

Are social and financial exclusion two sides of the same coin? An analysis of the financial integration of vulnerable people

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Abstract

The economic crisis has increased the inequality and heterogeneity of people at risk of social exclusion, and thus their financial vulnerability. This article reviews the literature on the determinants of unbanking and underbanking and proposes a model linking financial and social exclusion. We aimed to determine if people at risk of poverty and social exclusion are integrated -and to what extent- in the financial system. To answer this question, we identified the demographic and the social exclusion factors that determine both the status of financial vulnerability and the use of banking services. We used multivariate analysis methods to analyze the information from the survey on social vulnerability conducted by the Red Cross Spain in 2015. Our results show a negative relationship between the risk of social exclusion and the intensity of use of banking services. This leads to financial vulnerability and exclusion in the most extreme situations. We suggest that underbanking is the most relevant - but not previously studied- situation of financial vulnerability in Europe and discuss its implications for policymakers. This paper contributes to the measurement of the link between financial and social exclusion, and is the first quantitative study on the use of banking products by vulnerable people in a European context.

Keywords: social exclusion; financial vulnerability; consumer vulnerability; banking services; unbanking; underbanking

JEL classification: D14, A13 e I31.

1 Introduction

Social exclusion is clearly related to the concept of poverty, and even goes further by considering relational aspects (INE, 2006; Bhalla and Lapeyre, 1997). It is the inability to participate in activities considered normal in a society for reasons beyond the individual. According to this definition, the difficulties of participating in the banking market in a highly 'financialized' society, i.e. the risk of financial exclusion, are a crucial risk factor or determinant of poverty or social exclusion.

Demirgüç-Kunt et al. (2015) found that, in high-income economies, 6% of adults remained unbanked in 2014. Fellowes and Mabanta (2008) provided evidence that unbanked people in the U.S. paid around \$40,000 more for financial services throughout their adult working life. Ampudia and Ehrmann (2016) estimated that the percentage of unbanked adults is 3% and 7% in the Euro area and in the U.S., respectively. They also found that banked households reported a higher net wealth of around \$71,000 and \$57,000 in the Euro area and the U.S., respectively. This may be because banked households are more likely to have purchased their main residence and to have benefitted from the increase in house prices in the years before the crisis. As Allen et al. (2012) indicate, having access to financial instruments provides more possibilities for consumption and investment in physical and human capital, improves economic welfare, reduces inequality and fosters economic growth.

Previous studies on financial exclusion in developed countries have focused on the difficulty of geographic access to banking products and services and its determinants (Leyshon and Thirft, 1995; Carbó et al., 2005). However, financial exclusion is mainly due to: difficulties to access banking services (Seaver and Fraser, 1979; Evanoff, 1988; Dymski, 2003), difficulties of use and consumption (Kempson et al., 2000; Devlin, 2005; Gloukoviezoff, 2007) and difficulties of perception (Hill and Kozup, 2007; De Meza, 2008). During the financial crisis, these difficulties have increased consumer financial vulnerability, especially in the case of those with fewer material resources and education. This financial vulnerability may be visible in the case of unbanked individuals who do not use any kind of financial services and underbanked people who have a bank account without payment facilities (Anderloni et al., 2008).

Most studies have focused on unbanked people in the general population in developed countries, and many of them have been developed in the U.S. Some of them identified supply-side factors as important determinants of being unbanked, like banking deregulation in the U.S. (Beck et al., 2010; Célerier and Matray, 2014). Other studies have focused on the demand side, particularly in financial literacy (OECD, 2013). Furthermore, the revised literature relates financial vulnerability to risk factors of social exclusion like unemployment, immigration and low income.

As far as we know, no previous studies have focused on socially excluded people in a particular advanced country after the recent financial crisis. This study aims to analyse the relationship between the concepts of social and financial exclusion. We also investigate the determinants of a higher or lower use of banking services by this collective, making them more vulnerable to use unorthodox financial channels to meet their basic needs. We also analyse the socioeconomic and demographic risk factors of underbanking or unbanking for people at risk of social exclusion.

Three circumstances bring about the need to carry out this exploratory study. Firstly, the importance of the relationship banking model has decreased in favor of a transactional model which seeks to segment customers according to their profitability (García-Montalvo, 2014). Secondly, the financial crisis has increased inequality and social vulnerability. The latter has been defined in terms of low levels of resilience to hazards (Bergstrand et al. 2015), as a situation of unstable balance between advantage and disadvantage factors, with the risk of falling into social exclusion. Finally, there is a growing need to use banking products to be socially integrated and certain consumers are vulnerable in making proper use of them, including digital services. We are particularly interested in the study of underbanking, because having a bank account does not guarantee being financially included in modern society.

In highly banked economies, the access to financial services can be a barrier to social inclusion (Gloukoviezoff, 2007; Carbó et al., 2005). In this study, we focus on Spain. The country has been severely affected by the crisis and social banking has virtually disappeared. The population studied, people at risk of social exclusion, has increased in both percentage and diversity of profiles in recent years. According to the Foessa Foundation (2014), up to two-thirds of the Spanish population lives in a situation of social exclusion or precarious integration. The

scope of financial services analyzed is limited to formal banking institutions (regulated), because in Spain they offer better guarantees in terms of regulation and consumer protection and better performance-cost binomial to the user (European Economic and Social Committee, 2015).

This paper is structured as follows. In the next section, we review the academic literature to propose a framework for our study and an appropriate analysis model. The third and fourth sections explain the methodology and the main results, respectively. Section five focuses on the discussion. The paper ends with a section of conclusions and recommendations.

