

Postal Users' Needs Regarding Accessibility to the Postal Network



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1 Introduction

Under the Postal Services Directive¹ (henceforth, Directive), and in the framework of the universal service obligation (USO), European Union's (EU) Member States (MS) shall ensure that users enjoy the right to a postal service of a specified quality at all points in their territory at affordable prices for all users. To this end, EU MS shall take steps to ensure that the density of the points of contact and of the access points takes into account users' needs. In our view, the Directive gives substantial discretion to EU MS and to National Regulatory Authorities on identifying users' needs and defining the allocation of costs involved. In this paper we discuss an approach under discussion at ANACOM, the Portuguese NRA.

Section 2 reviews literature on postal network density. Section 3 characterizes the distribution of postal outlets in Portugal. Section 4 presents Portuguese residential and businesses' usage of postal outlets, based on surveys promoted by ANACOM to identify the needs of users regarding access to postal outlets. In Sect. 5, the results of estimated logit models on the probability of going to postal

The views in this paper are those of the authors and do not reflect the views of ANACOM, neither UCP.

¹Directive 97/67/EC, amended by Directive 2002/39/EC and by Directive 2008/6/EC.

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outlets and on the willingness to pay (WTP) are presented. Concluding remarks are provided in Sect. 6, highlighting the redistributive nature of current network density arrangements.

2 Literature Review

According to Borsenberger et al. (2011), decisions regarding the configuration of the postal network are complex and multidimensional because, in addition to economic efficiency, they are strongly influenced by the socio-economic and political context. The authors provide cross-country analysis of postal network accessibility relying on demographic and geographic coverage dimensions. The number of working hours of the postal outlets was introduced as an explanatory variable of the degree of access to the postal retail network. The authors considered that accessibility to postal services in a given country may be lower if postal outlets are open less hours per day or per week, even if the country has the same (or higher) density of outlets compared to other countries.

Regulated postal retail networks simultaneously embrace public and business objectives. According to some views, this leads to oversized postal retail networks as compared to the ones that would be sustained in purely commercial basis (Cohen et al. 2008).

Boldron et al. (2008) argued that, broadly speaking, commercial services networks tend to be more concentrated in urban areas and tend to offer a much better accessibility in urban areas than in rural areas. Notwithstanding, they have shown that postal outlets in rural areas create positive spillovers that may enhance social welfare.

It has also been suggested that the role of postal services in local communities' dynamics should be considered when evaluating network density. Bradley (1986), Cloke (1997) or Higgs and White (2000), provided evidence on the influence of public services, particularly when they establish direct interaction with citizens, in the health and well-being of communities.

According to a report produced by the Boston Borough Council (2006), the postal retail network in rural areas gain ascendancy and importance among the population by being decoded as essential service delivery points for everyday life.

A report published by Age Concern (2006), has shown that in the United Kingdom (UK), postal outlets are very important for the older population and are highly relied on. In addition to meeting the needs of postal services, the UK's senior population uses postal outlets to meet needs of a different nature, such as savings, payment or pension withdrawal, as well as social interaction either with employees or with other customers.

Higgs and Langford (2013) conducted an in-depth research with the rural elderly population in Wales to assess the impact of the closure of rural postal outlets on the ability of these populations to meet postal needs and other services usually performed at postal outlets, such as payment of expenses and the execution of

financial investments. They have concluded that this age group is very dependent on the postal retail network.

Woods (2009) argued that heterogeneity in the availability of postal services in rural areas contributes to explain the dynamism or decay of specific local communities.

More recently, ERGP (2016) and Zurel (2016) surveyed recent studies on changes in postal users' needs. Zurel (2016) found that, in general, the postal network seems to correspond to the postal users' needs, although there appear to be large differences between EU MS.² ERGP (2016) concludes that users are generally satisfied with the current provision of access points, though in some countries there is demand for longer opening hours.

Results in this paper are broadly consistent with some of these views but the relevance of network density for specific residential and business users is highlighted. Moreover, our results suggest that it seems fair to say that users are happy with current network density as long as they are not paying directly or explicitly most of its costs.

3 Distribution of Postal Outlets in Portugal

The distribution of postal outlets in Portugal is disproportionate both in relation to the area covered and to the population. A large proportion of postal outlets (46%) is located in predominantly urban areas, which represent only 18% of the country's land area but a most of the population (72%). At the same time, 35% of postal outlets are located in predominantly rural areas, which represent only 13% of the population but 62% of the land area (Table 1).³

Almost all outlets located in predominantly rural areas are postal agencies (postal outlets managed by third entities) and only 1% post offices (postal outlets owned by the USP), these representing also only 1% of the total number of post offices. The majority (76%) of post offices are located in predominantly urban areas and the other 23% in medium urban areas. Compared to post offices, postal agencies are relatively more evenly spread across the country's land area (47% are located in predominantly rural areas, 31% in predominantly urban areas and 22% in medium urban areas).

