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UNIVERSAL SERVICE IN THE LIBERALISED POSTAL SECTOR

Study on the effects of market liberalisation on network coverage in the EU



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SUMMARY

This thesis examines the effects of liberalisation on network coverage in the postal sector. After presenting the economic and structural features of the postal sector, the thesis deals with the main theories that regulate the relationship between competition and coverage. These theories and models are divided in two groups: on the one hand, those that predict an increase in network density after liberalisation and, on the other hand, those that foresee a decrease in the provision of universal service. Two hypotheses are formulated in order to guide the process of analysis and to isolate the impact of liberalisation on coverage, controlling for other influencing factors (mail volume, level of competition). Statistics for postal network density and mail volume are tested through a time-series observational study: for each country, four indicators are measured both before and after the implementation of liberalisation, resulting in upward or downward trends in network coverage and volume of letters. The analysis includes sixteen EU Member States that opened their postal market to competition before 2012 (Austria, Bulgaria, Denmark, Estonia, Finland, France, Germany, Great Britain, Ireland, Italy, Netherlands, Norway, Portugal, Slovenia, Sweden, and Spain). The results show a general downward trend in the retail network coverage that cannot be explained only by the decline in mail volume. Liberalisation appears to have had a negative impact on the total number of post offices and letter-boxes in almost all the sample countries. A particularly relevant exception is represented by Germany, which registered a significant increase in all the indicators for network density. The case of Germany can be explained by the particular configuration of its postal market and by the high level of end-to-end competition in areas with high population density.

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1. INTRODUCTION

"Since they constitute an essential instrument for communication and information exchange, postal services fulfil a vital role which contributes to the objectives of social, economic and territorial cohesion in the Union. Postal networks have important territorial and social dimensions which make universal access to essential local services possible."

(Directive 2008/6/EC)

The postal sector is a core infrastructure sector of the economy of the European Union and it is a vital part of the communication within the Internal Market. In the EU, every year 135 billion postal items are handled and the total turnover amounts to € 90 billion, which represent about 1% of the EU GDP (European Commission, 2015a). In line with the Lisbon strategy and together with other service industries (such as telecommunications, energy, gas, and railways), the postal sector has been subject to an intense program of reforms aimed at enforcing competition in all Member States. The stated objective of this policy is to improve the quality of service, in particular in terms of better delivery performance and more convenient access for all customers, both business and consumers (European Commission, 2015a).

In the recent years, the very nature of the postal provision has changed. In the majority of Member States, the traditional mail volumes are stagnating or even declining while other market areas (e.g. parcels delivery) offer important growth opportunities. Postal operators have increasingly moved to a market-driven provision of services, they diversified their businesses to face these sector developments, with a trend towards non-universal services and internationalisation (NERA, 2004, p. 9). Similarly to other network industries, postal services have traditionally been arranged through public monopolies that allowed governments to control directly the provision of the service. Despite some economic

justifications of these monopolistic systems (mainly arguing about network externalities), many authors have put into question the rationale of these state-owned vertically integrated undertakings, which were seen as sources of inefficiencies or instruments used by politicians and bureaucrats to increase their political power (Schuster, 2013, p. 3608).

Although these problems have been evident for long time, the process of liberalisation in Europe has started in a relatively recent period: apart from Sweden and Finland, which opened up their markets in the 1990s, all the other European countries have followed the gradual and controlled liberalisation promoted by the European Commission and concluded in 2008 with the Third Postal Directive (2008/6/EC). This has been a long and complicated process because it was not just a matter of removing the previous regulatory controls: careful attention has to be paid when introducing new regulations in order to ensure a non-discriminatory access to all the essential facilities (OECD, 2001, p. 3). Considering the many difficulties that liberalisation in the postal sector implies, this work is aimed at verifying the effect of privatisation on the accessibility of the service and it tries to answer the question "Did the liberalisation of the postal sector lead to a reduction in service coverage?".

In the following sections, I briefly present the problems posed by liberalisation in the postal sector, specifically the effects on service accessibility. Then, I introduce the main research question and the objective of this study, followed by a small discussion on the importance of this work, both in terms of theoretical and social relevance. The last section of this chapter outlines the structure of the thesis in order to guide the reader through the chapters.

1.1 - PROBLEM STATEMENT

In the paragraphs below, I explain the rationale for the provision of universal service and I illustrate the main threats posed by liberalisation in order to show the need for this research.

1.1.1 - The Universal Service

An efficient, accessible and affordable postal service is considered a service of general economic interest (SGEI) by the European Union, defined as “an economic activity that public authorities identify as being of particular importance to citizens and that would not be supplied (or would be supplied under different conditions) if there were no public intervention” (European Commission, 2015b). It is believed, in fact, that in absence of a strict regulatory framework the level and quality of the service provided would be suboptimal in terms of welfare maximisation. This allocative inefficiency characterise both monopolistic and liberalised markets but, whilst government-owned postal operators could be forced to serve certain market areas and offer fixed prices through the mechanism of cross-subsidisation, in a liberalised and deregulated market it is more difficult to provide services to unprofitable users (Choné et al., 2000; Cremer et al., 2008). Therefore, competition can lead to outcomes that are not desirable from the point of view of the regulator: the absence of legal constraints on the service provider(s) can create a situation in which some users are excluded from the market, while others face different tariffs because of their consumption/cost characteristics (Choné et al., 2000, p. 250).

The right of access of all users to the service(s), the equity of their treatment and the continuity of service in space and time are considered essential features in the definition of public service, which derives from the traditional concept of “service public” of French origin (Rapp, 1996). The provision of the universal service is costly and often unprofitable but, as NERA (2004, p. 147) observed in a report for the European Commission, “while maintenance of an extensive retail post office network is only necessary to fulfil the access requirements for a small number of mail items, they also fulfil a wider social role and provide a number of ancillary services that would be difficult to duplicate without a physical network presence”. This social role includes, but is not limited to, promoting territorial cohesion, preventing depopulation of rural areas, and providing a focal point for small and rural communities.

Therefore, in a sector that is headed towards full liberalisation, the necessity to provide a public service to all citizens is the major argument used to advocate for some residual regulation (Cremer et al., 2008).

1.1.2 - The role of Universal Service Obligations

The universal service has been recognised to be a necessary instrument for social and economic inclusion not only by the academic community (Cremer et al., 2001; Gautier & Wauthy, 2012; Rosston & Wimmer, 2000 among many others) but also by the regulatory bodies and the postal operators themselves (PostEurop, 2014). In fact, while the liberalisation process has made the monopoly protection and the traditional subsidisation arrangements obsolete, the core idea of universal service has remained relatively unchallenged (Cremer et al., 1998).

For these reasons, regulators have kept imposing Universal Service Obligations (USO) on the postal operators even after the liberalisation of the market. These obligations force the incumbent firm (and sometimes even the competitors) to provide the level of service that is considered socially optimal in terms of prices and coverage. Regulatory constraints involve both minimum requirements in service quality (by fixing minimum deliveries per week, number of post offices, etc.) and uniform price constraints (firms are not allowed to differentiate prices geographically or between consumer types). These obligations go always together because, if one is missing, operators are able to change either service quality or prices according to their internal cost function and USO would be an empty condition (H. Cremer et al., 1998, p. 2). Nevertheless, the creation of a regulatory framework that reaches the desired outcomes without affecting competition represents an important challenge for the national regulators, mainly in respect to the funding of these obligations.

As OECD (2001) pointed out in a report containing the guidelines for liberalisation in the postal sector, the first step of the process is to assess which market segments can sustain competition and which ones cannot. Then, the second step is the creation of a (profitable) Reserved Area (a segment of the market, in terms of types of mails, where the incumbent

is entitled a legal monopoly) through which the universal service provider can cross-subsidise the (unprofitable) USOs. However, the full liberalisation promoted by the European Union gradually reduced the scope of Reserved Areas, *de facto* obliging the incumbent undertakings to find new ways to fund the existing USOs.

1.1.2 - Other threats to service quality

Liberalisation does not represent the only important global transformation that has affected the postal sector in the recent years and that lead to a decline in the total volume of letters sent. With particular respect to universal service, changes in consumption patterns have seriously threatened the continuity of service in space and time; two are the most important challenges that European postal operators have to face:

- *E-substitution* : the quality, speed and penetration of electronic communication systems have grown enormously in the last two decades, making telecommunications an economical alternative for physical mail (OECD, 2001).
- *Growth of express and parcels carriers* : the e-commerce market has grown at a high pace, resulting in a very competitive delivery market where new specialised service providers have taken the lead of e-logistics, parcels and express deliveries. Traditional postal operators have tried to benefit from the e-commerce opportunity but they won't be able to compensate for the mail decline everywhere (PostEurop, 2014).

1.2 - RESEARCH AIM AND QUESTION

The level of universal service in the postal sector can be evaluated on the basis of two dimensions: quality, which can be further divided into the intrinsic quality of mail (such as frequency of delivery and reliability) and coverage, and price (Calzada, 2009, p. 11; Gautier & Wauthy, 2012, p. 254). These two elements are strictly interconnected to each other: in fact, following the traditional functioning of the market, higher quality leads to higher prices. However, in a market where minimum quality requirements and price constraints were

imposed on the service providers, it is important to investigate the effects of deregulation on the level of quality and prices.

Even though all the above-mentioned attributes are equally important from the regulators' point of view, the ubiquity of service represents the fundamental feature of the postal service, which is aimed by its very nature at connecting people. In an era of deep transformations of the postal sector (because of new market structures, increasing competition from other markets, changed communication patterns, etc.), the existence of a traditional postal network is at severe risk. Despite the alternatives offered, on the one hand, by new means of electronic communication and, on the other hand, by players from other markets (mainly parcels and express couriers), a traditional infrastructure made of post offices and letter-boxes that provide the collection and delivery of mail still plays a vital role in the economy of the EU and it continues to represent the core element of the postal service. Therefore, I decided to focus on the coverage component of the service quality and to use empirical data on post offices density in order to test the accessibility of the traditional postal service in a competitive environment.

Given the characteristics of the problem and the aim of this study, the main research question can be formulated as follows:

"Did the liberalisation of the postal sector lead to a reduction in service coverage?"

1.3 - THEORETICAL RELEVANCE

Given the existence of thorough literature on the topic of postal sector liberalisation and its effects on service quality, this study on the postal service coverage could appear repetitious at a first sight. However, although many authors created economic models that are intended to predict the side effects of a market liberalisation in terms of coverage and accessibility

(Calzada, 2009; Choné et al., 2000; Crew & Kleindorfer, 1998; Valletti et al., 2002), so far there is no empirical study that tested the actual validity of these hypotheses. In addition, several of the projects that deal with changes in universal service provision focus either on similar industries (such as communications) or on network industries in general, rather than offering a detailed analysis centred on the postal sector only (Barros & Seabra, 1999; H. Cremer et al., 1998; Madden, 2010; Rosston & Wimmer, 2000). Other publications discuss the characteristics of the postal sector in a general manner (Cremer et al., 2008; Fabra & Gagnepain, 2004; Jaag, 2014) without providing sufficient insights for the explanation of the phenomena under analysis.

Schuster (2013), through an empirical analysis of the changes in post offices density that resulted from privatisation, represents the most important reference in relation to the research question of this thesis. Nevertheless, the relationship between the introduction of competition and the accessibility of the postal service has, to my knowledge, not been examined directly by any researcher.

1.4 - SOCIAL RELEVANCE

For what concern the social implications of this investigation, it is immediately clear that many citizens are affected by changes in postal service coverage, both in terms of costs to access/substitute the service (for example by having to reach a more distant post office or to learn how to use e-mails) and in terms of social cohesion/redistribution (depopulation rural areas). In fact, the presence of physical retail outlets in scarcely populated areas produces positive externalities for the local economy not only by providing to businesses and citizens easier access to basic services and direct connection with the central government but also by offering job opportunities and by maintaining a community focal point (NERA, 2004). The introduction of competition can lead indeed to outcomes that are not necessarily optimal from a welfare point of view: without adequate regulatory measures, some citizens would happen to be excluded from the market, and users would face different

tariffs depending on different consumption or cost characteristics. In absence of coverage constraints, operators could decide not to provide the postal service (or to offer it at extremely high price) to those citizens/businesses that are more costly to reach, for example those located in remote areas or those isolated from any other urban agglomerate. The equal access of all users to the market is particularly important in developed countries in order to promote the access of a large number of citizens to new technologies, such as the Internet. In developing countries, and especially in case of full liberalisation, coverage constraints are crucial to ensure a proper development of networks (Choné et al., 2000, p. 250). For these reasons, geographical differences in the provision of postal services are often used as a source of criticism against governments, bureaucrats, politicians, or of the state in general. The “postcode lottery” (indicating the differences in services between locations with different postcodes) has an important influence on house prices, depopulation and migration trends, and it has also the potential to change local communities. (Eliassen & From, 2009, p. 239)

In conclusion, the social relevance of this topic is witnessed by the fervent debate that involves not only regulatory bodies, postal operators and political parties, but also the economic academic community (OECD, 2001; PostEurop, 2014).

1.5 - CHAPTER OUTLINE

The structure of this thesis is as follows: Chapter 2 provides a background of the universal service in the postal sector and the core elements involved in the analysis are defined in order to allow a better understanding of the dynamics in play. In Chapter 3, I introduce the main theories that predict and explain the effects of liberalisation on coverage and examine other variables that could influence the analysis. Chapter 4 and Chapter 5 advance, respectively, the hypothesis, together with the research design, and the operationalisation of the variables. In Chapter 6, the actual data analysis is conducted and the results are

discussed in Chapter 7. In Chapter 8, I summarise the findings of the research and I give advice for further research in the field.

2. BACKGROUND

In this chapter, I present the main principles that govern the functioning of the postal sector and I introduce the essential definitions that are needed to understand and answer question “*Did the liberalisation of the postal sector lead to a reduction in service coverage?*”

After a short introduction, I briefly analyse the characteristics of the postal sector and I compare them to the other similar industries. Then, I expose the traditional configuration of the market and I provide the most important economic and social justifications for the existence of natural monopolies. In Section 2.3, I deal with the issues of liberalisation: I present the differences between de-regulation, liberalisation and re-regulation and I show the rationales that underlie these processes. In Section 2.4, I provide the definitions for universal service, coverage, and universal service obligation. These concepts represent the core of this thesis and, therefore, are analysed more in depth. Finally, in Section 2.5, I offer a general outlook on the recent developments in the legal framework of the European Union, with a specific emphasis on USO definition and provision.

2.1 - INTRODUCTION

The postal sector constitutes an industry with unique features. In fact, although it has many characteristics in common with other natural monopolies and network industries, such as the railways and energy sector, it differs from all these businesses in many aspects. For this reason, the postal sector must be analysed in its distinctiveness in order to capture the economic principles that underlie its functioning and to evaluate the policies and regulations that have been implemented in different contexts.

Nevertheless, many important lessons can be learned from similar industries, especially from the telecommunications sector. With the necessary level of abstraction, evidence from other sectors can be applied to the postal service to predict not only the most appropriate

measures that regulators can adopt but also the likely market developments following these measures.

2.2 - CHARACTERISTICS OF POSTAL SECTOR

The postal sector has two essential features: it is at the same time a network industry and a natural monopoly. In the following section, I demonstrate that these dimensions are strictly interrelated.

2.2.1 - A network industry

According to Shy (2001), network industries have four distinctive characteristics: complementarity, compatibility and standards; consumption externalities (network effects); switching costs and lock-in; significant economies of scale in production. All these four characteristics typify the postal business and play a crucial role in the strategy decisions of postal operators; however, the aspects of network externalities and economies of scale are particularly important in respect of universal service provision and coverage of all customers.

In their analysis of the costs and benefits of universal service, Cremer et al. (2008, p. 31) affirmed that "network externalities arise when the benefits from using a network depend on the number of individuals who are connected to the network." Thus, it is immediately clear that the geographical coverage by the postal operator(s) determines the number of households any particular user can communicate with. The undertakings' decisions to cover or not certain areas affect the utility of other customers of the service: the benefits for the senders depend on the coverage of delivery network at a minimum level of service (Cremer et al., 2008, p. 33). Therefore, in an unregulated market these externalities can lead to a suboptimal outcome where the access rates to the network are too low: in this situation, universal service obligation can be seen as a device to reduce market inefficiencies that derive negative network effects.

The other fundamental dimension of the post service are economies of scale, together with economies of density and scope. As showed by Farsi et al. (2006) in a study of the cost structure of Swiss Post's delivery network, units with low mail volumes (such as rural post offices) are characterised by higher cost advantages as the production increases. Empirical findings suggest that a considerable amount of postal delivery units seem too small to produce optimal economies of scale because the volume of mail processed is not large enough to compensate fixed costs (Farsi et al., 2006). In fact, the costs of building and maintaining a post office and the labour costs do not vary with the number of collected and distributed mail items; therefore, efficiency gains and cost advantages could be generated by post offices with larger service areas (Filippini & Zola, 2005, p. 7).

The rural market often appears inherently unprofitable because of these large fixed costs (Anton et al., 2002) but, as Fabra & Gagnepain (2004) pointed out, competition is feasible in the low-volumes areas because only the delivery of mail is characterized by economies of scale, while the efficiency of other functional features (such as processing and transportation) do not increase with higher volumes. However, delivery of physical mail represents the biggest cost item of postal operators, accounting for about 50 percent of total costs, and its relevance in the introduction of competition should not be underestimated (Farsi et al., 2006).

2.2.2 - A natural monopoly

A natural monopoly can be defined as "an industry in which multi-firm production is more costly than production by a monopoly" (Baumol, 1977, p. 810). General economic theories actually affirm that competition between different firms improves efficiency or welfare gains by driving prices to costs and reducing outlays. However, whereas competition has been traditionally seen by economists as an attractive virtuous cycle of costs and prices reduction and increased demand, in a natural monopoly the presence of multiple competitors is likely to create a vicious cycle of lower economies of scale, higher costs, and consequent financial losses (Crew & Kleindorfer, 2009, p. 4). This condition often arises in those industries that

require some sort of infrastructure to operate and where fixed costs are extremely high. In this respect, network industries are typically natural monopolies because the costs to build a new infrastructure to compete with the incumbent firm are often so high that they prevent the entrance of new competitors on the market. When it is necessary to build a new highway to compete on the same route or to place new pipes to offer an alternative gas/water provision, possible entrants can be discouraged by these large initial investments and, in case they decide to enter the market, the level of the demand can be too low to generate profits for both the incumbent and the entrants.

Nevertheless, it is important to note that these natural monopolies are not static. In fact, changes in the available technologies and product innovations can lead to disruptive modifications in the market configurations: barriers to entry can thus be reduced by the introduction of new technologies, de facto making competition feasible and sustainable in the previous natural-monopoly markets (Katz, 2006, p. 246).

In his analysis of natural monopolies, Posner (1969, p. 548) stated that "if the entire demand within a relevant market can be satisfied at lowest cost by one firm rather than by two or more, the market is a natural monopoly, whatever the actual number of firms in it". This definition immediately leads to the conclusion that a larger production is the determinant of the cost advantages of the monopolistic firm (due to economies of scale) and, for this reason, Posner in the same essay affirmed that competition is not a viable regulatory mechanism under natural monopoly conditions (Posner, 1969). In the case of the postal sector, the introduction of competition would result in an increase of postal operator's unit costs by losing some benefits of scale economies while the fixed costs of the infrastructure (and of universal service obligation) would continue (Crew & Kleindorfer, 2009). However, the conventional assumption that scale economies are an essential feature that justify the existence of public monopolies has been questioned by Baumol in a famous study, whose most important finding was that "scale economies are neither necessary nor sufficient for monopoly to be the least costly form of productive organisation" (1977, p. 809).

The reasons why natural monopolies have been traditionally arranged as legal public monopolies are indeed not only economic, but are to be found in other domains. One important driver of the existence publicly owned postal incumbents can be identified in the intent of the national legislators to control directly the provision of universal service. Services of General Economic Interest have been often arranged under a direct governmental control in order to deliver social programmes that could be threatened by the introduction of competition.

In fact, the easiest way to provide universal service was to give the incumbent a legal monopoly: this market configuration allowed the operators to practice the so-called "cross-subsidisation", which was used to serve non-profitable villages at affordable prices (Calzada, 2009, p. 17). In low cost areas, the operator is protected from rival entrants that would deplete the surpluses it is using to subsidise the losses on high cost routes (OECD, 2001). Entrants are indeed likely to focus on the profitable (low-cost) segments, even when it would be more efficient for these segments to be served only by the incumbent. If they are successful, entrants may take business away from the incumbent in the profitable areas, leaving the incumbent firm in the unsustainable position of providing service only to the unprofitable markets. It was a common belief that, without some sort of legal protection, the provision of universal service would become unfeasible (Crew & Kleindorfer, 1998, p. 104). Two possible solutions to this problem have been presented: on the one hand, tolerate differences in pricing in different geographic areas, on the other hand, use funding and cross-subsidisation mechanisms that are competitively neutral (OECD, 2001).

Nevertheless, beyond the mechanism of cross-subsidisation, public monopoly offered other two important advantages: on the one hand, it allows the government to manage public services directly and use them not only as SGEIs, but also as instrumental means to pursue political objectives (Harker, Kreutzmann, & Waddams, 2013, p. 9); on the other hand, the governmental control "has the advantage of providing some rough-and-ready protection against monopoly exploitation to consumers in high cost areas" (Crew & Kleindorfer, 1998, p. 107).

2.3 – LIBERALISATION

Public ownership has frequently been blamed for the inefficiencies of public services on the basis of two main arguments: on the one hand, welfare maximisation and political power distort the objective function of the firm, on the other hand, the 'soft budget constraint' discourages efficiency (Schuster, 2013). For these reasons, in accordance with the approach adopted in the other industries within the Single Market, the European Union have promoted a gradual liberalisation of the postal sector since the early 1990s.

