

The Transformation of Post Offices in Partner Offices: Analysis of Effects on Demand

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I – Introduction

All postal operators have been for 10 or 20 years engaged in a transformation movement of their post office network. This movement is often characterized by a double trend: a reduction in the size of the network and an increase in the number of partnerships, replacing owned post offices. The objective of such movement is to optimize postal networks in a context of decreasing volume of mail and market liberalization¹. Due to mail volume decline, infrastructures become larger than necessary and to address competition issues, postal operators are engaged in efforts to modernize their retail networks and adapted them to customers' needs.

The counter-effect of a reduction of the number of outlets could be a negative impact on demand for postal products, since the post office network is traditionally the window or the established hallmark of postal operators. For example, Buser et al. (2007) analyzed the impact of post office closures in Switzerland on overall mail volumes. They found no significant effect of post office closures on overall mail volumes and explained this result (considered by the authors as not surprising) by the fact that *"private customers only reflect a small fraction of total mail volumes (about 15%) and as a collection channel for private customers, letter boxes are a valuable and very accessible alternative to post offices"* (p. 92). *"At the same time, Swiss Post's profitability increased steadily, (partly) due to channel costs savings in collection related to the post office restructuring, and customer satisfaction remained high."* (p. 96)

In France, the transformation of the postal network was engaged for some years now: the size of the postal network was not reduced but wholly-owned branches were transformed into partner points. In this paper, we seek to analyze the impact of the transformation on postal activities in these outlets: had the transformation generated a decrease, an increase or had no impact on the demand for postal services and consequently on activity level in these points?

Our paper is organized as follows. In section 2, we describe the evolution of post office networks in some European countries and we focus on the activity observed in the French network from data we collected. The econometric model used to assess the impact of the transformation on postal activities in these outlets is presented in section 3 and results are discussed in section 4. Section 5 concludes and gives some future avenues of research.

II – The evolution of post office networks in Europe

¹ Some papers dealt with the cost of postal networks and their optimal size (see for example, Borsenberger et al., 2011, or Postal Regulatory Commission, 2008).

In all countries, post office networks distribute to the customers primarily the products offered by the postal operator (stamps, mail, parcels, express). In many countries, the post office network is also a channel to deliver other services. In UK, a typical post office branch offers around 170 products and services from foreign currency to prepaid phone cards, fishing rod licenses, card account, bill payment, broadband internet, saving accounts, and so on.

Post office networks play a valued role in communities, in social cohesion and even in local economic development. Boldron et al. (2008) argue that the strong territory presence of postal counters creates a positive externality on their immediate environment and therefore contributes to economic development. In many countries, the post office network is one of the biggest retail networks across the country. A high proportion of the population is near a post office, even in rural areas. A 2009 study estimated the social value of the British post office network at least £2.3 billion per year (NERA, 2009).

For several reasons (financial reasons, adaptation to customers' needs...), postal operators in Europe have modernized their network for several years. To address challenges caused by a falling number of customers visiting a branch, an increase of real-estate costs, and a decrease in profitability, and to put again the postal network on the path of financial sustainability, postal operators have several tools:

- Modernizing branches and making them more relevant for customers (reducing queues, extending opening hours, improving customer service and so on);
- Reducing/optimizing the size of the network (reducing the number of branches);
- Transforming branches into partner points;
- Offering new products and developing online services and multi-channel solutions.

a) The reduction of the PO network size

Some European countries took the way of the reduction of the size of the network twenty years ago. For example, the Swedish postal operator, Posten AB, quickly reduced the size of its network of self-run full-range post offices after the market was completely liberalized in 1993. In UK, the number of post office branches has fallen over the last decade from over 18,000 in 2001 to around 11,500 now. Between 2003 and 2009, 5,000 branches, or 28% of the network, were shut under closure programs. On the contrary, some postal operators have chosen not to reduce the size of their network. This is the case of La Poste, whose network is still composed of 17,000 points of contact.

b) The development of partnerships

The theoretical advantage of a partnership is cost effectiveness. By forming partnerships with private-sector entities that own and operate retail sites, postal operators decreased their own operating costs (largely facility- and labor-related costs). Partners themselves benefit from this agreement: they benefit from higher customer traffic which generate additional sales, an additional revenue source, additional customer service and satisfaction and a competitive advantage. Today, a great number of postal operators maintain a network with a majority of partner-operated retail facilities rather than their own traditional post offices. Only, Italian and Spanish postal incumbents have not yet implemented a process of partnership and franchising of postal outlets (see table 1).

