1999 to 2006, finding 73 articles. The latter integrate the study by adding the 87 articles published from 2007 to 2014. They both find that the literature is focused mainly on adoption by consumers and technological aspects, such as security and trust. Another literature review on payment instruments

[2] For more information see: https://www.ecb.europa.eu/services/glossary/html/glossp.en.html

[3] For more information see: https://www.ecb.europa.eu/services/glossary/html/glossm.en.html#598

is the one of Khando *et al.* (2022), who analyze the research on the main digital payment methods, finding that the most analyzed category is indeed mobile payment.

Also, Patil *et al.* (2017) specifically review the research on adoption of digital and mobile payment. The authors analyze 21 contributions finding that the most applied theories are the TAM - both original and extended - and UTAUT/UTAUT2. Also, the 21 papers are all focused on mobile payment.

What emerges is a focus on the adoption of mobile payment only. As examples, Morosan and DeFranco (2016) analyze the topic within hospitals in the United States. The authors apply UTAUT2 and find that performance expectancy is the main driver to the behavioral intention to adopt the technology, while the effect of hedonic motivation, habit and social influence is weaker.

Oliveira *et al.* (2016) combine UTAUT2 and the DOI theory, to analyze adoption and intention to recommend mobile payment among consumers in Portugal. Also, Al-Okaily *et al.* (2020) study the adoption of mobile payment in Jordan, by adding four additional factors to UTAUT2, namely awareness, security, privacy and culture. Finally, Migliore *et al.* (2022) integrate UTAUT2 and Innovation Resistance Theory (IRT) to investigate the differences in adoption between China and Italy. The authors find that the tradition barrier is the only significant impediment to mobile payment adoption.

To sum up, the literature on payment instruments is focused on mobile payment only, while other methods - like payment cards - are largely neglected. However, investigating digital payments in general - i.e. adding cards to the framework - is of practical relevance. Indeed, the majority of governmental policies that aim to foster digital payments target the entire category, that is, both cards and mobile payments. For this reason, research that highlight which factors drive or hinder the adoption of digital payments in general can provide useful insights to governments, allowing to improve the efficiency of the policies.

3. Empirical context

We have studied digital payments in the context of Italian consumers because the Italian case is of particular interest for several reasons. First, the infrastructure for the acceptance of digital payments is well developed, as it consisted of 60,647 POS terminals per million inhabitants, significantly above European Union (EU) average (32,663), and 1.99 payment cards per capita, slightly above EU average (1.92), as of 2020 (European Central Bank, 2021). Nevertheless, digital payments are underused. In 2020 Italian citizens made on average 80.7 transactions with payment cards, well below the EU average (145.8) (European Central Bank, 2021). Also, as shown in Section 1, cash is still widespread. This raises questions on the mismatch between the potential and actual usage of digital payments in Italy.

In addition, in 2019 the Italian government introduced the Piano Italia Cashless policy. The policy includes both incentives and deterrents that

target both consumers and retailers, with the goal of encouraging the usage of digital payments, in order to reduce cash usage and, eventually, tax evasion. For our analysis, we will focus on the incentives granted to consumers, namely the so-called Cashback and a receipt lottery.

The Cashback incentive granted consumers a 10% reimbursement on the purchase of goods for transactions made in stores with payment cards. It was active for two periods: from December 8th 2020 to December 31st 2020 and from January 1st 2021 to June 30th 2021[4]. The second incentive is a receipt lottery introduced on February 1st 2021 and still ongoing. It is a lottery where the ticket number is incorporated in purchase receipts[5].

Finally, from a theoretical perspective, in their review of the literature, Patil *et al.* (2017) suggest that future research should focus on Western countries with high cash usage, and Italy fits the description.

4. Research model and hypotheses

We resorted to UTAUT2 because it has become the preferred theoretical lens to investigate the adoption of digital and mobile payments, thereby suiting the goal of our paper (e.g. Al-Okaily *et al.*, 2020; Migliore *et al.*, 2022; Morosan and DeFranco, 2016; Santosa *et al.*, 2021; Sivathanu, 2019; Slade *et al.*, 2014).

In the present paragraph, we present the hypotheses of the research model, distinguishing between the hypotheses derived from UTAUT2 and the proposed new hypotheses. The investigated variables are the UTAUT2 factors, as defined in Section 2.1.

4.1 UTAUT2 hypotheses

As shown in Section 2.1, UTAUT2 investigates the factors that influence the behavioral intention to adopt a technology and its actual usage. Such factors are performance expectancy, effort expectancy, social influence, facilitating conditions, price value, hedonic motivation, and habits.

Performance expectancy refers to the benefits provided by the technology: the higher the perceived benefits, the higher the likelihood that a consumer will adopt that technology (Venkatesh *et al.*, 2012). The majority of studies on mobile payment adoption have found performance expectancy to be one of the most significant drivers of consumer's behavioral intention to adopt mobile payment (Patil *et al.*, 2017). Accordingly, it can be proposed that the utilitarian benefits provided by digital payments are expected to foster adoption, as they offer a convenient way to make a transaction. Namely:

H1: Performance expectancy positively affects the behavioral intention to adopt digital payments.