The liberalisation process can be divided into two essential steps: de-regulation and re-regulation. The former consists in removing the legal barriers to entry, eliminating any discrimination and breaking the vertical integration in the monopoly (by separating the incumbent operator from the regulator). The latter entails the implementation of new regulation in order to ensure a fair competition and to correct the market failures that could eventually arise. Below I explain in detail the rationale of these processes.

2.3.1 De-regulation

The main objective of liberalisation is to introduce competition in order to improve efficiency and quality of the service, while at the same time reducing the burden of the States' budget. Competition between different firms is believed to be beneficial not only for customers (who face lower prices), but also for the competing firms and the society as a whole (because firms have incentives to innovate and increase service quality to attract customers). Deregulation is a fundamental part of the liberalisation process because not only it provides the benefits of competitive entry but also it reduces the transaction costs and other inefficiencies that are usually associated with regulation and monopoly (Finger & Finon, 2011). One main objective of the regulator is, in fact, to pursue equity, economic development and even economic efficiency through "competitively neutral" policies letting the market determine the efficient allocation of services (Valletti et al., 2002, p. 170).

The major problem with the definition of de-regulation is that it is used and applied in a very loose meaning. In postal services, de-regulation has taken several forms: first, liberalization of access in upstream operations (such as collection and sorting of mail) followed the logic that such access could promote competition from new entrants who could provide these upstream operations with higher quality and lower costs than the incumbent postal operator could. Second, there have been more radical interpretations to allow entry and competition by different undertakings anywhere in the postal value chain (Finger & Finon, 2011).

The first step before the beginning of the de-regulation process is to assess which markets can sustain competition and those that cannot (OECD, 2001, p. 3). Some aspects of the postal service are unlikely to be liberalised because of their natural monopoly elements and the introduction of more suppliers in such sectors would indeed lead to duplications and inefficiencies (Harker et al., 2013, p. 74). This does not imply that other elements of the service cannot be liberalised or that some parts of the service associated with the postal network cannot be competitively supplied. Even monopoly elements themselves could be competitively provided through franchising, as it has been done in many transport contexts, and markets for the utilisation of the networks can be developed (Harker et al., 2013, p. 78).

However, after the abolition of previous regulation the market mechanisms alone are not always able to provide the welfare objectives that the legislator desire. In practice, de-regulation is rarely interpreted as the need to remove all existing legal bindings and leave the industry to unregulated competition, as a superior governance structure existed. This happens because politicians, pressure groups, regulators (and thus the civil society in general) are not willing to give up certain elements that have become the very essence of the postal service. In particular, cross-subsidisation and consumer protection are seen as the most distinguishing features of regulation; yet, it is exactly these features of regulation that make the de-regulation process so problematical or even unattainable (Finger & Finon,

2011). Hence, after full de-regulation, a new legal framework must be established in order to create the right conditions for the best service delivery.

2.3.2 Re-regulation

“An effective regulatory system meets customer and shareholder needs; maintains efficiency and investment incentives; and minimizes regulatory uncertainty and risk. The regulator should create conditions for the delivery of public services in an effective and efficient way, ensure that citizens of rural and urban areas have equal access to the services, ensure non-discriminatory access to the services; consider the social aspects of delivery; and ensure that the consumer is effectively protected” (Torres & Pina, 2002, pp. 43–44).

In order to achieve these socially desirable outcomes, the main obstacles that come with liberalisation are associated to the funding of the unprofitable market areas. As I showed above, de-regulation and liberalisation were thought to jeopardise the provision and the quality of universal service by preventing the incumbent firm to cross-subsidise the loss-making regions with the profits from the other segments (Calzada, 2009; Cremer et al., 2001). Apart from few governments that granted direct support to the Universal Service Providers, the USO was usually financed through the creation of a “reserved area” (in terms of a weight or price limit below which they are the only legal providers) that allowed the firm to cross-subsidise Universal Service while remaining financially viable (Rodriguez & Storer, 2000, p. 286).

This practice is no longer permitted because it alters the competition in the market: in the EU any reserved area had to be abolished by 31 December 2010 (for 11 Member States by 31 December 2012). Hence, the provision of universal service is at risk, especially in certain high cost areas, and new competitively neutral funding methods must be found to guarantee an affordable service to all consumers. Nevertheless, as emphasized by Crew & Kleindorfer: “the joint objectives of achieving full liberalization of postal markets and maintaining the USO in its current form demonstrate a lack of understanding and natural propensity of policy makers to address mutually inconsistent but separately desirable alternatives sequentially

rather than confront the inherent trade-offs that would arise from addressing them simultaneously. Solutions to the problem are likely to be complex” (2009, p. 6).

2.4 – COVERAGE

Coverage, together with the intrinsic quality of mail (intended as frequency of delivery and reliability), are the two quality attributes of the mail services (Calzada, 2009, p. 11). Considered the high social/welfare value that legislators (as expression of the civil society) pose on Services of General Economic Interest, and on the postal service in particular, the quality of these utilities represent a fundamental element to evaluate the effectiveness of the policies adopted by the governments.

Below I explain the usefulness of a wide coverage on economic and welfare bases; then I define the most common indicators used to calculate the level of coverage; in Sub-Section 3, I assess the role of Universal Service Obligation and, finally, I deal with the other issues and opportunities related to the network coverage.

2.4.1 The importance of coverage

In the eyes of regulators, the importance of coverage is twofold: on the one hand, from an economic point of view, the accessibility of the service is essential for the functioning of a network industry like the postal sector. As I have explained above, the postal industry is characterised by significant network externalities: this means that the benefits of the senders depend directly on the coverage of the delivery network at a sufficient level of service (Cremer et al., 2008, pp. 31–33). Therefore, it is in the interests of regulators to promote a sufficient level of coverage in order to take advantage of network externalities, without depressing the positive effects of scale economies. In fact, as noted by some authors (Farsi et al., 2006; Filippini & Zola, 2005), the geographical spread leads to the existence of too many delivery units that appear to operate at mail volume that is too low to produce efficient scale economies. These authors suggest that, where geographically feasible,

mergers between post offices in adjacent service areas could improve the scale efficiency of these units.

On the other hand, however, regulators pursue objectives that go beyond the simple correction of market imperfections. In fact, as Filippini & Zola pointed out: “from the economic point of view of the society, the decision to merge smaller postal offices should be based not only on cost effects, but also by considering the potential negative impacts on consumers’ welfare of this kind of restructuring process. For instance, the closure of a local post office could generate a loss of welfare for the population in terms of an increase in the generalised transport costs to go to the postal office or the loss of a social local meeting point.” (Filippini & Zola, 2005, p. 7).

Another stated objective that legislators want to achieve through an accessible postal service is redistribution. Redistribution can be either towards high-cost customers and addresses (generally people living in rural areas) or towards low-income individuals. Nevertheless, it is observed that these two categories often overlap (low income people are more likely to live in rural areas). Providing the service “to all individuals at affordable prices” allows to redistribute resources to those areas/households that otherwise would not be able to receive/afford them (Cremer et al., 2008).

Finally, a geographically uniform service is seen as an instrument to promote social and territorial cohesion and also as a tool for regional policies. “For instance, uniform pricing can be a way to subsidize rural customers, in order to encourage households and firms to locate in rural areas (or to prevent them from moving away). Similarly, maintaining basic public services (like post offices) in small villages may contribute toward preventing the decline of rural areas”. (Cremer et al., 2008, p. 34)

2.4.2 Definition of coverage

The basic units that form the postal network are the post offices. Retail post offices offer an access point for physical acceptance of mail item(s) - in particular items that need individual weighing, pricing or proof of mailing – and for payment for postage. They also supply other

kind of facilities, including financial transactions, direct access to government services and several other non-postal services (NERA, 2004). The most important factors that affect the typical post office activities are: the overall number of consumers served, the density of consumers in the service area, the size of the post office delivery area and the total amount of mail items collected and distributed (Filippini & Zola, 2005).

In order to measure access, coverage and quality, post offices should represent the basic unit of analysis, but many different indicators could be considered; nevertheless, difficulties in retrieving data or time constraints to analyse them lead to a necessary selection of the most appropriate indicators. For example, in his analysis of the effects of privatisation on postal coverage, Schuster (2013, p. 3670) uses three indicators to assess network density: the absolute number of post offices, the number of offices per 1000 inhabitants and the number of letterboxes per 1000 inhabitants. Other important indicators of postal sector coverage are: average area covered by a permanent office (km²), average number of inhabitants served by a permanent office, number of letterboxes, and percentage of the population without postal services.

2.4.3 The role of Universal Service Obligations

Based on an understanding of how citizens value service quality (and specifically coverage), regulators usually set quality levels by creating explicit obligations, the so-called "Universal Service Obligations", within the license for incumbent providers. These legal constraints are binding for the postal operators and require them to meet minimum standards of service, in terms of ubiquity (intended as the presence everywhere or in many places simultaneously), affordability and reliability, that customers can assume to receive even in the absence of significant pressure deriving from competition (Balogh et al., 2006). This type of requirements can be seen as a "means to protect the weakest citizens from market liberalization", with an emphasis on the negative rather than positive effects of competition (Harker et al., 2013, p. 8). In fact, ubiquity of service and uniform pricing can be considered the two primary attributes of the universal postal service: "It costs the mailer the same to

post a letter for delivery in his home town as it does for delivery in some town at the other end of the country. Similarly, the mailer pays the same whether his letter is addressed to an electric utility that receives thousands of letters a day or whether it is addressed to his aunt living on some outlying farm” (Crew & Kleindorfer, 2009, pp. 103–104). Although the costs of running a post office diverge largely in each of these cases, the sender still faces the same price: this happens because the requirement of ubiquity of delivery combined with the uniform price are the basic characteristics that constitute the universal service obligation.

When setting targets, the regulator must test economic achievability for the company and balance it with an assessment of the actual customer needs. In fact, as I outlined above, regulatory intervention can be aimed at correcting a market failure (this might be the case for network externalities) or at meeting social objectives: the latter are not properly addressed through market mechanisms and therefore they fall outside the sphere of activity of a market process. Hence, recognising this tension is crucial to understand the rationale of the USO and to achieve successfully the general purposes of the regulators (Harker et al., 2013, p. 14).

Because of the different value that national regulators pose on coverage, the regulatory requirements for the geographical spread post offices vary between different countries; however, most postal undertakings face political, administrative or regulatory constraints on reducing the number of retail offices, particularly in rural areas. Most countries present regulatory arrangements regarding accessibility and network density, mostly in form of requirements about the maximum distance to the closest office and minimum service supplied. Absolute number of post offices and number of POs per inhabitant, on the other hand, are loosely regulated (Schuster, 2013, p. 3670). According to NERA (2004), when governments wanted to maintain uneconomic retail outlets for social policy reasons, they used to provide direct financial support (as in the case of Ireland, Sweden, and Great Britain) or extensive tax relief (e.g. France). However, this type of state aid is not allowed anymore and, in general, the management flexibility to modify the size of the postal network is constrained by regulations or by direct government involvement (NERA, 2004, p. IX).

Besides the advantages of providing protection against market failures and promoting socially desirable outcomes, USO is also an instrument to pursue redistribution within the society. However, redistribution in the postal sector is difficult because cost differentials depend on the locations of the addresses, but the paying customers are the senders. It is therefore necessary to justify the USO to show that its beneficiaries are the high-cost addresses (rural households) and not the senders. Three are the main arguments in support of USO (Cremer et al., 2008, p. 30):

- Cost differentials according to the location of the addresses are directly caused by the USO: rural delivery is more expensive exactly because operators are obliged to deliver at a given frequency/in a given area;
- Providers could adopt fixed fees on rural addresses to compensate for cost differentials;
- Mail products are seen mainly as intermediate inputs rather than final goods: given that a large part of mail items are sent by businesses, they would shift (part of) the costs on their customers, leading to increases in prices of final goods and services.

2.4.4 Other network opportunities

The maintenance of an extensive network of post offices is usually justified on the basis of the universal service obligation. Nevertheless, among the key functions of the postal retail network, two – collection of mails and stamps sale - have cheaper alternatives that can generally fulfil the common USO requirements (letters can be collected from post boxes, while stamps can be sold through different distribution channels, such as vending machines and third party agents). However, the post office network provides the primary and, in most cases, the only means of acceptance for important services such as parcels, insurance, proof of mailing etc. Whilst these items represent only a small proportion of the total volume of mail, they have few alternatives and the need to preserve their existence places political and regulatory constraints on the closure of physical retail offices (NERA, 2004).

In addition, according to NERA (2004, p. 135), the post office network is highly valued because of other side features:

- It supports the local economy, by providing citizens cash that they can spend on local businesses and services and by creating convenient banking facilities for those businesses;
- It guarantees the existence of a local shop (food store, pub, etc.), which is particularly important in those isolated areas with few other shops or facilities;
- It offers a community focal point, especially in rural communities.

The importance of these features is recognised by the EU, which affirms: "Rural postal networks, in, inter alia, mountain and island regions, play an important role in integrating businesses into the national/global economy and in maintaining cohesion in social and employment terms. Furthermore, rural postal points in remote regions can provide an important infrastructure network for access to new electronic communications services" (Directive 2008/6/EC, 2008, Provision 19).

Finally, the control of a large postal network represent a great opportunity for postal operators to capitalise on their assets by diversifying their business. As CERRE (2014, p. 40) pointed out: "Since incumbent postal operators still have a rather dense network, with postal offices spread over the country, there is an allegation that they might leverage this asset into other sectors (e.g., banking or mobile phones)".

2.5 - LEGAL FRAMEWORK IN THE EU

"An effective regulatory system meets customer and shareholder needs; maintains efficiency and investment incentives; and minimizes regulatory uncertainty and risk. The regulator should create conditions for the delivery of public services in an effective and efficient way, ensure that citizens of rural and urban areas have equal access to the services, ensure non-discriminatory access to the services; consider the social aspects of delivery; and ensure

that the consumer is effectively protected” (Torres & Pina, 2002, pp. 43–44). This statement can summarise the objective of the EU efforts in implementing the reform of the postal sector.

The liberalisation of the postal industry (like in the other network industries) has been initially promoted on the assumption that competition would have automatically brought about efficiency and welfare gains. This postulation has proved not to hold true in many situations (CERRE, 2014, p. 5). For this reason, after the first Postal Services Directive (97/68/EC), the Commission have investigated, in the light of experience, what liberalisation and open competition concretely entail for the postal industry and have tried to rebalance its policy objectives (CERRE, 2014, p. 39).

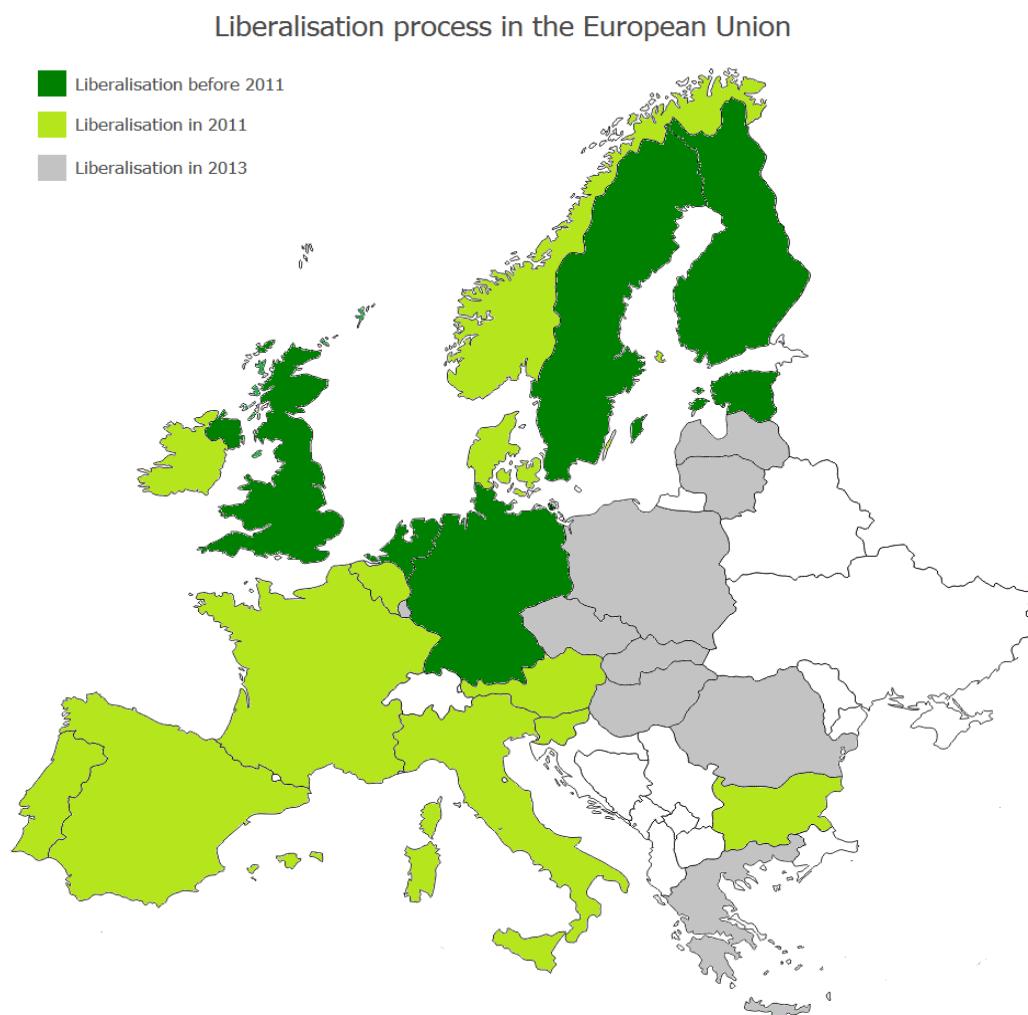


Figure 1 - Liberalisation process in Europe. Source: personal elaboration

The first two Postal Services Directives (as Directives 97/68/EC and 2002/39/EC are commonly known) have provided for the opening up of several postal services, including the parcels delivery and express services. Incumbent operators, acting as “universal service providers”, were authorised to keep their legal monopoly on the delivery of letters weighing less than 50 grams (the above mentioned “reserved area”, which represented 70% of all mail post and around 60% of all postal revenues in the EU). The third Postal Services Directive (2008/06/EC), however, imposed to all EU Member State the abolition of all the remaining reserved areas by 31 December 2010 (31 December 2012 for some countries: Czech Republic, Greece, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Poland, Romania, Slovakia). With the elimination of the reserved market, the latest Directive provides specific instructions for the compensation of Universal Service Obligations. The new mechanisms reflect those that already exist in telecommunications: where the USOs involve a net cost that places a significant burden on the universal service provider, every Member State has the choice either to compensate it directly, or to create a compensation fund with contributions obtained from service providers and/or users’ fees. The obligation to contribute can be included as a condition in the authorisations issued to service providers (Harker et al., 2013, p. 59).

The ability for each Member State to specify its provision and financing arrangements represents one of the strengths and justifications for USOs within the EU framework. It is possible indeed to observe considerable variation in the funding provisions amongst different national regulators: in their survey, Harker et al. (Harker et al., 2013, p. 77) affirmed that “this can also be seen as a weakness from the perspective of ensuring a level playing field across Member States, with suspicion that they may permit ‘State Aid’ by the back door, but if USOs are not sensitive to individual nation needs, there seems little point in allowing any local discretion.” However, this approach evidently reduces the transferability of one solution, even within a certain sector, to another situation in a different Member State, where the nature and the objective of the SGEI and the needs of the society may be different.

For what concern the postal network coverage, the dispositions included in the EU legal framework are very loose. Starting from the very definition of universal service, described as “the permanent provision of a postal service of specified quality at all points in their territory at affordable prices for all users” (Directive 97/67/EC, Art. 1), the EU provides only some guidelines that, however, are not binding for Member States. In fact, Directive 2008/06/EC states that “they should take appropriate regulatory measures to ensure that accessibility to postal services continues to satisfy the needs of users, including, by ensuring, where appropriate, a minimum number of services at the same access point and, in particular, that there is an appropriate density of access points to postal services in rural and remote regions.”(Directive 2008/6/EC, Art. 20) and that “Member States should ensure that sufficient access points are established that take account of the needs of users in rural and sparsely populated areas. Member States should ensure an appropriate density of access points in these areas in order to satisfy the universal service obligation.” (Directive 2008/6/EC, Art. 54).

Nevertheless, as CERRE (2014) affirmed in its report about the regulation of network industries, the regulatory action of the European Union should now focus on the simplification of existing rules and on the proper implementation and enforcement rather than the introduction of new rules.

3. THEORETICAL FRAMEWORK

3.1 INTRODUCTION

As Harker et al. (2013) correctly affirmed: “The question of whether and how to ensure that all consumers should have appropriate access to essential services, and what is defined as essential, is not a new problem, but its relevance changes both as technology offers new opportunities and as markets are opened to competition”.

Traditionally, the common belief was that the entry of new operators into the low-cost segments would reduce the incumbent’s profitability and would force it to cut down the quality of its service. The EU has initially faced this problem by granting some reserved areas to incumbent postal operators until 2009 (Calzada, 2009, p. 18). Nevertheless, these regulations have the effect to lower the firms’ profits and to profoundly alter the nature of competition, modifying the strategic interaction between the competing undertakings (Valletti et al., 2002, p. 171). For this reason, full liberalisation took place in all European Member States by 31 December 2012 and two possible solutions to this problem were proposed: on the one hand, accept differences in pricing in different geographic areas, on the other hand, use funding and cross-subsidisation mechanisms that do not alter the nature of competition (OECD, 2001).

In this Chapter, I display the economic consequences of market liberalisation on network coverage and I describe the welfare effects of the alternative regulatory policies. I divide the effects of these policies in two different sub-sections: first those that represent a threat to service quality and after those that have a positive impact on network density. Finally, I present some evidence from other network industries in order to evaluate the outcomes of similar liberalised markets.

