

Measuring Consumer Detriment from Postal Quality-Price Misperceptions in France

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Magali Cecchet^a, Mette Damgaard*, Nicole Doise^a,
Julien Coulier^b, Lionel Janin^b, Patrice Muller*, and
Gregory P. Swinand*

*London Economics, ^aDGCIS-France, ^bARCEP¹



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Head Office: 11-15 Betterton Street, London, WC2H 9BP, United Kingdom.

w: www.londecon.co.uk e: info@londecon.co.uk

t: +44 (0)20 7866 8185 f: +44 (0)20 7866 8186

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Abstract

This paper studies the issue of consumer detriment in the context of postal markets in France. The issues of the trade-offs between quality and price, and how important these are to consumers, are of key interest with regards to current and future USO policies in many countries. Recent surveys of consumers' needs and perceptions of quality and price in France show that consumers in France are in many cases poorly informed of the price and quality parameters of first-class and second-class letter mail. A large portion of survey respondents said they did not know of the existence of the second-class letter mail product.

We study the particular issue of how large is the problem of the lack of knowledge in letter mail in France due to the lack of knowledge of the existence of the second-class letter product. We use a combination of survey results and an econometric approach with an out-of-sample prediction to answer the question: "How would second-class letter mail volume change if consumers were informed of the existence of the second-class product?" The approach suggests second-class letter mail volume from individual letter mailers could roughly double.

Our results suggest that a significant but not large welfare value of consumer detriment exists, with values ranging from €25m to €28m euro.

1 Introduction

This paper studies the issue of consumers making ‘mistakes’ about quality of service and price trade-offs using a consumer detriment analysis. The framework is applied to the universal postal service provider in France.

In regulated markets, one of the remaining economic justifications for economic price and entry regulation is a universal service obligation (USO). It is also generally well recognized in regulated markets with a USO, that meaningful USOs require service quality regulation.

The postal service is one of the markets where questions surrounding the USO cost, and the sustainability of the USO, in the light of requirements for retaining the USO and liberalization from EU Directives and national laws, have generated some of the more lively policy debates. Regulators and policy makers in many industrialized countries are considering reworking price and quality USO regulation, due to the pressures on posts from the economic downturn, e-substitution, and changing usage patterns. Should quality standards be increased or decreased in light of these recent events?

Postal markets across the EU are largely similar in terms of some key quality of service target parameters. For example, speed of delivery is typically measured by class of mail and percentage of that class meeting the J+n delivery target (in other words, +n days from posting a first-class letter has X% chance of being delivered). Another important quality parameter is the number of days of delivery per week (e.g., 6 in France, the UK, the USA, 5 in Ireland, etc).

In this context, ARCEP²/DGClS³ commissioned London Economic (and IPSOS) to survey French postal users. Two large consumer surveys covering representative samples of households and businesses were carried out in late 2010 (early 2011).

Some surprising results emerged; they showed that a significant proportion of users are unable to distinguish key product elements: for example, circa 2/3 of consumers did not know the actual price of first-class and second-class letters, almost 1/3 did not know of the second-class letter, and perceptions of delivery speed diverged from both the official delivery targets and from measured delivery speed.

The existence of erroneous user knowledge raises a number of interesting questions, such as whether policy makers should care (how big is the problem in terms of value?), or how regulatory policy should be formulated given this state of affairs. It is therefore important to study further these phenomena with an aim to informing policy makers as to how important the lack of consumer knowledge is in postal markets.

We evaluate the case of French consumers using standard consumer detriment tools. We use estimates of demand parameters in a neoclassical demand model and calculate surplus lost given market failure.

² L’Autorité de Régulation des Communication Electronique et des Postes—the French Regulator for Post.

³ La Direction générale de la compétitivité, de l’industrie et des services (DGClS) – which forms part of the Ministère de l’Économie, des Finances et de l’Industrie—the french Ministry in charge of public postal service regulation and responsible for the supervision of USP

Consumer detriment is apparently quite often used by competition authorities⁴, but to our knowledge, a quantification of detriment has not yet been examined in the context of quality-price trade-offs for postal services.⁵ In the case at hand, we study a number of sources of consumer detriment arising from lack of knowledge about quality-price relationships between first and second-class mail. Our measures of consumer detriment require data and estimates about demand levels and demand curve parameters and we use demand data from ARCEP and demand function parameters from existing studies on French postal demand.⁶

We present results of estimates of consumer detriment and the relative magnitudes of different sources of detriment, and present policy recommendations.

The work extends other papers that have considered consumer detriment.⁷

We begin by examining definitions of consumer detriment in the literature. Next, we examine various methodologies used to measure consumer detriment. We choose a methodology and apply it to available data from our surveys and from existing data, and our econometric results. Finally, we present our conclusions.

2 Review of Literature

2.1 Defining of Consumer Detriment

Consumer detriment, at some high level, should seem rather intuitive; some form of market failure, or 'mistake', or poor behaviour, somehow reduces the achievable surplus value of consumers below a theoretical optimum. Although this may seem intuitive, a definition that lends itself to more formal investigation has been perhaps more elusive.

Consumer detriment is a difficult thing to define and to measure because it can be affected by a particular consumer's own circumstances, perceptions and priorities. According to DG SANCO (Europe Economics 2007), there are two definitions of consumer detriment: (1) Personal detriment refers to negative outcomes for consumers relative to expectations or reasonable expectations; the individual consumer has a problem with his own transaction. (2) Structural detriment is more general, and refers to the overall loss of consumer welfare caused by a pervasive regulatory or market problem. Because it is a pervasive problem, structural detriment potentially impacts the entire market or sector, causing loss to many or all consumers in that sector.⁸

⁴ See for example, London Economics (1997), Office of Fair Trading, (2000). Office of Fair Trading, (2006). Office of Fair Trading, (2008).

⁵ While some previous studies have looked at consumer detriment in the postal sector, the focus was on personal detriment from lost items, damaged items, junk mail, etc.

⁶ See for example: Cazals, Catherine, Frédérique Fève, Patrick Fève and Jean-Pierre Florens (2005), p. 1-6. Looks at how to identify demand parameters with merely cross sectional evidence, but gives some good insights to what structural models of demand might be reasonable. A wide number of studies exist including: Florens, Jean Pierre, and Catherine Cazals (2004)

⁷ Davies, Mary, (2010) Assessing Anticompetitive Behavior in a Postal Market, 18th Conference on Postal and Delivery Economics.

⁸ Europe Economics (July 2007), "An analysis of the issue of consumer detriment and the most appropriate methodologies to estimate it," DG SANCO: http://ec.europa.eu/consumers/strategy/docs/study_consumer_detriment.pdf.