[4] For more information see https://www.cashlessitalia.it/cashback.html

[5] For more information see https://www.lotteriadegliscontrini.gov.it/portale/home

Effort expectancy relates to the work that the consumer expect to be necessary to use the technology (Venkatesh *et al.*, 2012). The harder the effort, the lower should be the adoption. Conversely, if less effort is required, then the consumer will have stronger intention to use any kind of technology (Sivathanu, 2019). More specifically, it can be proposed that if consumers find using digital payment effortless, they will be more likely to adopt the technology (Santosa *et al.*, 2021). Accordingly, it is proposed that:

H2: Effort expectancy positively affects the behavioral intention to adopt digital payments.

Social influence refers to the impact that the social network - e.g. family and friends - has on consumers' decision to adopt the technology (Venkatesh *et al.*, 2012). Consumers tend to have a favorable image of a technology if they believe that they can gain social status by using it (Venkatesh and Davis, 2000; Venkatesh and Morris, 2000). Among others, (Sivathanu, 2019) provides evidence that social influence has a positive impact on the behavioral intention to adopt digital payments, while Migliore *et al.* (2022) and Yang *et al.* (2012) found that social influence is an antecedent of the behavioral intention to adopt mobile payments. Thus, based on the existing literature, it is proposed that:

H3: Social influence positively affects the behavioral intention to adopt digital payments.

Facilitating conditions indicate the resources and support that the consumer can rely on when using a new technology (Venkatesh *et al.*, 2012). Using mobile payments requires both consumers to have certain skills and qualities, e.g., to be confident in their ability to use a smartphone for making payments, and the availability of relevant infrastructure, e.g., reliable internet coverage (Migliore *et al.*, 2022). The same applies to the usage of payment cards as well. Consequently, it is proposed that:

H4: Facilitating conditions positively affect the behavioral intention to adopt digital payments.

Hedonic motivation represents the pleasure and fun that a consumer experience by using a technology (Venkatesh *et al.*, 2012). Consumers are expected to enjoy using a technology when it is pleasurable and fun to use (Lee, 2009). Moreover, over time the enjoyment and emotional aspects associated with purchases gained significance also in the digital context (Zerbini *et al.*, 2022). Consistently, it can be proposed that if consumers expect digital payment to be enjoyable to use, they will be more likely to adopt it:

H5: Hedonic motivation positively affects the behavioral intention to adopt digital payments.

Price value refers to the comparison between the perceived benefits of the technology and its costs (Venkatesh *et al.*, 2012). The adoption of a technology is expected to increase when its perceived benefits are greater and the perceived monetary cost is low (Migliore *et al.*, 2022). Consistently, it can be proposed that if consumers perceive that digital payment providers offer good price value, they will be more likely to adopt the technology (Santosa *et al.*, 2021):

H6: Price value positively affects the behavioral intention to adopt digital payments.

Habits are defined as a self-reported perception, i.e., "the extent to which an individual believes the behavior to be automatic" (Venkatesh *et al.*, 2012). Habits are expected to have a positive impact on the intention to use a technology, including for digital payments. Thus, it is proposed that:

H7: Habits positively affect the behavioral intention to adopt digital payments.

Finally, behavioral intention indicates the consumer willingness to adopt digital payments and it is assumed to be an antecedent of usage behavior of digital payments, as already stated by previous studies (Venkatesh *et al.*, 2003, 2012). We therefore propose the following hypothesis:

*H8: Behavioral intention positively affects the digital payment*s use

4.2 Extended model hypotheses

UTAUT2 does not include some factors that might be of interest when analyzing the adoption of digital payments, namely (i) the role of government incentives, (ii) concerns related to privacy, and (iii) the degree of aversion towards tax evasion.

Government incentives refers to financial motivations for people to take certain actions. They can also be defined as subsidies, i.e. "government assistance that allows consumers to purchase goods and services at prices lower than those offered" (Schwartz and Clements, 1999, p. 120). The Piano Italia Cashless introduced in Italy falls under this definition. We decided to include government incentives since they are measures specifically designed to affect consumers' behavior and therefore should have an impact on the acceptance and use of digital payments. Moreover, previous research suggested the need to investigate the impact of government support (Sivathanu, 2019). The formative construct "government incentives" measures the participation to both the Cashback initiative and the receipt lottery. Since the two programs provide monetary incentives to adopt digital payments, it can be proposed that:

H9: Government incentives positively affect the behavioral intention to adopt digital payments.

