e-banking culture: A comparison of EU 27 countries and Portuguese case in the EU 27 retail banking context

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A R T I C L E   I N F O

A B S T R A C T

The aim of this research is two-fold. Firstly we conducted a wise comparative analysis of EU 27 countries and secondly we identified distinct e-banking user segments of Portuguese citizens. We used a questionnaire for data collection ($n=2358$) and Latent Class Models (LCM) for data analysis. LCM revealed three segments in EU 27 (Portugal is in the poorest cluster, concerning the indicators used, with Greece, Spain and Cyprus) and two e-banking user segments in Portuguese citizens: *Those who do not risk* (49%), and *Those who risk* (51%). Our findings enable e-banking managers for taking appropriate strategic decisions.

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1. Introduction

Bradley and Stewart (2003) indicated that Internet banking is a very important issue in retail banking, and the explosion of Internet usage and the huge funding initiatives in electronic banking have drawn the attention of researchers towards Internet banking, (Sivanand and Geeta, 2004). Over the last 10 years the Internet has changed the rules for practically all industries, including the banking sector (Muñoz-Leiva et al., 2010). Financial institutions aim decreasing servicing and marketing costs, thus increasing economies of scale.

Durkin (2004) argued that key to understanding customer motivations in embracing specifically Internet banking is an appreciation of how customers make decisions in the adoption of new innovations such as the Internet. Accordingly, the issue of how customers make decisions, what will motivate customers to make the decision to embrace the Internet banking platform, and how such motivations can be identified, understood and influenced, is deemed key to bank marketers. Despite the fact that e-banking provides many advantages, such as quicker transaction speed and lower handling fees, there are still a large group of customers who refuse to adopt such services due to uncertainty and security concerns (Littler and Melanthiou, 2006). Therefore, understanding the reasons for this resistance would be useful for bank managers in formulating strategies aimed at increasing online banking use (Lee, 2009).

Classifying consumers in homogeneous clusters allows e-commerce retailers to be more efficient when satisfying their customers' needs and, hence, increase their sales (Barnes et al., 2007). We argue that clustering via Latent Class Models (Fonseca, 2010) will be the best way to classify consumers in that way. With this study we intend to test the heterogeneity of EU 27 countries in the e-banking issue, and uncover the profile of Portuguese citizens, concerning risk attitudes, in e-banking context. Moreover we intend to know which demographics are more responsible by this profile. The study proposed a way of identifying customer groups through how they expose their perceptions regarding the adoption of Internet banking, and their attitudes toward risk.

The main contributions of this paper are as follows: (1) the comparison of EU 27 countries, considering e-commerce and in particular e-banking variables, and some Internet skills variables; (2) the study of Portuguese citizens' attitudes towards e-banking, in particular e-banking risks; (3) the study that the more citizens trust in Insurance Internet Services the more they use e-commerce and e-banking in particular; (4) the study of which demographic factors contribute more to discriminate different classes of attitudes.

2. Electronic banking and risk

2.1. Electronic banking

Electronic banking (e-banking) technology represents a variety of different services, ranging from the common automatic teller

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machine (ATM) services and direct deposit to automatic bill payment (ABP), electronic transfer of funds (EFT), and computer banking (Kolodinsky, 2004). According to Liao et al. (1999), e-banking is defined as the conducting of transactions and accessing bank account information via personal computers (PC), and sometimes, it is called Electronic banking (e-banking).

Online banking is the newest delivery channel for retail banking services, and refers to several types of services through which bank customers can request information and carry out most retail banking services such as balance reporting, inter-account transfers, bill-payment, etc., via a telecommunication network without leaving their homes or organizations (Daniel, 1999). The concept of e-banking includes all types of banking activities performed through electronic networks. It is the most recent delivery channel of banking services which is used for both business-to-business (B2B) and business-to-customer (B2C) transactions (Rehman, 2012).

e-banking is changing the way banking customers conduct their banking transactions (Moga et al., 2012), and they no longer have to visit their bank to perform banking activities. The evolution of e-banking has fundamentally transformed the way banks traditionally conduct their businesses and the ways consumers perform their banking activities (Eriksson et al., 2008).