Postal agencies are also characterized by having more diversified opening hours during the day and week, compared to post offices. While the opening hours of postal agencies ranges from 3 to 168 h per week, postal offices opening hours range between 35 and 45 h a week.

²Zurel (2016) came to this conclusion from the analysis of studies in eight countries: Belgium, UK, Ireland, Italy, Poland, Netherlands, Romania and Sweden.

³Data are similar when comparing the distribution of postal outlets relatively to business users.

Table 1 Postal outlets, population and land area by level of ruralness in Portugal

Level of ruralness ^a	Number of Postal outlets			Population	Land area (km ²)	Population density	People per Postal outlet
	Post offices	Postal agencies	Total				
Predominantly urban area	469	534	1003	7,614,451	16,825	453	7592
Medium urban area	140	379	519	1,539,280	18,642	83	2996
Predominantly rural area	6	811	817	1,408,447	56,758	25	1724
Total	615	1724	2339	10,562,178	92,225	115	4516

Source: Postal outlets (USP—end of 2016); Population, land area and level of ruralness (Statistics Portugal)

^aAccording to the classification of the level of ruralness of the parish where the postal outlet is located. The outlet may serve users in areas with different ruralness levels

Postal outlets provide postal and non-postal services, e.g. issuance and payment of postal money order, utility bills payments, financial services and (since 2016) CTT's bank branches.⁴

Globally, mail business represents circa 72% of the revenues of the USP's Group, express and parcels account for 18% of the revenues and financial services for 10%.

4 Usage of Postal Outlets

ANACOM promoted a survey, between February 13 and March 15 of 2017, on users' needs and usage of postal access points, separately for two groups of users of the postal access points: (a) residential users and (b) micro, small and medium-sized enterprise (MSME) users (IMR 2017).⁵

For residential users, results are representative of the level of ruralness, place of residence⁶ and vulnerability of the respondent. For MSME users, the sample is representative of the level of ruralness of enterprise's location, number of employees and activity sector.

The survey concluded that 77.5% of residential users and 91.4% of MSME users use postal outlets. While half of the MSME users claim to visit it every week, half of the residential users claim to visit it every month.⁷ Residential users generally use

⁴At post offices.

⁵A computer-assisted personal interviewing (CAPI) was used. The sample was composed of 3240 respondents for both residential (15 years old and above) and MSME users.

⁶Predominantly rural, medium urban or predominantly urban areas.

⁷Studies made by Ernst & Young for the Maltese regulator in 2014, cited by ERGP (2016), have shown that 70% of residential users and 72% of business users claimed to have visited the postal outlet in the last 12 months, 43% of the residential users every month and only (when compared to the result in Portugal) 11% of business users every week.

postal outlets to receive postal items (parcels and registered letters) while MSME users mainly use postal outlets to send letters. In terms of user profile, two specific groups of residential users show different patterns: (i) people aged between 15 and 24 use postal outlets to send or receive parcels and (ii) people with more than 74 years use postal outlets mainly to collect their pension funds.

Among residential users of postal outlets (Table 2), 54.8% use them to send postal items of any kind. This is considerably lower (34.5% and 27.8%) among the youngest respondents (15–24 years old) and oldest respondents (more than 74 years old), respectively. When MSME are considered, 75.6% of these users claimed to use postal outlets to send any kind of postal items. MSME situated in urban areas use more frequently postal outlets to send postal items (78.1%).

Concerning the reception of postal items, 62.7% and 58.4% of residential and MSME users, respectively, said that they use postal outlets to receive postal items. Again, the frequency of usage is lower among the youngest and oldest respondents (41.6% and 42.4% respectively). MSME users situated in urban areas use more frequently postal outlets to receive postal items (60%).

Table 2 Usage of postal outlets

		% of users that use outlets			
		In general	To send	To receive	To use/purchase non-postal services
Residential users					
Urban areas	Rural	73.7%	52.5%	61.7%	31.7%
	Urban	72.2%	55.2%	63.0%	26.6%
Professional situation	Does not work	62.2%	40.9%	52.7%	26.4%
	Works	79.3%	63.9%	69.3%	28.2%
Age	15–24	51.8%	34.5%	41.6%	17.1%
	25–34	79.7%	62.1%	70.8%	24.7%
	35–44	79.1%	66.3%	71.6%	28.6%
	45–54	78.8%	63.2%	68.5%	31.5%
	55–64	75.8%	57.1%	63.6%	31.6%
	65–74	70.9%	45.5%	59.5%	29.9%
Education level	More than 74	50.5%	27.8%	42.4%	27.8%
	Illiterate	63.6%	35.0%	51.2%	36.7%
	Elementary school	68.4%	40.3%	56.9%	34.7%
	Preparatory school	65.3%	44.7%	54.2%	26.8%
	High school	71.9%	56.7%	62.2%	23.6%
	University	81.9%	70.9%	74.4%	27.1%
Total		72.5%	54.8%	62.7%	27.5%
MSME USERS					
Ruralness	Medium urban	75.7%	69.0%	56.0%	13.3%
	Rural	63.3%	57.8%	44.5%	6.9%
	Urban	84.1%	78.1%	60.0%	9.5%
Total		81.6%	75.6%	58.4%	9.8%