Privacy concerns are defined as "concerns about possible loss of privacy as a result of a voluntary or surreptitious information disclosure" following

a transaction made through a digital payment instrument (Dinev and Hart, 2005). The importance of protecting one's privacy is becoming ever more relevant, especially when adopting digital technologies (Stewart and Segars, 2002; Zerbini *et al.*, 2022). Privacy concerns may lead consumers to safeguarding behaviors that may negatively affect their engagement with a technology (Soodan and Rana, 2020; Stewart and Segars, 2002), and should therefore be included in the proposed extended model as specified in the following hypothesis:

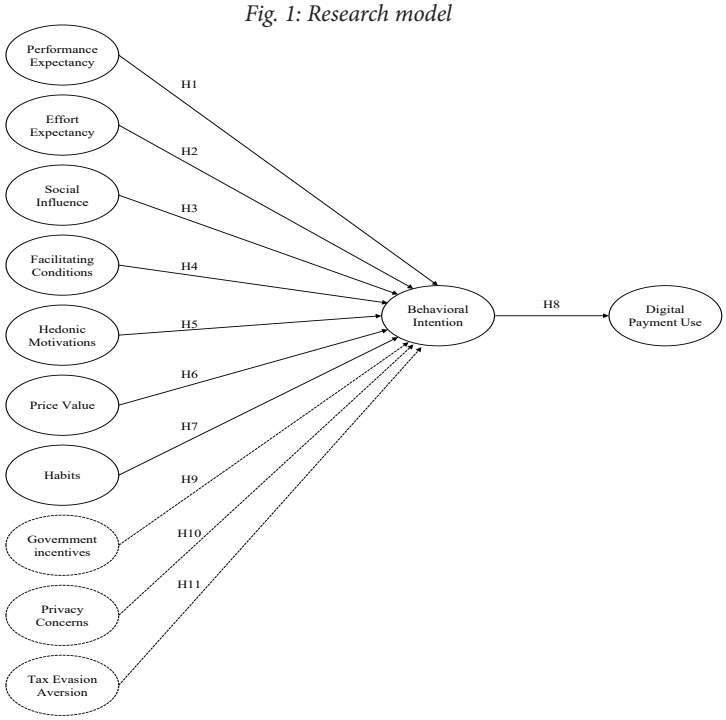
H10: Privacy concerns negatively affect the behavioral intention to adopt digital payments.

Tax evasion aversion indicates the aversion of a consumer towards tax evasion. Digital payment methods are traceable and therefore make tax evasion more complicated (Immordino and Russo, 2018). As a consequence, a buyer who is highly concerned about the negative externalities brought by tax evasion may choose to pay with digital means only, to prevent the seller from evading taxes. For this reason, we decided to include the following hypothesis in the model:

H11: Tax evasion aversion positively affects the behavioral intention to adopt digital payments.

Fig. 1 shows the research model with the proposed hypotheses.

Fig. 1: Research model



Source: authors' elaboration

5. Research methodology

The target population is composed of adult (18+) Italian consumers. To collect the data, we designed a questionnaire that included constructs and scales derived from previous studies (Dinev and Hart, 2005; Venkatesh *et al.*, 2003, 2012) - see Appendix B for further details. We used a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree" to measure the various items.

The questionnaire was administered in Italian. Since the scales drawn from the literature were in English, the initial questionnaire was developed in English and then translated into Italian by the main author. The Italian version was then double-checked by Italian-speaking researchers in order to check the consistency and the comprehensiveness of the various questions.

There were two further assessments of the validity of the questionnaire. First, the questionnaire was pre-tested with the help of Ipsos, a firm specialized in market research. The second test was conducted with the main players of the Italian payment sector[6]. Based on the feedback, the wording of some questions was changed, to better reflect the context of the study.

The questionnaire was administered by Ipsos. To ensure representativeness, we resorted to quota controls. More specifically, the sampling was conducted by Ipsos using a software that selects potential respondents who match the target using interactive selection algorithms based on marginal and crossed quotas.

The survey was carried out using Computer-Assisted Web Interviewing (CAWI) methodology, which is not uncommon in the literature (e.g. Migliore *et al.*, 2022; Oliveira *et al.*, 2016). Thus, the population of reference is Italian citizens, aged from 18 to 75. The online survey was conducted between November 2021 and December 2021, and a total of 1,894 answers were gathered.

All factors were measured through reflective indicators, with the only exceptions of use behavior and government incentives. Digital payment use was measured as a formative compositive index of frequency of digital payments use, as suggested by Venkatesh *et al.* (2012). Respondents were provided with a list of the five main digital payment method types, namely prepaid cards, debits cards, credit cards, mobile wallets, and mobile payment apps, and were asked to indicate their usage frequency for each instrument. The anchors of the 5-point Likert scale ranged from "never" to "always". The construct government incentives were measured as a