Table 1. Postal networks in 2010

	Post-owned offices		Partners points		Total
	number	%	number	%	
<i>Austria</i>	733	39,6%	1117	60,4%	1850
<i>Denmark</i>	98	12,0%	718	88,0%	816
<i>Finland</i>	142	13,3%	923	86,7%	1065
<i>France</i>	10213	59,8%	6866	40,2%	17079
<i>Germany</i>	300	2,1%	13750	97,9%	14050
<i>Greece</i>	840	53,6%	726	46,4%	1566
<i>Ireland</i>	57	4,9%	1107	95,1%	1164
<i>Italy</i>	13978	100,0%	0	0,0%	13978
<i>Luxembourg</i>	99	85,3%	17	14,7%	116
<i>Netherlands</i>	296	13,5%	1900	86,5%	2196
<i>Norway</i>	179	12,5%	1255	87,5%	1434
<i>Portugal</i>	877	30,3%	2013	69,7%	2890
<i>Spain</i>	3183	100,0%	0	0,0%	3183
<i>Sweden</i>	310	16,5%	1570	83,5%	1880
<i>Switzerland</i>	1950	84,5%	358	15,5%	2308
<i>United Kingdom</i>	355	3,0%	11465	97,0%	11820
<i>United States</i>	27077	88,0%	3694	12,0%	30771

Source: UPU Statistical Database, January 2012.

c) Focus on the French post office network and its activity: what we learn from our database

The French network is composed of 17,000 points of contact which are either owned by La Poste or partnerships. This figure is defined in the 2010 postal law in order to satisfy two services of general economic interest (SGEI) the French State has given to La Poste.

One is related to the universal service. The European requirement according to which *"Member States should take steps to ensure that the density of the points of contact and of the access points takes account of the needs of users"* was translated in French law by the following constraints: 95% of French households in each department and 99% of French households at the national level should live at less than 10 km from a postal point of contact.

In addition to the USO, La Poste is in charge of a mission of country-wide presence. By its presence, La Poste should contribute to the development of regions. This mission of regional planning requires that no more than 10% of the population of a French "department" is further than 5 kilometres or 20 minutes' car drive from the closest postal point of contact.

Whereas in other countries, partnerships with private entities were contracted primarily in order to maximize profitability of postal operators, in France partner points contribute to the regional planning mission. According to the law, these partnerships could be

established with local communities ("*Agence Postale Communale*") or with local retailers ("*Relais Poste Commerçant*"). The first consideration when establishing a partnership is to fulfill the SGEI in "*the best economic and social efficiency*" conditions as stated in the law and not to simply maximize profits in purely commercial conditions.

To study the impact of the transformation of owned-post office to partner points, we collected data on post offices transformed into "Agence Postale Communale" (APC) between January 2007 and December 2010². Over the period, the number of APC increased by 1,463 or 44%.

The general trends of postal activity leak out the activity figures of postal outlets. Globally, the activity of all non-transformed (wholly-owned) post offices (measured by the number of operations) decreased over the period. This fall is primarily due to the reduction of the number of financial operations realized over-the-counter (-30% between January 2007 and December 2010) and the decrease in the number of mail operations (-21% over the period). These trends are explained by mail e-substitution and by the development of multi-channel solutions to make banking operations. On the contrary, parcel activity over-the-counter increased, pushed by the development of CtoC and CtoB e-commerce.

It seems that the decline of activity is even more severe in outlets which have been transformed into APC: mail operations decreased by 35% on average, financial operations by 67%. This heaviest decline in activity could be explained by the fact that the transformation strategy was applied to the smallest branches in terms of activity (number of operations a month) and to branches where a decreasing trend in the number of operations was observed.

A second factor could be put forward: the effect of the transformation itself. The objective of the econometric model developed in the following section is precisely to determine if the transformation negatively impacted demand and activity or not.

III – Econometric model

Let us consider a set of post offices at risk for a possible transformation. We define this set by a size constraint assuming that large post offices will never be transform into partner. Let I this set and i a particular office in I . For each i we observe its monthly activity during 4 years. Let $(Y_{it})_{t=1,...,T}$ the sequence of activity of office i over the period, where T is the number of observed months.

