

# A Report to the European Commission DG-MARKT

Prepared by NERA

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# The views and opinions expressed in this study are those of the authors and do not necessarily reflect the position of the European Commission

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# EXECUTIVE SUMMARY

#### **Objectives of the Study**

- 1. This is the report of a study conducted by NERA Economic Consulting for the European Commission. The <u>aim of the study</u> was to provide for a fuller shared understanding of the economics of postal services, in particular of the scale and nature of the costs inherent in postal provision and about the different ways postal operators in the Member States have developed their business organisation and strategy.
- 2. This fuller understanding and greater transparency was intended to provide an essential analytical underpinning for the further development of Community policy in this area, prior to further steps towards the full accomplishment of the internal market or any other appropriate step.

#### How We Undertook the Work

- 3. The analysis was based on an initial data gathering exercise based on a detailed questionnaire to postal operators, a less detailed letter to postal regulators, and an extensive review of published information in annual reports, operator websites and other sources. We also consulted with stakeholders from the sector at two stakeholder meetings.
- 4. On the basis of the information collected, the report describes the way in which provision of postal services in Europe has been changing, analyses the way postal strategies have been developing (and the way we expect them to develop in the future), reviews the information available on postal costs, and explains developments with regard to the provision of retail networks.
- 5. We also developed our own econometric model of postal costs in Europe. We compared the results with those from previous studies of costs in the postal sector.

## The Changing Nature of Postal Provision

6. Postal services in the European Union are changing. Since the adoption of the Postal Directive and its transposition into national legislation, a number of important market developments have taken place. Postal operators have moved towards a market-driven provision of postal services, in some cases accompanied by partial privatisation. Changes have been made to sorting and delivery networks to increase efficiency. Postal operators have increasingly diversified into non-universal services such as express and logistics, and there is a trend towards internationalisation of the sector.

- 7. The activities that postal operators undertake to deliver their services are very similar to each other. However, there are important differences in *how* these activities are undertaken and in how the postal infrastructure is organised. Many, but by no means all, of these operational differences between countries reflect historical differences in the legacy of post boxes, sorting and delivery offices as well as geographical differences between countries rather than markedly different strategic approaches to processing the mail.
- 8. The <u>collection</u> activity is now dominated by collections from business premises, though post boxes are still important because of the universal service obligation. Post box density varies considerably between countries, in part reflecting population density differences, but also in part the regulatory constraints that postal operators face. A few operators have third party collection arrangements, implying a partial outsourcing of the collection activity.
- 9. <u>Sorting</u> is increasingly undertaken automatically, and many operators have plans for further increases in the use of automation. The differences between the percentages of mail sorted automatically and the percentages that are machinable show that there is indeed scope for further automation in many countries. Deutsche Post World Net and TPG are among the operators achieving the highest percentages of mail sorted automatically, perhaps as a result of strong cost efficiency incentives faced by these listed companies.
- 10. In the <u>transport</u> area, a large shift, particularly from rail to road has occurred in recent years. Transport is also one of the areas where a degree of outsourcing is starting to develop. Reorganising the transport network is often related to changes in the sorting office network.
- 11. <u>Delivery</u> costs can be reduced in several ways, for example by reducing delivery frequencies where the universal service obligation is not binding, retiming deliveries, and simplifying the role of delivery (allowing lower wages). The number of delivery offices tends to be particularly high in Eastern European countries. However, when expressed per thousand square km, the differences are less pronounced, suggesting that geographical factors (transport costs) as well as mail volumes are factors influencing the efficient number of delivery offices.
- 12. In regard to <u>parcels</u> and <u>express</u>, many universal service providers share facilities between letter mail on the one hand, and parcels and express on the other. The post office network is the most obvious facility to be shared, but (parts of) sorting, transport and delivery networks are also shared in a number of cases. When volumes are high, however, parcels and express delivery networks tend to be separate. Our analysis therefore suggests that there are economies of scope between the non-delivery elements of the parcels/express and letter mail networks, and even between the delivery elements in the low-volume parts of the network.

#### **Developing Postal Business Strategies**

- 13. The report reviews the ways that postal business strategies have been developing across Europe.
- 14. There have been major changes to the <u>external environment</u> in which postal services are provided. We identify three main factors:
  - the <u>changing composition of demand</u>, with some operators experiencing reductions in total mail volumes;
  - <u>regulatory developments</u>, including market opening, and, in some Member States, explicit regulation of prices and of downstream access to the universal service provider's delivery network; and
  - <u>corporatisation, or even privatisation</u>, of the universal service provider.
- 15. Against this background, operators have adopted a number of strategies, including <u>vertical integration</u> (into activities such as logistics), <u>horizontal integration</u> (into express markets, often through acquisitions), <u>internationalisation</u> (again sometimes through acquisitions, and in some cases driven by "economies of skill" which result from being first to benefit from the need to respond to economic incentives in the domestic market), <u>implementation of cost efficiency measures</u> (which may be in response to increased competition, regulation of tariffs or financial difficulties), and <u>new product strategies</u> (including priority/non-priority mail, hybrid mail, and sales channel innovations).
- 16. The report develops a typology of postal operators that is shown in Figure 1. We identify two principal dimensions, the services offered, and the degree of internationalisation of the business ("reach"). The figure shows all universal service operators (denoted by their country abbreviation), the two remaining independent global express providers (Fedex and UPS), and the position of most competing private operators. In the main body of the report we categorise universal service providers under the headings "global ambitions", "cautious expansion" and "consolidating existing position". We also show what we expect to be the direction of future developments.

Figure 1 Typology of Postal Operators



- 17. NERA believes that business strategies of postal operators may impact on the economics of postal services in the following ways:
  - <u>horizontal integration into the express market</u>, mainly caused by changed customer demands, may allow a consolidation of domestic parcel services into the express business;
  - <u>the internationalisation of the industry</u>, caused by changed customer demands and the trend towards corporatisation/privatisation of universal service providers, may lead to cost efficiencies and, in some cases, the exploitation of some (rather limited) economies of scale;
  - <u>the cost reduction strategies</u> of postal operators, caused by changes in customer demands (including substitution to electronic products), privatisation/corporatisation, competition between operators and incentives provided by regulation, will not only lead to lower cost levels (and the report quotes some examples) but could also as a result increase the difficulty of market entry by making it more difficult for new entrant firms with lower

traffic volumes to compete with established operators because of cost disadvantages; and

• some of the <u>product strategies</u> pursued by postal operators (not shown in the chart, but see Section 4.3.6) also may make entry more difficult because new entrants may not be able to offer as wide a range of services as their established competitor.

## **Postal Costs in Europe**

- 18. The amount of information on cost levels provided by operators in response to our questionnaire was variable, so we supplemented this information with published information from annual reports, websites and other sources. Our report provides a summary of the data available.
- 19. Naturally total costs rise with mail volumes, and Figure 2 shows that operators which experienced more rapid increases in volumes also had greater increases in costs.



Figure 2 Changes in Letter/Parcels Costs and Changes in Mail Volumes

20. Labour costs are the largest single component of postal costs, averaging 63 per cent in the 20 universal service providers for which we have detailed data. Figure 3 shows how these proportions vary across the countries, with the lowest proportion in Luxembourg where terminal dues form an important component of costs.





21. In contrast capital charges, in the form of depreciation/amortisation charges, form a low proportion of total postal costs, as shown in Figure 4. For the 19 countries for which we have data, capital charges averaged 5.2 per cent of total costs.

Figure 4 Depreciation/Amortisation Costs as Percentages of Total Costs by Operator, 2002



22. The proportion of costs accounted for by different activities varies between letters and parcels. Figure 5 summarises the differences for a number of countries for which comparable information is available. Delivery costs are the most important single component of costs, but delivery accounts for a higher proportion of total costs in letters (where it accounts for a half of total costs) than it does in parcels. In contrast transport costs are proportionately more important in parcels than they are in letters.



Figure 5 Costs of Activities in Letters and Parcels

#### Initial View of the Determinants of Postal Costs

- 23. In understanding postal costs it is important to distinguish between <u>economies of scale</u>, <u>economies of density</u> and <u>economies of scope</u>. These determine what happens to unit costs when traffic volumes or mix change. Returns to density show what happens to unit costs when traffic increases on a fixed network, while returns to scale show what happens when network size and traffic both increase in the same proportion.
- 24. We have presented plots of unit costs against the factors that we expect to impact on costs. These factors include traffic volumes, traffic network density (mail per household), demographic factors (overall population density and the proportion of the population living in urban areas), postal infrastructure (sorting offices, delivery offices, and post boxes), regulatory constraints and quality of service performance. It is difficult to determine underlying patterns using this approach, and so the more important part of our analysis concentrates on the use of econometric analysis

#### **Review of the Econometric Approach**

25. The econometric approach to cost estimation involves establishing a statistically significant relationship between costs and the factors affecting costs. The approach has been widely used in the postal sector, and the results of many of the studies using the approach have been published in the academic and other literature. This

literature provides a valuable resource for the understanding of how and why costs vary in the postal sector, and we include a survey of it as part of the present report.

- 26. A major advantage of the econometric approach is that it is able to control for the impact of a range of different factors that impact on costs simultaneously. One postal operator might have higher unit costs than another, and both higher output and higher hourly wage costs the econometric approach can in principle separate out the impact of output on unit costs (i.e. whether there are economies or diseconomies of scale) from the impact of higher hourly wage rates on unit costs.
- 27. Not only can the econometric approach identify individual factors affecting costs, but it can also quantify the impact of individual cost drivers. This enables one to estimate the marginal or incremental costs of changes in the levels of cost drivers, for example estimating the marginal cost of an increase in the level of a particular type of output, or estimating how costs would change if a particular component of cost, such as staff wages, should change.

## A European Postal Cost Function

- 28. The main difficulty in applying the econometric approach is to obtain sufficient data of suitable quality to perform the econometric analysis. In the present study we have converted the data that we had available into as comparable a form as possible.
- 29. We then used this data set to estimate a total cost function, and cost functions for each of the main postal activities, collection, sorting, transportation and delivery.
- 30. We find that total costs (of letter mail and parcels) are primarily determined by unit wages, letter mail volumes, parcels volumes, the number of households, and demographic factors (of which the proportion of the population living in urban areas has better explanatory power than overall population density).
- 31. The evidence in the EU15 shows constant returns to scale and economies of network density. A 10 per cent increase in traffic on a fixed network would be expected to increase total costs by 6.5 per cent. A 10 per cent increase in the proportion of the population living in urban areas would be associated with a 6.7 per cent reduction in total costs. We also find that unit costs are lower when traffic volume density (defined in terms of mail handled per household) increases.
- 32. While there are also economies of density in the new Member States, our evidence suggests that there may also be economies of scale for universal service providers in these countries. Marginal costs per item handled are lower in the new Member States (where wage rates are lower) than in the EU15 countries.

- 33. In regard to <u>collection costs</u>, collection cost levels are positively related to the numbers of post boxes. There are economies of density in collection costs: holding constant the number of post boxes, a 10 per cent increase in mail volumes in the EU15 would be associated with a 6.8 per cent increase in collection costs, so unit collection costs would fall.
- 34. In regard to <u>sorting costs</u>, these are positively related to the number of sorting offices, but a 10 per cent decrease in the number of sorting offices would reduce sorting costs by 2.9 per cent. Our results also indicate that there are economies of scale in sorting costs increasing both mail volumes and the number of sorting offices in proportion would reduce unit sorting costs.
- 35. In regard to <u>transportation costs</u>, these are positively related to the numbers of post offices and to the geographical area of the country. We find evidence of economies of scale in the transport function.
- 36. The <u>delivery cost</u> function shows evidence of economies of density, with a 10 per cent increase in traffic leading to about a 6 per cent increase in delivery costs. Delivery costs are also negatively related to the proportion of the population living in urban areas: a 10 per cent increase in this proportion is associated with a 5.4 per cent reduction in delivery costs.

#### **Retail Networks**

- 37. The report reviews the <u>provision of retail post office networks</u> across all of the Member States. There are regulatory requirements for provision of post offices that vary between different countries, but most postal operators face political, regulatory or administrative constrains on reducing the number of retail outlets, particularly in rural areas. Where governments wish to maintain uneconomic post offices for social policy reasons, they have provided direct financial support (Ireland, Sweden, UK) or extensive tax relief (France). In general, management flexibility to adjust the size of their network is restricted by regulators or by direct government involvement.
- 38. Nevertheless, most postal operators have been remodelling their networks, usually by closing the smallest or least profitable offices and converting directly-owned post offices to franchises, but also by relocating or opening new urban offices to take account of changes in urban population and customer flows. Some operators have developed different formats of post office with different brand names each aimed at a different market (Austria, Denmark, Norway and Sweden). In addition, most networks have also been modernising their outlets and introducing improvements for customers.

39. A major change has been the extension of franchising of retail outlets. Franchising can reduce (and cap) the cost of providing retail services to customers, and it offers a number of advantages with comparatively few disadvantages: it allows the potential to widen what would otherwise be a fairly narrow product line; it allows employees' time to be spread between postal and non-postal customers; it attracts customers who might then buy other products; and it may allow for longer opening hours than would be expected at traditional postal counters.

#### **Conclusions on the Economics of Postal Services**

- 40. The final chapter of the report brings together the material from the individual chapters to present NERA's final conclusions on the economics of postal services and the implications for the dynamic development of the sector.
- 41. Our report has brought together an analysis of the postal sector and postal costs across the whole of the enlarged EU.
- 42. In this study we have undertaken a detailed assessment of the evidence on costs in the sector, and have provided an assessment of the impact of different cost drivers. This assessment of the impact of different cost drivers has been based both on a literature review of previous cost studies, and on our own econometric analysis of the data which we have collected from operators and from published sources. We have complemented this with a review of business strategies across the sector to assess the impact of developing strategies on the economics of postal services.
- 43. On the basis of our analysis of costs we believe that barriers to entry related to costs are low for small scale postal operations. However, the cost barriers progressively increase once the scale of operation becomes larger and become high for a postal network with universal coverage involving large-scale automated sorting centres.
- 44. The cost economics of the industry also mean that there is scope for competition in a number of activities in the value chain, particularly collection of business mail, transportation of mail, and some sorting. Competition in delivery is more difficult, but not impossible.
- 45. <u>Provided access to delivery networks is granted where necessary</u>, we believe that the scope for competition in postal services is significant. In particular, we believe that a large part of the market for mail sent by businesses is potentially open to competition. Business mail often involves large volumes, mass mailings are often pre-sorted and many types of bulk mailings are not sensitive to transit times.

- 46. Competition in the market for consumer-to-consumer mail, particularly where this is time-sensitive, is much less open to competition. This market is characterised by relatively dispersed volumes of traffic across the network, and requires, for a network with national coverage able to compete with the universal service provider, a number of large-scale automated sorting centres. In combination with the low individual mail flows, we do not envisage that entrants will actively compete for consumer mail, except on a small scale (e.g. local mail within large cities). Consequently we believe that this market will to a large extent continue to be served by the universal service provider. Moreover, given that the national infrastructure for consumer mail is already in place, the universal service provider can benefit from substantial economies of scope in handling business mail, which will restrict the market shares of competitors in the business mail market.
- 47. In regard to the long-term dynamics of the industry, we believe that it will be based on:
  - a continuing important role for the universal service provider in all countries;
  - development of competition for, in particular, business mail in all countries, with competitors achieving small but significant market shares;
  - a consolidation of the most important players in the industry into a number of large groups;
  - a need for those groups to offer a one-stop-shop and therefore to have a presence in as many countries as possible; and
  - increased separation between mails services and retail services.

# 1. INTRODUCTION

# 1.1. This Report

This is the final report of a study that has been carried out for the European Commission, DG-MARKT, by NERA Economic Consulting.

# **1.2.** Our Terms of Reference

According to the Commission's Terms of Reference, the aim of this study is to provide for a fuller shared understanding of the economics of postal services, in particular of the scale and nature of the costs inherent in postal provision and about the different ways postal operators in the Member States and Candidate Countries have developed their business organisation and strategy.

This fuller understanding and greater transparency is intended to provide an essential analytical underpinning for the further development of Community policy in this area, prior to further steps towards the full accomplishment of the internal market or any other appropriate step.

The scope of the study includes:

- the nature and scale of postal costs and the ability to vary these costs according to changes in volumes (including impact of economies of scale and scope);
- the breakdown of costs into different components by "value chain" (collection, sorting, transport, delivery), and by different factor inputs (labour, materials, capital);
- the impact of key trends in public and private postal organisation and strategy for example in process and organisational innovations (with case studies);
- a comparison of the different approaches that public and private, USO and non-USO, operators have taken to the organisation of their value chain;
- the relationship of public and private providers' retail outlets with postal services provision (including with universal service provision); and
- the development of a model of costs of postal provision.

Three diagrams in the Terms of Reference gave an indication of the approach that was to be followed.

Figure 1 (Figure 1.1 below) sets out a simplified diagram of postal provision across the postal value chain. Figure 2 (Figure 1.2 below) identifies an indicative list of inter-related

factors for consideration at the macro level. Finally, Figure 3 (Figure 1.3 below) provides an indicative list of key factors and inter-relationships to be considered at a micro level, that is, across each of the steps of the value chain.





Source: Figure 1 of Commission Terms of Reference.





Source: Figure 2 of Commission Terms of Reference.





Source: Figure 1.3 of Commission Terms of Reference.

# **1.3.** Coverage of the Study

The study covers the 25 countries that are now members of the European Union, that is, the existing members at the time the study commenced:

• Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, the United Kingdom;

and the new Member States who joined on May 1st 2004:

• Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia.

The study also covers mail, parcels and express operations. A major feature of the study is that it covers a wide range of different networks in the 25 Member States of the European Union.

## 1.4. Structure of the Rest of this Report

The structure of the rest of this report is as follows:

- Chapter 2 explains the approach that we have used, including our data and other information sources, and our workplan.
- Chapter 3 provides a view of the changing nature of postal provision, including a review of the way that postal services are provided across different countries and providers.
- Chapter 4 shows how postal business strategies have been developing in different countries.
- Chapter 5 provides an overview of the information that we have collected on postal cost levels in different countries.
- Chapter 6 provides an initial view of the factors affecting postal costs, and particularly the unit costs of postal services.
- Chapter 7 of the report contains a detailed review of previous econometric cost studies in the postal sector that we have undertaken as part of the present study.
- Chapter 8 presents the results of our own econometric analysis of cost drivers in the postal sector which we have developed using the data collected in this study.
- Chapter 9 presents a review of information on the retail network in the postal sector.
- Finally, Chapter 10 sets out our main conclusions.

The report also includes a number of appendices:

- Appendix A provides a brief review of the theory of the cost function.
- Appendix B provides a review of the main published studies on the econometric estimation of the cost function in the provision of postal services.
- Appendix C consists of a set of individual country studies for each of the 25 Member States.
- Appendix D provides details of how we have prepared a consistent data set for our econometric analysis.

# 2. OUR APPROACH

## 2.1. Methodology

Our work has proceeded as follows:

- At the beginning of the project we:
  - Undertook an initial review of publicly-available data on operator websites, collected annual reports and reviewed relevant published evidence;
  - Met with the Commission to discuss the project.
- We prepared a very detailed questionnaire for operators. This questionnaire was discussed both with the Commission and with one of the major universal service providers. We also prepared a letter to national regulators asking for their views.
- The questionnaires were circulated to each of the 25 universal service providers, and to a number of private (including express) operators, and the letters were sent to regulators.
- We attended the first stakeholder meeting in Brussels on February 4<sup>th</sup>, where we explained the basis of our study, went through the questionnaire, and requested cooperation from the stakeholders. We subsequently attended a meeting of the Postal Users Group to elicit the views of users.
- We had asked for responses to the questionnaire by February 29<sup>th</sup>, but this proved unrealistic eventually we received responses from all but two of the national operators, though the last of these was only received on about May 17<sup>th</sup>. Most of the regulators responded much more quickly than the operators though the burden of information collection that we imposed on them was much less than the one we imposed on the operators.
- We reviewed the literature on previous econometric studies on costs in the postal sector, and assessed their relevance for the present study. This is the material in Chapter 7 and Appendix B of this report.
- We submitted an interim report to the Commission reviewing progress on March 29<sup>th</sup> and met with them shortly afterwards.
- Once we had received the responses to the questionnaire we drafted sets of country reports detailing as much information on costs as possible. To do this we had to revisit the operators' annual reports and websites to fill in as much as possible of the missing information on costs. The country reports are contained in Appendix C.

- We carefully constructed a database to use in our own econometric estimation of a European postal cost function. In particular, it was important to ensure that the data from different countries were prepared on as comparable a basis as possible.
- We used the questionnaire responses (and some other sources) to prepare our review of the changing nature of postal provision. This is Chapter 3 of this report.
- We used the questionnaire responses, our own knowledge of the way that the industry is developing, and a search of published information (including market information) to write our review of developing postal business strategies. This is Chapter 4 of the report.
- We have also held face-to-face meetings with the universal service providers in Spain, The Netherlands and the United Kingdom.
- We used the material in the country reports and the data set we had constructed to provide the overall summary of the evidence on postal costs which appears in Chapter 5 of the report.
- We undertook a graphical analysis of relationships between unit costs and other variables which is reported in Chapter 6.
- We undertook detailed econometric estimation to produce the results for both total cost functions, and cost functions for individual activities (collection, sorting, transportation and delivery) that are reported in Chapter 8. Appendix A provides a more technical introduction to the theory of the cost function.
- We combined the answers to the questionnaires on retail networks with published information to produce the survey on retail networks and the way that they are developing which is reported in Chapter 9.
- Finally, for this final report, we combined the information from the various sections to present our overall conclusions in Chapter 10.
- We presented our interim results at the Second Stakeholders' Meeting held in Brussels on June 9<sup>th</sup>.
- The final version of this report has taken account of a detailed response from the Commission on our Draft Final Report, as well as feedback from the Second Stakeholder Meeting.
- We have also produced a spreadsheet to run different scenarios based on our econometric model.

Figure 2.1 presents our project timetable in schematic form.

## Figure 2.1 Project Timetable



## 2.2. Information Sources

In order to undertake this study we have gathered data and information from a number of sources.

Our primary sources have been:

- answers to the very detailed questionnaire that we have sent to postal operators;
- answers to letters to national regulators;
- a series of follow-up questions and discussions with postal operators; and
- a very detailed review of the cost data published in operators' annual reports and websites.

Secondary sources include:

- earlier reports on the postal sector for the European Commission;
- UPU statistics;

- the CERP Regulatory Institutions Compendium;
- published econometric studies of postal costs; and
- other publicly available literature on postal economics.

As noted above, the country studies in Appendix C provide a review of the main data for each country. Appendix D explains how we collated the data to provide a comparable database for use in our econometric analysis.

# 3. THE CHANGING NATURE OF POSTAL PROVISION

# 3.1. Introduction

Postal services in the European Union are changing. Since the adoption of the Postal Directive and the transposition of this into national legislation, a number of important market developments have taken place. Postal operators have moved towards a marketdriven provision of postal services, in some cases accompanied by partial privatisation. Changes have been made to sorting and delivery networks to increase efficiency. Traditional mail volumes in a number of Member States are stagnating, but there are growth opportunities in other areas. Postal operators have increasingly diversified into non-universal services such as express and logistics, and there is a trend towards internationalisation of the sector.

In the present chapter, we consider the changing nature of postal provision. We focus on *how* postal services are provided and how far the movement towards market-oriented provision of postal services has impacted on this. In Chapter 4, we then develop a broader perspective by examining the more general strategies of postal operators.

In both chapters, we will only examine those developments that impact (or have the potential to impact) on the economics of postal services, since this is the focus of the present study.<sup>1</sup>

The structure of the present chapter is as follows:

- First, in Section 3.2, we review the types of services that are provided by the universal service providers in different countries and the activities that are undertaken to deliver those services.
- Next we consider the traditional postal value chain (which consists of the stages of collection/clearance, outward sorting, transportation, inward sorting and delivery), and how it is organised, particularly in the letter mail business. Section 3.3 considers the way that the postal value chain is organised in different countries. We consider the overall features of postal infrastructure as well as each of the stages of the operational process. We also highlight recent and proposed changes in different countries.
- In Section 3.4 we concentrate on parcels and express services. In particular we are interested in the implications of joint or separate provision of services for economies of scope in the mails business.

<sup>&</sup>lt;sup>1</sup> A more general discussion on main developments in the postal sector can be found in the companion study *Main Developments in the Postal Sector,* carried out by WIK Consult.

• Section 3.5 provides conclusions on the key economic features of the provision of postal services and the different elements of the postal value chain.

## 3.2. Services Provided by Universal Service Providers

All universal service providers in the 25 members of the European Union provide the following services:

- Residential and business letter mail;
- Unaddressed mail services;
- Parcels and express services;
- Newspaper and periodical services; and
- Philatelic services.

However, some services are only provided by some universal service providers. These include:

- Logistics services<sup>2</sup> (all except La Poste (Belgium), Poland Post, Malta Post, Lithuania Post, Poste Italiane, Hellenic Post and Royal Mail);
- Financial services (all except **Finland Post**, **Sweden Post**, **TPG** and **Royal Mail**<sup>3</sup>); and
- IT/consultancy services<sup>4</sup> (provided by some, but not all, universal service providers).

In relation to postal activities:

- All universal service providers collect mail from post boxes and post offices;
- All universal service providers collect mail at client premises, and bulk mail centres;
- Third party collection agreements (amounting to partial outsourcing of the collection activity) are operated by La Poste (France), Correos, La Poste (Belgium), Denmark Post and Estonia Post;
- All universal service providers carry out inward sorting, outward sorting, transport and delivery services;

<sup>&</sup>lt;sup>2</sup> This includes warehousing (reception, storing, in-house collection, output, inventory control etc), consignment shipping, mail order and customs brokerage.

<sup>&</sup>lt;sup>3</sup> Although some of these operators have previously provided financial services which have been sold to private enterprises – see Chapter 9 for further details.

<sup>&</sup>lt;sup>4</sup> Internet outlets, network management and e-services (certification, digital time-stamping and e-post box)

• All universal service providers exclusively use their own network to carry out delivery services, apart from **Poland Post** and **Estonia Post** (who combine usage of their own delivery network with third party delivery).

Overall there is a high degree of commonality between the services provided by universal service providers and the activities they conduct to deliver those services. However the different operators may use different approaches to the provision of these services – these areas are explored in the subsequent sections.

# 3.3. The Traditional Postal Value Chain

## 3.3.1. Components of the chain

Figure 3.1 shows the traditional postal value chain.



Figure 3.1 The Postal Value Chain

Mail is:

- <u>Collected/cleared</u> from post boxes, post offices or mailers' premises and taken to the initial sorting offices. In some countries it may be collected from individual houses by postal workers undertaking delivery. In many countries mailers or their agents may be able to take mail in bulk to the outward sorting office (or potentially, possibly via consolidators, to the inward sorting offices).
- <u>Prepared</u> (separated between different postal streams e.g. packets, large flats, standard letters, first/second class machinable/unmachinable etc., faced, post-marked etc.).
- There is an <u>initial (outward) sort</u> of mail (generally between the different inward sort destinations, although for more common locations there may be a higher level of sortation).

- <u>Transported</u> between sorting centres by road and (in some countries) also by air and/or rail.
- Received at the inward sorting office where it is consolidated and there is a <u>final</u> <u>(inward) sort to delivery office or walk-sort level.</u>
- Received at a delivery office and then likely to receive a <u>final preparation</u> for the postal delivery worker's round (although some mail may be walk-sorted at an earlier stage in the process).
- <u>Delivered</u> to residential and business customers by foot, bicycle or car/van.

All universal service providers engage in all of these stages and deliver to all (or nearly all) addresses in their country. But the structure of the postal infrastructure varies according to geography or organisational model. In addition, both customer pressures for better service and deregulation have led to increased involvement by other firms at various stages of the value chain. Indeed, where the area of the business is not reserved for the universal service provider, private sector operators may undertake all stages of the process.

The following sections examine the individual elements of the postal value chain to identify trends and differences in the way postal services are delivered between the different countries in the European Union.

## 3.3.2. Collection

There are two main methods of mail collection:

- Traditional collection from post boxes in the street or in post offices; and
- Bulk collection, either from the customer's premises or by delivery by the customer or his agent to the postal operator.

The relative importance of these two will depend in part on the relative importance of mail sent by businesses and mail sent by households - of the countries responding to this question, this varies from 12 to 13 per cent of mail posted by residential customers in Portugal and the UK through 15 to 16 per cent in Belgium, France, Luxembourg and the Netherlands to 21 per cent in Slovakia.

The costs of traditional collection will depend in part on regulatory and universal service constraints, both in terms of the frequency of collection (set out in the EC Directive) and in terms of the location of post boxes (a national matter). In part because of these requirements, the costs of traditional collection are largely independent of the actual volumes collected.

Table 3.1 shows that the number of post boxes per square kilometre has remained stable over the last five years in most countries. However it also shows that post box density varies quite considerably between countries.

In part, this reflects differences in population density and location patterns (e.g. degree of urbanisation) between countries. Some of the countries with very low scores, such as Finland and Spain, are countries with low population densities, whereas countries with levels above the EU average are typically those that are more densely populated.

However, the differences between countries are also influenced by constraints on postal operators in changing the number (and often) location of existing post boxes and therefore their limited ability to actively manage (particularly in a downwards direction) this cost area to reflect changing posting patterns. In addition, there are also historical differences between countries in the provision of and expectations around access to the postal network.

Country	1998	2003	Difference
Austria		0.25	
Czech Republic		0.31	
Denmark	0.24	0.23	-0.01
Estonia	0.08	0.08	0
Finland		0.02	
France		0.25	
Greece	0.10	0.09	-0.01
Hungary	0.18	0.20	+0.02
Ireland	0.08	0.09	+0.01
Latvia	0.04	0.04	0
Lithuania	0.07	0.07	0
Luxembourg	0.41	0.41	0
Malta	1.90	1.66	-0.24
Netherlands	0.47	0.47	0
Poland		0.18	
Portugal	0.20	0.20	0
Slovakia		0.08	
Slovenia	0.85	0.90	+0.05
Spain	0.07	0.08	+0.01
United Kingdom		0.48	
Weighted average	n/a	0.28	n/a

# Table 3.1Number of Post Boxes per Square Km

Source: NERA questionnaire, European Commission.

Note: Italic values in the 2003 column are not for 2003 but for the latest year for which data were provided.

Universal service providers' flexibility to reduce costs by reducing collection frequency is constrained by the EC Directive requirement to clear every post box every working day and the impact of late clearance on quality of service. Nonetheless, some postal operators (**Post** 

Austria, La Poste (Belgium) and Hellenic Post) have reduced collection frequency within this constraint to reduce costs or more generally as part of a network optimisation process. At the same time, in other countries there has been an increase in collections from (business) customer premises (in Italy, Portugal, Luxembourg, the Netherlands, Spain, Estonia, Poland and Slovenia), suggesting a shift in the focus of resources from residential collections to business collections.

It is also interesting to note that **Luxembourg Post** and **Estonia Post** have introduced third party collection arrangements implying partial outsourcing of the collection activity and suggesting that this is not necessarily an intrinsic part of the post infrastructure. In many countries large posters and consolidators deliver their post directly to outward (or in some cases inward) sorting offices and bulk mail centres, thus completely by-passing the collection part of the process. **Malta Post** have centralised the collection of mail so that all collection and processing of mail from letter boxes is performed from one central point.

## 3.3.3. Sorting

A key feature of the postal network is the sortation process. This is the area where cost efficiencies through mechanisation can most easily be achieved. As set out in Section 3.3.1 above, there are a number of different stages to the sortation process as the mail is consolidated and sorted to increasingly localised areas and eventually walk-sorted for final delivery. While the main focus of cost-reducing automation is on the actual sortation process, operators have also introduced machines that automate the initial segregation (separation between different classes of mail), facing (ensuring all items are stacked in the same direction and orientation), cancellation and culling (removing non-machinable items) parts of the process.

The use of automated sorting machines to replace manual sortation both provides an opportunity to reduce costs (a manual sorter can generally sort at around 2,000 items per hour, whereas automatic sorting machines can achieve rates in excess of 30,000 items per hour) and improve quality of service (error rates are generally much lower using automatic sorting machines than manual sortation).

The relative benefits in terms of cost saving and quality of service improvement and the proportion of mail handled by automatic machinery depends on a number of factors. These include:

• The degree of and sophistication of post-coding as well as its usage - to facilitate automatic sorting;<sup>5</sup>

<sup>&</sup>lt;sup>5</sup> In Lithuania the main planned change to the sortation process is the introduction of post-codes.

- The degree of pre-sortation by large customers and consolidators and the increasing use of customer bar-coding of mail items;
- The total volume of mail and whether or not a "critical mass" is required to employ a particular technology or sorting network structure;
- The proportion of the total mail volume that is suitable for automatic sortation (size/shape of envelope, weight of item, quality of addressing etc);
- The pattern of mail flows to allow maximum use of automated machinery. In countries where mail is widely dispersed, the costs of gathering and transporting mail to an automatic sorting centre could be higher than the reduction in costs associated with automatic sorting;
- The regulatory and competitive pressures on the operator to invest in automation to improve quality of service;
- The relative costs of capital and labour and therefore the opportunity to make efficiency improvements from investment in automation;
- The historic availability of capital for investment in automation and (generally government) constraints on access to capital for investment;
- The flexibility of the workforce to the changes in working practice and staff numbers associated with mechanisation; and
- How advanced the operator is in the process of improving and mechanising its postal operations (some operators introduced their first sorting machines in the 1960s and 1970s and may be on their 'second generation' of sorting technology, while others introduced mechanisation much more recently) and the functionality<sup>6</sup> and flexibility<sup>7</sup> of their sorting machines.

