

Economic Factors Underlying Postal Reform in the European Union *

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1. INTRODUCTION

The European Union (EU) has undoubtedly been the trendsetter in the postal reform area. Starting in the early 1990s, driven by the vision of a unified internal postal market, the EU and its executive arm, the European Commission (EC), set out on a course of change toward fully competitive postal markets. This process saw its culmination in the Third Postal Directive, which was formally approved by the European Parliament and Council on February 20, 2008, and which established for most EU member states the date of 1/1/2011 as the date of '*full market opening*' (FMO), with all EU member states required to abolish their reserved area by 1/1/2013 at the latest. This provision of the European Directive constitutes, in fact, the "*last mile*" of the long journey the European Union has been undertaking in creating a liberalized internal market for postal services. This paper reviews some of the major issues that surfaced in developing the Third Postal Directive. The centerpiece of these issues concerned the sustainability of the postal Universal Service Obligation (USO) in each Member State and the potential impact of FMO on the future provision of universal service.

Several studies were undertaken for the EC leading up to the Third Postal Directive, including ECORYS (2005), WIK (2004, 2005, 2006) and PricewaterhouseCoopers (PwC, 2006). PwC (2006) examined two key questions associated with opening the postal market: 1) Could FMO be accomplished without undermining the financial viability of the national postal operator (PO), which is the current Universal Service Provider (USP) in all member states? 2) What factors in postal markets would be important determinants of the outcome of FMO?

The USO has been a dominant feature of postal service for many years. Its origins can be traced back to 1840 with the implementation of the reforms of Rowland Hill in the form of the Penny Post in the United Kingdom. Prepayment by means of a stamp was a significant innovation in 1840. For the price of a stamp, delivery anywhere in the country was provided. Thus, the twin notions of ubiquitous delivery and uniform price inherent in the USO evolved, and these have remained the essence of the USO ever since.

The USO has traditionally been maintained by restricting entry to the postal market by means of a "reserved area" (RA). The reserved area was traditionally defined in terms of weight or value thresholds. The prohibition of entry in the reserved area prevents entrants from cream skimming by entering the low-cost markets and undercutting the PO. On the other

hand, prohibiting entry leads to a weakening stimulus for innovation and optimizing customer value. So, there has been continuing pressure in the postal sector and in other previously monopolized businesses (e.g., energy and telecommunications) to liberalize the sector.

In the European postal sector, the debate on increased competition has focused primarily on the desire to establish an internal European market and on integrating postal services with other communications markets. Other forms of communication have seen great technological advances (telecom, mobile telecom and the Internet) and these often have important implications for changes in postal products as well. The emerging substitutes have gradually increased the competitive pressure on letters and have resulted in a decline of overall mail demand in many countries, as several country studies in this volume have noted.

Other central factors driving postal reform and liberalization in Europe have included shifting consumption patterns, at the level of corporations as well as households and Small and Medium sized Businesses. These shifts have resulted in an increased need for refined market and product segmentation with corresponding pricing policies and service performance. Improved and new technologies allow the POs, but also other actors in the postal market such as large mailers and consolidators, to increase the efficiency of their logistics processes, leading to higher flexibility, more capacity to treat large volumes, and improved performance at lower costs. In addition to these economic and market factors, increasing budgetary restrictions have made national governments less willing to finance the deficits of public service organizations, including POs. Thus, increasingly, policy makers are feeling the need to review (and perhaps adapt) the principles of the postal market model to allow POs to be self-sustaining.

Given these complexities of interacting markets, changing consumer demands, and the financial and social importance of the postal sector, it is not surprising that market-based solutions, i.e. liberalization, became the focus of attention for postal reform in Europe. At the same time, it has been recognized that if there is not a reasonable balance between the burdens placed on the PO and its USO, competition could have deleterious effects of inefficient cream skimming and even financial insolvency of the PO. Given the importance of the sector in Europe,¹ the key challenge in moving the liberalization agenda forward is to garner the benefits of competition while controlling the risks.

This is one of three chapters that address regulatory reform in the EU. This chapter focuses on the economic issues underlying the liberalization in Europe and the factors that have come to be recognized as determining the prospects for competition in the EU postal sector and the ability of incumbent PO's to continue to provide universal service at historical levels after market opening. Campbell, Dieke, and Niederprüm (2008) describe reforms in the postal laws of the EU member states that were accomplished in the wake of the original Postal Directive of 1997 and the second, amendatory directive of 2002. Eccles (2008) reviews the legal requirements flowing from the recently adopted Third Postal Directive.

The paper proceeds as follows. Section 2 examines the factors in postal markets that are likely to impact the outcomes of FMO in the EU, including the outcome on the financial condition of the PO, the market share of entrants, and on the nature and extent of entry under

FMO. Section 3 describes efficiency and restructuring initiatives underway at national POs. Section 3 also provides summary findings on the readiness of each of the 30 countries studied in PwC (2006) for market opening as prescribed by the Third Postal Directive. Section 4 concludes.

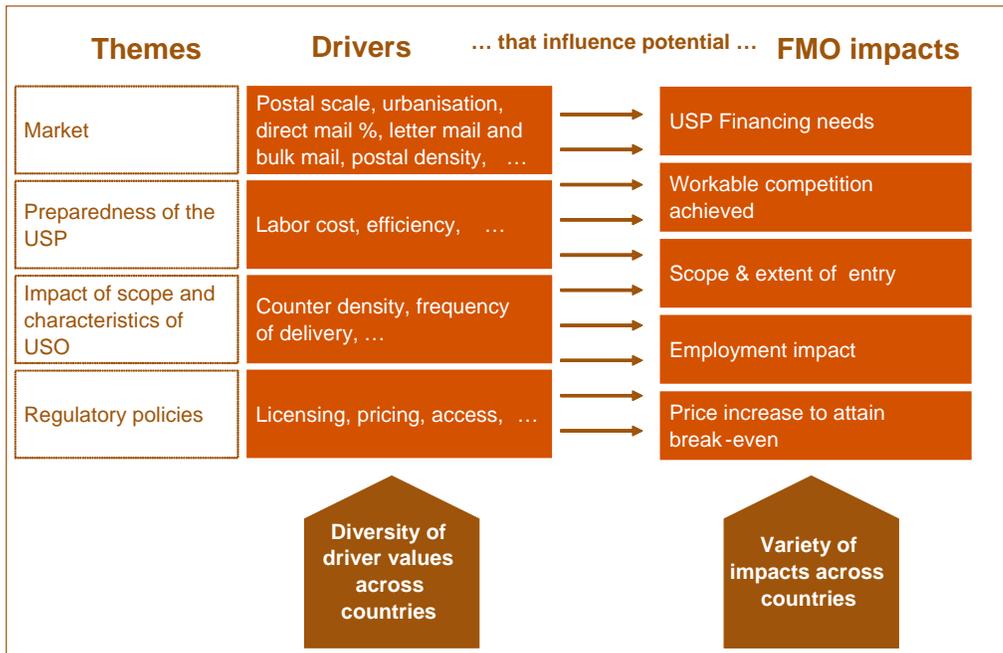
2. THE POSTAL SECTOR IN THE EUROPEAN UNION

PwC (2006) undertook a detailed study of the potential impact of FMO on the Universal Service Obligation (USO) in the 27 member states of the EU as well as 3 additional countries (Iceland, Norway and Lichtenstein). We will use the framework developed in the PwC study to organize our discussion here.

2.1: Themes, Drivers and Diversity Across the EU

In understanding the impact of FMO in different countries of the EU, four themes are central: 1) the postal market characteristics in each country; 2) the structure and efficiency of the incumbent PO/Universal Service Provider (USP); 3) the scope of the USO in the country; and 4) the nature of regulatory regimes imposed. These 4 interdependent themes are summarized in Figure 1, together with potential impacts that could arise from the introduction of FMO.

Figure 1: Themes, Drivers and Potential Impacts of Liberalization in the EU

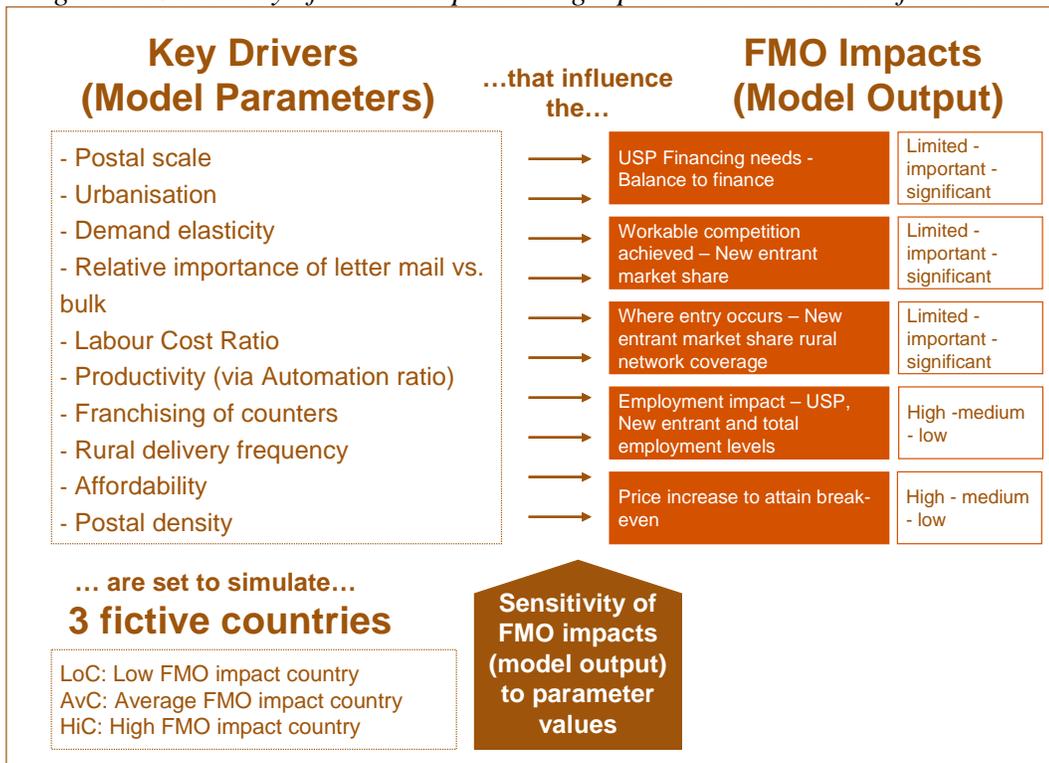


As shown in Figure 1, the economic outcomes at stake were, chiefly, the viability of the USP (and potential financing needs to support the USO), the effects on consumers as measured by price levels and the maintenance of the USO, and employment effects in the postal sector. In addition, the question of whether workable competition could be established in and across various national postal markets in the EU remains of central interest in the