In an effort to gain clarity on the economic concept of consumer detriment, the Office of Fair Trading in the UK (OFT) conducted a study based on eleven consumer focus groups in 2004 and published a report on its findings in January 2006.⁹ The two primary elements of consumer detriment they found were: out-of-pocket expenses incurred as a result of problems with goods/services, and the cost of time consumed in attempt to resolve those problems. These can be assigned economic value. However, additional factors, such as negative feelings caused by the experience, might impact future dealing, but the quantitative impact on such feelings would be difficult or impossible to measure with a meaningful degree of certainty.

The OFT study indicated that the Delivery/Postal Services sector ranks third as a sector in terms of number of complaints received (3.8million per year).

In this study, we focus on what others have defined as “structural detriment”, the detriment due to an overall structural problem in the market.

2.2 Theory of consumer detriment: a review

Measuring consumer detriment typically has come from the neoclassical consumer and competitive market models as starting points.

Perfect competition assumes that consumers (as well as firms) have perfect information with regards to all variables. But in reality, consumers do not usually have perfect information. They may lack certain knowledge, understanding, or awareness; but they must still make their purchase decisions.

Information can be difficult or costly to obtain, so a rational utility maximising consumer cannot be expected to pursue all available information at any cost (Europe Economics 2007 p. 141). Proper measurement of consumer detriment should therefore not include the situation where consumers merely are making the ‘correct’ choices, when taking the total cost of consumption including informational costs.

In 1997, London Economics studied consumer detriment resulting from imperfect quality and price information in several sectors that were investigated by the OFT.¹⁰ The Monopoly and Mergers Commission found that both market power and the regulatory regimes were the causes of the problems in these sectors, so these were ‘structural’ detriment areas.

Informational problems with product quality as a source of failure have been treated in the literature for a long time. Akerloff (1970)’s seminal paper about ‘lemons’ demonstrates the risk of inefficient market outcomes if credible signals for quality are not available. With regards to consumer detriment caused by lack of information, Vickers (2003) proposed a model of consumer detriment and its impact on equilibrium quality levels. He showed that, if firms cannot guarantee the quality of their product, they would have incentive to under-provide quality. Consumers would recognise this incentive and the result would involve lower price and quality than that which would occur given perfect information or with the firm’s prior commitment to the full-information level of quality.¹¹

⁹ OFT 826 (January 2006), Focus Group Research on Consumer Detriment, Prepared for OFT by FDS International.

¹⁰ London Economics (August 1997), “Consumer Detriment under Conditions of Imperfect Information”, prepared for the OFT.

¹¹ Vickers, J., “Economics for Consumer Policy,” British Academy Keynes Lecture 2003.

Where a consumer makes uninformed or misinformed decisions with regards to price, the loss they suffer as a result is seen as measurable detriment.¹² Fictitious price comparisons or false sales could be used to deter consumer search deceptively and profitably. In Wilson (2004), a model shows how this mechanism could exist when combined with moderately enforced consumer regulatory policy.¹³

In 2001, Hunter *et al* developed the model for the OFT which defined consumer detriment as the loss in consumer surplus which arises when consumers overestimate quality. Consumer detriment arises in this case because at any price level, consumers have a higher demand than they would if they had perfect information.¹⁴

The focus group research indicates that certain consumers may be more vulnerable to detriment than others, for example, those less educated about their rights as consumers may not fully understand their transactions at the outset, thus leading to detriment at some point later in the transaction. This last facet of USO and consumer detriment seems particularly interesting in the context of post, where the rationale for the USO is, in part, to protect certain vulnerable consumers.

3 Models and approach

3.1 Measuring consumer detriment-graphical model

Given the works cited above, we move on to a discussion of different potential models of consumer detriment. We present the models graphically as an intuitive and accessible means of presentation and motivation.

In line with the work of London Economics (1997), Hunter (2001), and the OFT (2006), in the case of structural detriment, there can be two proposed models to measure structural¹⁵ consumer detriment.

In the first model, demand is higher than it ought to be, because quality is misunderstood. It could be that perceived quality exceeds actual quality (and this is not recognised).

In this graphical model, quantity demanded is too high relative to what demand would be if consumers were well-informed; the demand curve should shift back if consumers were better informed. The red shaded area is a change in consumer surplus. This red area, according to logic and prevailing practice (See Europe Economics 2007, and the discussion around 'structural detriment'), however, is not counted as consumer detriment. This is because this red area is what consumers would have been willing to pay for the erroneously believed better service¹⁶ but which is not available or provided in the counterfactual.

¹² OFT 790 (June 2005), Research into misleading price comparisons, Report prepared for the OFT by Nottingham University Business School.

¹³ Wilson C., (2004) "Price deception, market power and consumer policy", Centre for Competition Policy W.P., 04-01.

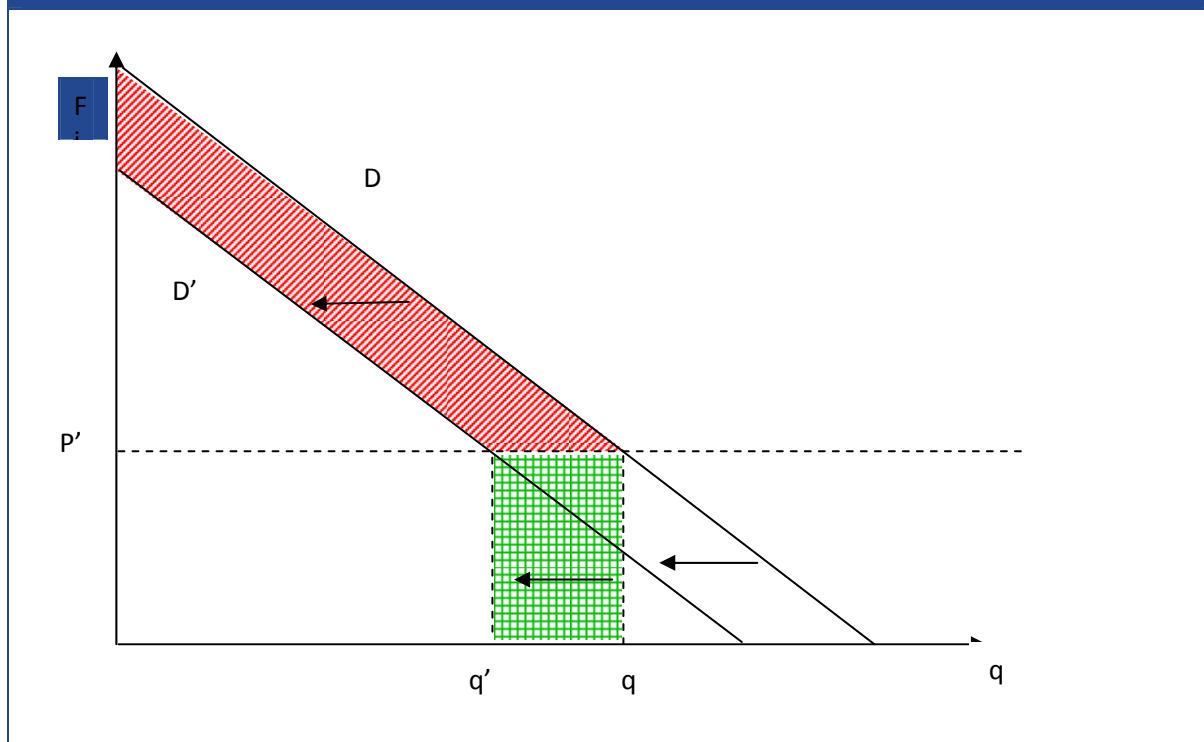
¹⁴ Hunter, J., Ioannidis, C., Iossa, E. and Skerrat, L., (2001) "Measuring consumer detriment under conditions of imperfect information", Report prepared for the OFT.