[6] The questionnaire was sent for a preliminary assessment to the following companies: Agos, American Express, Banca Cambiano, Banca Mediolanum, Banca di Asti, Banca Popolare di Sondrio, Banco BPM, Bancomat, BNL - Gruppo BNP Paribas, Capgemini, Cassa Centrale Banca, Custom, Deloitte, Deutsche Bank, Edenred Italia, Edison, Enel X Global Retail, EY, HYPE, Intesa Sanpaolo, ING, Klarna, LIS Holding, Mastercard, Mooney, Nexi, N&TS GROUP, Opentech.com, PAX Italia, Pay Reply, PayDo, PayPal, PayPlug, PostePay, PwC, Q8, Scalapay, Sinergia, Soldo, Software AG, TeamSystem, UNGUESS, UniCredit, UnipolSai, Visa, Wolters Kluwer Tax&Accounting, Zucchetti.

formative compositive index of frequency of receipt lottery use and the participation to the Cashback program. The frequency of receipt lottery use was measured using a 5-point Likert scale with anchors ranging from "never" to "always", whereas the participation to the Cashback initiative was measured through a dummy variable equal to 1 if the respondents had taken part in the incentives, 0 otherwise.

6. Results

In this paragraph, we first present descriptive statistic and, then, the results of the proposed research model.

6.1 Descriptive statistics

Table 1 provide descriptive statistics about the sample. 51.46% of the respondents to the survey are female, while the remaining 48.54% is male. This distribution is in line with the one of the population of reference: of the Italians aged 18 to 75, 50.4% is female[7]. Also, the majority of the respondents - 54.55% - is older than 45, while respondents younger than 33 years old account for 25.40% of the total sample. Again, this is in line with the Italian population.

Moving to education, 40.05% have a lower degree of education, while 17.75% are highly educated. Finally, regarding the place of residence, the majority of the respondents live in towns with less than 30,000 inhabitants and 23.54% live in bigger cities.

Tab. 1: Descriptive statistics

	Share of total sample
Gender	
Male	48.54%
Female	51.46%
Age	
18-24	9.03%
25-34	16.37%
35-44	20.05%
45-54	17.5%
55-75	37.05%
Education	
Low	40.05%
Medium	42.2%
High	17.75%
Place of residence (number of inhabitants)	
< 30,000	54.91%
30,000 - 100,000	21.55%
> 100,000	23.54%

Source: authors' elaboration

[7] http://dati.istat.it, accessed on October 23th, 2023.

6.2 Measurement and structural model

We first checked the normality of data by testing the skewness and kurtosis *of* each indicator. The p-values of the tests were all equal to 0.00, meaning that the null hypothesis of normal distribution is rejected. Data were then analyzed using Partial Least Squares (PLS) - Structural Equation Modeling (SEM), which is "a causal modeling approach aimed at maximizing the explained variance of the dependent latent constructs" (Hair *et al.*, 2011). We resorted to PLS-SEM since it is usually suggested when: (i) the research goal is extending an existing structural theory; (ii) the structural model includes formative constructs; (iii) the structural model is complex, i.e., it includes many constructs; and (iv) data are nonnormal to some extent (Hair *et al.*, 2011). Stata17 software was used to run the statistical analyses, together with the plssem package (Venturini and Mehmetoglu, 2019).

Following Hamdollah and Purya (2016), results are provided using the two-step approach: first the measurement model is evaluated and then the structural model is examined.

The first step is to evaluate the measurement model's reliability and validity (Hair *et al.*, 2011). Reflective constructs have been assessed with respect to their reliability and validity. Indicator reliability was assessed by verifying that the factor loadings are all greater than 0.7 (Hair *et al.*, 2011). Since we found a factor loading smaller than 0.7 for the item FC_3, we decided to exclude the variable from the analysis and to revert to two-item measurement for the latent variable facilitating conditions. Construct reliability was tested by computing the Cronbach's alpha, which exceeded the minimum threshold of 0.7 for every construct (Hamdollah and Purya, 2016). Convergent validity was tested using the average variance extracted (AVE). The AVE should exceed the minimum threshold of 0.5, indicating that the latent variable explains at least half of the variance of its indicators (Hamdollah and Purya, 2016). Results are shown in Tab. 2.

Discriminant validity was tested by using two measures. First, we checked that an indicator's loading with its associated latent variable is higher than the cross-loadings (Hair *et al.*, 2011). Then, the Fornell-Larcker criterion (Fornell and Larcker, 1981) was applied, testing whether the AVE of each latent construct is higher than the latent construct's squared correlation with the other latent constructs (results are shown in Tab. 3). Government incentive and digital payment use were measured using two and five formative indicators, respectively, and had weights between 0.26 and 0.86, and 0.20 and 0.53. Results are shown in Tab. 4.