Let also define the transformation process N_{it} which verifies

$$N_{it} = 0 \text{ if } i \text{ is an owned post office in } t$$

$$N_{it} = 1 \text{ if } i \text{ is a partner at time } t$$

Technically N_{it} is a jump process which may be also written

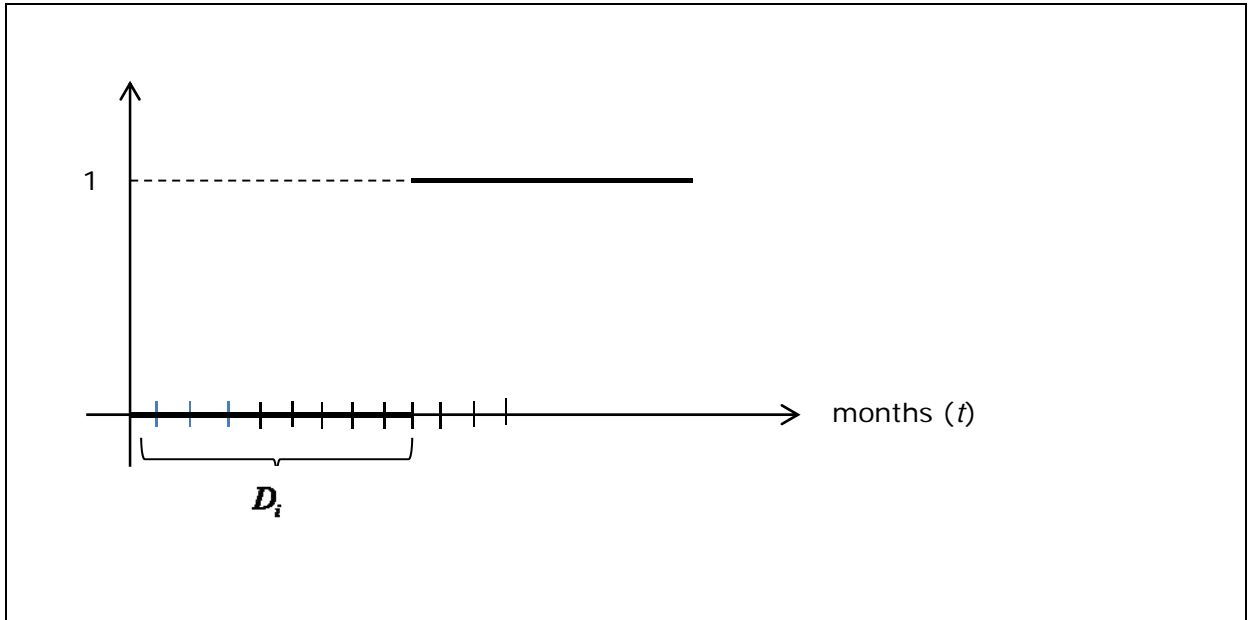
² We excluded from your analysis partnerships with retailers ("*Relais Poste Commerçant*") due to a lack of reliability of these data.

$$N_{ti} = \mathbb{I}(t \geq \tau_i)$$

where $\mathbb{I}(\cdot)$ is the indicator function and τ_i is the date at which the post office i was transformed into a partner point. In other words, if this transformation occurs before the period we considered (t), the variable N_{ti} is equal to 1; if the transformation has not yet happened, this variable is equal to zero.

The following graph represents this jump process with D_i is the number of months from the beginning of the observation period to the date of transformation. For some post offices no transformation occurs during the observation period. In that case $N_{ti} = 0$ for $t = 1, \dots, T$ and D_i is observe only as a censored observation (we know that $D_i > T$).

Graph 1. The N_{ti} process



We wrote a simple dynamic model explaining the activity in the outlet i in at t , Y_{ti} by its activity in the previous period Y_{t-1i} and by the fact it was or not transformed into a partner between $t-1$ and t (representing by variables N_{ti} and N_{t-1i}):

$$Y_{ti} = \alpha + \beta Y_{t-1i} + \gamma N_{ti} + \delta N_{t-1i} + u_{ti} \quad (1)$$

Given the transformation process, the activity is modeled by a simple Markovian process. The impact of the transformation process may be viewed in different ways. We may rewrite $\gamma N_{ti} + \delta N_{t-1i}$ by $a N_{ti} + b(N_{ti} - N_{t-1i})$ ($a + b = \gamma, b = -\delta$) where a is the permanent impact and b the instantaneous impact of the transformation of the post office i into a partner point of contact.