¹⁵ From here on, we will refer to consumer detriment to mean "structural consumer detriment", since this is what we focus on.

¹⁶ To see the logic of this, suppose consumers were 'fooled' into believing a new "fountain of youth" drug was available. The willingness to pay for such a drug might be quite high—but it is not obtainable in reality. Therefore, the 'counterfactual' does not include the surplus that is not attainable. If we included this unattainable-perceived-lost consumer surplus in our measure of consumer

This model fits well with our purposes of considering the consumer detriment from consumers being misinformed or not knowing about the existence of second-class letters in France.

Figure 1: Supply & Demand with Consumer Detriment

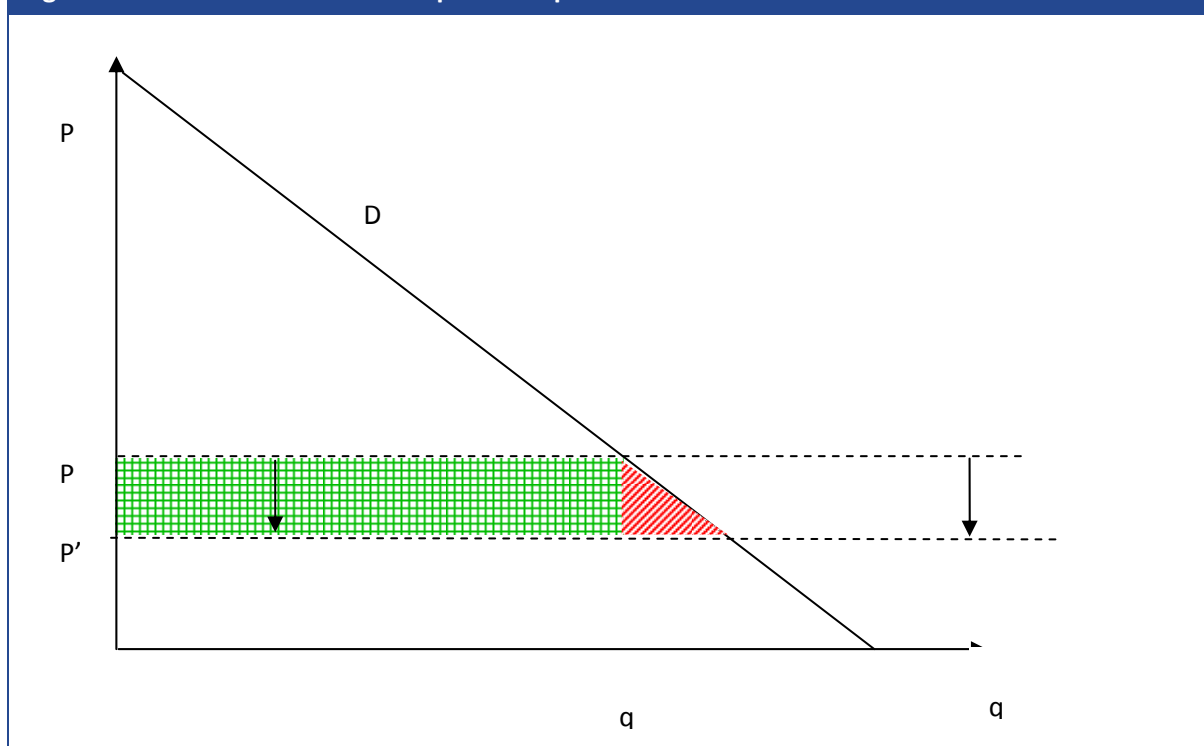


Source: London Economics

An alternative case of consumer detriment is where the optimum price should be lower than it otherwise is. In this case the area that is consumer detriment might be considered to be the green plus the red shaded areas in the figures below.

detriment, then the value would be quite high in this case (assuming consumers would be willing to pay a lot for such a drug), but consumers wouldn't be much worse off on the whole if the drug didn't work (other than their lost money and effort).