In addition there will be differences between the quality (speed, rejection rates, number of sorting categories, reliability etc) of the automatic sorting machines used by postal operators and the extent to which they substitute for more than one element of the sorting process (for example on outward and inward sorts).

<sup>&</sup>lt;sup>6</sup> Different sorting technologies can include optical character recognition, video-coding (on and off-line), links to address databases etc.

<sup>&</sup>lt;sup>7</sup> Different sorting machines can sort different ranges of letters (varying thicknesses, size - standard envelope to A4 etc.)

For example, **Poland Post** reported that after increases in automation, several intermediary steps in sorting were eliminated which resulted in the improvement and simplification of the sorting process.<sup>8</sup> Similarly for **Slovenia Post**, all collected mail is sent to the two Mail Sorting and Logistic Centres where after sorting (up to the individual address) it is dispatched to the delivery post offices - thereby combining the inward and outward phases of the sortation process and substituting an element of extra transportation.

Table 3.2 shows that the proportion of mail handled by machines has generally increased over time, reflecting investment in automation by the different operators. These often increase in steps – representing a wave of investment in new technology rather than a gradual process. Only in **Luxembourg Post** is use of automatic sorting ubiquitous. This suggests that automatic sorting is an economically attractive option for large as well as smaller operators (though Luxembourg Post is still a large operator compared to, for example, some start-up competing private operators in Germany). High scores have also been achieved by **Deutsche Post World Net** and **TPG**. A possible explanation for this may be the strong cost efficiency incentives faced by these listed companies (and perhaps their capability to raise finance to fund the investment in new sorting centres).

On average, in 2003, 67 per cent of mail in those countries for which data were available were sorted automatically.

In order to assess how the potential for automation in each country is exploited, Table 3.2 also shows the percentage of mail that is machinable. This shows that (with the exception of **Denmark Post**, **Luxembourg Post**, **TPG** and **Slovenia Post**), there is generally significant room for further increasing the use of automatic sortation.

<sup>&</sup>lt;sup>8</sup> In line with this, WIK (2003, p.145) reports that "At end of 2002, the USP operated 65 sorting centres but is about to reduce this number significantly; in May 2003, 64 centres were used. In the medium term, by 2005, plans are to have 10 or 11 fully automated sorting facilities while at present approx. 20 centres are equipped with machinery. Within the re-structuring process, the current, mostly small facilities will be closed and replaced by newly built automated centres located close to the highways or main roads"

Country	1998	2003	Trend 1998-2003	Mail that is machinable in 2003
	(%)	(%)	(%-point)	(%)
Austria		72		81
Belgium	50	55	+5	90
Czech Republic	12	25	+13	
Denmark	60	60	0	60
Estonia		50		94
Finland	63	73	+10	
France		63		
Germany		89		
Hungary	19	19	0	37
Ireland	25	75	+50	85
Luxembourg	97	97	0	97
Netherlands	75	80	+5	80
Poland		45		80
Portugal		56		80
Slovenia	56	64	+8	75
Spain		68		90
United Kingdom		50		
Weighted Average	n/a	67*	n/a	n/a

Table 3.2Per Cent of Mail Handled by Automatic Machinery for Universal Service Providers

Source: NERA questionnaire, Deutsche Post Annual Report 2003.

Notes: \*The average in this column has been calculated excluding Poland and Belgium and adopting as weights the share of each country in total European mail volumes.
Italic values in the 1998 column are not for 1998 but for the first year for which data were provided.
Italic values in the 2003 column are not for 2003 but for the latest year for which data were provided.

Most of the postal operators have plans for increased use of automation in the sortation process over the next five years:

- **Austria Post** is expecting to introduce more sorting machines in 2005;
- La Poste (Belgium) is planning to replace four of the existing sorting centres with purpose built centres, while the other sorting centres are being renewed and upgraded;
- **Denmark Post** is planning to introduce automatic sorting of large letters to delivery district level;
- **Finland Post** is expecting to re-organise its sorting processes over the next five years;
- **Hellenic Post** is in the middle of a programme of total automation to allow mechanised sorting to individual addresses;
- **CTT Correios** is currently introducing new equipment with OCR capability and extending the postcode. It will then upgrade its sorting facilities;
- **La Poste (France)** is planning to provide an email delivery service sorted according to delivery walk over the next five years and also increase mechanisation;
- **An Post** is considering improvements in its use of sorting technology to increase efficiency;
- **Poland Post, Estonia Post** and **Czech Post** are planning to reduce the number of sorting offices and increase automation;
- **Latvia Post** are planning construction of a main sorting office with automatic sorting machines;
- **Slovakia Post** are planning to introduce automatic sorting machines in the two main manual sorting centres;
- **Hungary Post** are reducing the number of regional processing centres from 33 to 17 and linking them to a new sorting centre; and
- **Lithuania Post** are introducing a new postcode system and introducing automation to improve quality of service.

The only operators that did not report plans to improve sortation are **Slovenia Post** (which seems logical given the existing level of automation and that they only have two main sorting centres) and **Malta Post**.

Table 3.3 shows the available data on the number of sorting offices of universal service providers. The table distinguishes between pure sorting offices (offices that are dedicated to sorting) and total sorting offices (also including delivery or post offices where some sorting takes place as well).

	Pure sorting offices		Trend 1998-	<b>Pure Sorting</b>	Total sorting	
Country	1998	2003	2003	offices per billion letters, 2003	offices, 2003	
Austria		8		2*	8	
Belgium	5	5	0		43	
Czech Rep	52	16	-36	21	16	
Denmark	9	8	-1	6	8	
Estonia	1	1	0	7	1	
Finland	7	7	0	8	7	
France	115	114	-1	6	114	
Germany		82		4	82	
Greece	22	18	-4	29	23	
Hungary	1	1	0	1	34	
Ireland	1	4	+3	6	15	
Latvia	1	1	0	16	1	
Lithuania	5	1	-4	22	1	
Luxembourg	0	0	0	0	1	
Malta	1	1	0	15	10	
Netherlands	12	8	-4	1	8	
Portugal	9	9	0	7	417	
Slovakia	7	4	-3	16	4	
Slovenia	2	2	0	3	2	
Spain		17		4	52	
UK		73		4	1443	
Average	n/a	22	n/a	4**	109	

Table 3.3
Number of Sorting Offices of Universal Service Providers

Source: NERA questionnaire, Deutsche Post Annual Report 2003.

*Notes:* \* *Volumes for Austria have been estimated.* \*\* *Weighted average, calculated excluding Belgium and adopting as weights the share of each country in total European mail volumes.* 

*Italic values in the 1998 column are not for 1998 but for the first year for which data were provided. Italic values in the 2003 column are not for 2003 but for the latest year for which data were provided.* 

In general, the number of pure sorting offices is related to mail volumes, with the three operators with the highest mail volumes (**Deutsche Post World Net, La Poste (France)** and **Royal Mail**) also having the largest numbers of sorting offices.

When expressed in relation to mail volumes, a number of small countries have an apparently high score, which can be explained by the fact that these countries have only one pure sorting office, i.e. the absolute minimum. Other operators with high scores are **Czech Post** (although the number of sorting offices in this country has been substantially reduced in the last five years), **Slovakia Post** and **Hellenic Post**.

As shown in the final column, there are a number of operators that also use other offices (delivery or post offices) in the sorting process, resulting in the total number of offices in which sorting takes place being far higher than the number of pure sorting offices. This applies in particular to **Royal Mail**, **CTT Correios**, **La Poste (Belgium)**, **Correos** and **Hungary Post**.

**TPG** has, in the 1990s, concentrated all its sorting activities for <u>domestic mail</u> in six sorting centres, most of them purpose built.<sup>9</sup> The new sorting centres replaced 12 old centres which were located close to railway stations, which was no longer necessary following the transfer of all traffic to road (see below). The company handles about 80 per cent of mail automatically.

In the coming years, TPG will gradually implement sequence sorting to individual addresses. To achieve this, more than 100 sequence sorters will be installed throughout the country. Among other things, sequence sorting will allow the company to simplify the role of deliverer and cut delivery costs (see Section 3.3.5 below).

An Post are currently completing concentration of their mails processing centres into four automated hubs (Athlone, Cork, Dublin and Portlaoise). Mail is collected and transported to the designated sorting hubs, where it is processed and then, if required, transported to the relevant downstream hub for further processing to delivery office and delivery route. Mail is then dispatched to one of the 640 delivery offices in the country. This consolidation involves a move from 87 sorting offices. The associated investment programme in automating mails is the largest in the company's history – when completed in 2005 over 75 per cent of letters will be sorted to delivery route level for all major urban areas. In moving to sortation by delivery route, An Post have indicated that they may outsource some activities. Table 3.3 shows that by 2003 there were 4 pure sorting offices in Ireland, and a total of 15 sorting offices.

### 3.3.4. Transportation

Changes in the postal network and also demographic and posting patterns will lead to changes in transport needs. With increasing automation accompanied by fewer sorting centres, mail will usually need to be transported longer distances, but there will be considerable cost economies when mail is transported in bulk.

<sup>&</sup>lt;sup>9</sup> In addition there are two other TPG sorting centres, but they do not handle domestic mail.

The differences in costs of transportation between countries will predominantly be determined by differences in geography, road infrastructure and posting patterns. However there are opportunities for operators to make efficiencies through optimising their transport network or making trade-offs between centralised sortation functions with fewer larger sorting centres that require more transportation between them, and a more decentralised structure with more, smaller sorting centres. In many cases, these decisions have been driven more by operational requirements to achieve quality of service improvements, rather than cost reductions.

Different operators organise their transport networks in different ways.

The transport network of **La Poste (France)** is organised at three levels. The lower level consists of two road networks: from the post office to the sorting centre (known as the 'concentration network') and from the sorting centre to the post office (known as the 'dispersions network'). The medium level consists of road links between sorting centres in the same region (there are eight regions in total). The upper level consists of road, rail or air links between sorting centres in different regions.

Due to noise restrictions, the company has had to reduce its use of air transport and reorganise its road network. In addition, a new road network has been created to increase the reliability of D+1 and D+2 letter mail, but also to reduce transport costs. The company, faced with these noise restrictions, is currently studying whether to increase the use of the rail mode.

- **Royal Mail** has point-to-point road links between most of its large sorting centres, with a number of key hubs at airports for longer distance air carriage.
- **TPG** operates a two-level network consisting of point to point road links between its eight sorting centres, and a local network which links delivery offices to sorting offices in the region.
- La Poste (Belgium) combines direct links between its sorting centres and between sorting centres and a number of delivery offices with a hub-and-spoke network between sorting centres and other delivery offices.
- **Estonia Post** uses a hub and spoke network with the main routes between the central sorting office and the regional offices and local routes between regional offices and local post offices.
- **Poland Post's** transportation network includes 52 sorting centres connected mainly by road supported by rail and air. Mail is transported between sorting centres and post offices by road.

• **Lithuania Post** has three transport layers: one linking the main transport centre with regional main offices, a second linking regional offices with district offices and a third linking regional and district offices with local post offices directly.

In principle, all transport networks of postal operators can to some extent be regarded as hub-and-spoke networks, with the sorting offices acting as hubs and the delivery offices as spokes. Differences between operators occur in the extent to which sorting centres are directly linked or whether use is made of further hubs via which sorting offices are linked in an indirect way. When the total number of sorting offices is small and distances short, like at **TPG**, it is possible to provide direct links between all sorting offices. When the number of sorting offices is large, direct links between all of them may not be feasible. Additional hubs are also required when air transport is used to cover large distances, such as in **Royal Mail**.

Transport is one of the areas in the postal value chain where a degree of outsourcing is starting to develop. Where this is financially profitable, **Post Denmark** outsource some of their transport to private carriers. **Lithuania Post** partly outsource the first layer of their transportation activity. The 2003 annual report of **Deutsche Post World Net** reports the loss of 4,000 jobs in the Mail Division due to ongoing outsourcing in the transport area and similar measures.

As Table 3.4 shows, road is the primary transport mode for the vast majority of mail in the different countries for which we have data. Rail is only a significant mode in Spain and in Slovakia. On average, in 2003, road was the primary transport mode for 82 per cent of mail.

In recent years, rail has (apart from the above exceptions) lost the vast majority of its postal traffic. In Belgium the proportion of mail handled by rail fell from 35 per cent in 1988 to 15 per cent in 2003, and **La Poste (Belgium)** have told us that they plan to phase out rail completely. In the UK nearly 15 per cent of mail was transported by rail in 2003, but by early 2004 use of rail had been almost completely abandoned, despite considerable investment in the rail distribution network (in terms of both trains and terminals) in the previous ten years.<sup>10</sup> In Denmark there has been a significant shift from rail (and air) to road over the last 5 years (from 20 per cent rail and 10 per cent air to only 5 per cent rail and 5 per cent air). The move away from rail appears to be ubiquitous, occurring in small as well as in large countries. However, as mentioned above, **La Poste (France)** is currently studying whether to increase the use of the rail mode.

Air transport is used within a number of countries, most notably France, with smaller proportions in Lithuania, Latvia, Estonia, the UK, Spain, Denmark and Portugal. Some of the use of air transport (for example in the Baltic countries) is likely to relate to international mail.

<sup>&</sup>lt;sup>10</sup> However, in mid-2004 Royal Mail were reported to be negotiating with a new potential rail operator for some rail movements (using Royal Mail's own specialised trains) on some trunk routes.

Country		1998			2003	
	Road	Rail	Air	Road	Rail	Air
	(%)	(%)	(%)	(%)	(%)	(%)
Austria	45	55	0	80	20	0
Belgium	65	35	0	85	15	0
Cyprus				100	0	0
Czech Republic	60	34	6	83	11	6
Denmark	70	20	10	90	5	5
Estonia	92	0	8	91	0	9
Finland				97	0	3
France	76	4	20	80	3	17
Hungary	94	6	0	91	9	0
Latvia	85	9	15	92	0	8
Lithuania	82	5	13	90	1	9
Luxembourg	99	1	0	100	0	0
Malta	100	0	0	100	0	0
Netherlands	100	0	0	100	0	0
Poland				96	2	2
Portugal	96	4	0	96	0	4
Slovakia	50	50	0	20	80	0
Slovenia	100	0	0	100	0	0
Spain				65	30	5
UK				79	14	7
Weighted Average	n/a	n/a	n/a	82*	10*	8*

# Table 3.4Percentage of Mail by Primary Transport Mode for Universal Service Providers, 1998-2003

Source: NERA questionnaire.

*Note:* \* *The averages have been calculated excluding Cyprus and Belgium and adopting as weights the share of each country in total European mail volumes.* 

Italic values in the 1998 column are not for 1998 but for the first year for which data were provided. Italic values in the 2003 column are not for 2003 but for the latest year for which data were provided.

# 3.3.5. Delivery

Delivery of mail to individual addresses, particularly residential addresses, remains the most labour-intensive process and the one that accounts for the largest individual proportion (on average some 50 per cent – see Table 5.7 below) of total costs. In general postal operators use a mix of vehicle (car/van), bicycle and foot for deliveries to residential customers, while business customers tend to have a greater proportion delivered by vehicle (due to the much higher volumes going to specific locations).

While the Universal Service Obligation restricts the freedom of operators to make changes to their delivery network, a number of operators have nevertheless been able to implement changes with the aim to reduce the costs of delivery. The main changes include:

- Reducing delivery frequencies. Until 2004, **Royal Mail** delivered two times a day to most urban and some rural addresses. The company is currently eliminating the second delivery (which it claims accounts for 4 per cent of mail delivered but 20 per cent of total delivery costs).
- Retiming deliveries by spreading deliveries over the day, in particular by delivering residential mail after business mail has been delivered.
- Street-level sorting. Automatic sorting up to walk route level can simplify the role of the deliverer, who no longer has to undertake any sorting himself. **TPG** will, over the coming years, take advantage of this development by transforming the function of deliverer into part-time jobs in a lower pay scale.

In addition, it might be possible to remove the requirement to deliver right to the door (i.e. either to kerb-side boxes or communal sets of post-boxes for apartment blocks etc.). However any systematic change in policy along these lines would be a very politically sensitive move for an operator to propose and would probably face strong customer opposition.

Table 3.5 shows the numbers of delivery offices for the countries for which data were available in 1998 and 2003. It can be seen that the number of delivery offices has generally been reduced, with particularly significant reductions implemented by **Austria Post**, **Poste Italiane**, **Poland Post** and **Malta Post**. Only **Correos** and **Slovakia Post** have shown small increases in the numbers of delivery offices.

Country	1998	2003	Trend 1998-2003	Delivery offices per million letters, 2003	Delivery offices per thousand inhabitants, 2003	Delivery offices per thousand square km, 2003
Austria	1950	584	-1366	0.1*	0.07	7
Belgium	573	557	-16		0.05	18
Czech Republic	2597	2245	-352	2.9	0.22	28
Denmark		318		0.2	0.06	7
Estonia	605	553	-52	3.8	0.41	12
France	5110	4750	-360	0.2	0.08	9
Greece	973	865	-108	1.4	0.08	7
Hungary	2728	2506	-222	2.4	0.25	27
Ireland	640	640	0	0.9	0.16	9
Latvia	989	968	-21	10.6	0.42	15
Lithuania	967	944	-23	20.8	0.27	14
Luxembourg	38	38	0	0.2	0.08	13
Malta	27	9	-18	0.2	0.02	28
Netherlands		523		0.1	0.03	13
Poland	5694	4775	-919		0.12	16
Portugal	431	408	-23	0.2	0.04	4
Slovakia	1496	1470	-26	5.8	0.27	30
Slovenia	473	490	+17	0.8	0.25	24
Spain	1557	1647	+90	0.4	0.04	3
United Kingdom 1370				0.1	0.02	6
Average	n/a	1526	n/a	0.4**	0.06**	10**

# Table 3.5Number of Delivery Offices of Universal Service Providers

Source: NERA questionnaire, Eurostat.

Notes: \* Volumes for Austria have been estimated. \*\*Weighted average, calculated excluding Poland and Belgium and adopting as weights the share of each country in total European mail volumes.

*Italic values in the 1998 column are not for 1998 but for the first year for which data were provided. Italic values in the 2003 column are not for 2003 but for the latest year for which data were provided.* 

In order to compare the number of delivery offices between countries, Table 3.5 also shows the number of delivery offices expressed per million letters, per thousand inhabitants and per thousand square kilometres.

This analysis shows that in terms of delivery offices per million letters and delivery offices per thousand inhabitants, it is the Eastern European countries that generally show the highest ratios. The proportionate differences when expressing delivery offices per million letters are most striking, reflecting the combination of a relatively high number of delivery offices and low mail volumes in some of the new Member States. But the numbers of delivery offices expressed per thousand inhabitants show clear differences too.

By contrast, the differences between Member States in the numbers of delivery offices per thousand square km are much less pronounced. An operator like **TPG**, which has low ratios of delivery offices per million letters and per thousand inhabitants, has a ratio of delivery offices per thousand square km slightly above the EU average. The relatively limited differences between Member States in delivery offices per thousand square km suggest that geographical factors (transport costs) are an important factor driving the efficient number of delivery offices, though mail volumes are clearly a driver too.

Some operators have stated their intention to increase motorised delivery (**Lithuania Post**) in order to improve quality of service and to ensure mail and postal worker safety, or have changed the delivery frequencies (such as delivery on Saturdays in Poland) in order to respond to customer needs, improve the quality of service and respond to competition. **Malta Post** states that new working schedules (including late night shift) will be introduced - mainly to achieve cost savings and to respond to competition. It is also interesting that Malta Post have developed a network of separate delivery offices, suggesting that for certain population densities the existence of economies of scope between collection and delivery may not be so important.<sup>11</sup>

**Hungary Post** closed a significant number of self-operated offices in 2003 and replaced them with mobile post offices. They plan a new organisational scheme separate from the standard postal network with the creation of a few delivery bases, which will undertake delivery to smaller locations in their geographic area. Hungary Post have created a separate delivery network for each postal product in order to tailor the number of delivery offices to the specific geography and population pattern.

# 3.4. Parcels and Express Services

As we have seen in Section 3.2, universal service providers offer parcels and express services in addition to mail services. In addition, there are many private firms providing parcel and express services. This includes global operators like UPS, Fedex, DHL and TNT, as well as many national and local operators.

The fact that universal service providers offer parcel and express services in addition to mail services raises the question as to whether they can provide the combination of these services more efficiently than each of the services individually. If they can, this will have important implications for the economics of postal services.

Generally, parcels and express items are taken by customers to post offices or collected from business premises rather than collected from post boxes. Very few sorting offices have automatic parcels sorting machines, so most sorting is undertaken manually.<sup>12</sup> Because of

<sup>&</sup>lt;sup>11</sup> For example Czech Post plans to introduce a separate business letter mail delivery network.

<sup>&</sup>lt;sup>12</sup> It is more difficult to sort parcels because of their bulk and different sizes, compared to letters.

their value express items also tend to be separated in the sorting process. Both of these processes generally occur in the same sorting office as letters, but in separate physical areas and would include additional facilities for track and trace etc. Transportation between outward and inward sorting offices can be undertaken either sharing the lorries and vans used for letters or using a separate dedicated network.

In practice, there are significant differences between operators in the extent of network sharing. Table 3.6 provides an overview of network sharing for those operators that provided information on this issue.

# Table 3.6 Parcels and Express Services Sharing the Letter Mail Network for Universal Service Providers

Country	Shared parcels and letter network				Shared express and letter network			
	Collection	Transport	Sorting	Delivery	Collection	Transport	Sorting	Delivery
Belgium	$\checkmark$	$\checkmark$						
Estonia	$\checkmark$	$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
France	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$				
Greece	$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$			
Hungary	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Latvia	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$			
Lithuania	$\checkmark$	$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Luxembourg	$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$			
Poland	$\checkmark$	$\checkmark$			$\checkmark$	$\checkmark$		
Portugal	$\checkmark$	$\checkmark$		$\checkmark$				
Slovakia	$\checkmark$			$\checkmark$	$\checkmark$			$\checkmark$
Slovenia	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$

Source: NERA questionnaire.

Notes :

\* In all cases, the table indicates the countries where part or all of the networks are shared. In a number of cases, networks are shared in some areas but separate in other areas.

\* Only operators that provided answers to the questions concerned are included. In some cases where answers were not entirely clear, the table represents NERA's interpretation of the answer given. Some operators provided an answer for parcels but not for express.

\* Czech Post and Malta Post also reported some network sharing between letters, parcels and express without providing further detail

Table 3.6 shows that in many cases the parcels and express networks share facilities with the letter mail network. The most obvious facility that is shared is the network of post offices, though transport and delivery facilities are also frequently shared. However, even in countries where delivery networks are shared, there is sometimes partial independence in the delivery process between letters and parcels. In particular:

- **Poland Post** has separate parcels delivery personnel;
- **Czech Post** has a separate network for B2B parcels;

- Hellenic Post recipients are currently required to collect parcels over 20Kg from delivery offices (parcels under 20Kg are delivered with letters), but they plan to set up a dedicated parcels delivery network in the next 5 years;
- **Slovenia Post** has separate parcels delivery in large cities and plan to introduce separate parcels delivery personnel;
- **Luxembourg Post** parcels delivery is undertaken by a subsidiary in populated areas and by the letters staff in other areas;
- La Poste (France) have separate networks for parcels and letters in densely populated areas of the country, but in less densely populated areas letters and parcels share facilities; and
- **CTT Correios** has since 2003 outsourced its parcels sorting activities to a subsidiary express/courier company (Postlog).

**Post Danmark** will generally collect business customers' parcels and mail at their own premises at the same time so as to optimise transport. Four of the company's parcels centres are located at the same premises as mail centres. Transport of parcels and mails from these centres to the distribution centres is undertaken by Post Danmark Transport, and both parcels and mails are carried out with these vehicles to optimise logistics. The delivery of parcels in rural areas generally take place with the delivery of mail.

In Portugal collection, transport and delivery of parcels share the network facilities used for letter mail by **Correios**. But since the end of 2003 parcels sorting has been transferred to the Postlog subsidiary, the company dedicated to express/courier and parcels services, which has modern sorting equipment. Express and courier services had been transferred to Postlog in 2000. This company has its own network for collection, transport, sorting and delivery of express items, and it also uses the universal service provider network for collection of items from post offices.

Similarly for express items:

- **Hungary Post** use a parallel distribution network for express items in large cities;
- Latvia Post express items are delivered separately from other items in Riga;
- **Czech Post** has a separate delivery network in highly populated areas;
- For **Poland Post**, express delivery is by messenger; and

• For **Slovenia Post**, Express Post (delivery on same day posted) has a separate transport and delivery network.

Express networks can be specialised to provide for the needs of customers. As an example of a specialised network (in a small country) **Slovenia Post** offers its customers a same-day delivery service known as Express Post. This involves a road delivery network known as "traffic cross", centred on Ljubljana. Vehicles travel in to Ljubljana collecting Express Post at selected post offices. They then return from Ljubljana to their starting points later in the day delivering mail to the post offices included in the Express Post network.

This suggests that there are economies of scope between the non-delivery elements of the parcels and letters networks (and even the delivery elements in low volume parts of the network). However for the delivery process and at higher volumes, the efficiencies that separate networks produce outweighs these benefits. This makes sense given the practical constraints on delivery of heavy parcels on delivery rounds that are often on foot/bicycle, with items that do not fit through the letterbox and may require proof of delivery. It also suggests that while there is a fixed cost in setting up a separate network, higher volumes allow the operator to absorb these and therefore gain the benefit of greater homogeneity in the service being provided, and tighter control over the particular network. Express operators have also tended to set up separate delivery networks, though they make extensive use of network sharing and subcontracting to other express operators in areas where volumes are low.

In most cases, express items are transported in special bags and receive priority in the postal chain. Some operators use a parallel network for express items to ensure a higher quality of service and to ensure additional security for what are generally higher value and time sensitive items. These tend to involve additional features such as track and trace, insurance, proof of posting, proof of delivery, compensation for loss/performance failure etc.

A number of operators have outsourced some of their activities in relation to parcels and express. **Luxembourg Post** only undertakes collection of express items, which are then sorted, transported and delivered by TNT Express Luxembourg SA – a joint venture of P&T and TNT. Similarly in **CTT Correios** all express and courier services were recently outsourced to Postlog which also relies on the CTT Correios post office network for collection of items. **La Poste (France)** has outsourced some of its parcel delivery in rural areas.

As a result of the intensity of competition in the markets for parcels and express services and the consequent commercial sensitivity of data, operators have been very reluctant to provide us with other data on parcels and express services. We have not received any response from private express operators, nor from the most important public ones. We have also been unable to find much useful material in the public domain.

As a result, we are unable to provide further detail on parcels and express services, nor to report on differences in the organisation of the parcels and express networks between public and private operators.

# 3.5. Conclusions

In this chapter we have shown how postal services are organised in the Member States and how this has changed over the last five years.

There is a high degree of commonality between the services provided by the operators. All universal service providers provide basic services like letter mail, unaddressed mail, parcels and express services, newspaper and periodical services and philatelic services. There are however important differences in the supply of logistics and financial services, which will be further discussed in Chapters 4 and 9 respectively.

The activities that postal operators undertake to deliver these services are also very similar to each other. However, there are important differences in *how* these activities are undertaken and in how the postal infrastructure is organised. Many, but by no means all, of these operational differences between countries reflect historical differences in the legacy of post boxes, sorting and delivery offices as well as geographical differences between countries rather than markedly different strategic approaches to processing the mail.

The <u>collection</u> activity now largely consists of collections from business premises, though post boxes are still important because of the universal service obligation. Post box density varies considerably between countries, in part reflecting population density differences, but also in part the regulatory constraints that postal operators face. A few operators have third party collection arrangements, implying a partial outsourcing of the collection activity.

<u>Sorting</u> is increasingly undertaken automatically and many operators have plans for further increases in the use of automation. The differences between the percentages of mail sorted automatically and the percentages that are machinable show that there is indeed scope for further automation in many countries. **Deutsche Post World Net** and **TPG** are among the operators achieving the highest percentages of mail sorted automatically, perhaps as a result of strong cost efficiency incentives faced by these listed companies.

In the transport area, a large shift from particularly rail to road has occurred in recent years. The preference for using road appears to be universal, irrespective of the size of the country. Only **La Poste (France)** is considering increasing the use of the rail network, in part because of noise restrictions at airports. Transport is also one of the areas where a degree of outsourcing is starting to develop. Reorganising the transport network is often related to changes in the sorting office network.

Delivery costs can be reduced in several ways, for example reducing delivery frequencies where the universal service obligation is not binding, retiming deliveries, and simplifying

the role of delivery (allowing lower wages). The number of delivery offices tends to be particularly high in Easter European countries. However, when expressed per thousand square km, the differences are less pronounced, suggesting that geographical factors (transport costs) as well as mail volumes are factors influencing the efficient number of delivery offices.

In regard to parcels and express, we have seen that many universal service providers share facilities between letter mail on the one hand and parcels and express on the other. The post office network is the most obvious facility to be shared, but (parts of) sorting, transport and delivery networks are also shared in a number of cases. When volumes are high, however, delivery networks tend to be separate.

Our analysis therefore suggests that there are economies of scope between the non-delivery elements of the parcels/express and letter mail networks, and even between the delivery elements in the low-volume parts of the network.

# 4. DEVELOPING POSTAL BUSINESS STRATEGIES

# 4.1. Introduction

Having set the scene by discussing the changing nature of postal services in Chapter 3, we now develop a broader perspective. In this chapter, we discuss the corporate business strategy of postal operators. As we will see, these strategies increasingly involve expanding into activities beyond traditional postal services.

The main purpose of the chapter is to examine the impact these corporate strategies have on the economics of postal services and how these impacts may change in the near future. We examine the strategies and are particularly concerned with the factors driving them. On the basis of these insights, we then determine whether the economics of traditional postal services are likely to be impacted by the corporate strategies of postal operators and in particular by their expansion policies.

We will proceed as follows:

- In Section 4.2 we discuss the external environment which provides the background against which postal operators are developing their strategies. We discuss developments like the changing composition of demand, global trends resulting in an increase in the demand for one-stop-shop services, and the impact of regulatory policies.
- Section 4.3 examines the main strategies followed by postal operators, including vertical integration, horizontal integration, internationalisation, cost efficiency, and product and pricing initiatives. The section also briefly examines the internal business organisation of postal operators.
- In Section 4.4, we use the differences in the main strategies followed by postal operators to develop a typology of postal operators. We consider both the present situation and the likely direction of future developments.
- Section 4.5 concludes the chapter and discusses the potential impact of the strategies discussed earlier on the economics of postal services.

We note that business strategy issues relating to the retail network are the subject of a separate chapter, Chapter 9. Consequently, the present chapter does not deal with retail network issues.

# 4.2. The External Context that Operators Face

#### 4.2.1. Introduction

In recent years, the environment in which postal operators operate has been subject to considerable changes. The use of internet and email has started to have an impact on the demand for traditional postal services. The postal market is gradually being opened and competition is emerging in certain countries. And global developments, including the globalisation of the economy, are having an impact on the nature of services demanded by customers of postal operators.

Before discussing the ways in which postal operators are reacting to these developments, it is useful to examine them in some more detail. In this section, we distinguish between the following main factors:

- changes in the demands by customers;
- regulatory developments; and
- corporatisation/privatisation.

Each of these factors is in turn driven by a number of separate developments. We will examine these in the next three subsections where we examine each main trend in turn.

### 4.2.2. Changing composition of demand

Historically, the postal industry was characterised by a stable environment in which postal volumes usually displayed moderate but continuous growth. However, in recent years, this situation has started to change with a number of universal service providers now experiencing declining mail volumes.

**Post Denmark**, for example, saw its letter volumes fall by 4.2 per cent in 2003 and is expecting that this trend will continue. The Mail Division of **La Poste (France)** recorded a fall in volumes of 0.9 per cent in 2003, the first fall in its history. **TPG** is expecting addressed mail volumes to decline by 2.5 per cent per year until 2010, about 20 per cent in total. **La Poste (Belgium)** expects volumes to fall by 8 per cent in the period until 2007.

These developments are driven by the following factors:

• <u>Increased competition from substitute products</u>. In recent years, growth in electronic means of communication has started to have an impact on traditional mail volumes. In particular the demand for addressed mail is under pressure due to such developments as internet banking and online billing.

• <u>Increased competition from other operators</u>. In a number of countries, competition is increasing as a result of partial opening of the market. In the United Kingdom in particular, the market for bulk mail above 4,000 items from a single site in a similar format was liberalised on 1 January 2003, and a next step will be taken on 1 April 2005. As a result, a number of competitors have entered the market. Long-term licences have among others been issued to UK Mail, TPG Post UK Limited and Deutsche Post Global Mail (UK) Limited. In Germany, a large number of firms are now active in the postal market in competition with Deutsche Post, though almost all of these only have a local reach. In the Netherlands, two national mail providers are competing with TPG for those types of mail for which the market has been liberalised, including direct mail.

Of course, competition from other operators does not reduce total demand, it merely redistributes demand between operators. But it is a relevant factor influencing the business strategies of incumbent operators. It is worth noting though that at present, the impact of competition from other operators is generally limited. The threat of substitute products is a more important factor driving the downward trend in volumes.