These two impacts are short terms impacts because we control by Y_{t-1i} . In the long term,

if $|\beta| < 1$ the long term effects on the stationary regime are $\frac{a}{1-\beta} = \frac{\gamma+\delta}{1-\beta}$ for the permanent impact and $\frac{b}{1-\beta} = \frac{-\delta}{1-\beta}$ for the instantaneous impact.

An important econometric question is the possible endogeneity of the process N_{it} . If this process is treated exogenously the estimation is straight forward over done by OLS. Else the estimation is done by instrumental variables.

Let W_{it} a set of instruments such that $E(U_{it} | W_{it}) = 0$. Model (1) is then rewritten:

$$\begin{aligned} Y_{it} &= E(Y_{it} | W_{it}) + \varepsilon_{it} \\ &= \alpha + \beta E(Y_{t-1i} | W_{it}) + \gamma E(N_{it} | W_{it}) + \delta E(N_{t-1i} | W_{it}) + \varepsilon_{it} \end{aligned} \quad (2)$$

where ε_{it} satisfies the conditions of the OLS estimation.

Assume that the past of Y_{it} and of N_{it} belongs to the set of instruments. Then $E(Y_{t-1i} | W_{it}) = Y_{t-1i}$ and $E(N_{t-1i} | W_{it}) = N_{t-1i}$. The only change of the model will be to replace N_{it} by its expectation. This expectation is equal to 1 if $N_{t-1i} = 1$ (that is to say if the post office i had already been transformed into partner) and to the probability that the transformation is happening exactly in t if $N_{t-1i} = 0$ (that is to say if the outlet i is still a post office in $t-1$). In other words, $E(N_{it} | W_{it})$ is equal to the hazard function of the duration D_i at the point t up to the transformation time.

We then construct an auxiliary model for this estimation based on a Cox proportional hazard function for the duration D_i . Equivalently:

$$P(N_{it=1} | W_{it}) = h(t) e^{a'W_{it}} \quad (3)$$

where h is a function of time estimated non parametrically.

This model is estimated by the Cox semi parametric approach. The instruments are the history of N_{it} and Y_{it} . However we simplify the specification by assuming that the hazard function of D_i only depends on its past and on the value of the activity at the beginning of the observation period.

IV – Empirical results

We consider a set of post offices at risk for a transformation into a public partner in 2008, 2009 and 2010, defined as “small” post offices in terms of volume of activity (number of operations per month).

For these offices we also have data for 2007 and these data may be used as instruments.

We don't consider offices transformed into private partner and offices transformed in 2007 or before.

We estimate the model presented in section 3 but also an extension of it where we introduce a time specific effect for the instantaneous impact of the transformation i.e.:

$$Y_{ti} = \alpha + \beta Y_{t-1i} + aN_{ti} + \sum_{\tau=13}^{48} b_{\tau}(N_{ti} - N_{t-1i})1 I (\tau = t) + U_{ti}$$

The coefficient b_{τ} represents the instantaneous impact of a transformation the month τ between January 2008 and December 2010.

We estimate these models using two scopes of the activity observed in post office. Firstly we take the total activity defined by an aggregation of all activities found in a post office (sales of products and services related to mail, parcels, financial services and other products) and secondly we focus on mail and parcel activities only (we eliminate the financial services and other products categories).

We estimate the model under respectively the exogeneity assumption by using OLS method and the endogeneity one by using the instrumental variable analysis described in section 3. Basically, to deal with the endogeneous model, we made estimates using two different instruments: an indicator of the activity during the year 2007 and the duration between the beginning of the period and the transformation data. We use two different indicators of the 2007 activity as instruments. In the model named IV I, the instruments are the duration and the monthly mean activity observed in 2007; in the model named IV II, the instruments are the duration and the growth rate of the monthly activity in 2007.

For simplicity we just give the results for the initial model (same b for all the periods) but the graphs are obtained using different b_{τ} .