liberalization and postal reform debate. To inform this debate, a model-based analysis was undertaken in PwC (2006). The model employed was a variant of the model described in d’Alcantara and Amerlynck (2006), and we will follow here the same approach in discussing the predicted impacts of FMO in the EU. The general structure of the analysis is depicted in Figure 2 below.

For each of the 30 countries studied, the postal market itself was first characterized in terms of scale, urbanization and other drivers of supply and demand discussed in greater detail below. The d’Alcantara and Amerlynck model was then used to simulate the predicted consequences of FMO under various scenarios on the scope of the USO, the efficiency of the USP, and tariff structures. The results in terms of market shares and profitability for the incumbent USP and entrants were then computed (and adjusted in consultation with various stakeholders in each of the 30 countries). We will summarize the results of this study by considering only three representative postal markets, which were constructed using the range of parameters for demand and supply conditions present in EU Member States. These three representative countries were created by choosing parameters for the national markets that represent low, average and high FMO impact countries (LoC – Low FMO impact Country, AvC – Average FMO impact Country and HiC – High FMO impact Country). These countries represent a set of postal market conditions where FMO would have very little predicted impact on either the USP or the market, the LoC case, or would have moderate or important predicted impacts, the AvC and HiC cases.

Figure 2: Sensitivity of model output to single parameter value modification



The market structures and key parameters defining the three representative countries are characterized by the parameters in Table 1.

Concerning demand responsiveness, these variables are likely to be important in determining the effects of FMO on the USP and on the viability of entrants. In the results reported here, own price elasticity of market demand was assumed to be -0.2 for household demand and -0.6 for business demand for all three representative countries, a mid-range for these elasticities based on a variety of studies reviewed in Robinson (2007).

*Table 1: Definition of representative countries: LoC, AvC and HiC**

Name	Definition	LoC	AvC	HiC
Scale	Mail items per person per year	500	200	10
Urbanization rate (one element of Postal Density)	Percentage of population in urban area (UN standard)	45%	70%	95%
Labor cost ratio	Ratio of freelancer vs. employee FTE cost (Eurostat)	90%	75%	60%
Shifting elasticity at given loyalty	Variation of 1% of volume associated to a 1% variation of price	Medium	Medium	Medium
Automation % in sorting	Percentage of mail item automatically processed	90%	50%	10%
Automation % in sequencing	Percentage of mail item automatically processed	75%	25%	10%
Flexible USP workforce in collection	Percentage of freelancer FTE hired by USP in activity	0%	0%	0%
Flexible USP workforce in sorting	Percentage of freelancer FTE hired by USP in activity	26%	6%	0%
Flexible USP workforce in transport	Percentage of freelancer FTE hired by USP in activity	57%	10%	0%
Flexible USP workforce in delivery	Percentage of freelancer FTE hired by USP in activity	29%	8%	0%
Franchised counters	Percentage of counters franchised	46%	28%	0%

* Certain other characteristics were assumed as part of the definition of all the three representative USPs and countries. See PwC (2006) page 38 for details. For example, USO counters costs were assumed to represent half of the of the total counter costs, with the latter set at 15% of total costs of the USP, Franchised counter costs were assumed to equal 40% of non-franchised counter costs, and the USO was assumed to specify one collection box per 10 square kilometers and 1 counter per 5000 inhabitants.

Two additional parameters are used to describe shifting elasticities between the incumbent and entrants.² First is the *loyalty parameter* describing the percent discount that entrants must offer in order to begin attracting business away from the incumbent USP. Second is the *cross-price elasticity* between entrant and incumbent demand, once the loyalty factor has been exceeded, which is the percent increase in demand for an entrant's product for each

percentage increase in the price of the incumbent’s product (beyond the initial loyalty discount). The loyalty and shifting elasticities used are shown in the table below. The Medium case corresponds to comparative studies from the literature (e.g., Robinson, 2007). The same baseline elasticities were used for all three representative countries (corresponding to the Medium case in Table 2). B refers to Business and Government sector mailers. C refers to Households and Small and Medium size Enterprise mailers.

Table 2: Definition of cross-price (shifting) elasticities

	(Actual) Shifting Elasticity		Loyalty	
	B- originating	C- originating	B- originating	C- originating
Low	-0.75	-0.5	0%	30%
Medium	-1.0	-0.7	0%	20%
High	-1.25	-0.9	0%	10%

Note that while it is possible to vary one factor at a time in the sensitivity analysis, the final impact of introducing FMO in a market will be largely linked to the *combined impact* of various factors. The point here is that the situation facing any specific country may embody both positive factors as well as negative factors – for instance, a USP may have significantly higher labor costs relative to entrants, but may also operate in a market with a scale factor that makes defending the market against entry relatively easy. We will note a few of these interactions below. The simultaneous presence of positive and negative factors implies that considerable care must be exercised in drawing conclusions on the impact of FMO on the basis of single-factor sensitivity analysis.

2.2: Representative Results of Simulation Studies of EU Markets

The intrinsic characteristics of the market are among the main factors that will determine the impact of introducing FMO. Some of these characteristics may have very significant impacts, differing from country to country, while others have a more progressive impact, more balanced from one country to the other. For example, high mail volumes per capita, potential for growth in direct mail volumes, a high degree of urbanization and population density may allow entrants to secure sufficiently high volumes to build a sustainable business case. On the other hand some of these factors may also moderate the impact FMO will have on the USO since they mitigate the cost burden associated with providing the USO. We review here only a few of the major factors listed in Table 1.

2.2.1: Postal scale factor (mail items delivered per inhabitant)

Considering that the primary costs incurred by a postal operator are in the delivery process and that those costs are often considered to be essentially fixed costs, it follows that the higher the mail scale, the lower the unit cost of delivery will be. Consequently, entrants – even if more efficient or generally benefiting from lower labor costs than the incumbent – will be confronted with a USP that benefits from these economies of scale and will have difficulties matching the unit costs achieved by the incumbent operator. On the other hand, since the USP

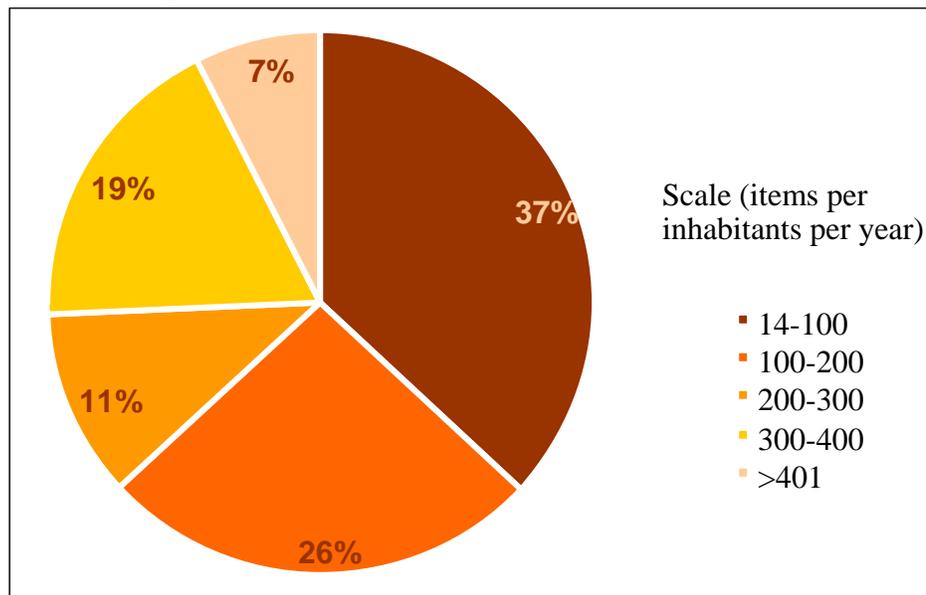
has the obligation to deliver every day everywhere on the territory, it follows it has a fixed cost which the entrants does not.