3.2 EFFECTS OF LIBERALISATION ON NETWORK COVERAGE

Calzada (2009) offers the most direct and clear model to analyse the relationship between liberalisation and coverage in the postal sector. His work aims at finding whether USOs are sustainable in a competitive environment, where entrants can limit their service to market niches/profitable segments or choose product differentiation, and the consequent changes in welfare under constraints regarding minimum quality and coverage. He analyses the traditional obligation imposed on the incumbent operator to serve non-profitable villages at affordable prices, with the consequence that the incumbent firm would cross-subsidise the loss-making regions with the profits from the other segments. This kind of regulation favours the entrants, because they can opt for a smaller coverage and set higher prices. Regulators can then require a minimum coverage area on the entrant to reduce the difference in coverage and enlarge the duopoly area with the consequence of a strengthened competition and lower prices by both firms (Calzada, 2009, p. 17).

Nevertheless, Ambrosini et al. (2006, p. 27) stressed the fact that calculating the costs and benefits of this type of obligation in a liberalised market is difficult because the losses deriving from liberalisation are often confused with the net cost of USO. The cost function of the universal service is directly affected by the service quality that, in a broad sense, involves: frequency of delivery and collection, transit time objectives, accessibility of post offices and mailboxes, responsibility over lost/damaged items, and delayed mail. The ubiquity constraints reduce the degree of freedom of the service providers because if only price was regulated they would reduce the quality to raise their profits.

3.2.1 Threats to universal service provision

Crew & Kleindorfer (1998; 2009) have argued that the classical Universal Service Obligation is unlikely to remain feasible in absence of some sort of reserved area or any other efficient method for the funding of the USO. They affirmed that full liberalization would lead to a vicious cycle of higher outlays because of lower economies of scale and consequent financial losses: although the consensus is that coverage and delivery standards should not be

excessively different across the whole territory, outlying areas would get worse service quality. Relaxing service quality standards in this or other ways, however, may undermine the value of the universal service itself, as it is typically understood to embody ubiquity and some uniformity in service quality. Reductions in service quality would likely be concentrated in remote high-cost locations, producing significant differences in network density between high and low cost areas (Crew & Kleindorfer, 2009, p. 8).

This negative outcome can be explained in the light of the estimated economies of density, which clarify the efficiency gains of open competition at all points of a given service territory against the monopolistic provision of delivery postal services. Findings by Farsi et al. (2006) show that “the cost of serving a market of size y over a municipal territory with one delivery unit is lower than the cost of serving the same market with n competitive delivery units that install parallel facilities everywhere. Therefore, side-by-side competition is less cost-efficient than the monopolistic distribution of postal services”.

Similar results were obtained by Cremer et al. (2008), showing that, via a two-sided market model, a profit-maximizing postal operator chooses a suboptimal quality of delivery (either in terms of geographical coverage or reduced frequency of service), de facto leading to a reduction in demand. Cremer et al. (2008) concluded that this issue might be solved, or at least alleviated, through the imposition of USOs, and thereby provide a basis for coverage and quality constraints.

Mirabel et al. (2009) noted that, in a situation of open competition, Universal Service Obligations (in the form of requirements of ubiquity of service and uniform pricing) produce connections between the markets that are served by the incumbent undertaking, and these links can lead to decreases in welfare. The universal service provider will increase its coverage, but the duplication of some network assets produce several uncertainties regarding the welfare outcome.

Finally, empirical analysis of the liberalised countries made by Schuster (2013) shows a clear downward trend in post office density in almost all countries. As he affirmed in the

conclusion of his paper, “the regulation variables indicate that post market liberalization has led to a decrease in post office density and as we could show, at least for the letter market, in the descriptive analysis, the reduction is not accompanied by a greater supply by competitors” (Schuster, 2013, p. 3677).

3.2.2 Counterbalancing market forces

However, other authors found many positive outcomes of liberalisation in terms of wider coverage and higher network density.

For instance, in his analysis of the relationship between quality and coverage in the postal sector, Calzada (2009) affirms that when the entrant in the market is able to modify its quality of service, it decides to cover a larger area than when the quality is fixed. In general, in order to reduce competition postal operators prefer to increase product differentiation rather than to reduce coverage. However, in a private duopoly the entrant covers only part of the country, leaving the monopoly over some areas to the incumbent, which consequently charges higher prices. On the other hand, in a mixed duopoly (where one or several private entrants compete with a public incumbent) the presence of a public firm has two positive effects: first, qualities are set efficiently by firms; second, coverage by entrants tends to be higher (Calzada, 2009, pp. 10–11)

Moreover, in an industry characterized by important network externalities such as the postal sector, “the entrant prefers a wide coverage in order to increase the valuation of the service. Therefore, network externalities might compensate for the distortions of the entrant’s coverage that are created by the imposition of a uniform price on the incumbent.” (Calzada, 2009, p. 11)

Harker et al. (2013, p. 79) recently affirmed that in the long run the segments of the market that can feasibly become competitive should produce benefits for consumers as a whole, and there are likely to be more effective and efficient methods to protect vulnerable consumers than continuing the cross-subsidisation from other consumers (even if not directly through access charges on entrants or general public subsidies).

Fabra & Gagnepain (2004) presented a model that explicates competition between the incumbent, which is constrained by universal service obligations (USO) and the entrant, which can freely choose the level of coverage and prices. In their analysis, they showed that competition is feasible in the postal sector because, provided an adequate level of universal service obligation, the service can be offered by competing firms and the incumbent will have to innovate and diversify its business to remain on the market.

Finally, Jaag (2014) offered new insights about the effects of liberalisation on the postal network: he noted that although theoretical considerations have shown that the introduction of competition puts the funding of USO at severe risk, however, recent experience suggests that entrant firms in liberalized postal markets have difficulties to compete directly with incumbent universal service provider due to economies of scale and scope, which are particularly high in delivery. In addition, the decline in physical mail volume driven by indirect competition strongly reduces the attractiveness of market entry for new competitors, because fewer firms will be profitable in the future. Nevertheless, it is important to note the increasing popularity of electronic means of communication may foster the competitive pressure on incumbent postal operators, resulting to be much more dangerous for the preservation of universal service (Jaag, 2014, p. 271).

3.3 EVIDENCE FROM OTHER SECTORS

The relationship between competition and coverage has been studied and tested by the academic community in many other contexts: the evidence obtained from the analysis of the same phenomena in similar sectors can be helpful to predict the possible market developments in the postal sector and provide important explanations for the findings of this research.

Valletti et al.(2002), for example, studied the effects of coverage constraints in telecommunications. They noted that "if the incumbent is subject to a coverage constraint, the entrant's coverage increase in the mandated coverage of the incumbent. While this is

good in principle since more customers will be able to select services from alternative providers, we demonstrate that prices increase as a consequence, hence welfare of previously served costumers falls. This is a typical example of unintended consequence of poorly designed (or poorly understood) USOs." (Valletti et al., 2002, p. 172) They showed that there are clear trade-offs between larger network coverage and higher welfare of served costumers, and also between the welfare of costumers in a competitive market and under monopoly. "Higher coverage imposed by the regulator naturally rises the number of customers, but previous customers lose welfare due to higher prices." (Valletti et al., 2002, p. 172)

In fact, for what concern the evaluation of consumer welfare, it is important to distinguish the different groups of customers depending on their access to two, one or no provider before and after the application of regulatory/policy measures. These policies, however, must be evaluated in relation to the competitive context and to other policies in order to fully comprehend the effects they have on welfare (Valletti et al., 2002, p. 185).

In their analysis of the telecommunication sector, Barros & Seabra (1999) questioned the widely-held presumption that the liberalisation of the access has an overall negative impact upon universal service provision: telephone density should decrease because of the abolition of cross-subsidies between high-cost calls and both local calls and installation prices. They assumed that this effect should be partially offset by a overall decrease in the average cost of phone calls (if access is sensitive to the price of use) but the first effect is still expected to dominate (Barros & Seabra, 1999, p. 59). Nevertheless, their findings are ambiguous: they concluded that "there is no definite conclusion as to whether competition is harmful or beneficial to the universal-service objective. Simple regression analysis of telephone density on market structure suggests that the effects of competition on telephone density are indeterminate, with the results ranging from negative to non-significant impact. In fact, the statistical significance of these effects depends upon the econometric approach followed." (Barros & Seabra, 1999, p. 59)

On the other hand, Wolak (1996) used microeconomic data from the US Survey of Consumer Expenditures to specify an econometric model of an entire system of household demand equations. His results showed that the increase of competition in telecommunications and the consequent diminution of cross-subsidies from long-distance calls to local calls not only failed to produce any significant reduction in the overall amount of households connected to the network, but also have led to an increase in total welfare.

Finally, in a discussion of the efficiency of public-private provision of local services, Torres & Pina (2002, p. 46) found that gains in productivity and quality are connected more to the intensification of competition rather than with a change from private to public ownership. Nevertheless, governments need to regulate sectors in order to create the conditions for fair competition, ensure compliance with the contracts and protect customers/citizens.

3.4 CONCLUSIONS

In conclusion, the effects of liberalisation and the subsequent regulatory policies on network coverage are not clear. In fact, as Harker et al. (2013, p. 81) noted, the most economically efficient way to deliver universal service may not be the most socially acceptable, especially if the efficient policies involve less transparency about the coverage requirements and the compensation mechanisms. However, "it is striking that many of the issues USO were meant to address have been largely solved, not primarily by direct public policy initiatives, but rather by the functioning of the market mechanisms enabled by a new institutional and regulatory framework and the introduction of new technologies" (Eliassen & From, 2009, p. 240).

4. HYPOTHESIS AND RESEARCH DESIGN

4.1 INTRODUCTION

After having presented the main characteristics of the universal service in the postal sector (in Chapter 2) and the empirical studies on the effects of liberalisation (Chapter 3), in this Chapter, I introduce two hypotheses that will guide the empirical analysis and that will help to answer the question: “Did the liberalisation of the postal sector lead to a reduction in service coverage?”.

In Section 3, I display the research design of this thesis and I briefly discuss the reason for this choice among the available research designs; in Section 4, I specify the variables of the study, which are treated more deeply in Chapter 5; finally, in Section 5, I list the countries that are included in the analysis and I present the criteria for the selection.

4.2 HYPOTHESES

Given the findings presented in the previous Chapter, I formulate two hypotheses that can help to answer the main research question of this thesis.

The first hypothesis is based on the idea that the liberalisation process leads to mitigation of the USO requirements by abolishing all reserved areas and, consequently, the possibility to cross subsidise the high cost routes (Cremer et al., 2008). The incumbent firm, therefore, will reduce its network coverage to cut its costs and to increase its profits by merging together small post offices and eliminating some outlets in non-profitable rural areas (Farsi et al., 2006). The imposition of coverage constraints by the government can help to alleviate the decline of network coverage, especially where the presence of postal outlets have a political or socio-economic importance; however, this type of regulation is not sufficient to compensate the effects of full liberalisation and the former effect will prevail (Ambrosini et al., 2006).

Therefore, the first hypothesis is formulated as follows:

H1: In the years immediately after liberalisation, countries witness a reduction in postal network density.

The other dominant cause of reduction in network coverage has been identified in the decline of the volume of sent mails throughout Europe. According to many authors (Crew & Kleindorfer, 1998; 2009; PostEurop, 2014), this trend still represents the main risk for the maintenance of universal service. Nevertheless, the situation is different across the Member States: despite a general decreasing trend in the use of postal services, some countries witnessed minimal reductions or even increases in the total number of postal items (CERRE, 2014). For this reason, the second hypothesis tests the relationship between the demand for postal products and the network coverage offered by postal operators:

H2: A steeper decline in mail volumes leads to a steeper decline in network density.

According to Johnson & Reynolds (2011, p. 115), hypotheses not only propose the causal link between two or more variables, but also specify the unit of analysis, that is the type of political actor/institution to which the hypotheses are thought to apply. In this research, the unit of analysis are countries, and more specifically EU Member States: postal liberalisation and regulation is indeed implemented at a national level and its effects are expected to be limited to the national territory.

4.3 RESEARCH DESIGN

4.3.1 Selection of feasible design

Given that only an appropriate research design allows to draw sound conclusions that are supported by evidence, the choice of a specific research design plays a crucial role in the final outcome of the research and in its overall quality (Johnson & Reynolds, 2011).

The choice for one particular design must be based on the extent of data and findings that each design can offer and on the possibility to put in practice the theoretical design. These criteria drove the decision to use the time-series observational study design for answering the question “Did the liberalisation of the postal sector lead to a reduction in service coverage?” Although the time-series non-experimental design is generally applied to econometric studies that make use of regressions and statistical analyses, I use this method in a slightly different way, using the term ‘time-series observational study’ in a broader sense: in this thesis, this design is used to measure several indicators over a time period that goes from three years before to three years after the liberalisation of the postal market in each country.

In fact, the final choice for the appropriate research design to be implemented can be found in the way the research question is formulated. Given that the nature of the research question at hand is to explain the impact of liberalisation on postal network coverage, the time-series non-experimental design proves to be the most suitable approach since it allows for comparison between before and after liberalisation, and is therefore more likely to have explanatory power than a single case study or a cross-sectional design. One of the biggest strengths of the time-series observational study, which is the main justification for its use in this thesis, is indeed the fact that it facilitates to test the variation in coverage over time, and more specifically the time period when liberalisation occurs.

4.3.2 Time-series observational study

Kellstedt & Whitten (2013, p. 83) defined an observational study as “a research design in which the researcher does not have control over values of the dependent variable, which occur naturally. However, it is necessary that there is some degree of variability in the independent variable across cases, as well as variation in the dependent variable”. Even if Kellstedt & Whitten referred mainly to econometric analyses, the need to select cases that present differences in the variables applies to all non-experimental research designs. Given that the research question asks whether the liberalisation of the postal sector leads to a reduction in network coverage, and that liberalisation took place in different moments/conditions in each Member State, the time-series observational design provides an appropriate approach to investigate the relationship between the dependent and the independent variable.

In the choice a research design, it is also necessary to consider to what extent the design chosen influences the internal and external validity of the study itself. Internal validity refers to the strength of the cause-effect relationship between the dependent and independent variables (De Vaus, 2001). In this particular study, the question is whether liberalization in the postal sector has an impact on network density and geographical coverage. In order to achieve a high degree of internal validity, in this research I do not select cases randomly: I choose all the cases where it is possible to observe the presence of the independent variable (all the countries that liberalised their postal market) so that the sample presents sufficient variation on the central independent variable. Given that this research is focused on (and restricted to) the European Union, the divergence in the application of the EU directives of postal liberalisation is limited. However, although the characteristics of the national regulations are rather similar, Member States differ considerably in many other respects that influence network coverage, for example geographical dimension, population density, socio-economic conditions, structure of the market and of the incumbent operator, etc.

According to De Vaus (2001), a research with high external validity enables to draw wide-ranging conclusions and to generalise the results obtained to a population that is larger than

the initial sample. When there is limited variation in the independent variables (as in this case liberalisation in the EU followed the guidelines from the Postal Directives), and there is sufficient control for the other influencing variables, the results obtained can be used by researchers to predict the effects of liberalisation in similar contexts. However, this thesis involves only a small number of cases, de facto limiting the possibility to generalise the results and therefore limiting the overall external validity of the study.

4.4 CONCEPTUAL MODEL

The research question of this thesis (“Did the liberalisation of the postal sector lead to a reduction in service coverage?”) explicitly involves two clear variables: the independent one (liberalisation of the postal sector) and the dependent one (service coverage). These variables form the core elements of the relationship that the present analysis tries to explain.

In addition, all other variables that could have an effect on this relationship should be taken into account in order to draw valid causal inferences (Kellstedt & Whitten, 2013). For this reason, a second independent variable is added to the model: mail volume, in fact, represents an important determinant in coverage decisions of postal operators. All the three variables will be analysed in depth in the next chapter.

Below, it is represented the conceptual model of this thesis, which emphasizes the distinct role of the two independent variables on the network coverage in the postal sector.

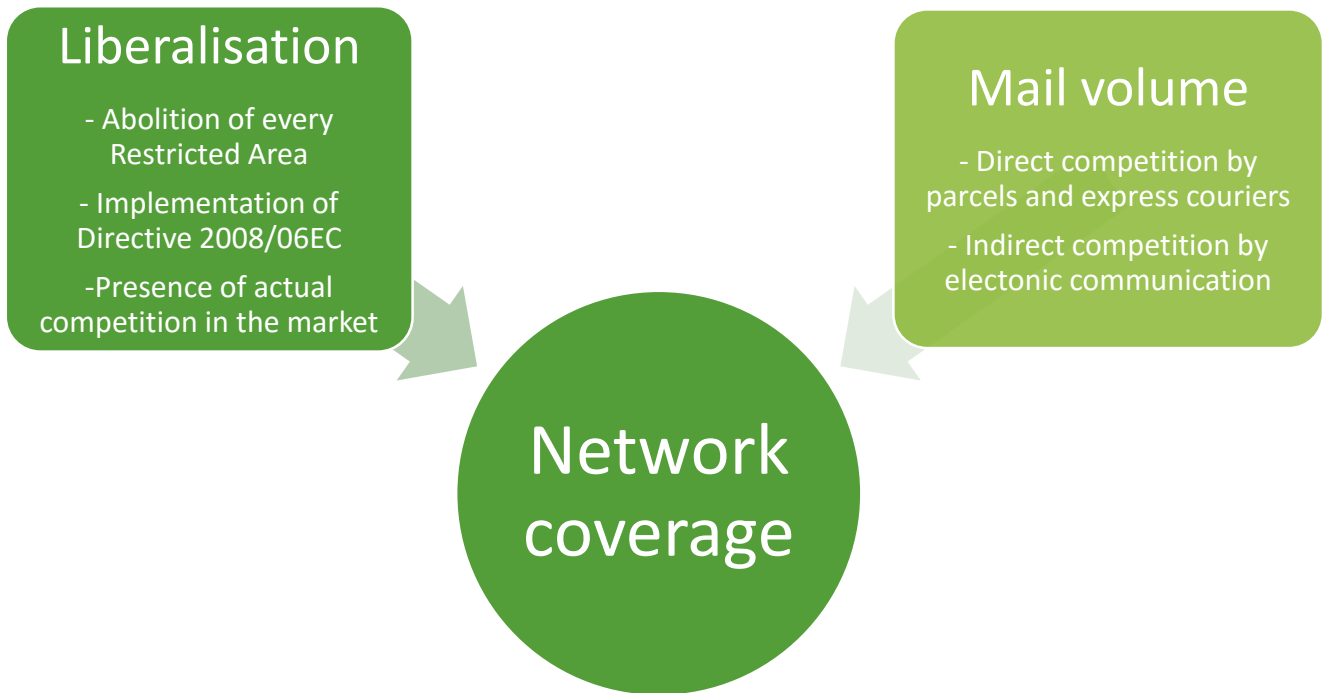


Figure 2 - Conceptual model

4.5 COUNTRIES INCLUDED IN THE ANALYSIS

This thesis examines the relationship between liberalisation and coverage in the postal sector in the European Union: the available cases are therefore limited only to EU Member States. However, not all the EU countries are included in the analysis because some Member States liberalised their postal market only two years ago and the accessible data are not sufficient to evaluate the effects of liberalisation in those countries. In fact, as I discussed above, the Directive 2008/6/EC imposed the abolition of any reserved area by December 31st, 2010 but, for twelve countries (Czech Republic, Greece, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Poland, Romania, Slovakia) the implementation of this Directive was postponed by two years (implementation by December 31st, 2012).

Among the countries that opened their market to competition before 2011, the majority adopted the new regulation only a few months before the deadline set by the EU. These countries, namely Austria, Belgium, Bulgaria, Denmark, France, Iceland, Ireland, Italy, Norway, Portugal, Slovenia, and Spain, can be considered to have fully liberalised their

postal sector between 2010 and 2011: hence, for these countries, 2011 is counted as the first year of liberalised market where the effects on coverage should be visible. Belgium and Iceland, however, are not included in the analysis because data on their postal sectors are missing.

On the other hand, six countries were fully liberalised before 2011: Sweden, Finland, Germany, Great Britain, Netherlands, and Estonia went through all the stages of the liberalisation process before the conclusion of the policy promoted by the EU institutions. Sweden was the first European country to open its postal market to competition: there, the market for mail has been opened to competition since 1993 (Jaag, 2014, p. 270). Finland followed in 1995, after initial market opening in 1993. The process of liberalisation of the postal sector in the Great Britain was completed by the end of 2005, with full market opening since January 1st, 2006 (Pond, 2006); in Germany, full opening took place on January 1st, 2008 (Drews, 2009). Finally, both the Dutch and the Estonian mail markets were fully opened to competition in April 2009 (Dieke et al., 2013, p. 184; Sepp & Ernits, 2012).

The table below provides an overall view of the countries that are part of the analysis and specifies the first year of liberalised market.

Country:	Liberalised since:
Sweden	1993
Finland	1995
Great Britain	2006
Germany	2008
Netherlands, Estonia	2009
Austria, Bulgaria, Denmark, France, Ireland, Italy, Norway, Portugal, Slovenia, Spain	2011

Table 1: Liberalisation overview. Belgium and Iceland are not included in the analysis because they do not provide statistics on their postal services

4.5.1 Formal and material liberalisation

Nevertheless, despite the introduction of regulations that allow equal access to the market, in the majority of Member States the former incumbent postal operator still remained the

only provider on the market, without any significant competition. The absence of competitors in the years immediately after liberalisation can be probably explained by the freshness of these regulations. This group of countries, where liberalisation of the market was not accompanied by an increase in actual competition, can be said to have put in place a “formal” liberalisation (Schuster, 2013).