Tab. 2: Descriptive statistics and indicators for the evaluation of the measurement reflective model

Construct	Item	Mean	Standard deviation	Cronbach's alpha	Outer loadings	AVE
Performance expectancy (PE)	PE_1	3.965	0.911	0.776	0.794	0.690
	PE_2	3.883	0.994		0.857	
	PE_3	3.856	0.903		0.840	
Effort expectancy (EE)	EE_1	3.908	0.880	0.790	0.821	0.703
	EE_2	3.978	0.869		0.841	
	EE_3	3.990	0.838		0.854	
Social influence (SI)	SI_1	3.501	0.967	0.748	0.767	0.666
	SI_2	3.365	1.018		0.870	
	SI_3	3.261	1.076		0.807	
Facilitating conditions (FC)	FC_1	3.861	0.910	0.707	0.866	0.773
	FC_2	3.956	0.866		0.892	
Hedonic motivation (HM)	HM_1	3.510	1.000	0.821	0.841	0.737
	HM_2	3.478	1.008		0.854	
	HM_3	3.659	0.944		0.880	
Price value (PV)	PV_1	3.565	0.961	0.771	0.804	0.684
	PV_2	3.531	1.023		0.844	
	PV_3	3.417	1.056		0.833	
Habits (HA)	HA_1	3.503	1.102	0.814	0.827	0.730
	HA_2	3.843	0.941		0.866	
	HA_3	3.844	0.994		0.869	
Privacy concerns (PC)	PC_1	3.254	1.045	0.750	0.796	0.651
	PC_2	3.319	1.002		0.754	
	PC_3	3.100	1.046		0.866	
Tax evasion aversion (TEA)	TEA_1	4.130	0.963	0.825	0.833	0.741
	TEA_2	4.097	0.934		0.860	
	TEA_3	4.126	0.952		0.888	
Behavioral intention (BI)	BI_1	3.640	1.090	0.819	0.813	0.734
	BI_2	3.954	0.903		0.884	
	BI_3	4.014	0.911		0.872	

Source: authors' elaboration

Tab. 3: Fornell-Larcker criterion for discriminant validity

	PE	EE	SI	FC	HM	PV	HA	PC	TEA	BI
PE	**0.690**									
EE	0.486	**0.703**								
SI	0.267	0.148	**0.666**							
FC	0.388	0.544	0.134	**0.773**						
HM	0.453	0.291	0.306	0.233	**0.737**					
PV	0.392	0.299	0.238	0.263	0.387	**0.684**				
HA	0.603	0.459	0.309	0.381	0.470	0.388	**0.730**			
PC	0.019	0.015	0.001	0.007	0.001	0.011	0.029	**0.651**		
TEA	0.335	0.280	0.111	0.243	0.158	0.162	0.255	0.007	**0.741**	
BI	0.629	0.448	0.279	0.386	0.431	0.361	0.656	0.025	0.339	**0.734**

Source: authors' elaboration. AVE is shown in bold on the main diagonal and squared correlations below the main diagonal.

Tab. 4: Descriptive statistics and outer weights for formative constructs

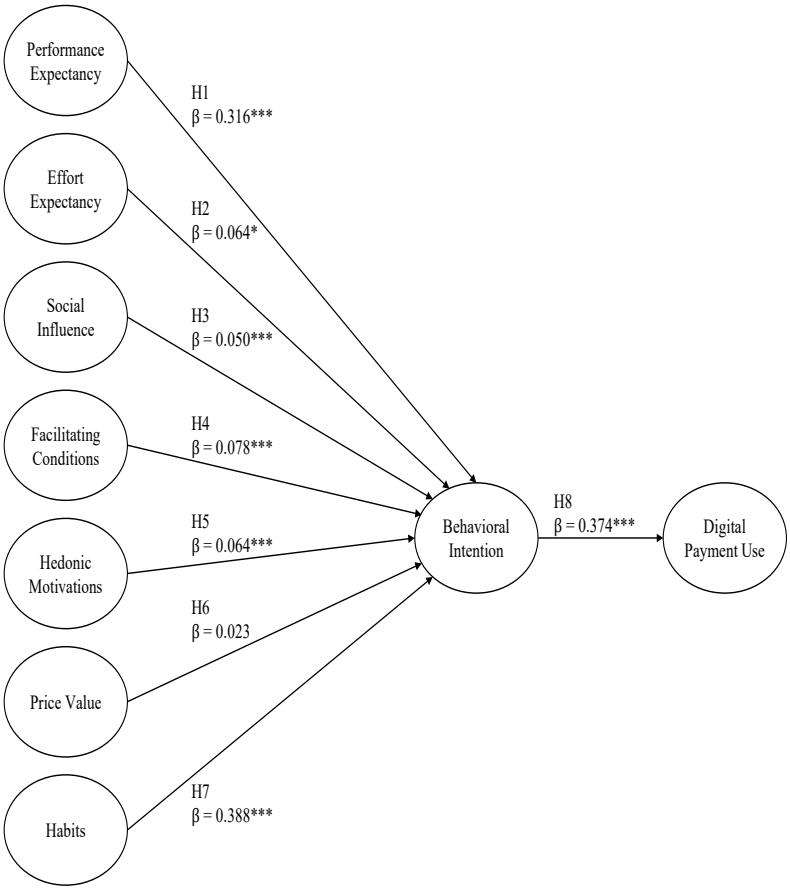
Construct	Item	Mean	Standard deviation	Outer weights
Government incentives	Cashback	0.468	0.499	0.859
	Lott_use	1.140	1.674	0.262
Digital payment use	UB_prepaid	1.904	1.766	0.384
	UB_debit	2.315	1.914	0.520
	UB_credit	1.417	1.795	0.543
	UB_wallet	0.351	1.030	0.203
	UB_mobile_app	1.316	1.704	0.340