For this reason, most of the entrants use a different business model, delivering at a lower frequency bulk mail that is pre-sorted by the mailer itself, avoiding them to invest in expensive sorting centers. Next to this phenomenon, in a high mail scale market, market share lost by the USP to entrants increases the USP's unit cost of delivery but to a lesser extent than in a low mail scale market.

The relation between the postal unit cost of an operator and the postal scale is inherent to the postal process itself. Indeed, the technical coefficients and hence the fixed costs are related to the postal delivery tour that the postman makes to reach households, small businesses, large companies, etc. The fixed costs relating to this delivery process are spread over the mail items volumes, which are dependent on the postal scale. In the case of a high postal scale environment, low unit costs provide an initial advantage to the historic operator relative to entrants.

Mail scale across countries in the EU vary widely from 14 (Bulgaria) to 489 (Luxembourg) mail items per inhabitant with an average of 195 and a median of 137.

Figure 3: Variation in Postal Scale across Member States

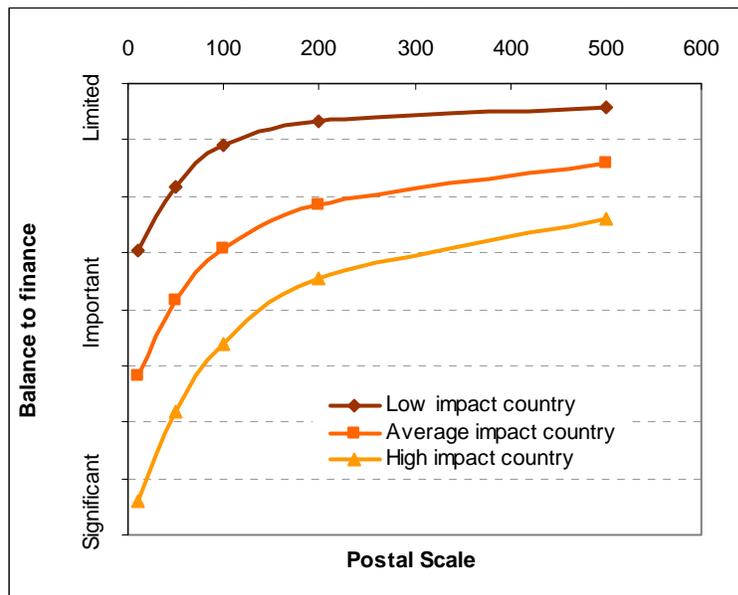


The above shows that 37% of the countries show low mail scales (below 100 items per inhabitant per year) and 26% operate in a market that presents high postal scales (300 and more). Low postal scales (less than 150) is a characteristic of the market that may affect countries such as Italy, Greece, Spain, Latvia, Lithuania, Malta, Cyprus, Ireland, Romania and Bulgaria. In these countries, mail is often associated with administrative issues: in Italy for example 16% of the letter mail volume is registered mail. On the other hand, the (relatively) high mail scale countries (mail scale higher than 300) include the Nordic countries, Estonia,

the United Kingdom, France, Germany, Belgium, The Netherlands, and Luxemburg, which present a more attractive market for entrants and hence are more prone to attract entrants.

Figure 4 indicates, as expected, the critical importance of scale on the ability of the USP to support its USO under entry. The simulations underlying Figure 4 assume that a constant pricing constraint is imposed on the USP under entry, with the vertical axis in Figure 4 being the loss sustained relative to pre-FMO operations by the USP under this constant-price scenario, which must then be financed either through price increases, efficiency gains or subsidies. One can see that the impact of FMO on the USP balance to be financed depends on scale. The balance to finance is measured by the coverage of the revenues linked to USO products of the costs associated with USO provision. In order to compare results across different countries, the balance to finance is normalized by using the total postal revenues. The (normalized) balance to finance equals the difference between USPs revenues and costs associated with the USO divided by total postal revenues. We show only ordinal values: limited, important and significant. Countries with small postal scale will probably require counterbalancing drivers against financing problems for the USP whereas countries with large postal scale will experience fewer difficulties with USP financing. In the AvC representative country for example, where impacts of FMO are average for the EU, the need to finance the USP decreases from important to only limited when scale increases from 10 to 200.

Figure 4: Sensitivity to postal scale of the balance to finance for the USP

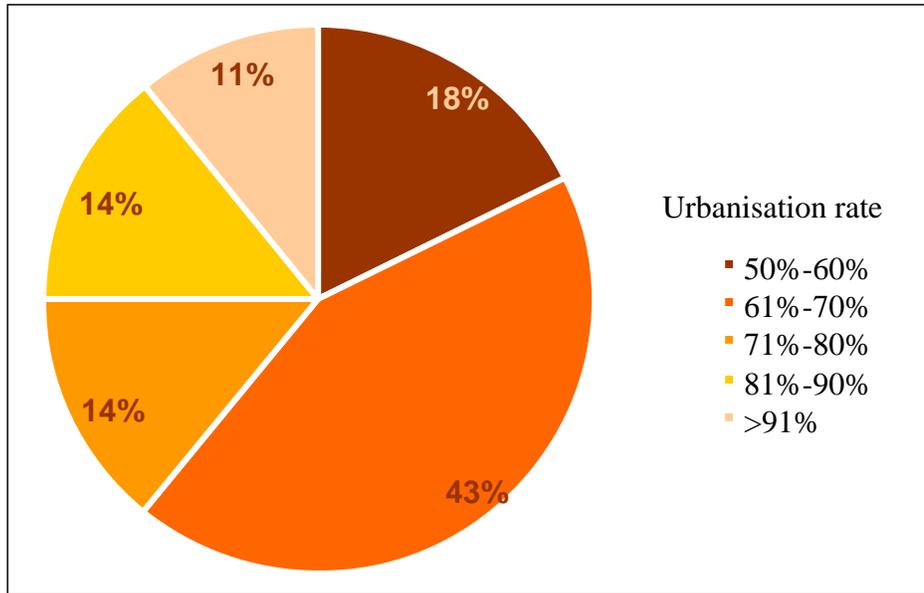


Clearly, low postal scale represents a risk for the USP. However, low postal scale by itself may also be a deterrent for entrants, given the fixed costs in delivery. Thus, in terms of the impact of FMO, the impact of postal scale will be interdependent with population density and urbanization rate, factors we now examine.

2.2.2: Population Density and Urbanization Rate

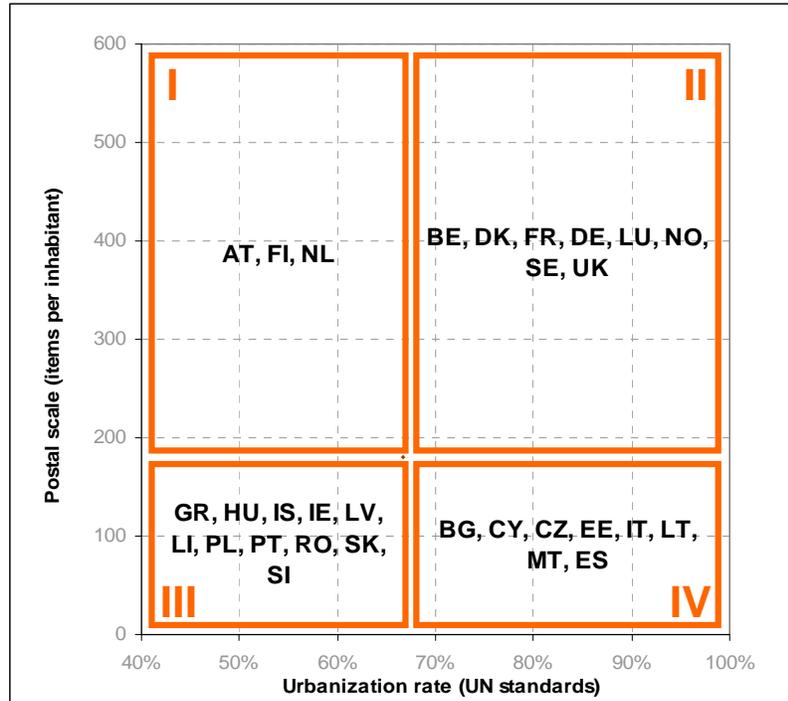
Price uniformity imposed on a USP as part of its USO implies that entrants will focus on less costly destinations, namely Urban Routes. Furthermore, Urban Routes are used to generate a margin to finance deliveries on Rural Routes. Consequently, in markets with an important proportion of Rural Routes, losing even a limited market share in the Urban Area implies³ that a significant part of the de facto subsidy available to fund the Rural Area will be lost. Figure 5 shows urbanization rates across the EU.⁴

Figure 5: Distribution of EU countries in terms of urbanization ratio



Belgium, Luxemburg, the United Kingdom, Denmark, Germany, The Netherlands and Malta are among the most urbanized countries (>80%) whereas Ireland, Finland, Portugal, Romania, Lithuania and Greece are among the least urbanized (<65%). Figure 6 below illustrates in a matrix both postal scale and urbanization measurements (expressed as postal items per inhabitants and the urbanization rate as estimated by the United Nations) and shows 4 clusters of countries constructed according to these 2 fundamental drivers of the impacts of FMO.

Figure 6: Postal scale and urbanization rate



The division of the clusters is based on the average values of the drivers, that is to say that in the above Figure countries such as Belgium, Denmark, France, Germany, Luxemburg, Norway, Sweden and the United Kingdom all show higher than average urbanization rates and scale. In contrast, Greece, Ireland, Latvia, Lithuania, Poland, Portugal and Romania - among others - prove to be characterized by values below average for both drivers.