Scope of the study: Mail + Parcels

$$Y_{ti} = \alpha + \beta Y_{t-1i} + \gamma N_{ti} + \delta N_{t-1i} + U_{ti}$$

Parameters	OLS	IV I	IV II
α	38.45	38.37	41.15
β	0.91	0.91	0.90
γ	-42	-17	-17.5
δ	36	11.1*	9.7*
R^2	0.84	0.837	0.83

All the parameters are significantly different from 0 at 5 % except for the parameter δ in the model IV I (p value = 0.06) and IV II (p value = 0.09).

Scope of the study: Total Activity

$$Y_{ti} = \alpha + \beta Y_{t-1i} + \gamma N_{ti} + \delta N_{t-1i} + U_{ti}$$

Parameters	OLS	IV I	IV II
α	15.2	15.69	19.76
β	0.95	0.95	0.94
γ	-49.6	-14.7	-25.7*
δ	62.9	28.3	37.6
R^2	0.90	0.90	0.88

All the parameters are significantly different from 0 at 5 % except for the parameter γ in estimation with instrumental variables II (p value = 0.12).

Taking for instance the exogeneous model, according to the estimated parameters, the total activity of the outlet i at t is equal to:

- Before the transformation (i is still a post office at t): $Y_{ti} = 15.2 + 0.95Y_{t-1i}$
- The month of transformation (i were a post office at $t - 1$ but a partner at t): $Y_{ti} = -34.4 + 0.95Y_{t-1i}$
- After transformation (i was already a partner at $t - 1$): $Y_{ti} = 28.5 + 0.95Y_{t-1i}$

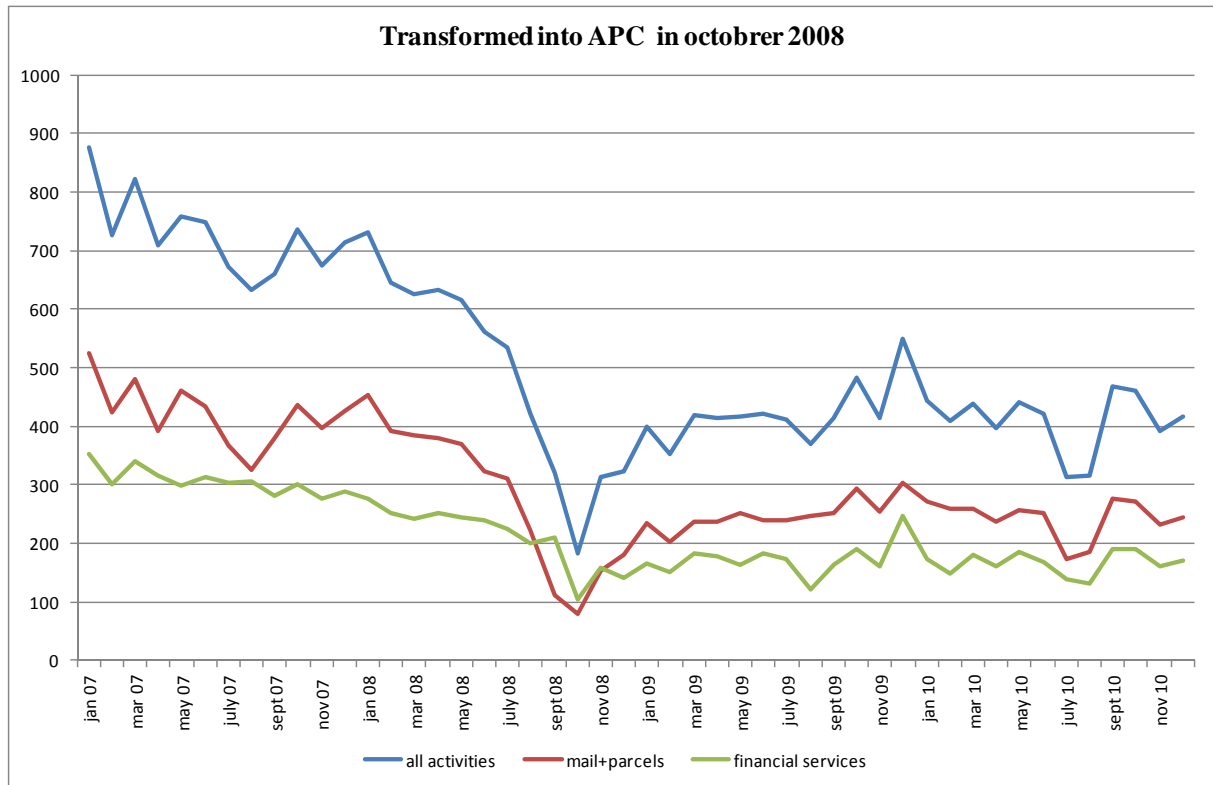
So, the estimated model shows that the transformation of a post office into a partner has an instantaneous negative impact on its activity but once transformed the activity in the partner point of contact increases progressively.