• <u>Economic slowdown</u>. In the field of direct marketing, demand has been affected by the poor economic climate in recent years. Like many marketing activities, direct marketing is particularly sensitive to changes in GDP. However, unlike the demand for addressed mail, the demand for direct mail is expected to pick up once the economy recovers, and to continue to grow.

Contrary to the trend in many of the original 15 Member States, mail volumes in the new Member States had often still been displaying strong growth. In addition, competing private operators are able to benefit from the growth opportunities created by the gradual opening of the market in certain countries.

There are also a number of more general trends that impact on the demand for postal and related services. These include:

- <u>Globalisation of the economy</u>. This is a development occurring at a European level, related to the completion and expansion of the Single Market, but also at a global level. The trend started many years ago, is a gradual one and is likely to continue. The increasing number and importance of multinational corporations may put some pressure on postal operators to develop a presence in multiple countries.
- <u>Tendency to outsource non-core activities.</u> This development was an important management trend in the 1990s and led to increases in the demand for, for example, logistics services. It is possible that this trend will continue, though this is less clear than in the case of the trend towards globalisation of the economy.

The impact of these factors is less immediate than that of the other factors discussed above. But, as we will see later on in this chapter, they create opportunities for postal operators to gain a competitive advantage by providing a "one-stop-shop" to their customers, both in terms of products offered and geographical areas served.

## 4.2.3. Regulatory developments

Trends in regard to the regulation of postal services vary widely across Member States. A detailed overview of developments by country is outside the scope of the present study.<sup>13</sup> The present section only deals with the most significant regulatory trends impacting on operators' business strategies.

At Community level, the regulatory framework for the sector has been laid down in the Postal Directive 97/67/EC as amended by the 2002/39/EC Directive. Key features of the Directive are a gradual reduction of the maximum weight in the reserved area (currently 100g, to be reduced to 50g from 1 January 2006), a requirement for transparent and clearly separated cost accounting systems by universal service providers, and the definition of minimum quality of service standards.

At national level, key regulatory trends impacting on operators' business strategies are the following:

- <u>Regulation of postal tariffs.</u> Postal tariffs are increasingly determined by independent regulators. In a number of countries including Germany and the United Kingdom, decisions in regard to tariffs have been taken which are causing postal tariffs to fall (in real terms). In the Netherlands, where tariffs are regulated by the relevant Ministry, postal tariffs have been frozen for a period of five years. Given that the demand for postal products tends to be price inelastic,<sup>14</sup> a reduction in postal tariffs will also lead to a reduction in postal revenues. In many other countries, however, postal tariffs are allowed to increase in line with inflation levels.
- <u>Access to postal networks (downstream access)</u>. Different approaches are taken in different countries. In the United Kingdom, an agreement has been reached between **Royal Mail** and **Business Post/UK Mail** regarding access to Royal Mail's delivery network, and the terms under which access is to be given (after the Regulator, Postcomm, had proposed access terms and conditions). Allowing competitors downstream access allows entrants to compete in only the upstream parts of the value chain.

<sup>&</sup>lt;sup>13</sup> But see the report to the European Commission by WIK.

<sup>&</sup>lt;sup>14</sup> The price elasticity of demand is defined as the percentage change in demand divided by the percentage change in price. If price is inelastic, a given fall in price will lead to a smaller percentage increase in traffic, and operator revenue will fall.

By contrast, in the Netherlands, access to **TPG's** delivery network is not considered necessary since two of TPG's competitors are already rolling out a delivery network with national coverage. In Germany, third-party consolidation of mail is currently expressly forbidden. There had been press suggestions that the relevant legislation might be challenged by the European Commission before the Community Courts.<sup>15</sup> However, at end May 2004 the German Minister for Economic Affairs was reported to have agreed to amend the law on postal services to open up the market for the collection and sorting of letters.

The regulatory trends, both at national and Community level, are providing powerful incentives for some operators. As we will see below, **Royal Mail**, for example, has had to embark on an extensive cost cutting programme as a result of the combination of a strict price control regime and the opening of the market for bulk mail (for which the company is required to provide downstream access). And all operators are having to adjust to the gradual opening of the market provided by lowering the weight limits in the reserved area.

# 4.2.4. Corporatisation/privatisation

Another development facing postal operators is the change in the ownership structure of postal operators. The first stage of this has been the move to corporatisation, that is the transfer of the postal operation from a part of the civil services, often with civil service pay and conditions, to an autonomous or semi-autonomous organisation still in public ownership. This process is largely complete in the EU, and only **Cyprus Post** is part of the Cypriot government itself.

La Poste (in France) became an autonomous public sector service provider on January 1<sup>st</sup> 1991, under the application of the July 1990 law on the organisation of the public mail and communications services in France. In accordance with this law, La Poste operates on a financially independent basis, responsible for managing its assets and liabilities and for operating the business on a profitable basis. La Poste independently determines the nature and volume of its business and assesses its need for finance. Relations with the state are based on a multi-year contract.

Source: La Poste AR&A (English version) 2002.

<sup>&</sup>lt;sup>15</sup> *Financieele Dagblad,* 10 May 2004.

However, the second – and more dramatic stage – the move from corporatisation to privatisation, is less far advanced, and some Member States have no intention of privatising their national postal operators.

At present, of the 25 universal service providers, all are 100 per cent state-owned except for:

- **TPG**, which is a listed company, though the government still owns 34.8 per cent of the shares;
- **Deutsche Post World Net** is also a listed company but the government still controls (either directly or indirectly) 62.6 per cent of the company's shares; and
- **Malta Post** is partially privatised but not listed (35 per cent owned by Transend, a subsidiary of New Zealand Post).

**Postal services in the Netherlands** were partially privatised in 1994. In that year, a minority stake of around 30 per cent in the national post and telecoms operator KPN was sold to private investors. At the time, telecommunications services were, in terms of their value to the company, much more important than postal services. The decision to privatise postal services might therefore be regarded as a "by-product" of the decision to privatise telecommunications services. However, an alternative would have been first to separate the company into a telecommunications and postal operator and then to decide separately on whether or not to privatise each company individually. This approach was taken in a number of other countries.

In the event, the privatised company decided itself to demerge into a postal and a telecommunications business. Following the acquisition of the Australian express operator TNT in 1996, the postal division of the business had become much more important and was judged to be viable on its own. The different characteristics of the postal and telecommunications businesses, including growth potential and exposure to systematic risk, were also factors impacting on the decision to split the company.

After its demerger, the new independent postal operator TPG continued to make acquisitions in order to become a global postal, express and logistics operator. The government's stake in the company has gradually been reduced but, for the time being, the government retains a minority stake in the company. The firm has implemented large cost cutting programmes in its postal services business and continues to do so (see Section 4.3.5). Tariffs have fallen in real terms and service quality has improved due to the introduction of widespread automatic sorting. However, the company has faced criticisms over service level reductions in rural areas and over reductions in the services offered in the network of post offices.

The legal status of operators may impose constraints on the adoption of the most cost effective or profit maximising strategy. For example, in some cases state-owned companies may be unable to invest in private companies or enter into associations or consortia, they may have very tightly controlled rules over their business activities and may be constrained from raising capital or undertaking investment. They may also face severe constraints on their ability to reduce staffing levels.

Other Member States have plans to partially or totally privatise their postal operators in the near future, which would free them from many of these constraints. These include:

- during 2004, the Danish government plans to sell 25 per cent of **Post Denmark** shares;
- the Greek government also plans to sell 25 per cent of the shares in **Hellenic Post**;
- Portugal plans a 30 per cent partial privatisation of **CTT Correios** through an IPO in 2004; and
- there are plans for privatisation of **Austria Post**, **Hungary Post** and **Slovakia Post**.

# 4.3. Strategies Adopted by Postal Operators

### 4.3.1. Introduction

Against the background of the main external trends that postal operators face, discussed in the previous section, in the present section we discuss the main strategies that operators have adopted.

We distinguish between the following five main strategies:

- vertical integration;
- horizontal integration;
- internationalisation;
- cost efficiency; and
- product strategies.

Each of these will be discussed in turn in the next five subsections.

In Section 4.4, we then combine the main strategies adopted by postal operators to develop a typology of postal operators.

#### 4.3.2. Vertical integration

One of the most important strategic developments in the postal sector in the last 10 years has been the <u>upstream vertical integration of postal operators</u>.

To understand this, it is useful to consider an extended version of the traditional value chain. The traditional postal value chain, of which a detailed version is shown in Figure 3.1, essentially covers the activities of collection, transport, sorting and delivery. But the actual value chain for many postal times includes more activities, since the postal items first need to be produced before they can be dispatched.

These activities can be captured into an "extended value chain" for postal operators, shown in Figure 4.1.





The extended value chain recognises that in the case of the majority of postal and express items, a number of activities have already taken place before the items are delivered to the postal operator or collected from the customer's premises.<sup>16</sup>

An online book retailer, for example, receives books from a large number of publishers (*inbound logistics*). The retailer needs to store these books, package them and ensure that they are marked with the address of the customer who has ordered the book (*operations*). It then needs to collect all the prepared items and prepare them for dispatch or collection by the express operator (*outbound logistics*). The express operator subsequently collects the item, transports it to the sorting hub, sorts it, transports it to the delivery office and finally delivers it to the customer. If the customer does not like the book, he may return it, in which case a reverse link exists between delivery and inbound logistics.

Due to the trend towards outsourcing of non-core activities, the market for logistics services has grown substantially in the last decade.<sup>17</sup> This in itself has made it attractive for postal

<sup>&</sup>lt;sup>16</sup> Of course, the "extended value chain" is does not apply to <u>all</u> postal items. It is not relevant for example for mail posted by residential customers.

<sup>&</sup>lt;sup>17</sup> In recent years, however, growth has slowed down due to difficult economic conditions.

services to enter this market. But there are a number of other factors that explain why the logistics market is particularly attractive for postal operators. These include:

- Postal operators operate highly complex logistic systems themselves and thus have extensive experience in the field.
- By organising the logistic processes in a company, postal operators are well placed also to compete, where appropriate, for the mail (and express) items dispatched by the same company. This creates a "one-stop-shop" for the operator's clients.

Because of the "one-stop-shop" synergy, express operators have historically offered logistics services as well. These companies were therefore particularly attractive as partners for universal service providers, as shown by acquisitions of **Deutsche Post World Net** (of DHL and Danzas) and **TPG** (of TNT), who are now among the world's largest providers of logistics services.

Other universal service providers have also moved upstream in the extended value chain, albeit on a smaller scale. A number of universal service providers have acquired national logistics companies so that they too are now providing, at the national level, a one-stop-shop.

On the other hand, there are other operators that do not provide logistics services or only do so on a marginal scale. These include **Royal Mail**, **Poste Italiane**, **Correos** and many of the smaller operators.

Most universal service providers, including those mentioned above, have (also) become active in the extended value chain in other ways. For example:

- **TPG** has acquired a number of companies in the communication, data and document management market and has bundled these into its "Cendris" subsidiary. The two principal services offered by Cendris are direct marketing and document management services. The company is active in the Benelux, Germany, the United Kingdom and in a number of Eastern European countries.
- **Finland Post** has invested in a number of printing, enveloping and mailing services in the Finland, Sweden, Norway and Germany areas as a way to extend their involvement in the messaging value chain from customer to customer. They have also invested in a newspaper delivery service in the Helsinki area to extend their core delivery business.
- La Poste (Belgium) has acquired companies specialising in administrative mail and global solutions for document management in order to create a presence in the "enlarged" mail value chain. A joint venture has been set up with the national telecoms provider Belgacom, to provide electronic certification services. A direct marketing business has also been acquired with the aim of moving upstream in the

direct marketing value chain in order to offer comprehensive solutions developed inhouse. Finally, a company offering a point-to-point pick up and delivery service has been acquired. All companies are located in Belgium, with one exception (France).

#### 4.3.3. Horizontal integration

In addition to vertical integration upstream in the extended value chain, postal operators have also <u>integrated horizontally into the express market</u>.

The demand synergies between mail, express and logistics can be illustrated using Figure 4.2, which shows the combined value chain of all three activities.



Figure 4.2 Combined Extended Value Chain

Having integrated into logistics, a mail operator will find it attractive to expand into express services as well to exploit the demand synergies between logistics and express. In practice, some of the acquired companies already provided both express and logistics services. Of all the Universal Service Providers, **Deutsche Post World Net** and **TPG** have been most successful in establishing a presence in the extended value chain. Deutsche Post acquired a majority share in the global express company <u>DHL</u> between 1998 and 2002, and in addition acquired the Swiss logistics company <u>Danzas</u> in 1999. Earlier, in 1996, TPG had acquired the Australian worldwide express operator <u>TNT</u>. The two companies have since then further expanded their position by a number of additional acquisitions of express and logistics companies. Deutsche Post and TPG have been able to become a full-service provider of mail, express and logistics services with a global reach.

La Poste (France) have not acquired a foreign express operator but have entered into an alliance with Fedex. In addition, it has acquired a national express operator in Germany and has further cooperation agreements with Correos, Poste Italiane and Sweden Post.

In addition, unlike between mail and logistics, there may be some cost synergies between mail and express. In a number of countries, networks are to some extent shared between the two activities (see Section 3.4). In addition, post offices can be used as retail outlets for the express network. This explains why some universal service providers have integrated horizontally into the express markets even if they do not offer logistics services.

In 2000, **Denmark Post, Sweden Post** and Norway Post bundled their respective crossborder parcel businesses in a joint venture "Pan Nordic Logistics" (PNL). Following the withdrawal of Sweden Post from the joint venture, an express operator in Sweden was acquired and cooperation agreements were entered into with **Finland Post**, **Estonia Post, Latvia Post and Lithuania Post.** With the exception of Sweden, the joint venture does not have its own infrastructure; for example Post Denmark still carries out sales, sorting and distribution of international parcels on behalf of PNL. PNL aims to become the leading Nordic company in the express and parcels markets.

Finally, the combination of mail and express may result in service quality improvements, in part because of the use of management skills. Postal users for example have expressed the view that in the delivery of mail and express services, USPs that own express operators often provide a better quality of service than those that do not.<sup>18</sup>

<sup>&</sup>lt;sup>18</sup> View expressed by FEDMA in response to written questions by NERA.

#### 4.3.4. Internationalisation

A third important strategic trend in the postal industry is the <u>internationalisation of the</u> <u>sector</u>.

In part, the internationalisation of the postal sector is related to the fact that the sector was historically organised along national lines, whereas postal operators now operate in a single European market. But the fact that universal service providers now have incentives towards internationalisation can also be explained by a number of other, more specific factors. These include:

- <u>Upstream vertical integration in the extended value chain.</u> Historically, logistics and express operators were to a much lesser extent organised along national lines than postal operators were. With the acquisition of express and logistics firms, postal operators have "imported" a lot of international activities into their business. To exploit synergies, they are also looking to expand the scope of their traditional activities.
- <u>Globalisation of the economy.</u> Where businesses internationalise and increasingly develop presences in multiple countries, postal and express operators that have a presence in each of these countries will have a competitive advantage over others that do not. In the European context, the completion and expansion of the single market is another important factor.
- <u>"Economies of skill" and differences in the speed of reform in various countries.</u> Member States have taking different approaches to the reform of their postal sector. Two countries in particular, the Netherlands and Germany, have introduced private sector disciplines into their universal service providers at an early stage. As a result, these operators have gained a wealth of experience in turning round postal businesses, which they are eager to apply in other countries where the pace of reform has been slower.

**TPG** has repeatedly stated its interest in acquiring an interest in other European universal service providers (including **La Poste (Belgium)** and **Austria Post**), provided a majority share can eventually be obtained, and explicitly mentions its established track record in postal reorganisations in this context.

• <u>Corporatisation/privatisation</u>. For structural alliances (involving one USP taking a share in another) or mergers to take place, the government of the acquired firm will need to be prepared to sell some or all of its shares in the operator. In addition, listed operators will find it easier to acquire other firms since they can fund the acquisitions with their own shares.

• <u>Economies of scale.</u> Where they exist, economies of scale also provide incentives to expand the scale of operations via international expansion. The question whether economies of scale exist in postal services will be discussed in Chapter 8. We will see there that postal operations in original Member States are characterised by constant returns of scale, but that economies of scale may exist in the new Member States. In view of this, we do not believe that economies of scale are a very important factor driving the internationalisation of the postal industry, though they may sometimes be relevant.

The internationalisation of the sector takes a number of forms. One of these is <u>international</u> <u>acquisitions by universal service providers</u>, such as:

- **Royal Mail** has acquired parcels subsidiaries in Germany, France, Denmark and the Netherlands. In addition, it has bought a mails subsidiary in Sweden and associated parcels undertakings in Italy and Poland. It also has mail operations in the Netherlands.
- **TPG** and **Deutsche Post World Net** have as noted above acquired numerous foreign companies to strengthen their mail, express and logistics businesses.
- **La Poste**, through its GeoPost subsidiary, have progressively created a European express business by acquiring local European express operators.
- A number of other universal service providers have some form of interests and operations abroad, including **Post Denmark**, **Finland Post**, **Austria Post**, **Correos** and **CTT Correios**.

Internationalisation is also possible through <u>alliances and joint ventures</u>. Alliances may be an attractive option where acquisition is not possible (for example because the partner is state-owned), where the cooperation only concerns a subset of the parties' activities, or where new products are jointly set up.

Examples of important alliances between postal operators are:

- *Spring*, a joint-venture between **Royal Mail**, **TPG** and **Singapore Post**, offering crossborder mail and value-added services;
- a strategic alliance between **TPG** and **China Post**;
- a series of strategic alliances between La Poste (France), Fedex, Correos, Poste Italiane and Posten (Sweden);
- *Pan Nordic Logistics,* an international logistics company jointly owned by **Post Danmark** and Posten Norge, working together with **Finland Post** and the **Baltic postal operators** (see also Section 4.3.3 above); and

• the *Baltic Express* service, a service that allows **Estonia Post**, **Latvia Post** and **Lithuania Post** to deliver parcels from door to door in the Baltic countries by using the delivery network of their partners' universal service providers.

Other operators have indicated their intention to enter an alliance with a major international player but have not yet achieved this.

**Post Denmark**'s "Strategy 2006" explicitly lists an alliance with a major international player as one of its strategic objectives, including a share sale.

So far, <u>mergers between universal service providers</u> have not yet occurred. But in view of the above, the possibility of this happening in the future cannot be ruled out. TPG was reportedly in merger talks with Royal Mail in 2002 and even considering an all-share bid for the company. TPG has also been linked to other universal service providers. But in many countries, there may be political objections against selling the national postal operator to a foreign company.

We believe that any mergers between universal service providers will primarily be driven by demand synergies and "economies of skill", not necessarily by economies of scale.

### 4.3.5. Cost efficiency

Although the aim of achieving cost efficiency is a normal business practice, usually driven by competitive conditions, many postal operators currently explicitly regard achieving an efficient cost level as one of their key business strategies. The current need for postal operators to achieve an efficient cost level is usually driven by one or more of the following factors:

- <u>Increased competition</u>, or the threat of competition, both from substitutes and, in some cases, from competing operators. Where competition is leading to falling volumes, this may create an environment in which the organisation might be able to make decisions that would have been unthinkable in the past.
- <u>Regulatory decisions</u> resulting in falling postal tariffs (in real terms), for example in Germany, the United Kingdom and the Netherlands. As with increased competition, such decisions may provide the management of postal operators with arguments to convince the organisation that measures are necessary.
- <u>Financial difficulties</u>, such as those faced by **Royal Mail** after a number of years in which heavy losses were incurred.

In 2002, **Royal Mail** announced a three-year Renewal Plan that aimed to return the company to profitability by achieving an aggregate cost saving of over  $\in$ 2 billion by the end of 2005.

The target saving is equivalent to 17 per cent of total Royal Mail operating costs in 2001/02. Measures to achieve the cost saving target include:

- Eliminating the second daily delivery, which accounts for 4 per cent of volumes but 20 per cent of costs. The target cost saving: is €500 million.
- Restructuring the parcel network, including withdrawing from the unprofitable three-day delivery market. The target cost saving is €750 million.
- Operational improvements in Royal Mail, including streamlining the transport network and introducing new automated sorting equipment. The target saving is €700 million.

**TPG**, which has already gone through previous savings programmes, has initiated an additional cost flexibility scheme that aims to deliver cumulative cost savings in the Mail Division of  $\notin$  320 million by 2013. The target cost savings amounts to 11 per cent of total operating costs in the Mail Division in 2001, the year before the programme began to have an impact. The overarching aim of the scheme is to retain the company's operating margins in an environment characterised by volume declines and frozen tariffs for reserved services (see Sections 4.2.2 and 4.2.3 above).

Whereas the previous reorganisation of TPG was mainly aimed at the sorting process, the present programme mainly focuses on improving the efficiency of the distribution process. An overview of the sources of the savings and of example measures in each area is provided in Table 4.1.

Area	Target saving 2013 (€m)	Examples of measures
Automation & redesign	185	Implementation of automatic sequence sorting
		Adjusting sorting capacity to declining volumes,
		potentially closing one centre (out of six)
		Restructuring in area of parcels and delivery depots
Mail deliverers	80	Separating roles of preparation and delivery
		New part-time mail delivers in lower pay scale
Commercial	55	Integrating and outsourcing call centres
		Converting fixed cost retail network into a variable cost
		network

# Table 4.1TPG Cost Flexibilisation Programme

Source: TPG Analyst Presentation, 20 February 2003.

**Deutsche Post World Net** aims to increase total EBIT by €1.4bn by 2005 through its STAR value creation programme. However, since the impacts of the programme includes both revenue and cost effects, it is difficult to determine the exact cost savings

that the company aims to achieve. The targeted EBIT impact in the Mail division is  $\notin$  300m. If all of this were to be due to cost savings, the savings would be equal to 3 per cent of total operating costs of the Mail Division in 2001.

The scale of the planned efficiency improvements at companies like TPG and Royal Mail, which face powerful incentives because to their regulatory and/or ownership framework, suggests that there may still be inefficiencies at other operators who do not currently face such powerful incentives. There are however other examples of cost reduction programmes at universal service providers. **La Poste (Belgium)**, for example, aims to have reduced total operating costs by €300 million by 2007 (14 per cent of total operating costs). A number of other universal service providers also report cost efficiency programmes without specifying the exact amount of savings to be generated from them.

We refer to Section 3.3 for a detailed discussion of the scope for cost reductions in the collection, sorting, transport and delivery activities.

Wage costs can also be reduced if postal employees are no longer treated as civil servants. For example, at **Deutsche Post World Net** civil servant status is only retained by those employees who were employed by the company when it was still a government organisation. New employees are hired on different conditions and are, according to views expressed by competing private German postal operators, significantly cheaper to employ than employees with civil servant status (in part because of lower pension costs).

Cost savings and cost flexibility can sometimes also be achieved through <u>outsourcing</u>. Outsourcing can often result in a greater variability in cost structures, which may be important to cope with declining mail volumes. But outsourcing also often results in cost savings due to wage differences between universal service providers and private firms. Important examples of outsourcing in postal services include:

- In May 2003, a contract was signed between Royal Mail and the Prism Alliance led by the Computer Sciences Corporation (CSC). With the contract, worth over €2 billion, Royal Mail outsourced all its IT services. The move was accompanied by the transfer of over 1,700 staff from Royal Mail to its partners. Aggregate cost savings of €375 million were identified, amounting to 17 per cent of the total value of the contract.
- **Deutsche Post World Net** has reached an agreement with its union under which parcel deliveries in up to 600 districts will be outsourced. In addition, the company reports that up to 4,000 employees have been transferred due to outsourcing in the

transport area of the Mail Division.<sup>19</sup> However, under the agreement with the union, no further delivery activities will be outsourced until the end of 2006.

• **CTT Correois** and **Posten (Sweden)** have outsourced their IT to IBM.

Another area in postal services where outsourcing is increasingly important is the retail network. This will be discussed separately in Chapter 9.

#### 4.3.6. Product strategies

Since the focus of the present study is on the fundamental economics of the postal sector (and in the context of this chapter, on strategies influencing these), we do not discuss detailed product initiatives by postal operators in this chapter.

We only note the following highlights:

- <u>Introduction of priority/non-priority mail.</u> A number of operators including **Poste Italiane** and **La Poste (Belgium)** have introduced a choice between priority and nonpriority mail in recent years. Apart from being able to offer greater choice to consumers, an objective of this is also to be able to internally separate mail flows, leading to cost reductions.
- <u>Hybrid mail</u> sent electronically from the sender to the postal operator, who then prints and wraps the mail and takes care of its processing and delivery. This is an example of postal operators moving upstream in the extended value chain (see Section 4.3.2).
- <u>Sales channel innovations</u>, including electronic stamps. These are mainly convenient for the customer, but will also result in some cost savings for the operator.

# 4.4. A Typology of Postal Operators

#### 4.4.1. Current position

In this section, we develop a categorisation of postal operators on the basis of the discussion in the previous sections of this chapter.

Given the focus of the chapter on business strategies, the categorisation will also focus on the business strategies pursued by operators (as opposed to, for example, the external factors driving them<sup>20</sup>).

<sup>&</sup>lt;sup>19</sup> <u>Deutsche</u> Post annual report 2003, p. 79.

Accordingly, we have developed our categorisation of postal operators on the basis of the following two principal dimensions:

- <u>Services offered.</u> This dimension relates to the trends towards vertical and horizontal integration of universal service providers, discussed in Sections 4.3.2 and 4.3.3 above. Operators that offer the full spectrum of mail, express and logistics services have been classified as "full-service firms". By contrast, operators that focus on only one or two specific services (e.g. mail consolidation) are "specialised firms". universal service providers that do not have a full-service offering are somewhere in between these two categories.
- <u>Degree of internationalisation of the business.</u> Developments in this field were discussed in Section 4.3.4. Universal service providers were traditionally nationally oriented, but some of them have acquired some international activities. **Deutsche Post** and **TPG** are most advanced in this area since each of these companies has acquired a global express operator. La Poste (France) is with operations in many European countries and an alliance with the global express operator Fedex not far behind, followed by Royal Mail. Most competing private operators in Europe currently have a local reach, though, as we will see below, this position is changing.

A graphic presentation of the position of the various public and private operators in Europe is shown in Figure 4.3. The figure shows all universal service providers (denoted by their country abbreviation for ease of reading), the two remaining independent global express operators UPS and Fedex, and the position of most competing private operators.

<sup>&</sup>lt;sup>20</sup> This includes the regulatory frameworks faced by operators (and the associated incentives provided by these), which are reviewed in detail in the companion study by WIK Consult.

Figure 4.3 Typology of Postal Operators



Note: universal service providers denoted by the abbreviation of their respective countries for ease of reading

Based on their respective positions, universal service providers can be categorised in three distinct categories (shown in the chart). These are:

• <u>Global ambitions.</u> A few universal service providers in Europe have, either through size or through past acquisitions, developed a worldwide presence and aim to develop this further. The most prominent company in this category is **Deutsche Post World Net**, which aims to become the global leader in all markets in which it is active. TPG's ambitions are slightly more modest than those of Deutsche Post but otherwise very similar. It achieved its position as a result of its takeover in 1996 of the Australian express company TNT. **La Poste (France)**, being at the centre of a network of alliances involving the Spanish, Italian and Swedish universal service providers, as well as Fedex, is also well placed. **Royal Mail**, which is not active in the logistics market and does not have a linkage with one of the big four express companies, is somewhat behind and will likely be struggling to close the gap.

Operators in this category will derive a large proportion of their revenue from services other than mail. Their universal service focus will also be relatively limited.

However, the universal service in general and the mail services in particular account for a large proportion of the profits of some of these operators.

<u>Cautious expansion.</u> About half of the universal service providers in the 25 Member States are following a strategy of horizontal/vertical integration, internationalisation, or both. Most of these have some interests or operations abroad, including Posten (Sweden), Post Denmark, Estonia Post, Latvia Post, Lithuania Post, Correos, CTT Correios and Austria Post. Seven of the 12 companies in this category offer a full-service, the rest do not.

In spite of their cautious expansion into other areas, operators in this category continue to be heavily dependent on mail revenue and continue to be largely focused on the universal service in their own country.

• <u>Consolidating existing position.</u> The remaining eight universal service providers do not significantly engage in any of the trends described above. They concentrate on improving and maintaining their position on their home market, sometimes by becoming active in document management and related activities. This group of companies includes the universal service providers from some smaller Member States, but also those of for example Belgium, Ireland and the Czech Republic.

Of the three groups of operators, operators in this group will have the greatest mail revenue dependency. They will also be almost exclusively focused on the universal service (and related services) in their home country.

### 4.4.2. Future direction

As already noted, the picture shown in Figure 4.3 is not a static picture. The postal market is developing and we believe that the changes that we have seen so far will be followed by significant further developments.

Our view on the likely direction of the main future trends is shown in Figure 4.4.



Figure 4.4 Direction of Future Developments

Key points to note from the figure are the following:

• <u>Competing private operators</u>, currently mainly active in specialised markets with a local reach, will be expanding both into broader markets and broader sets of activities. In part, this trend is already occurring. In the Netherlands, for example, two operators are setting up a delivery network with nationwide coverage (although one of these companies is in fact controlled by Deutsche Post).

**Business Post** in the UK is not only able to accept express items for dispatch to anywhere in the world (through a partnership with Fedex), it is also about to start a nationwide business mail service (in part using Royal Mail's delivery network, see Section 4.2.3 above).

It is likely that certain competing private operators will conclude that the necessary scale can best be achieved by selling out to a larger operator. **Hays**, a UK business services group, has announced that its Mail division will no longer form part of the
company over the longer term. First, however, it wishes to demonstrate the value of its new long-term postal licence.

- Companies in the "<u>consolidating existing position</u>" group will come under pressure to expand their activities in order to exploit demand synergies. If they do not do so, they will eventually become vulnerable to entry by integrated foreign companies who derive a competitive advantage from the fact that these can exploit these synergies. Activities can be expanded by organic growth, by takeovers of competing private operators in other countries, or by selling (a stake in) the company itself to a major international grouping.
- The "<u>cautious expansion</u>" group of companies are likely to continue to pursue this strategy, focusing on particular niche markets. **Austria Post** for example is developing operations in South-East Europe, whereas **Correos** aims to develop a presence in Latin America. But none of these companies is likely to have the scale to develop global ambitions. Some of the companies in this category have already entered into an alliance with one of the big four companies (in particular with **La Poste (France)**), and this and other developments could lead to further consolidation.
- Companies with <u>global ambitions</u> will be pursuing these ambitions vigorously.
  **Deutsche Post World Net, TPG and La Poste (France)** are all well placed, with Royal Mail currently being behind. The expansion policies of these companies are likely to involve a combination of:
  - Acquisitions of competing private operators in other countries, potentially using these as a platform from which further to develop activities in a particular company. For example, **Deutsche Post World Net** acquired the UK express company Speedmail in January 2004. At the same time, Speedmail also acquired a long-term licence to handle and deliver bulk mail and mail over 100 grams.
  - Alliances with major global players, such as **La Poste (France)**'s alliance with Fedex and **TPG's** with China Post.
  - Alliances with or take-overs of universal service providers in other countries, such as the alliances between La Poste (France) with Correos, Poste Italiane and Posten. As noted above, outright mergers between or takeovers of universal service providers have not yet occurred, though TPG and Royal Mail were in merger talks during 2002. TPG has also been linked to various other operators including La Poste (Belgium) and Austria Post.

**Deutsche Post World Net** and **TPG** have a particular advantage since they can use their own shares to fund acquisitions. **Royal Mail**, by contrast, is unable to do so and in addition has limited access to cash resources after a number of years in which losses were incurred. These difficulties will severely constrain its capability to catch up with the other three firms in this category. In the group of <u>global express integrators</u>, three out of four firms now have linkages with a major European universal service provider. Two of these, **TNT** and **DHL**, are actually part of TPG and Deutsche Post World Net respectively, whereas **Fedex** has entered into an alliance with **La Poste (France)**. **UPS**, the global market leader, does not currently have such a link. The company has for a number of years now been engaged in a dispute with Deutsche Post World Net regarding alleged illegal crosssubsidisation from the very profitable mail business of Deutsche Post to its parcels and express operations.

### 4.5. Conclusion: Impact of Strategy on the Economics of Postal Services

In this chapter, we have reviewed business strategies adopted by postal operators.

In the past, universal service providers did not face strong incentives to control costs and their strategies were mainly service and revenue driven.

This situation has now changed due to a number of factors. We have seen that postal operators in a number of Member States are currently facing a downward pressure on mail volumes due to competition and mail substitution. The demands from customers are also changing, in part because of the globalisation of the economy and because of the tendency towards outsourcing non-core activities. In addition, regulatory intervention sometimes leads to falling tariffs (in real terms) and in some cases to a requirement for incumbent operators to make the delivery network available to third parties.

Against this background, the strategy of many postal operators, both universal service providers and competing private operators, involves expanding the scale of operations. This is done by vertical integration upstream into the value chain, horizontal integration into express activities and internationalisation. In addition, a number of operators have embarked on major reorganisation programmes with a view of reducing their costs.

Many of the key strategies pursued by postal operators are <u>demand-driven</u>. For example, postal operators have integrated into express and logistics services in order to offer their customers an integrated service. The internationalisation of traditional postal operations is also to a large extent driven by customers' demands.

In fact, in the case of some of the strategies followed by postal operators, we do not believe that they have a material impact on the economics of postal services. This applies in particular to <u>vertical integration</u> by postal operators, upstream into the value chain. In terms of their operations, logistics services are completely separate from traditional postal services. The same applies to products like document management services. In our view, the synergies from vertical integration are entirely based on demand-relationships.