According to the rationale outlined above, the impacts of FMO would be mitigated for countries in quadrant II as (i) their high postal scale allows them to drive their unit costs down making them more competitive and (ii) their high urbanization rate puts the USPs less at risk as they tend to have less expensive rural routes to support. This conclusion may be counterbalanced by the attractiveness for entrants of such high urbanization and high postal scale environments and must be considered mainly in conjunction with the efficiency level of the USP. Many other factors are also at play here, including the ratio of bulk mail volumes (Transaction Mail + Direct Mail)⁵, demand elasticities and customer loyalty in various market segments, the efficiency of the USP, and the relative cost of labor for the USP versus entrants. We consider here only USP efficiency and labor cost issues.

2.2.3: Labor Costs and Labor Productivity in the EU

The USP preparedness drivers which interact with the FMO impact indicators (outcomes) fall into to 3 categories, namely: the *commercial freedom and pricing flexibility* allowed the operator, the *efficiency levels* attained or expected to be attained in the medium term, and finally the *labor-related conditions* including eventual social liabilities, resulting from the historical status of the USPs as state-owned enterprises. These three dimensions are related to

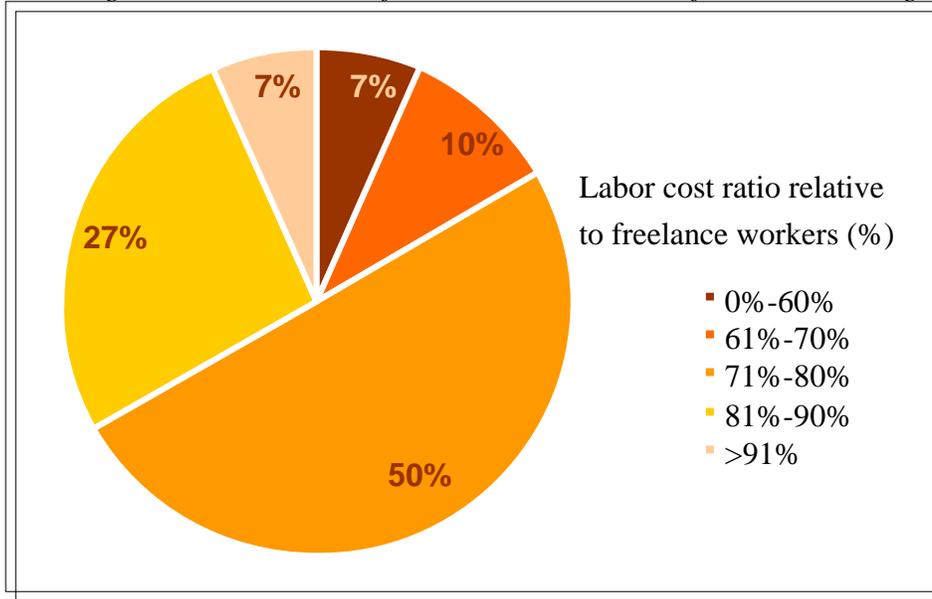
the overall USP capacity to operate in an efficient manner and the flexibility to respond to competitive threats.

In general, it can be assumed that an operator presenting overall high levels of efficiency is more likely to take advantage of new (or increased) competition following FMO, innovating in new products and services. In a context of high efficiency, the optimized cost structure and processes in place will translate to relatively lower unit costs that will make it more challenging for the entrant to align to the highly efficient operator.

Indeed, entrants will most probably follow a low-cost strategy, competing on price in order to capture sufficient market share necessary to absorb its fixed costs. This commercial strategy will only be possible - in terms of preservation of margins - if the entrant can operate in a highly efficient manner, actually more efficiently than the USP. It already can be observed that most of the entrants follow a different business model, allowing them to offer competitive prices, but also time-definite services, corresponding to clients' expectations. They focus on delivery, part of the sorting being done by the mailer itself, without requesting daily frequency of delivery.

The efficiency levels attained are strongly correlated to the ability of the management to engage in improvement exercises or restructuring without political influence. Commercial freedom allowed to the USP, performance accountability of the USP management and the USP capacity to undertake efficiency improvements are the critical factors. The same goes for the labor conditions which are also a constraint originating in general from specific collective labor agreements or more simply from the special status (mostly) of USP postal workers. The PwC (2006) study examined the issue of labor cost differences by considering the sensitivity of key outcomes to the *labor cost ratio*, defined as the relative cost of the freelance workforce (the assumed source of labor for entrants) relative to the average USP labor cost. Figure 7 below, from PwC (2006), summarizes the diversity of the labor-cost ratio across EU countries.

Figure 7: Distribution of countries across cost of labor ratio ranges

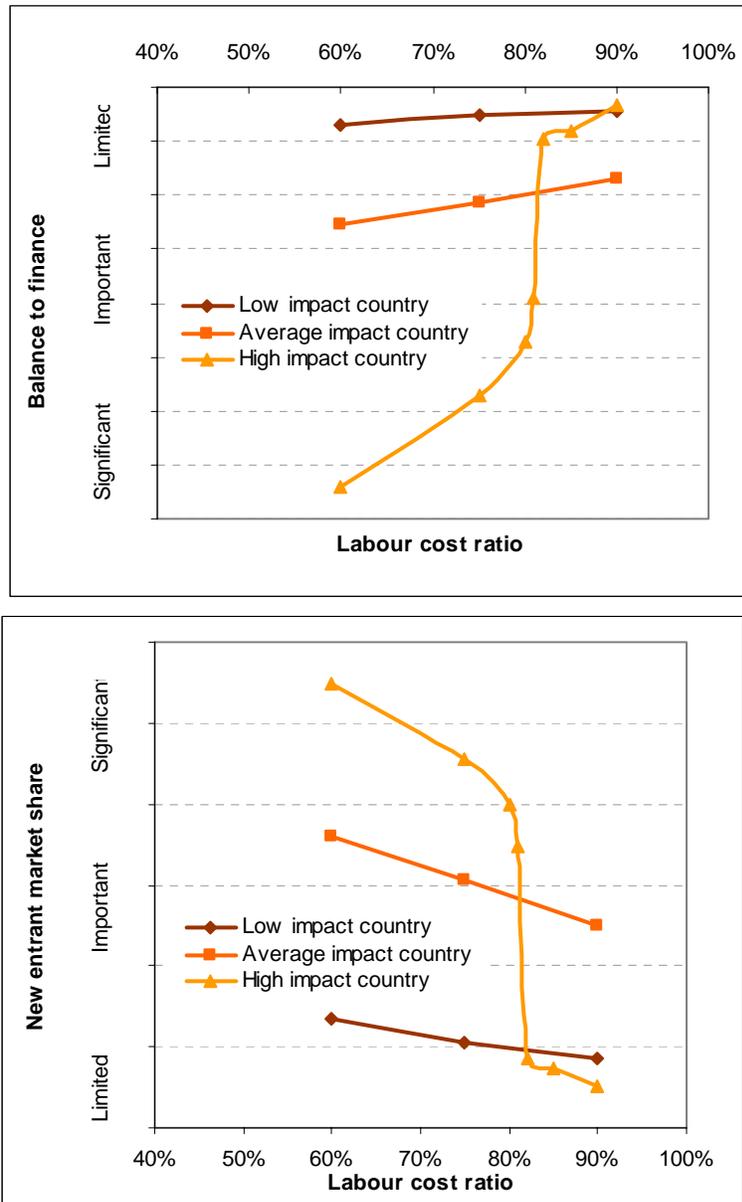


In some countries, such as Poland, the labor cost ratio is higher than 1, in other words the freelance labor costs are higher than for the USP. This atypical situation will make it difficult for entrants to compete, and will also not be particularly encouraging to the USP to realize efficiency gains in labor. By contrast, in two thirds of the countries the entrants potentially benefit from favorable labor cost ratios of 80% or less, that is the cost of freelance labor at a cost of 80% or less than that of the USP. This cost differential is most advantageous to the entrants in countries such as Sweden (74%), Norway (75%), Italy (72%), Greece (69%), France (73%) and Belgium (68%).

Figure 8 shows the results on market share of entrants and on the deficit of the USP under constant prices for the three representative countries of Table 1 as the labor-cost ratio varies. As expected, there is a high sensitivity of these outcomes to the labor cost ratio. A low ratio allows the entrant easy market penetration. On the other hand, if the labor cost differential is negligible, so is market penetration by entrants. Of course, the prevailing cost disadvantages for the USP in the labor market can be countered by allowing pricing flexibility in the USP, or by imposing the same collective labor conventions on entrants as obtain for the USP.⁶

A higher value of the labor cost ratio unsurprisingly reduces the competitive advantage of entrants relative to the USP. Nevertheless, above some level (80% in this model) even in the HiC environment, a significant drop of the competitive advantage of the entrant leads to very limited market share for entrants. The reason for this is the combination of high population density, high urbanization rate, and low postal scale in the HiC environment. Interestingly, entrants can only exploit such a market if they have an advantage in labor costs. The nonlinear relation between the unit cost and the postal scale is evident in Figure 8 and shows that several factors can interact in postal markets to determine outcomes.