We illustrate these results with an example of offices transformed in October 2008. In graph 1 we represent the mean observed activity for these offices (total, mail + parcel, others). In graph 2 we show the estimations of the three models (OLS, IV I and IV II) for the total activity. In graph 3 the same analysis is done restricting the scope of the activity to mail and parcel.

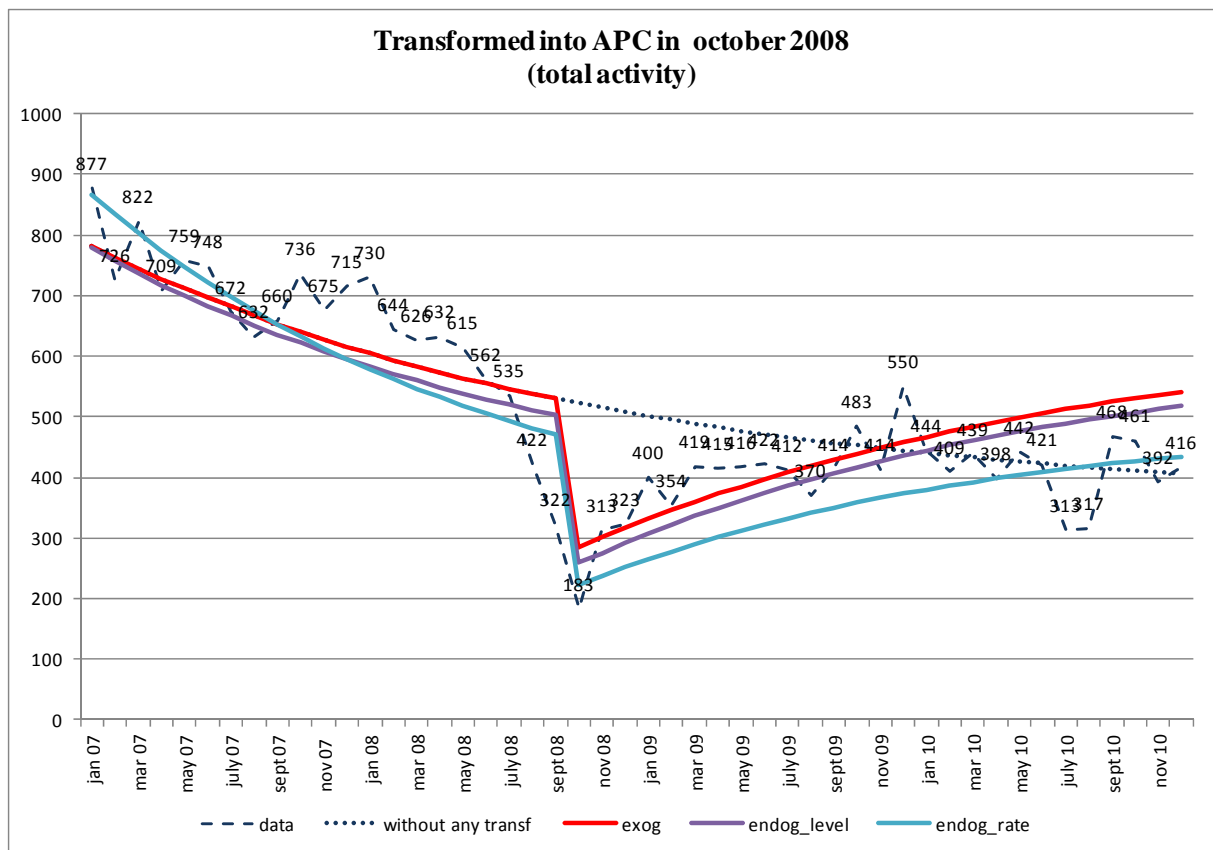
Recall first that except $b(=-\delta)$ the other parameters are common for all the periods.

First the different activities decline on the period. The model shows in particular that, even without transformation, the global activity is divide by 2 (800 to 400) in the four years. Second the transformation creates an immediate shock on the activity but this impact is temporary and disappears in the long term where the outlet goes back to its own evolution.