The survey concluded that only 27.5% and 9.8% of residential and MSME users, respectively, use postal outlets for non-postal services.⁸

For residential users, proximity to home or work is the main factor when choosing a postal outlet, but proximity to home is more relevant for users in urban areas than for rural areas.⁹

On average, both type of users spend 13 min and 3 km in a round trip to a postal outlet, values very similar to the ones mentioned by the same users as being adequate ones. An increase of 5 km in the distance to travel by car to the postal outlet was viewed negatively by 70.6% of residential users and by 57.0% of MSME. MSME mentioned that they would move to digital solutions or reduce the current level of postal items sent if the distance increases.

Most of the respondents don't have a specific day to use postal outlets and half have no specific period of the day either. The majority of users rejected a scenario of reduction of the opening hours, a result that is in line with ERGP (2016) and Zurel (2016).

Both residential and MSME (more than 80%) reject a reduction of the number of postal outlets. This rejection is stronger among users located in rural areas when compared to users in urban areas.

In general, the majority of respondents (77.5% of residential users and 85.1% of MSME) are satisfied with the current access points in Portugal and consider that there is no need to make any changes (83.8% of residential users and 81.0% of MSME).

Residential and MSME users of postal outlets were asked about the hypothetical payment of an annual rate to maintain the current number of postal outlets.¹⁰ The rate of responses willing to pay an amount zero was very high (around 50% for both users, in all scenarios).

On average,¹¹ residential respondents admit a value between 3.7 and 4.8 euros, while MSME users admit a value between 9.8 and 10.6 euros (Figs. 1 and 2).

5 Estimated Models

In this section, the results of estimated Logit models are presented. The objectives were to (1) estimate the probability of users using a postal outlet to send, receive postal items (in general and, specifically, correspondence and parcels) or to use non-postal services and to (2) estimate the probability of a user's WTP a fee for

⁸Such as financial services, bill payments (e.g. utilities) and purchase of non-postal products (e.g. books, concert tickets, etc.).

⁹According to a study by Input Consulting (2012) cited by ERGP (2016), 82% of residential users consider a short distance to the closest postal outlet as very or rather important.

¹⁰Three types of values for the rates were asked: Ideal, admissible and exaggerated value.

¹¹Considers the responses above zero euros.

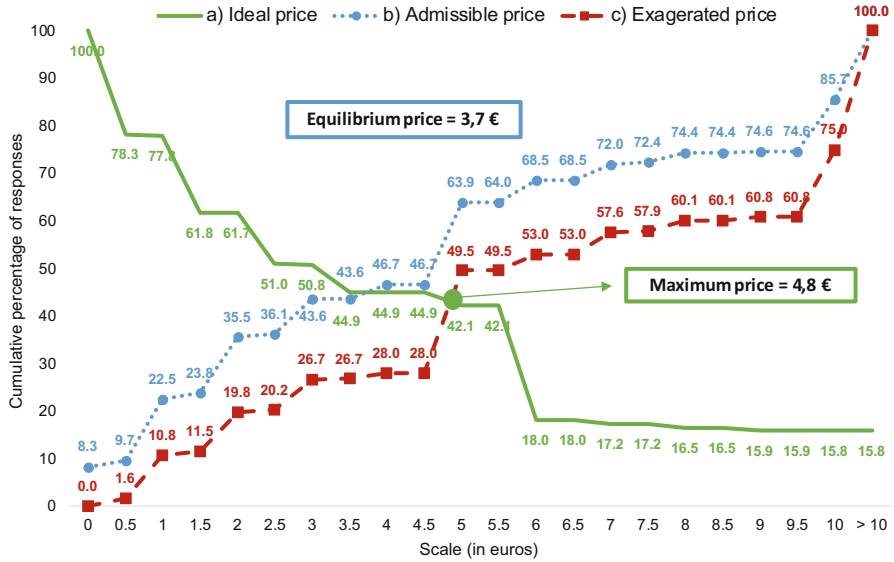


Fig. 1 Predisposition of residential users to pay an annual fee to maintain the number of postal outlets. Source: Adapted from IMR (2017)