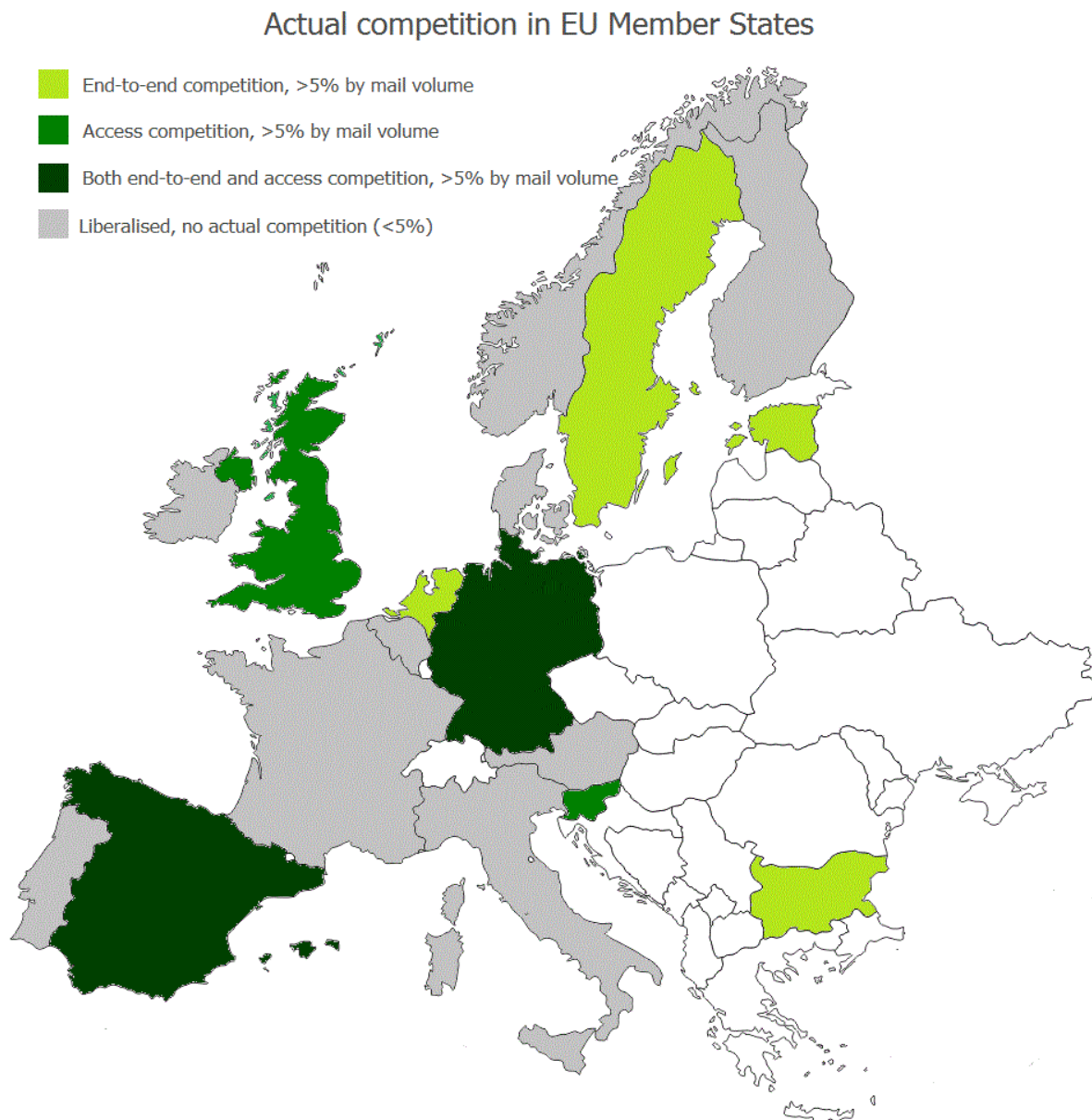


Figure 3: Competition in the EU as per 2013¹ (Source: re-elaboration from ERGP (2014) data)

¹ Spain has more than 5% competition (around 18% of volumes) but it is not possible to define whether these are end-to-end or access volumes. Hence, for the purpose of this analysis, Spain will be considered to have both forms of competition.

On the other hand, some Member States witnessed the entrance of other operators in the mail market, still with many differences in the extent of competition from Member State to Member State (see Figure 3 above). However, given the presence at the same time of both elements of liberalisation (equal entry regulation and actual competition), in these countries the process of liberalisation can be defined as “material”.

More specifically, it is possible to classify the type of competition into two separate groups depending on the strategy adopted by postal operators to provide letter services: on the one hand, entrants in the postal market can build up their own local or national delivery network, leading to the so called “end-to-end competition”, on the other hand, competing firms may use parts of the postal infrastructure and the network elements of the incumbent operator to deliver mail services (this market structure is called “access competition”) (ERGP, 2014, p. 3). It is important to note that these strategies are not mutually exclusive, so they can both be present at the same time in the same country.

In conclusion, this analysis includes sixteen countries among all the EU Member States, divided in a group of eight “formally” liberalised countries (Austria, Denmark, Finland, France, Ireland, Italy, Norway, and Portugal) and a group of eight “materially” liberalised countries (Bulgaria, Estonia, Germany, Great Britain, Netherlands, Slovenia, Spain, and Sweden). Then, the latter group can be further divided depending on the type of competition: whilst only Germany and Spain have both access competition and end-to-end competition, Great Britain and Slovenia show relevant access competition alone, and Bulgaria, Estonia, Netherlands and Sweden present only end-to-end competition.

4.5.2 Additional hypotheses

These different forms of liberalisation and competition can have different effects on the object of this study, postal network coverage, and consequently on the first hypothesis formulated above (“In the years immediately after liberalisation, countries witness a reduction in postal network density.”). In fact, these distinctions between formal and

material liberalisation, and between end-to-end and access competition can help to provide explanations for different patterns and trends among the sample countries.

For this reason, two sub-hypotheses are created to complete the first main hypothesis and to find better explanations for the phenomena analysed in this thesis.

First, the implementation of material liberalisation can be expected to have stronger negative effects on network coverage because actual competition from entrant firms would lower the incumbent's profits and induce it to reduce its coverage in order to contain costs (Cremer et al., 2001). However, the presence of actual competitors could activate the counterbalancing market forces described in the previous chapter, de facto leading to an increase in postal network density. Hence, the first sub-hypothesis can be formulated as follows:

H1-bis: Materially liberalised countries show higher decrease in postal network density compared to formally liberalised countries.

Second, given that in the case of end-to-end competition the entrants build their own service and delivery network, it is possible to assume that coverage and postal network density is higher in the Member States where end-to-end competition takes place compared to those that have only access competition (where competitors use the existing infrastructure of the incumbent). Therefore, the second sub-hypothesis tests the existence of a causal link between the form of competition and the trends in network density.

H1-ter: Access competition leads to higher reductions in postal network density compared to end-to-end competition.

5. OPERATIONALISATION

5.1 INTRODUCTION

“Because there is no random assignment to treatment groups, as in experiments, some scholars claim that it is impossible to speak of causality in observational studies. [...] However, if sufficient attention is paid to accounting for all the other possible causes of the dependent variable that are suggested by current understanding, then we can make informed evaluations of our confidence that the independent variable does cause the dependent variable” (Kellstedt & Whitten, 2013, p. 83). Hence, in the next Sections, I closely describe the variables included in the analysis and I present the indicators that I use to measure these variables.

5.2 DEPENDENT VARIABLE (COVERAGE)

The dependent variable was defined by Johnson & Reynolds (2011, p. 124) as “the phenomenon thought to be influenced, affected, or caused by some other phenomenon”. In this study on the effects of liberalisation on service accessibility, the first and only dependent variable is coverage.

Despite being only one dependent variable, the concept of coverage is wide-ranging and includes many aspects that need to be taken into account. Given that, in this thesis, coverage is used as a measure for the accessibility of service (as part of the universal service), the dependent variable should reflect the degree to which citizens can access the service at affordable prices, regardless their location. According to Schuster (2013), “measuring the quality aspect of the universal service is not straightforward and it certainly differs between countries”. Nonetheless, to measure the postal service in terms of access, coverage and quality, one of the possible approaches is to measure the postal network density, intended as the concentration of access points (mobile or permanent post-offices, letter-boxes, post-office boxes) within a certain territory.

5.2.1 Indicators

In order to assess the density of the postal network in the sample countries, I selected three indicators that contribute to an accurate representation of the dependent variable.

The first indicator is the “total number of permanent post offices”. This is the most important gauge because post offices still represent the main physical structure of the postal network, as well as the point where several important services are delivered. In fact, as Jaag (2014, p. 266) noted, in the postal sector “there is no physical network consisting of cables and rails, as found in more typical network industries. Instead, the postal network consists of postal outlets (or franchised counters) for the collection of items and mailmen who build up the delivery network anew every day by driving or walking”. The total number of permanent post offices therefore indicates the dimension of the service network itself, enumerating the total number of access points where it is possible to make use the postal service.

The second indicator is the “average number of inhabitants served by a permanent office”. This indicator, similar to the “number of offices per 1000 inhabitants” used by Schuster (2013), assess the actual accessibility of a post office for the citizens of a country. In addition, this gauge varies together with population: thus, it is possible to examine how the postal sector responds to demographic changes in a certain country. Another indicator that could be used is the “average area covered by a permanent office (km²)”; however, this measure offers just the same results as the “total number of permanent post offices”: in fact, whilst population keeps changing, it is possible to assume that the total area of EU countries is stable over years and the total number of post offices would be the only determinant of variations in this indicator. Hence, this type of measure would be redundant. It is important to note that because of its formulation (inhabitants served by a post office), an increase in this indicator implies a decrease in network coverage, where more people have access to less post offices.

The third and final indicator is the “number of letter-boxes”. Letter-boxes are a fundamental component of the postal service. In fact, on the one hand, post-offices are the central hubs

for mail delivery and they offer the biggest number of services (not only physical acceptance of mail items and payment for postage, but also financial transactions, direct access to government services and several other non-postal services), and for these reasons they account for the largest part of postal operators' running costs. Letter-boxes, on the other hand, carry out one single function, that is the collection of mail, with relatively low costs. This task, however, is essential in the functioning of the postal service: as I explained above, in this industry the paying consumer is the sender, while the beneficiary is the addressee. Hence, the accessibility of letter-boxes influences strongly the decisions of senders whether to use the service or not. For this reason, letter-boxes are an indispensable element to take into account when evaluating the coverage of the postal network.

Nevertheless, because of its essentiality in the functioning of the postal service and because of all the other functions it carries out, in this study the total number of permanent post office is considered the main indicator for network density, with average number of inhabitants served by a permanent office and number of letter-boxes playing a secondary role.

5.3 INDEPENDENT VARIABLE (LIBERALISATION)

The independent variable is "the phenomenon thought to influence, affect, or cause some other phenomenon" (Johnson & Reynolds, 2011, p. 124). In this thesis, the first independent variable is liberalization. In fact, according to the first hypothesis formulated above, liberalisation is thought to be one of the main determinants of changes in postal network coverage. This concept, however, has been already examined in Chapter 2, where I distinguished the process of liberalisation into two phases: de-regulation and re-regulation. In the next sub-section, I select the two most accurate indicators that testify the existence of a liberalised postal market in a certain country.

5.3.1 Indicators

The first indicator that I use to test liberalization is entry regulation. It involves the existence of a legal system that allows new operators to enter the market under the same conditions of the incumbent operator. In particular, this legal framework can be considered in place when countries complete the implementation of the Postal Directive 2008/6/EC. As I showed above, this Directive abolishes every reserved area, leaving the market open to full competition (in terms of services to offer and area to cover) between the incumbent and the entrants. Even though by 2013 all Member States have opened their postal market to competition, in the timeframe of this thesis only the countries that implemented the Directive 2008/6/EC by 2011 are classified as fully liberalised (see Table 1 above). The implementation of the Third Postal Directive is set at the EU level and this data can be retrieved from both the EU documents and national legislations, and this enhances the reliability and validity of the indicator. Following the approach used by Schuster (2013), the creation of a legal system that allows equal entry to the market of mail is classified as a “formal” liberalisation.

The second indicator for liberalisation is the presence of postal competitors in the market other than the incumbent operator. This situation can be classified as “material” liberalisation, meaning a condition in which postal enterprises actually compete on the same market. Even if the market share of the different operators is not taken into consideration, simply the presence of postal competitors can be seen as a reliable indicator for liberalization: in fact, this implies that the national legal framework not only complies with the EU requirements, but also it allows new operators to feasibly enter the market.

Before the analysis, countries will be classified in groups depending whether they implemented only formal liberalisation or both formal and material privatisation. This arrangement can help to test whether the abolition of cross-subsidies through the new legal system is sufficient to reduce/increase the quality of the universal service and the network coverage by the operators, or whether the presence of actual competitors on the market is the cause of reduced/enhanced coverage.

5.4 INDEPENDENT VARIABLE (MAIL VOLUME)

The second independent variable, which does not appear in the main research question, is the total number of mail items sent. However, this variable is fundamental in this analysis because it represents one main driver of postal operators' decisions regarding the dimension of the network.

In addition, mail volume plays another essential role in this research: given the global trends towards new means of communication and the increased popularity and diffusion of emails, the trends in the amount of posted items reflect the degree of e-substitution in every Member State. In fact, as showed in the conceptual model of this thesis, the mail volume is influenced, on the one hand, by direct competition from parcels and express couriers and, on the other hand, by indirect competition from new telecommunication tools.

5.4.1 Indicators

For this variable, only one indicator has been chosen: the "average number of letter-post items posted per inhabitant". This measure shows the trends in the use of basic postal services by the citizens of a certain country: the indicator indeed does not take into account the ancillary services and other items that can be used through the postal network. It considers only letters, allowing to focus on the core business of postal operators that is, eventually, the main determinant of coverage decisions. As explained above, the average number of letter-post items per inhabitant is influenced by many factors, including the level of e-substitution and the accessibility of the service itself.

Nevertheless, this indicator is not available for all the countries that are part of this analysis. For this reason, another measure is needed in order to control for the usage of core postal services in certain Member States. In this regards, the most similar indicator is the "number of letter-post items, domestic service", which is an appropriate gauge to express the trends of mail volumes in a certain country.

6. DATA ANALYSIS

6.1 INTRODUCTION

In this chapter, I present the results of the empirical analysis and I comment the findings in order to find a reliable and valid answer for the research question of this thesis.

The chapter is structured as follows: in Section 2, I present the cases that are selected for the analysis and I offer detailed information on the data and indicators used; in Section 3, I show the actual execution of the study and the decisions that underlie the process of data analysis; in Section 4, I examine the indicators for postal network density that are needed to test the first hypothesis “In the years immediately after liberalisation, countries present a reduction in postal network density”; finally, in Section 5, I analyse the trend in mail volume that underlie the second hypothesis “A steeper decline in mail volumes leads to a steeper decline in network density”.

6.2 POPULATION AND SAMPLE

In order to answer the question “Did the liberalisation of the postal sector lead to a reduction in service coverage?” this study should examine a population made of all the countries that liberalised, to some extent, their postal market. However, given the differences between national regulations and the practical difficulties to find data and compare a large number of countries, this thesis is focused only on the European Union and in particular on the Member States that opened their postal market before 2011. These sixteen countries (Belgium and Iceland are excluded because data is missing completely) represent the sample of this study (see Chapter 4.5 for details).

6.2.1 The Universal Postal Union database

Data about the countries included in the sample are retrieved from the database of the Universal Postal Union. The Universal Postal Union (UPU), established in 1874, has its

headquarters in Bern and it is the second oldest international organization in the world. The UPU includes 192 member countries and it represents the primary forum for cooperation between postal sector players.

The International Bureau of the Universal Postal Union has published postal statistics regularly since the first edition in 1875. These data have been frequently amended and improved to meet as closely as possible the postal sector's needs for information. The UPU's statistical database offers a dynamic overview of the situation of the postal sector in each country. It contains records from over 200 countries and comprises approximately 100 indicators of postal development, grouped in 12 chapters. The data is collected annually from all UPU member countries and published in the Postal Statistics Yearbook (Universal Postal Union, 2015).

6.2.2 Description of the indicators

Postal establishments open to the public are post offices where customers can go for postal services. Offices open to the public can be operated by officials of the designated operators or by persons from outside the designated operator, and they can be permanent (fixed) or mobile.

The first indicator of this study, the total number of permanent post offices, corresponds to the sum of offices staffed by officials of the designated operator and offices staffed by persons not connected with the designated operator, and represents all offices open to the public and operating on fixed premises. Offices staffed by designated operator officials can be full-service offices or secondary offices. Full-service post offices are post offices where, in principle, customers can go for all postal services. This category also comprises exchange offices or sorting offices offering similar services. Secondary offices usually have reduced services and, generally, come under a main post office. Offices operated by persons not connected with the designated operator are post offices or other establishments ran by other operators that provide post office counter services on the basis of a contract with the designated operator.

The second indicator, average number of inhabitants served by a permanent office, measures the degree of coverage of permanent offices in each country while the third indicator, number of letter boxes, represent the total amount of letter boxes located on streets and in post offices for the posting of mail.

As I explained above, two indicators are used to measure the trend in volume of mail in each country: first, the average number of letter-post items posted per inhabitant, and second (when the first is missing), the number of letter-post items, domestic service.

Letter-post items consist of letters, postcards, printed papers (newspapers, advertising, periodicals, etc.), small packets, and, as applicable in the domestic service, commercial papers, samples of merchandise, "Phonopost" items, postal packets, etc.

As stated in Article 12 of the Universal Postal Convention (UPU, 2013), letter-post items are:

- priority items and non-priority items, up to 2 kilogrammes;
- letters, postcards, printed papers and small packets, up to 2 kilogrammes;
- literature for the blind, up to 7 kilogrammes;
- special bags containing newspapers, periodicals, books and similar printed documentation for the same addressee at the same address called "M bags", up to 30 kilogrammes;

These items may be given special treatment, such as items admitted free of postal charges, insured or registered items; however, letter-post items shall be classified on the basis of either the speed of treatment or of the contents of the items in accordance with the Letter Post Regulations. In the domestic service, each operator has the authority to set the rules and conditions governing the classification of items and the operation of the postal services.

In the average number of letter-post items posted per inhabitant are included, in principle, both ordinary items and items given special treatment (registered items, insured letters, newspapers) and also advertising items and hybrid mail. However, only since 2001 have operators been obliged to indicate clearly whether these different types of items are included in the gauge. Until 2000, the average number of letter-post items posted per inhabitant was

calculated as being the sum of domestic and international mail volume divided by the population.

6.3 MEASUREMENT

In order to test the effects of liberalisation on the selected indicators, the value of the indicators is measured before and after the formal opening of the market, resulting in a trend of growth or decrease. More specifically, postal network density and volume of mail are measured three years before and three years after the coming into force of the liberalisation regulation in each country.

The decision to choose a time span of six years is not random: given that, as showed in Chapter 2, liberalisation is a process that involves different steps and that the implementation of these regulations can take several years, a six years period is considered large enough for all the effects to take place. In fact, on the one hand, most of the Member States included in the analysis started their process of market opening around two years before the formal liberalisation (by initially reducing and removing some of the reserved areas). On the other hand, a time period of three years after liberalisation permit not only the physical reduction of postal establishments, but also the development of actual competition in the market, the revision of the regulation and the restructuring of the publicly owned incumbent operator.

Nevertheless, data for this six years' time span aren't available for all indicators in all counties; for this reason, when complete data is missing, the time span can be reduced to five or four years. Anyway, the fundamental criteria is still to measure postal network density and mail volume before and after liberalisation, no matter if it's three years or only one year.

6.4 LIBERALISATION AND POSTAL NETWORK DENSITY

In this Section, I analyse the trends in postal network density three years before and after liberalisation in the sixteen Member States that are part of this study in order to test the first hypothesis of this thesis: “In the years immediately after liberalisation, countries witness a reduction in postal network density”.

Figure 4 below provides an overview of the variation in the three indicators of network density before and after liberalisation. As it is immediately clear from the graph, all the three measures indicate a steep decrease in the degree of coverage of the postal network: in fact, the sample countries witnessed an overall decline of around 9% both in the total number of permanent post offices and in the number of letter boxes and an increase of almost 15% in the average number of inhabitants served by a permanent post office².