However, other strategies pursued by postal operators do have the potential to impact on postal costs and thereby on the economics of postal services.

In Section 3.4, we have seen that a number of operators share network facilities between letter and express, or between parcels and express services. In principle, therefore, the <u>horizontal integration</u> of postal operators into express services could therefore affect the economics of traditional postal services. In some cases, we believe that this is indeed the case. **Deutsche Post World Net**, for example, has fully integrated its domestic parcel business into the express company DHL that it acquired between 1998 and 2002. By contrast, **TPG** has not been successful in doing so and has returned its domestic parcel business to the Mail Division (previously parcels were carried by the Express division). The small home market for parcels of TPG, compared to the size of its global express operations, could have been a factor influencing this.

We are not aware of operators having acquired express operators and subsequently having integrated these with the letter mail network. Our impression is that operators that do share network facilities between letters and express tend to be relatively small and/or have low mail volumes. In that case, spare capacity in the letter mail network can make the sharing of facilities worthwhile.

<u>Internationalisation</u> of postal operators is another factor that has the potential to impact on the economics of postal services. It may do so in one of the following ways:

- to the extent internationalisation leads to increased competition between operators (for example **Deutsche Post World Net** entering the Dutch and UK markets), this will increase pressures for cost efficiency on the incumbents;
- in the future, structural alliances or mergers between universal service providers may lead to cost efficiencies in case "economies of skill" are exchanged between the two partners; and
- alliances or mergers between universal service providers may exploit economies of scale where these exist. In Chapter 8, we will see that postal operations in original Member States are characterised by broadly constant returns to scale, but that economies of scale may exist in the new Member States.

The <u>cost reduction strategies</u> of postal operators do of course have an impact on the economics of postal services. Postal operations are becoming more and more capital intensive as a result of for example the introduction of sequence sorting. **TPG** is exploiting this development by transforming the jobs of postmen into "mail deliverers", part-time and on a lower pay-scale. Cost levels are being reduced and postal services are increasingly organised on the basis of economic principles, rather than the sometimes politically motivated considerations of the past.

And, as we have seen, some of the <u>product strategies</u> of postal operators including the introduction of priority/non-priority mail may also impact on the economics of postal services.

The impact of business strategies, and the external factors driving these, on the economics of postal services is summarised in Figure 4.5. The figure shows a high-level summary in which only the most important impacts are included. There will be other impacts, for example those related to product strategies, but these in our view are on a more minor scale.

Figure 4.5 Summary of the Impacts of Business Strategies on the Economics of Postal Services



As shown in the chart, we believe that business strategies of postal operators may impact on the economics of postal services in the following ways:

- <u>horizontal integration into the express market</u>, mainly caused by changed customer demands, may allow a consolidation of domestic parcel services into the express business (and some subsequent sharing of costs);
- <u>the internationalisation of the industry</u>, caused by changed customer demands and the trend towards corporatisation/privatisation of universal service providers, may lead to cost efficiencies and, in some cases, the exploitation of some economies of scale;
- <u>the cost reduction strategies</u> of postal operators, caused by changes in customer demands (including substitution to electronic products), privatisation/corporatisation, competition between operators and incentives provided by regulation, will not only lead to lower cost levels but could also as a result increase the difficulty of market entry by making it more difficult for new entrant firms with lower traffic volumes to compete with established operators because the cost disadvantages; and

• some of the <u>product strategies</u> pursued by postal operators (not shown in the chart, but see Section 4.3.6 above) also may make entry more difficult because new entrants may not be able to offer as wide a range of services as their established competitor.

A further important consequence of the overall strategic developments which we have reviewed in this chapter is that they have implications for the competitive position of operators because of the <u>structure</u> of costs and not just the <u>level</u> of costs. We will return to consider these implications in our final chapter, Chapter 10, once we have reviewed the evidence on both the level and structure of costs in the postal sector in Chapters 5, 6, 7 and 8.

### 5. POSTAL COSTS IN EUROPE

### 5.1. Introduction

This chapter provides an overall view of the information available on postal cost levels in Europe.

We have collected this information from two sources:

- responses to NERA's questionnaire to national postal operators in each country. We received responses from all 25 universal service providers except those in Cyprus and Sweden. However, many operators were reluctant or unable to supply detailed information on costs.
- published information on costs from annual reports or other sources such as operators' websites.

In this next section of this chapter, Section 5.2, we provide an overview of the information that is available to us on the costs of postal operations in European countries. This information relates to universal service providers, since we have been unable to obtain any information on the costs of operation by non-universal service providers.

The rest of the chapter provides a review of the cost data itself, as follows:

- in Section 5.3 we consider overall levels of postal costs. We present some preliminary information on variation of costs with output levels.
- in Section 5.4 we review the information on costs by cost category, particularly labour costs, depreciation and materials etc costs.
- we consider labour costs in more detail in Section 5.5. Here we report information on unit labour costs, and the way they are split into different components such as actual wages, social security payments and pensions costs. We also consider variation of costs with variations in average wages. We provide some information on relative labour productivity.
- Section 5.6 considers evidence on the split of costs by components of the postal value chain, collection/clearance, sorting, transportation and delivery.
- Section 5.7 considers evidence on how costs vary between characteristics of traffic, including type/speed of service, size or format of item, density of delivery area, and weight of item.
- finally in this chapter, Section 5.8 considers the evidence available on costs in the parcels and express sectors.

While this chapter contains a summary of information on costs, more detailed information is available in the individual country reports which are contained in Appendix C. We have also prepared a detailed technical appendix, Appendix D, on how we have collated cost and other information for our econometric analysis – this provides a detailed summary of what is available for each operator, but not actual numbers.

### 5.2. Availability of Cost Information in the Postal Sector

In the increasingly competitive postal environment it is not surprising that postal operators are increasingly unwilling to reveal cost information to their competitors or customers.

However, some cost information is published in annual reports or in other financial sources.

In the present study we had wanted to obtain cost information by different types of business – primarily letter mail, parcels and express. Table 5.1 shows the availability of this type of information.

Most countries publish or have made information available on employee numbers.

Most countries also publish or have made available information on staff costs. This means that we can calculate average staff costs (in most cases per full time equivalent worker) in all countries except Cyprus, the Netherlands and Poland.

We can also split these staff costs into components (such as wages/salaries, social security and pension costs) in the following countries:

• Austria, Denmark, Finland, France, Hungary, Ireland, Italy, Portugal, Sweden, and the United Kingdom.

Table 5.1
Availability of Information on Costs by Type of Business

Countries which provided us with separate information as requested for mails, express and parcels
Czech Post
Estonia Post
Hellenic Post
Hungary Post
Post Italiane
Luxembourg Post
CTT Correios
Slovakia Post
Slovenia Post
Correos
Operators for which only some very broad breakdown is available
Deutsche Post publishes separate financial information for the mail, express and logistics divisions
TPG publishes separate financial information for the mail and express divisions
The UK Post Office publishes some split between the retail business and the postal business
Operators for which cost information is only available at the overall level of activity
Austria Post
La Poste (Belgium)
Denmark Post
Finland Post
La Poste (France)
An Post
Latvia Post
Lithuania Post
Malta Post
Sweden Posten
Operators for which no cost information, except very limited information from UPU sources, is available
Cyprus Post, who did not respond to our questionnaire, and for which there are no published reports
Polo d Post of a did not in do do one cost information in their many new to some mostly market and for

Poland Post, who did not include any cost information in their response to our questionnaire, and for whom we have no published cost information.

The situation with regard to the availability of information on splits of costs between different stages of the postal value chain is shown in Table 5.2.

#### Table 5.2

#### Availability of Information on Costs by Type of Activity

Recent information	Availability
Czech Post	For letters, parcels and express for each of the years 2001 to 2003
Estonia Post	For letters, parcels and express for the year 2003 only
La Poste, (France)	USO parcels and letters, 2000 and 2001
Deutsche Post	A limited collection/sorting/delivery split for 1998
Hellenic Post	Separate splits for letters and parcels, 1999, 2000, 2001 and 2002
Hungary Post	For letters, parcels and express for each of the years from 1999 to 2003
Luxembourg Post	Separate splits for letter mail, parcels and express in 2001
Slovenia Post	Separate splits for letter mail, parcels and express for each year from 1998 to 2003
Slovakia Post	Separate splits for letter mail, parcels and express for each year from 2000 to 2002, and for the first half of 2003
Correos	Separate splits for letters and parcels for 2001, 2002 and 2003
Royal Mail	A split for around 2000, and earlier separate splits for letters and parcels
	in 1996/97
Information only availab	e from NERA's 1998 study for the European Commission
Austria Post	Letters and parcels separately
Denmark Post	Letters and parcels separately
Finland Post	Letters and parcels separately
An Post	Letters and parcels separately
Poste Italiane	Letters and parcels separately
No information on costs b	by activity
La Poste (Belgium)	
Cyprus Post	
Latvia Post	
Lithuania Post	
Malta Post	
TPG	
Poland Post	
CTT Correios	
Posten	

#### 5.3. Total Cost Levels

Table 5.3 shows total operating costs for each universal service provider (and year) for which information is available. For most countries we have taken total postal operator costs, but in Germany we have only included DP mail division costs, and for the Netherlands we have only included TPG letter mail division costs. All figures have been converted to 2003 price levels using the inflation index for each individual country, and then to euros using the PPP adjustment index for 2003.

As noted previously, the only countries for which we have virtually no cost information are Cyprus and Poland.

	1998	1999	2000	2001	2002	2003
	(€m)	(€m)	(€m)	(€m)	(€m)	(€m)
Austria	1753	1922	1660	1557	1513	
Belgium	1786	1905	1842	1895	1941	
Czech Republic				905	904	934
Denmark	1142	1166	1146	1111	1068	1014
Estonia	66	73	73	79	75	87
Finland	946	930	942	956	974	971
France		16004	16792	17641	17707	
Germany	10244	10509	9458	9299	9403	9231
Greece		356	386	419	460	
Hungary	798	833	862	942	1049	1017
Ireland	519	550	560	604	639	
Italy	8307	8232	8300	8454	8514	
Latvia		58	57	57	61	77
Lithuania	83	84	85	90	88	92
Luxembourg				83		
Netherlands		3039	3000	3062	3141	
Malta		31	23	24	25	25
Portugal	766	810	840	906	957	
Slovakia			326	335	332	
Slovenia	198	210	212	224	223	208
Spain				1410	1421	1441
Sweden	2202	2394	2472	2270	2251	2339
United Kingdom	9936	10940	13654	13715	15599	12898

Table 5.3
Total Operating Costs for Universal Service Providers

Source: Data in country reports, converted to 2003 prices and to euros at 2003 PPP.

Notes: Countries missing: Cyprus, and Poland.

Since we do not have data for every country for every year, it is more difficult to identify trends in total cost levels. However, Table 5.3 does include information for 19 of the countries for every year from 1999 to 2002, so we have summed costs for these countries in each year. Total costs were  $\in$ 60.1 billion in 1999,  $\in$ 62.4 billion in 2000,  $\in$ 63.4 billion in 2001, and  $\in$ 65.7 billion in 2002, an overall increase of 9.4 per cent over this period.

We can divide total operating costs by total units of traffic to derive costs per unit of mail handled. This is shown in Table 5.4, <u>though great care needs to be taken in interpreting</u> <u>these particular numbers because of differences in coverage</u>. However, it is worth making the following observations with regard to the resulting unit costs:

• Relativities between countries will in part reflect the use of the PPP method to make inter-country comparisons, and relativities would change to some extent if we used

actual exchange rates (but we believe use of PPP's gives a better comparison in terms of real purchasing values);

- Comparisons between countries will be distorted because the overall costs may include costs of activities other than letter mail, whereas the denominator is simply letter mail volume. Consequently, an operator with a wide range of other activities will appear to have a higher unit cost than an operator with a narrower range of other activities. We <u>do</u> adjust for this factor in our econometric results that are reported in Chapter 8.
- It is more relevant to look at trends in individual countries, since these are converted to constant prices. Such intra-country comparisons show that the general trend in unit costs over time is downwards rather than upwards.

	1998	1999	2000	2001	2002	2003
	(€)	(€)	(€)	(€)	(€)	(€)
Austria	0.57	0.60	0.51	0.37	0.33	
Belgium	0.49					
Denmark	0.41	0.41	0.41	0.40	0.40	0.39
Estonia	1.50	1.29	1.28	0.68	0.53	0.50
Finland	1.12	1.07	1.05	1.07	1.12	1.10
France		0.81	0.87	0.93		
Germany	0.51	0.50	0.43	0.43	0.46	0.44
Greece		0.66	0.67	0.71	0.76	
Hungary	1.50	1.10	1.10	1.11	1.18	1.30
Ireland	0.78	0.78	0.76	0.77	0.81	
Italy		1.25	1.25	1.23	1.31	
Latvia		1.61	0.72	0.65	0.68	1.25
Lithuania	2.21	2.21	2.25	2.21	1.94	2.02
Luxembourg				0.33		
Netherlands		0.43	0.43	0.43	0.46	
Malta				0.44	0.45	0.38
Portugal			0.52	0.53	0.58	
Slovakia			1.04	0.99	1.34	
Slovenia	0.51	0.48	0.43	0.41	0.37	0.31
Spain				0.37	0.35	0.34
Sweden	0.40	0.43	0.43	0.41	0.42	0.44
United Kingdom	0.54	0.58	0.70	0.69		

## Table 5.4Unit Costs for Universal Service Providers

Source: Total cost data from Table 5.1 divided by traffic data from country reports.

Notes: Countries missing: Cyprus, Czech Republic, and Poland.

Given the great differences between the sizes of different postal operators across Europe we would expect that total costs would be positively related to postal volumes, and this is

shown in Figure 5.1. <u>Here total costs are total costs of letters and parcels</u> (which in many cases are NERA's estimates), and volume is letter mail volume. For each operator, all of the years shown in Table 5.4 are included. There are three operators with very much higher volumes than the rest, **Deutsche Post**, **La Poste** and **Royal Mail**, each of which has an annual volume of around 20 billion letters, and this pattern is clearly shown in the figure.

We would also expect changes in total costs to be related to changes in total volumes. The relationship is shown in Figure 5.2. The figure shows the annual average compound growth rate in total costs in each country plotted against the annual average compound growth rate in output in that country. There appears to be a broad positive relationship – countries with more rapid increases in letter volumes have more rapid increases in costs.<sup>21</sup>



Figure 5.1 Total Letter/Parcels Costs and Mail Volumes, 1998-2003

If all else were constant we could use the graph to assess the value of the elasticity of cost with respect to output, since this elasticity is equal to the percentage change in costs divided by the percentage change in output. But of course not all else is constant, since other factors affecting costs in each country also change. We return to estimate this elasticity in Chapter 8, where we report our econometric results.





### 5.4. Categories of Cost: Labour; Depreciation; Materials etc

It is possible to split costs by different categories of input (labour, materials, depreciation, etc) in a number of countries.

The postal sector is a labour-intensive one, and labour costs account for the largest single proportion of costs. Figure 5.3 shows labour costs (including associated labour costs such as social security and pensions) as a percentage of total costs for different operators in 2002 – or the most recent year if 2002 data are not available for the particular country.



Figure 5.3 Labour Cost as Percentages of Total Costs by Operator, 2002

Note: Missing countries: Cyprus, Lithuania, Malta, the Netherlands, and Poland. The figure for Finland is for 2001. The figure for Estonia is for 2003.

Labour costs only account for 45 per cent of total costs in Luxembourg, but we understand from the operator that this low proportion arises because of high payments of terminal dues to other operators as a result of the large cross-border component of mail in Luxembourg. This helps to explain the high proportion of letter mail costs in this country that are included in the "other operating costs" category.

Labour costs lie between 50 and 59 per cent of total costs in Sweden (51 per cent), Germany (55 per cent), Hungary (55 per cent), Finland (56 per cent), Latvia (57 per cent), and the UK (58 per cent).

Labour costs lie between 60 and 69 per cent of total costs in Estonia (63 per cent), Italy (63 per cent), Slovakia (63 per cent), France (64 per cent), Austria (65 per cent), Denmark (67 per cent), Ireland (69 per cent) and Portugal (69 per cent).

Labour costs were above 70 per cent of total costs in the Czech Republic (71 per cent), Slovenia (73 per cent), Spain (74 per cent), Belgium (76 per cent) and Greece (77 per cent).

Figure 5.4 shows that depreciation allowances are a low proportion of total costs in posts ranging from 3 per cent of total costs in the Czech Republic and Greece, 4 per cent in Belgium, Germany, Latvia, Sweden and the UK, 5 per cent in Denmark, France, Ireland and

Source: Data in country reports.

Luxembourg, 6 per cent in Estonia, Finland, Italy, Portugal and Spain, 7 per cent in Austria and Hungary, and 9 per cent in Slovakia.



Figure 5.4 Depreciation/Amortisation Costs as Percentages of Total Costs by Operator, 2002

Source: Data in country reports.

Note: Missing countries: Cyprus, Lithuania, Malta, the Netherlands, Slovenia, and Poland. The figure for Finland is for 2001. The figure for Estonia is for 2003.

### 5.5. Unit Labour Costs

Most national postal operators publish or have made available information that enabled us to calculate average costs of labour, usually in terms of costs per full-time equivalent worker (FTEs).

Table 5.5 shows annual costs per employee in different operators for years for which we have information between 1998 and 2003. These annual costs include worker-related costs such as social security and pensions payments. All these figures have been converted to year 2003 prices in each country, and then converted to euros using year 2003 PPP values. Most relate to average cost per FTE worker, with the exception of the figures for the Czech Republic, Finland, Ireland and Latvia.

	1998	1999	2000	2001	2002	2003
	(€'000s)	(€'000s)	(€'000s)	(€'000s)	(€'000s)	(€'000s)
Austria		34.56	33.32	34.02	33.79	
Belgium	34.75	34.74	34.46	36.51	37.89	
Czech Republic	11.91	12.90	13.36	12.93	13.45	13.86
Denmark	29.01	29.98	30.32	31.22	30.79	30.88
Estonia	7.49	8.58	8.63	10.11	10.10	10.89
Finland	21.86	22.66	22.43	23.63		
France		38.21	38.53	38.63	38.87	
Germany					37.27	38.50
Greece		34.39	37.37	37.06	37.67	
Hungary	12.09	16.41	14.15	15.69	15.05	
Ireland	41.12	41.65	40.82	42.79	43.43	
Italy	35.23	34.71	34.44	33.24	33.17	
Latvia		3.78	3.89	4.30	4.83	5.25
Lithuania	6.36	6.77	6.88	7.29	7.64	8.00
Luxembourg				26.77		
Malta	22.50	17.78	19.60	19.60	19.62	23.31
Portugal	32.34	32.62	33.90	36.29	39.09	
Slovakia			17.44	17.90	15.12	14.54
Slovenia	19.97	20.96	21.97	22.42	24.78	23.67
Spain				21.16	21.30	21.79
Sweden	32.01	34.68	35.33	31.30	31.09	
United Kingdom	31.28	34.22	36.75	36.00	39.42	34.63

Table 5.5Annual Average Labour Costs for Universal Service Providers

Source: Data in country reports, converted to 2003 prices and to euros at 2003 PPP.

Notes: Countries missing: Cyprus, the Netherlands, and Poland.

One reason for the differences between unit labour costs between different operators will be different treatments of social security and pensions costs in different countries. We have detailed information on the make-up of these costs in Austria, Denmark, Finland, France, Hungary, Ireland, Italy, Portugal, Sweden and the United Kingdom. Results of an analysis of these components are shown in Table 5.6. This shows wages and salaries as a proportion of total labour costs in 2002, ranked from lowest (Portugal, 62 per cent) to highest (Denmark, 91 per cent).

	Wages/salaries	Social security	Pensions	Severance	Other	Total
	(%)	(%)	(%)	(%)	(%)	(%)
Portugal	62	15	24	0	0	100
Hungary	65	25		0	10	100
France	67	14	18	0	0	100
Sweden	68	29	0	0	3	100
Italy	74	19	0	5	2	100
Austria	76	22	0	1	1	100
Finland	80	7	13	0	0	100
Ireland	86	5	9	0	0	100
United Kingdom	89	6	5	0	0	100
Denmark	91	1	8	0	0	100

### Table 5.6Components of Labour Costs for Selected Countries, 2002

Source: Data in country reports.

Note: Social security proportion for Hungary also includes pensions.

We expect average wage to be an important driver of cost levels. This is shown by Figure 5.4, which plots the annual average compound growth rate in total costs (of letters and parcels) against the annual average compound growth rate of average wages. There appears to be a positive relationship – countries with more rapid increases in average real wages of postal workers have more rapid increase in total costs.<sup>22</sup>

<sup>&</sup>lt;sup>22</sup> If all else were constant we could use the graph to assess the value of the elasticity of cost with respect to the average wage, since this elasticity is equal to the percentage change in costs divided by the percentage change in the average wage. But of course not all else is constant, since other factors affecting costs in each country also change. We return to estimate this elasticity in Chapter 8, where we report our econometric results.



Figure 5.5 Changes in Letter/Parcels Costs and Changes in Average Wage

Another important factor determining how labour inputs will influence total costs is labour productivity, which we have not analysed in detail for this report.

### 5.6. Costs in the Postal Value Chain

As we explained in Section 5.2, there is information on the split of costs between different components of the postal value chain in a number of countries.

Table 5.7 summarises the results for letter mail in 16 countries.<sup>23</sup>

<sup>&</sup>lt;sup>23</sup> It is possible that there are some differences in definitions of activity between the different countries.

Country	Year	Collection	n Transport	Sorting	Delivery	Overheads	Retail	Total
		(%)	(%)	(%)	(%)	(%)	(%)	(%)
Austria	pre 1998	22	2	22	54	0		100
Czech Republic	2003	17	9	12	39	23		100
Denmark	pre 1998	5	5	9	43	38		100
Estonia	2003	17	10	12	32	5		76
Finland	pre 1998	13	10	20	50	7		100
France	2001	8	5	15	46	21	5	100
Germany	1998	13.2		17.4	69.4			100
Greece	2002	21.4	2.9	14.3	50.7	10.7		100
Hungary	2003	13	9	4	54	20		100
Ireland	pre 1998	12	7	24	57	0		100
Italy	pre 1998	17.7	9	26.3	47	0		100
Luxembourg	2001	9.3	7	20.8	51.4	11.5		100
Slovakia	2002	8.1	9.4	11.2	27.4	43.9		100
Slovenia	2003	1.4	4.5	4.5	77	12.6		100
Spain	2003	9.1	5.9	14.3	52.2	18.5		100
United Kingdom	circa 2000	5	14	26	43	12		100
Unweighted averag	re	12.0	7.3	15.8	49.6	14.9		100

Table 5.7Cost Splits by Activity in Letter Mail for Universal Service Providers

Sources: Country reports and, for pre-1998 data, NERA USO report (NERA, 1998).

Notes: Figures for La Poste relate to the USO business, and overhead costs include an element of "other direct costs". Figures for Estonia do not sum to 100 per cent.

Table 5.7 shows that:

- **Delivery costs** account for the largest share of total costs, averaging 50 per cent of total costs, from lows of 27 per cent in Slovakia and 32 per cent in Estonia, to highs of 69 per cent in Germany (but this figure appears to include a wider range of activities than in other countries) and 77 per cent in Slovenia;
- **Sorting** is the next most important activity in terms of costs, with an overall average of 16 per cent, ranging from lows of 4-5 per cent in Hungary and Slovenia, to highs of 24 per cent in Ireland and 26 per cent in Italy;
- **Collection costs** are the third largest component, averaging 12 per cent, and ranging from less than 2 per cent in Slovenia, and 5 per cent in Denmark and the UK, up to just over 20 per cent in Austria and Greece;
- Last in size are **transport costs**, averaging 7 per cent, from lows of 2-3 per cent in Germany, up to 14 per cent in the United Kingdom.
- Treatment of **overhead costs** varies between countries. The average proportion reported in the table is 15 per cent.

### 5.7. The Costs of Different Types of Traffic

The costs of different types of traffic have been calculated from information originally published by the British postal regulator Postcomm who had used cost data supplied by **Royal Mail**. (This study was concerned with the costs of universal service provision.) Activities and traffics were broken down in a number of ways, including:

- Type of product (first class stamped mail, second class stamped mail, postage paid first class metered mail, second class metered mail, pre-sorted mail, etc);
- Weight categories;
- Size or format of item;
- Distance between collection and delivery points (local/neighbouring/distant);
- Density of delivery area (city centre, urban, suburban, rural, deep rural); and
- Type of recipient (business or residential).

For each of these breakdowns, revenue, volume and contribution (that is, revenue minus avoidable costs) were published (Postcomm, 2001), so it is possible to calculate <u>long-run</u> <u>avoidable costs</u> for each item. These are presented in the following tables.

Table 5.8 shows costs by different types of traffic. Mailsort is pre-sorted mail, with different delivery conditions – Mailsort 1 is D+1, Mailsort 2 is D+3, and Mailsort 3 D+7. Walksort is pre-sorted mail which is pre-sorted to delivery round level. Table 5.8 shows avoidable costs of €0.29/0.30 for first class mail and €0.23 for second class mail. The various types of pre-sorted mails, which are carried at discounted prices, have much lower avoidable costs. But larger-sized items (flats or parcels) have much high avoidable costs than standard items in their service quality (1<sup>st</sup> or 2<sup>nd</sup>) band.

Type of traffic	Cost per item (€)
First class stamped mail	0.29
Second class stamped mail	0.23
First class metered mail	0.30
Second class metered mail	0.23
Mailsort 1	0.12
Mailsort 2	0.13
Mailsort 3	0.12
Walksort direct	0.11
Flats/parcels 1	0.56
Flats/parcels 2	0.39

## Table 5.8Avoidable Cost by Type of Traffic, Royal Mail

Source: Calculated by NERA from information in Postcomm (2001)

Table 5.9 shows costs by size or format of item. The main features which impose additional costs are having to sort the letter manually rather than mechanically, and its being a packet rather than a regularly-shaped object. This issue is currently being considered in detail in the UK as **Royal Mail** have presented proposals for a move from the present weight-based pricing to size-based pricing to the regulator, Postcomm, on the grounds that such a tariff system would be more cost-reflective. Royal Mail are proposing to introduce three main types of mail size, letters, large letters and packets, and have published some estimates of ratios of long-run marginal costs between each of these three types for different types of product.<sup>24</sup>

Postcomm's study of avoidable costs also considered how costs varied by weight of item. Results showed little variation up to 100 grams, but with cost then rising.

Size/type of item	Cost per item (€)
Mechanised letter - size C5 or less and thickness	
<10mm – sorted mechanically	0.17
Manual letter - size C5 or less and thickness	
<10mm – sorted manually	0.36
Flat – size >C5 and <b4, <10mm<="" and="" td="" thickness=""><td>0.17</td></b4,>	0.17
Packet - all others	0.51

## Table 5.9Avoidable Cost by Size or Format of Item, Royal Mail

Source: Calculated by NERA from information in Postcomm (2001)

Table 5.10 shows how distance of transit from collection point to delivery point influences costs.

# Table 5.10Avoidable Cost by Delivery Distance, Royal Mail

Size/type of item	Cost per item (€)
Local	0.25
Neighbouring	0.21
Distant	0.18
Distant	0.10

Source: Calculated by NERA from information in Postcomm (2001)

Table 5.11 shows costs by density of delivery area. This shows higher levels of cost for rural and deep rural areas, but average costs for rural areas are only some 15-20 per cent above costs for urban suburban areas. It is only in the limited number of delivery areas in the most

<sup>&</sup>lt;sup>24</sup> Postcomm have expressed some concerns about the ways these costs were calculated. The Royal Mail estimates, and the Postcomm response, are available in Postcomm (2004, pp. 23-41).

remote parts of the United Kingdom (such as the Scottish Highlands and rural Wales) that unit costs of delivery rise substantially above the average.<sup>25</sup>

### Table 5.11Avoidable Cost by Density of Delivery Area, Royal Mail

Size/type of item	Cost per item (€)
City centre	0.20
Urban	0.20
Suburban	0.20
Rural	0.23
Deep rural	0.24

Source: Calculated by NERA from information in Postcomm (2001)

Finally, Table 5.12 shows costs by type of recipient. Costs per item sent to residential addresses are higher than those sent to business addresses, but not by a great margin.

### Table 5.12Avoidable Cost by Type of Recipient, Royal Mail

Size/type of item	Cost per item (€)
Business	0.19
Residential	0.21

Source: Calculated by NERA from information in Postcomm (2001)

### 5.8. Costs of Parcels and Express Services

There is more limited information available on parcels and express costs, and we consider them each in turn.

#### 5.8.1. The costs of parcels services

Costs per parcel are obviously greater than cost per letter. We have information from our questionnaire from eight countries, four of the original Member States and four of the new ones. And of the four original Member States, two are large countries and two are small ones. The ratios of cost per parcel to cost per letter vary, but average about 12 across all eight countries.

Table 5.13 shows the split of parcels costs between labour, materials, depreciation and other costs in a limited number of countries which, with the exception of Spain, are all smaller countries.

<sup>&</sup>lt;sup>25</sup> See the Royal Mail delivery cost curve published in NERA's USO report for evidence of this (NERA, 1998, pp. 221).

Country	Year	Labour	Materials	Depreciation	Other	Total
		(%)	(%)	(%)	(%)	(%)
Czech Republic	2003	79.1	4.5	2.6	13.8	100
Estonia	2003	63.7	0.8	5.3	30.2	100
Greece	2002	77.2	0.6	3.4	18.8	100
Luxembourg	2001	46	3	5	46	100
Slovakia	2002	61.6	9.2	8.3	20.9	100
Slovenia	2002	61.1	1.2	0	37.7	100
Spain	2003	74.8	2.7	6.6	15.9	100
Average		66.2	3.1	4.5	26.2	100.0

### Table 5.13Cost Splits by Cost Components in Parcels

Source: Country reports.

Table 5.13 shows that labour costs accounted for an average of 66.2 per cent of total parcels costs, materials for 3.1 per cent, depreciation for 4.5 per cent, and others for 26.2 per cent.

We have compared these percentages with the equivalent percentages for letter mail in the same set of seven countries shown in Table 5.13, and the figures for letters are not very different: 63.9 per cent for labour; 3.0 per cent for materials; 4.4 per cent for depreciation; and 28.7 per cent for other. This in itself would suggest that parcels are slightly more labour-intensive than letters, but this result is obtained from a limited set of operators.

Table 5.14 summarises information available on the split of costs by different activity in parcels. Information is shown for 13 countries.

Country	Year	Collection	Transport	Sorting	Delivery	Overheads	Total
		(%)	(%)	(%)	(%)	(%)	(%)
Austria	pre 1998	18	26	11	45	0	100
Czech Republic	2003	14	12	7	45	22	100
Denmark	pre 1998	7	18	9	30	36	100
Estonia	2003	0	16	1	28	8	53
Finland	pre 1998	9	33	18	34	6	100
Greece	2002	16.2	53.4	7.8	12.9	9.7	100
Hungary	2003	14	9	34	21	22	100
Ireland	pre 1998	10	15	35	40	0	100
Italy	pre 1998	3.6	38.5	35	22.9	0	100
Luxembourg	2001	8.6	7.6	10.1	72.7	1	100
Slovakia	2002	12.5	19.6	13.7	19.5	34.7	100
Slovenia	2003	1.9	5	4.1	75	14	100
Spain	2003	6.7	16.1	16.6	45.2	15.4	100
Unweighted average		10.1	21.1	16.8	38.6	13.4	100

# Table 5.14Cost Splits by Activity in Parcels

Sources: Country reports and, for pre-1998 data, NERA USO report.

Note: Figures for Estonia do not sum to 100 per cent. Unweighted average excludes Estonia.

Table 5.14 shows that:

- As with letters, **delivery costs** are the largest single component, accounting for 39 per cent of parcels costs;
- **Transport** rather than sorting is now the second biggest component, accounting for 21 per cent of total parcels costs;
- **Sorting** is the third biggest component, accounting for 17 per cent of total parcels costs;
- **Collection** accounts for 10 per cent of parcels costs.

Table 5.7 on letters and Table 5.14 on parcels are not directly comparable, since there are three large countries in Table 5.5 (France, Germany and the UK) that are not included in Table 5.14. Consequently in Table 5.15 we make a direct comparison between the cost shares by activity for letters and parcels using a common set of countries. Exclusion of the letters shares for France, Germany and the UK does not change the letters shares very much, and Table 5.15 confirms that delivery costs are less important in share terms in parcels than in letters.<sup>26</sup> while transport costs are more important in share terms in parcels than in letters.

<sup>&</sup>lt;sup>26</sup> Though of course delivery cost per parcel will be much higher than delivery cost per letter, since overall cost per item is much greater for a parcel than for a letter.

Cost shares of sorting and collection are more similar to each other between sectors (with sorting more important than collection), though for parcels sorting is marginally more important, and collection marginally less important, than for letters.

	Collection	Transport	Sorting	Delivery	Overheads	Total
	(%)	(%)	(%)	(%)	(%)	(%)
Letters	12.4	6.7	15.2	50.2	15.4	100.0
Parcels	10.1	21.1	16.8	38.6	13.4	100.0

Table 5.15
Comparison of Splits of Costs between Activities between Parcels and Letters

Source: Derived from figures in Tables 5.5 and 5.7.

Notes: These proportions relate to a common set of countries: Austria, Czech Republic, Denmark, Finland, Greece, Hungary, Ireland, Italy, Luxembourg, Slovakia, Slovenia and Spain.