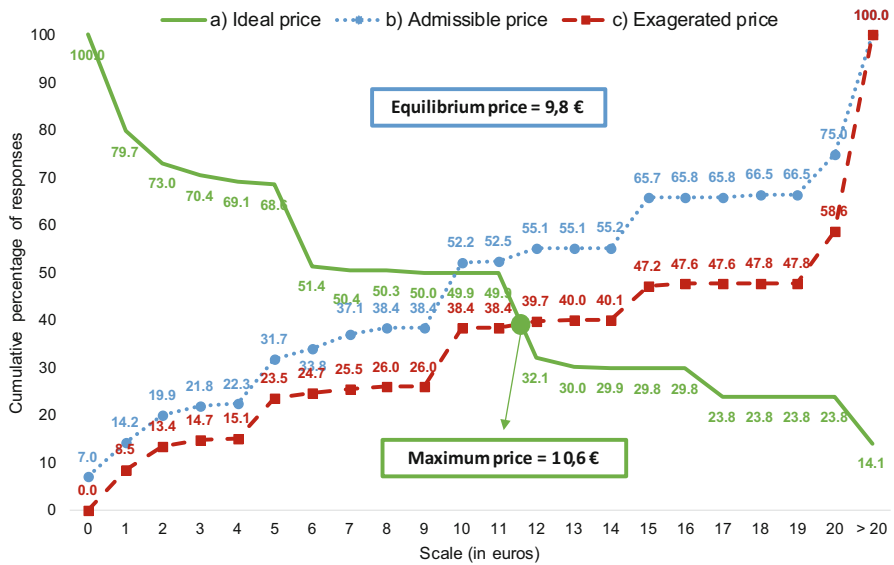


Fig. 2 Predisposition of MSME users to pay an annual fee to maintain the number of postal outlets. Source: Adapted from IMR (2017)

maintaining the current level of the postal outlet network. It is intended to assess the type of users that really value (or not) the existent postal outlet network. All models passed the significance and fit tests.

5.1 Probability of Going to a Postal Outlet to Send or Receive Postal Items or Use Non-postal Services

5.1.1 Model Specification

A dummy was used as a dependent variable, which was:

- (a) 0, if a user (residential or MSME) does not use a postal outlet to send/receive any postal item or if did not use a postal outlet to use any of the existent non-postal services;
- (b) 1, otherwise.

5.1.2 Estimated Results: Residential

The model correctly predicts between 63.5% and 69.8% (depending on the model) of the real outcomes for the residential users' model and between 59.4% and 90.2% for the MSME user's models (Table 3).

According to the results of the estimation, the level of ruralness of the user's residence is not statistically significant to explain the probability that a user would go to a postal outlet to send or to receive postal items (of any kind). The same result was obtained for sending or receiving letter mail or parcels. However, users living in urban areas are 22.6% less likely to go to a postal outlet for non-postal services, probably because in urban areas it is easier to access non-postal services than in rural areas. This finding seems to be in line with the findings of surveys cited in the literature review section, e.g. Woods (2009).

Employed people have a higher probability to go to a postal outlet, for sending or receiving postal items, than users that are unemployed (59.1% and 38.3%, respectively).

Residential users that use Internet have a higher probability of going to a postal outlet to send or receive postal items (in general) than those that do not use Internet (92% and 36% more). Compared to those that do not use Internet, the probability of sending postal items is higher than the probability of receiving and the probability to send (receive) parcels is higher than to send (receive) letter mail.

Compared to the 15–24 years old group, residential users aged between 35 and 44 years old have a higher probability of using a postal outlet to send or receive parcels (133% and 118% more, respectively) and people between 45 and 54 have a higher probability to use postal outlets to send or receive correspondence (332% and 390%, respectively). The group of age between 15 and 24 years is the one less likely to use a postal outlet to send or receive postal items (in general). People aged