Source: authors' elaboration

The measurement model was found to be reliable and valid, and therefore the path analysis was carried out. We ran two separate models: the first one to the support for the baseline UTAUT2 model (direct effects only) and the second one for the proposed extended model. We first tested for multicollinearity by computing the Variance Inflation Factors (VIFs), which were found to be less than the threshold of 5 (Venkatesh *et al.*, 2012) in both models, thereby suggesting that multicollinearity was not a major issue in our study.

As shown in Fig. 2 the main structure of UTAUT2 was confirmed, with the only exception of price value, which was surprisingly found to be insignificant. Similarly, when the three proposed additional constructs were added to the model, significant path coefficients were found with all latent variables, with the only exception of price value (Fig. 3). Results are shown in Tab. 5 as well.

Fig. 2: Structural model results: UTAUT2 model



Source: authors' elaboration. *p < 0.05; **p < 0.01; ***p < 0.001; all other correlations are insignificant

Fig. 3: Structural model results: extended model, new constructs are shown as dotted lines

Source: authors' elaboration. *p < 0.05; **p < 0.01; ***p < 0.001; all other correlations are insignificant.

Tab. 5: Structural model results, UTAUT2 and extended model

	UTAUT2		Extended model	
Hypothesis	Path coeff.	Decision	Path coeff.	Decision
H1: Performance expectancy positively affects the behavioral intention to adopt digital payments.	0.316***	Supported	0.263***	Supported
H2: Effort expectancy positively affects the behavioral intention to adopt digital payments.	0.064**	Supported	0.045*	Supported
H3: Social influence positively affects the behavioral intention to adopt digital payments.	0.050***	Supported	0.049**	Supported
H4: Facilitating conditions positively affect the behavioral intention to adopt digital payments.	0.078***	Supported	0.061**	Supported
H5: Hedonic motivation positively affects the behavioral intention to adopt digital payments.	0.064***	Supported	0.077***	Supported
H6: Price value positively affects the behavioral intention to adopt digital payments.	0.023	Not supported	0.019	Not supported
H7: Habits positively affect the behavioral intention to adopt digital payments.	0.388***	Supported	0.365***	Supported
H9: Government incentives positively affect the behavioral intention to adopt digital payments.			0.036**	Supported
H10: Privacy concerns negatively affect the behavioral intention to adopt digital payments.			-0.031**	Supported
H11: Tax evasion aversion positively affects the behavioral intention to adopt digital payments.			0.128***	Supported
H8: Behavioral intention positively affects the use of digital payments	0.374***	Supported	0.373***	Supported

Source: authors' elaboration. *p < 0.05; **p < 0.01; ***p < 0.001; all other correlation are insignificant

R^2 was computed in order to assess the amount of variance in the endogenous constructs that is explained by the exogenous constructs (Hair *et al.*, 2022). Generally speaking, the higher R^2, the higher the in-sample predictive accuracy of the model. However, there is no general threshold for acceptable R^2 values, since it depends on the research disciplines as well as on the model complexity (Hair *et al.*, 2022). The average R^2 computed for the UTAUT2 model was quite high at 43.9 percent, while the average R^2 of the extended model was slightly higher at 44.5 percent. We then re-ran the tests for both models with significant paths only, i.e., excluding price value, to verify the change in the average R^2. We found that it decreased by only 0.06 percent and 0.02 percent, respectively.

The quality of the structural model was assessed by looking at the redundancy index. Redundancy shows "the amount of variance in the indicators measuring the variable that is explained by the exogenous latent variables that predict the endogenous variable" (Venturini and Mehmetoglu, 2019). Generally speaking, the higher the redundancy, the higher the predictive power of the latent independent variable, since no cut-off threshold has been suggested for redundancy so far (Hamdollah and Purya, 2016). The average redundancy of the UTAUT2 specification was equal to 0.542, whereas the average redundancy of the extended specification was slightly higher at 0.551.

7. Discussion

7.1 Theoretical contributions

This study adds value to the existing theory on the adoption of digital payments by extending the framework to prepaid, credit, and debit cards, instead of considering mobile payments alone. As pointed out in Section 2.2, the literature is mainly focused on mobile payment adoption by consumers. However, mobile payment is only a part of digital payments, which comprehend card payments as well. These methods are still far from being widespread, despite the benefits provided. Thus, our work contributes to the literature by providing evidence on the drivers to the adoption of digital payments in general in Italy.