2 Literature review and analysis model

Consumer vulnerability can be defined as the individual characteristics and structural constraints that are barriers (real or perceived) to obtaining proper value in consumer transactions. For example, illiteracy may decrease confidence and the ability to act socially when consumer needs are denied or threatened (Adkins and Ozzane, 2005). Other examples include personal factors (age or recent divorce), social conditions (which can lead to the discrimination and stigmatization of different groups) and structural vulnerability (how resources are distributed). In the financial market, this may imply a lack of user control and abuse by the financial institutions (De Meza et al., 2008). Consumer vulnerability may also entail bad business practices such as confusion marketing, which hinders the comparison of products from different entities and induces instant decisions-making (Bowman et al., 2014).

Research on vulnerable consumers in the banking market is limited. A study on the unbanked and financially underserved population¹ of six European countries (Ipsos Mori, 2013), concluded that the main reasons for unbanking are: not having enough money, self-exclusion (no desire or need for an account) and the availability of accounts of family or friends to pay expenses. The vulnerable consumers limited technological access and its disinterest in the use of electronic banking is also a relevant fact.

¹ Financially underserved people are defined in that study as the population that has no means of electronic payment.

The crisis has evidenced the vulnerability of the financial consumer. These consumers are simultaneously affected by both static socio-demographic factors (e.g., living in depressed communities or rural areas with low banking presence), and dynamic factors. The new situation alters the banking market (e.g., a smaller branch network and accelerated use of new technologies), the labor market (rising unemployment) and the society (increasing inequality).

Figure 1 adapts the conceptual model of Baker and Mason (2012) on the theory of consumer vulnerability and resilience. We have adjusted the model to the consumption of financial products within a context of financial and economic crisis, resulting in banking restructuring. Consumers experience a risk of vulnerability (i.e., inappropriate value in consumer transactions) based on four factors: individual (capabilities or socioeconomic status), family (family structure and roles), community (place of residence or limited access to goods and services) and macro-forces (regulation or access to technology).

Fig. 1 Consumer vulnerability and resilience in the banking market

[Insert Figure 1 here]

Source: Adapted from Baker and Mason model (2012)

A 'trigger event', usually a shock in the market or its environment, will impact on consumers depending on the combination of these four factors. For example, during an economic crisis with rising unemployment, consumers may find it difficult to pay their mortgages, depending on their employment status, their ability to maintain or seek new sources of income, their family support or the level of protection that regulation offers to over-indebted people.

The 'aftershocks' can exacerbate the consequences of financial vulnerability. These include ideological tensions between individuals and other stakeholders (Baker and Mason, 2012), such as the debate about who should guarantee that consumers make adequate economic decisions: households or individuals by assuming greater responsibility or financial literacy; regulators by strengthening supervision, or banks by providing appropriate advice. The impact of these ideological tensions determines the circle of consumer resilience, as reflected on the right side of the figure. Thus, the consumer could rely on regulation and the public protection structure,

the flexibility of banks to renegotiate the debt, or personal skills to overcome unemployment, as long as these options exist and are relevant. Other supporting pillars could be the family or credit from charities, or even alternative financial providers such as credit agencies (payday loans) or informal lenders, which may increase the risk of financial vulnerability.

Table 1 summarizes the determinants of being unbanked or underbanked identified in the reviewed studies. Most of them focused on the general population. The main factors refer to demographic, economic, social and perception aspects such as educational level, origin, age, employment, income and level of financial literacy.

More recently, Ampudia and Ehrmann (2016) concluded that households earning low incomes, unemployed, or poor educated are the most likely to be affected by unbanking. From a demand perspective, the risk factors for unbanking are also low income, loss of employment and loss of health insurance coverage, wealth and education (Rhine and Greene, 2006 and 2013; Campbell et al., 2012). From a supply perspective, Beck et al. (2007) identified the quality of the institutional environment, the cost of enforcing contracts and the degree of governmental ownership of banks as determinants of unbanking.

The European Union set priorities concerning financial exclusion (European Union, 2014; Anderloni et al., 2008). The most important stages of financial exclusion affecting social exclusion are lack of access to a bank account and transactional facilities, lack of access to credit and insurance, and finally, lack of access to savings services. The latter is becoming more relevant, as the future of public welfare systems is being questioned (Braga, 2007). Therefore, the underbanked population accesses to a bank account, but not to other payment facilities or credit services.

Table 1 Studies on the determinants of unbanking and underbanking

Source	Context	Situation	Definition	Risk factors or determinant*	Typology
FDIC(2013)	United States of America (general population)	Unbanked	Lack of bank account	Age (+young)	Demographic
				Gender (+male)	
				Minorities (+Black and Hispanic , - Asian)	
				Immigrants/Foreigners	
				Region (+metropolitan areas)	
		Underbanked	Use of bank account but also other alternative financial services, outside the banking system (AFS)	Income (+low income)	Economic
				Employment (+unemployed)	
				House ownership (+ non-homeowner)	
				Educational level(+ lower level)	
				Single-parent families (+ women)	
Unbanked	Lack of bank account	Disability (+)	Social		
		Non English-speakers (+)			
		Age (+ young)		Demographic	
		Educational level			
		Immigrants/foreigners			
Employment (-not in labor force)	Economic				
House ownership (+ non-homeowner)					
Underbanked	Use of bank account but also other alternative financial services, outside the banking system (AFS) (FDIC data and definition, 2013)	Single-parent families (general)	Social		
		Disability (+)			
		Age (non-linear, + young)		Demographic	
		Minorities (+Black and Hispanic , - Asian and White)			
		Income (+low and middle incomes)			Economic
Educational level (+ lower level)					
Unbanked	Lack of bank account	Internet Access (+ no-Access)	Social		
		Minorities (+Black)		Demographic	
		Region (+metropolitan areas)			
		Income (+low and middle incomes)			Economic
		Educational level (+ lower level)			
Anderloni et al. (2008)	EU 14	Unbanked	No use of banking services		Age (+ young)
				Gender (non-significant)	
				Region (+rural areas in countries with higher levels of financial exclusion)	