Table 3 Odds ratio of the models estimation: residential users

	Went to postal outlet to send (odd ratios)				Went to postal outlet to receive (odd ratios)				Went to postal outlet for non-postal services
	Went to postal item		Parcels		Went to postal item		Parcels		
	Any postal item	Correspondence	Correspondence	Parcels	Any postal item	Correspondence	Correspondence	Parcels	
Urban area (dummy)	NS	NS	NS	NS	NS	NS	NS	NS	NS
Professional situation (base = employed)	59.1%	49.9%		38.5%	38.3%	43.1%		59.8%	-22.6%
Internet usage (dummy)	92.3%	74.9%		139.7%	35.8%	51.6%		75.1%	NS
Gender—male (dummy)	NS	NS		NS	NS	NS		NS	NS
Physical problems (dummy)	NS	NS		NS	-22.7%	-22.4%		NS	NS
Age (base = 15–24)									
25–34	114.0%	172.0%		95.8%	155.0%	233.0%		102.0%	NS
35–44	189.0%	277.0%		133.0%	190.0%	329.0%		118.0%	76.0%
45–54	247.0%	332.0%		94.2%	207.0%	390.0%		78.5%	95.0%
55–64	269.0%	328.0%		111.0%	194.0%	377.0%		NS	85.2%
65–74	246.0%	304.0%		67.6%	216.0%	310.0%		NS	63.5%
More than 74	108.0%	133.0%		NS	77.0%	129.0%		NS	NS
Education level (base = completed university)									
Illiterate	-47.3%	NS		-72.4%	NS	NS		-87.6%	NS
Elementary school	-59.5%	-56.8%		-64.1%	-40.5%	-41.4%		-55.6%	NS
Preparatory school	-67.0%	-65.9%		-65.5%	-59.2%	-45.1%		-67.1%	NS
High school	-43.0%	-43.5%		-30.6%	-38.7%	-33.0%		-30.9%	NS
Wage (base = more than 2350 euros)									
400 euros or less	NS	NS		NS	NS	NS		NS	NS
401 euros to 700 euros	59.3%	37.7%		NS	46.4%	34.8%		NS	NS
701 euros to 1100 euros	70.5%	47.2%		NS	56.9%	57.5%		NS	NS
1101 euros to 1350 euros	NS	NS		NS	NS	NS		NS	NS

(continued)

Table 3 (continued)

	Went to postal outlet to send (odd ratios)		Went to postal outlet to receive (odd ratios)			Went to postal outlet for non-postal services
	Any postal item	Correspondence	Parcels	Any postal item	Correspondence	
1351 euros to 1850 euros	50.8%	NS	NS	NS	NS	NS
1851 euros to 2350 euros	NS	NS	NS	NS	NS	NS
Correctly Predicted Results	65.4%	64.9%	69.8%	65.8%	63.5%	67.0%
						72.6%

NS Non-significant, p-value was equal or more than 0.05

To facilitate the interpretation of the results, only the odds ratios of predictors as percentages are shown. The percentage odds ratios are the result of the exponentiation of the coefficients of the logit regressions: $(e^{\beta} - 1) \times 100$

between 35 and 74 years old are more likely to go to a postal outlet to use non-postal services, compared to people between 15 and 24 years old.

According to the results of the models, when compared to users with college degrees, any other education level has a lower probability of sending or receiving postal items. The lower the education level, the bigger is the difference, when comparing to college degree users. The education level is not an explanatory factor of using non-postal services.

People who earn between 401 and 1100 euros are more likely to send or receive postal items, when compared to users that earn more than 2350 euros. The models did not produce statistically significant results for the other levels of income and for the relation between the level of income and the usage of postal outlets for sending or receiving parcels and neither for the access to postal outlets for non-postal services.

Vulnerable people are less likely to go to a postal outlet to receive a postal item when compared to someone not physically vulnerable.

Gender is not an explanatory factor for one to use a postal outlet.

5.1.3 Estimated Results: MSME

The percentage of outcomes predicted correctly is higher for the model regarding access to postal outlets for non-postal services (90.2%), while for the model regarding access to postal outlets to send any postal item the percentage is 75.7% and for the model to receive any postal item the percentage is lower (59.4%).

According to the results, number of workers and sales are not explanatory factors of the usage of postal outlets. The activity sector and the ruralness of the geographical localization of the company are explanatory factors. Compared with companies in urban areas, companies in rural areas are less likely to go to postal outlets to send (52.9% less) or receive (46.8% less) postal items and companies in medium urban areas are 65.6% more likely to go to postal outlets for non-postal services, compared to MSME in urban areas (Table 4).

5.2 WTP to Keep the Current Number of the Postal Outlets

5.2.1 Model Specification

In order to explain the WTP for network density a Logit model was estimated, in which the dependent variable was equal to 0, when there was no WTP and 1 if WTP was higher than zero. For that purpose, the answers to the question related to the hypothetical admissible value for the annual rate were used.