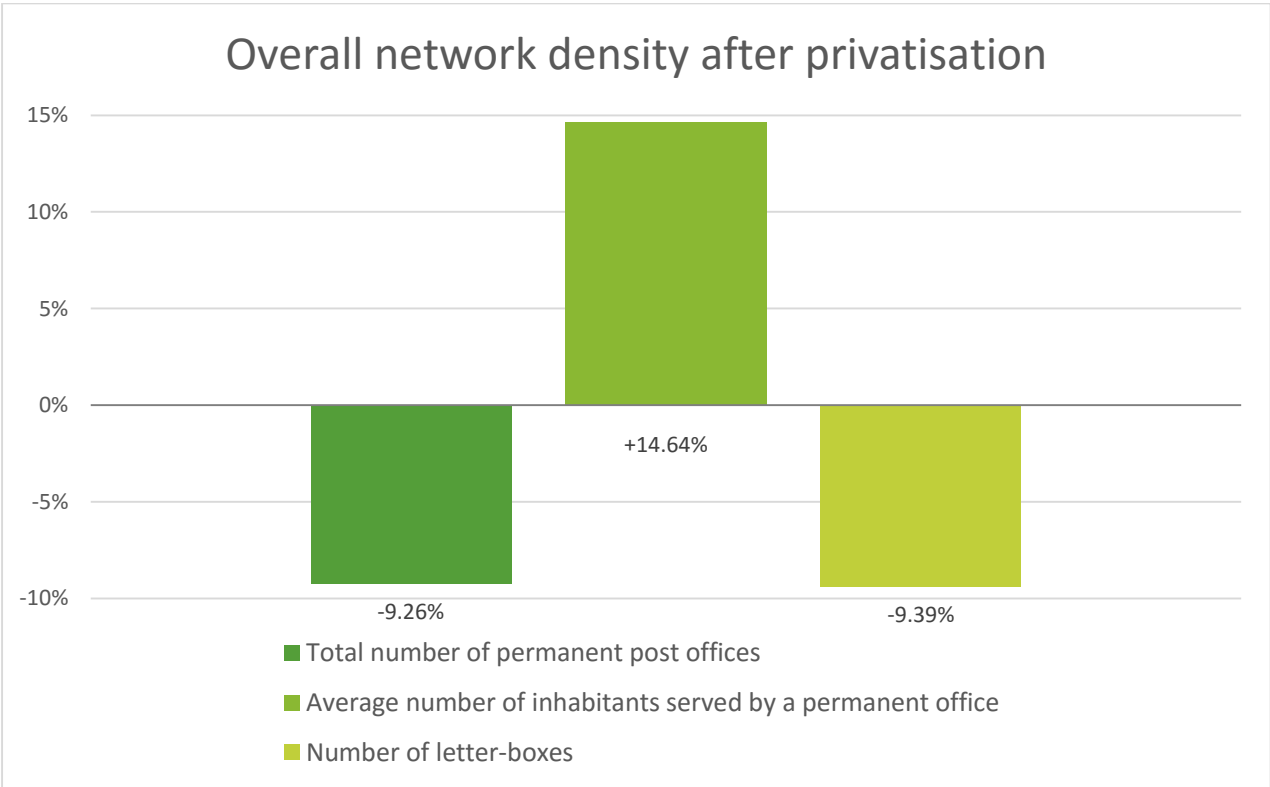


Figure 4: Trends in postal network density

² As I emphasised in Chapter 5, an increase in this indicator implies a decrease in network coverage, because more people have access to less post offices.

It is interesting to note that only four countries (Bulgaria, Finland, Germany, and Spain) show any sign of increase in postal network density and Germany is the only one where all the gauges indicate an increase in postal coverage. All the other countries present the same configuration: a decline in the total number of post offices, an increase in the average number of inhabitants served by a permanent post office and a decrease in the number of letter-boxes.

6.4.1 Total number of permanent post offices

In the occurrence of liberalisation, the total number of permanent post offices decreased on average by 9.4% in the sample countries. Figure 5 below shows the percentage decrease/growth of post offices in each Member State.

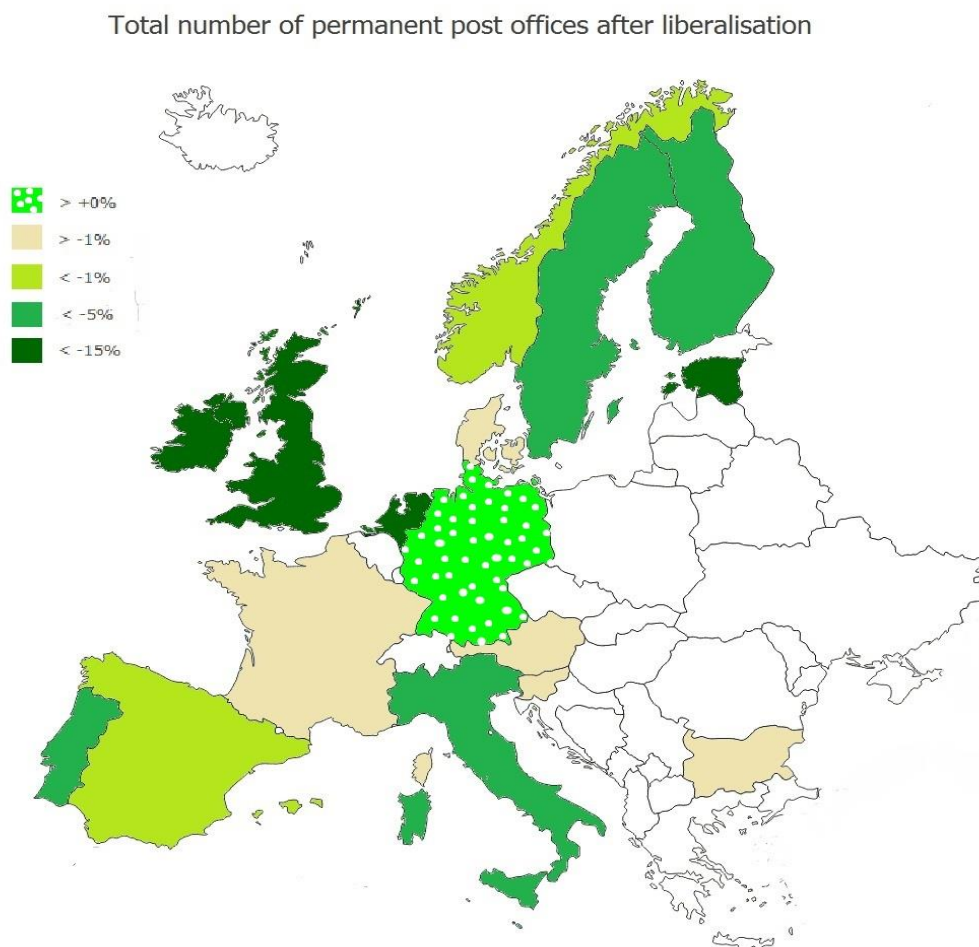


Figure 5: Variation in the total number of permanent post offices. Source: re-elaboration from UPU data

The first and most striking finding is that only one country witnessed an increase in this indicator: Germany indeed passed from 12671 post offices in 2005 to 14050 in 2010, with an increase of almost 11%. All the other Member States show negative trends that range from very small changes (between 0% and 1%) to enormous reductions (around 40% as in the case of Estonia).

As it is possible to see in Figure 5 above, five countries (Austria, Bulgaria, Denmark, France and Slovenia) do present only minimal variations (<1%) in the total number of post offices but, a part from Bulgaria (which had the same number of offices, 2981, both in 2008 and 2013), the trend in these countries is still negative (it ranges from -0.18% of France to -0.94% of Austria).

In the remaining ten countries, the reduction in the number of post offices has been significant: the biggest reduction took place in Estonia, which almost halved its postal outlets (-39%), passing from 564 offices in 2008 to 343 in 2013, then Netherlands, Ireland, and Great Britain reduced the number of postal outlets by more than 15% (respectively by 17%, 20%, and 25%).

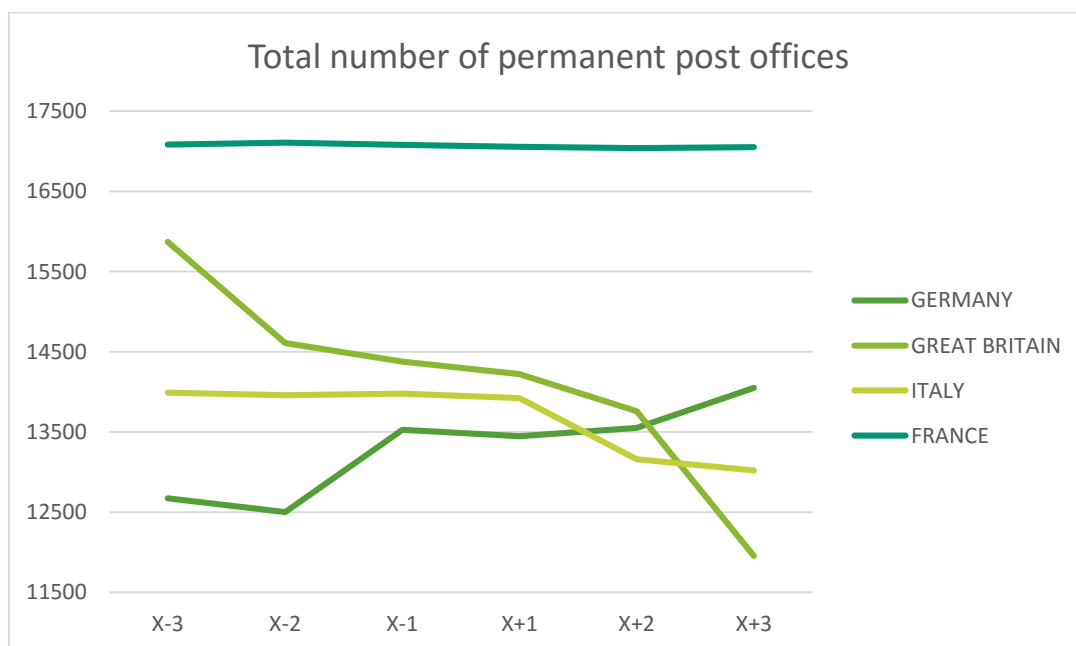


Figure 6: Total number of post offices in four countries. Source: re-elaboration from UPU data.

Figures 6, 7 and 8 show the actual number of permanent post offices in each Member State from three years before to three years after liberalisation. The countries have been divided into three groups because of the differences in the magnitude of the total number of post offices, usually due to differences in the territorial dimension of each country. For this reason, Figure 6 includes countries with more than 15000 outlets, Figure 7 contains six countries with a number of outlets between 1500 and 15000 and Figure 8 includes the five smallest countries with less than 1500 postal outlets.

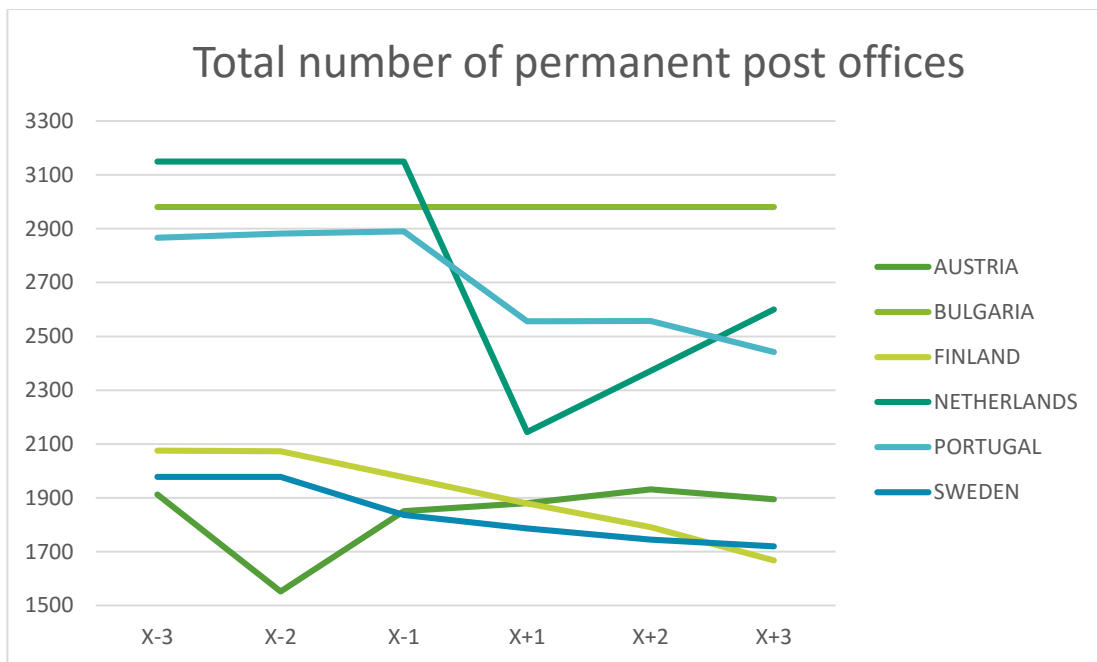


Figure 7: Total number of post offices in six countries. Source: re-elaboration from UPU data.

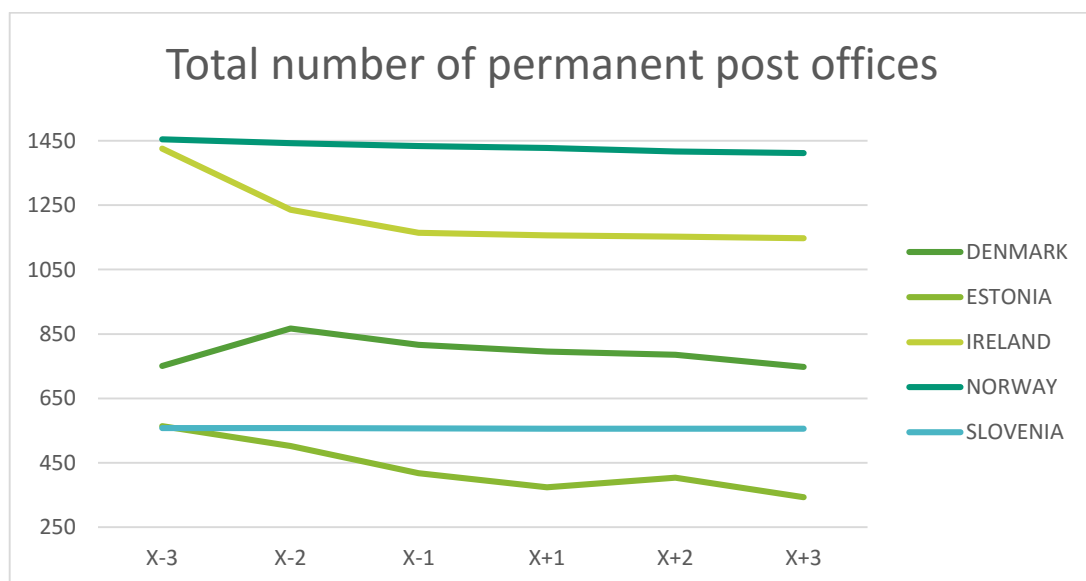


Figure 8: Total number of post offices in five countries. Source: re-elaboration from UPU data.

In line with the data I presented above, all the three graphs reflect the general downward trend in almost all the selected countries. Nevertheless, it is possible to note important differences between Member States: looking at the total number of permanent outlets in each country over time, the transition to open competition does not seem to have brought disruptive changes in most of the countries. In fact, in ten cases the trend is constant during the six years period, with the number of post offices always declining or remaining stable. Other six countries, however, show variations in their trends, increasing network density in some years and diminishing it in others but, as I stated before, Germany resulted to be the only country that ended the liberalisation period with more permanent post offices than it started with.

Finally, five countries show a particularly interesting trend: Italy, Netherlands, Portugal, Finland and Sweden reduced significantly the number of post offices in the years immediately close to liberalisation. It is curious to note that these countries are among those that eventually presented the biggest overall reduction in permanent post offices.

6.4.2 Average number of inhabitants served by a permanent post office

The average number of inhabitants served by a permanent post office is the second indicator used to measure the effects of liberalisation on postal network density. As explained above, this gauge is influenced by the number of post offices available to citizens and the number of citizens itself. An increase in this indicator means that the existing post offices are used by more consumers and they have to provide services for more people: this can be considered a reduction of postal network density and, consequently, it leads to a reduction in the quality of the postal service.

Looking at the aggregate data, the sample countries registered an average 14.6% increase in the average number of inhabitants served by a permanent office with only two countries (Germany and Bulgaria) that showed a decrease in the indicator. Figure 9 below offers an overall view of the trend in the selected Member States. As it is immediately evident from the figure, the downward trend is more marked than in the total number of permanent post

offices (first indicator, see Figure 5). In fact, apart from Germany and Bulgaria (which diminished the number of inhabitants served by a post office by respectively 10% and 5%), all the remaining Member States witnessed a relevant increase in the indicator (>1%), with no cases of non-significant or absent variation (between -1% and +1%).

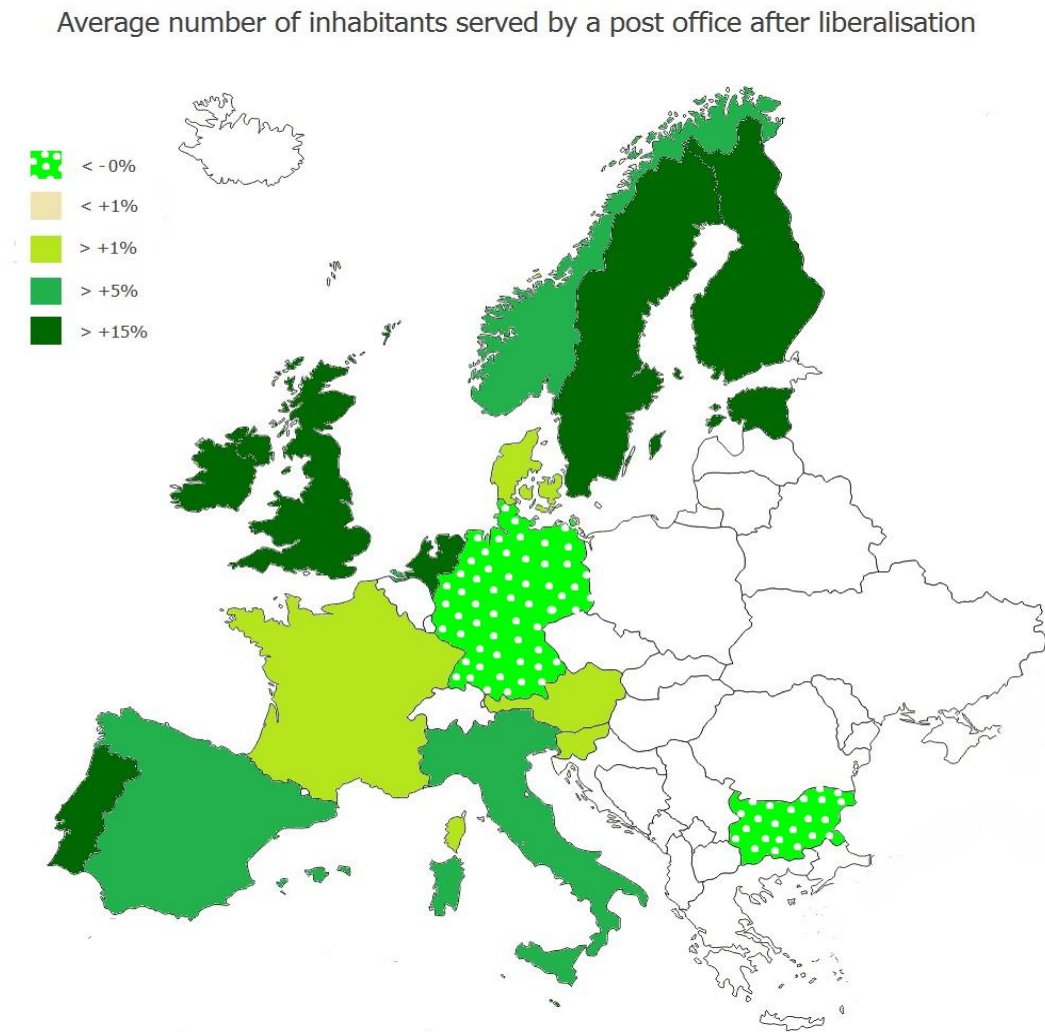


Figure 9: Variation in the average inhabitants served by a post office. Source: re-elaboration from UPU data

More specifically, seven countries registered an increase of more than 15% and, among these, four had an increase of more than 30% of average inhabitants served by a post office (+23% in the Netherlands, +32% in Ireland, +36% in Great Britain and +64% in Estonia). Finally, Austria, Denmark, France and Slovenia showed only a slight increase, around 3%.

Figure 10 and Figure 11 below show the trend in average number of inhabitants served by a post office in some Member States. In this case again, it is difficult to recognise a clear

pattern in the trends but it is still possible to find analogies between countries that indeed can be grouped together. In Figure 10, for example, the countries whose initial level of the indicator was similar (Great Britain, Italy, and Sweden, which began with around 4000/4300 inhabitants for each post office) followed similar upward trends, with a slight increase until 4500/5000 inhabitants for each post office.

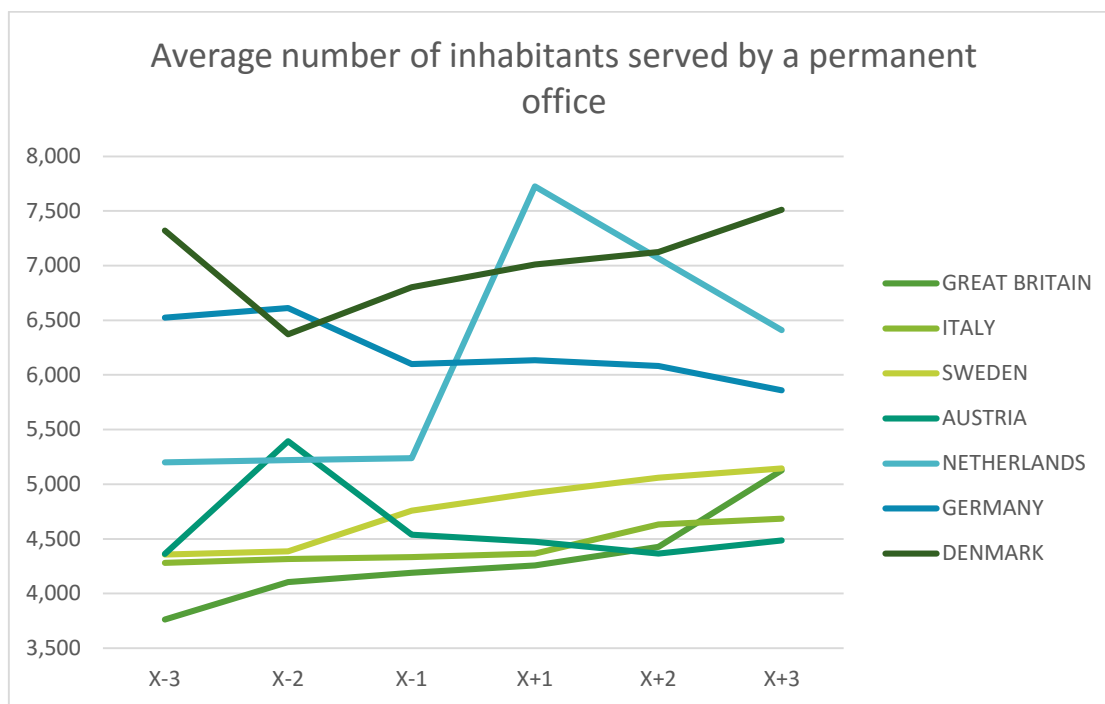


Figure 10: Average number of inhabitants served by a permanent office in seven Member States. Re-elaboration from UPU data.