Figure 2: Consumer Detriment impact on Optimum Price



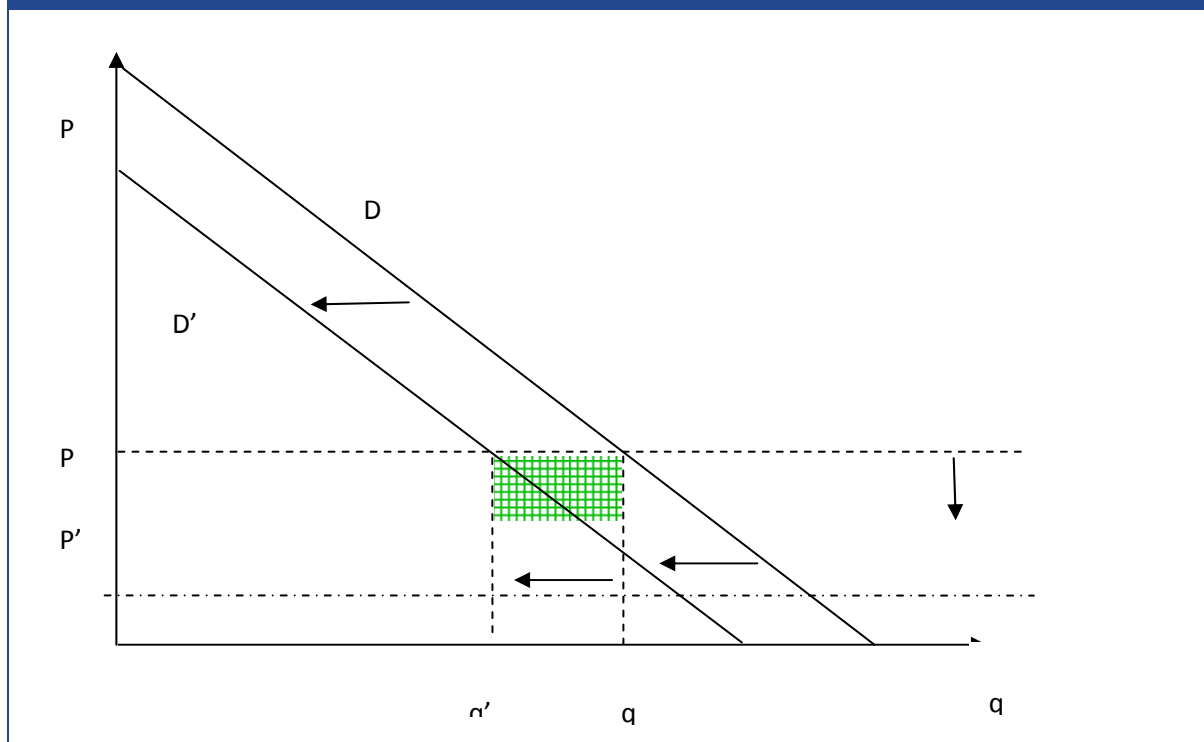
Source: London Economics

Some interesting additional issues come to the fore when considering the presented models against some of the previous research. Previous research, such as London Economics (1997), the OFT (2006), and Europe Economics (2007), all seem to focus on the ‘welfare loss’ as their theoretical measure of consumer detriment. Notice, under this definition, any change in consumer surplus that is merely a transfer from consumers to producers is not considered consumer detriment.

In our model proposed here, we include welfare transfer from consumers to producers as our measure of consumer detriment for intuitive reasons. First, we believe from a policy perspective, the notion of protecting consumers vis-a-vis the power of large and potentially monopolistic firms rightly should include this value. Second, it is evident that the actual practice of measuring consumer detriment has often included this value, as in practice, researchers have simply summed up values from direct measurement of detriment

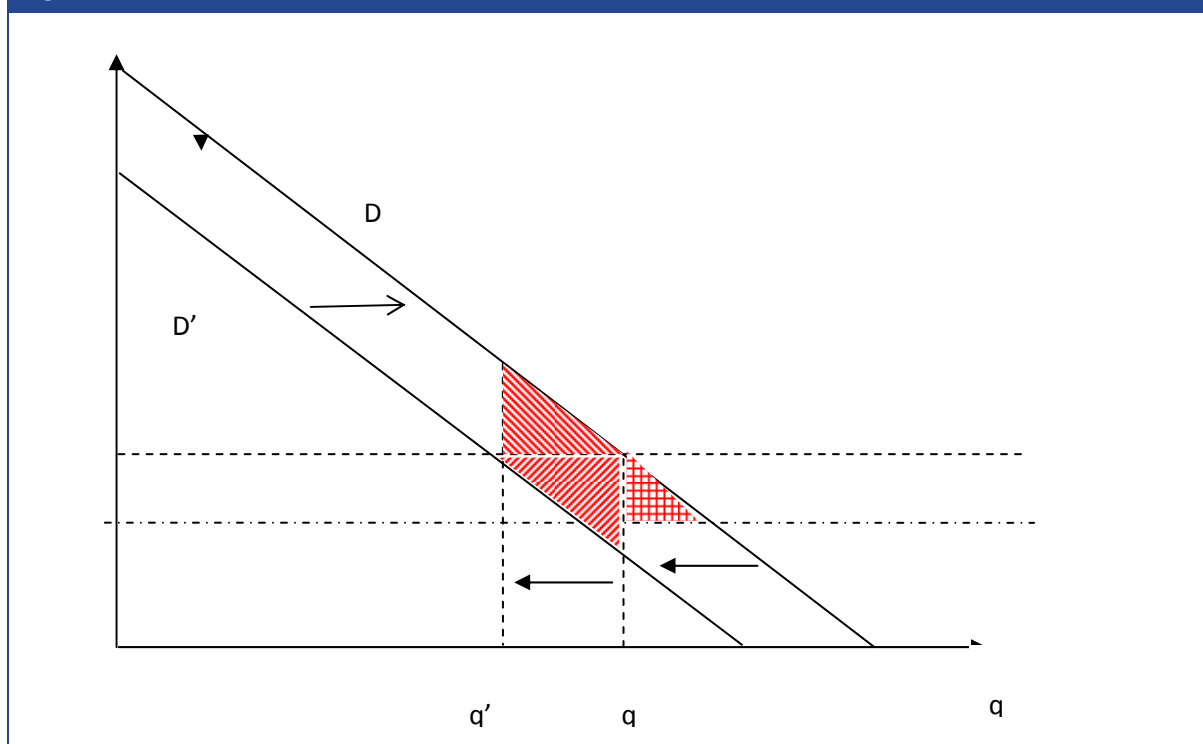
In our model of consumer detriment, we include the value of the differential between the first-class stamp price and the quantity of mail that is predicted to shift from first-class to second-class, under the counterfactual of ‘better’ information. This is depicted graphically below.

Figure 2: Consumer Detriment net cash total



There are also three deadweight loss values, depicted as the shaded triangles in the figures below. One is the deadweight loss from the fact that the demand for first-class is too high. The other is the DWL from the fact that the demand for second-class is too low (both shifts in the demand curve). Finally, we assume a price elasticity impact, where an additional movement along the second price demand curve is included (this last value turns out to be empirically rather small). Note that the figure is not technically exact, as the 'base' quantities of first- and second-class are not the same (empirically), while the assumed "shift" is equal and opposite by definition/assumption (we assume the first-class mail "shifts" to second-class).

Figure 5: Consumer Detriment DWL total



3.2 Econometric modelling approach

As in any consumer detriment assessment, a key challenge is to determine how consumers would behave if they were fully informed.

To consider this issue further, in the context of our study of French mail, consider each member of the household¹⁷ population as being a member of one of three groups:

- 1) The perfectly informed households. These households know that a second-class stamp exists, know the price differential (we use a continuous measure of price differential between stated and actual). We also know what the expectations of these households are in terms of speed of delivery for both first-class and second-class mail.
- 2) The households who know only first-class mail.
- 3) The households who know both first and second-class mail but don't know the precise price differential between first- and second-class mail.

It is reasonable to assume that the consumers who do not know that the second-class mail exists would behave, in terms of volume of first and second-class mail sent, like the fully informed

¹⁷ We use the term "household"; respondents were asked to respond for their household and if they were the principle person who looked after mail in the household. Naturally, the "households" is in fact the respondent to the questionnaire.

consumers, conditional on similar socio-economic characteristics, intensity of other mail usage and needs in terms of delivery time.