Table 4 Odds ratio of the models estimation: MSME users

	Went to a postal outlet to send any postal item	Went to a postal outlet to receive any postal item	Uses postal outlet for non-postal services
Urban typology			
Medium urban areas	-28.5%	NS	65.6%
Rural areas	-52.9%	-46.8%	NS
Number of employees	NS	NS	NS
Sales volume	NS	NS	NS
Activity sector (Other activities)			
Fisheries and agriculture	NS	46.6%	NS
transforming industries	500.0%	NS	NS
Construction	153.0%	NS	NS
Wholesale and retail trade; repair of motor vehicles and motorcycles	151.0%	59.2%	NS
Accommodation, restoration and similar	82.5%	66.6%	120.0%
Information and communication activities	NS	NS	NS
Real estate activities	474.0%	102.0%	NS
Consulting, scientific, technical and similar	382.0%	51.8%	NS
Administrative activities and support services	167.0%	NS	NS
Education	207.0%	NS	NS
Artistic, spectacular, sports and recreational	78.3%	128.0%	NS
Other sectors	NS	NS	NS
Correctly Predicted Results	75.7%	59.4%	90.2%

NS Non-significant, p-value was equal or more than 0.05

5.2.2 Estimated Results: Residential

The model correctly predicts 67.5% of outcomes. The results are presented in Table 5. The main highlights are as follows:

- (a) Compared to people between 15 and 24 years old, people aged 55 years or more are less willing to pay than people younger than 55 years.
- (b) Those who use most frequently postal outlets are also those more willing to pay an annual rate to keep the same number of postal outlets. However, those who most frequently use postal agencies are less willing to pay to keep the current level of postal agencies when compared to users that do not use these access points. A possible explanation for this may be that users may prefer post offices to postal agencies.¹²

¹²RARC (2015) found that both consumers and MSME value maintaining postal outlets compared to alternative retail access, such as postal counters and postal kiosks.

Table 5 Odds ratio of the model estimation: residential users

Urban tipology (base = urban)	
Rural areas	NS
Medium urban areas	NS
District (base = Viseu)	
Beja	4170.2%
Braga	113.6%
Castelo Branco	-57.7%
Coimbra	-46.0%
Faro	-53.0%
Guarda	-84.3%
Leiria	124.5%
Other districts	NS
Gender (base = male)	
	NS
Age (base = 15-24 years old)	
25-54	NS
55-64	-37.6%
65-74	-40.4%
More than 74 years old	-58.0%
Physical problems (dummy)	
	2.7%
Education level (base = completed university)	
Illiterate/Elementary school	NS
Preparatory school	-27.0%
High school	NS
Wage (base = 400€ or less)	
401€ to 1350€	NS
1351€ to 1850€	94.5%
1851€ to 2350€/More than 2350€	NS
Household size	
	NS
Internet usage (base = every day)	
3-6 days per week	NS
1-2 days per week	151.3%
Less than 1 day per week	53.4%
Never	43.5%
Frequency of access to post offices (base = never)	
1-3 times month/1 time per quarter	NS
Once a week or more	94.2%
Frequency of access to postal agencies (base = never)	
1-3 times month/1 time per quarter	NS
Once a week or more	-59.1%
Sent non-registered letters (dummy)	
	43.1%
Sent registered letters (dummy)	
	-19.9%
Sent parcels (dummy)	
	NS
Received registered letters (dummy)	
	NS

(continued)

Table 5 (continued)

Received parcels (dummy)	NS
Time to postal outlet in a round trip (base = more than 20 min)	
Up to 10	NS
11–15	–34.2%
16–20	NS
Would you change something in the current network of access to postal services (dummy)?	NS
Level of satisfaction with the current network of access to postal services (using a scale from 1 to 10, where 1 is Not Satisfied and 10 is Very Satisfied)	17.3%

NS Non-significant, p-value was equal or more than 0.05

- (c) Users that send registered letters are less likely (–20%) to pay an annual rate than those who do not use this service. Conversely, users who send non-registered letters seem to be more willing (+43%) to pay an annual rate, when compared to those that do not use this service.
- (d) Sending or receiving parcels by residential users seems not to be relevant to the WTP an annual rate to keep the current level of postal outlets. It may also imply that users may use other points of contact (at least to receive parcels) or that they may use other postal service providers.
- (e) The higher the level of satisfaction of residential users with the postal network, the higher is the WTP to keep it as it is.
- (f) The model did not produce relevant results as to the WTP an annual rate to keep the current level of postal outlets based on ruralness of where people live but showed some differences between districts.