Figure 8: Sensitivity of the balance to finance and of the entrant's market share to the labor cost ratio (Cost of freelancers relative to that of the USP)



Two important additional indicators of labor costs are the percent of civil servants working for the USP and labor productivity, the latter of which was measured in the PwC (2006) as the total number of mail items per year processed per USP FTE staff allocated to USO. Labor productivity does not take into account country specificities such as, for example, the country geography and population density, postal scale, ratio of bulk mail relative to total volumes, and many other factors which could effect this rather simple measure. Figures 9 and 10 below present results for civil servants employed at USPs and labor productivity ratios across EU member states in 2006.

Figure 9: Distribution of civil servant ratios across EU countries

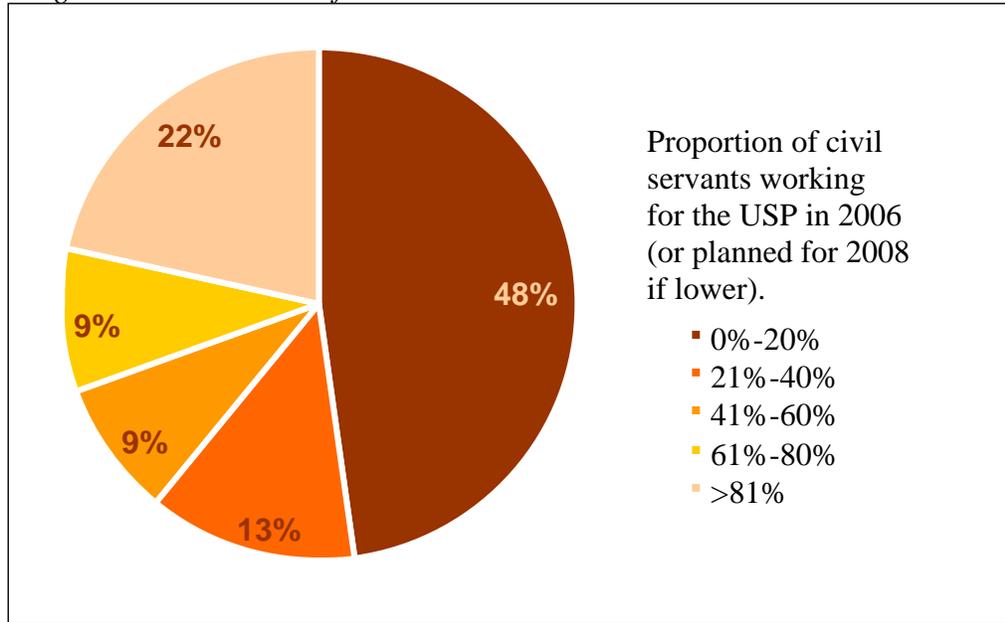
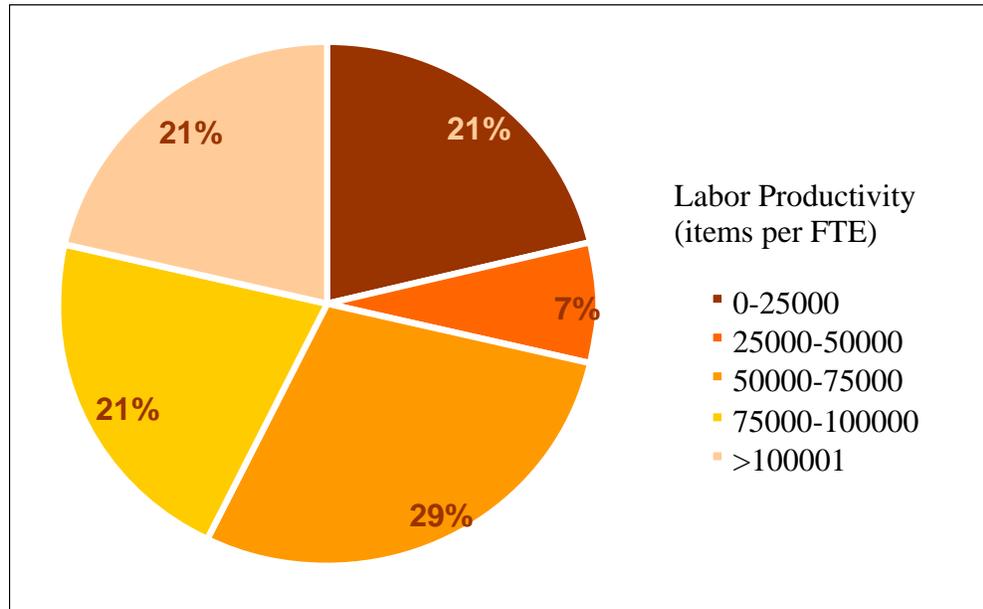


Figure 10: Distribution of countries across labor productivity ranges (measured as postal items per FTE)



2.2.4: The Impact of the Universal Service Obligation (USO)

Defining the scope of the USO remains one of the most complex questions when assessing the impact of the FMO. The USO defines the rights of postal users to benefit from postal services in a context where postal traffic still constitutes an essential channel of communication. Originally, the main objectives when defining USO were to ensure provision of postal

services at a predefined quality level, accessible to all throughout a country or region on a permanent, transparent and non-discriminatory basis, under the control of an independent authority and at an affordable price.

For the last 20 years, the European Commission has worked on the regulatory framework of the postal sector with a view to the Full Accomplishment of the Internal Market for Postal Services. The first stage of the development of the European Postal policy was the Green Paper published in 1992. The First Postal Directive (97/67/EC) that followed in 1997 outlined the basis of the Universal Postal Services. This Directive was amended in 2002 by the Second Postal Directive (2002/39/EC). Neither the Second nor the just approved Third Postal Directive of (2008/06/EC) brought any modifications to the scope or characteristics of the Universal Postal Services, except regarding the progressive reduction of the reserved area, which will be completely eliminated in all EU member states by 2013.

The latitude allowed by the Directive concerning the upward weight limit for parcels allows countries to set up limits on their internal market that differ from other countries. However, the upper weight limit among all countries for inbound cross-border mail should be equal to 20 kg, as part of the UPU obligation of acceptance for inbound cross-border postal items. The specific case of newspapers and periodicals delivery is worth mentioning. The inclusion or not in the USO product scope varies widely from country to country. Indeed, countries such as France, Italy, Finland, Germany, Denmark, have included newspapers and periodicals in the scope of the USO and in some cases, an important state subsidy is foreseen to cover the associated costs (as is the case in France, Italy and Belgium).⁷

Delivery frequency is a sensitive aspect of the USO in the European Union. Most of the USO related literature focuses on the delivery dimension of access to the postal services (receiving) although it includes both receiving and sending mail. One of the reasons provided to justify this focus is that delivery constitutes a large part of postal operators' costs. Although the minimum required by the Directive is one delivery per working day (equivalent to 5 deliveries per week), the national regulations of a large number of countries (37% of EU member states) impose on their operators 6 deliveries per week. Also some exceptions are allowed, such as lower frequency of delivery to outlying islands in Finland, Greece and Norway.

Maintaining or increasing the current delivery frequency level would increase the likelihood that the costs of the USO will not be fully covered financially (USPs balance to finance). Measurement of the USO burden remains an active area of interest in the EU, especially considering prohibitions against state aid under European competition law.⁸ The PwC (2006) study and several others (e.g., see d'Alcantara and Gautier, 2008) have underlined the fact that the main costs generated by the USO are due to the combination of pricing uniformity and the costs associated with delivery frequency. For example, as pointed out in PwC (2006), a reduction in delivery frequency from 6 to 3 per week in rural areas would significantly reduce the balance to be financed for each type of countries (LoC, AvC, HiC) as it will reduce high costs generated in rural area. In the case of the incumbent USPs, this would help to counterbalance the loss of market share to entrants in urban area.

While less important than delivery frequency, another driver of the cost of the USO is the accessibility requirement to counter services, typically defined in terms of distance to classical access points (public letter boxes and classical post offices). The definition of the postal counter access standards differs from one country to the other. However, the frequency of collection and delivery, the post office geographical accessibility (minimum postal network density, franchising operation level, etc) and time accessibility (opening hours) seem to be the critical characteristics when assessing the scope of the USO. The 2006 situation in the EU relative to counter services is summarized in Figures 11-12 below. For additional details, see Cohen et al. (2008) and Buser et al. (2008).