Our approach is as follows: We use observations on volume of mail sent by individual households, and explanatory data on socio-demographic characteristics, knowledge of the mail, etc. For some households, their survey response indicated they were not aware of the second-class product, and so these households necessarily had zero volume for second-class mail; for these households, we then do an out-of-sample prediction of second-class mail demand, given the socio-economic observations.

A second issue is what the mail demand for second-class mail would be for households that know of the existence of second-class mail, but are ill-informed/have poor knowledge of the true price and quality values. In this case, we use the same model, but the predictions are within sample, given a change in the explanatory variables. For this group, we use explanatory variables that proxy for the quality of knowledge on price information: the % deviation of their believed price vis-à-vis the 'true' price, as well as for quality (their stated guess of the quality vis-a-vis the actually achieved quality in terms of delivery speed hitting the target). We then adjust the explanatory variables such that consumers with poor knowledge, defined as >X% from the actual, have at least a minimum accuracy, defined as Y%.

4 Data

Data come from two surveys of French consumers and businesses conducted using CATI (computer aided telephone interviews) and online responses done by IPSOS. The total number of household responses was 1,304. The sample was representative of the French population in as much as possible by age, gender, and geographical location. Additional weightings of the sample to more fully reflect a nationally representative sample were done during the regression modelling.

An additional note on product definition might be useful for those not familiar with French postal products. The study focused on single piece (non bulk) addressed letter mail. In France, this mail has a first and second-class. The delivery speed target for first-class mail is 84% of letters delivered by J+1, i.e., next day-delivery for all of continental France (i.e., excluding the Départements d'outre-mer-Guadeloupe, Martinique, Guyane and La Réunion). Additional survey work was undertaken for registered mail and parcels. We focus on the single piece letter mail because this is the item for which there seemed the clearest case for consumer detriment, as the two products, first-class and second-class, are nearly indistinguishable except for their speed of delivery target (and delivery time actually achieved).

Data on socio-demographic characteristics of the respondents and/or of the households was collected directly via the questionnaire, including: 6 age categories, professional status, profession, sex, rural/urban, and household size.

Data on mail use was collected via the questionnaire by asking respondents how many letters of each type the respondent sent on average over the last 12 months. Respondents were allowed to give their own time-frame reference (e.g., per week, per month), and then this was coded up to give an annualized figure.

In terms of knowledge of the second-class letter, respondents were asked directly if they knew of the second-class letter (economic letter). If they did not, then no further questions were asked in relation to second-class mail.

Respondents were asked directly what they believed the prices of first-class and second-class letters were, as well as the prices of packages/packets and registered letters.

Respondents were also asked directly what their experience of quality of service was in terms of delivery speed. We did not attempt to ask questions such as what the respondent believed was the actual performance or the regulated target (which are conceptually different, potentially interesting, but also potentially confusing).

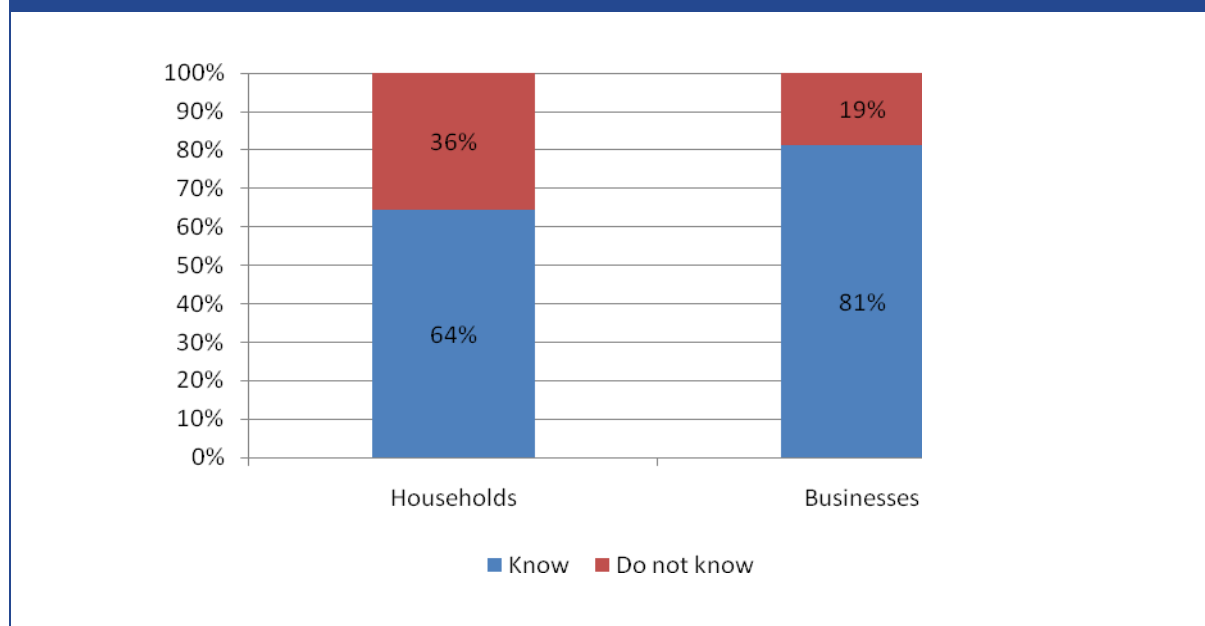
Additional questions on users' use of alternative forms of communications, needs for speed of delivery, importance of various aspects of the service, and levels of satisfaction (overall and with specific elements) were also asked. Some additional details on the variables can be found in the annexes.

5 Results

5.1 Results-descriptive statistics

There are some interesting overall descriptive statistical results that motivate our discussion. Overall, 1/3 of households and 1/5 of businesses responded that they did not know of the existence of the second-class letter in France. Nonetheless, in spite of this low level of knowledge, other factors appear to influence the usage of the first-class letter over the second-class letter in France.

Figure 7: Knowledge of second-class mail – percentage of households and businesses who know and do not know the existence of second-class mail



Note: Analyse des réponses aux questions 2.3 (questionnaire ménages) et 5.6 (questionnaire établissements)

French postal users' knowledge of the prices of letters is also seemingly poor, for both households and businesses. Only 29% of households and 34% of businesses knew the actual price of the standard first-class letter. In the case of the second-class letter, the level of knowledge falls to 19% and 18%, for each group respectively. The fact that prices changed in July 2010 might partly explain this result.