We also contribute to the existing literature by further testing the explanatory power of UTAUT2. Our findings confirm the main structure of UTAUT2, with the only exception of price value, which is found to have no explanatory power on behavioral intention when applied to the digital payment technology, in contrast with the extant research conducted in other domains. A possible explanation for this result is that digital payments providers do not charge consumers for every transaction but apply monthly fees for payments cards. In some cases, there are no fees at all for payment cards, while mobile payment methods are usually free of charge for consumers. For these reasons, it might be difficult for a consumer to evaluate a tradeoff between the perceived benefits of a technology and the monetary cost for using it. Our finding suggests that when the technology under investigation is free of charge for the consumer

or costs are not charged according to use, price value might not play a significant role.

Our major theoretical contribution is integrating UTAUT2 with two variables that act at the meso-level, namely government incentives and tax evasion aversion; and a third constructs that is relevant when investigating a technology that can potentially map users' behavior, i.e., privacy concerns.

First, our analysis shows that privacy concerns have a negative impact on the behavioral intention to adopt digital payments. As explained in Section 2.1, since 2012, when UTAUT2 was first developed, the diffusion of new digital technologies has dramatically increased (OECD, 2020). As a consequence, the amount of personal data generated and shared has increased substantially, bringing more and more attention to the safeguard of one's privacy (OECD, 2017; Soodan and Rana, 2020). This is confirmed by our findings. For these reasons, we recommend future researchers that wish to investigate the adoption of a given technology to integrate the role of privacy concerns into their theoretical frameworks.

Second, our study shows that the aversion towards tax evasion has a positive, and one of the highest, impact on the behavioral intention to adopt digital payments. Unlike cash, digital payments are traceable, which means that they make it harder for a malevolent seller to conceal the transactions history and thereby hinder tax evasion attempts (Immordino and Russo, 2018). A consumer who is highly concerned with the negative externalities brought about by tax evasion is more likely to adopt digital payments, in order to prevent the seller from evading taxes. Tax evasion is a behavior that produces negative externalities that are specific to digital payment technology and therefore cannot be extended to the theory of adoption of technologies in general. However, each technology is adopted in a given context, with its own characteristics that might differ from one another. Therefore, we suggest that technology adoption theories should be adapted to the context in which the technology they investigate is used. A possible way to do so would be to integrate the specific factors producing positive or negative externalities that can be strengthened or weakened by that technology, as it is the case for tax evasion and digital payments.

The context, i.e., the meso-level, is also important with respect to external influence. For instance, in 2019 the Italian government introduced the Piano Italia Cashless which, as shown by our analysis, had a positive impact on the behavioral intention to adopt digital payments. This factor is of course specific to our study; however, it shows that if there are external factors that can affect the behavior of consumers, such as policies, they should be considered, while the relative theoretical framework should be adjusted accordingly.

Finally, to our knowledge, this study is unique as it examines the adoption of digital payments during the introduction of the Piano Italia Cashless in Italy, thereby allowing to investigate the impact of government support on the adoption of a given technology. By doing so, we also answer (Sivathanu, 2019) call for further investigation of the role of government support in the adoption of digital payment by consumers. The role of government incentives could be tested further, to contribute to the generalizability of our finding.

7.2 Practical implications

On the basis of the empirical research described above, it is found that the constructs performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, habits, government incentives, privacy concerns, and tax evasion aversion have a significant positive influence on the behavioral intention to adopt digital payments, which in turn positively affect the actual use of the technology.

Habits is the construct with the largest impact on the behavioral intention to adopt digital payments in Italy. This suggests digital payment providers to leverage the importance of a person's habits. For instance, they could provide benefits for frequent or loyal users.

Another important factor is performance expectancy. Its positive effect suggests that digital payment providers, as well as public authorities, should enhance the benefits that digital payments provide in the daily life to increase users' awareness. For instance, digital payment providers could run surveys among users to identify which features they value the most and they would like to have and try adding them to their product. Also, they could provide guidelines that highlight already existing or new features. Conversely, public authorities could develop communication campaigns describing tasks enabled by digital payments.

The third most-important construct is tax evasion aversion. Consequently, public authorities are encouraged to develop an institutional communication program about the negative externalities of tax evasion. The objective of such a program should be to increase consumers' awareness about the negative effects of tax evasion and, therefore, the importance to fight it.

Going to the other constructs, the positive impact of effort expectancy may encourage digital payment providers to work constantly to simplify the user's experience of the payment process, to reduce the effort required to the consumer, thereby increasing the behavioral intention to use such instruments. A proper user experience that makes digital payments pleasurable to use may also booster hedonic motivation, thereby increasing the behavioral intention to adopt digital payments. The influence of other people (social influence) is found to be significant as well. Consequently, digital payment providers are encouraged to foster higher social interaction in the use of digital payment instrument, for instance by offering zero-fee peer-to-peer transactions. Encouraging world of mouth can also persuade consumers to adopt digital payments, for example by introducing rewards to extant users who bring in new customers. Improving customer care, thereby enhancing the facilitating conditions, could also help in fostering the behavioral intention to adopt digital payments.