Figure 11: Distribution of countries across ranges of postal counter densities (geographic)

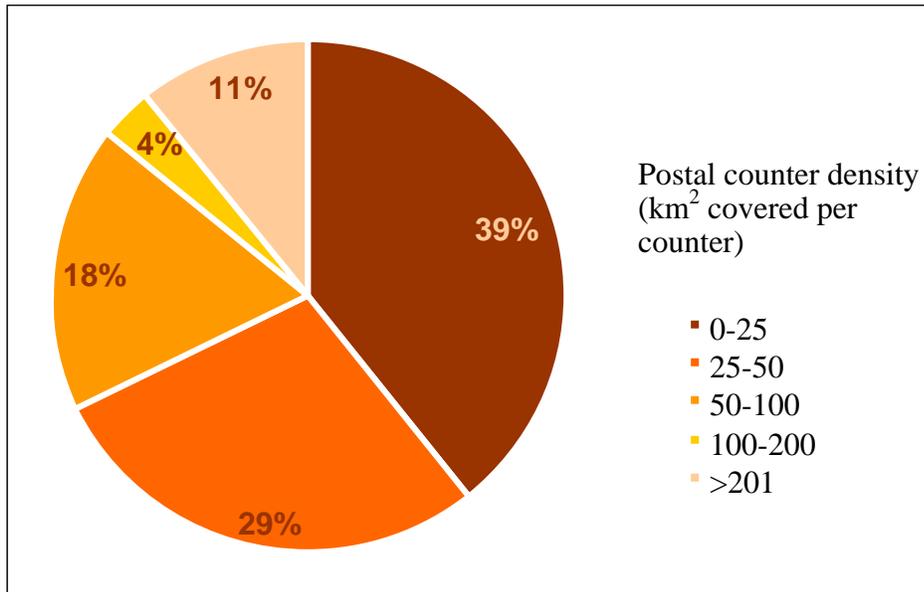
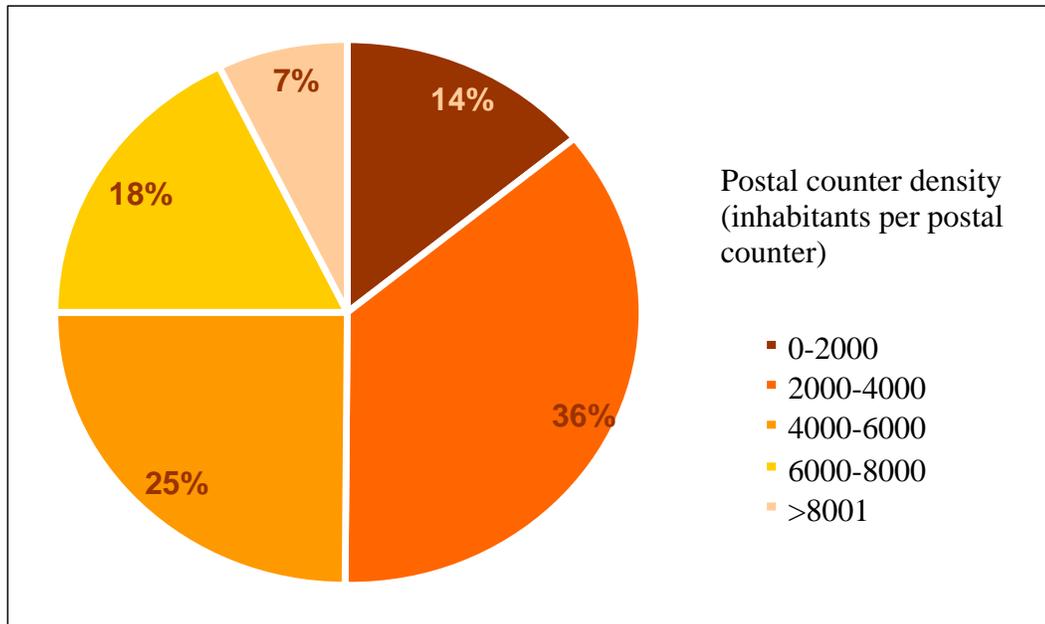


Figure 12: Distribution of countries across ranges of postal counter densities (inhabitants)



A final matter of obvious importance in considering postal reform is pricing. As discussed in Crew and Kleindorfer (2008a) and Campbell, Dieke and Niederprüm (2008), price regulation in the EU has generally been implemented via price caps. However, price caps are implemented in different ways, and the scope of price uniformity and the structure of access and worksharing prices varies considerably. Movement towards zonal pricing and other aspects of aligning price and underlying are expected under FMO. Similarly, given competitive pressures, one can expect that the price of bulk mail will decrease relative to the less elastic single-piece mail. As of January, 2008, EU average prices for a 20g letter averaged \$0.84 with a standard deviation of \$0.22,⁹ though variation is considerably higher if these are adjusted for Purchasing Power Parity (DPAG, 2006).

Constraints on uniformity of prices (e.g., prohibiting zonal pricing) for bulk mail and constraints on price levels for single-piece letters can have significant impacts on the ability of incumbent USPs in the EU to finance their USO from their own earnings. Such uniformity is not required by the Postal Directives and can be expected to be under pressure as liberalization unfolds. To see the effects of pricing restrictions, consider Figures 13-14 for the three representative countries of interest here. These figures show the consequences of relaxing pricing uniformity and levels on bulk (B) mail, together with relaxation of constant price levels for single-piece (C) mail. Allowing pricing flexibility for the business segment (B) in the market would have different impacts depending on the group of countries discussed, growing from LoC to HiC clusters. Only small adjustments in price levels are required to achieve break even operations for LoC countries and AvC countries. On the other hand, for HiC countries, significant price increases for both bulk mail and single-piece mail market segments are likely to be required to achieve break even operations, given current levels of the USO. Note that allowing pricing flexibility in both markets allows the USP to maintain higher market shares, as relying on both bulk prices and single-piece prices obviously provides greater commercial flexibility to support the USO and to respond to competitive threats segment by segment.

Figure 13: Sensitivity of the USP balance to finance to a relaxation of the fixed price constraints

B = Business Mailers mainly Bulk
 C = Household Mailers mainly Single-piece

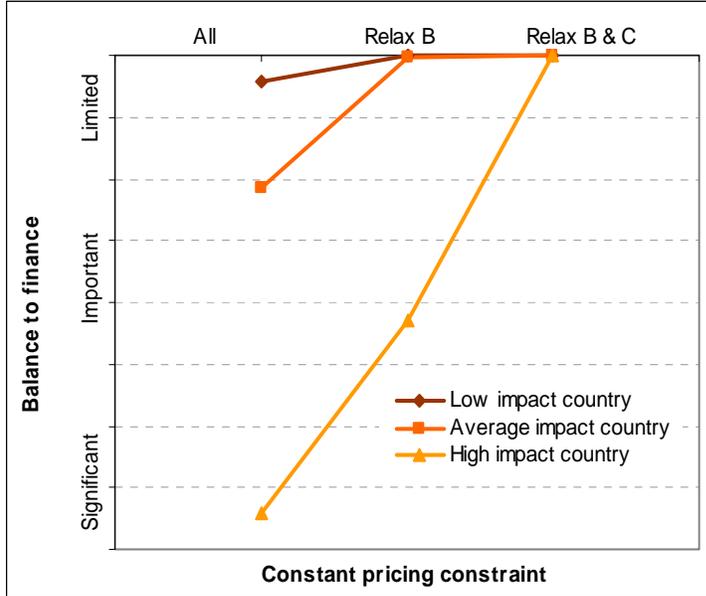
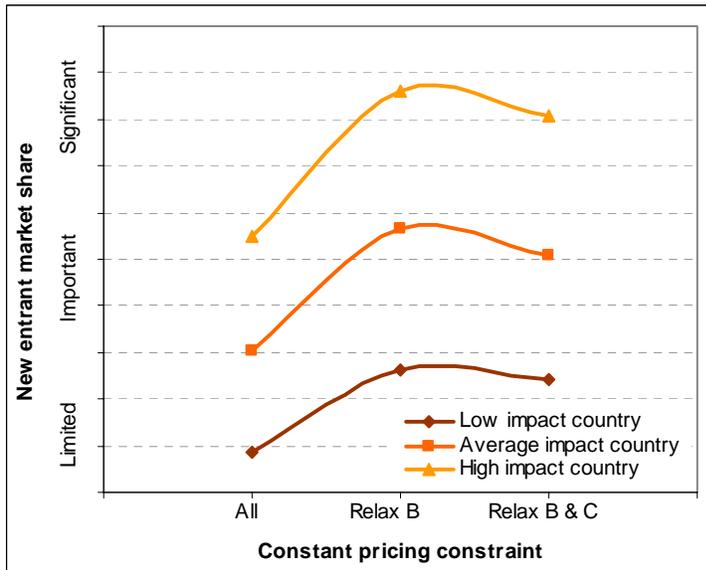


Figure 14: Sensitivity of the entrant's market share to a relaxation of the constant pricing constraint

B = Business Mailers mainly Bulk
 C = Household Mailers mainly Single-piece



As expected from theory (e.g., Crew and Kleindorfer, 2007), relaxing the uniformity constraint is important for bulk mail, thereby making access prices and worksharing discounts

sensitive to delivery costs (see also Crew and Kleindorfer, 2008b). Uniformity is expected to continue for single-piece mail in EU member states.

As a final matter of interest concerning the USO, practically all the countries have standards of quality that are based on the intra-community cross-border quality standards. In some case, incumbents have some difficulties to respect the standards incorporated in each Member State's regulation. It is also the responsibility of each Member State to arrange independent monitoring of Universal Service quality standards and for the publication of the results.

2.2.5: Competitors and Entrants

In several countries, competition has already been present for some time on different segments of the postal market. The main segments of the postal market that have attracted the interest of the competition include the newspapers and press delivery, the bulk mail in general (above reserved area limits and the direct mail in countries where it isn't reserved area), the date certain delivery products, and of course the non-addressed mail (although it is not perceived as being part of the postal market).

Entry strategies differ widely from country to country. The origin of the development of the competition ranges from the logistics business that diversified into the mail business (e.g. BD in Belgium) to the pure entrant (e.g. Sandd in the Netherlands) or to the development from a newspaper distribution base (e.g. Adrexo in France). In a context of overall decreasing mail volumes and slightly increasing Direct Mail volumes (depending on the market of course), the existing market players rely for their development on the growth of the Direct Mail as an advertisement medium and on the capture of market share from the incumbent. Some competitors claim they could still thrive in a zero growth market by simply gaining market share from the USP.