#### 5.8.2. The costs of express services

We only have information on cost per express item in four countries, all of which are small. On average cost per express item is about 60 times that of cost per letter when one extreme (high) outlier is excluded.

There is some information comparing cost shares by type of cost between mails and express services.

Information relating to **Deutsche Post** is shown in Table 5.16, and shows that the company's mails business appears to be much more labour-intensive than its express business.<sup>27</sup>

<sup>&</sup>lt;sup>27</sup> In interpreting these data, account must be taken of the accounting policies of Deutsche Post. In the prospectus for the IPO of the company in the year 2000, the company acknowledged that in order to facilitate comparisons between the results in the Express Division with that of competing firms in this sector, the company has allocated the costs of the civil servants employed in this division to the extent they reflect the costs of non-civil servants in the same function. All costs in excess of this are allocated to the Mail Division. The company is of the opinion that this allocation is preferable since it reflects the historic link between the civil servant status and the universal service obligation to which the Mail Division is subject.

	Mails (%)	Express (%)
Labour	57	29
Materials	23	54
Depreciation	4	4
Other	16	13
Total	100	100

### Table 5.16Cost Shares in Mails and Express Compared, Deutsche Post, 2003

Source: Deutsche Post Analyst Presentation, 9th March 2004.

We only have limited information from seven other operators on cost shares in express. One of these shows the same pattern as Deutsche Post, with express much less labour-intensive than mail. The other six show broadly similar proportions of labour in total costs in letters and express services.

### 5.9. Conclusions: Information on Postal Costs

This chapter has summarised information available on the costs of postal services. On the basis of the partial answers to our survey of national postal operators, and our review of published sources, we conclude that:

- There is information on overall cost levels for most operators, though it is not available on a comparable basis because of differences in the range of activities that national operators engage in and the lack, in many countries, of information on the split of costs between these activities.
- It is possible to split costs between labour costs, depreciation, and other costs in most national operators, so we can identify the relative importance of these categories, and see how they vary between operators.
- Information on average annual labour costs, usually per full time equivalent worker, is available for most national postal operators. It is also possible to split labour costs between wages/salaries, social security, pensions and other labour cost categories in a number of these operators. It is clear that average wages are an important driver of postal costs in each operator.
- Information on the split of costs by activity in letter mail is available in 16 countries, and for parcels in 13 countries. The information was produced for different years, and there is some uncertainty as to the exact definition of activities in different countries. Nevertheless, averaging the information gives a reasonably clear picture of the relative importance of the different components of the value chain in both letters and parcels.

• Limited additional information is available on the structure of costs in parcels or express services, though we do have some information on the split of costs in parcels services between labour, materials, depreciation and other costs.

We believe that this study has identified a considerable amount of information on postal costs,<sup>28</sup> but it has also revealed substantial gaps in the information available to the Commission and others. One possibility would be for the Commission to organise the collection of a database on a regular basis, but this would require the willing co-operation of national postal operators. We doubt that this would be forthcoming (and we are not in a position to comment on the Commission's legal powers in this regard).

<sup>&</sup>lt;sup>28</sup> And see also Appendix C.

# 6. AN INITIAL VIEW OF THE DETERMINANTS OF POSTAL COSTS

### 6.1. Introduction

The previous chapter has considered levels of postal costs in Europe. In the present chapter we consider factors affecting the structure and levels of postal costs. We saw in Section 5.3 that, not surprisingly, postal cost levels rise with mail volumes. In the next section, Section 6.2, we explore the relationship between costs and mail volumes in more detail. Specifically we are concerned with the way that <u>unit</u> costs vary with mail volume, by distinguishing between returns to scale, returns to density and returns to scope. In Section 6.3 we consider the potential impact of demographic factors, such as population density and the proportion of the population living in urban areas, on unit costs. Section 6.4 is concerned with the impact of the postal infrastructure on unit costs: we consider whether there are any apparent relationships between the level of infrastructure provided (sorting offices, levels of automation, delivery offices and post boxes) and postal unit costs. Section 6.5 considers Universal Service Obligations and unit costs, while Section 6.6 considers quality of service and unit costs. Section 6.7 reviews the approach adopted in this chapter and looks forward to the econometric evidence to be presented in Chapters 7 and 8.

All of the analysis in this chapter is in terms of apparent relationships. We want to see if the data we have collected show any patterns that might indicate what are the main factors determining postal costs and the way that costs vary with output. But such an analysis is an imperfect substitute for a more detailed statistical analysis which separates out the impact of each individual driver on costs. Such analysis has already been used by other researchers in the postal sector, and in Chapter 7 we review the results of this earlier analysis. In Chapter 8 we present our own multiple regression analysis using the data collected and collated in this study.

### 6.2. Economies of Scale, Density and Scope

An important factor determining the cost per unit of providing postal services is the way that costs change when output changes. If unit costs fall when output increases, then increases in output will mean that unit costs will fall and the service provided by the operator will become more attractive to customers if prices fall in line with the reduction in unit costs.

In order to interpret evidence on how costs vary with output it is necessary to understand the difference between <u>economies of scale</u>, <u>economies of density</u> and <u>economies of scope</u>.

The distinction between economies of scale and economies of density is a crucial distinction in <u>network industries</u>, of which postal services are an important example.

The definitions are as follows:

- <u>Economies of scale</u> relate to what happens to unit costs when traffic and size of network increase in the same proportion.
  - if unit costs fall when output and network size increase in the same proportion there are economies of scale;
  - if unit costs are unchanged when output and network size increase in the same proportion there are constant returns to scale; and
  - if unit costs increase when output and network size increase in the same proportion there are diseconomies of scale.
- <u>Economies of density</u> relate to what happens to unit costs when traffic increases on a fixed network:
  - if unit costs fall when traffic increases on a fixed network there are economies of density;
  - if unit costs are unchanged when traffic increases on a fixed network there are constant returns to density; and
  - if unit costs increase when traffic increases on a fixed network there are diseconomies of density.
- <u>Economies of scope</u> relate to what happens to unit costs when a single firm produces two or more different types of output (e.g. letters and parcels):
  - if unit costs fall when the two or more types of output are provided by the same firm there are economies of scope;
  - if unit costs do not change when the two or more types of output are provided by the same firm there are neither economies nor diseconomies of scope; and
  - if unit costs increase when the two or more types of output are provided by the same firm there are diseconomies of scope.

Figure 6.1 illustrates the distinction between economies of scale and economies of density by showing a case where there are economies of density but constant returns to scale. Point A shows unit costs,  $c_1$ , at the existing mail volumes,  $q_1$ . If mail volume were to increase on the fixed network from  $q_1$  to  $q_2$ , then unit costs would fall to  $c_2$  along the unit cost curve which shows unit cost with the network fixed. However, if an increase in mail volume from  $q_1$  to  $q_2$  could only be achieved by an equal proportionate increase in the size of the network, then unit costs would not change as the operator would move out along the horizontal unit cost curve that shows constant returns to scale.



Figure 6.1 Economies of Density and Constant Returns to Scale

Figure 6.2 attempts to show whether there is any apparent relationship between unit costs (defined as costs of letters plus parcels traffic, divided by total letter volume) and volume. The figure shows unit costs in 2002 converted to euros using 2002 PPP exchange rates. The data are those which we use in our econometric analysis, so they have been converted into as comparable a form as possible.<sup>29</sup> The data show universal service providers which have very different network sizes, so it would not be possible to use this figure to distinguish between returns to scale and returns to density. However, there is no clear indication that unit mail costs are lower for the higher volume operators. Instead, there is a very wide spread of unit costs between the different lower volume operators, and much less spread between the three operators which have annual volumes around 20 billion letters.

<sup>&</sup>lt;sup>29</sup> Appendix D explains how we have done this.



Figure 6.2 Unit Costs v. Letter Mail Volume

Source: NERA database.

Notes: Unit costs are defined as the sum of letter and parcel costs divided by letter volume.

It has often been argued that unit costs will fall if mail volumes per household rise. Figure 6.3 shows a plot of unit costs in 2002 against traffic density measured in terms of letters handled per household.



Figure 6.3 Unit Costs v. Mail Volume per Household

Figure 6.3 shows a rather unclear pattern, though there may be some tendency for unit costs to fall as traffic volume increases. This may be because with higher mail volumes, assets can be used more intensively. To investigate this, Figures 6.4, 6.5 and 6.6 plot mail volumes per household against, respectively, mail volume per "pure" sorting office,<sup>30</sup> mail volume per delivery office and mail volume per post box, to see if higher overall mail volume densities are indeed associated with higher utilisation of individual assets. Generally speaking, there does appear to be a positive correlation, though it is more marked for post boxes and delivery offices than it is for sorting offices.

*Source:* NERA database. *Notes:* Unit costs are defined as the sum of letter and parcel costs divided by letter volume.

<sup>&</sup>lt;sup>30</sup> As noted in Section 3.3.3 above "pure" sorting offices are offices that are used only for sorting, and not for other activities such as delivery.



Figure 6.4 Volume Per Pure Sorting Office v. Volume Per Household

Source: NERA database.

Figure 6.5 Volume Per Delivery Office v. Volume Per Household



Source: NERA database.



Figure 6.6 Volume Per Post Box v. Volume Per Household

Source: NERA database.

### 6.3. Unit Costs and Demographic Factors

We might expect that unit postal costs will also be affected by demographic factors. Since we are analysing postal costs in up to 25 individual countries, we need a demographic factor that is measured on a comparable basis for each individual country. One such is overall population density, and another is the proportion of the population living in urban areas.

In general, the more densely packed together are delivery points, the lower we would expect the unit cost of serving each point to be. Figure 6.7 plots delivery as a proportion of total costs against the percentage of the population living in urban areas, but we can discern no clear trend that this proportion falls as the percentage of the population living in urban areas rises.



Figure 6.7 Delivery as a Proportion of Total Costs v. Percentage Urban Population

Figure 6.8 shows unit operating costs in 2002 plotted against national population density, while Figure 6.9 shows unit operating costs in constant prices plotted against the proportion of the national population living in urban areas.

Source: NERA database, and Table 5.7.



Figure 6.8 Unit Costs v. Population Density

Notes: Unit costs are defined as the sum of letter and parcel costs divided by letter volume.

Source: NERA database.


Figure 6.9 Unit Costs v. % Urban Population

Source: NERA database.

Notes: Unit costs are defined as the sum of letter and parcel costs divided by letter volume.

Table 6.8 excludes the figure for Malta, which has very much higher population density than the other Member States. Figure 6.9, showing the relationship between unit costs and urban population, appears to show some broad negative relationship between unit costs and the proportion of the population living in urban areas.

### 6.4. Unit Costs and Postal Infrastructure

The charts in this section show how unit postal costs vary with the average levels of traffic handled by different parts of the infrastructure, namely "pure" sorting offices, delivery offices, and post boxes.

Figure 6.10 plots unit costs in 2002 against volume handled per "pure" sorting office.



Figure 6.10 Unit Costs v. Volume Per "Pure" Sorting Office

Source: NERA database.

Notes: Unit costs are defined as the sum of letter and parcel costs divided by letter volume.

Figure 6.11 plots unit costs in 2002 against volume handled per delivery office.



Figure 6.11 Unit Costs v. Volume Per Delivery Office

Source: NERA database.

Notes: Unit costs are defined as the sum of letter and parcel costs divided by letter volume.

Finally, Figure 6.12 plots unit costs against volume per post box. (However, we should note that in many countries high volumes of mail will not be collected from traditional post boxes, but will consist of bulk mail collected or delivered from customers' premises, so that average volume per post box can be misleading.)



Figure 6.12 Unit Costs v. Volume Per Post Box

Figure 6.13 investigates the question of whether there is any apparent correlation between unit costs and the proportion of mail handled by automatic machine. Data on this proportion are available (from Table 3.2) for 18 countries, but we cannot see any clear relationship from this figure.

Source: NERA database.

*Notes: Unit costs are defined as the sum of letter and parcel costs divided by letter volume.* 



Figure 6.13 Unit Costs v. Mail Handled by Automatic Machine

Source: NERA database.

Notes: Unit costs are defined as the sum of letter and parcel costs divided by letter volume.

# 6.5. The Impact of Universal Service Obligations

Information on delivery requirements and practice was provided in the presentation by WIK to the Second Stakeholder Meeting. Slide 18 from Part A of the presentation (which covered Regulatory Developments) showed the number of deliveries per week (either 5 or 6) in different Member States, both in terms of regulatory requirements and actual practice. We would expect that costs will be more closely related to actual practice than the minimum requirement. Figure 6.14 shows unit costs plotted against the actual number of deliveries per week. Apart from one outlier, there is no evidence that the universal service providers which deliver on six days rather than five have higher unit costs than those which deliver only on five days per week.



Figure 6.14 Unit Costs v. Delivery Practice

Figure 6.15 shows the proportion of total costs that consist of delivery costs plotted against the delivery practice information from the WIK presentation. The delivery cost proportion data are taken from our Table 5.7 and relate to different years. Subject to this qualification, there does appear to be some tendency for delivery as a proportion of total cost to be higher in those countries that have 6 deliveries a week compared with those that have only 5 a week.

Source: NERA database, WIK Second Stakeholder Presentation, Part A, Slide 18. Notes: Unit costs are defined as the sum of letter and parcel costs divided by letter volume.



Figure 6.15 Delivery as a Proportion of Total Costs v. Delivery Practice

The WIK presentation also showed how access requirements, in terms of access to both post boxes and postal outlets, varies between Member States. Slide 19 from Part A of the WIK presentation shows access requirements under the alternative headings of 'no requirements', and access requirements based on minimum numbers of facilities, distance to facilities, population criteria, and community criteria. We have split countries into two categories, 'no requirements' and 'some requirements', and Figure 6.16 plots unit costs against these two criteria. This suggests that there may be some tendency for unit costs to be higher in countries which do impose some access requirements.

*Source: NERA Table 5.7, WIK Second Stakeholder Presentation, Part A, Slide 18. Notes: Unit costs are defined as the sum of letter and parcel costs divided by letter volume.* 



Figure 6.16 Unit Costs v. Access Requirements

Source: NERA database, WIK Second Stakeholder Presentation, Part A, Slide 19. Notes: Unit costs are defined as the sum of letter and parcel costs divided by letter volume.

### 6.6. The Impact of Quality of Service Requirements

In this section we present some brief analysis on the relationship between quality of service and unit costs, again based on information in the WIK presentation to the Second Stakeholder Meeting. Slide 24 in Part A of their presentation divided universal service providers in terms of D+1 transit time performance. This division was into three categories, better than 90 per cent, between 80 per cent and 89.9 per cent, and worse than 80 per cent. Figures were only available for 20 countries and, of these, a half were in the first category, and a quarter in each of the other two categories. Figure 6.17 plots unit costs for the 20 countries against quality of service performance. We can discern no clear pattern, but also no indication that unit costs are higher in those countries with better service performance. We will return to a more systematic consideration of this issue in Section 8.3 below.



Figure 6.17 Unit Costs v. Quality of Service

*Source: NERA database, WIK Second Stakeholder Presentation, Part A, Slide 24. Notes: Unit costs are defined as the sum of letter and parcel costs divided by letter volume.* 

# 6.7. Conclusions: Summary of the Initial Review of Cost Drivers

This chapter of our report has outlined the important distinction between economies of scale, economies of density and economies of scope and the way that they impact on unit cost when volumes change.

It has also provided some plots of unit costs against factors that might be expected to impact on postal costs. These factors are letter mail volume, volume per household, population density, proportion of the population living in urban areas, postal infrastructure variables, proportion of mail handled by automatic machinery, delivery practice (days per week), access to service requirements, and quality of service requirements.

It is often quite difficult to discern clear patterns. This is not surprising, as very many factors will influence postal costs simultaneously. The discussion in this chapter must therefore be interpreted with care: it can only be used as a way of investigating whether there are any apparent relationships, and of suggesting hypotheses for further more detailed and systematic investigation. In the next two chapters we consider such a more systematic approach, first by reviewing previous studies using the econometric approach and, secondly, by presenting our own econometric analysis of the data collected in the present study, comparing our results from those from previous work, and drawing conclusions about what we are able to conclude from the evidence on the factors determining postal costs.

# 7. THE ECONOMETRIC APPROACH TO ASSESSING COST CAUSALITY

# 7.1. An Introduction to the Econometric Approach

The econometric approach to cost estimation involves establishing a statistically significant relationship between costs and the factors affecting costs. The approach has been widely used in the postal sector, and the results of many of the studies using the approach have been published in the academic and other literature. This literature provides a valuable resource for the understanding of how and why costs vary in the postal sector. Studies have considered how costs (especially unit costs) vary with output, with the mix of outputs produced by a single firm, with the characteristics of output (such as letter size), with input prices, with demographic factors such as population density, with the type of technology and operation used (eg automated sorting, and/or regional sorting centres), and with service quality such as number of deliveries per week or the speed and reliability of delivery.

A major advantage of the econometric approach is that it is able to control for the impact of a range of different factors that impact on costs simultaneously. For example, one postal operator might have higher unit costs than another, and both higher output and higher hourly wage costs – the econometric approach can in principle separate out the impact of output on unit costs (i.e. whether there are economies or diseconomies of scale) from the impact of higher hourly wage rates on unit costs.

Not only can the econometric approach identify individual factors affecting costs, but it can also quantify the impact of individual cost drivers. This enables one to estimate the marginal or incremental costs of changes in the levels of cost drivers, for example estimating the marginal cost of an increase in the level of a particular type of output, or estimating how costs would change if a particular component of cost, such as staff wages, should change.

Further use of the econometric approach enables one to test different specifications of the cost function, so that one can see in more detail the best mathematical representation of the relationship between costs and the factors affecting costs.

However, this requires data, and the main difficulty in applying the econometric approach is to obtain sufficient data of suitable quality to perform the econometric analysis. This is particularly difficult where data are prepared according to different accounting conventions, or where they are not comparable in other ways – for example because they do not cover exactly the same range of activities in different organisations.

# 7.2. A Review of Previous Econometric Studies of the Postal Sector

This chapter of our report provides a review of previous econometric studies of the costs of postal services.

- Section 7.3.1 summarises the main findings of this previous research, with particular reference to:
  - economies of scale in delivery;
  - economies of scale across the whole postal value chain;
  - economies of scope;
  - evidence on natural monopoly;
  - the impact of geographical factors;
  - the factors that drive efficiency;
  - impacts of competition and policy reforms;
  - the impact of technology;
  - impact of the size of items; and
  - impact of changes in delivery frequency.
- Section 7.3.2 provides information on functional specifications and data used in the studies.

### 7.2.1. Main findings of previous research

### 7.2.1.1. Economies of scale in delivery

Postal services are provided by a sequence of activities, by which postal services move from the sender to the recipient. These activities are collection, outward sorting, transportation, inward sorting and delivery. Given the relative importance of delivery with respect to other activities the cost characteristics of the provision of postal products is going to be highly influenced by the delivery activity.

In this respect, the econometric analysis of the cost function in the postal sector has paid special attention to the delivery activity. Thus, there have been several studies aimed at assessing and quantifying the existence of economies of scale in this activity. We have found evidence for France and the US, which is summarised in Table 7.1.

Study	Returns to scale in delivery	Country
Cazals, Florens, Roy (2001b)	$1.13^{31} - 1.68$	France
Cazals, Rycke, Florens and	1.10	France
Rouzaud (1997)		
Christensen et al. (1993)	1.26	US

# Table 7.1Evidence of Economies of Scale in the Delivery Activity

As it can be seen from Table 7.1 economies of scale range from 1.10 to 1.68. These values mean that a 10 per cent increase in inputs would be enough to manage an increase in the number of items delivered of between 11 per cent and 16.8 per cent. Reciprocally these values imply that a 10 per cent volume increase will increase costs less than proportionally (by about 9 per cent and 5.1 per cent respectively).

It is not easy to assess why the economies of scale vary so much between countries or even within studies for the same country. In the case of France the answer seems to lie in the use of panel data. Thus, Cazals et al. studies of 1997 and 2001 use similar information and estimate similar econometric specifications (translog cost functions, using labour quantity as dependent variable and outputs and the density of the delivery area as explanatory variables). This would explain why the results on the cross sectional analysis are similar in both studies (1.10 and 1.13). When the model is estimated with panel data in 2001, the returns to scale value increases up to 1.68. The authors justify this result in the ability of panel data to correct for the heterogeneity in the sample arising from the lack of information relative to the environmental characteristics of delivery.<sup>32</sup>

Additionally to these studies Cohen and Chu (1997) estimate the economies of scale in the delivery of mail in the US at 6.1 billion dollars (13 per cent of total cost). However here the estimation process is significantly different from the studies reported in Table 7.1. Cohen and Chu (1997) split street delivery costs into fixed and variable components. They consider route time costs as fixed and load time as variable while the third component, access time, is partly variable. Thus the econometric analysis is aimed to assess the variable part of the access time, which is used to estimate the economies of scale (the authors consider the economies of scale as the difference between the street delivery cost of a given volume provided by a monopoly and the street delivery cost of the same volume provided by two operators sharing the market). Therefore in this study the existence of economies of scale is assumed instead rather than tested.<sup>33</sup>

<sup>&</sup>lt;sup>31</sup> In the cross sectional and in the panel data models, respectively.

<sup>&</sup>lt;sup>32</sup> Thus the use of panel data reduce the estimation bias caused by unobservable variables.

<sup>&</sup>lt;sup>33</sup> This is our interpretation following the cost function specified by the authors, which contains a fixed component and a variable component with constant marginal costs.

Bernard et al. (2002) and Bradley and Colvin (1994) also find evidence of decreasing unit costs with volume in the delivery activities of **United States Postal Service** and **La Poste** in the case of Bernard et al. (2002),<sup>34</sup> and the United States Postal Service for Bradley and Colvin (1994). However given how the results are reported in these studies we have not been able to obtain a figure for the economies of scale.

## 7.2.1.2. Economies of scale in the whole value chain of postal provision

There are also studies assessing the existence of economies of scale in the whole postal value chain. Thus Wada et al. (1997) estimate the cost function for the Japanese mail service and Norsworthy et al. (1991) use information on the costs of 200 Management Sectional Centres (MSCs) in the US. Given that these MSCs have responsibility for mail collection, forwarding and delivering for geographic regions in 50 states of the US, these MSCs reflect the costs of providing postal services in certain areas.

These studies obtain similar results for the economies of scale. Wada et al. (1997) estimates a returns to scale value between 1.03 - 1.06<sup>35</sup> and Norsworthy et al. (1991) find a value of 1.10. Both studies are similar in the sense of using a translog specification and including several types of mail, however Norsworthy et al. (1991) estimate a short run cost function by assuming that the capital input is fixed.

It should be noticed that the value of the returns to scale is lower than when the focus of the study is only in the delivery activity. This makes sense given that the transport and sorting activity are included in the specification and they do not usually exhibit returns to scale.<sup>36</sup> In this respect, Rogerson and Takis (1993) report nearly constant returns to scale for long distance transportation costs (specially by freight rail or air, with values of returns to scale of 1.01 and 1.05 respectively). In the case of long distance transportation by highway, the values are higher (1.11) suggesting the existence of certain economies of scale. Economies of scale are clearer in short haul transportation (within a processing facility's service area) taking a value of 1.52. According to the authors this is explained in that in short distance transportation the operator "adjust vehicle size, trip frequency, distances traveled and number of stops per trip to reduce unit costs at higher volumes" (Rogerson and Takis, 1993, p. 115).

The same authors refer to the existence of studies showing mixed evidence of economies of scale in sorting. However their opinion is that mail processing operations are not characterized by strong economies of scale, which is supported by the presence of private

<sup>&</sup>lt;sup>34</sup> However the results are expressed in an index, so we have not been able to obtain a value for the economies of scale.

<sup>&</sup>lt;sup>35</sup> For a generalised translog and a translog cost function specification, respectively.

<sup>&</sup>lt;sup>36</sup> Note however that if there are coordination economies between different activities (i.e. if there are cost savings when a single operator provide all the activities of the value chain) then the overall cost function may exhibit economies of scale or scope even if the individual operations do not (Rogerson and Takis (1997), page 113).

presort companies which seems to indicate that their costs are not higher than those of United States Postal Service.

In the counter activity Cazals, Duchemin and Florens (2001) find economies of scale (1.25 on average). When the authors distinguish between post offices according to their size, returns to scale are relatively high in small post offices (1.61) while there are constant returns to scale in large post offices (1.01). According to the authors, the reason for the difference is that front office activities generate back-office activities. In large post offices the back office activities can no longer be performed by front-office employees, which imply that over capacity in front-office activity declines when the post office becomes larger and requires, therefore, dedicated resources for back office activities. Building upon this article Gazzei, Pace and Scarfiglieri (2002) find that, although there are returns to scale between 10 per cent and 25 per cent<sup>37</sup>, they are constant across counters types when controlling for the inefficiency caused by the overcapacity in the counter network. This means that the differences found by Cazals, Duchemin and Florens (2001) are caused by unsaturation, meaning the amount of time spent by a worker at the counter not performing any specific task but waiting for the next customer to serve. When controlling for this aspect, there are returns to scale in the counter activity, which are the same across office types.

There is one interesting exception to the existence of economies of scale in the provision of postal services. Mizutani and Uranishi (2003) find diseconomies of scale in the cost function of postal services. Although the authors do not explain whether this result is plausible, it may be caused by the use of a single output measure made up of letters, cards, parcels and other business goods, (this last being the number of parcels which is the main output variable for 5 out of 6 of the companies modelled). In fact, Wada et al. (1997) estimates product specific economies of scale for letters (1.09) but not for parcels.<sup>38</sup>

# 7.2.1.3. Economies of scope

Table 7.2 summarises the degree of economies of scope<sup>39</sup> between postal products found by Bradley and Colvin (1994) for the US.

<sup>&</sup>lt;sup>37</sup> Depending on the econometric specification.

<sup>&</sup>lt;sup>38</sup> Although according to the authors the latter result is explained because "an improper region of the estimated cost plane was used for the evaluation of the relevant indicator" page 17.

<sup>&</sup>lt;sup>39</sup> The degree of scope economies related to a particular subset of product T is measured by the following expression:  $SC_T(y) \equiv [C(y_T) + C(y_{N-T}) - C(y)]/C(y)$ 

	Degree of economies of scope
First class single piece	54%
Second class	22%
Third class bulk	44%
Fourth class	1%

# Table 7.2Degree of Economies of Scope Between Products in the Delivery Activity

Source: Bradley and Colvin (1994). First class mail issued for letters, post cards, greeting cards and checks or money orders. Third class mail, also known as bulk class mail, is primarily used by retailers, catalogers, and other advertisers to promote their products and services. Second class mail is limited to publishers and registered news agents and Fourth class mail is for packages weighing more than one pound.

This study shows that there are strong cost complementarities between postal products with the exception of parcels. The likely reason is that parcels, because of their size, must be carried separately thus causing a new delivery. Whenever a carrier repeats a delivery to drop off a parcel or a special delivery (such as express mail), these products lose some joint cost advantages that lead to the existence of economies of scope.

Roy (1999) constructs an engineering model and simulates the existence of economies of scope in the delivery of D+1 and D+7 products. He finds that if traffic is very unbalanced (very little D+1 and a lot of D+7) the daily rounds of D+1 products will have a low number of stops while the D+7 dedicated weekly route will be full. The weekly budget for the rounds will give a low number of stops performed six times (rounds of D+1 product) plus a very high number of stops performed just once (D+7 product round). If the round is integrated, the D+7 traffic distributed over the week added to the D+1 traffic generates a large number of additional stops each day for just one less active route than if they were undertaken separately: the weekly budget therefore contains a large number of stops performed six times. Thus in this case there would be diseconomies of scope between these two products. Conversely, when the D+1 product saturates all stops, the economies of scope are clear.

Rogerson and Takis (1993) reason (but do not provide evidence) on the existence of scope economies in the transportation and sorting activities. For the former, scope economies arise when, for instance, the premium transportation is used to move other classes of mail. An example of this type of economy of scope is when the first class mail is used in the hub-and-spoke air network as this network issued for express and priority mail. In the case of sorting, economies of scope arise when automatic sorting machines are used in the off-peak hours to sort deferrable non-preferential classes of mail.

Interestingly, Norsworthy et al. (1991) find diseconomies of scope between collection and delivery - more specifically the authors find that a 10 per cent increase in the volume of mail collected and delivered will increase costs by 0.8 per cent

# 7.2.1.4. Natural monopoly

For a multi-product industry to be characterised as a natural monopoly, the cost function must be sub-additive. This condition implies that the costs of producing a vector of outputs in combination are less than the costs of producing them separately, for any combination of outputs.

The application of this condition implies that a global test for any combination of outputs should be conducted. Cazals, Rycke, Florens and Rouzaud (1997) find some evidence of cost sub-additivity in delivery, although they do not test it for every output combination but just for three scenarios. In scenario 1 two firms share the existing volume of mail. In scenario 2 one firm takes all offices in which the volume of mail is above the average and two firms share the remaining post offices, and in scenario 3, one firm takes all post offices in which the volume of mail is lower than the average and two firms share the rest of the post offices. The cost savings from the single provision of delivery activities is 5.2 per cent, 1 per cent and 4.2 per cent for each scenario respectively.

Another approach to assess the existence of natural monopoly is to test for the compliance of the cost structure with the sufficient conditions for existence of natural monopoly. In this regard, Bradley and Colvin (1994) find economies of scope and product specific economies of scale in the delivery activity, which are sufficient conditions for the existence of natural monopoly in the delivery activity. However they recognize that given the functional form specified, the conditions turn out to be easy to satisfy. By using a less restrictive functional form, Wada et al. (1997) find mixed evidence (depending on the cost function specification) on cost subadditivity in the provision of letter and parcel services.

# 7.2.1.5. Geographic factors

Several studies assess the importance of geographic factors in the costs of the provision of postal services.

Cazals, Florens and Roy (2001) include postal density of the delivery area per post office as an explanatory variable for the costs of the outdoor postal delivery activity in France.<sup>40</sup> This variable is measured as the number of delivery points divided by the length of the route; therefore one would expect that, for a given route length, the greater the number of delivery points, the lower the costs per delivery item. These authors find that this effect is significant and equal to -0.27, which means that a 10 per cent increase in postal density would decrease unit costs by 2.7 per cent.<sup>41</sup>

<sup>&</sup>lt;sup>40</sup> In the study, the outdoor delivery cost is measured by the number of labour hours per week.

<sup>&</sup>lt;sup>41</sup> This result is not explicitly stated by the authors but we have derived it from the information contained in Table 2 and Table 1 of their article.

Bernard, et al (2002) define postal density as the number of delivery points (addresses) that can be visited by the carrier in one hour of time. Although we cannot derive elasticity figures from their study because the results are unit cost indexes, we would like to point out that the authors find not only that the postal density is a significant explanatory variable of the cost function, but also that its importance increases when volume is low. Reciprocally, the importance of volume as a cost driver is higher when postal density is low. Table 7.3 reproduces the results obtained by Bernard, et al (2002).

La Poste USPS		Low Postal Density (PD) (78 Addresses/Hour) (67 Addresses/Hour)	Medium Postal Density (PD) (135 Addresses/Hour) (94 Addresses/Hour)	High Postal Density (PD) (256 Addresses/Hour) (140 Addresses/Hour)	% Change in AC (due to PD)
La Poste	Low Volume				
USPS	(673 Pieces/Address/Year)	1.81	1.09	0.62	-66%
	(1,090 Pieces/Address/Year)	1.76	1.28	0.92	-48%
La Poste	Medium Volume				
USPS	(767 Pieces/Address/Year)	1.64	1.00	0.58	-65%
	(1,448 Pieces/Address/Year)	1.35	1.00	0.73	-46%
La Poste	High Volume				
USPS	(946 Pieces/Address/Year)	1.40	0.87	0.52	-63%
	(1,919 Pieces/Address/Year)	1.04	0.79	0.59	-43%
La Poste	% Change in AC (due to Vol)	-23%	-20%	-16%	
USPS	% Change in AC (due to Vol)	-41%	-38%	-36%	

# Table 7.3Index of Average Cost for La Poste and USPS in 1999

\* Street Time only (Seconds per Piece)

Note: Low = 25% Quartile; Medium = 50% Quartile or Median; and High = 75% Quartile

Source: Bernard, et al (2002)

The results in Table 7.3 show that when postal density is low, increments in volume lead to a reduction of average cost of 23 per cent for **La Poste** and 41 per cent for **USPS** whilst when postal density is high, the same increase in volume reduces cost by 13 per cent for La Poste and 36 per cent for USPS. The authors explain that this effect is because at low postal density the fixed costs are higher and the potential for scale economies is therefore greater.

By using an engineering cost model Roy (1999) also studies the impact of population density and of grouping index<sup>42</sup> on delivery costs. The cost elasticity of density varies with the density (measured as delivery points per km<sup>2</sup>) as the following table indicates

Table 7.4Cost Elasticity with Respect to Density of Delivery Points per Square Km

Density	20	100	150	200	300	500	700	1100	2000	3000
Elasticity	-0.18	-0.15	-0.14	-0.14	-0.13	-0.11	-0.07	-0.06	-0.12	-0.11

Source: Roy (1999). These values assume grouping index=1. For densities higher than 500 the grouping index is assumed to be 10. Traffic per delivery point and per day is equal to 2.5

A similar simulation is done for the grouping index. Interestingly the author finds that these cost elasticities are larger than the relative cost variations due to variations in density.