				Income (+ 1° and 2° lower quartiles)	Economic
				Employment (+unemployed housewives and the retired)	
				Household type (-couples; + single-parents)	Social
				Is it easy to compare information about bank fees and conditions? (+ Doesn't know)	
				Is it easy to know in advance the cost of the credit? (+ very difficult)	
				Is the marketing of financial institutions aggressive? (+ Doesn't know/ Disagree)	Perception
				Do you expect personal assessment by banking entities? (+ Doesn't know/ Disagree)	
		Underbanked	Use of bank account, but lack or very limited use of payment facilities	No analysis	
		Fully banked	Access and use of transaction services adapted to personal needs and status	No analysis	
Anderloni and Carluccio (2007)	Spain (low income- precariousness, low financial literacy)	Unbanked (Only immigrants. Not relevant for the Spanish population)	Lack of bank account	Low level of financial literacy	Perception
				No perception of banking utility	
				Immigrant in a non-regulated situation	Social
		Underbanked	No advantage of the full potential of banking products= Restricted or basic access	No analysis	
Devlin (2005)	UK	Unbanked	Lack of bank account and other services	Age (+elderly)	Demographic
				Gender	
				Minorities	
				Region	
				Income (+low income)	Economic
				Employment (+unemployed, students, housewives)	
				Home ownership(+ social housing)	
				Social class (+low class)	Social
				Educational level (- high)	
Household type(-couples)					
Household size (+large)					

Source: Own elaboration based on the previously mentioned studies.

* The sign indicates the link is positive (+), negative (-) or neutral

Following both the adaptation of the model by Baker and Mason (2012) on consumer vulnerability and the above-mentioned determinants, we propose a model of the relationship between social and financial exclusion focused on people with social risk² (Figure 2).

Fig. 2 Relationship between social exclusion, financial exclusion and consumer vulnerability

[Insert Figure 2 here]

Source: Own elaboration

We aim to determine if people at risk of social exclusion are integrated -and if so to what extent- in the formal financial system. To answer this question, we identify the social exclusion factors (poverty, material deprivation, working instability), - as well as demographic factors (gender, age, nationality) that can also accentuate this situation -, which determine the status of financial vulnerability (unbanking or underbanking) and the use of banking services. If the risk factors of financial vulnerability were also determinants of the use of banking services, we could affirm that they are related phenomena. In this case, financial vulnerability would be a lower stage in the use of banking services.

This paper analyzes the relationship between the risk of social exclusion and the risk of financial exclusion in the forward direction of the model (left to right), although we believe that this relationship can be reversed, creating a vicious cycle.

3 Methods

3.1 Study scope, source of data and sample

This study aims to identify the risk factors of unbanking and underbanking in Spain, a country where most of the population is banked (Bover et al., 2014): a 97.6% of adults owns a financial account (The World Bank, 2014). Since 2008, the risk of social and/or financial exclusion in the country has increased due to two main factors. The first is the decline of social and relationship banking (Calvo and Martín de Vidales, 2014; García-Montalvo, 2014). The second is

² We do not consider the circle of resilience of the adaptation of the model of Baker and Mason (2012) in our relationship model. We only consider the circumstances determining the status of financial vulnerability.

the increase in size and diversity of the socially vulnerable population (Foessa Foundation, 2014). The target population of this study is people who are in a situation of social vulnerability.

Red Cross Spain provided data for the empirical analysis. This organization carries out an annual panel survey to monitor its beneficiaries. We had access to the last edition of the survey. The sample consisted of 1050 respondents over 18 years of age, all of them participating in the programs of social help of Red Cross and in situation of social vulnerability³. They were interviewed through telephone surveys in the spring of 2015.

3.2 Data

The Red Cross Spain panel featured 27 questions related to financial services, 55 questions related to economic, social and employment situation, and 22 questions related to housing and demographical factors. These questions provide information on the social exclusion of the respondents. Furthermore, each year the panel includes a specific group of questions focusing on a relevant issue for Red Cross Spain. In 2015, this issue was financial exclusion. This study has used eight of the questions of the panel. The predicted variables deal with financial exclusion. The predictor variables refer to demographic and social exclusion issues, particularly those related to the three dimensions of the European indicator AROPE (At-Risk-Of Poverty and Exclusion): monetary poverty, material deprivation and work intensity.

Social exclusion was measured using the AROPE indicator derived from the European Strategy 2020 (Eurostat, 2015). The AROPE indicator complements the monetary measurement of poverty with income factors (relative poverty). It additionally assesses severe material deprivation (inability to afford some items considered by most people to be desirable or necessary to lead an adequate life), and low work intensity (ratio of the total number of months that all working-age household members have worked during the income reference year and the total number of months the same household members theoretically could have worked in the same period). AROPE has been previously used to assess the risk of poverty and social exclusion for particular collectives (Aguayo et al., 2015; López-Vilaplana, 2013) or countries (Pérez Prieto, 2015; Nikolka, 2013; Cojocaru and Ruggeri, 2013).