The typical market for the competitors is the bulk mail (pre-sorted or not) delivered in the urban zones or intercity. Of course un-addressed mail remains well represented among competitors, as it is not a part of the reserved area of USPs even now, and represents much lower delivery costs and setup costs for an operator. Similarly, newspaper distribution has seen considerable growth in competitor services and independent providers.

Some characteristics of the USO such as 5- or 6-day delivery frequency are not considered by most competitors as essential to the postal service. Indeed, these operators typically operate on 2- or 3-day delivery frequencies, and put more emphasis on date definite delivery rather than on fixed frequency. This alternative product feature allows their customers to better target their audiences (e.g. mail delivered on the last day of the week to ensure attention during week-end) and to better plan within their organizations (e.g. customer services availability in the mail order business).

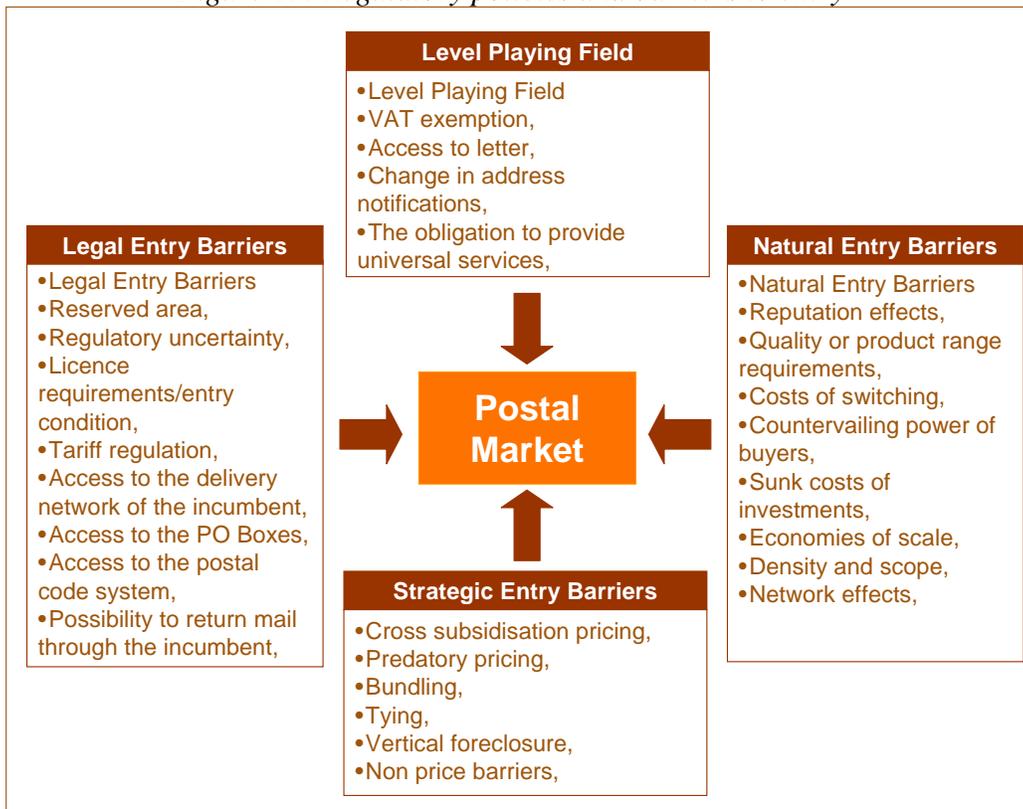
Most entrants/competitors also differentiate themselves from the incumbent postal operators by proposing more attractive pricing, but using advanced address databases. On the side of the customers, PwC (2006) reports that the vast majority of Large Mailer customers

interviewed are looking forward to the opening of the postal market as they are all convinced that FMO will induce a decrease in prices and an improvement in quality.

2.2.6: Regulatory Policies

PwC (2006) lists a number of common concerns by competitors and other stakeholders about barriers to entry, and these concerns are currently active issues for postal regulators in the EU. These include the pricing practices of the incumbent operator (e.g., for access services); VAT exemption of postal operators; access to addresses database (change of address, re-expedition, PO box access); letter boxes access (digital codes or keys); non-transparent standards (sorting, addressing); and constraining licensing schemes. For details on one regulator’s approach to these matters, see the French case described in Gallet-Rybak et al. (2008). Figure 15 summarizes the basic arguments raised by EU competitors to date, as reviewed in PwC (2006).

Figure 15: Regulatory policies and barriers to entry



2.2.7: Summary of EU Postal Market Conditions Relative to FMO

Summarizing, the predicted impact of introducing FMO in the EU has been studied here by three Representative Countries, with postal market parameters defined in Table 1. The key parameters differentiating these postal markets in terms of the impact of FMO on the USP and on the USO are: postal scale, labor-cost ratio, and urbanization rate.

Impact of postal scale: The impact of postal scale for the most sensitive countries (HiV), exhibiting scales of 10-20 letters per inhabitant per annum, is very significant, while the impact of the same driver is much less important at average to high postal scale.

Impact of Labor cost ratio and postal Density (Urbanization rate): Both of these parameters imply significant sensitivity in moving from HiC country to AvC countries and from AvC countries to LoC countries. Furthermore, the “cumulative” effect associated with reducing the labor-cost ratio from HiC to LoC (i.e., from Table 1 in going from a ratio of 60% to 90%) reduces significantly the USP market share loss as well as its balance to finance. In other words, one can consider that USPs characterized by an unfavorable high urbanization rate and a high labor-cost ratio would actually not be significantly worse off than a USP benefiting from a favorable urbanization rate and an unfavorably low labor-cost ratio. It is the combined effect of unfavorable labor costs relative to the competition and high urbanization levels that encourages competitive entry that is difficult for the USP to counter.

A further key factor affecting the outcomes of market opening is, of course, the efficiency of the USP. Some of the drivers of efficiency are noted above. We now consider the wave of restructuring activity that has already been launched in EU POs in anticipation of the competition enabled by the Third Postal Directive.

3. EFFICIENCY AND RESTRUCTURING ACTIVITIES OF USPs IN THE EU

Following the gradual introduction of competition in the European postal sector, USPs have introduced various restructuring programs with a view to improving their efficiency, retaining their share of the postal markets and developing activities in new markets such as the financial and logistic sectors. Initially, two main groups of countries could be distinguished: proactive USPs, often initiating reforms in advance of the European agenda, and reactive USPs, that implemented reforms as challenges arose. In the first category are countries such as Sweden, United Kingdom, The Netherlands and Germany. These may be the leaders, but nearly every PO in the EU has begun the process of restructuring, in many instances imitating initiatives set in motion by proactive POs. Introducing restructuring programs is not straightforward as such programs often confront opposing forces representing stakeholders for whom change is perceived as difficult or not in their interest. Restructuring initiatives have occurred on two dimensions: 1) reducing the level of costs while maintaining the required level of outputs and maintaining or increasing the level of output quality; and 2) increasing the level of revenues, while maintaining the level of costs, primarily through diversification of product lines to leverage economies of scope in the USP network. We treat each of these activities separately.

3.1: Efficiency Initiatives of the USP

Efficiency initiatives European USPs have included the following.¹⁰

Table 3: Efficiency measures observed in various USPs in the EU

Efficiency measures	Potential expected effect
Sorting automation and/or rationalization of transport and sorting networks	increase in productivity
Centralized sorting centers	increase in productivity and cost reduction
Counter franchising	reduction of fixed cost base but still a variable cost in most cases
Diversification of products and services at counters	increase in revenue and loyalty
Modernizing and automating the counter network	decrease in costs and increase in quality of service
Postal counter front-office automation (front office IT)	increase in productivity and quality of service
Replacement of counters with mobile counters	reduction of fixed cost
Counter density reduction	reduction of fixed cost base
Reduction of mail boxes	reduction of fixed cost base
Redeployment of mail boxes	reduction of fixed cost and
Walk sequencing and/or walk routes optimization	increase in productivity
Increase in the motorized delivery in order to increase delivery speed	increase in productivity and quality of service
Management and staff incentives	increase in productivity
Outsourcing of transportation activities	cost reduction
Contractual workforce, replacing civil servants contracts	
Hiring self employed, or part-time workforce	cost reduction and flexibility
Cost accounting implementation	improvement of management decision
Management Information Systems implementations	improvement of management decision
Reduction of central /regional overheads	reduction of fixed costs and improved management accountability

Significant diversity is observable throughout EU POs in terms of the specifics of their efficiency initiatives. For example, (further) automation of the sorting process in countries where labor costs are relatively low (Poland, Hungary, Czech republic) is not always economically sound because the return on investment remains negative due to the relatively high cost of implementation and sorting and sequencing activities may not yet be possible due to market organization (deliveries, post codes, etc). Some initiatives are driven directly by the USP whereas in other cases the postal regulator triggers efficiency improvement initiatives.

For example, the Danish competition authority has encouraged Post Denmark to further outsource its post offices.

The Italian case is a good example of some of the restructuring initiatives undertaken by USPs in the EU in anticipation of FMO. Over the past 10 years, Poste Italiane has radically improved its efficiency and the overall quality of its services. Among its several initiatives, one can note: the redesign of the overall delivery processes, the ongoing reduction in the number of sorting centers, and the outsourcing of the delivery of both parcels and registered mail; all leading to an overall employment reduction from 220 000 to 150 000. This led (in 2002-2004) to the first profits in 50 years and comfortable EBIT margins, demonstrating that the efficiency improvement efforts of the last decade are bearing fruit.