Table 7.5Cost Elasticity with Respect to Grouping Index										
Grouping index	1	3	5	7	9	11	12	13	14	15
Elasticity	-0.54	-0.51	-0.42	-0.32	-0.29	-0.26	-0.25	-0.25	-0.24	-0.23

# *Source:* Roy (1999). These values assume a density of 500 up to a grouping index of 5 and then 2000 delivery points per km<sup>2</sup>. *Traffic per delivery point and per day is equal to 2.5*

This author also estimates a cost elasticity with respect to volume, which ranges from -0.79 to -0.84<sup>43</sup>, suggesting that traffic is the main cost factor of delivery. He also finds, as do Bernard, et al (2002), that as population density falls, economies of scale from volume become more important. Following these results, Roy concludes that the costs of outdoor delivery work can vary by a factor of up to 32 between a very densely populated, highly urbanized area receiving a great deal of traffic, and an area that is not very densely populated, with individual homes receiving little traffic.

<sup>&</sup>lt;sup>42</sup> A grouping index of 1 indicates that each stop point has a corresponding, unique, delivery point.

<sup>&</sup>lt;sup>43</sup> Given a density of 100 points of delivery per km<sup>2</sup> and a grouping index of 1

Finally Wada et al. (1997) find that a 10 per cent increase in the population size per post office decreases total costs between 2.5 and 2.8 per cent.<sup>44</sup>

## 7.2.1.6. Drivers of efficiency

Given that the variables commented above affect the costs of the provision of postal services they also affect the efficiency of the service. There is a study, undertaken by Baron and Bradley in 1993, that quantifies the factors that affect operating efficiency (measured as the ratio between aggregate output and aggregate resource use). The authors apply the analysis to Mail Processing Centres of the USPS, whose main feature that differentiates them from traditional notions of a mail facility is that, like a small operating division, they have one large central facility and a network of smaller stations, branches and delivery units.

Table 7.6 summarises their main findings on the factors that increase operator's efficiency, namely automation, volume, support costs, space utilization and the degree of labour flexibility. On the other hand, the age of the facility, the number of delivery points and the number of locations in which mail processing takes place decrease operating efficiency.

Factor	Description	Effect on OE (*)
Degree of automation	Percentage of piece handling (sortations) performed	9.55
Degree of untofinition	on automated equipment	
Volume of mail	Total piece handling	2.51
Age of facility	Age measured in years	-0.31
Degree of support costs	% of labour hours in human resources and training	1.03
Degree of support costs	functions	
	# of pieces handled per square foot of mail processing	0.65
Space utilization	space	
Degree of flex labour	% of work force that is classified as part-time or casual	0.37
Delivery network	# of delivery points for a given volume	-2.25
Number of locations	# of locations in which mail processing takes place	-1.13

 Table 7.6

 Important Factors Determining Operating Efficiency (OE) at Mail Processing Centres

(\*) Effect on OE is measured by the per cent response of OE to a 10 per cent increase in the factor

To understand the results note that, as the authors point out, operating efficiency can be viewed as a measure of the cost of producing a given level of output. Viewed in this way, the operating efficiency approach can measure cost savings generated by a change in a specific operating strategy or condition, while controlling for the contributing impact of other changes. Thus, the effect of the degree of automation shown in the Table 7.6 indicates that a 10 per cent increase in the degree of automation would increase operating efficiency

<sup>&</sup>lt;sup>44</sup> For a generalised translog and a translog cost function specification, respectively.

by 9.6 per cent, which means that the same output could be achieved with 9.6 per cent less costs.

### 7.2.1.7. Impact of competition and policy reform

Mizutani and Uranishi (2003) explicitly model the impact of competition and institutional reform. The study finds that the introduction of competition in the Japanese postal market has reduced costs in private companies but has not affected the public postal operator. However the public postal operator did respond to competition by developing new strategic options for the demand side (such as discounting prices and introducing new services) which led to an increase in productivity. This study does not find any relationship between government policy changes and cost reduction either on public or private operators. The authors explain this result on the "vagueness of the announcement itself, which did not clearly state but implied that privatisation might be an option. The lack of response might also be a reflection of the perceived political power of those in whose interest it was for the Post Office to remain in the public sector."<sup>45</sup>

On the other hand Christensen et al. (1993) find that after the establishment of USPS as an independent agency in 1972 (before this, there was a Post Office Department within the Executive branch) costs were about 5.5 per cent lower than before.

## 7.2.1.8. Impact of technology

Some studies try to measure the impact of technology on costs. In Mizutani and Uranishi (2003) technology is modelled by a time trend because of the lack of data, and the authors find that it has an impact on cost reduction. Christensen et al (1993) model a time trend and a time shift to take into account the completion of the mechanization of mail processing in 1978 in USPS. They find that the cost function of USPS was 2.3 per cent lower than before 1978.

### 7.2.1.9. Impact of item size on costs and ratio of marginal costs

In their study on the drivers of the delivery activity, Cazals et al. (2001b) assess the "size" effect of delivered items on the cost of outdoor delivery for La Poste. To that end, they define four different outputs in the cost function (standard size letters, non-standard size letters, parcels and other items) and calculate the ratio of marginal costs for these products with respect to the standard size letters. The results are presented in the Table 7.7.

<sup>&</sup>lt;sup>45</sup> Mizutani F. and Shuji U. (2003), page 318.

	Cross section model (evaluated at the sample mean)	Panel data model (evaluated at the sample mean)
Non-standard size letters	2.73	2.43
Parcel	21.59	16
Other items	17.8	20.67

### Table 7.7 Ratios of Marginal Costs with Respect to the Standard Size Letters

Source: Cazals et al. (2001b)

The authors find that at the sample mean, the marginal costs of non-standard size letters, parcels and other items are respectively 2.73, 21.59 and 17.8 higher than the marginal cost of standard size letters in the cross section model and 2.43, 16 and 20.67 in the panel data model. However the authors mention that the results should be interpreted carefully, especially for non-standard size letters, as this category of output is very heterogeneous (it includes newspapers and letters with large envelopes).

# 7.2.1.10. Impact of changes in the delivery frequency

Cohen et al. (2003) report the impact on delivery costs of changes in the number of deliveries per week. Their estimation assumes that halving the number of delivery days will halve the fixed costs of delivery (the fixed costs of delivery in 1999 is US11.5 billion) and assume a linear relationship between fixed delivery costs and delivery days. Table 7.8 reports their results:<sup>46</sup>

	Cost saving (US\$ billion)	Percent of total costs
5 days	1.9	3
4 days	3.8	6.1
3 days	5.7	9.1
2 days	7.6	12.1
1 day	9.5	15.2

# Table 7.8Cost Savings from Reducing Delivery Days on Non-Business Routes

Source Cohen et al (2003)

<sup>&</sup>lt;sup>46</sup> The authors point out that this is an upper bound on the savings since the analysis has not taken into account costs that might be incurred in order to accommodate reduced delivery frequency.

Cohen and Chu (1997) also report cost savings from reducing delivery frequency, which we reproduce in Table 7.9. It is not clear from the article how they arrive at these figures although it is very likely that they follow a similar process than in Cohen et al. (2003).<sup>47</sup>

Delivery	Frequency Delivery	Cost Savings
6 Days	10.07	
5	8.88	1.19
4	7.70	2.37
3	6.51	3.56
2	5.32	4.74
1	4.14	5.93

Table 7.9Cost of Delivery Frequency (\$ Billion 1993)

### 7.2.2. Aspects related to the estimation and the data

### 7.2.2.1. Functional specification

Economic theory states that the cost function is the minimum cost of producing a given level of output (y) from a specific set of inputs (x) which belong to the production set V(y) given the price of the inputs (w). Mathematically, the cost function can be written as follows:

$$C(w,y) = \min\{w^*x \ x \in v(y)\}$$

Thus the cost function takes costs as the dependent variable and output and input prices as explanatory exogenous variables. Of course this does not exclude the use of other exogenous factors, such as postal density, as additional explanatory variables.

This specification is used to estimate the costs of the postal services in Mizutani and Uranishi (2003), Christensen et al. (1993) and Wada et al. (1997). Regarding the functional form, Mizutani and Uranishi (2003) and Wada et al. (1997) use a translog or a generalised translog cost function, while Christensen et al. (1993) use a linear in logarithms cost function.

Other studies use as the dependent variable some measure of labour, such as the number of labour hours for a week (Cazals C., et al (2001b)), minutes worked in outside and inside work (Cazals C., et al. (1997)); attendance minutes of employees at counters (Cazals C., et al (2001a)) and street time (Bernard et al (2002)). These studies include output quantities but not prices as independent variables. Implicitly they are assuming that cost variations between observations are not explained by differences in the unit costs of inputs, which are supposed to be the same. Clearly this would not be the case if the mix of inputs between

<sup>&</sup>lt;sup>47</sup> Note that the savings per day are constant (\$1.19 billion).

observations (for instance between delivery offices) is different and they have different unit costs (for instance because in one delivery office more costly labour inputs are used than in others). These studies use a translog functional form with the exception of Cazals C., et al (2001b), which uses a third order polynomial cost function.

Finally, there are some studies in the US that use a different approach (Bradley and Colvin (1994) and Cohen and Chu (1997). Their underlying logic is best explained in the latter study. The cost analysis start from a specification of the delivery cost function where costs are split into their main components. More specifically, the equation for the delivery costs is as follows:

 $SC_m = RC_m + EC_m + f_m * AC_m + V_m * AC_m,$ 

Where:

- SC<sub>m</sub> is street delivery costs
- RC<sub>m</sub> is route time costs, which is the cost of the time it would take a carrier to walk or drive the route, passing, but not accessing, any delivery point
- EC<sub>m</sub> = is elemental load cost, that is, the cost of the time it takes a carrier to place the mail in a mail receptacle; and
- AC<sub>m</sub> = is access costs, which is the cost of the time it takes a carrier to deviate from the route in order to make a delivery. This may mean departing from the basic line of travel and walking or driving to a delivery point and returning to the basic line of travel, or it may mean slowing down from normal driving speed, stopping to make a delivery to a curb side mail receptacle, and then resuming normal speed.

Route time costs are considered fixed with volume and load time costs fully variable. Access time is considered partly variable, so the econometric analysis is focused on the estimation of the part of the access costs that is variable with volume. To that end, the number of actual stops is specified as a function of mail volume, indicating that an increase in volume will increase the number of actual stops less than proportionally.

Therefore, in this type of analysis the cost function is not specified in the usual way (i.e. as a function of output and input prices) but into a fixed and a variable component that depends on the output. Given this, the likelihood of finding economies of scale and subadditivity is high, as is pointed out by Bradley and Colvin (1994), page 143.

# 7.2.2.2. Data used

Regarding the data used, it is important to note that:

• The cost analysis is done by using data of the same country;

- They all use data for a single operator with the exception of Mizutani and Uranishi (2003) who use data from 6 different firms operating in the same country (Japan);
- Especially for delivery, there are studies using very disaggregated data, at the level of delivery routes (Cohen and Chu (1997), Bernard et al. (2002) and Bradley and Colvin (1994)). Other studies for delivery use data at the level of delivery offices (Cazals C., et al (1997), and Cazals C., et al (2001b));
- For the collection activity, the studies use data at the level of postal offices (Cazals C., et al (2001a) and Gazzei et al. (2002));
- When the cost of the provision of several activities is analysed, the studies use data at the level of operator (Wada et al. (1997)) or at the level of operating units that undertake several activities. This is the case of Mail Processing Centres in Baron and Bradley (1993) and Management Sectional Centres in the study of Norsworthy et al. (1991), both for the US.

# 7.3. Conclusions

This chapter has provided an introduction to the econometric approach to cost estimation. We have shown how the approach involves establishing a statistically significant relationship between costs and the factors affecting costs. As we noted at the beginning of this chapter, a major advantage of the econometric approach is that it is able to control for the impact of a range of different factors that impact on costs simultaneously. Moreover, the approach can also quantify the impact of individual cost drivers.

In the chapter we reviewed the results of previous studies with particular reference to economies of scale, economies of scope, the impact of geographical factors, the factors driving efficiency, and the impacts of competition and policy reforms.

- In regard to <u>economies of scale</u>, the studies find evidence of economies of scale both in delivery and – to a lesser extent – in the whole value chain of postal provision (though we should note that the studies do not always make the distinction between economies of scale and economies of density clear).
- There is evidence of strong <u>cost complementarities</u> between different postal products (with the exception of parcels) in the United States. These complementarities, or economies of scope, arise because the different products (first class mail, second class mail, third class bulk mail) use the same network.
- <u>Geographical factors</u> do impact on cost levels. For example, in France, unit costs fall as the density of the delivery area rises a 10 per cent rise in the number of delivery points per km of route would reduce unit costs by nearly 3 per cent.

- <u>Efficiency of mail processing centres</u> is driven by factors such as the degree of automation, the age of the facility, and the degree of labour flexibility. Increasing automation in the United States Postal Service increased efficiency and reduced costs.
- In Japan, <u>introduction of competition</u> in the postal market reduced the costs of private companies, but did not affect the costs of the public postal operator. However, the public operator did respond to competition by introducing new products. But researchers in the United States found that after establishment of the United States Postal Service as an independent agency in 1972, costs were over 5 per cent lower than they had been before.

# 8. ESTIMATION OF A EUROPEAN POSTAL COST FUNCTION

# 8.1. Introduction

In this chapter of the report we present NERA's econometric estimates of postal cost functions in Europe. We have first estimated a total cost function, and then estimated individual cost functions for the collection, sorting, transport and delivery activities. These results are based on the data we have collected in the course of the present study.

Our estimates are based on the costs faced by a universal service provider. These operators' universal service obligations will oblige them to provide postal services in a particular form, and that in turn will influence the costs of provision. In particular, the obligation to provide services throughout their territories, and to deliver every day to every address, will mean that costs per unit of traffic will be higher than would be costs for an operator (such as a new entrant) which was not faced with these obligations and which would have greater flexibility in deciding which customers to serve and how to serve them. The obligation to collect from individual post boxes throughout the territory served will also impose additional costs on a universal service operator.

A major part of this exercise has involved the collection and analysis of data. We received an incomplete set of information from the postal operators we surveyed, and so it was necessary to complement this with our own data gathering exercise based on published sources - primarily the operators' annual reports and websites, and information published by the Universal Postal Union (UPU). Inevitably in an exercise of this type, different operators will use different conventions in collecting data and there will be difficulties in checking whether data have been collected on consistent bases. Our objective in preparing the data for the statistical analysis was to ensure that data are as comparable as possible, but inevitably there will still be some inconsistencies. Although there are econometric techniques that allow the analyst to control for unobserved effects between countries/operators, the restricted number of observations means that we were only able to do this if the operator was operating in one of the original Member States or provided services in one of the new Member States. We have however, wherever possible, compared our results with those obtained in similar studies that have previously been carried out, and which we reviewed in the previous chapter.

In line with economic theory we have modeled a general cost function of a form in which total costs are represented by the following variables:

- mail volumes;
- the size of the network;
- input prices; and
- control variables reflecting country-specific, regulatory and quality variables.

We have separated the volume variable from the network variable because we believe that an important characteristic of the postal sector, as of other network industries, is that costs of provision will vary significantly between operators depending not only on the volume of output (in terms of mail handled) but also on the characteristics of the network, in particular in terms of the number of points where service - both delivery and collection - is provided. This will allow us to distinguish between *economies of scale* and *economies of density*.<sup>48</sup>

Appendix A contains a technical discussion of the type of cost function and estimation methods that we have used.

# 8.2. Data

### 8.2.1. Data requirements

In order to estimate a cost function for postal services it is necessary to collect data on costs for postal services, including parcels, letters and express services, traffic volumes for these services, and input prices. It is also necessary to include network variables such as the numbers of post offices, post boxes, and sorting offices, and geographical variables like population, geographical area, population density, and urban population. In addition, if we want to estimate a cost function for each of the activities in the postal value chain, we need to know the proportions that collection, sorting, transport and delivery costs represent of total operating costs.<sup>49</sup>

### 8.2.2. Data sources

The questionnaire was used as the main source for information for the econometric estimation. We sent our detailed questionnaire to the Universal Service Operators in all 25 Member States and received 23 responses.

We did not receive responses from the operators in Cyprus and Sweden. In addition, we do not have any cost information for Poland.

Information from the questionnaire was supplemented by information from other sources, including operators' annual reports and web pages, and the UPU database.

In total, we had 99 observations over the period 1998 to 2003.

<sup>&</sup>lt;sup>48</sup> These concepts were introduced in Section 6.2 and will be discussed further in Section 8.3.

<sup>&</sup>lt;sup>49</sup> Information on these proportions is summarised in Chapter 5.

### 8.2.3. Information on total costs

The main sources of information on total costs were the questionnaire responses and operators' published accounts. We were particularly concerned to get information from operators on costs split between letters, parcels and express, but many operators were unable or unwilling to supply this information. In a few cases we were unable to find any information on costs, and so were not able to include the countries in the data set.

For those countries where costs for letters, parcels and express were available for some but not all years we interpolated or extrapolated data between years for which data on the split of total costs was available.

In other countries where we had no information on the split of total costs between letters, parcels and express services we had to make broader assumptions, based on splits in comparable countries.

### 8.2.4. Information on labour costs and wages

Labour costs are an important input into the econometric estimation as they are necessary to impose some restrictions on the cost function; in particular we need them in order to impose the restriction that the estimated cost function is consistent with the assumption of cost minimization.<sup>50</sup>

We had included some questions in our questionnaire where we asked separately for the percentage that staff costs represent of total costs for letters, parcels and express, but only a few operators answered these questions. However, many operators do publish some information on the split of their costs between staff and other costs – in some cases operators publish separate information for letters and parcels, but where they do not we had to assume that labour's share of costs was the same in the two sectors. In a few cases we had to assume that labour's share of costs in particular countries was the same as in comparable countries.

We have defined average wages as equal to staff costs divided by the number of full time equivalent postal workers. This was taken from information reported in the questionnaire, or calculated from published sources.

### 8.2.5. Information on costs by activity

We asked respondents to provide splits of total operating costs of letters, parcels and express services into the different activities: collection, transport, sorting, delivery and overheads.

<sup>&</sup>lt;sup>50</sup> This uses what is known as Shephard's lemma, which implies that the share of labour in total costs is equal to the derivative of the cost function with respect to the unit price of labour, multiplied by the wage, and divided by total cost.

We provide an overall view on the information available on postal cost levels in Chapter 5. For some countries information was not available for every year. For others no information was available so we had to assume similar proportions to comparable countries.

### 8.2.6. Information on traffic volumes

Most of the countries did not report traffic volumes for every year for which we requested information. Therefore, we used UPU year-on-year growth rates to fill in gaps.

Other countries did not include any figures on volumes in the questionnaire. For these countries we completed the data set using information from published annual reports or the operators' web pages. In the cases where this information was not available we used UPU data.

Although we asked for volumes for express services, very few operators reported these data. In addition neither the UPU database nor annual reports include information on these services. Consequently we did not include express services in the econometric estimation.

### 8.2.7. Post offices, post boxes, sorting offices

In order to control for network differences between countries we asked in our questionnaire for information on the number of post offices, post boxes and sorting offices. Most of the operators that answered the questionnaire reported information for these variables. However they did not include information for every year. As for other variables, we used UPU year-on-year growth rates to fill in gaps.

For those operators that did not include information for these variables we used the UPU database and statistics included in annual reports or web pages.

### 8.2.8. Observations included in the data set

Our data set includes the following variables: operating costs for letters and parcels, operating costs for letters and parcels split into activities, volumes for letters, volumes for parcels, wages, labour cost share, population, area, population density, percentage of population in urban areas, number of households, number of post offices, number of sorting offices, percentage of mail handled by automatic machinery, targets in D+1, existence of quality regulation, average number of collections per week and per collection point, average number of deliveries per week and per collection point and type of country (original or new Member State).

# 8.3. Total Cost Function

Having prepared our data set, we first of all estimated the total cost function. In line with economic theory we have included as explanatory variables output measures (letter and parcel volumes), input prices (wages, and material, rents and services<sup>51</sup>), postal infrastructure variables (numbers of pure sorting offices, numbers of delivery offices, and numbers of post boxes), and a number of additional control variables. In regard to the latter, we tested different specifications controlling for network size (by using number of post offices and households), geographic variables (taking population density and the percentage of urban population), quality variables (percentage of mail delivered in D+1), regulation (a "dummy" variable taking the value of 1 when quality regulation exists and 0 where it does not), and the average number of collections and deliveries per week.

In choosing the specification for the regression analysis we had to consider whether there would be any differences in the way costs would behave in different countries. The categorisation that NERA believed would be most relevant was that between the EU15 and the ten countries which, when we started this study, were about to join the EU. There are three reasons why we expected that results could well be different. First, these countries generally have lower volumes of mail per household. Second, as Table 5.5 showed, these countries have had very much lower unit wage costs in the postal sector than countries in the EU15. Third, in the period covered by our data set (1998 to 2003) these countries were in the transition period to EU membership, in most cases towards a very much more marketbased environment than the one in which they had operated in the past. So our specification includes a "dummy" variable to control for whether the observation comes from a new Member State. While we did not find that this variable had a *direct* impact on costs, we did find in our favoured specification that two interaction terms between letters and parcels volume and the dummy variable were significant. This flexible specification allows traffic volumes to have a different impact on costs for new and original Member States. The empirical evidence provided by the estimation of this specification strongly indicates that cost functions do indeed differ.

<sup>&</sup>lt;sup>51</sup> To estimate the system of equations efficiently, one factor share equation has to be removed and the price variables in the remaining share equations can be expressed as a relative price with the denominator being the price of the factor whose share equation has been removed. For this reason, the coefficient of the input material rents and services will not be reported in the results.

We believe that it is important to control for network size so that we can take account of the difference between <u>economies of scale</u> and <u>economies of density</u>. As we explained in Section 6.2, economies of density measure the reduction in unit costs (e.g. cost per letter) as the volume handled on a network increases while network size is held fixed. Economies of scale measure the change in unit costs (e.g. cost per letter) when both volume on the network and the size of network itself increases. Furthermore, <u>economies of scope</u> indicate whether the cost of producing two products together is lower than the cost of producing the two products separately.

The size of the postal network can be understood in terms of the number of points where mail is delivered. For instance Christensen et al. (1993) introduce the number of delivery addresses as a measure for network size. Similarly, in the transport sector the number of points served has been used as an indicator of the size of an airline network.<sup>52</sup>

As we had no information on the <u>number of delivery addresses</u>, we considered two alternative variables to measure the size of a postal network. These were the number of households, and the number of post offices. The number of post offices is more closely related to the size of the collection network and, although the universal service providers have obligations regarding the number of post offices, it is the number of households that is likely to be most closely related to the number of delivery addresses. Nevertheless we tried both measures to control for network size, but found that the number of households produced more sensible results.

As well as allowing for network size, we also needed to take account of the <u>impact of demographics on costs</u>. We had two variables available at national level, overall population density, and the proportion of the population living in urban areas. In principle one would expect that the percentage of urban population is a more relevant cost driver than population density. For instance consider a country with a high percentage of urban population, but where national population density is low (this would occur if most of the population lived in a small number of urban areas). In this case one would expect low unit costs of postal services because delivery can take place relatively efficiently, despite the low overall population density. In principle, both variables could have an impact on costs, although when we tried both variables in our model we never found that both variables were significant at the same time.

While we did test for postal infrastructure variables in our equations, these variables were generally not significant. In addition, because of data restrictions, inclusion of these variables reduced our sample size and the value of the estimates obtained. Finally, we discarded some specifications that performed poorly and yielded estimated coefficients that were not economically meaningful.

<sup>&</sup>lt;sup>52</sup> See for instance Caves Christensen and Tretheway on economies of scale and density in the airline industry (Caves, et al, 1984).

Table 8.1 shows the results of the estimation of the total cost function.<sup>53</sup> An explanation of the terms used in the table is provided in Box 8.1.

The coefficient on the log of traffic volumes captures the impact of volumes on costs <u>common</u> to both original and new Member States. This number also represents the elasticity of costs with respect to volumes in Member States. The coefficient on the interaction terms is a coefficient specific to the traffic volume in the new Member States, and it provides some information on the <u>difference</u> on cost elasticities between original and new Member States. Finally, the elasticity of costs with respect to volumes for new Member States is given by the sum of the interaction term coefficient and the coefficient on volumes. This information is reported in italics in all tables.

# Table 8.1Total Cost Function (Specification including the Number of Households and the<br/>Percentage Urban Population)

Dependent	Explanatory variable	Coefficient	Standard	<b>P-</b>
variable			Error	value.
Total costs (log)				
	Log of wages	0.63	0.01	0
	Log of letter mail volume	0.61	0.04	0
	Log of parcel mail volume	0.04	0.01	0.001
	NMS interaction term (letters) <sup>54</sup>	-0.25	0.05	0
	NMS interaction term (parcels) <sup>55</sup>	0.15	0.03	0
	NMS overall letter mail elasticity	0.36		
	NMS overall parcels elasticity	0.19		
	Number of households	0.40	0.07	0
	Percentage urban population	-0.93	0.34	0.007
	Constant term	-4.21	0.33	0
R-squared: 0.959				
Share of labour in	total costs			
	Constant term	0.63	0.01	0
R-squared: 0.979				

*Source: NERA estimation. Notes: Number of observations 99.* 

<sup>&</sup>lt;sup>53</sup> Given the particular functional form that we have used (Cobb-Douglas), we have in this and all following cases estimated a system of two equations: the cost system itself, and a labour cost share equation based on cost minimisation. The table contains the results of both equations. A more detailed discussion of the type of cost function and estimation methods that we have used is contained in Appendix A.

<sup>&</sup>lt;sup>54</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of letters from the country.

<sup>&</sup>lt;sup>55</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of parcels from the country.

# Box 8.1 Explanation of Concepts Used in Econometric Tables

**Coefficients** We have estimated the impact on costs of different *explanatory* variables. The numbers reported in the coefficients column provide information on the sensitivity of costs to a change in one of the explanatory variables, keeping all other variables constant. However, due to the presence of an interaction term between the new Member States dummy and volumes, the coefficient on volumes does not fully capture the effect of volumes on costs.

**Standard errors and P-values** These are indicators that relate to the precision of the estimated coefficients. When the ratio of coefficient value to the standard error is high, this indicates a high degree of precision in the estimates. The P-value statistics provide information on the level of confidence in the estimated coefficients. A low P-value is associated with a very precise estimation of the coefficient value. A commonly adopted approach is to regard variables with a P-value below 0.05 as having a significant impact on the dependent variable.

**R-squared** The R-squared is an indicator of how well the model specified fits the available data. In other words, this is an indicator of how much cost variability is captured by the explanatory variables. The difference between one and the R-squared indicates the amount of unexplained variability, namely the differences in costs due to residual factors not specified in the model. The goodness of fit measure in all regressions has been adjusted to take into account the particular methodology that we have followed to estimate systems of equations.

We can summarise the total cost function results shown in Table 7.1 as follows:

- **Significance of variables.** All the variables are very significant and have the expected sign. An increase in wages and in volumes has a positive effect on total operating costs. Furthermore, a wider network is also associated with higher costs, while costs are lower when a larger share of the population lives in urban areas.
- **Differences between different countries.** The empirical estimates strongly suggest that there are different cost functions in new and in original Member States. The differences are captured by the two interaction terms which are both statistically significant. The existence of different cost functions is consistent with what one would expect a priori.
- **Economies of density.** There are economies of density both in original and new Member States. In the original Member States a 10 per cent increase in the volume of

letters and parcels, given a fixed network size, would increase costs in these countries by 6.5 per cent.<sup>56</sup> This result compares with that found by Christensen et al. (1993) who estimated that 10 per cent increase in "volume workload" for the United States Postal Service would increase costs by 7.8 per cent.

In the new Member States we find that a 10 per cent increase in the volume of letters and parcels would increase costs by 5.6 per cent,<sup>57</sup> lower than in the original Member States. We have not found any published evidence for new Member States with which to compare this result. However, in their answers to the questionnaire, Slovenia Post reported that a 10 per cent increase in letter mail volume would increase their costs by 5.6 per cent, whilst a 10 per cent increase in parcel volume would increase costs by 9 per cent. Although we did not receive information on how this calculation was made, a weighted average by volume of this figures gives a value quite close to 5.6 per cent, which is the same as the estimated value.<sup>58,59</sup>

The greater economies of density in new Member States could be explained by different labour costs and postal network utilisation in these countries. In the presence of excess capacity, increases in traffic volumes are associated with lower increases in operating costs than in networks that are already congested or close to full capacity. Moreover, volume increases are accompanied by an increased demand for labour, which is provided more cheaply in new than in the original Member States.

• Economies of scale. The value of economies of scale in the original Member States, estimated at the sample mean of the number of households is 1.03.<sup>60</sup> We did not find sufficient statistical evidence to reject the hypothesis that there are constant returns to scale when both mail volume and network size increase. This result is consistent with that of Christensen et al, who report for the delivery activity that "there are neither advantages nor penalties to growth in the overall size of the system" (Christensen, et al, 1993, p.248). For the total cost function, Wada et al. (1997) in Japan estimate the returns to scale value between 1.03-1.06, including letters and parcels as the output variable although they do not control for network size.

<sup>&</sup>lt;sup>56</sup> This value corresponds to the sum of the estimated coefficients for parcels and letters volumes.

<sup>&</sup>lt;sup>57</sup> This value corresponds to the sum of the estimated coefficients for parcels and letter volume and the interaction terms.

<sup>&</sup>lt;sup>58</sup> Note that the weighted average is similar to the 5.6 per cent value as the volume of letters in 2003 was about 680 million whilst the volume of parcels was only 206,000.

<sup>&</sup>lt;sup>59</sup> The operator in the Czech Republic reported that 10 per cent increase in either parcel or letter mail volume would increase their costs by only one per cent, which is much lower than our estimate and one of which we regard as suspiciously low.

<sup>&</sup>lt;sup>60</sup> In this chapter we define economies of scale as the inverse of the elasticity of costs and network size with respect to output. The figure reported is calculated as the sum of the estimated coefficients for parcels and letter volumes and the number of households multiplied by the average number of households.
Norsworthy et al. (1991) find a value of 1.10 (these authors include a network variable in the specification).

For the new Member States, our estimate of economies of scale is 1.14. The statistical evidence rejects the hypothesis that costs display constant returns to scale, rather than increasing returns to scale. Again we do not have any published information from new Member States with which we can compare this result, but the value is quite similar to the lower bound of the range provided by Cazals, Florens and Roy (2001b) for the delivery of a set of different types of mail items (standard size letters, non-standard size letters, parcel and other items) in France.

- Impact of geographic variables. We find that <u>both in new Member States and in the</u> original Member States, a 10 per cent increase in the percentage of urban population reduces operating costs by 6.7 per cent, which shows the importance of controlling for these variables when comparing the costs of different operators. We have not found any published evidence on the impact on unit costs of the percentage of the urban population. If we model population density instead of the percentage of urban population, we find that a 10 per cent increase in population density would decrease costs (valued at density sample mean) by 1.6 per cent. This result is not far from that presented by Cazals, Florens and Roy (2001) for La Poste, where the authors find that a 10 per cent increase in postal density decreases costs by 2.7 per cent, though Cazals et al define postal density as the number of delivery points divided by the length of the route.
- Marginal costs. Marginal cost is defined as the cost increase following a one unit increase in output. In this case, letter marginal cost could be defined as the cost increase caused by collecting, sorting, transporting and delivering one additional letter. We find that the marginal costs for letters are different in original Member States than in new Member States. Thus the marginal cost of a letter in an original Member State is estimated at €0.36 whilst in a new Member State it is estimated at €0.17. We note however that the absolute figures should be treated with caution, since significant differences in marginal costs can be explained by differences in capacity utilisation.

We have developed the model shown in Table 8.1 further to include variables controlling for:

- The numbers of collections and deliveries per week;
- A dummy variable that takes the value of 1 when D+1 is regulated; and
- Four dummy variables that take the value of 1 if D+1 target is equal or higher than 95 per cent, between 90 and 95 per cent, between 80-90 per cent, and below 80 per cent.

Our best specification includes only a dummy that takes a value of one when the service quality target is set above 95 per cent of D+1 deliveries. Our preliminary empirical investigations showed that differences in delivery target below this threshold have no impact on operating costs, except where the target is below 80 per cent.

The results, shown in Table 8.2 below, indicate that a 10 per cent increase in letter and parcels volume increases costs in original Member States by 6.1 per cent and increases costs in new Member States by 5.0 per cent. The value for economies of scale (which we evaluate at the sample average households number) is 1.00 for the original Member States and 1.22 for new Member States. We do not find conclusive statistical evidence to rule out the existence of constant returns to scale in the original member countries. However, the hypothesis of constant returns to scale is rejected for the new Member States (at the 6 per cent level).

#### Table 8.2 Total Cost Function (Specification including the Number of Households, Percentage of the Urban Population and Dummies on D+1 Variables)

Dependent	Explanatory variable	Coefficient	Standard	
			Error	P-value.
Total costs (log)				
	Log of wages	0.63	0.01	0
	Log of letter mail volume	0.56	0.04	0
	Log of parcel mail volume	0.05	0.13	0
	NMS interaction term (letters) <sup>61</sup>	-0.30	0.05	0
	NMS interaction term (parcels) <sup>62</sup>	0.19	0.03	0
	NMS overall letter mail elasticity	0.26		
	NMS overall parcels elasticity	0.24		
	Number of households	0.51	0.07	0
	Percentage urban population	-0.85	0.32	0.009
	D+1>95% <sup>63</sup>	0.35	0.10	0
	Constant term	-4.08	0.31	0
R-squared: 0.962				
Share of labour ir	a total costs			
	Constant term	0.63	0.01	0
R-squared: 0.979				

Source: NERA estimation.