Financial exclusion is approached in two ways: Firstly, through the use of banking products, measured by the number of financial products consumed. Secondly, through the state of financial vulnerability, that is, being unbanked or underbanked. Anderloni et al. (2008) define these two states (Table 1).

3.2.1 Predicted variables

The predicted variables are financial vulnerability and the use of financial services. The data for these variables were obtained by one of the panel questions which enquired about the number of financial services hired by the respondent. The variable use of financial services measures the number of financial services hired by the respondents. Through this variable, we were able to test if the determinants of the use of financial services were the same as the risk factors of financial vulnerability. The variable financial vulnerability indicates if the respondent is unbanked, underbanked or fully banked. It allowed us to observe if the risk factors influencing each group of financial vulnerability were different.

3.2.2 Predictor variables

Following the previous literature (Table 1), the potential risk factors of financial exclusion can be divided into two groups:

- Demographic factors: gender, age and origin of respondents.
- Factors of poverty and social exclusion: material deprivation, unexpected expenses, monetary poverty and job instability. These variables were selected to build an approximation of the AROPE indicator for the studied sample. The predictors have been previously used to estimate this indicator for people facing social vulnerability in Spain (Spanish Red Cross, 2012, 2015 and 2016).

Table 2 summarizes and describes the variables used in this study.

Table 2 Definition of risk factors and their measurement

Typology	Variable	Label	Definition	Measurement
Financial exclusion	Financial vulnerability	Vulnerability	Financial vulnerability of the respondent. If the respondent hires no financial services, he/she is unbanked. If he/she has just one bank account, he/she is underbanked. Otherwise, he/she is banked.	0 if the respondent is unbanked 1 if the respondent is underbanked 2 if the respondent is banked
Financial exclusion	Use of banking services	Use	Number of financial services hired by the respondent	Number of financial services hired with financial entities
Demographic	Gender	Gender	Gender of the respondent	0 if the respondent is a man 1 if the respondent is a woman
Demographic	Age	Age	Age of the respondent	0 if the respondent is from 18 to 64 years old 1 if the respondent is 65 years old or more
Demographic	Origin	Origin	Origin of the respondent	0 if the respondent comes from Spain 1 if the respondent comes from Maghreb 2 if the respondent comes from Latin America 3 if the respondent comes from Black Africa 4 if the respondent comes from East Europe 5 if the respondent comes from other regions
Poverty and social exclusion	Material deprivation	Deprivation	Lack of access to three goods and services: food (meat and fish), heating and holidays.	0 if the respondent has access to the three goods and services 1 if the respondent has access to two goods or services 2 if the respondent has access to one good or services 3 if the respondent has no access to any goods or services
Poverty and social exclusion	Unexpected expenses	Unexpected	Inability of the respondent to cope with unexpected expenses up to 600€ with own resources	0 if the respondent is able to afford unexpected expenses 1 if the respondent is not able to afford unexpected expenses
Poverty and social exclusion	Monetary poverty	Poverty	Respondent's household income level. The monetary poverty threshold is set at € 7,961 per unit of consumption (Source: INE (2014) Survey of living conditions).	0 if the income level is above the monetary poverty threshold 1 if the income level is below the monetary poverty threshold
Poverty and social exclusion	Job instability	Instability	Job instability of the respondent. The respondent has a stable source of	0 if the respondent has a stable source of income 1 if the respondent has an unstable source of income

income if he/she has a salary, is self-employed or retired.

3.3 Data analysis

We chose the method attending to the kind of the predicted variable. Firstly, intensity of the use of banking services is a continuous variable. We draw upon multiple regression to detect the determinants of social exclusion related to the use of financial services.

Secondly, financial vulnerability is an ordinal variable. This situation demands ordinal regression models (ORM), which are extensions of the logistic regression model for dichotomous data (O'Connell, 2006, p.27). ORM enable us to identify the risk factors of financial vulnerability.

ORM are based on the parallel regression or proportional odds assumption (Williams, 2006). The assumption requires the odds ratios of the predictors to be the same across the categories or levels of the predicted variable. However, the assumption is hard to meet (Long and Freese, 2014, p. 331). In such cases, possible alternatives are partial proportional odds models and multinomial logistic regression models (Guzman-Castillo et al., 2015; Williams, 2006). These methods allow us to identify the risk factors affecting the probability of belonging to different alternatives of financial vulnerability: being unbanked, underbanked and banked.

3.3.1 Multiple regression

The effect of the risk factors on access to banking services was analyzed through multiple regression. The model was estimated by ordinal least squares (OLS) and includes the interaction effect between gender and age.

3.3.2 Partial proportional odds models

The parallel regression assumption can be tested for each predictor. A model that relax the parallel regression assumption for some variables is a partial proportional odds model (Guzman-Castillo et al., 2015; Williams, 2006). We estimate two different partial proportional odds model: partial generalized ordered logit model (PGOLM) and partial continuation ratio model (PCRM).

Generalized ordered logit models relax the parallel regression assumption for all the variables, but they can be difficult to estimate and interpret. PGOLM models are easier to estimate and interpret than generalized ordered logit models. PCRM is a kind of ordinal model where categories represent levels. It can be thought of as stages in some process through which an individual can advance (Guzman-Castillo et al., 2015). In our case, unbanked level must occur before underbanked level, and underbanked before banked. Guzman-Castillo et al. (2015) explains both the mathematical expression of these models and the interpretation of their results.

