EXECUTIVE SUMMARY

While the process of liberalising the postal sector was initiated a decade ago in Europe, the impact of liberalisation and competition on efficiency and innovation have not been assessed yet.

The literature on the relationship between competition and innovation does not have a clear answer as to whether competition stimulates innovation or not. Increased competition is said to have both positive and negative effects on innovation. The positive effect is a result of the firm's quest to optimize profits through increasing its efficiency and reducing its cost of production. Profitability pushes the development and adoption of more efficient technologies and processes. At the same time, competition decreases the rents of the monopolist and might reduce its market share. Therefore, revenue will also decrease. As a result, firms will have fewer resources to invest, for instance, in research and development. Similarly, they are also likely to encounter more difficulties when trying to recover potential investment into new technologies and new processes (not sufficient economies of scale). The lack of consensus is more apparent when the theoretical results are compared with the empirical results.

A clear distinction is made between liberalisation and competition. Liberalisation is understood as the relaxation or abolishment of previous entry barriers. This paper focuses not only on the relationship between competition and innovation, but also on the impact of liberalisation *per se* on the incentives to innovate. There is also a debate on this issue, where the most widespread theory is the one on contestable markets, which argues that the threat of competition on its own induces a monopoly to be efficient.

This paper aims at contributing to the literature with empirical evidence on the effect of both liberalisation and competition on innovation in the postal sector. The impacts of private ownership and of market size are also analysed. Due to the lack of quantitative data on upstream and downstream access we restrict ourselves to the analysis of end-to-end competition.

To this end data on liberalisation, competition and innovation in the postal sector was collected for seventeen European countries over ten years. An econometric analysis was then performed. The explanatory variables of interest are: (1) the percentage of market liberalized (based on the evolution of the reserved area); (2) the market share of new entrants; (3) the percentage of public ownership; and (4) letter volume. We control for Gross Domestic Product (GDP) per capita and for population density. Regarding the data on innovation, seventeen critical innovations were identified and postal operators were inquired, through a survey, about their date of introduction. Based on this information an innovation index (that corresponds to the average delay or advance, in years, in introducing the critical innovations) and the accumulated number of innovations were computed. Additionally, labour productivity was also computed.

A total of forty two models were estimated by Generalised Least Squares (GLS) and using Prais-Winsten estimation with Panel Corrected Standard Errors (PW-PCSE). In general, the models estimated have a high explanatory power. We can conclude that the answer of the incumbent to liberalisation policies occurs either in the same year the policy comes into force or in the years that precede that event, i.e. the incumbents may react to liberalisation policies in advance. Nevertheless, there is less evidence concerning the effect of the percentage of market liberalised forward one period than of the contemporaneous answer. It may happen that some of the investments in innovation are decided in advance but they are only observable in the following(s) year(s).

If we compare the models that better fit the data (selected models) we see that the models estimated by GLS give rise to stronger results. The use of one innovation measure instead of another one does not originate significantly different results.

All the selected models point out to the positive effect that liberalisation has on innovation. In all these models the degree of liberalisation is statistically significant and has a positive impact on innovation (the estimated coefficients have the expected signs).

The actual competition, measured by the market share of the entrants, is always statistically significant among the selected models and has also a positive effect on innovation. As predicted, the larger the market share of the entrants, the more

innovative the incumbent is, at least until the market share of the entrants reaches a certain threshold.

In the selected models, the percentage of public ownership is always statistically significant but contrarily to what was expected, the percentage of public ownership is negatively related to innovation. This does not necessarily mean that concerns with welfare maximisation do not stimulate innovation. It can also mean that the hypothesis that the ownership structure more likely to promote welfare maximisation is public ownership is wrong. In other words, under the hypothesis that public ownership creates more incentives to innovate than private ownership is the assumption that governments are likely to maximise social welfare, which in reality might not be always true.

Concerning the letter volume handled by the operators there is strong statistic evidence that it has a positive impact on the incentives to innovate.

GDP per capita is always statistically significant and has a positive sign, which means that the larger the GDP per capita the more innovative the incumbent is. This reflects the fact that in the most developed economies and countries with higher standards of living the general level of investment in innovation tends to be higher.

Further work could introduce work-sharing (upstream access) and downstream access, as explanatory variables in the model. It would also be interesting to replicate this study for other network industries, in particular the ones where competition is more developed.