In the same way, in Figure 11, Norway, Slovenia and France, which started respectively with 3300/3600 citizens served by a permanent post office witnessed a similar increase to 3600/3800 after liberalisation.

However, there are also countries that show unique configurations: the Netherlands, for example, exhibit a steep increase in the indicator exactly in the year when liberalisation took place and, then, a strong decline in the following years (see Figure 11). Similarly, Estonia (which was the country with the lowest initial level of this indicator) showed a great growth until one year after liberalisation and a decline after that.

Finally, despite the differences in the configurations of the trends, it is fundamental to remark that among the sixteen countries that are part of the analysis, fourteen presented a

higher value of the indicator at the end of the liberalisation period, while only two Member States (Germany and Bulgaria) showed a decrease in the average number of inhabitants served by a permanent post office.

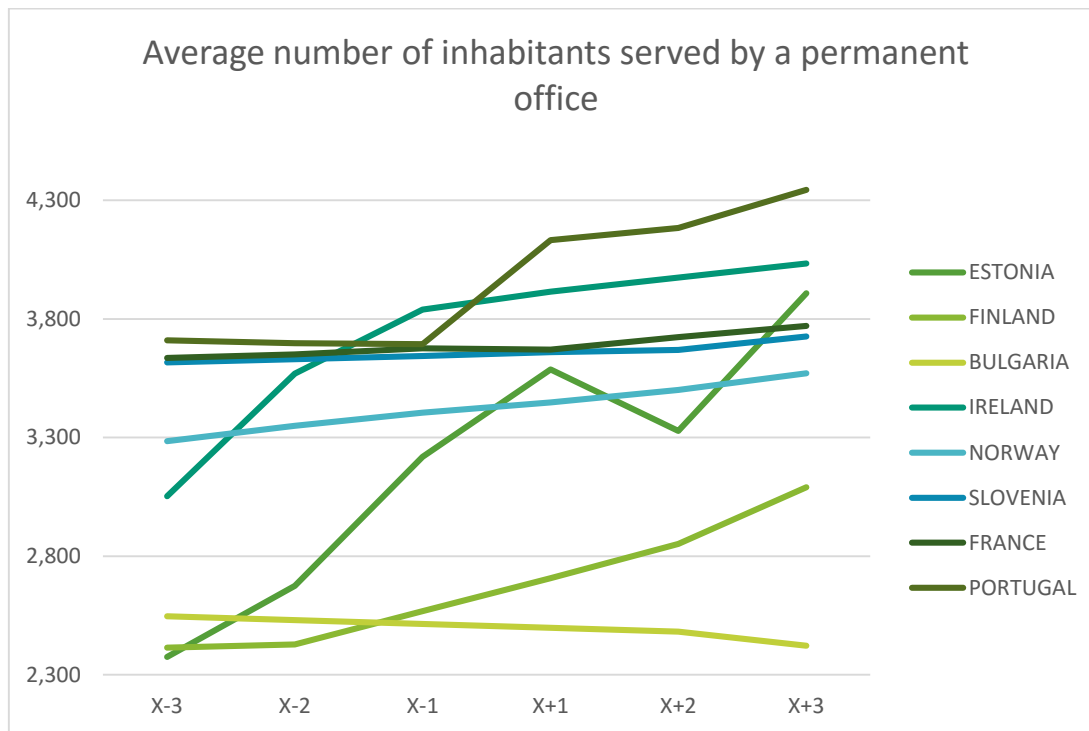


Figure 11: Average number of inhabitants served by a permanent office in eight Member States. Re-elaboration from UPU data.

6.4.3 Number of letter-boxes

The third and last indicator is the number of letter-boxes. As mentioned at the beginning of this Section, aggregate data from the UPU show an average decrease of more than 9% after liberalisation in the selected Member States. This result is very close to the one found for total number of permanent post offices, however, in this case the range between the countries that increased the most and the one that diminished the most is smaller (from -34% to +2%, whilst for post offices ranges from -39% to +11%).

Similarly to the other indicators, Figure 12 displays the differences among the countries that I analysed. In this case, only three countries show disruptive changes in the number of letter boxes (Italy, Portugal and Slovenia, which reduced the number of letter-boxes respectively by 15,5%, 34% and 24%). On the other hand, nine countries registered high

reductions in this component of postal network density: in Denmark and Norway, for instance, the number of letter-boxes decreased by more than 12% whilst in Austria, Bulgaria, Estonia, France, Ireland, Netherlands and Sweden the average decrease was more than 5 %.

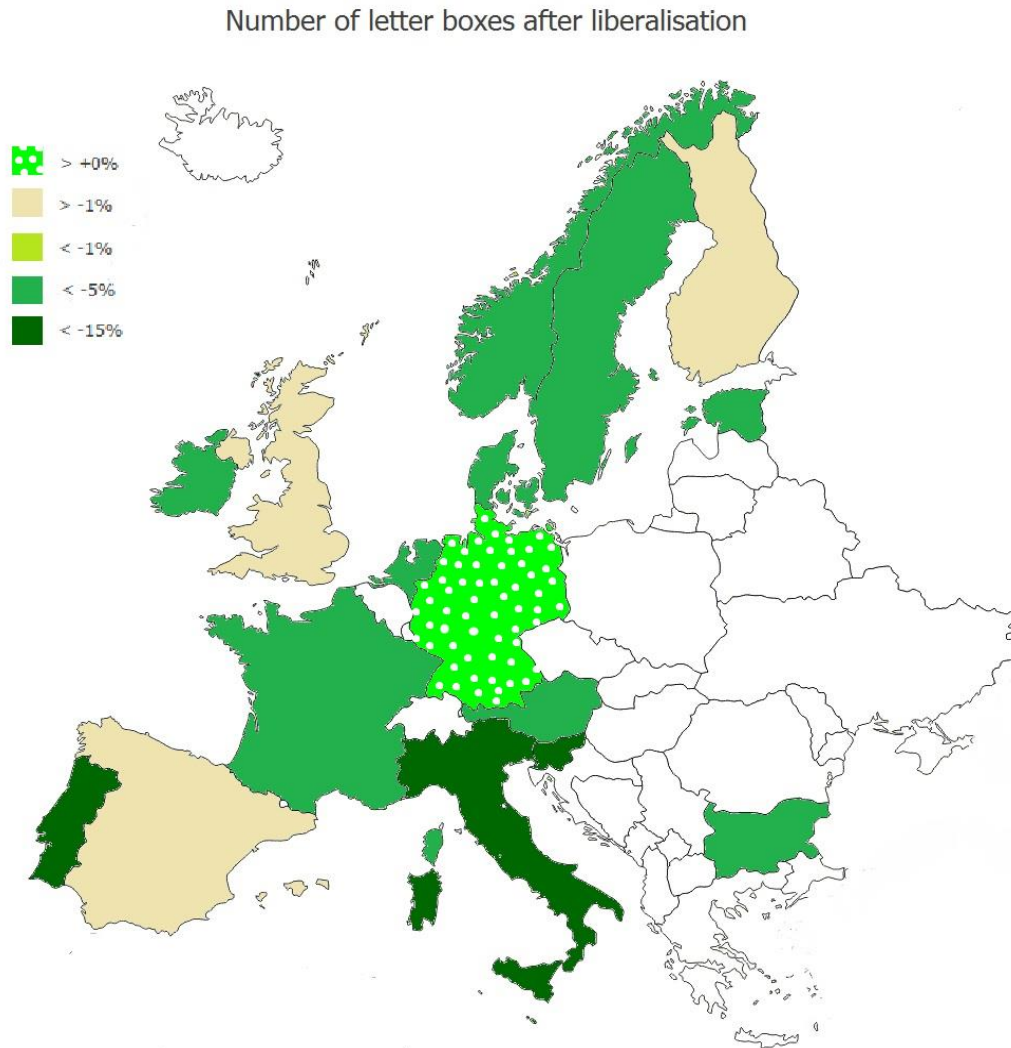


Figure 12: Variation in the number of letter boxes. Source: re-elaboration from UPU data

Three Member States can be considered to have maintained the same level of letter-boxes during the period of market opening: Great Britain passed from 116000 letter-boxes in 2003 to 115500 in 2008, which correspond to a 0,43% reduction; Spain maintained 33609 before and after liberalisation; and Finland increased its letter-boxes network by 0,74%, passing from 14000 letter-boxes in 1991 to 14103 in 1995.

Figure 13, 14 and 15 display the number of letter-boxes in different countries, presented in three groups based on the average dimension of their postal network.



Figure 13: Variation in the Number of letter-boxes in three Member States. Re-elaboration from UPU data.

These graphs appear immediately different from those of the other indicators: in fact, whilst for the total number of permanent outlets and the average number of inhabitants served by a post office it is difficult to recognise clear patterns, in this case the trends are quite similar from Member State to Member State. Not only almost all the countries show a slight decreasing trend, but also there are no overlaps or crossings between countries. This means that the variation in the number of letter-boxes has been almost parallel in all the countries that are part of the analysis.

Finally, like in the other indicators it is possible to note that in some countries there has been a steep decline in the period immediately after liberalisation. It is the case, for example, of Portugal (see Figure 14), which passed from almost 16000 letter-boxes in 2010 to less than 12000 in 2011 (24% reduction in only one year), and France (see Figure 13), which had 150000 letter-boxes until the opening of the postal market in 2011 and after liberalisation it witnessed a progressive decline to 140000 letter-boxes in 2013.

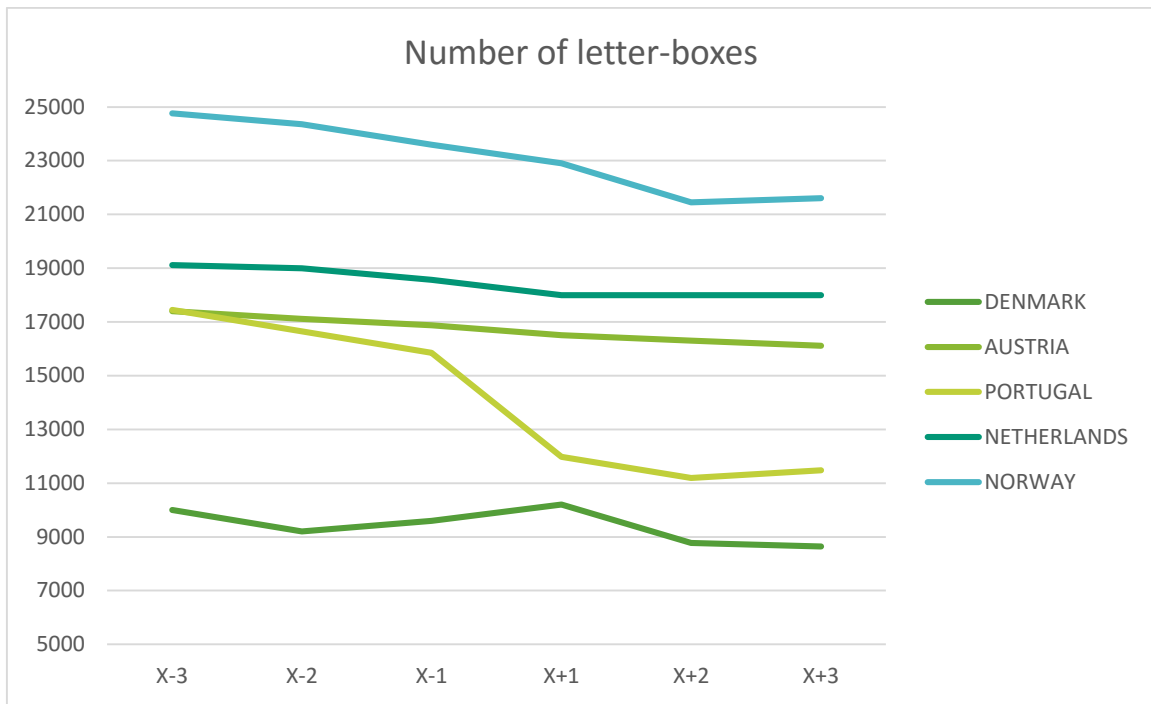


Figure 14: Variation in the Number of letter-boxes in five Member States. Re-elaboration from UPU data.

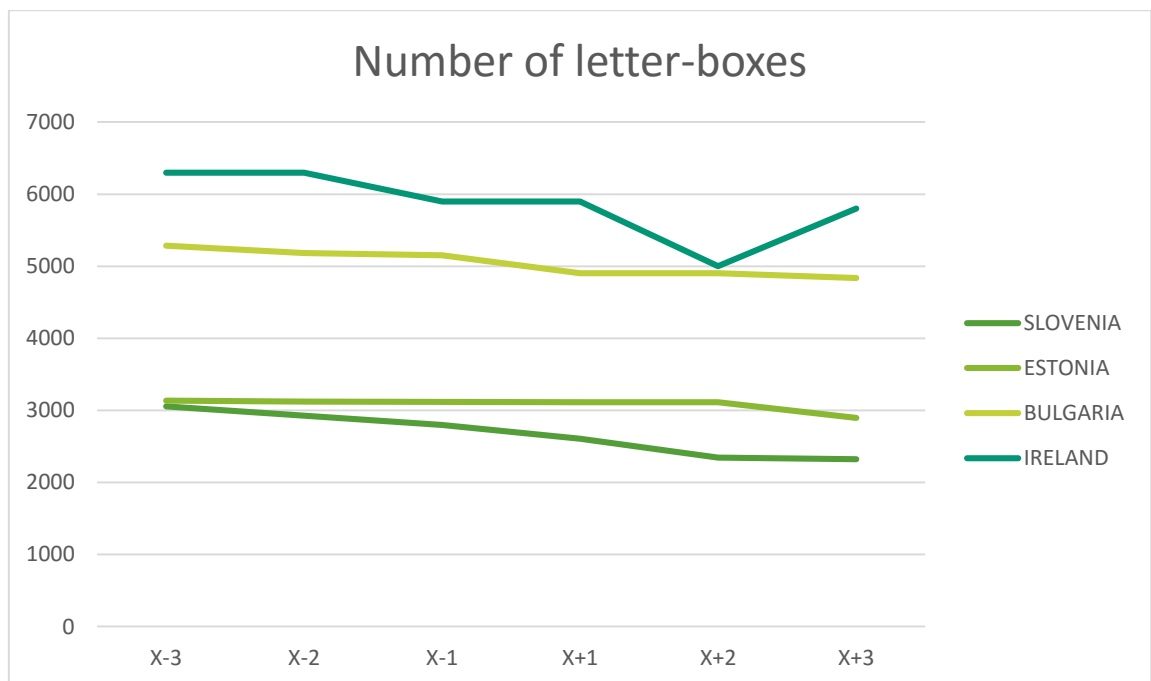


Figure 15: Variation in the Number of letter-boxes in four Member States. Re-elaboration from UPU data.

6.4.4 Overview

In the following paragraphs, I combine the results for the three indicators presented above in order to display the actual overall trends in postal network density in each Member State.

Figure 16 below shows the variation in the three indicators in each Member State after liberalisation. The trends are divided in three categories: positive (▲) when the gauge indicates an increase in network density, neutral (▬) when the variation is between -1% and +1%, and negative (▼) when the gauge indicates a significant decrease in network density. This summary table allows to gain a better understanding of the overall change of postal network density in the occurrence of market opening.

Country		Total number of permanent post offices		Average number of inhabitants served by a permanent office		Number of letter-boxes
AUSTRIA	▬	-0.94%	▼	2.82%	▼	-7.41%
BULGARIA	▬	0.00%	▲	-4.87%	▼	-8.51%
DENMARK	▬	-0.40%	▼	2.64%	▼	-13.59%
ESTONIA	▼	-39.18%	▼	64.55%	▼	-7.65%
FINLAND	▼	-13.69%	▼	18.10%	▬	0.74%
FRANCE	▬	-0.18%	▼	3.71%	▼	-6.45%
GERMANY	▲	10.88%	▲	-10.20%	▲	1.85%
GREAT BRITAIN	▼	-24.68%	▼	36.33%	▬	-0.43%
IRELAND	▼	-19.57%	▼	32.18%	▼	-7.94%
ITALY	▼	-6.95%	▼	9.44%	▼	-15.45%
NETHERLANDS	▼	-17.46%	▼	23.27%	▼	-5.81%
NORWAY	▼	-2.96%	▼	8.74%	▼	-12.74%
PORTUGAL	▼	-14.79%	▼	17.09%	▼	-34.24%
SLOVENIA	▬	-0.36%	▼	3.04%	▼	-23.97%
SPAIN	▼	-4.93%	▼	9.34%	▬	0.00%
SWEDEN	▼	-13.04%	▼	18.09%	▼	-8.71%

Figure 16: Overview of the variation of postal network density in the sample countries after liberalisation

At a first sight it is instantly evident the predominance of network density reductions across all the sample countries. More specifically, seven Member States display a decrease in all three gauges: Estonia, Ireland, Italy, Netherlands, Norway, Portugal and Sweden can be considered with little doubt to have reduced, more or less drastically, the density of their postal network. Six countries (Austria, Denmark, France, Great Britain, Slovenia and Spain) registered significant reductions in two indicators on three and slight reductions in one indicator.

Only three countries present some sort of increase in postal network density: on the one hand, Finland had a substantial reduction in network density both for what concern the total number of post offices and the average number of inhabitants served by a post office but it also witnessed a slight increase in the number of letter boxes. However, this increase was very small (only +0,74%) and cannot be considered a proper expansion of the network. On the other hand, Bulgaria shows a different trend in each indicator: whilst it presents a reduction in the number of letter-boxes (-8,5%), the total number of permanent post offices remained stable and the average number of inhabitants served by a permanent office diminished (resulting in increased network density).

Finally, Germany is the only Member State that displays a clear and unquestionable growth in postal network density: in fact, it registered a +10,8% increase in the total number of post offices (with a consequent 10,2% reduction in the average inhabitants served by a post office) and a +1,8% increase in the number of letter boxes.

6.5 VOLUME OF MAIL AND POSTAL NETWORK DENSITY

In this section, in order to test the validity of the second hypothesis of this research (“A steeper decline in mail volumes leads to a steeper decline in network density.”), I present the data for the indicators of mail volume in the European Union. As I already explained in Chapter 5, the average number of letter-post items posted per inhabitant is used as the primary indicator for the volume of mail in each country but, unfortunately, data for this indicator are not available for all the selected Member States. For this reason, this measure is integrated by another gauge, the number of letter-post items, domestic service, which covers almost all the countries/years included in the analysis.

Figure 17 below provides an overall view of the trends in mail volume in the EU during the liberalisation period.

Volume of mail after liberalisation

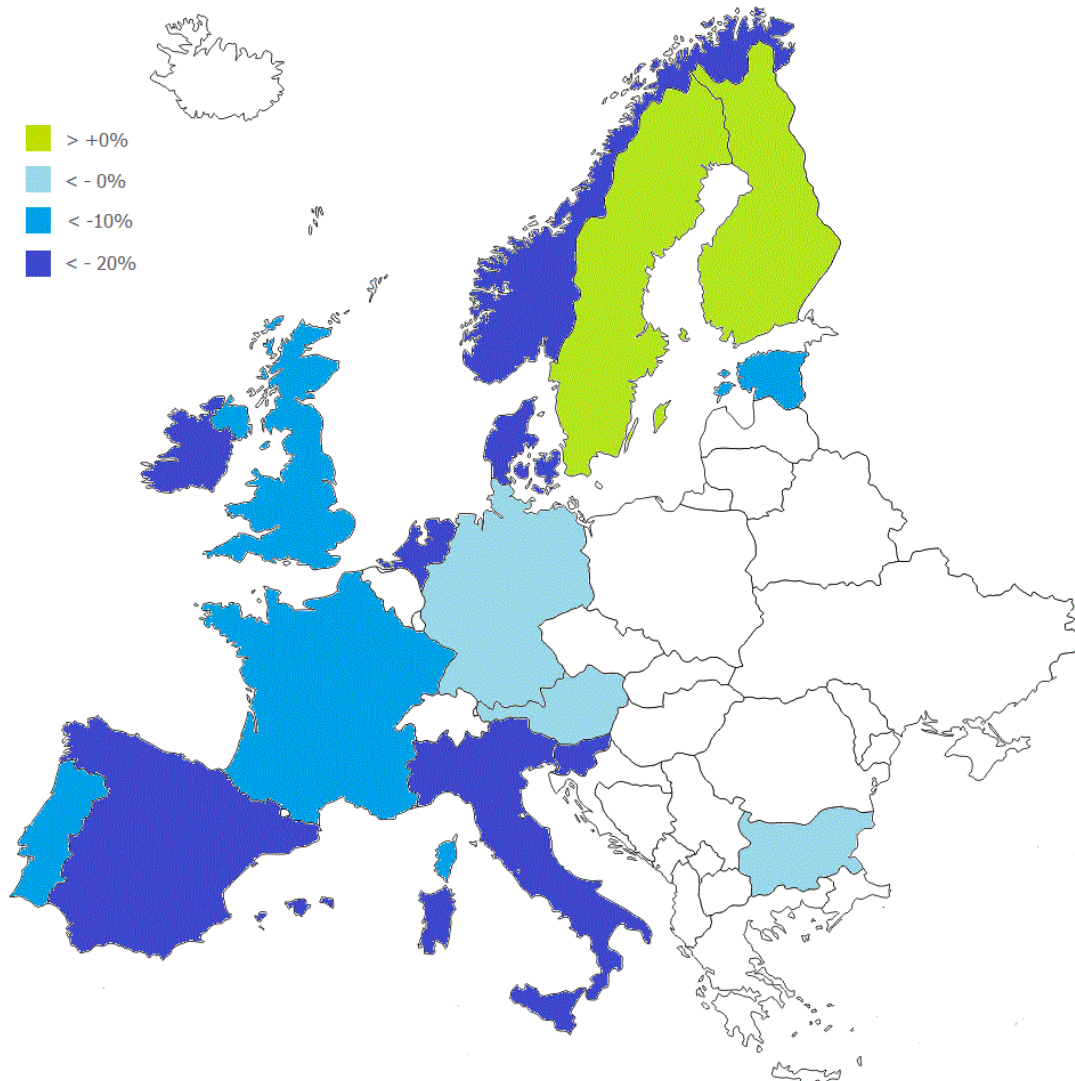


Figure 17: Variation in the volume of mail during liberalisation. Source: re-elaboration from UPU data

Aggregate data from the UPU database show a general decrease in mail volume among the sample countries in the years when markets were opened to competition. The average decrease for the sixteen Member States analysed in this study was 10.38%. It is possible to find, however, not only countries that registered enormous drops in the volume of mail but also countries that witnessed an increase in the usage of letter-post services, mainly due to the early period of their liberalisation.