The results are expressed in odds, defined as the probability of an event occurring divided by the probability of that event not occurring. The odds ratio compares the change in the odds that results from a unit change in the predictor. An odds ratio greater/lower than 1 indicates that, as the predictor increases/decreases, the odds of the event occurring increase/decrease by a factor of $\exp(\text{odds ratio})$, holding all the other variables constant. The odds ratios of the PGOLM inform how likely is being in the banked category versus the category unbanked or underbanked. The odds ratios of the PCRM indicate how likely is to progress to a higher category, either from underbanked to banked or from unbanked to underbanked or banked.

3.3.3 Multinomial logistic regression model

In multinomial logistic models (MNL), the effects of the predictors vary across the categories of the nominal predicted variable. MNL requires fixing a base category, which is the reference for interpreting the odds of other categories. The model was estimated by the method of maximum likelihood. This model estimates the parameters maximizing the probability of obtaining the observed data (Schmidt, 2005; Kennedy, 2003). The effect of the predictors on the predicted variables was provided in coefficients (in terms of multinomial log-odds), the relative risk ratio (RRR) and marginal effects.

RRR is the ratio of the probability of a respondent belonging to a category relative to a base category. The base category for the regressions is the one that allowed a more intuitive interpretation of the results. If RRR was greater than one, the respondent was less likely to belong

to the base category. If the RRR was less than one, then the respondent was more likely to belong to the base category.

For the risk factors coded with 0 and 1, the marginal effect was calculated as an average direct pseudoelasticity of probability: the percentage change in probability when a variable changed from 0 to 1 (Çelik and Oktay, 2014). For the risk factors with more than two codes, origin and unexpected expenses, pseudoelasticity was calculated for each category as if it were coded with 0 and 1. For example, the average direct pseudoelasticity of probability for category 2 of the risk factor origin was calculated as the percentage change in probability when the respondent changed from not being Latin American to being Latin American.

4 Results

4.1 Descriptive statistics

Table 3 summarizes the frequencies of the demographic and risk factors. The number of unbanked respondents (n=57) was lower than the number of underbanked (n=256) and banked respondents (n=737), indicating that most of the socially excluded Spanish population has access to financial services.

Age and monetary poverty are measured as categorical variables in the Red Cross Panel. The number of categories of these variables was reduced to two. Following the AROPE, we are interested in differentiating between high working intensity (people with regular employment), low working intensity (no regular employment or unemployment). Retired people can be included in the first situation, because not working is not a problem of income for them. This aim is sufficiently covered by the segregation of both variables in the mentioned categories. Additionally, with more than two categories, the small size of the unbanked group hindered the estimation of the multivariate models.

Table 3 Frequencies and percentages of risk factors

		Unbanked (n=57;5.4%)	Underbanked (n=256; 25.3%)	Banked (n=737; 70.19%)	Total (n=1050; 100%)
Demographic factors					
Gender					
	Man ^a	25(6%)	91(22%)	297(72%)	413(39.33%)
	Woman	32(5%)	165(26%)	440(69%)	637(60.67%)
Age					
	From 18 to 64 years old ^a	49(8%)	162(25%)	427(67%)	638(60.76%)
	65 years old or more	8(2%)	94(23%)	310(75%)	412(39.24%)
Origin					
	Spain ^a	22(3%)	171(24%)	509(73%)	702(66.86%)
	Maghreb	9(8%)	33(29%)	70(63%)	112(10.67%)
	Latin America	14(15%)	15(16%)	65(69%)	94(8.95%)
	Black Africa	9(11%)	20(25%)	52(64%)	81(7.71%)
	East Europe	3(6%)	12(25%)	33(69%)	48(4.57%)
	Others	0(0%)	5(38%)	8(62%)	13(1.24%)
Risk factors					
Deprivation					
	No goods or services ^a	14(8%)	44(25%)	116(67%)	174(16.57%)
	One good or service	17(6%)	80(29%)	180(65%)	277(26.38%)
	Two goods or services	21(5%)	113(29%)	252(65%)	386(36.76%)
	Three goods or services	5(2%)	19(9%)	189(89%)	213(20.29%)
Unexpected expenses					
	Able to afford ^a	7(3%)	43(16%)	217(81%)	267(25.43%)
	Unable to afford	50(6%)	213(27%)	520(66%)	783(74.57%)
Poverty ^b					
	Above threshold ^a	5(3%)	18(1%)	155(87%)	178(20.67%)
	Below threshold	42(6%)	192(28%)	449(66%)	683(79.33%)
Job instability					
	Job stable ^a	11(2%)	119(22%)	411(76%)	541(51.52%)
	Job unstable	46(9%)	137(27%)	326(64%)	509(48.48%)

Percentages calculated from frequencies of rows, except total percentages, which were calculated from the number of respondents

^a Base category

^b The sample size of *monetary poverty* is 861 respondents

4.2 Pre-estimation procedures

Data analysis was performed using Stata 14. We followed two pre-estimation procedures.

Firstly, we performed independence tests to measure the association between predicted variables

and predictors. These tests indicated whether there were significant differences between the groups of predictors defined by the predicted variables. Table 4 shows the results of the measures of association. Even though no significant differences were found across groups for the risk factor gender, it was incorporated into the model to account for the interaction term between gender and age.