We also wished to investigate the relationship between postal costs and postal traffic density, which we define as the total mail volume per household. We expect that postal

<sup>&</sup>lt;sup>61</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of letters from the country.

<sup>&</sup>lt;sup>62</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of parcels from the country.

<sup>&</sup>lt;sup>63</sup> This is a dummy variable which takes the value of 1 if D+1 target is equal or higher than 95 per cent

traffic density will primarily impact on unit costs, and that unit costs would fall as traffic density increases. Consequently we have estimated a unit cost function, where unit costs are defined (as in Chapter 6 above) as total costs divided by the sum of letters and parcels volumes.<sup>64</sup>

Dependent variable	Explanatory variable	Coefficient	Standard Error	P-value.
Unit costs (log)				
	Log of wages	0.64	0.09	0.000
	Log of postal traffic density	-0.29	0.06	0.000
	NMS interaction term	-0.46	0.07	0.000
	NMS dummy	-0.70	0.11	0.000
	Percentage urban population	-0.88	0.25	0.001
	Constant term	-6.76	0.23	0.00
R-squared: 0.645				
Share of labour ir	n total costs			
	Constant term	0.64	0.01	0.000
R-squared: 0.979				

### Table 8.3 Unit Cost Function

Source: NERA estimation.

These results show that unit costs are inversely related to both the proportion of the population living in urban areas, and to postal traffic density. The coefficient on the proportion of urban population is consistent with the estimates in Tables 8.1 and 8.2 (the *percentage* impact on total and unit costs should be the same). The coefficient on the postal traffic density term shows that a ten per cent increase in postal traffic density will be associated with a 2.9 per cent reduction in unit costs for the Original Member States.

#### 8.4. Collection Cost Function

In order to estimate a collection cost function we first eliminated from the sample the observations from Slovenia, which reported an unrealistically low proportion of collection costs (1.5 per cent, compared with the average of 12 per cent).

We then included a number of variables to measure specific aspects of collection costs, including the number of post boxes, the geographical area of the country, the percentage of the urban population, number of collections per week and population density.

<sup>&</sup>lt;sup>64</sup> We are assuming constant returns to scale (as an increase in the number of households that exactly matches an increase in volumes does not affect the traffic density ratio). This assumption is supported by our results for the original Member States, while the estimates based on the new Member States suggest that in these countries the assumption of increasing returns to scale provides a better fit.

The best results for the collection cost function are shown in Table 8.4, where we have included the number of post boxes among the explanatory variables.

Dependent variable	Explanatory variable	Coefficient	Standard Error	P- value.
Total costs (log)				
	Log of wages	0.63	0.01	0
	Log of letter mail volume	0.67	0.06	0
	Log of parcel mail volume	0.01	0.02	0.43
	NMS interaction term (letters) <sup>65</sup>	-0.51	0.12	0
	NMS interaction term (parcels) <sup>66</sup>	0.32	0.07	0
	NMS overall letter mail elasticity	0.16		
	NMS overall parcels elasticity	0.33		
	Post boxes	0.09	0.03	0.001
	Percentage urban population	-1.32	0.51	0.009
	Constant term	-6.13	0.42	0
R-squared: 0.946				
Share of labour in to	tal costs			
	Constant term	0.63	0.01	0
R-squared: 0.979				

# Table 8.4Collection Cost Function

Source: NERA estimation. Notes: Number of observations 87.

Table 8.4 shows that holding constant the number of post boxes, a 10 per cent increase in the letter mail and parcel volume increases collection costs by 6.8 per cent in original Member States and by 4.8 per cent in new Member States.

By allowing the number of post boxes to change, we have estimated the returns to scale to be 0.99 for original Member States (suggesting constant returns to scale, although we cannot reject the hypothesis of constant returns to scale statistically) and 1.26 for new Member States (here we can reject the hypothesis of constant returns to scale). It seems a reasonable assumption to assume that for a given number of post boxes and collections per week, collection costs also depend on the geographical distribution of post boxes within a country. The percentage of the urban population within a state, which is the only proxy available for the degree of dispersion or concentration of post boxes, indicates that, at the sample average, a 10 per cent increase in the percentage of the urban population would reduce collection costs by 9.7 per cent.

<sup>&</sup>lt;sup>65</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of letters from the country.

<sup>&</sup>lt;sup>66</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of parcels from the country.

# 8.5. Sorting Cost Function

To estimate the sorting cost function, we have included the number of sorting offices as an explanatory variable in addition to the variables related to wages, volumes and new Member States that we used in the earlier equations. Table 8.5 shows the estimation results of the sorting cost function.

Dependent variable	Explanatory variable	Coefficient	Standard Error	P- value.	
Total costs (log)					
	Log of wages	0.64	0.01	0	
	Log of letter mail volume	0.54	0.05	0	
	Log of parcel mail volume	0.02	0.02	0.295	
	NMS interaction term (letters) <sup>67</sup>	-0.37	0.07	0	
	NMS interaction term (parcels) <sup>68</sup>	0.29	0.04	0	
	NMS overall letter mail elasticity	0.10			
	NMS overall parcels elasticity	0.31			
	Sorting offices	0.01	0.002	0	
	Constant term	-6.98	0.34	0	
R-squared: 0.891					
Share of labour in to	otal costs				
	Constant term	0.64	0.01	0	
R-squared: 0.979					

#### Table 8.5 Sorting Cost Function

Source: NERA estimation.

Notes: Number of observations 93.

As in the other activities, there are substantial economies of density in sorting. More interestingly, the estimated parameter for sorting offices is positive, indicating that an increase in the number of sorting offices leads to cost increases. Thus a 10 per cent decrease in the number of sorting offices would lead to a reduction of 2.9 per cent in sorting costs, calculated at the sample mean. This result is higher than that found by Baron and Bradley (1993). These authors report that a 10 per cent increase in the number of "locations in which mail processing takes place" would lead to a 1.1 per cent reduction in operating efficiency. This means that the same output would be produced with a 1.1 per cent higher costs. This result would also explain the trends in some new Member States to reduce the number of sorting centres.

<sup>&</sup>lt;sup>67</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of letters from the country.

<sup>&</sup>lt;sup>68</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of parcels from the country.

Under this specification of the sorting cost function, the returns to scale parameter in original Member States (evaluated at the sample average number of sorting offices) is 1.18. On the basis of our estimates we reject the hypothesis of constant returns to scale in sorting.<sup>69</sup> Rogerson and Takis (1993) indicate that there is mixed evidence of economies of scale in sorting. However the author's opinion is that mail processing operations are not characterised by strong economies of scale, which is supported by the presence of private presort companies. In the case of new Member States, the economies of scale parameter is 1.33 indicating the presence of economies of scale in the sorting activity.<sup>70</sup>

We have also tried to explain sorting costs by the level of automation of sorting operations, but have not been able to find any meaningful results here.

# 8.6. Transport Cost Function

The transport network connects post boxes with post offices, and post offices with sorting centres, and sorting centres with each other. Thus a specification for the costs of the transport network should take into account these network points. Also the costs of the transport network will depend on the size of the country, so it would be appropriate to control for the geographic area.

After different attempts that aimed to control for the postal network points we have found that only post offices and geographical area are significant. The results are reported in Table 8.6.

<sup>&</sup>lt;sup>69</sup> Although when calculated at the sample mean of EU countries, we cannot reject the hypothesis of constant returns to scale.

<sup>&</sup>lt;sup>70</sup> When we evaluate the economies of scale parameter for the new Member States the parameter is very large (1.89), which leads us to treat these results with caution.

Dependent variable	Explanatory variable	Coefficient	Standard Error	P- value.	
Total costs (log)					
	Log of wages	0.64	0.01	0	
	Log of letter mail volume	0.48	0.05	0	
	Log of parcel mail volume	0.01	0.01	0.459	
	NMS interaction term (letters) <sup>71</sup>	-0.36	0.06	0	
	NMS interaction term (parcels) <sup>72</sup>	0.27	0.04	0	
	NMS overall letter mail elasticity	0.12			
	NMS overall parcels elasticity	0.28			
	Post offices	0.68	0.18	0	
	Surface area	0.15	0.05	0.003	
	Constant term	-6.75	0.32	0	
R-squared: 0.914					
Share of labour in to	tal costs				
	Constant term	0.64	0.01	0	
R-squared: 0.979					

# Table 8.6Transport Cost Function

Source: NERA estimation.

The most important results from Table 8.6 are that the returns to scale value for original Member States is 1.28 (we reject the hypothesis of constant returns to scale), which looks high as one would not expect the existence of economies of scale in the transport network. However close comparison with published evidence (Rogerson and Takis, 1993) show that returns to scale in the transport activity increase the shorter are the transport distances. Thus, these authors report that the value of returns to scale in long distance transportation (by freight rail or air) in the US lies between 1.01 and 1.05. For long distance transportation by road, the values are higher (1.11). Finally, the authors report that economies of scale are clearer in short haul transportation (within a processing facility's service area) taking a value of 1.52. Therefore in this sense, the results obtained in this study would be consistent with those of Rogerson and Takis (1993) provided that transport routes are short distance. For new Member States, the returns to scale value is 1.45, higher than in original Member States. Again these results should be treated with caution, as ideally one would like to have as an independent variable the number of transport routes instead of the number of nodes in the postal network.

<sup>&</sup>lt;sup>71</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of letters from the country.

<sup>&</sup>lt;sup>72</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of parcels from the country.

# 8.7. Delivery Cost Function

We tested several specifications for the delivery cost function that, apart from volumes and wages, included numbers of post offices, numbers of households, population density and the percentage of urban population. The inclusion of post offices as an explanatory variable in order to control for differences in the network size did not produce promising results, in particular it affected the precision of the estimate of the coefficient on parcel volumes. Hence, in our favoured specification we include among the explanatory variable the percentage of the urban population and the number of households as independent variables. Table 8.7 shows the results.

As in the published econometric studies, when we evaluate returns to scale using the average number of households in the sample and our estimates, we find that there are returns to scale in the delivery cost function, although our estimated parameter for original Member States (1.06) is lower than that found in other studies.<sup>73</sup> As this number is higher than one, it shows that there could be increasing returns to scale, although testing statistically we cannot reject the hypothesis of constant returns to scale. For new Member States there are also returns to scale and the value, 1.17, is in the upper part of the range of the international experience.

Depen variabl	Dependent Explanatory variable variable		Coefficient	Standard Error	P- value.	
Total	costs	in				
logs						
-			Log of wages	0.64	0.01	0
			Log of letter mail volume	0.60	0.05	0
			Log of parcel mail volume	0.04	0.02	0.010
			NMS interaction term (letters) <sup>74</sup>	-0.12	0.05	0.023
			NMS interaction term (parcels) <sup>75</sup>	0.06	0.03	0.074
			NMS overall letter mail elasticity	0.48		
			NMS overall parcels elasticity	0.10		
			Number of households	0.37	0.08	0.000
			Percentage urban population	-0.74	0.38	0052
			Constant term	-5.00	0.36	0
R-squar	red: 0.9	46				
Share o	of labou	ır in	total costs			
			Constant term	0.64	0.01	0
R-squar	red: 0.9	79				

### Table 8.7: Delivery Cost Function

Source: NERA estimation. Notes: Number of observations 99.

<sup>75</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of parcels from the country.

<sup>&</sup>lt;sup>73</sup> It ranges from 1.13 to 1.68 (see Cazals, Florens and Roy (2001b) and Cazals, Rycke, Florens and Rouzaud (1997). Both of these studies use data from La Poste).

<sup>&</sup>lt;sup>74</sup> This is the coefficient on the interaction term between a dummy variable that takes a value of 1 when the country is a new Member State (and zero otherwise), and the volume of letters from the country.

Our estimates strongly suggest that there are substantial economies of density. They imply that a 10 per cent increase in volume, keeping constant the size of the network, leads to a cost increase of 6.4 per cent in original Member States and of 5.8 per cent in new Member States.

Our results also indicate that a 10 per cent increase in the percentage of urban population leads to 5.4 per cent reduction in delivery costs.

On the basis of our estimates, we also find that the marginal delivery costs for letters are lower in new Member States ( $\in 0.10$ ) than in original Member States ( $\in 0.15$ ). These absolute figures should be treated with care, though the estimates strongly suggest the presence of higher marginal costs in the original Member States.

We also included in the specification additional explanatory variables to control for the impact of average number of deliveries per week and geographical characteristics on delivery costs. However we found that the estimated parameters of these explanatory variables were not statistically significant.

#### 8.8. Conclusions

In this chapter, we have presented our cost function estimates. In spite of the data limitations associated with a sample size of roughly a hundred observations, our results are broadly consistent with the results already published in the economic literature on postal costs. Importantly, we have also found consistent and statistically very significant evidence of distinct cost functions between original and new Member States, as we expected to find. While the precise estimation of the magnitude of the coefficient should be treated with caution, our empirical analysis has provided substantial evidence of a different elasticity of costs with respect to traffic volumes in both parcels and letters between original and new Member States.

With respect to letter volumes, the results suggest that costs react more to traffic increases in the original Member States than in new Member States. We also find that there are economies of density in all cost functions. For the new Member States we also find statistical evidence that supports the existence of economies of scale in total cost, collection, sorting, transport and delivery costs. For the original Member States, although the point estimates suggest the existence of economies of scale, when tested statistically we only find them for the transport and sorting activities. Again, our estimates indicate that economies of scale are stronger in new Member States than they are in the original Member States.

Finally, our estimates also show the importance of demographic variables, such as the percentage of the population living in urban areas, when comparing cost levels between operators.

# 9. POST OFFICE RETAIL NETWORKS

# 9.1. Introduction

This chapter examines the retail networks of the different operators. Retail post offices provide an access point for payment for postage<sup>76</sup> and physical acceptance of mail item(s) – particularly items that require individual weighing, pricing or proof of mailing. They also provide retail services including financial transactions, access to government services and many other non-postal services.

This chapter compares the key features of the different networks. It then looks in more detail at three operators (**Royal Mail** in the UK, **Posten** in Sweden and **TPG** in the Netherlands) and at a particular development – the selling of post banks, which has been a feature of a number of operators.

# 9.2. Functions of the Retail Network

Maintenance of an extensive network of post offices is often justified on the basis of the postal universal service obligation. However, of the key postal functions of the retail network, two - collecting letters and selling stamps - have alternatives which are generally cheaper and can fulfil the USO requirement for acceptance of mail - letters can be collected from post boxes, and stamps can be sold through vending machines, third party agents and other distribution channels. However 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.

The retail network is also valued because it:

- Supports the local economy, providing individuals with cash to spend on local businesses and services and offering convenient local banking facilities for those businesses;
- Keeps a local food shop (or pub etc) going particularly in isolated rural areas with few other facilities or shops;
- Provides a community focal point, particularly in rural communities.

<sup>&</sup>lt;sup>76</sup> This generally involves the sale of stamps but may also include resetting of meters where this has not been replaced by electronic meter setting.

# 9.3. Constraints on Changing the Retail Network

Most postal operators face political, regulatory or administrative constraints on reducing the number of retail outlets, particularly in rural areas (where the financial viability of these post offices may be particularly questionable). The Belgian and French governments have recognised the social role post office networks play by entering into contracts with them specifying these roles. Some post offices have contracts with government or legal requirements which set out access criteria based on settlement size, average distance from post office or total number of post offices (e.g. Germany, Netherlands, the Czech Republic, Estonia, Lithuania and Poland). In some cases postal operators are required to provide post offices in each municipality (Belgium, Finland, Norway and Hungary) usually as part of the postal operator's USO. In Sweden, **Posten** have to provide a universal service for access to cash. There are also requirements for minimum opening times in Hungary, Malta, the Czech Republic and Slovenia.

Where governments wish to maintain uneconomic post offices for social policy reasons, they have provided direct financial support (Ireland, Sweden, Norway and Italy) or extensive tax relief (France). A number of countries have policy restrictions on post office closures – these range from moratoria (France and Ireland) to extensive and difficult consultation processes. Table 9.1 sets out the public service or accessibility requirements for retail networks in the different countries. While these vary significantly in the way they are expressed or formulated, they generally have the effect of severely restricting management flexibility to adjust the size of the network to changes in demand for their products.

Country	Regulatory Requirement
Belgium	The contract of Belgian Post with the Belgian Government establishes that each
	commune (county borough) must have a post office.
Czech Republic	The Czech regulator considers the closure of a post office on the basis of customer complaints.
	All residential districts must be no more than 2 km from the nearest post office.
Estonia	Post offices should serve a 5 km radius area in the country and 1.5 km in towns.
	24-30% of post offices must be sited in areas with a population of 200-500 people.
Finland	The Postal Service Act 2001 requires at least one post office in each municipality.
France	The contract between the French Government and La Poste requires:
	La Poste to consult on changes to the network with local authorities.
	10% of new offices to be located in deprived areas.
Germany	The Universal Service Ordinance 1999 requires <b>DPWN</b> to:
	Operate a post office in (a) every community of 2000 or more, and (b) those communities defined as "central locations" under regional planning regulations.
	Ensure that users in urban areas are within 2 kms of a post office.
	Ensure that there is one post office for every 80 square kms in each district.
Hungary	At least one outlet in each town (the outlet may be mobile in towns under 600 inhabitants).
	At least one outlet per 20,000 inhabitants and in a radius of 3 km.
Latvia	There are minimum accessibility requirements.
Lithuania	At least 944 post offices in the whole country.
	Changes in the postal network must be agreed with the regulator.
Luxembourg	2000 Postal Services Act requires the location of postal access points to be agreed with users and the regulator
Netherlands	In residential areas of more than 5,000 residents, there must be an office within 5 kms with a full range of USO services plus an additional office per 50,000 inhabitants.
	In residential areas of less than 5,000 residents, post offices should be provided where they are commercially viable or substitutes should be provided.
	In addition, 95% of the population should be within 5kms of a post office, and in rural areas 85 per cent of the population within 5kms.
Malta	Changes in the postal network must be agreed with the regulator.
Poland	At least 8,240 branches, distributed according to demand.
	Average coverage:
	• In urban areas, 7,000 inhabitants
	• In rural areas, 65 km <sup>2</sup> .
	At least one point of contact in each town exceeding 2,500 inhabitants. Those towns under 2,500 may be covered by the point of contact of a neighbouring town or by a mobile point of contact.

# Table 9.1Regulatory Requirements for Retail Networks

Country	Regulatory Requirement
Portugal	Post offices cannot be closed or opening hours reduced without prior approval by the regulator (in consultation with municipal authorities)
Slovakia	There are requirements on the maximum distance from any building to a post office in municipalities.
	Fewer post offices are required if they are accessible by public transport.
	There are differing requirements for "round" and for "long" municipalities.
	Provision must be ensured for 90% of the population.
Slovenia	Prior consent required from the regulator when closing post offices.
	At least one post office for every given number of households (the number depends on the town population).
Spain	<b>Correos</b> is required to guarantee the USO across the country through post offices and mobile offices but there are no formal requirements.
Sweden	There should be a post office in each municipality
United Kingdom	Across the country, 95% of the population should be within 5 kms of a post office; and in each postcode area, 95% of the population should be within 10 kms of a post office.

# 9.4. The Network of Retail Post Offices

Table 9.2 shows the number of post offices in the different countries. Across all the postal operators there has been a great deal of stability in the number of post offices, with four (Greece, the Netherlands, Latvia and Poland) showing increases and ten showing reductions over the last five years. Networks tend to have grown where the operator is able to move from directly owned post offices to franchises (Netherlands and Sweden).

Most postal operators have been remodelling their networks, usually by closing the smallest or least profitable offices and converting directly-owned post offices to franchises, but also by relocating or opening new urban offices to take account of changes in urban population and customer flows. Some operators have developed different formats of post office with different brand names each aimed at a different market (Austria, Denmark, Norway and Sweden).

Most networks have also been modernising their outlets and introducing improvements such as: removing security screens (France, Germany and Italy), improving disabled access (Italy), adding automatic stamp vending machines (France and Italy), queue management systems (Italy and Portugal), introducing new IT systems (Malta) or in larger 'flagship' offices putting in areas for private meetings – usually to discuss financial products or the needs of small businesses. A number have also been retraining staff to be more customer-focussed (Belgium and Italy) and increased the use of contract workers (Estonia).

The right hand column of Table 9.2 shows the number of post offices per square kilometre. This shows a wide range from less than 0.01 (Finland and Latvia), to much higher densities in Malta (0.161), the UK (0.071) and the Netherlands (0.058). This suggests that the costs of maintaining the retail network in the different countries is likely to vary due to the density of the network which may (because of the regulatory constraints on closing post offices) be difficult for the postal operator to directly manage.

Country	1998	1999	2000	2001	2002	2003	Post offices/ square km (2003)
Austria				2300	1699		0.020*
Belgium	1393	1393	1391	1352	1342	1328	0.040
Czech Republic	3409	3373	3374	3401	3407	3415	0.043
Estonia	605	604	578	555	554	553	0.012
Finland	1601	1555	1489	1410	1410	1410	0.004
France	17018	17080	17065	17125	17048	16965	0.012
Greece	1213	1604	1702	1957	2065	2194	0.017
Hungary	3232	3237	3240	3245	3254	3085	0.033
Ireland	1911	1913	1914	1783	1680	1509	0.021
Italy	13987	13980	13831	13860	13747	13748	0.046
Latvia	310	314	380	413	432	419	0.006
Lithuania	967	965	959	944	944	945	0.014
Luxembourg	106	106	108	108	108	108	0.038
Netherlands	2387	2361	2282	2313	2407	2431	0.058
Malta	51	51	51	51	51	51	0.161
Poland	7836	7887	8063	8222	8245	8304	0.027
Portugal	3727	3789	3795	3845	3848	3549	0.038
Slovakia	1624	1623	1626	1627	1626	1617	0.033
Slovenia	547	550	548	548	550	549	0.027
Spain	10515	10386	10183	10158	10101	10021	0.020
United Kingdom	18175	17795	17249	16995	16663		0.071*

# Table 9.2Number of Post Offices and Network Density

\* Data for 2002.

Source: NERA questionnaire, Eurostat.

#### 9.5. Changes in the Provision of Post Office Services

To reduce the costs of maintaining an extensive network of outlets, particularly in remote rural areas, a number of the universal service providers have franchised the operation of their retail services outlets often in association with existing businesses (village shops, banks etc) – in some countries such as the UK almost all (97 per cent) post office branches are franchised. Some universal service providers (Portugal, Hungary and Spain) have extended the role of mobile post offices that serve a number of different communities on different days, although others (Finland and France) are phasing them out. Some universal service

providers have extended the role of postmen to provide other services including cash provision (Belgium, France, Austria, Germany, Finland, Norway, Sweden, Portugal and Spain). In Italy in rural areas mail delivery is handled by the Post Office network rather than the mail delivery part of the postal operator.

Franchising offers postal operators a number of advantages with comparatively few disadvantages:

- It allows the potential to widen what would otherwise constitute a fairly narrow product line;
- It allows employees' time to be spread between postal and non-postal customers;
- Postal products attract customers who might then buy other products, particularly convenience items; and
- They are often open to the public for more hours or at more convenient times than traditional counters.

There has been a major move towards operating the retail network through a franchised retail network in Finland with over 1,100 out of 1,400 post offices currently franchised to third parties. The main reasons for this has been the reduced need for post office facilities, responding to changing customer preferences and cutting costs.

Franchising therefore reduces (and caps) the costs of providing retail postal services to the public and may make the costs more variable than self-operated counters. Table 9.3 shows the percentage of post offices that are operated directly by franchisees and third parties across the different operators. In Germany and Sweden, while franchises account for 52 and 43 per cent respectively of all outlets by number, they only account for 10 per cent of those post offices 'retail revenue (Haldi and Schmidt, 2002). In the UK, while only 3 per cent of post office branches are directly managed (as opposed to franchised), these account for 20 per cent of transactions.

Country	1998	1999	2000	2001	2002	2003
	(%)	(%)	(%)	(%)	(%)	(%)
Estonia	4	4	5	3	3	3
Finland				78	78	79
France	17	17	17	17	17	17
Greece	20	40	47	54	58	61
Germany		52				
Hungary	10	10	12	13	13	14
Ireland	95	95	95	95	94	94
Latvia	0	0	0	0	0	0
Lithuania	0	0	0	0	0	0
Luxembourg			3	3	3	3
Netherlands	94	94	94	90	87	86
Malta	41	41	41	39	39	39
Poland	6	11	17	23	26	28
Portugal	71	72	72	72	72	70
Slovakia	0	0	0	0	0	0
Slovenia	0	0	0	0	0	0
Sweden		43				
United Kingdom	97	97	97	97	97	

Table 9.3Percentage of Post Offices Run by Franchises/Third Parties

Source: NERA questionnaire, Haldi and Schmidt (2002).

#### Case Study: The UK Post Office Network

Post Office Ltd (POL) began operating as a separate company within the Royal Mail Group in October 2001. It is the largest retail network in Europe with 17,239 branches of which it directly manages 576, with the remainder being franchised out to subpostmasters. POL branches offer around 170 products and services including postage and distribution, personal and business banking, savings and investments, stakeholder pensions, money transfers, bill payments, passport applications, lottery tickets and benefit payments. The number of POL branches has been falling steadily over the last 20 years from 22,058 in 1983/84. In 2000/01, 13 per cent and in 2001/02 16 per cent of subpostmasters whose resignation led to branch closure gave as their prime reason financial viability (including bankruptcy).<sup>77</sup>

The key factor affecting Post Office Ltd has been the pressure on its profitability. In 2002/3, it made a loss of £195 million before exceptional items, compared to a £160 million loss in the previous year. In addition, from 2003/4, it will start to lose a revenue stream of over £400 million a year from processing payments of benefits and pensions, due to the switch to direct payment of these benefits, planned to be completed by March 2005 – this will also have an adverse impact on the working capital of the business. Part of this profitability problem was caused by POL taking over the liabilities associated with running their front office computer terminal system from the Government in 1999. This resulted in a one-off payment of £550m and substantial on-going maintenance costs (aggregate costs of around £1bn before the contract terminates in April 2005). This turned the retail business into a loss-making operation.

This problem of on-going losses was addressed by renegotiating the computer contract; rationalisation of the urban network, reducing overhead costs and implementing a strategic review. POL introduced a universal banking system in April 2003 with Post Office account cards, basic bank accounts and other new products. POL are also discussing with Government the future funding of the network (the Government have provided a £450 million funding package to support the rural network over the period 2003-6).

Rationalisation of the urban network is now underway with around 150 branch closures a month planned, and an aim to ensure a Post Office branch within one mile of 95 per cent of urban customers when the policy is complete. This has faced some local opposition and around 40 proposed closures have been delayed or withdrawn following public pressure.

In rural areas the aim is to maintain accessibility (over 60 per cent of villages have a post office branch compared to only 9 per cent that have a bank) and a Government rural assistance package of £450 million over 3 years has been launched to provide stability in the financing of rural branches and to prevent avoidable closures in rural areas<sup>78</sup> (which have slowed slightly as a result). POL is also looking into alternative ways of providing retail post office services – including new configurations of satellite services and delivery of post office services to peoples' homes by postmen, subpostmasters and other agents.

<sup>&</sup>lt;sup>77</sup> Source Consignia, quoted in *Post Offices, Customers and Communities*, Postcomm 2002

<sup>&</sup>lt;sup>78</sup> An avoidable closure is one where no-one suitable is prepared to take over from the departing subpostmaster, where no suitable premises remain available or can be identified or where an associated retail business is no longer commercially viable.

#### Case Study: Posten – The Swedish Retail Post Office Network

Posten is a PLC owned by the Swedish Government but operating in an entirely liberalised market. Sweden Post is not required to maintain a specific number of outlets, but has to maintain at least one branch in each municipality with the state paying compensation for branches that are not commercially justified. Overall Posten receives  $\notin$ 44 million per year to fulfil its universal service obligation (which includes the requirement to provide all citizens with the right to make and receive banking payments at uniform prices).

Posten is delivering its public service requirement to provide nationwide cashier service through a newly established and autonomous service network: Svensk Kassaservice (Swedish Cashier Service). This is a competition-neutral cashier service network that also acts on behalf of Sweden's major banks. Posten received SEK200m in 2001 and SEK400m in 2002 from the government to provide these services in rural areas.

Posten has undertaken a major change in the way in provides retail services. In 2001 there were 850 post offices and 520 postal agencies (in stores) together 256 agencies offering limited services. This has been changed to around 3,000 outlets made up of 400 directly owned Post Centres offering the full range of postal services, 1,800 letter and parcels service outlets in supermarkets and petrol stations and 1,000 letter service outlets in convenience stores, petrol stations, airports and hospitals.

Posten are planning to completely phase out the retail network and provide these services through convenience stores, gas stations and supermarkets. The aim is to enhance customer convenience through closer proximity and substantially longer business hours. Posten will no longer be a venue for conducting postal transactions, or a company tasked with the handling of physical mail, but rather a service company with a comprehensive range of services - physical and electronic - within the messaging and logistics area.

#### Case Study: TPG Post - The Dutch Retail Post Office Network

Following the sale of Postbank NV to ING in 1989 (see Section 9.7) and the privatisation of 55 per cent of PTT, the retail post office network in the Netherlands is effectively privatised and is operated at a profit.

TPG Post is increasingly franchised or third party operated – it operates 985 venue points for all postal products and banking, of these 350 are post offices and the rest (postal agents) are operated by shop-keepers. TPG Post also has 950 service points, which are venue points for the most important postal products (stamps, registered mail, parcels) operated by shop-keepers and retail-chains. There are 205 Business Points, wholly owned by TPG Post, for business customers (bulk mail, P.O.Boxes etc). In addition about 6000 shops sell TPG Post stamps. There is a requirement on all branches to have a minimum number of transactions each year to justify their existence - this is due to change to a minimum postal revenue figure in the near future.

The plans for the future include further remodelling of the network with increased differentiation of service level and more branches in shopping centres. This will see a move from 1,676 full service and 538 limited service branches in 2001 to 800 full service offices, 1,300 limited service offices and 1,000 service points by 2005, which would increase the total number of outlets from 2,414 to 3,100.

# 9.6. Non-Postal Services Provided by Retail Post Offices

Even where it is not franchised, as well as providing access to postal services and selling stamps and other postal products, retail post offices also sell other non-postal products and services as shown in Table 9.4. This takes advantage of the economies of scope in retail provision and offers a contribution to the fixed costs of maintaining the retail network, which would generally not be covered by postal products alone. In terms of value, the largest set of non-postal products offered are financial and banking services, indeed many postal operators have sold their postal bank to other financial institutions for substantial sums as described in Section 9.7.

In Italy **Poste Italiane** have recently made a massive move into offering banking and financial services through their retail network in order to cross-subsidize the loss making postal services. As a result, Banco Posta has been a large success and has moved the whole postal group from large losses to small profits.

Country	Non-Postal Services provided through the Retail Network
Austria Belgium	Paper, stationary, giftware, mobile phones, greetings cards, phone cards Financial services: both government contract products and commercial products (daily banking, saving, investment, credit, insurance), fishing permits, lottery tickets, stationary items
Czech Republic	Financial services, banking, lottery, betting, telecommunication services, insurance, pension payments, fax services.
Denmark	Greetings cards, packaging materials, office supplies, mobile phones, phone cards, theatre and other tickets
Estonia	Lottery tickets, phone cards, stationary, public transport tickets, sweets, soft drinks, etc.
Finland	Packaging materials, envelopes, postcards, preliminary voting in parliamentary elections
France Germany	Financial services, telephone cards, photocopies, fax, internet access, SNCF tickets etc. Financial services, pay TV, stationary, motorway access stickers
Greece	Greeting cards, UNICEF cards, telephony products and services (fixed & mobile), financial services, etc
Hungary	Commercial products, financial services including saving and securities, insurance, mobile phones, cards and accessories.
Ireland	Social Welfare payments, National Savings, bill payments for third party utilities, agency banking, TV Licences, stationary, mobile phone credit top ups.
Italy	Financial services, banking, internet access
Latvia	Financial, retail services, utility services, periodicals
Lithuania	Payments for utility services, fixed and mobile phone services, cable TV, insurances, cash withdrawal, facsimile services, magazines and newspapers, mobile phone cards, payphone cards.
Malta	Money transfers, bill payments, postal order and stationery
Luxembourg	Financial services, telephony
Netherlands	Banking, car registration/issuing permits and the sale of diverse products including mobile phones, stationary, theatre tickets.
Poland	Financial services, insurance services and retail goods.
Portugal	Financial services (postal money orders, postal collections, funds transfer, payments for social security contributions, payment of taxes, saving and insurance products); phone services; phone cards; telegrams; fax services; internet; photocopies, etc.
Slovenia	Financial services, retail sale, lottery ticket sale, mobile telephones, bus tickets, receipt of orders for the sale of shares
Slovakia	Lottery, mobile cards, newspapers, magazines, payment of telephone bills, payments of social benefits.
Spain UK	Financial services (checks, money orders, banking), telecommunications products, etc. Banking, bill payment, investments, insurance and personal loans, travel insurance, foreign currency, licenses for motor vehicles, driving, TV and fishing, home phone services, phonecards, mobile top-ups, pensions and benefit payments.