2.2. Risk

Perceived risk is a key inhibitor of Internet banking use (Aldás-Manzano et al.,, 2009). Perceived risk is depicted as a concept that is 'complex, multifaceted and dynamic' (Zhao et al., 2008), and is defined as a consumer's perceptions of the uncertainty and the possible undesirable consequences of buying a product or service (Littler and Melanthiou, 2006). Risk plays a role in the formation of trust (Chen and Dhillon, 2003), but it is not evident the relationship risk has with trust especially in regards to the perceived risk consumers have in transacting on the Internet (Wong et al., 2009).

Consumer confidence has been adversely affected as a result of the global economic slowdown and turbulence in the financial markets all across the world (Ganguli and Roy, 2010), and in this current business scenario, the banking industry has become highly competitive. Financial risk is defined as the potential for monetary loss due to transaction error or bank account misuse (Lee, 2009), and according to Kuisma et al. (2007) many customers are afraid of losing money while performing transactions or transferring money over the Internet.

3. Data and methods

We are going to use two datasets in this study. Firstly, we use a dataset from eurostat, based on variables defined in Table 1, trying

to position Portugal in a comparative study of EU 27, in terms of Internet skills and uses. Concerning our dataset, first, we reviewed the literature on e-commerce, e-banking in particular, Internet and information technologies use to determine which constructs to include in the study. After some minor modifications in the survey questions based on feedback from the pilot study we applied the questionnaire. We will use a dataset we get from an e-mail survey of 2358 Portuguese citizens, trying to know how they deal with home banking issues, namely risk issues. From our survey we concluded that 1916 (81%) did use Internet and so we used in the study the dataset with $n = 1916$.

Segmentation is a key method employed by banks to better understand and service their customers in this increasingly competitive environment (Meadows and Dibb, 1998). As for methods, because we intend to profile both EU27 countries and Portuguese citizens, we are going to use clustering methods via LCM, in order to know the position of Portugal in EU 27, and for profiling Portuguese citizens concerning e-banking risk attitudes; we argue that LCM are the best way to segmenting customers (Fonseca, 2009, 2013a, 2013b).

As a suitable method for model selection, we used the information criterion AIC_3 (Akaik's Information Criterion family) because the segmentation base variable only contains categorical variables (Fonseca and Cardoso, 2007). Thus we select the best model that presents the minimum value for AIC_3 or an elbow, criterion value with slowly decreasing.

4. Data analysis and discussion of results

4.1. Portugal in EU 27

What is the current Internet banking level of supply in the current European Union countries (EU27)? Before considering the situation in Portugal under the theme, we felt a wise comparative analysis, trying to check the position of Portugal in the EU 27, for the purpose considering the following items (Table 1), using a database established from Eurostat.

Table 2 displays parameters estimates of three-latent cluster model: segment 1, with 51% of the countries, segment 2, with 26%, and segment 3 with 23%.

Two kinds of probabilities are estimated by LCM: probabilities of belonging to each segment, and probabilities of being in a variable category conditional on belonging to a given segment.

For instance, probability 0.9857 (bold) represents the probability of a country value of 19–29 on variable individuals using the Internet for Internet banking (electronic transactions with a bank for payment, etc., or for looking up account information), given that it

Table 1
The variables used to cluster the EU 27 countries.

Variables	Measurements
Individuals using the Internet for Internet banking (electronic transactions with a bank for payment, etc., or for looking up account information)	Percentage of individuals aged 16 to 74
Individuals using the Internet to buy or order online content	Percentage of individuals aged 16 to 74
Individuals using the Internet for ordering goods or services	Percentage of individuals aged 16 to 74
Individuals using the Internet for ordering goods or services from other EU countries	Percentage of individuals aged 16 to 74
E-government usage by individuals by sex – percentage of individuals aged 16 to 74 using the Internet for E-government	Percentage of individuals aged 16 to 74 using the Internet for E-government
Individuals having ordered/bought goods or services for private use over the Internet in the last three months	–
Individuals' level of Internet skills	Percentage of the total number of individuals aged 16 to 74
Individuals having accessed the Internet at home	Percentage of individuals having used the Internet in the last 3 months
Individuals using the Internet for finding information about goods and services	Percentage of individuals aged 16 to 74
Individuals having ordered/bought goods or services for private use over the Internet in the last three months	–