Table 4 Measures of association

	χ^2 (p-value)	Likelihood ratio χ^2 (p-value)	Degrees of freedom
Demographic factors			
Gender	2.315 (0.314)	2.327 (0.312)	2
Age	18.333 (<0.001)	20.687 (<0.001)	2
Origin	36.360 (<0.001)	32.136 (<0.001)	10
Risk factors			
Deprivation	46.345 (<0.001)	52.726 (<0.001)	6
Unexpected expenses	21.520 (<0.001)	23.111 (<0.001)	2
Poverty	30.806 (<0.001)	34.873 (<0.001)	2
Job instability	31.614 (<0.001)	33.216 (<0.001)	2

Secondly, we ascertained if the models meet the parallel regression assumption. The Brant test checks the null hypothesis that the model and their variables satisfy the parallel regression assumption (Long and Freese, 2014, p.328; Williams, 2006). We estimated a provisional ORM in order to test the assumption. The model included all the predictors excepting origin-other. It was excluded because it prevented the estimation of the Brant test. The exclusion had no significant effect on the model ($\chi^2 = 0.08$, $p > 0.1$).

Table 5 reports the results of the Brant test. Four variables break the parallel regression assumption. We removed the assumption for the most significant variable, origin-Latin American ($\chi^2 = 14.38$, $p < 0.000$) and then re-estimated the model. We found that no variable broke the assumption for a level of confidence of 95%. These results provide evidence that the partial proportional odds models should be estimated removing the parallel regression assumption for the origin-Latin American variable.

Table 5 Brant test for parallel assumption

	χ^2	$p > \chi^2$	Degrees of freedom
All variables simultaneously	33.66	0.001	13

Demographic factors			
Gender	0.05	0.824	1
Age	0.41	0.522	1
Gender*age	2.78	0.096	1
Maghreb	0.59	0.441	1
Latin America	14.38	0.000	1
Black Africa	4.81	0.028	1
East Europe	0.28	0.599	1
Risk factors			
Deprivation			
One good or service	0.72	0.402	1
Two goods or services	0.79	0.373	1
Three goods or services	1.72	0.189	1
Unexpected expenses	0.03	0.860	1
Poverty	4.04	0.044	1
Job instability	5.52	0.019	1

4.3 Multiple regression

The results of the multiple regression model can be seen in Table 6. Regarding the overall fit of the model, the model explained 14.4% of the variability in the use of banking services. Three demographic determinants were significantly related to the use of banking services: origin and the interaction between age and gender. All the risk factors of poverty and social exclusion were related to the use of banking services except for the predictor unexpected expenses.

Table 6 Multiple regression results

		Coefficient ^a	
Demographic factors			
Gender		0.022	(0.190)
Age		-0.297	(-1.450)
Gender*age		-0.351*	(-1.660)
Origin			
	Maghreb	-0.427***	(-2.660)
	Latin America	-0.301*	(-1.730)
	Black Africa	-0.500***	(-2.640)
	East Europe	-0.267	(-1.250)
	Others	0.240	(0.550)

Risk factors	
Material deprivation	
One good or service	-0.023 (-0.17)
Two goods or services	-0.058 (-0.42)
Three goods or services	0.523*** (2.74)
Unexpected expenses	-0.073 (-0.53)
Poverty	-0.803*** (-5.98)
Job instability	-0.390*** (-3.30)
Cons	3.500*** (14.78)
R ²	0.144
Adjusted R ²	0.130
F(13.846)	10.23***

***, ** and * indicate significance at the 0.01, 0.05 and 0.10 levels, respectively.
a z-values in brackets

4.4 Partial proportional odds models and multinomial logistic regression model

Table 7 shows the coefficients of the MNLM. The banked category is the base for the interpretation of the coefficients. Since the MNLM does not relies on the parallel regression assumption, the variable origin-others was included in the model. The results are discussed using RRR and average pseudoelasticity (Table 8). These two magnitudes, which proceed from the MNLM estimations, allows us to compare results and observe their consistency. The visual summary of the direct average pseudoelasticity streamline and eases its interpretation. PGOL, PCRM and MLNM provide quite similar results.

4.4.1 Demographic factors

Neither gender, age, nor their interaction was significantly related to financial vulnerability in the models we estimated. However, there are significant results for two predictors of origin: Latin American and Black Africa. Latin American respondents were three times more likely to be unbanked than banked (RRR=3, 95% CI=1.227–7.337). As observed in the average direct pseudoelasticity values, having a Latin American origin increases the probability of being unbanked by 217.38%, while having a Black Africa origin increases unbanking probability by 157.68%.

4.4.2 Risk factors of poverty and social exclusion

Respondents having three goods or services (meat or fish, heating and holidays) were more likely to be banked. The measures of association revealed different capacity to cope with unexpected expenses across the three groups of the financial vulnerability predicted variable. However, the results of the models showed that this risk factor had no significant effect on the models.

Monetary poverty decreases the likelihood of being banked. People living in households in a situation of monetary poverty were 2.8 times more likely to be underbanked than banked (RRR=2.847, 95% CI=1.603–5.057). Monetary poverty increased the probability of being underbanked by 136.16%.