Two countries show an increase in mail volume after liberalisation: Finland and Sweden saw the dimension of their letter-post market increase respectively by 147% and 53% (Finland

passed from an average of 153 letter-post items per inhabitant in 1991 to an average of 379 in 1996; Sweden grew from 2'850'000'000 letter mails in 1992 to 4'360'000'000 in 1996³). Austria, Bulgaria and Germany present only a slight decline in mail volume, with a reduction between 0% and 10% (Austria -0.4%, Bulgaria -4.7%, and Germany -6.8%), while in four Member States the decrease was between 10% and 20%: in Estonia it was -18.8%, in France -18.7%, in Great Britain -12.5%, and in Portugal -18.2%. Finally, in the remaining sample countries the reduction of the letter-post market was even higher than 20%: whilst Ireland, Netherlands and Slovenia faced a decrease around 25%, countries like Denmark, Italy and Spain registered a 35% drop in the volume of posted mail and Norway reached the extraordinary peak of -65% (from 540 letter-post items posted per inhabitant in 2008 to only 190 in 2013).

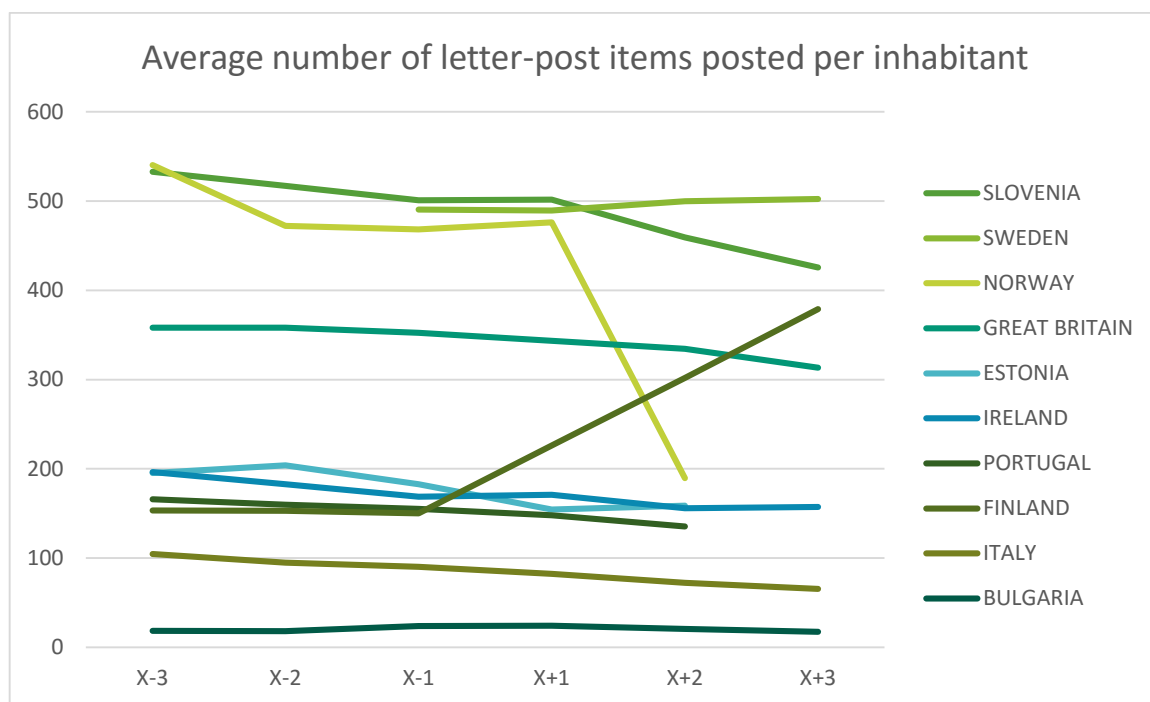


Figure 18: Variation in the average number of letter post-items during liberalisation. Source: re-elaboration from UPU data.

Figure 18 and figure 19 show the variation in mail volume during the six-year liberalisation period. Figure 19 includes the countries for which the average number of letter-post items

³ If I consider the average number of letter-post items posted per inhabitant, Sweden registered an increase of only 2.5%. However, in this case, data are available only from 1993 onwards and, as total number of letter-post items shows, there was a significant increase from 1992 to 1993.

posted per inhabitant is not available (Austria, Denmark, France, Germany, and Netherlands).

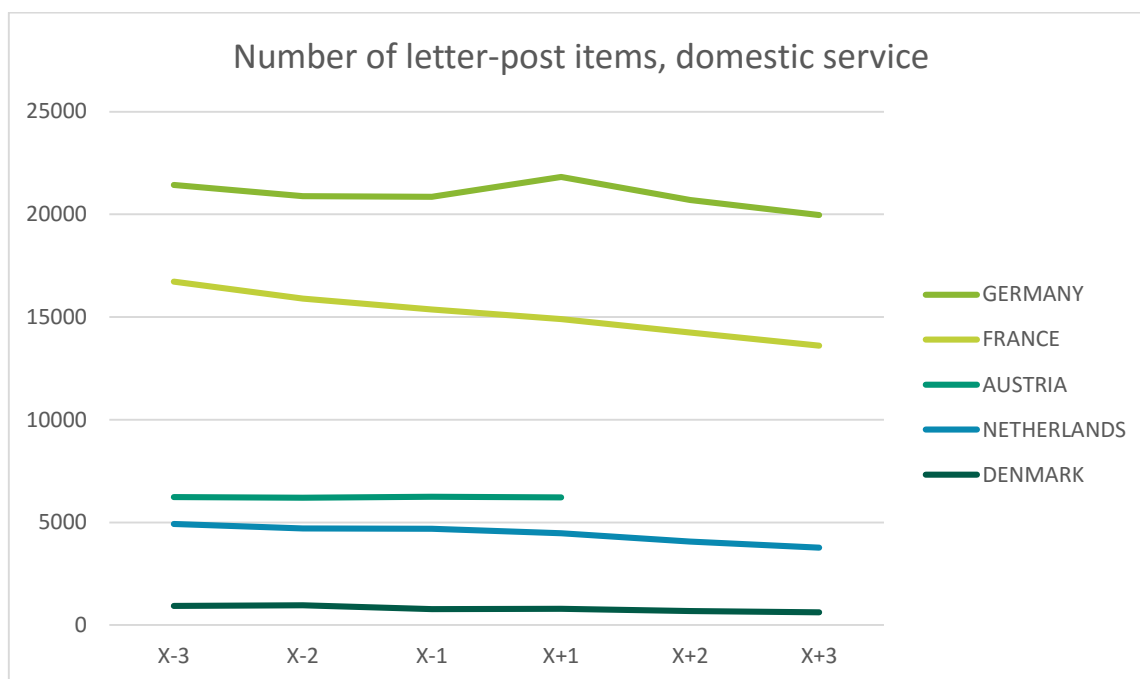


Figure 19: Variation in the number of letter post-items during liberalisation. Source: re-elaboration from UPU data.

The graphs above display a general downward trend, both in Member States with high initial levels of mail volume and in those with little initial usage of postal services (considering both per capita and overall). Moreover, excluding Sweden and Finland (which increased their mail volume), and Norway (which shows a steep fall in average letter-post items posted per inhabitant from 2010 to 2012), the trends are rather linear in the selected countries, with only little variations from year to year.

7 DISCUSSION OF FINDINGS

7.1 INTRODUCTION

The data presented in the previous chapter offer several insights about the relationship between liberalisation and coverage in the postal sector. The presence of clear common trends and patterns among the selected countries allows to draw inferences about the causal effects of the independent variables (liberalisation and competition, on the one hand, and volume of mail, on the other hand) over the dependent variable (network density and coverage). In this chapter, therefore, I make use of academic literature and previous studies to provide reliable interpretations to the results that emerged from the empirical analysis.

The Chapter is structured as follows: in Section 2, I discuss the validity of the first hypothesis by commenting the evidence obtained in Section 6.4; in two separate sub-sections I examine the two additional hypothesis introduced in Chapter 4 to test whether differences in the liberalisation process lead to different outcomes; in Section 3, I discuss the relationship between the volume of mail and postal network density in order to verify the second hypothesis; lastly, in Section 4, I give an overall interpretation of the findings in order to provide a clear and complete picture of coverage in the postal sector after liberalisation.

7.2 EFFECTS OF LIBERALISATION ON POSTAL NETWORK DENSITY

In the search for reliable explanations for the observed phenomena, when trying to identify the causal links between the variables, it is fundamental to have always clear in mind the main research question of the study. In this case, the query that guided the whole analysis is: "Did the liberalisation of the postal sector lead to a reduction in service coverage?" In order to help the process of analysis two major hypotheses were formulated that seek to predict the outcomes of the empirical analysis through the application of previous theories and evidence from other sectors. The first hypothesis of this study is: in the years immediately after liberalisation, countries witness a reduction in postal network density.

The empirical results presented in the previous chapter show that in the occurrence of market opening there is a general tendency to reduce coverage and postal network density. As I already said, fourteen countries out of sixteen show a significant decrease in at least two of the indicators for postal network density and only three countries (Bulgaria, Finland and Germany) registered some sort of growth in at least one of the gauges. Moreover, Germany is the sole country that display evident signs of increasing coverage.

Hence, given the average 9% reduction both in the total number of permanent offices and in the number of letter-boxes, and the 14% increase in the average number of inhabitants served by a permanent office, it is possible to affirm that the first hypothesis of this study is correct: in the sixteen Member States that are analysed in this thesis there has been a reduction in postal network density in the years immediately after liberalisation.

The explanations for this phenomenon are various and are treated in Chapter 2 and Chapter 3; however, in light of the results of the data analysis it is important to select the theories and causes that better explain not only the general trend among the cases but also the differences between them. For example, Harker et al. (2013) pointed out that one of the strengths and justifications of Universal Service Obligations is the ability for each Member State to choose its provision requirements and financing arrangements within the EU framework. Therefore, considerable variation in coverage in the sample countries and distinctive trends over time reflect not only the different responses to competitive pressures but also the sensitiveness of USO to individual nation needs and political discretion.

From an economic perspective, the reduction in service coverage can be justified by the need to reach the efficiency gains that result from merging small postal offices that operate in the same/adjacent service. These mergers generate cost advantages by integrating core functions such as collecting, processing and distributing, in order to act as a single post office (Filippini & Zola, 2005). The liberalisation of the market, with the abolition of any reserved area, leads to a lessening of the USO requirements due to the high financial burden they pose on operators and the prohibition to fund them through state aid (Crew & Kleindorfer, 2009). This is probably the main explanation for the general reduction I found

both in the total number of post offices and in the number of letter-boxes: the introduction of a competitive neutral legal framework allows the postal operators to decide more freely the desired level of coverage and this often leads to a reduction in postal network density, which was kept artificially high through high USO requirements (Eliassen & From, 2009, p. 242).

In this context, Germany noticeably represents an exception. Germany, in fact, is the only Member State that displays evident proofs of growth in service coverage: the increase in the number of post offices and letter-boxes and the decrease in the average number of inhabitants must have, therefore, causes and explanations that are not present in the other Member States. Nevertheless, before providing a final justification for this situation it is necessary to verify whether other factors had influence over the political and economic developments in the German postal market. Control for other variables, in addition, can give more strength to the conclusions regarding the causal link between liberalisation and coverage.

7.2.1 Formal and material liberalisation

As explained in Chapter 4, the sample countries were selected because they all had opened their postal market to competition and the independent variable (liberalisation) is present in all the case studies. However, the number of case studies is wide enough to allow some degree of variation in the independent variable among the selected Member States (De Vaus, 2001). In fact, not only the year of market opening varies from Member State to Member State (consequently leading to different conditions in which the liberalisation took place), but also the process of liberalisation is not the same in all the case studies.

As I explicated above, liberalised countries can be divided into two groups depending on the actual characteristics of their postal market: on the one hand, countries that implemented the EU Directives but did not register any relevant competition are classified as “formally” liberalised; on the other hand, Member States where the abolition of any legal monopoly was accompanied by the rise of actual competition in the market are defined

“materially liberalised”. Hence, a sub-hypothesis (H1-bis) has been introduced in Chapter 4 to test for possible differences in network density that depend on the type of liberalisation: “materially liberalised countries show higher decrease in postal network density compared to formally liberalised countries.”

Data presented in the previous Chapter show that materially liberalised Member States (Bulgaria, Estonia, Germany, Great Britain, Netherlands, Slovenia, Spain, and Sweden) registered an average decrease of more than 11% in the total number of permanent post offices, compared to only 7.4% of the formally liberalised countries (Austria, Denmark, Finland, France, Ireland, Italy, Norway, and Portugal). Even the average number of inhabitants served by a permanent office increased more in the countries with material liberalisation (+17.5% on average) than in those with simply formal liberalisation (11.8% on average). In this respect, it is interesting to note that the countries that most reduced their postal network are Estonia and Great Britain, both materially liberalised, which witnessed respectively a 39% and a 25% reduction in the total number of post offices (+65% and +36% in the average number of inhabitants served by a permanent office). Therefore, the above stated sub-hypothesis can be said to be correct.

Germany and Bulgaria, however, are the Member States with the highest increase/smallest reduction, respectively +10.9% and +0% (-10% and -5% in the average number of inhabitants served by a permanent office), and they are both materially liberalised countries.

These results could appear surprising at a first sight; for this reason in the next sub-Section I analyse the differences in market configuration among the materially liberalised countries in order to find valid explanations for these findings.

7.2.2 Access vs end-to-end competition

The most distinctive feature that varies within liberalised countries and that allows to categorise them is the configuration of their postal market and the type of competition that takes place in those markets. Competition in the postal market indeed can be distinguished into access competition, where competitors make use of the existing infrastructure (usually

the incumbent's network), and end-to-end competition, where each operator builds up its own retail network. In respect to network density, the configuration of the market can be expected to have an influence on coverage because of the different strategies adopted by postal operators. In a situation where every postal undertaking creates its own physical network the total number of post offices is expected to increase (Crew & Kleindorfer, 2013); however, the corresponding reduction of the existing network by the incumbent in response to competitive pressures could overturn the overall benefits to service coverage (NERA, 2004). Testing the second sub-hypothesis ("Access competition leads to higher reductions in postal network density compared to end-to-end competition") can help to clarify the actual effects of end-to-end and access competition on network density.

On the one hand, the group of Member States with relevant end-to-end competition, which includes Bulgaria, Estonia, Netherlands and Sweden, registered an average 17% decrease in the total number of permanent post-offices. On the other hand, surprisingly, the Member States with access competition (Great Britain and Slovenia) registered on average only a 12.5% reduction in the same indicator. Finally, Germany and Spain, which have both forms of competition at the same time, registered a general increase in service coverage with a 3% growth in the total number of post offices. Thus, it can be affirmed that the second sub-hypothesis does not hold true for the case studies analysed in this thesis.

As explicated by NERA (2004), estimated economies of density can explain this difference in coverage between end-to-end and access competition by analysing the net efficiency of end-to-end competition at all points of the service territory versus provision of delivery postal services through the incumbent's network. In fact, NERA's findings show that the cost of serving a market of a certain size over a local/national territory with one delivery unit is lower than the cost of providing postal services to the same market with several competitive delivery units that build up parallel facilities everywhere. Hence, the high costs of end-to-end competition can explain the higher network density reduction compared to access competition.

7.3 DECLINING MAIL VOLUME

Many authors (Cremer et al., 2001; Crew & Kleindorfer, 2009; OECD, 2001 among many others) have claimed that the decline in mail volume in the EU is one of the main determinants of lower network density in the member states. As Jaag (2014) explained in detail, a decrease in the number of letter-post items sent every year leads to lower economies of scale, forcing the postal operators to cut their outlays by reducing their service network. This implies not only reducing the frequency of collecting and delivery, but also closing or merging small/rural post offices.

As I showed in the previous chapter, we assist to a general downward trend in the volume of mail in almost all the sample countries during liberalisation. This decline is caused by several factors (OECD, 2001): first of all, the increasing popularity of electronic means of communication has provided a cheap and accessible alternative to physical mail; secondly, new technologies have also changed the provision of many services, including some typical facilities that used to be delivered through the existing postal infrastructure (payment of municipal taxes and collection of pensions, for example, are now available on internet); thirdly, competition from express and parcels couriers has eroded the demand for letter-post services; lastly, but not less important, the recent financial crisis lead to a general reduction of consumptions by both individuals and businesses, with severe repercussion on the postal services as well (ERGP, 2014).

Considered that letter-post items represent the core business of postal operators, as well as one of their most important sources of revenue, they can be expected to have a deep impact on the operators' strategic decisions regarding network density and geographical coverage. For this reason, in order to correctly affirm that liberalisation affects the total number of postal outlets it is necessary to test also the effects of the reduction in mail volume on network density itself. To do this, in Chapter 4 I formulated this hypothesis: "A steeper decline in mail volumes leads to a steeper decline in network density." In case this

proposition turns out to be wrong, then it is possible to isolate the effects of liberalisation on network density and to draw valid conclusions on the observed phenomena.

In order to test the above-mentioned hypothesis, I compare the trend in mail volume with the variation in network density in each country in the six-year liberalisation period.

Country	Volume of mail	Postal network density
FINLAND	147.1%	-13.7%
SWEDEN	53.0%	-13.0%
AUSTRIA	-0.4%	-0.9%
BULGARIA	-4.7%	0.0%
GERMANY	-6.8%	10.9%
GREAT BRITAIN	-12.5%	-24.7%
PORTUGAL	-18.2%	-14.8%
FRANCE	-18.7%	-0.2%
ESTONIA	-18.7%	-39.2%
IRELAND	-20.0%	-19.6%
SLOVENIA	-20.1%	-0.4%
NETHERLANDS	-23.2%	-17.5%
DENMARK	-34.2%	-0.4%
SPAIN	-35.9%	-4.9%
ITALY	-37.2%	-6.9%
NORWAY	-64.9%	-3.0%

Table2: Comparison between variation in volume of mail and postal network density (measured with the total number of permanent post offices) in each Member State. Source: re-elaboration from UPU data.

Table 2 above shows the trend in mail volume in the selected Member States, together with the corresponding reduction/increase in postal network density (measured using the main indicator, total number of permanent post offices). Countries are ranked from the one with the highest increase in mail volume to the one with the highest decrease; darker cells correspond to smaller reductions both in volume of mail and postal network density. Therefore, if the hypothesis “a steeper decline in mail volumes leads to a steeper decline in network density” holds true, I would expect to see a parallel ranking in both columns.

Looking at table 2, however, it is immediately evident that there is no strong relationship between the trend in the number of letter-post items sent in each country and the corresponding increase/decrease in network density. For instance, Finland and Sweden, which are the only two Member States that registered an increase in mail volume, rank only 11th and 10th for what concern the reduction in total number of permanent offices (with a decrease around 13%, four points above the average of the sample, which decreased only by 9.3). In addition, countries like Denmark, Spain, Italy and Norway, which registered the highest decline in mail volume, had only small reductions in post office density compared to countries such as Great Britain and Estonia that lie at the middle of the distribution.

These findings contradict with the hypothesis presented above (“a steeper decline in mail volumes leads to a steeper decline in network density”) that, therefore, needs to be rejected. Indeed, these results represent a clear proof that there is no direct relationship between the volume of mail and postal network density.

7.4 UNIVERSAL SERVICE IN THE LIBERALISED POSTAL SECTOR

As a conclusion of this chapter, in this section I provide an overall justification for the changes in service coverage that took place in the EU after liberalisation.

As emerged from the data analysis and the discussion of the hypotheses, EU Member States registered a general reduction in postal network density in the years when liberalisation took place. Despite the influence of declining mail volumes and different market configurations, however, this decrease in the number of post offices and letter-boxes can be ascribed, at least partly, to the process of liberalisation itself. In the following paragraphs, I deal with some of the causes of the negative relationship between liberalisation and coverage.

7.4.1 The drivers of reduced network density

Preservation of an extensive network of post offices is usually justified on the need to provide postal services to all citizens at affordable rates. This objective has been usually

pursued through the creation of Universal Service Obligations that imposed on the incumbent operator certain requirements regarding service quality, such as a minimum frequency of delivery and collection and a minimum number of post offices and letter-boxes throughout the country. As the results of the empirical analysis show, the introduction of competition in the postal sector has led to a deterioration of the USO requirements, allowing the operators to reduce the density of their network.