5.2.3 Estimated Results: MSME

The model correctly predicts 67.3% of the outcomes (see Table 6). According to the results:

- (a) WTP of MSME users located in rural areas is 65% higher when compared to MSME users located in predominantly urban areas. This finding suggests that postal outlets may still have an important role on the economic inclusion of rural areas.
- (b) WTP is 38.5% higher among MSME users employing between 10 and 49 employees compared to MSME with less than ten employees.
- (c) The number of non-registered letters seems to be relevant. MSME sending more than 120 letters in 2016 have a higher propensity to pay (50% higher) an annual rate than other MSME.
- (d) Compared to the fisheries and agriculture sector, the human health activities and social support sector have 73.6% more chances of paying an annual rate,

Table 6 Odds ratio of the model estimation: MSME users

Urban typology (base = urban)	
Rural areas	65.7%
Medium urban areas	29.9%
District (base = Viseu)	
Other districts	NS
Beja	240.1%
Bragança	315.4%
Coimbra	-58.3%
Faro	-76.9%
Setubal	151.2%
Activity sector (base = A—Fisheries and agriculture)	
Other sectors	NS
Water collection, treatment and distribution	-59.9%
Real estate activities	-43.7%
Human health activities and social support	73.6%
Other activities	-48.3%
Number of employees (base = less than 10)	
10–49	38.5%
50–249	NS
Number of non-registered letters sent (base = 1–50)	
0–119	NS
120–270	47.8%
271–830	47.2%
Number of registered letters sent (base = 0)	
Up to 5/6 to 12	NS
13–36	65.2%
37–115	67.4%
More than 115	64.1%
Number of non-registered letters received (base = 0)	
Up to 150	-27.9%
151–240	NS
241–720	-59.6%
721–1480	-35.6%
More than 1480	-58.4%
Number of registered letters received (base = 0)	
Up to 270/More than 270	NS
Parcels sent (base = 0)	
1–9	NS
10–12	-49.2%
13–45	-43.1%
More than 45	NS
Parcels received (base = 0)	
Up to 36	NS

(continued)

Table 6 (continued)

37–100	46.4%
101–240	88.6%
More than 240	NS
Newspapers and periodicals received	
Up to 300/More than 300	NS
Internal mail treatment (base = expedition managed by administr. serv.)	
Didn't send	–64.0%
Have an own centralized service to deal with posted mail	–35.4%
Each department treatment of e-email issued/ Contract other companies to sort and ship mail	NS
Reception of mail (base = Mail acceptance is managed by administrative services)	
Didn't receive	NS
Possess an own and centralized service to treat the received mail	
Each department receives its own mail	
Contract other companies to handle the mail received	
Delivery to postal offices operators by employees (dummy)	–48.0%
Delivery of parcels to postal operators by employees (dummy)	NS
Frequency of access to postal outlets (base = every day)	
2–3 days a week/Once a week/2–3 times per month	NS
1 Time per month	75.7%
1 Time per quarter	109.0%
2 Times per year or less	293.7%
Less frequently	NS
Period of the day to go to the postal outlets (base = none in particular)	
Does not go	106.3%
Until 10 h	61.7%
10–12 h	NS
12–14 h	45.9%
14–16 h	109.9%
16–18 h/After 18 h	NS
Time, in minutes, to postal offices in a round trip (base = Does not go)	
Up to 20 min/More than 20 min	NS
Would you change something in the current network of access to postal services (dummy)?	NS
Level of satisfaction with the current network of access to postal services (using a scale from 1 to 10, where 1 is Not Satisfied and 10 is Very Satisfied)	NS

NS Non-significant, p-value was equal or more than 0.05

while the Real estate activities sector (–43.7%) and the water collection, treatment and distribution sector (–59.9%) have less chance.

- (e) MSME that send more than 12 registered letters per year have a higher propensity to pay (60% more) than MSME that send less registered letters per year.
- (f) MSME users that received more than 240 non-registered letters in the last year are less willing to pay.

- (g) MSME users that send 10–45 parcels are less willing to pay an annual rate compared to those that do not send or send more than 45 parcels. MSME users that receive 37–240 parcels are more willing to pay than those receiving less than 37 parcels or more than 240.
- (h) The WTP of MSME that go to postal outlets on a daily basis, is 76% lower when compared to MSME that go once a month, which is a counterintuitive result. This percentage is 109% for those that use postal outlets quarterly and 294% twice a year.
- (i) MSME that have a specific moment of the day to go to postal outlets are more willing to pay for the annual rate than those that do not have a specific moment to go, 62% more for those who go until 10 a.m., 46% for those between 12 and 14 and 110% for those between 14 and 16.
- (j) The time spent to travel to a postal outlet was not statistically relevant.
- (k) The degree of satisfaction with the postal network is not statistically relevant.

6 Conclusions

The results presented in this paper suggest that network density is important for specific groups of residential and business users, but not for all of them. Network density regulation may be seen as a way to address specific concerns of these users. Arguably, some of these groups may become less important as digitalization of mail increases. Thus, from a strictly postal point of view, network density regulation should aim at trying to make sure that some (traditional) users do not loose, or their losses are reduced, given the changes in the mail business. Therefore, at least for now, it seems a matter of managing the changes going on in postal markets. With the development and increasing use of e-commerce, access to postal outlets will have a different meaning, the problem being to make sure that users are able to receive (and send) parcels at convenient times and locations.