Unbanking and underbanking is associated with job instability. Respondents who did not have a stable job were five times more likely to be unbanked than banked (RRR=4.932, 95% CI=1.855–13.11). Job instability increased the probability of being unbanked by 346.15 %

Table 7 Partial proportional odds models and multinomial logistic regression model results

	PGOLM		PCRM		MNLM					
	Odds ratio ^a		Odds ratio ^a		Coefficient ^a		RRR ^b			
					Unbanked	Underbanked	Unbanked	Underbanked		
Demographic factors										
Gender	0.860	(-0.72)	0.875	(-0.74)	0.269	(0.78)	0.146	(0.70)	1.309(0.669–2.561)	1.158(0.767–1.747)
Age	1.105	(0.25)	1.130	(0.31)	0.318	(0.36)	-0.253	(-0.59)	1.375(0.241–7.841)	0.777(0.337–1.788)
Gender*Age	0.753	(-0.69)	0.745	(-0.74)	-1.309	(-1.21)	0.498	(1.15)	0.270(0.032–2.265)	1.645(0.704–3.844)
Origin										
Maghreb	0.876	(-0.51)	0.890	(-0.48)	0.421	(0.89)	0.037	(0.14)	1.523(0.603–3.845)	1.038(0.610–1.766)
Latin America ^c	0.367**(-2.54) / 0.161 (0.52)		0.370**(-2.53) / 1.732 (1.61)		1.099**	(2.41)	-0.645*	(-1.86)	3.000(1.227–7.337)	0.525(0.266–1.034)
Black Africa	0.822	(-0.59)	0.856	(-0.51)	0.956*	(1.94)	-0.185	(-0.55)	2.601(0.988–6.843)	0.831(0.428–1.612)
East Europe	0.976	(-0.07)	0.988	(-0.04)	0.262	(0.39)	-0.080	(-0.21)	1.300(0.347–4.866)	0.923(0.443–1.925)
Others	n.e.		n.e.		-11.683	(-0.02)	-0.024	(-0.03)	0(0–0)	0.976(0.239–3.985)
Risk factors										
Deprivation										
One good or service	0.889	(-0.53)	0.896	(-0.52)	-0.107	(-0.26)	0.210	(0.88)	0.898(0.400–2.016)	1.234(0.773–1.972)
Two goods or services	0.816	(-0.91)	0.826	(-0.89)	-0.035	(-0.08)	0.293	(-1.22)	0.965(0.422–2.207)	1.340(0.837–2.147)
Three goods or services	2.668**	(2.39)	3.275***	(-2.78)	-0.323	(-0.45)	-1.180***	(-2.79)	0.724(0.178–2.943)	0.307(0.133–0.704)
Unexpected expenses	1.108	(0.42)	1.101	(0.41)	-0.202	(-0.37)	-0.078	(-0.30)	0.817(0.276–2.418)	0.924(0.554–1.544)
Poverty	0.426***	(-3.18)	0.436***	(-3.17)	0.026	(0.05)	1.046***	(3.57)	1.026(0.322–3.168)	2.847(1.603–5.057)
Job instability	0.606***	(-2.62)	0.630**	(-2.55)	1.596***	(3.20)	0.219	(1.03)	4.932(1.855–13.11)	1.245(0.821–1.887)
Cons ^d	62.178***(9.16) / 6.720***(4.57)		62.040***(9.32) / 7.410***(5.02)		-3.817***	(-4.21)	-2.108***	(-4.53)		
	Number of observations: 861		Number of observations: 861		Number of observations: 861					
	Log pseudolikelihood: -610.110		Log pseudolikelihood: -610.196		Log-likelihood at zero: -647.111					
	Wald χ^2_{14} : 64,79*		Wald χ^2_{14} : 6,83**		Log-likelihood at convergence: -595.321					
					χ^2_{28} : 103.58***					

***, ** and * indicate significance at the 0.01, 0.05 and 0.10 levels, respectively

^a z-values in brackets

^b Lower and upper limits at the 95% confidence interval (CI) in brackets

^c In PGOLM, the left symbol value corresponds to the change from unbanked to underbanked, while the right value refers to the change from underbanked to banked. In PCRM, the left value corresponds to the change from unbanked or underbanked to banked, while the right value refers to the change from underbanked to banked.

n.e. Non-estimated

Table 8 Direct pseudoelasticity

	Average direct pseudoelasticity values			Visual summary of the average direct pseudoelasticity values		
	Unbanked	Underbanked	Banked	Unbanked	Underbanked	Banked
<u>Demographic factors</u>						
Gender	25.36%	11.17%	-3.98%	↑	↑	↓
Age	43.73%	-18.88%	4.47%	↑	↓	↑
Gender*Age	-75.45%	50.03%	-8.82%	↓	↑	↓
<u>Origin</u>						
Maghreb	48.68%	1.35%	-2.37%	↑	↑	↓
Latin America	217.38%	-44.50%	5.77%	↑	↓	↑
Black Africa	157.68%	-17.61%	-0.87%	↑	↓	↓
East Europe	31.19%	-6.94%	0.78%	↑	↓	↑
Others	n.a.	1.81%	4.31%	n.a.	↑	↑
<u>Risk factors</u>						
<u>Deprivation</u>						
One good or service	-14,24	17,99	-4,42	↓	↑	↓
Two goods or services	-9,48	25,46	-6,41	↓	↑	↓
Three goods or services	-11,01	-62,20	23,10	↓	↓	↑
Unexpected expenses	-16.25%	-5.22%	2.46%	↓	↓	↑
Poverty	-14.69%	136.16%	-17.07%	↓	↑	↓
Job instability	346.15%	12.52%	-9.67%	↑	↑	↓

Arrows indicate an increase (upward) or decrease (downward) in average direct pseudo-elasticity (probability). Shading indicates change greater than 100%.

n.a. Non-applicable

5. Discussion

Table 9 summarizes the results of models. To sum up, these results showed that financial vulnerability has specific risk factors that also influence the use of banking products. Thus, we can confirm that financial vulnerability is a lower stage of the use of banking services for people facing social exclusion. There are just two additional determinants of the use of banking services that were not risk factors for being unbanked or underbanked: being an elderly woman or coming from Maghreb. A positive relationship was found between a greater risk of social exclusion and a lower intensity of use of banking services. However, this relationship was moderate and differed depending on the level of vulnerability (unbanked or underbanked).