In fact, for instance, two of the key functions of the retail network (collection of mail and sale of stamps) have cheaper alternatives to the classical post offices: letters may be collected from letter-boxes, and stamps can be sold by vending machines, in supermarkets or through other distribution channels. This puts pressure on the postal undertakings to close or merge small and rural post offices in order to integrate collecting, processing, and distributing functions and generate cost advantages (Filippini & Zola, 2005). In addition, as ERGP (2014) noted, “the timing of market liberalisation for the majority of countries coincided with the economic recession impacting general economic activity across Europe and which has contributed to accelerated declines in letter mail volumes.” This was a further incentive for most postal operators to remodel their network, generally by closing the smallest or least profitable outlets and converting directly-owned post offices to franchises, but even by relocating offices to take account of trends in urban population and customer flows.

However, as NERA (2004, p. 135) pointed out, “the retail post office network does provide the primary and in most cases sole means of acceptance for certain services such as parcels, insurance, proof of mailing etc. While these items are only a small proportion of the total volume of mail they have few substitutes and their existence places political and regulatory constraints on closing post offices.” Moreover, from the point of view of the society, the decision to close smaller postal outlets should not be based only on net cost effects, but also considering the probable negative effects on consumers’ welfare of this kind of reorganisation process. “For instance, the closure of a local post office could generate a loss of welfare for the population in terms of an increase in the generalised transport costs to

go to the postal office or the loss of a social local meeting point.” (Filippini & Zola, 2005, p. 7). This explains why the idea of the obligation for the State to provide universal service to its citizens was more easily addressed in a situation in which the State or other public institutions (national, regional or local) could impose quality requirements on the postal operators and the provision of services was under political control (Eliassen & From, 2009, p. 242).

Looking at the political dimension of the liberalisation process it is possible to explain also the relative differences in the trends that emerged in Chapter 6: Harker et al. (2013) noted that Public and Universal Service Obligations are a significant political instrument to negotiate the limit between the power of the EU and Member States’ autonomy, reflecting the tensions that exist between open competition and social policy. Torres & Pina (2002, p. 44), for example, could classify European countries basing on their approach to public administration and on the effects on service delivery. Their distinction between Anglo-Saxon countries (such as Great Britain, Ireland and the Netherlands), which put particular emphasis on efficiency, effectiveness and value for money, and Germanic and southern European public administrations, based legalistic and bureaucratic approaches inherited from the French model, could explain many differences in the reduction of network coverage across EU Member States.

7.4.2 The exception of Germany

In the context of my analysis, Germany clearly represent an exception. In fact, as I showed in the previous Chapters, Germany registered an opposite trend in all the indicators for network density compared to the average of the sample. Given that Germany witnessed a decrease in mail volume like the majority of the Member States, this difference cannot be justified on the basis of different demand for letter-post services or increased volume of business. However, there are several factors that can explain why Germany could achieve an increase in the total number of post offices and letter-boxes while the other liberalised countries could not.

Niederprüm et al. (2010), for example, examined some specific characteristics of the German postal sector and compared it to the other network industries in Germany. They noted that since full opening of the postal market, the USO has been imposed on the market as a whole and no longer only on one single 'universal service provider'. Among other USO criteria, the density requirement for nationwide availability and ubiquity of post offices now relate to all postal operators jointly. Whilst in the reference sectors (petrol filling stations, banks and food retail stores), stagnating or declining demand, modifications in consumer behaviour, mergers and increasing cost pressure have led to a decline in the number of retail outlets; in the postal sector, increasing competition, higher demand for parcels, and low investment and operating costs of new organisation models have resulted in a considerably rising number of postal outlets. Due also to the participation to the highly-competitive parcels market, the incumbent operator (Deutsche Post) has increased the total number of access points since full market opening (Niederprüm et al., 2010).

According to ERGP (2014), the implementation of competition and the entrants of new players on the market has been successful also because of the level of urbanisation: local and regional end-to-end competitors could successfully enter the market and build new postal outlets because they were able to realise economies of scale and density in the congested regions and urban agglomerations. In fact, in Germany two thirds of the carried letters remain in the local region. "Due to the limited geographical coverage they preferably target mailers generating a high percentage of local and/or regional letters in congested areas. The targeted customer base includes for example municipal authorities, tax offices or the local bank branch." (ERGP, 2014, p. 16). An improvement of the market potential is also realised by the access to the postal infrastructure of the incumbent and by cooperation between providers acting as networkers to make up for the absence of economies of scale and to extend coverage nationwide.

Finally, in a report on the developments in the postal sector prepared for the European Commission, Dieke et al. (2013, pp. 193–194) affirmed that "competitors in the letter post market have created a noticeable number of access points and street letter boxes only in

Germany where end-to-end competition for private and small business customers exists. Competitors in other countries with a substantial share of competition target larger business customers whose mail is collected at their premises.” In fact, German competitors provided 24,225 postal outlets and 5,481 public collection boxes for letters in 2011. These access points are located mainly in areas with a high density of (small and middle-sized) businesses that do not have a sufficient volume of mail to qualify for collection at their premises. In this respect, Niederprüm et al. (Niederprüm et al., 2010) suggested that the legal criteria for USO could be simplified: the requirement of a minimum of 12.000 post offices could indeed be abolished. This standard appears to be redundant as current market performance outperforms the legal requirements.

8. CONCLUSIONS

8.1 SUMMARY OF THE FINDINGS

In this thesis, I analysed the effects of liberalisation on service coverage in the postal sector. After having introduced the functioning of network industries and the main theories that underlie the relationship between liberalisation and coverage, I formulated two main hypotheses in order to provide guidance to the process of analysis. Then, after having planned the structure and operationalisation of the research, I proceeded with the empirical analysis and I presented the data needed to test the hypotheses. Finally, I proved the validity of the hypotheses and I provided an overall explanation for the results that emerged from the observational analysis.

In conclusion, considered the trends that took place in the sample countries after the opening of the market, it is possible to answer the main research question of this study ("Did the liberalisation of the postal sector lead to a reduction in service coverage?"). It is possible to affirm indeed that liberalisation led to a decrease of network coverage: despite the influence of other external factors (such as mail volume and market configuration), the process of liberalisation itself has been a main driver for the reduction of the total number of post offices and letter-boxes.

The first hypothesis of this thesis, "in the years immediately after liberalisation, countries witness a reduction in postal network density", has proven to be correct, with a general decline in network density in almost all the Member States. The rare exceptions to this general trend could be explained by the particular configuration of the national postal markets. In this respect, in order to control for other influencing variables, two additional sub-hypotheses have been tested: H1-bis, "materially liberalised countries show higher decrease in postal network density compared to formally liberalised countries", appeared to be partially correct, but H1-ter, "Access competition leads to higher reductions in postal network density compared to end-to-end competition", did not obtain any validation from the empirical analysis.

Finally, the examination of the second main hypothesis, “a steeper decline in mail volumes leads to a steeper decline in network density”, showed that there is no (strong) relationship between the variations in the volume of mail and the changes in postal network density. This is an additional proof that the reduction in the number of post offices and letter-boxes all across the EU is caused by other factors, and liberalisation is certainly one of them.

8.2 SOCIAL IMPLICATIONS

“Since they constitute an essential instrument for communication and information exchange, postal services fulfil a vital role which contributes to the objectives of social, economic and territorial cohesion in the Union. Postal networks have important territorial and social dimensions which make universal access to essential local services possible.” (Directive 2008/6/EC). With this statement, which I quoted at the beginning of this work, the European Commission has expressed its view on the need of postal services in the era of telecommunications.

As Calzada (2009) affirmed, coverage represents one of the core elements of service quality in the postal sector. Reductions in the density of the network due to liberalisation affect not only businesses and individuals that make use of the service, but also the development of the economy in general. In fact, on the one hand, a dense retail network is valued because it offers a community focal point, it supports the local economy by keeping a local shop open and it provides essential facilities, especially in rural areas (NERA, 2004, p. 135). On the other hand, the development of an efficient postal sector is regarded as an important driver of the economy by regulators. In the Third Postal Directive, the European Commission underlined “[...] the importance of completing the internal market as an instrument to foster growth and create more and better jobs, and the important role that effective services of general economic interest have to play in a competitive and dynamic economy. These Conclusions remain applicable to postal services as an essential instrument of communication, trade, and social and territorial cohesion.” (Directive 2008/6/EC, Art. 8).

8.3 RESEARCH LIMITATIONS

During this research, I encountered several obstacles and difficulties. Whilst some of them could be overcome or ignored without reducing the overall legitimacy of the research, others can have a strong influence on both the internal and external validity of the research.

One of the most important problems, for example, has been the selection of the liberalisation time-frame in each Member State: on the one hand, the implementation of new regulations does not take place immediately but it is often a process that can take several months or even years. Therefore, in some cases it is difficult to agree on the exact moment in which the postal sector was liberalised in a certain country. On the other hand, even the choice of a six years' time span to test the effects of liberalisation is arbitrary: even though it allows to take into account most of the changes in coverage, it is still a short-term perspective and it does not measure the long-term effects of liberalisation.

Another crucial issue that I faced during this study is the number of case studies available. In fact, in principle I planned to examine not only the Member States that opened their postal market to competition before 2011, but also those that were liberalised more recently or that have not been liberalised at all. However, it resulted to be difficult not only to find up-to-date data for these countries, but also it raised problems regarding the terms of comparison between liberalised and non-liberalised countries: while liberalised Member States were observed within a six years' period centred on the liberalisation year, how should have been analysed those Member States that hadn't opened their market yet?

Finally, the data retrieved from the Universal Postal Union database presented some holes and incongruences: as I already pointed out in Chapters 5 and 6, the indicators are not available for all the selected Member States within the entire time-frame. For this reason, some indicators had to be combined (for example the average number of letter-post items posted per inhabitant and the number of letter-post items, domestic service), some gauges had to be estimated basing on the available data, and even some countries had to be omitted from the analysis (Iceland and Belgium).

8.4 RECOMMENDATIONS FOR FURTHER RESEARCH

Because of the important social implications of this field of research, other studies could be conducted to investigate more in depth the dynamics that cause the reduction of postal network density and to propose policy advices that could improve the quality of the postal sector. Although I mentioned some possible explanations for the situation of the German postal market, more research could be done to analyse the policies that have been implemented and the actual reasons for the increase in the number of postal outlets and letter-boxes.

In addition, the importance of the results obtained could be much higher if it was possible to generalise these findings not only the postal sector in other countries, but also to the other network industries in general. Further research should be undertaken in other sectors such as telecommunications, banks and energy sector in order to test the causal relationship between the implementation of full market opening (and the removal of any legal requirement or barrier to competition) and the ubiquity and accessibility of the service.

In conclusion, as affirmed by CERRE (2014, p. 39), "postal services are affected by the evolution of other sectors, especially intermodal competition for communication services. The European Commission should therefore initiate a discussion on whether USO is still meaningful for mail alone, as there are alternative technologies that allow communications to benefit also more remote areas."

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APPENDIX

Country	X-3	X+3	Trend
AUSTRIA	2008	2013	2008-2013
Total number of permanent post offices	1912	1894	-0.94%
Average number of inhabitants served by a permanent office	4,362	4,485	2.81%
Number of letter-boxes	17401	16111	-7.41%
Number of letter-post items, domestic service	6240000000	6215000000 ⁴	-0.40%
BULGARIA	2008	2013	2008-2013
Total number of permanent post offices	2981	2981	0.00%
Average number of inhabitants served by a permanent office	2,546	2,422	-4.85%
Number of letter-boxes	5286	4836	-8.51%
Average number of letter-post items posted per inhabitant	18,319	17,453	-4.73%
DENMARK	2008	2013	2008-2013
Total number of permanent post offices	751	748	-0.40%
Average number of inhabitants served by a permanent office	7,319	7,512	2.63%
Number of letter-boxes	10000	8641	-13.59%
Number of letter-post items, domestic service	934698000 ⁵	615000000 ⁶	-34.20%
FRANCE	2008	2013	2008-2013
Total number of permanent post offices	17082	17052	-0.18%
Average number of inhabitants served by a permanent office	3,635	3,770	3.71%
Number of letter-boxes	150000	140331	-6.45%
Number of letter-post items, domestic service	1672000000 ⁷	1360000000 ⁸	-18.66%
IRELAND	2008	2013	2008-2013
Total number of permanent post offices	1426	1147	-19.57%
Average number of inhabitants served by a permanent office	3,052	4,034	32.16%
Number of letter-boxes	6300	5800	-7.94%
Average number of letter-post items posted per inhabitant	196,468	157,155	-20.01%
ITALY	2008	2013	2008-2013
Total number of permanent post offices	13991	13019	-6.95%

⁴ Data from 2011

⁵ Excludes newspapers and unaddressed advertising items

⁶ Not including registered items, insured letters, newspapers and unaddressed advertising items

⁷ Including the international service but not including newspapers or unaddressed advertising items

⁸ Including the international service

Average number of inhabitants served by a permanent office	4,280	4,684	9.44%
Number of letter-boxes	61500	52000	-15.45%
Average number of letter-post items posted per inhabitant	104,486	65,614	-37.20%
NORWAY	2008	2013	2008-2013
Total number of permanent post offices	1455	1412	-2.96%
Average number of inhabitants served by a permanent office	3,284	3,571	8.73%
Number of letter-boxes	24762	21608	-12.74%
Average number of letter-post items posted per inhabitant	540,306	189,542 ⁹	-64.92%
PORTUGAL	2008	2013	2008-2013
Total number of permanent post offices	2866	2442	-14.79%
Average number of inhabitants served by a permanent office	3,710	4,344	17.07%
Number of letter-boxes	17449	11475	-34.24%
Average number of letter-post items posted per inhabitant	165,757	135,562 ¹⁰	-18.22%
SLOVENIA	2008	2013	2008-2013
Total number of permanent post offices	558	556	-0.36%
Average number of inhabitants served by a permanent office	3,616	3,726	3.04%
Number of letter-boxes	3054	2322	-23.97%
Average number of letter-post items posted per inhabitant	532	425	-20.11%
SPAIN	2008	2013	2008-2013
Total number of permanent post offices	3183	3026	-4.93%
Average number of inhabitants served by a permanent office	14,183	15,507	9.34%
Number of letter-boxes	33609	33609	0.00%
Number of letter-post items, domestic service	5123200000 ¹¹	3282400000	-35.93%
SWEDEN	1991	1996	1991-1996
Total number of permanent post offices	1978	1720	-13.04%
Average number of inhabitants served by a permanent office	4,356	5,144	18.09%
Number of letter-boxes	40176	36676	-8.71%
Average number of letter-post items posted per inhabitant	490405 ¹²	502424	2.45%
GREAT BRITAIN	2003	2008	2003-2008

⁹ Data from 2012

¹⁰ Data from 2012

¹¹ Excludes electoral postal traffic, registered items and insured letters

¹² Data from 1993

Total number of permanent post offices	15868	11952	-24.68%
Average number of inhabitants served by a permanent office	3,760	5,126	36.31%
Number of letter-boxes	116000	115500	-0.43%
Average number of letter-post items posted per inhabitant	358203	313412	-12.50%
FINLAND	1991	1996	1991-1996
Total number of permanent post offices	2075	1791 ¹³	-13.69%
Average number of inhabitants served by a permanent office	2,414 ¹⁴	2,851 ¹⁵	18.14%
Number of letter-boxes	14000	14103 ¹⁶	0.74%
Average number of letter-post items posted per inhabitant	153341	378892	147.09%
GERMANY	2005	2010	2005-2010
Total number of permanent post offices	12671	14050	10.88%
Average number of inhabitants served by a permanent office	6,522	5,857	-10.20%
Number of letter-boxes	108000	110000	1.85%
Number of letter-post items, domestic service	21437000000 ¹⁷	19970000000	-6.84%
ESTONIA	2006	2011	2006-2011
Total number of permanent post offices	564	343	-39.18%
Average number of inhabitants served by a permanent office	2,375	3,908	64.50%
Number of letter-boxes	3136	2896	-7.65%
Average number of letter-post items posted per inhabitant	195278	158673 ¹⁸	-18.75%
NETHERLANDS	2006	2011	2006-2011
Total number of permanent post offices	3150	2600	-17.46%
Average number of inhabitants served by a permanent office	5,199	6,409	23.27%
Number of letter-boxes	19110	18000	-5.81%
Number of letter-post items, domestic service	4918000000	3777000000 ¹⁹	-23.20%
AVERAGE 16 COUNTRIES			TREND
Total number of permanent post offices			-9.26%
Average number of inhabitants served by a permanent office			14.64%
Number of letter-boxes			-9.39%
Number of letter-post items, domestic service			-10.38%

¹³ Data from 1995

¹⁴ Data from 1992

¹⁵ Data from 1995

¹⁶ Data from 1995

¹⁷ Including international service - dispatch

¹⁸ Data from 2010

¹⁹ Data refer to addressed items only

Total number of permanent post offices¹

Country	X-3	X-2	X-1	X+1	X+2	X+3
GERMANY	12671	12500	13526	13445	13550	14050
GREAT BRITAIN	15868	14609	14376	14219	13756	11952
ITALY	13991	13957	13978	13923	13159	13019
FRANCE	17082	17107	17079	17054	17041	17052
AUSTRIA	1912	1552	1850	1880	1931	1894
BULGARIA	2981	2981	2981	2981	2981	2981
FINLAND	2075	2073	1976*	1879	1791	1667*
NETHERLANDS	3150	3150	3150	2144	2372*	2600
PORTUGAL	2866	2882	2890	2556	2557	2442
SWEDEN	1978	1978	1836	1786	1745	1720
DENMARK	751	867	816	795	785	748
ESTONIA	564	502	417	374	403	343
IRELAND	1426	1236	1164	1156	1152	1147
NORWAY	1455	1443	1434	1428	1417	1412
SLOVENIA	558	558*	557	556	556	556

*Estimates (calculated as arithmetic mean with year before/after)

¹Data for Spain are available only for 2008 and 2013

Average number of inhabitants served by a permanent post office²

Country	X-3	X-2	X-1	X+1	X+2	X+3
ESTONIA	2,376	2,675	3,219	3,587	3,328	3,908
FINLAND	2,414	2,429	2,568	2,707	2,852	3,090
BULGARIA	2,547	2,530	2,514	2,498	2,482	2,423
IRELAND	3,053	3,570	3,840	3,915	3,975	4,034
NORWAY	3,285	3,350	3,405	3,449	3,501	3,571
SLOVENIA	3,617	3,630	3,644	3,660	3,669	3,727
FRANCE	3,635	3,650	3,676	3,672	3,724	3,770
PORTUGAL	3,711	3,698	3,694	4,132	4,184	4,344
GREAT BRITAIN	3,761	4,105	4,191	4,256	4,427	5,126
ITALY	4,281	4,317	4,332	4,366	4,633	4,685
SWEDEN	4,356	4,387	4,759	4,921	5,058	5,144

AUSTRIA	4,363	5,393	4,537	4,475	4,365	4,485
NETHERLANDS	5,200	5,220	5,239	7,724	7,067	6,410
GERMANY	6,523	6,611	6,101	6,134	6,082	5,858
DENMARK	7,320	6,372	6,802	7,010	7,125	7,512

²Data for Spain are available only for 2008 and 2013

Number of letter-boxes³

Country	X-3	X-2	X-1	X+1	X+2	X+3
SLOVENIA	3054	2926*	2799	2608	2345	2322
ESTONIA	3136	3123	3115	3114	3114	2896
BULGARIA	5286	5185	5153	4902	4904	4836
IRELAND	6300	6300	5900	5900	5000	5800
DENMARK	10000	9200	9600	10200	8778	8641
AUSTRIA	17401	17115	16881	16505	16307	16111
PORTUGAL	17449	16655	15855	11984	11194	11475
NETHERLANDS	19110	19000	18562	18000	18000	18000
NORWAY	24762	24359	23600	22900	21450	21608
SWEDEN	40176	38088*	36000	36676	36698	36676
ITALY	61500	60000	60000	58000	53400	52000
GERMANY	108000	108000	108000	108000	108000	110000
GREAT BRITAIN	116000	116000	113000	116000	116000	115500
FRANCE	150000	150000	150000	144610	141646	140331

*Estimates (calculated as arithmetic mean with year before/after)

³Data for Spain are available only for 2008 and 2013; data for Finland are available only for 1992, 1994, 1995

Number of letter-post items, domestic service⁴

Country	X-3	X-2	X-1	X+1	X+2	X+3
GREAT BRITAIN	20749	21030	20790	20323	19903	18767
GERMANY	21437	20887	20857	21818	20702	19970
FRANCE	16720	15899	15365	14900	14250*	13600

AUSTRIA	6240	6210	6250	6215	NA	NA
ITALY	6138	5627	5371	4934	4325	3923
NETHERLANDS	4918	4701	4693	4473	4070	3777
SWEDEN		2850	4196	4210	4324	4360
NORWAY	2541	2255	2265	2325	926	861
SLOVENIA	1067	1038*	1010	1013	930	875
DENMARK	935	962	777	800	690	615
PORTUGAL	994	951	918	869	800	757
FINLAND	747	750	739	1110	1143	1910
IRELAND	652	646	603	614	538	526
ESTONIA	49	49	45	40	29	26
BULGARIA	49	33	24	19	16	15

*Estimates (calculated as arithmetic mean with year before/after)

⁴Data for Spain are available only for 2008 and 2013

Average number of letter-post items posted per inhabitant⁵

Country	X-3	X-2	X-1	X+1	X+2	X+3
SLOVENIA	533	517*	501	502	459	426
SWEDEN	NA	NA	490	490	500	502
NORWAY	540	472	468	476	190	NA
GREAT BRITAIN	358	358	353	343	334	313
ESTONIA	195	204	183	154	159	NA
IRELAND	196	183	169	171	156	157
PORTUGAL	166	160	155	148	136	NA
FINLAND	153	153	150	226*	302*	379
ITALY	104	95	90	82	72	66
BULGARIA	18	18	24	24	21	17

*Estimates (calculated as arithmetic mean with year before/after)

⁵Data for Austria, Denmark, France, Germany, Netherlands, and Spain are not available in the selected years