Public institutions can play a pivotal role in promoting the adoption of digital payments as well. The model has proved that the incentives designed by the Italian government had a positive impact on the behavioral intention to adopt the technology, which may encourage the Italian government itself to maintain such incentives in place and other governments to introduce similar policies.

Finally, privacy concerns is the only variable that has a negative impact, even though quite low. Public institutions are also encouraged to introduce, or to keep enforcing, laws that safeguard consumers' privacy when using digital payment instruments. When these laws already exist, the suggestion for public institutions is to develop communication campaigns with the goal of informing citizens on how to better protect their privacy when using digital payments.

8. Limitations and future research

The main limitation of this study concerns data gathering. The survey was conducted using the CAWI methodology, therefore targeting consumers that are already familiar with digital instruments, such as personal computers. Researchers are encouraged to integrate the CAWI methodology with other technology-free methods, e.g., CATI or CAPI.

Finally, future studies may address the impact of government incentives as well, in order to improve the generalizability. Also, we encourage researchers to further develop UTAUT2, adding variables that investigates also meso- and macro-level factors.

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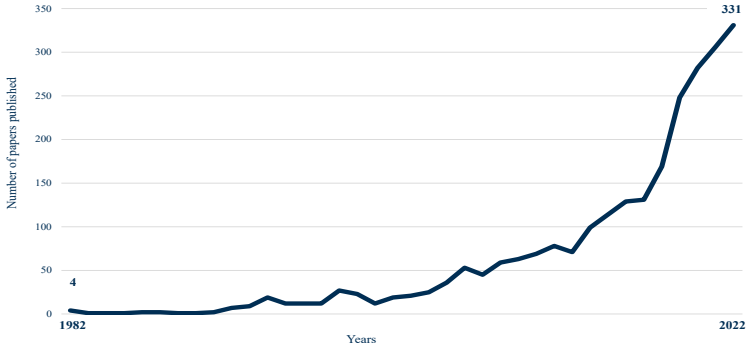
Appendix A

Fig. A1: Number of academic papers analyzing the topic of digital payments published in scientific journals indexed in Scopus



Source: authors' elaboration using Scopus data.
The following query was run on Scopus on January 28th, 2023: TITLE-ABS-KEY ((digital OR electronic OR card OR mobile OR smartphone) W/1 payment*)). Results were then limited to articles written in English and published in peer-reviewed journals before the end of 2022.

Appendix B

Tab. B1: Measurement scales for the constructs in the proposed research model

Construct	Item		Reference
Performance expectancy (PE)	PE_1	Digital payments help me pay more quickly.	Venkatesh et al. (2012)
	PE_2	Digital payments are more convenient than cash.	
	PE_3	Digital payments are useful in my daily life.	
Effort expectancy (EE)	EE_1	Digital payments are clear and understandable.	Venkatesh et al. (2012)
	EE_2	Learning how to use digital payments is easy for me.	
	EE_3	I find digital payments easy to use.	
Social influence (SI)	SI_1	People who are important to me use digital payments.	Venkatesh et al. (2012)
	SI_2	People who are important to me would like me to use digital payments.	
	SI_3	People who are important to me think that I should use digital payments	
Facilitating conditions (FC)	FC_1	I have the knowledge necessary to use digital payments.	Venkatesh et al. (2012)
	FC_2	I have the resources necessary to use digital payments.	
Hedonic motivation (HM)	HM_1	Using digital payments is satisfying.	Venkatesh et al. (2012)
	HM_2	Using digital payments is fun.	
	HM_3	Using digital payments is enjoyable.	
Price value PV)	PV_1	At the current price, digital payments provide a good value.	Venkatesh et al. (2012)
	PV_2	Digital payments are a good value for the money.	
	PV_3	Digital payments are reasonably priced.	
Habits (HA)	HA_1	I wish I could always pay with digital payments.	Venkatesh et al. (2012)
	HA_2	Using digital payments is natural to me.	
	HA_3	Using digital payment has become a habit for me	
Privacy concerns (PC)	PC_1	When using digital payments, I am concerned that the data can be stolen.	Dinev and Hart (2005)
	PC_2	I am concerned that the information I submit while using digital payments could be misused.	
	PC_3	Digital payments are a threat to my privacy.	
Tax evasion aversion (TEA)	TEA_1	Tax evasion causes negative consequences for the Italian economy.	Authors' own elaboration.
	TEA_2	Fighting tax evasion should be a priority in Italy.	
	TEA_3	Tax evasion is an urgent issue for Italy.	
Behavioral intention (BI)	BI_1	I intend to use cash less frequently in the future [a].	Venkatesh et al. (2012)
	BI_2	I will continue using digital payments in the future.	
	BI_3	I intend to continue using digital payments in the future.	

Source: authors' elaboration. [a] Reversed scale.

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