Residential users and MSME, in general, are satisfied with the retail access points they use, but, more often than not, they do not pay for it and (more than half of the respondents to the survey) claim not to be willing to pay for it. Those that are willing to pay for it are willing to pay an amount unlikely to be enough to pay for the current levels of network density.

Considering that the issue is the payment of an annual rate, it is expected that respondents ultimately indicate that they will not pay for a service they already have “for free”, even when they rationally consider that it could be worth paying for keeping the current postal network if the alternative was to stop having it (at the same level as today).

This suggests that users are happy with current network density levels. The current level of satisfaction is subject to the underlying financing mechanisms in place. Data on loss making postal outlets is not publically available. The same happens with the contribution of network density to the net costs of the universal service. However, it

should be noticed that users do not pay for most of the services demanded in accessing local postal outlets – receiving standard mail, receiving parcels or acquiring some financial services. Actually, mail senders, or in the case of financial services, the State and insurance companies, are the ones paying the services provided at postal outlets. Basically, many users are happy to have convenient locations to access these services, not paying for them. Cohen et al. (2008) argued that under a competitive scenario the network of post offices would largely be paid by single-piece revenue,¹³ which would be a heavy burden to place on single piece mailers. The Portuguese USP, and this may be the case for others, has however been able to internalize the costs of the retail network,¹⁴ something that may change in the future with additional decreasing volumes of traffic and if competition emerges. This suggests that, when appraising the appropriate levels of network density, regulators should keep in mind the underlying pricing arrangements.

Any way it should be noted that the model estimates use outputs of a survey that was not specifically designed to study the annual rate users are willing to pay, but a more comprehensive matter, and therefore there might be missing explanatory variables in order to estimate well fit models. This may be the subject of future research.

References

- Age Concern (2006). Rural postal outlets are a lifeline and center of community, Age Concern, London.
- Boldron, F., Dewulf, K., Joram, D., Panet, C., Roy, B., & Vialaneix, O. (2008). Accessibility of the postal retail network, social cohesion and economic development. In M. A. Crew & P. R. Kleindorfer (Eds.), *Competition and regulation in the postal and delivery sector* (pp. 47–61). Cheltenham, UK and Northampton, US: Edward Elgar.
- Borsenberger, C., Joram, D. & Roy, B. (2011). How many outlets if the USP does not face any USO? A cross-country comparison. In: *Reinventing the Postal Sector in an Electronic Age*, 123–141. Edited by M.A. Crew and P.R. Kleindorfer. Cheltenham, UK and Northampton MA, US: Edward Elgar.
- Boston Borough Council (2006). A sustainability Study of the Rural Settlements Consultation of Stage One – The Methodology. [http://www.boston.gov.uk/index.php?option = com_docman&task = doc_view&gid =915](http://www.boston.gov.uk/index.php?option=com_docman&task=doc_view&gid=915)
- Bradley T., (1986) Poverty and dependency in village England in: Lowe, P., Bradley T., Wright, S. (Eds), *Deprivation and Welfare in Rural Areas*. GeoBooks
- Cloke, Paul J., Goodwin, Mark, and Milbourne, Paul. (1997). *Rural Wales: Community and Marginalization*. University of Wales Press, Cardiff.
- Cohen, R., Di Paola, L., Sheehy, R., & Comandini, V. V. (2008). The distribution of postal outlets in Italy and the United States. In: *Competition and Regulation in the Postal and Delivery Sector*, 36–46. Edited by M.A. Crew and P.R. Kleindorfer. Cheltenham, UK and Lyme, US: Edward Elgar.
- ERGP (2016). ERGP report Universal Services in light of changing postal end users' needs

¹³Since most mail related retail activities are for single-piece mail.

¹⁴Costs have been reduced, by outsourcing a significant part of the retail access points.

- Higgs, G. White, S.D., (2000). Alternative indicators of social disadvantage in rural communities: the example of rural Wales. *Progress in Planning* 53 (1), 1–81
- Higgs, G., Langford, M. (2013). Investigating the validity of rural urban distinctions in the impacts of changing service provision.
- IMR (2017). Study on the postal users' needs on the accessibility to the retail access points of the Universal Service Provider (USP) in Portugal. <https://www.anacom.pt/render.jsp?contentId=1411504>
- RARC (2015). What postal services do people value the most? A quantitative survey of the postal universal service obligation
- Woods, M. 2009. Changing communities: restructuring rural services. In: Woods, M. (Ed.), *Rural Geography*. Sage, London
- Zurel, O. (2016). A Systematic Review of Postal Consumers' Needs Within the USO Framework. Paper presented at the 24th Conference on Postal and Delivery Economics, Florence