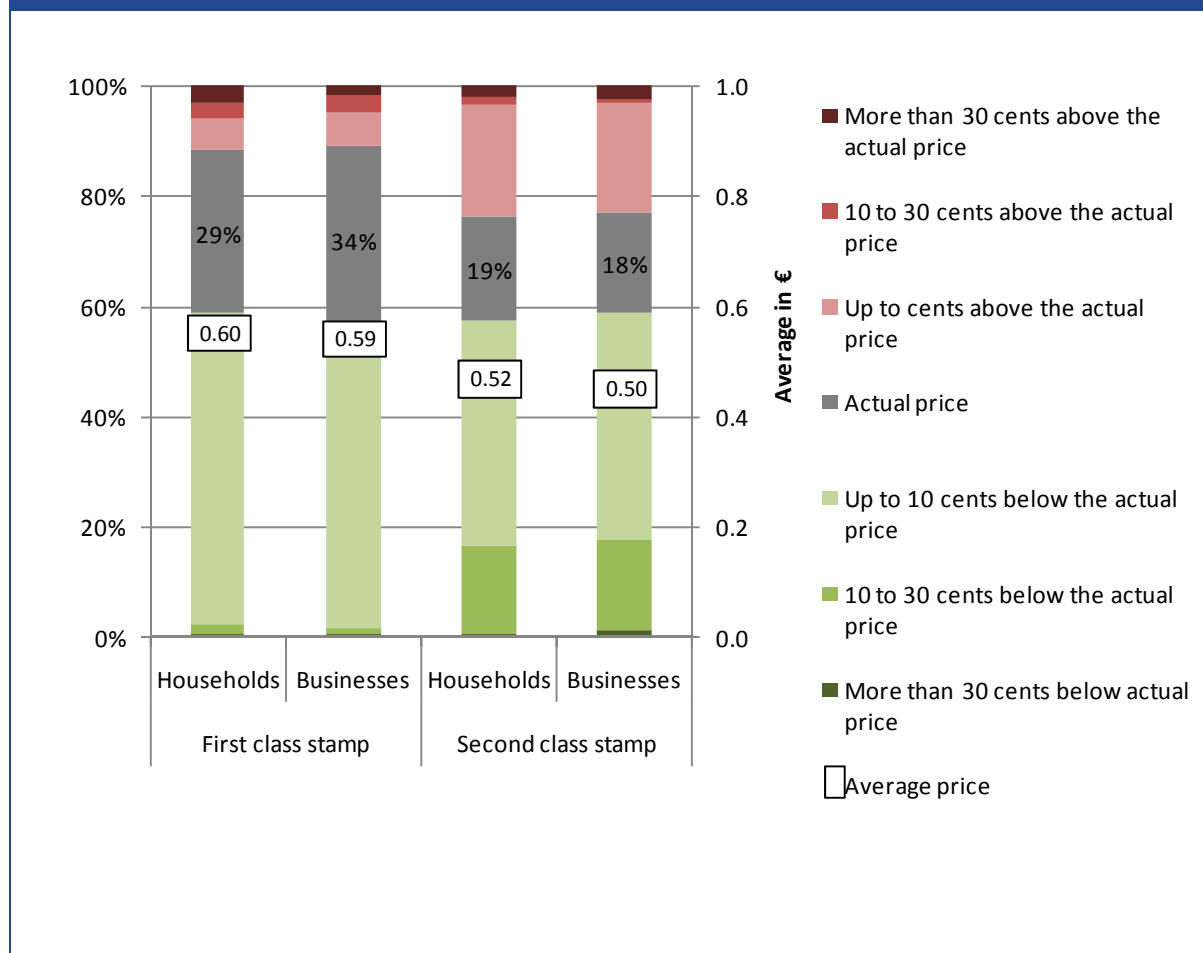
Interestingly, the percentages of those who did not know the price of the basic first class stamp, appeared to be correlated with things such as profession, but not much correlated with variables such as urban/rural, and age. Graphical evidence of this is shown below.

Figure 8: Percentage of survey participants not knowing existence of second class mail by different household characteristics

Age group	16-19	35%	Professional occupation	Farmer	27%
	20-24	40%		Blue collar	46%
	25-39	32%		Employee	35%
	40-54	32%		Middle-level manager	24%
	55-64	30%		Top level manager	23%
	65 +	47%		Liberal profession	31%
	<i>Average</i>	36%		Artisan	15%
Social aid	Yes	35%		Retailer	11%
	No	35%		Entrepreneur	15%
Territory of city policy	Yes	55%		At home	45%
	No	45%		Student	36%
Zone	Urban	34%		Unemployed	32%
	Rural	0%		Retired	39%
				<i>Average</i>	29%
5% more than group average					
10% more than group average					

The chart above shows the average beliefs of consumers about the prices of letters in France, as well as the distribution around the true prices of their responses. Recall that the actual price is €0.58 and €0.53 for the first-class and second-class letters respectively. While on average households and businesses were only about 1-2 eurocents below or above, a considerable dispersion is evident. This dispersion was much more evident for households, were for example about 18% of respondents were 10 to 30 cents below the actual price.

Figure 9: Knowledge of price of first and second class mail



Additional details on the variables and their sample means within the sample used for the regression and predictions can be found in the annex.

5.2 Results: econometric estimation

In our surveys, 457 out of 1304 household respondents said that they did not know of the existence of the economic letter. In order to estimate the prediction for the change in the level of second-class mail sent, if all households were aware of the “economical letter”, we first ran several regressions with volume of second-class mail as the dependent variable. These regressions were estimated using the responses of those that knew of the existence of second-class mail and socio-demographic and mail knowledge variables as the independent variables. We then make some assumptions in order to predict the change in the volume of second-class mail that would occur if all were made aware of the existence of the “economical letter”. We used the logic that those unaware of second-class mail would behave similarly to those aware of second-class mail, conditional on explanatory variables that included socio-demographic characteristics and other variables about mail use, demand, and knowledge.

Regressions

The table of regression results shows 5 of the regressions that were run. The results presented identify those variables that appear to be statistically significant in explaining the volume of second-class mail within the sample. We chose the 5th regression as our preferred model based on the R-squared value.

We note that we also tried a number of functional forms and specifications, including a Tobit model (this method would include all of the observations, including those where second-class mail demand is zero due to not knowing it), but the fits on these models tended to be quite poor.

The dependent variable in each of the regressions was the volume of second-class letters sent.