#### Table 9.4

#### Use of Retail Network for the Provision of Non-Postal Services

Source: NERA questionnaire, Postcomm report Post Office Networks Abroad (Postcomm, 2003).

# 9.7. Selling Postal Banks

A number of operators across Europe have sold, or are in the process of selling their retail postal banks to financial institutions. oThe large customer base and strong position in payments and transactions processing of postal banks offers strong synergies with the retail banking section of private banks and this allows the post office (or the state as shareholder) to release the capital tied up in the banking function and offers the banks access to a large network of post office branches which would be prohibitively expensive to duplicate.

- The **Dutch Postbank** was sold to ING Group in 1989. **TPG** and **ING** now run the retail network as a 50/50 joint venture.
- In July 1990 the **British Post Office** sold Girobank (their banking and transactions payments operation) to the Alliance and Leicester (a financial institution) for £112 million. Girobank services are now operated by A&L through the post office network and their own network. However this is not an exclusive arrangement and there are agreements with 17 banks and building societies to allow their customers to access their current accounts at post office branches.
- In 1991 Caja Postal de Ahorros, the postal bank owned by **Correos**, was integrated with the different state-owned banks in a newly formed society named Argentaria. Correos and Caja Postal continued to collaborate and provide financial services in Correos' offices. Correos sold the operation of financial services in their postal premises to Deutsche Bank in a public tender in 1999. Under this agreement, **Correos** act as a financial agent of Deutsche Bank and markets the financial products of the German bank. In 2000, Banco Bilbao Vizcaya acquired Argentaria.
- In August 1998, 78 per cent of the Bulgarian PostBank was sold to the American Life Insurance Company (ALICO) and Greek Consolidated Euro-Finance Holdings for \$38 million with a number of state-owned institutions holding the remaining shares.<sup>79</sup>
- **Posten** sold the Postgirot Bank AB, its banking operation to Nordea, one of Scandinavia's largest banks, in 2001.
- In June 2004 **Deutsche Post** launched a one billion euro convertible bond offering. The bonds are exchangeable into shares of Deutsche Postbank AG.<sup>80</sup>

<sup>&</sup>lt;sup>79</sup> Bulgarian Telecommunications Company (5 per cent), Bulgarian Posts (5 per cent), State Insurance Institute (5 per cent), State Savings Bank (5 per cent) and National Palace of Culture (2 per cent).

<sup>&</sup>lt;sup>80</sup> *Wall Street Journal Europe*, 28 June 2004.

# 9.8. The Cost of the Retail Post Office Network

The responses to our questionnaire did not provide information about the costs of maintaining a post office. However Table 9.5 gives an indication of the costs of establishing a post office franchise in the UK. It shows that these costs can vary from around £120,000 to £314,000 depending on the size of the office. In addition, the cost of buying the business depends on the turnover and whether it includes living accommodation, and ranges from £14,000 to £400,000 but is generally around £70,000 to £90,000.

Canital itoms	5 Positions	12 Positions
	5 rositions	12 1 051(10115
Equipment costs	34,550	63,250
Shopfitting (dependent on type and size	15,000	75,000
of premises)		
Franchise fees (based on £98k-£200k	24,500	50,000
remuneration)		
Security costs	25,000	60,000
Total capital items	99,050	248,250
Other items		
Advertising and promotions	1,000	5,000
Retail opening stock	10,300	45,000
Pre-opening staff costs	3,750	9,000
Professional fees	5,000	5,000
Telephone	750	750
Water/gas/electricity	750	750
Total other Items	21,550	65,550
Total establishment costs	120,600	313,750

# Table 9.5Estimated Costs of Establishing a Post Office Franchise (£)

Note: This exclude an allowance for rent deposit, purchase of a business including goodwill, building and renovation costs.

Source: Post Office Limited.

# 9.9. Conclusions

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.

To reduce the costs of operating the retail network many operators are restructuring it (subject to regulatory constraints), and have franchised some or most of the local post offices. They have also expanded the range of products offered by their outlets to include a wide range of postal, government, financial and commercial transactions.

In all three case studies of the retail networks in the UK, Sweden and the Netherlands, the operator was currently, or was planning major changes to the provision of retail services

through rationalisation, remodelling or restructuring of the network to try to manage the costs of the physical outlets while maintaining accessibility to rural communities. An interesting development is that **Posten** in Sweden are planning to phase out their entire retail network and provide postal services through convenience stores, supermarkets and gas stations.

Many of the operators are facing similar consumer trends towards electronic and telephone substitution for the services traditionally provided by the retail network and are finding it difficult to respond to these trends, particularly when subject to constraints on changes to the physical network. In many cases, profitable parts of the business (particularly banking and financial services) are being carved out and sold off to private companies.

# 10. CONCLUSIONS: THE ECONOMICS OF POSTAL SERVICES

# 10.1. Introduction

This final chapter of the report provides our key conclusions on the economics of postal services and the implications for the dynamic development of the sector.

In this study we have undertaken a detailed assessment of the evidence on costs in the sector, and have provided an assessment of the impact of different cost drivers. This assessment of the impact of different cost drivers has been based both on a literature review of previous cost studies, and on our own econometric analysis of the data which we have collected from operators and from published sources. We have complemented this with a review of business strategies across the sector to assess the impact of developing strategies on the economics of postal services. Our study has also included a separate review of the economics of retail networks.

For the first time, the study brings together information from different European countries to provide a picture of postal costs across Member States of the European Union. But as well as providing a picture of the present state of knowledge of costs, the study also shows how the present state of knowledge is incomplete.

In this final chapter we:

- review the aims of the study as set out in our Terms of Reference and explain how this report has been structured to meet those aims;
- summarise evidence on postal costs at both the level of overall activity and for different components of the value chain (collection, sorting, transport and delivery). We concentrate in particular on:
  - evidence on economies of scale, economies of density and economies of scope;
  - evidence on costs of the different components of the value chain; and
  - evidence on the different factors (labour, capital and materials) used to provide postal services.
- assess the impacts of cost levels and structures on the future development of competition in the industry. We consider whether the characteristics of costs in the sector impose barriers to entry. We also consider the implications of the evidence on economies of scale, density and scope for development of competition in different business sectors (letters, parcels, express) and in different postal activities (collection, sorting, transport, delivery).
- consider the future role of retail networks; and

• finally, in Section 10.6 we conclude the report by considering its implications for the strategic/dynamic direction of the industry.

### 10.2. The Aims of the Study

As we indicated in our initial chapter, the aim of this study was to provide for a fuller shared understanding of the economics of postal services, in particular of the scale and nature of the costs inherent in postal provision and about the different ways postal operators have developed their business organisation and strategy.

This fuller understanding and greater transparency was intended to provide an essential analytical underpinning for the further development of Community policy in this area, prior to further steps towards the full accomplishment of the internal market or any other appropriate step.

Chapters 1 and 2 explained, respectively, our brief and our approach. Chapter 3 'sets the scene' by reviewing the way in which postal services are provided in different Member States according to the traditional 'value chain' in postal service provision. Largely on the basis of responses to our questionnaire, the chapter also shows how postal service has been changing, and how operators expect it to change in the future. Chapter 4 takes the theme of change further, by reviewing how postal operators have been developing their business strategies, reacting to the changing business environment, and developing strategies that increasingly involve market diversification, internationalisation and, in some cases, privatisation. We show that various aspects of these developing strategies will impact on the economics of postal services, in particular in regard to costs. This is a theme to which we return at the end of the present chapter in regard to the structure of costs in the postal sector and its implications for the future development of the industry.

Chapters 5 to 8 consider in detail the nature and scale of postal costs, the breakdown into different components and value inputs and the way costs vary with changes in output (scale, scope and density). We review our detailed findings from our own cross-country econometric work, and from the work of others, in Section 10.3 below.

Information about cost levels and structure is of value in itself, but of greater interest is the implications that it has for the development of the sector. In Sections 10.4 and 10.6 we provide, as a contribution to the ongoing debate on the liberalisation of postal services, NERA's own views on the implications of the cost evidence that we have presented for the further development of the industry.

# **10.3.** The Evidence on Costs in the Postal Sector

#### 10.3.1. Economies of scale, density and scope

We have already indicated in this report that, in order to interpret evidence on costs in the postal sector, it is important to appreciate the difference between economies of scale, economies of density and economies of scope. The distinction between economies of scale and economies of density is an important one to make in network industries. As we explained in Section 6.2:

- Economies of scale relate to what happens to unit costs when traffic and size of network increase in the same proportion;
- Economies of density relate to what happens to unit costs when traffic increases on a fixed network; and
- Economies of scope relate to what happens to unit costs when a single firm produces two or more different types of output (eg letters and parcels).

#### 10.3.2. Overall postal cost levels

Our main conclusion with regard to total postal cost levels is that there are broadly constant returns to scale, but significant economies of network density. But where traffic volumes per head of the population are low, there are increasing returns to scale as well as economies of density.

The position with regard to economies of scope is harder to determine – in some circumstances there are some economies but in others there are diseconomies.

The evidence from our own econometric work is of constant <u>returns to scale</u>. The value of economies of scale (which is defined as the <u>inverse</u> of the elasticity of total costs with respect to output<sup>81</sup>) for the original 15 EU Member States estimated at the sample mean is 1.03, and we cannot reject the hypothesis that there are constant returns to scale when both mail volume and network size increase. This evidence of constant returns to scale is consistent with that from previous econometric studies. For the new Member States our estimate of economies of scale is 1.14. The statistical evidence rejects the hypothesis that costs display constant returns to scale.

The evidence from our econometric work is of <u>economies of density</u>. When traffic increases on a fixed postal network unit costs fall. In the original 15 Member States total costs would increase by 6.5 per cent if traffic on a fixed network were to increase by 10 per cent, while in the new Member States total costs would increase by 5.6 per cent if traffic on a fixed network

<sup>&</sup>lt;sup>81</sup> See Section 8.3, footnote 60.

were to increase by 10 per cent. The existence of economies of density is not inconsistent with evidence from the United States, where Christensen and his colleagues (1993) found evidence of economies of density for the United States Postal Service.

The data available for our econometric work has not allowed us to study the existence of <u>economies of scope</u>. But our conclusions from analysing the sharing of facilities between letters, parcels and express services are as follows:

- there are some economies of scope between the <u>non-delivery</u> elements of express, parcels and letters network;
- there are only economies of scope in <u>delivery</u> for letter and parcels at low mail volumes;
- at higher mail volumes, the advantages that having separate delivery networks for letters, parcels and express outweigh these economies of scope;
- there may also in some cases be economies of scope between parcels and express services, as shown for example by the successful integration of the parcels business of **Deutsche Post World Net** into DHL; and
- there are considerable economies of scope between different mail products, for example priority/non-priority, but also business/consumer mail. This issue is explored further in Section 10.4.4.

We have also considered the impact of <u>demographic factors</u> on unit costs of postal service provision. We were able to consider two variables, overall population density, and the proportion of the population living in urban areas. Of these, the proportion of the population living in urban areas provided the better fit. We found that in both the original EU Member States and the new Member States a 10 per cent increase in the percentage of the population living urban areas would reduce total costs by 6.7 per cent.

#### 10.3.3. Postal costs by activity level

We next discuss the results of our cost analysis of individual postal activities. However, we note that due to the quality of the disaggregated data, these detailed results need to be interpreted with care.

#### 10.3.3.1. Collection costs

On average collection costs account for <u>12 per cent</u> of total letter mail costs.

We find that holding constant the number of post boxes, a 10 per cent increase in traffic volume would increase collection costs by 6.8 per cent in the 15 original EU Member States and by 4.8 per cent in new Member States. This indicates economies of density in collection.

We find constant returns to scale in collection for original Member States, but increasing returns for new Member States. We also find that an increase in the percentage of the population living in urban area is associated with a reduction in collection costs.

However, although we do not have direct evidence, we would expect that the economies of collection differ between collection from post boxes, and bulk collection from mailers' premises.

### 10.3.3.2. Sorting costs

On average sorting costs account for <u>16 per cent</u> of total letter mail costs.

Previous work in both the United States and France has found evidence of broadly constant returns to scale in sorting (reported in NERA, 1998, pp.47-48). The evidence of constant returns is confirmed indirectly by the existence of private pre-sort companies.

As in other activities, we find significant economies of density in sorting. But contrary to previous evidence, we find increasing returns to scale in the sorting activity, with a returns to scale parameter of 1.18 in original Member States and of 1.33 in new Member States. It may be that this is related to the increased level of automation in sorting, as well as the concentration of sorting activity in a limited number of large-scale automated sorting centres. Indeed, a 10 per cent increase in the number of sorting centres, holding volumes constant, would result in a 2.9 per cent reduction in sorting costs.

We have not been able to find evidence on the impact of automation on the level of sorting costs.

#### 10.3.3.3. Transport costs

Our econometric results suggest that transport costs, which on average account for <u>7 per</u> <u>cent</u> of letter mail costs, are characterised by economies of density as well as returns to scale. The returns to scale coefficient is 1.28 for original Member States and 1.45 for new Member States.

Although one might not expect the existence of economies of scale in the transport network, earlier evidence suggests that there may be evidence of economies of scale in short distance transportation. It may be that the increased scale at such distances enables the network to be organised more efficiently.

#### 10.3.3.4. Delivery costs

Delivery costs are by far the largest component of letter mail costs, on average accounting for about <u>50 per cent</u> of total costs.

As in the case of all other postal activities, delivery is characterised by substantial economies of density, which explains why setting up a network provides an important competitive advantage. On the basis of our estimates, a 10 per cent increase in volume, keeping constant the size of the network, leads to a cost increase of 6.4 per cent in original Member States and 5.8 per cent in new Member States.

We have found no evidence of returns to scale in delivery, with a coefficient for original Member States of 1.06. For new Member States, our estimated value is however 1.6, implying significant returns to scale.

We have also tried to estimate the impact of the average number of deliveries per week, and of geographical characteristics, on delivery costs but have been unable to find any statistically significant evidence.

#### 10.3.4. Labour, capital and other inputs

This report has confirmed the well-known characteristic of postal operations that they are labour-intensive. But we have also been able to document the way that labour-intensity varies between different universal service providers, and to see how labour costs are split between wages/salaries, social security payments and pension costs in a number of different countries. We have also shown how the proportion of costs accounted for by depreciation provisions (always less than ten per cent of total costs) varies between operators.

We have also been able to consider how total costs will be affected by average labour costs. Our estimate of the elasticity of cost with respect to the average wage across all operators is 0.63, which implies that a 10 per cent increase in the average wage will increase total costs by 6.3 per cent. We note that this estimate is based on the assumption that postal operators act to minimise the costs of any given output produced, which in turn would follow if they were profit maximisers, though we have not been able to test these propositions directly.

#### 10.3.5. Efficiency in the provision of postal services

Another factor affecting postal costs will be the efficiency with which postal operators (both public and private) combine inputs – labour, capital and materials – to produce outputs. We might expect operators to differ in the efficiency with which they do this. Studies which benchmark the efficiency of different organisations, or of individual organisations over time, are becoming increasingly widely-used in many sectors of the economy, both as a means to determine the performance of regulated firms (in particular in regard to price caps) and to assess the success of different models of ownership or liberalisation. However, one essential pre-requisite for successful cross-country benchmarking of this type is good <u>comparable</u> international data and our present study has demonstrated the limited availability of this within Europe. Other forms of benchmarking may be more appropriate in the postal sector, including "top-down" comparisons of performance of individual operators over time, and a "bottom-up" approach in which particular aspects of performance (such as productivity of

sorting centres) are compared between operators, or in different parts of the same organisation, or over time in a particular organisation.

# **10.4.** Implications for the Development of Competition

#### 10.4.1. Introduction

Next we consider the implications of cost levels and structures for the development of competition in the postal sector.

First, in Section 10.4.2, we discuss the existence of barriers to entry in the postal industry. In Section 10.4.3, we then discuss the scope for competition in each of the main elements of the postal value chain. Finally, in Section 10.4.4, we examine the potential for competition in postal services as a whole.

#### 10.4.2. Barriers to entry

While there is no universally agreed definition of barriers to entry, they refer in general to disadvantages (such as higher costs, difficulties accessing key inputs, etc) that affect potential entrants but not incumbents, and that might prevent entry from occurring in cases where incumbent firms are earning excess (that is, super-normal) profits. In contrast, cost disadvantages that arise because incumbent firms are more efficient that potential entrants are not classed as barriers to entry. Barriers to entry may not prevent entry altogether, but may restrict it.

So-called *sunk costs,* costs associated with entry that cannot be recovered when the firm is forced to exit, can be an important entry barrier. If entrants know that entry will entail some sunk costs, they will only enter if they expect to make sufficient profits so that they can recover these costs. Potential entrants will base this decision on expected price levels and market shares *once they have entered the market,* rather than current price levels charged by the incumbent. For example, potential entrants will consider whether incumbent firms are likely to reduce their prices once they have entered the market.

While sunk costs are a significant feature of many network industries (railways, electricity and gas distribution, water supply, telecoms) they are not prevalent in all networks (eg airlines). The postal industry is a network industry but the main features of the network (local delivery, and road transport) do not impose significant sunk costs.

Indeed sunk costs are low for small scale postal operations, which can involve manual sorting. This is illustrated by the situation in Germany, where there have been a large number of local entrants into the market. In March 2004, a total of 1,566 licences had been issued by the German postal regulator. Although 499 of these firms have already left the market, this still leaves a total of 1,067 licensed postal operators in Germany.

However, if automated sorting is required then there can be higher sunk costs, since expensive machines will need to be bought and a network of sorting centres established. It may be possible to recover much of the cost of small sorting machines upon exit but we believe that the construction of large scale sorting centres such as those in use at universal service providers could involve high sunk costs.

We therefore conclude that barriers to entry are low for small scale postal operations. However they increase once the scale of operation becomes larger and become very high for a postal network with universal coverage involving large-scale automated sorting centres.

#### 10.4.3. Scope for competition in individual postal activities

#### 10.4.3.1. Collection

In a number of countries, significant competition is already emerging in the value chain. Specialised mailing houses collect mail from business customers' premises and consolidate it. If the mail is transmitted to the sorting centre electronically, and printed on the premises of the mailing house, physical collection before the sorting stage can even be eliminated completely.

Competition is less likely to emerge on a large scale as far as collection from post boxes is concerned. While it would theoretically be possible to replicate a post box network, or to collect mail via third parties such as supermarkets or convenience stores, the market for consumer mail is as we will explain below in general insufficiently attractive for competitors. But some competition could emerge on a smaller scale. For example, in Germany, the company **PIN AG** has a network of its own shops from which it collects mail from residential senders and small business for delivery in the local area.

#### 10.4.3.2. Transport

As in collection, competition in transport is already emerging in the form of mailing houses and competing private operators. The sunk costs of mail transport are low since the vehicles can easily be redeployed for other purposes. In view of this, we do not believe that there are any significant impediments to competition in mail transport – indeed it is already an area where there is outsourcing, which indicates that external firms can undertake the activity profitably.

#### 10.4.3.3. Sorting

Sorting is another traditional area for work-sharing, since mailing houses which collate mail from different mailers can generate sufficient volumes to compete with the universal service provider. The mailing house also does not need a linked network of sorting centres.

Manual sorting or sorting using small-scale sorting machines does not involve significant sunk costs and competition is feasible there. Many competing private operators, for example in Germany, sort their mail manually or using small machines.

However, as noted above, sorting on the scale of a universal service requires significant investment in large-scale automated sorting centres.

# 10.4.3.4. Delivery

The existence of significant economies of density in distribution means that competition at a national level, by replicating the universal service provider's delivery network, is difficult. In countries where population densities and/or mail volumes per capita are low, it may be necessary to grant competitors access to the delivery network of the universal service provider to ensure competition develops. This is the approach taken in the UK.

However, duplicating delivery networks is not impossible. In The Netherlands, where both population density and mail volumes per capita are high, there are now two national distribution networks with universal coverage in addition to that of TPG. But they only provide twice a week delivery and for delivery five days a week to be viable they would need significant growth in traffic volumes.

In most other countries parcels operators already have basic delivery networks, while document exchanges also have limited delivery networks. However, these two types of network (and the prices that are charged for the services provided) are set up so that it is economic to deliver single items to individual addresses without needing to build up the volumes that are necessary to compete in letter delivery networks.

# 10.4.4. Scope for competition in postal services

On the basis of our analysis in the previous sector, <u>but provided access to delivery networks</u> <u>is granted where necessary</u>, we believe that the scope for competition in postal services is substantial.

In particular, we believe that a large part of the business mail market is potentially open to competition. Business mail often involves large volumes and mass mailings are often presorted. In addition, many types of bulk business mailings – such as direct mail - can be prepared in advance and are not sensitive to transit times (although they often <u>are</u> very sensitive to the expected delivery day). All these features contribute to business mail being attractive to competing operators.

The market for consumer-to-consumer mail, particularly where this is time-sensitive, is considerably less open to competition. This market is characterised by relatively dispersed volumes of traffic across the network, and requires, for a network with national coverage able to compete with the universal service provider, a number of large-scale automated sorting centres. The construction of such centres involves high sunk costs. In combination with the low volumes to each address, which increase delivery costs per item, we do not envisage that entrants will actively compete for this type of consumer mail, except on a small scale (e.g. local mail within large cities). This market will to a large extent continue to be served by the universal service provider.

It is also important to note that universal service providers enjoy considerable advantages from being the sole provider of consumer mail services. The reason for this is that, once the national infrastructure for consumer mail is in place, the universal service provider benefits from substantial economies of scope with business mail. The incremental cost for the universal service provider of carrying business mail is low, allowing the universal service provider to compete vigorously with new entrants. In other words: the average costs for new entrants of carrying business mail will normally be lower than that for the universal service provider but their incremental costs will often be higher.

It is for this reason that we expect entrants' volumes to remain relatively limited and that they will only be able to achieve small but significant market shares. They will however be able to operate profitably at these volumes since they do enjoy advantages in certain market segments (notably non-time sensitive bulk mail).

However, to protect its market share, the universal service provider will need to respond to the products and service level offered by competitors. It will in many cases be necessary to adjust price levels or to improve service quality in order to be competitive.

# 10.5. The Role of Retail Networks

In the traditional model of postal service provision the local retail post office was an integral part of the postal network. The post office building would include a front office with counters where people come to buy stamps, and to hand over mail that needed to be weighed or registered. But there would also be a back office where mail was sorted and where the local delivery workers were based. Mail posted in the local area for local delivery would be postmarked and handed straight to the delivery workers.

This traditional model has changed with the move to automated sorting, which requires concentration of mail in large sorting centres. The link between the retail office and the process of collecting, sorting and delivery mail became much weaker.

Commercial pressures also meant that the economies of retail offices came under more careful scrutiny. Traffic volumes in individual offices might be low, while stamps can be sold from machines or a wide variety of types of retail outlet. Even where post offices provided other types of government services, such as sale of drivers' licences or payment of pensions, costs per transaction could be high.

So governments and universal service providers have sought other solutions, which are reviewed in Chapter 9. These have included the use of franchising (a form of outsourcing) and sale of the banking services offered by the retail network to financial institutions. In Sweden, the universal service provider is withdrawing from post offices altogether, transferring all postal services to convenience stores, gas stations and supermarkets.

# 10.6. The Dynamic Development of the Industry

#### 10.6.1. Current trends

In recent years, the postal industry has been characterised by a number of important strategic trends. These include:

- vertical integration into logistics and document management activities;
- horizontal integration into express activities; and
- the internationalisation of the industry.

We believe that these trends are largely driven by demand factors. Customers are increasingly demanding a one-stop-shop service and postal operators that are able to offer such a service will develop a competitive advantage over other operators that are not.

However, some of the trends are also driven by other factors. "Economies of skill", which can be used by efficient postal operators to help turn around the business of less efficient operators, may be an additional factor driving the internationalisation of the industry. And the horizontal integration of postal operators into express services may be partly explained by economies of scope between parcels and express.

#### 10.6.2. Possible long-term dynamic direction of the industry

#### 10.6.2.1. Introduction

Based on existing trends in the industry and the underlying economics of the sector, it is possible to infer what the structure of the industry might look like in the long term. In this section, we present a picture of what we believe might be the potential long-term direction of the industry.

The long-term picture is based on the following potential future developments:

- a continuing important role for the universal service provider in all countries;
- development of competition for, in particular, business mail in all countries, with competitors achieving small but significant market shares;

- a consolidation of the most important players in the industry into a number of large groups;
- a need for those groups to offer a one-stop-shop and therefore to have a presence in as many countries as possible; and
- increased separation between mails services and retail services.

We briefly discuss each of these factors in turn, and then present the potential long-term industry structure.

#### 10.6.2.2. Future role of universal service providers

As we have seen in Section 10.4 above, the universal service provider will be in a unique position even in a liberalised market. The presence of an extensive infrastructure to handle the most difficult type of mail (time-sensitive consumer mail) implies that the universal service provider is well placed to compete for other types of mail too. In addition, the universal service provider will benefit from an established brand name.

Because of these factors, we believe that universal service providers will be able to continue to command high market shares even in a fully liberalised market. This is indeed what can be observed in countries such as New Zealand and Sweden where full liberalisation has taken place.

#### 10.6.2.3. Development of competition

Competition between operators is developing in a number of countries. This applies in particular to countries such as Sweden, Germany, the Netherlands and the United Kingdom where part or all of the market has been liberalised, though signs of competition are also emerging in some other countries.

As noted in Section 10.4 above, competitors are well placed to compete for particular types of mail, in particular business mail. Given the importance of business mail, this means that a significant part of the market is potentially open to competition. However, due to advantages from economies of scope with consumer mail that the universal service provider enjoys, it is well placed to compete for most business mail too. Consequently, we expect that the market shares that competitors will be able to achieve will be relatively small, but nevertheless significant (and sufficient for them to be able to operate profitably).

#### 10.6.2.4. Consolidation of industry

The current internationalisation of the industry, primarily driven by demand synergies, may in the future lead to consolidation. "Economies of skill" could be a factor favouring structural links between operators. Initially, these links are likely to be in the form of alliances but eventually they could lead to mergers between operators. Mergers and alliances would be subject to competition rules. However, while many operators in the industry would eventually be part of this consolidation trend, we would expect a number of them to remain independent even in the long term.

#### 10.6.2.5. Need for one-stop-shop and presence in as many countries as possible

Due to the continuing trend towards globalisation of the economy, the most important customers of postal operators will increasingly be organised at a supranational level. This will create opportunities for postal operators with a presence at an international level. In view of this, we believe that the main international postal operators will aim to achieve a presence in as many countries as possible.

**Deutsche Post World Net**, for example, already considers that it possesses a "global network and [is] well positioned in all markets with growth potential throughout North America, Europe and Asia." <sup>82</sup>

#### 10.6.2.6. Potential long-term industry structure

In section 10.6.2.1, we have discussed the main potential future developments that we believe drive future industry structure. In NERA's view, these factors point to an industry structure where:

- <u>in any given country</u>, there will be:
  - a universal service provider with a large market share, as well as a number of competitors (the most significant of which will be controlled by international groups) with small but significant market shares;
  - a presence by a number of major international postal operators; and
  - structural separation between mails services and retail services.
- <u>each major international postal operator</u> will
  - have a presence in all of the main countries, either by controlling the universal service provider or a significant competitor; and
  - consist of a number of operating units, some of which are universal service provider in particular countries, others are competing operators in other countries.

<sup>&</sup>lt;sup>82</sup> Deutsche Post World Net Annual Report 2003, p31.
It is worth pointing out that while we believe this structure is the logical outcome of current trends and the underlying economics of postal services, it may be quite a long time before it actually materialises. National and political considerations could also result in particular developments being delayed or even failing to materialise.

## REFERENCES

Baron, D.M., and Bradley, M.D. (1993) "Measuring performance in a multiproduct firm: an application to the U.S. Postal Service", *Operations Research*, May-June 1993, vol. 41, no 3, 450-58.

Bernard, S., Cohen, R., Robinson, M., Roy, B., Toledano, J., Waller, J., Xenakis, S. (2002) "Delivery cost heterogeneity and vulnerability to entry". Published in *Postal and Delivery Services, Delivering on Competition;* edited by M.A. Crew and P.R. Kleindorfer, Kluwer Academic Publishers, 2002.

Bradley, M.D., and Colvin, J. (1994) "An econometric model of postal delivery" in *Commercialization of Postal and Delivery Services: National and International Perspectives*, edited by M.A. Crew and P.R. Kleindorfer, Kluwer Academic Publishers, 1994: 137-53.

Caves, D.W., Christensen, L.R., and Tretheway, M.W. (1984) "Economies of density versus economies of scale: why trunk and local service airline costs differ" *RAND Journal of Economics*, Winter, 15.

Cazals, C., Duchemin, P., Florens, J., Roy, B., and Vialaneix, O. (2001a) "An econometric study of cost elasticity in the activities of post office counters". Published in *Postal and Delivery Services: Pricing, Productivity, Regulation and Strategy*, edited by M.A. Crew and P.R. Kleindorfer, Kluwer Academic Publishers, 2001, 161-71.

Cazals C., Florens J., and Roy, B. (2001b) "An analysis of some specific cost drivers in the delivery activity". Published in *Future Directions in Postal Reform*, edited by M.A. Crew and P.R. Kleindorfer, Kluwer Academic Publishers, 2001.

Cazals, C., Rycke, M., Florens, J.P., and Rouzaud, S. (1997) "Scale economies and natural monopoly in the postal delivery: comparison between parametric and non parametric specifications". Published in *Managing Change in the Postal and Delivery Industries*, edited by M.A. Crew and P.R. Kleindorfer, Kluwer Academic Publishers, 1997, 65-80.

Christensen, D., Christensen, L., Guy, C., and O'Hara, D. (1993) "US postal service productivity: measurement and performance". Published in *The Regulation and the Nature of Postal and Delivery Services*, edited by M.A. Crew and Kleindorfer. Boston, Kluwer Academic Publishers, 1993, 237-60.

Cohen, R. H., and Edward H. Chu. (1997) "A measure of scale economies for postal systems." Published in *Managing Change in the Postal and Delivery Industries*, edited by Michael A. Crew and Paul R. Kleindorfer. Boston, MA: Kluwer Academic Publishers, 1997.

Cohen, R., Pace, C., Robinson, M., Scarfiglieri, G., Scocchera, R., Visco Comandini, V., Waller, J., Xenakis, S. (2002) "A comparison of the burden of universal service in Italy and

the United States", in Crew, M A., and Kleindorfer, P R Postal and Delivery Services: Pricing, *Productivity, Regulation and Strategy*, 2002.

Cohen R., Pace, C., Rato, A., Robinson, M., Santos R., Scarfiglieri, G., Comandini, V., Waller J., Xenakis, S. (2003) "Towards a General Postal Service Cost Function". Available in <u>http://www.prc.gov/tsp/103/Cost\_Function.pdf</u> (Accessed 27 January 2003).

Doganis, Rigas and Associates, The Aviation and Travel Consultancy Ltd, and York Consulting Ltd (1999) *The Importance and Impact of the Express Industry in Europe: a Report for the EEA*, October.

Gazzei, D.S., Pace, C., and Scarfinglieri, G. (2002) "On the output elasticity of the activities of post office counters in Italy". ,Published in *Postal and Delivery Services: Delivering on Competition*; edited by M.A. Crew and P.R. Kleindorfer, Kluwer Academic Publishers, 2002.

Haldi, J., and Schmidt, J.T. (2002) "Controlling postal retail transaction costs and improving customer access to postal products" in Crew, M A., and Kleindorfer, P. R. *Current Directions in Postal Reform*, 2002, pp.395-412.

Mizutani, F., and Uranishi, S. (2003) "The post office vs. parcel delivery companies: competition effects on costs and productivity" *Journal of Regulatory Economics*, May 2003; 23(3), 299-319.

NERA *Costing and Financing of Universal Services in the Postal Sector in the European Union* A Report to DGXIII, NERA, London.

Norsworthy, J.R., Jang,-Show-Ling, Shi,-Wei-Ming. (1991) "Productivity and cost measurement for the United States Postal Service: variations among regions " Published in *Competition and the Regulation of Utilities;* edited by M.A. Crew and P.R. Kleindorfer Norwell, Mass. and Dordrecht: Kluwer Academic 1991; 141-68.

PMS Ramboll (2002) *Employment Trends in the EU Postal Sector. Final Report.* A report for the European Commission.

Postcomm (2001) An Assessment of the Costs and Benefits of Consignia's Current Universal Service Provision: a Discussion Document, June 2001.

Postcomm (2003) Post Office Networks Abroad, December 2003.

Postcomm (2004) Royal Mail's Proposal to Introduce Size Based Pricing: a Consultation Document, April 2004.

Postwatch (2004) The UK Letter Market 2000-2003: a Market Report, Postwatch, London, January.

Rogerson, and Takis (1993) "Economies of scale and scope and competition in postal services" in Crew and Kleindorfer, eds, *Regulation and the Nature of Postal Delivery Services*, Kluwer.

Roy B. (1999) "Technico-economic analysis of the costs of outside work in postal delivery" in Crew and Kleindorfer, eds, *Emerging Competition in Postal and Delivery Services*, Kluwer.

Wada, T., Tsunoda, C., and Nemoto, J. (1997) "Empirical analysis of economies of scale, economies of scope, and cost subadditivity in Japanese mail service". *IPTP Discussion paper series*, August No.1997-08.

WIK (2003) *Survey on Some Main Aspects of Postal Networks in EU Adhesion Countries Part II: Country Reports.* Study for the European Commission, DG Internal Market.

Zellner, A. (1962) "An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias" *Journal of the American Statistical Association*.