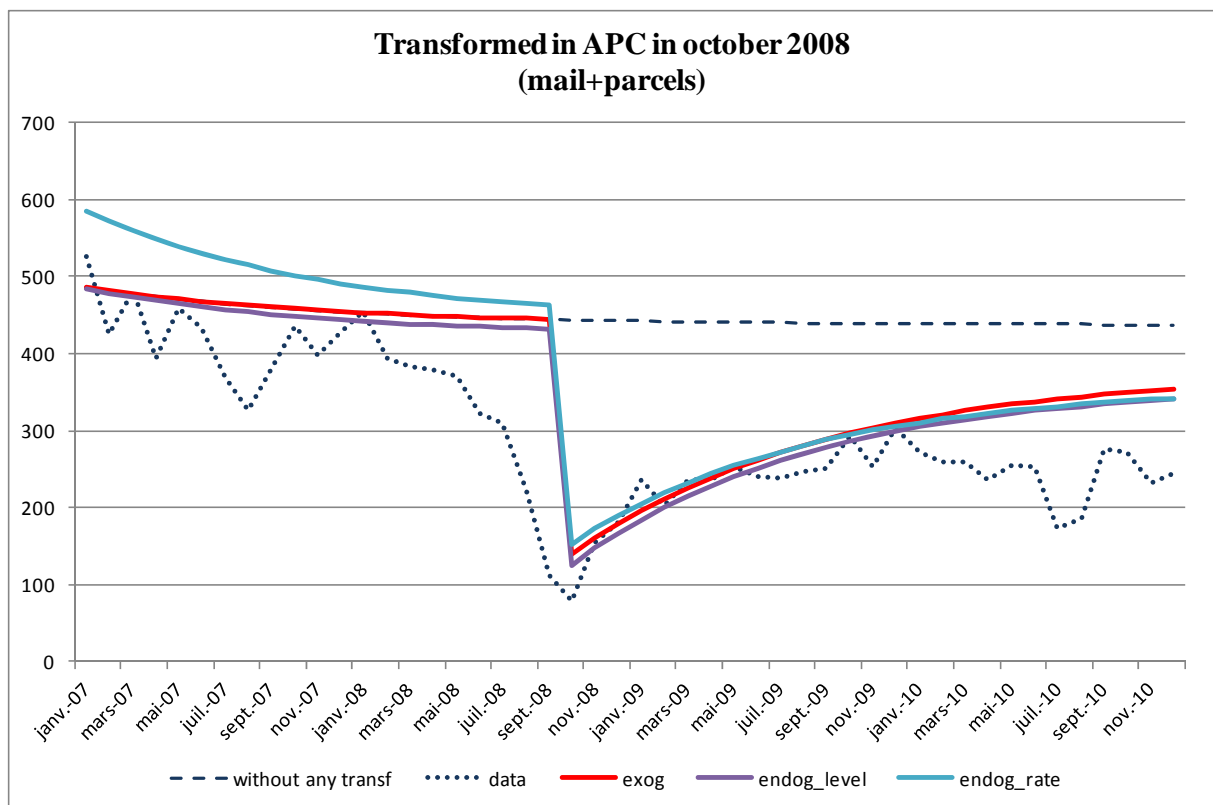
Graph 1



Graph 2



Graph 3



Finally a model where the transformation decision is considered as endogenous performs better and the good instrument for explaining the transformation process is the evolution rate for the activity in the year 2007. The endogeneity is less clear if the mail and parcel activity is considered but the results are essentially the same.

V – Conclusion

The transformation process of post offices, owned by postal operators, into partner points of contact is observed in most European countries. In a context of a decreasing volume of postal activity, this process aims to reduce costs either of the postal operator or in the specific French case of the SGEI mission of regional planning. However, if this transformation had a negative impact on demand and activity, this process could be counter-productive.

This econometric study based on French data seems to prove that in France, the transformation of post offices into “agences postales communales” over the period 2008-2010 had had a negative instantaneous but transitory impact on the activity. After the shock due to the transformation, activity goes up and recovers an activity level near the one that would be reached if there were no transformation.

These results sound good and are in line with the feedbacks from satisfaction questionnaires or opinion pools La Poste obtained, after the transformation of a post office into a public partner.

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