Table 9 Summary of results

	Financial vulnerability				Use of financial services
	PGOLM	PCRM	MNLM		
			Unbanked	Underbanked	
Demographic factors					
Gender	✗	✗	✗	✗	✗
Age	✗	✗	✗	✗	✗
Gender*Age	✗	✗	✗	✗	✓
Origin					
Maghreb	✗	✗	✗	✗	✓
Latin America*	✓ / ✗	✓ / ✗	✓	✓	✓
Black Africa	✗	✗	✓	✗	✓
East Europe	✗	✗	✗	✗	✗
Others	n.e.	n.e.	✗	✗	✗
Risk factors					
Material deprivation					
One good or service	✗	✗	✗	✗	✗
Two goods or services	✗	✗	✗	✗	✗
Three goods or services	✓	✓	✗	✓	✓
Unexpected expenses	✗	✗	✗	✗	✗
Poverty	✓	✓	✗	✓	✓
Job instability	✓	✓	✓	✗	✓

✓ Significant coefficient

✗ Non-significant coefficient

* In PGOLM, the left symbol corresponds to the change from unbanked to underbanked, while the right symbol refers to the change from underbanked to banked. In PCRM, the left symbol corresponds to the change from unbanked or underbanked to banked, while the right symbol refers to the change from underbanked to banked

n.e. Non-estimated

Thus, we found three different profiles regarding the use of banking services, characterized by different demographic and social determinants. These risk factors should be considered separately to promote the financial inclusion of people facing vulnerability-

Firstly, people who were at risk of social exclusion and were unbanked were characterized by job insecurity (they are unemployed or work in the informal economy). This is one of the main risk factors in studies regarding financial exclusion in the European context (Ampudia and Ehrmann, 2016; Anderloni et al., 2008), together with low income. Previous studies have found a higher impact of unbanking among the immigrant population in Spain (Anderloni and Carlucio, 2007) as well as in other European countries (Devlin, 2005). We found that Latin Americans and Africans had a higher risk of being underbanked.

Secondly, Underbanked people had low incomes and suffered material deprivation, such as lack of food or energy. Our results show that people who could afford at least one of these items had the greatest risk of being underbanked. The descriptive analysis indicates that they did not generally renounce heating.

Finally, it is noteworthy that, in the MNLM, material deprivation and monetary poverty are not significant risk factors for being unbanked, but they are in the case of being underbanked. Unbanked people may carry out informal economic activities with no formal working stability and have no need for a bank account. However, this does not necessarily mean that they have a lower income or lower access to some basic needs. We should also consider why immigrants coming from Latin America and Africa are more reluctant to use banking services. This may be due to cultural factors or bad experiences in their home countries. Cultural and religious factors might also influence the lower use of banking services by immigrants from Maghreb, as Muslims may feel uncomfortable with products based on interest rates which are forbidden (Zaher and Hassan, 2001). The preference of underbanked people for heating consumption - instead of other services- could be characteristic of elderly people, even though age is not a statistically significant

factor for underbanking. Birkenmaier et al. (2016) related the increase in unbanking during the crisis to food insecurity -one type of material deprivation- due to the general need of people that became socially vulnerable to reduce consumption. We argue that a similar process may have taken place in Spain, increasing the percentage of underbanked people. All of these reflections are interesting questions for future research.

6. Conclusion

Considering that in highly banked economies access to financial services is a barrier to social inclusion, this study tried to identify the socioeconomic and demographic factors with the greatest impact on financial vulnerability and the use of banking services. As this study was focused on a country where most of the population is banked, we tried to look deeply into the most vulnerable groups of people and in particular at the risk factors of being unbanked and underbanked. Although underbanking is a problem of financial vulnerability defined in the European context, it has not been properly analysed by previous academic research. Our study analysed the profile of underbanked people, which was clearly linked to economic precariousness. We propose that banking products and fees should be adjusted for this collective to prevent underbanking from becoming an additional factor of social exclusion.

The level of use of banking services and social exclusion are not two sides of the same coin. Social exclusion is just one factor completing the other side of the 'banking use' coin. However, when we focus on the financially excluded groups, we see that underbanking is the opposite side to monetary poverty, material deprivation and Latin-American origin. We also see that for the 'light' coin of unbanking the other side is represented by unstable employment, added to immigration in irregular situation.

Our model explained only a part of the variability of financial products owned by socially vulnerable people. Therefore, other unobserved determinants may also exist, like the effect of the crisis and the increase in the demand for social assistance from a significant part of the population which is socially integrated and banked. It would be interesting to analyze this issue using in-depth interviews. They could also be useful to study the circle of financial resilience for this collective and to confirm the two pillars revealed in our pool: family and social organizations,

which seem to be the main support for the payment of bills or unexpected expenses, and even for financial advice, in the case of vulnerable people.

The Payments Account Directive (European Union, 2014) addresses some specific needs in terms of financial inclusion of vulnerable consumers, like the right to a basic bank account with payment facilities, including on-line services with no cost or reasonable fees. Notwithstanding, national regulators should establish what 'a reasonable fee' is in each member state. Our conclusions support the recommendations of several authors for the future: reduce documentation requirements when opening a bank account (Allen et al., 2012), offer 'simple packages' with clear and fixed costs, improve communication regarding the criteria for granting credit, and facilitate it without banking history in the case of immigrants as well as encourage remittances through banks (Anderloni and Carlucio, 2007).

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