Table 1: Regressions					
	(1)	(2)	(3)	(4)	(5)
VARIABLES	rq35letters	rq35letters	rq35letters	rq35letters	rq35letters
Believe second-class mail takes 4+ days	-19.285*** (4.572)	-19.301*** (4.571)	-19.506*** (4.562)	-19.067*** (4.578)	-18.168*** (4.649)
Use internet or sms	-20.300* (10.379)	-18.392* (10.529)	-16.109 (10.593)	-10.824 (11.024)	-8.040 (11.189)
Age: 20-24				-11.493 (10.959)	-9.971 (11.817)
Age: 25-39				-6.502 (9.554)	-3.910 (11.786)
Age: 40-54				-1.393 (9.347)	-0.432 (11.989)
Age: 55-64				-11.004 (10.090)	-8.010 (13.707)
Age: 65+				8.025 (10.809)	13.496 (16.218)
Farmer					10.203 (19.259)
Worker					9.893 (18.165)
Intermediate executive					16.829 (18.418)
Senior executive					27.426 (20.064)
Self-employed					20.279 (23.337)
Artisan					78.826*** (26.235)
Shop owner					-8.087 (27.807)
Company owner					7.358 (24.000)

Housewife/house husband					27.483
					(19.865)
Student					16.780
					(20.880)
Unemployed					18.027
					(19.769)
Retired					13.749
					(19.661)
Refused to provide occupation					16.419
					(28.604)
Deviation between believed and actual price of second-class mail	59.384***	58.754***	57.696***	60.375***	55.479***
	(15.337)	(15.346)	(15.237)	(15.312)	(15.515)
(Deviation between believed and actual price of second-class mail)^2	-13.210***	-13.081***	-12.771***	-13.371***	-12.219***
	(3.966)	(3.967)	(3.940)	(3.952)	(3.993)
Household size		-1.753	-1.590	-1.833	-1.642
		(1.634)	(1.632)	(1.772)	(1.837)
Volume of first-class mail sent	0.146***	0.148***	0.150***	0.149***	0.139***
	(0.019)	(0.019)	(0.019)	(0.020)	(0.020)
Employed			-5.952	-2.705	
			(4.670)	(5.759)	
Constant	40.717***	43.690***	44.461***	42.041***	19.915
	(10.773)	(11.121)	(11.063)	(14.495)	(23.578)
Observations	406	406	402	402	406
R-squared	0.206	0.209	0.218	0.229	0.257
Adjusted R-squared	0.197	0.197	0.204	0.206	0.211

Source: London Economics

In the preferred model (5), the explanatory variables include: the deviation between believed and actual price of second-class mail, plus this value squared, household size, and the volume of first-class mail sent, whilst we also included dummy variables for age group, profession, whether respondents believe second-class mail takes 4 or more days to arrive, and whether the household uses the internet or sms.

The results show that if a respondent believes second-class mail will take 4 or more days to arrive they will send 18 fewer letters, on average, a year, whilst another significant result is that of the effect of a difference between believed and actual price of second-class mail on the level of

second-class mail sent¹⁸. It is very interesting to see that whilst the coefficient on deviations between believed and actual price of second-class mail has a positive coefficient, the coefficient on the square of deviations between believed and actual price of second-class mail is also significant, but negative. This is an interesting result to interpret (with caution), as it could suggest that while if someone overestimates the price of second-class mail they will send more second-class mail, after a certain point, they will send less second-class mail. Perhaps the interpretation could be that the initial impact is due to price insensitivity (due to uncertainty about the price, perhaps), while price sensitivity increases as the ‘perceived’ deviations get high. However, the net impact is negative, when evaluating at the sample means.

Another variable that is shown to be a factor in determining the volume of second-class mail is the level of first-class mail sent. It shows that if a household were to send 100 first-class letters more than a similar household, we would predict that they would also send around 14 more second-class letters, all else equal.

A further interesting result, of interest for the USO, suggests that artisans send significantly more second-class letters than people of other professions.

We also looked at several other variables, including the importance of next-day delivery, whether the household was in an urban or rural area, and the deviation between believed and actual price of first-class mail. However, these variables didn’t appear to significantly affect the volume of second-class mail sent.

Predictions

We predicted the second-class mail volumes for those who didn’t know the existence of second-class mail using an out-of-sample prediction (those who didn’t know second-class were not in the first sample). We also simply predicted assuming the proportion of mail sent remained the same for those who didn’t know second-class as for those who did. The working assumption is that demand is the same between the two groups, conditional on the independent variables.

For some of the variables, such as knowledge of the price of second-class, the speed of second-class, we did not have observations for these variables for those who didn’t know second-class existed. So for these variables, we did each of two things: we set them equal to the “perfect knowledge values”, and, we set them to the sample means (from the group that knew second-class). By ‘perfect knowledge’ we mean that we set, for example, the “estimated price differential” to zero, or the ‘speed of delivery for second-class’, to its actual value, etc.

Table 2: Volume predictions

Item	Proportional forecast	Perfect knowledge	Sample means

¹⁸ We tried a number of specifications including logs, which had considerably worse fits than the models presented. The log specification, while having the desirable property that it would not have the possibility of predicting negative volumes, also suffered from dropping observations where the volumes were correctly ‘zero’ but the 2nd class mail was known.

Volume first-class (millions)	1,727	1,690	1,697
Volume second-class (millions)	759	796	789
Change volume (millions)	360	397	390

Source: London Economics estimates

One of the more interesting results is that the predicted second-class volume increase is about 8% higher for the prediction at the sample means, and about 10% higher if explanatory variables were set at the perfect knowledge variables (about 30 million to 37 million items respectively), *vis-a-vis* the alternative naïve forecast, where we simply assumed those who didn't know the second-class mailed in the same proportions as those who did. The rationale for this difference is that the mix of those who didn't know second-class is correlated with the independent variables; in other words, those who didn't know second-class were slightly more likely to use second-class given their independent variables' values.

Another interesting result is that the perfect knowledge is predicted to give us about 7 million more items from this group. In other words, going from the sample means to 'correct' for this group, still will add some volume—consumer's lack of knowledge is significant (although not large) and in the expected direction (i.e., poor knowledge reduces demand).

5.3 Results: values of consumer detriment

Next we present results for the values of the consumer detriment. We present the values of the cash savings (the price differential from first- to second-class ($0.58 - 0.53 = 0.05$). The predicted shift in volumes is from 360m to 397m.

The deadweight loss value estimates include the consumer surplus lost from both the lack of second-class demand and the excess first-class demand, plus an additional 'movement down the demand curve' on the second-class mail demand curve (the three triangles depicted previously). The cash savings values are roughly 2.5 times the deadweight loss values. Deadweight loss still has a significant impact, but it is not large. This, in some ways, should be intuitive, as the assumed value for the price elasticity of demand of post is small in absolute value terms (-0.28). It is notable that these values would be larger if the price elasticity has increased with greater competition (both within the sector and in terms of other communications), impacts from the economic crisis, or with a long-run time perspective.

Overall the estimates range from about €25m to €28m.

Another notable item is that there about €2m in consumer value to be gained should mail volume increase to "perfect knowledge" (for those who didn't know the second-class mail existed). Presumably, there would be some additional value for those consumers who did know the second-class mail existed as well.

Table 3: Detriment estimates

Item	Proportional forecast	Perfect knowledge	Sample means
Cash Savings €m	18.0	19.9	19.5
DWL €m	7.0	7.7	7.5
Total Detriment €m	24.96	27.54	27.03

Source: London Economics estimates

It is also notable that we have assumed that “cash that could have been saved” and is not, is consumer detriment. Also of note is we have assumed no benefit from the additional speed in the letters that consumers got when buying first-class when they ‘should not have’.

6 Conclusions and future directions

We have estimated the consumer detriment from misperceptions and lack of knowledge. There is clearly some degree of failure in the postal market when a significant portion of consumers does not know of the existence of the more economical second-class product. We believe one of the interesting elements of this work is that it gives an estimate of how big is the problem.

The problem of lack of consumer knowledge of this particular type is clearly significant, but not overwhelmingly large, considering that total non-industrial mail spending in France is about €1.8bn. Thus €28m would be about 1.6% of total non-industrial mail spending. Nonetheless, the problem is significant in that clearly, if some regulatory action, or informational advertising, agreements with providing information at the post office were undertaken, then this could be a significant net benefit for consumers.

The regulatory policy responses to such a problem might consider options such as requirements to give notice, post price lists more prominently, or ‘suggestions’ at post office counters. Consideration of the costs of the selected mix of response measures could use the estimates of the consumer detriment as a guide to which responses might be the most appropriate and proportional. The gains for advertising should of course be weighted against the limited use of mail for most people. For small users, it is possible that a single offer would be the “correct” market outcome if information costs are significant: availability of different type of stamps might prove costly to handle for occasional usage. The need for a simplified offer could investigated in others studies.

There are a number of areas for possible future research.

The overall net welfare benefits of improving the offering in France would include net benefits to producers.

The net benefits for the USP of an informational campaign might be ambiguous (and we have not estimated this), as the USP would lose some revenues, incur some costs (advertising), save some costs (with a good proportion of mail that could go more slowly), while gaining some additional revenues from better serving customers' needs. It isn't clear what the true variable cost to the USP might be from the shift from first-class to second-class (i.e., do they achieve similar savings in unit costs to 5cent per letter item?).

Another area of significant interest could be to see if there would be different values on the consumer detriment if we added different welfare weights to different classes of consumers, such as older consumers, artisans or different professions.

Still further research might be done to sum up a total value of consumer detriment in the mail markets in a specific country. Such a value might consider other types of consumer detriment, such as lost or damaged mail, waiting times in queues, and other factors, that have been identified in the literature as sources of problems in mail markets.

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Annex 1 Additional prediction results

As an additional check of our models, we compared the predictions of total second-class volume that would occur given each of the five different models. While there is some variation in the results, the overall magnitude of the predictions is very much the same. It is also noteworthy that our chosen model, model (reg 5), gave a slightly lower result. We conclude that we are unlikely to have overestimated the consumer detriment based on model selection.

	second-class mail volume	% change in volume of second-class mail sent
Current total volume of second-class mail	13337	
Prediction of additional second-class volume (reg 1)	7221	54.1%
Prediction of additional second-class volume (reg 2)	7255	54.4%
Prediction of additional second-class volume (reg 3)	7025	52.7%
Prediction of additional second-class volume (reg 4)	6923	51.9%
Prediction of additional second-class volume (reg 5)	6841	51.3%

Annex 2 Additional details on variables for regressions

Variable	Observations	Mean	Std. Dev.	Min	Max
Volume of second-class mail sent	815	16.36442	41.9711	0	312
Believe second-class mail takes 4+ days	1214	0.742175	0.437618	0	1
Use internet or sms	1304	0.864264	0.34264	0	1
Age: 20-24	1304	0.120399	0.325552	0	1
Age: 25-39	1304	0.242331	0.428658	0	1
Age: 40-54	1304	0.257669	0.437518	0	1
Age: 55-64	1304	0.175614	0.380637	0	1
Age: 65+	1304	0.156442	0.363413	0	1
Profession:	1304	0.118098	0.322848	0	1

Farmer					
Profession: Worker	1304	0.217791	0.412903	0	1
Profession: Intermediate executive	1304	0.126534	0.332578	0	1
Profession: Senior executive	1304	0.04908	0.216117	0	1
Profession: Self-employed	1304	0.018405	0.134462	0	1
Profession: Artisan	1304	0.009969	0.099386	0	1
Profession: Shop owner	1304	0.006902	0.082822	0	1
Profession: Company owner	1304	0.015337	0.122938	0	1
Profession: Housewife/hou sehusband	1304	0.06365	0.244223	0	1
Profession: Student	1304	0.067485	0.250956	0	1
Profession: Unemployed	1304	0.057515	0.232914	0	1
Profession: Retired	1304	0.232362	0.422501	0	1
Profession: Refused to provide occupation	1304	0.006135	0.078115	0	1
Deviation between believed and actual price of second-class mail	896	-0.00542	0.226453	-0.41	4.9
(Deviation between believed and actual price of second-class mail)^2	896	0.104577	0.863438	0	24.01
Household size	1302	2.610599	1.398246	1	13
Employed	1296	0.576389	0.494321	0	1
Volume of first- class mail sent	1287	87.39361	106.6477	0	730

Annex 3 Mathematical annex

The calculation of the deadweight loss from each of the shift back of first-class letter mail demand and the shift out of second-class letter mail demand is done using the estimate of the price elasticity of demand of -0.28. This figure is from ARCEP and is from their decision on the 2008 price cap.¹⁹ The figure is assumed to be the same for both of first- and second-class mail.

The deadweight loss is the area of the triangle, as depicted in the graphical figures.

Note the definition of the price elasticity of demand:

$$\epsilon = \frac{\frac{\Delta q}{q}}{\frac{\Delta p}{p}} = -0.28$$

And define the slope of the inverse demand curve:

$$b = \frac{\Delta p}{\Delta q}$$

Since we know the elasticity and the price and quantity at a point, then we can find the slope. The slope can be used to find the area of the triangle for the deadweight loss:

$$\frac{1}{\epsilon} \frac{p}{q} = b \rightarrow \Delta q b = \Delta p$$

And then the deadweight loss is:

$$DWL = \frac{1}{2} \frac{\Delta q}{\Delta p}$$

¹⁹ http://www.arcep.fr/uploads/tx_gsavis/08-1286.pdf