As one of several efficiency measures from Table 3, consider the level of outsourced (or franchised) postal counters. The higher the proportion of outsourced postal counters the lower the fixed costs borne by the USP, with favorable consequences in reducing markups to cover these costs, as well as the opportunity for cream skimming by entrants in low-cost areas resulting from these markups.¹¹ Figure 16 from PwC (2006) shows the diversity of outsourced postal counter activity in the EU, along with postal counter density (on the vertical axis).

Figure 16: Postal counters outsourced and postal counter density

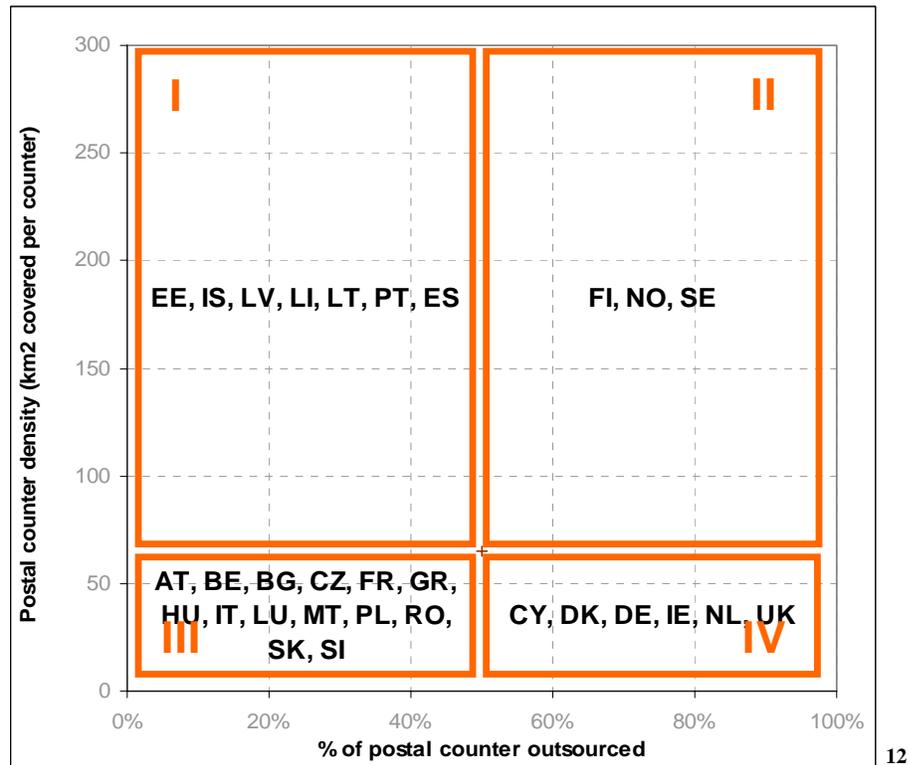


Figure 16 however does not take into account other ways some USPs have undertaken to reduce the fixed costs of their counter network. For example, Italy has succeeded to have most

of these paid by the development of their financial services while France maintains counters in remote areas, in part, through direct governmental subsidies.

3.2: Diversification Activities

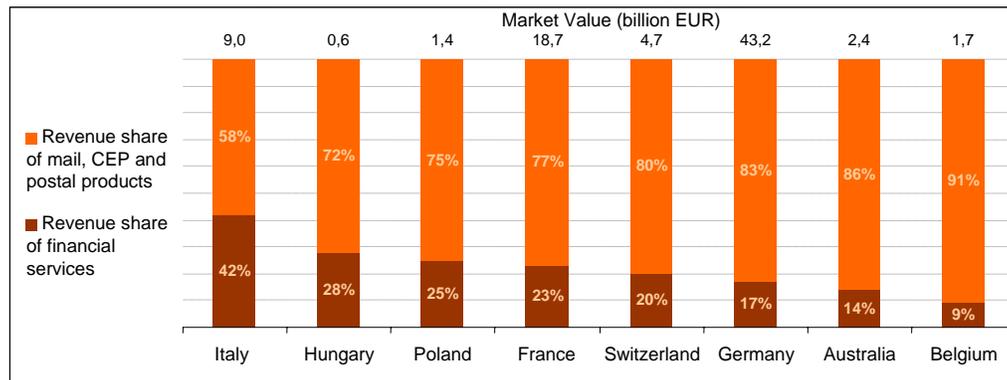
To increase revenues, building on their existing network, EU postal operators have often diversified their operations, developing financial services or international logistic activities. To reduce their level of costs, postal operators have embarked on traditional restructuring programs aimed at increasing organizational efficiency through the introduction of more adaptive and flexible structures and increasing organizational effectiveness through the introduction of quality measurements and improvements programs. Doing so, the most proactive postal operators have to date managed to achieve considerable success.

In seeking to increase their profitability, POs in the EU have naturally considered reducing costs and hence potentially rationalizing their networks, e.g., by increased franchising of counter services. This rationalization can, in some cases, lead to a network coverage reduction or to the perception by the public at large of a reduction in network coverage. However, even if justifiable, network rationalization is often confronted by resistance, individual interests being always difficult to balance with the public interest. Furthermore, network coverage is often associated with the terms of the USO and can therefore only be implemented to a limited extent. Consequently, even when network rationalization is necessary and has demonstrable benefits in improving the financial standing of USPs, it has not been viewed as the primary strategy for restructuring in the EU.

Rather, many USPs have attempted to increase revenues by diversifying their portfolio of activities to exploit their key strength: a ubiquitous presence in terms of counters and delivery. Diversification allows USPs to increase revenues with relatively small increases in their costs. The usual approach is through the development of new products belonging to the “traditional” postal market as well as through the introduction of new products such as financial services, administrative support and travel services. Several postal operators, such as TNT and DPWN, have successfully managed to diversify in logistics and transport activities through the acquisition of worldwide logistic operators. Others, such as La Poste (FR), have developed their own internal logistic activities.

Diversification into financial services has been one of the most important diversifications that has been implemented by postal operators and it was also probably to the most obvious to exploit since it allows the postal operator to leverage on their brand, customer base, network of counters, and existing experience in terms of support to or management of transactions between public authorities and citizens (tax bill payments and social benefit distribution). The following Table shows the relative importance of financial services in the total services for a selected number of postal operators that have diversified their activities to financial activities.

Table 4: Share of total revenues of POs derived from financial Services



* Source: La Poste/De Poste, presented at the Vienna Postal Conference March 20-21, 2006.

This figure clearly indicates the importance of financial services in the postal operators, this diversification being therefore a key means for postal operator to spread their fixed network costs over a broader range of activities, thereby reducing the burden associated with their USO coverage obligation.

Such diversification has taken several forms, depending on the financial resources of the postal operators and on market conditions. The most common are briefly described below:

Development of fully or majority owned bank: directly owned banks are developed as separate entities of postal operators. They are in possession of their own banking licenses and have concluded an agreement for using the distribution network of the postal operator, generally through an internal transfer fee payment. DPWN and Deutsche Postbank, as well as La Poste and La Banque Postale are typical examples of such type of diversification.

Development of banking joint venture: another possibility is to establish a joint venture with pre-existing banks. In Belgium, Fortis provides management services, back office and asset management services of financial product to a joint venture with La Poste/De Post. The joint venture pays a fee to La Poste/De Post for the utilization of its postal network. This case is similar to the previous one, to the exception that risks are shared between the postal operators and existing banks. This option is generally privileged in highly developed banking markets such as Belgium. Similar arrangements are implemented between the UK Post Office and Bank of Ireland and An Post and Fortis.

Integration of financial services: integrators are postal operators who distribute financial products under “white label” or co-branding from different financial services providers. In such cases, the postal operators control the product offers, are in charge of marketing and manage the clients’ database. Poste Italiane can be considered as an integrator. Its Banco Posta operates as a business unit without banking license, and is nonetheless the largest banking retail network in Italy. Similar arrangements are implemented for instance by Swiss Post.

Distributor of financial services: postal operators can also simply conclude distribution agreements with one partner. In this case they often distribute an entire family of financial products, the partner controlling often the product offer and the product marketing. The responsibility of the postal operator is therefore very much limited to the distribution of the financial products. Such arrangements are for instance in force between Correos Spain and Deutsche Bank, or between Posten Norge and DnB.

Shared network: another form of diversification / association, more symmetric and that exemplifies the value of a network of branches, can finally be listed. In this case, both the postal operator and a bank own a network in the form of a joint venture. Each partner pays fees based on volumes of sales associated to each partner. TNT and ING provide an example such a shared network model.

Diversification can also apply to other products besides financial products. In the United Kingdom, for instance, post offices are not “simple” post offices anymore but service centers, postal services being part of a broader portfolio of services that are offered to customers. This diversification was implemented through a large franchising initiative which began already in 1989. Services that are commonly provided in post offices include: postal services, travel services (passport support services, social support services, travel assurances, exchange office, etc), licenses (driver licenses, television licenses, fishing licenses, etc), telecom services (phone cards and prepaid cards for mobile phones) as well as financial services.

4. SUMMARY AND CONCLUDING COMMENTS ON POSTAL REFORM IN EU MEMBER STATES

4.1: Readiness of Member States for FMO

Considering both the market conditions analyzed in section 2 and the state of the USP analyzed in section 3, as well as the independence and experience of national regulatory institutions, one might pose the question as to the overall readiness of EU member states to profit from FMO. To provide some sense of this, and the variation in the challenges in introducing FMO across the EU, a scorecard of readiness for FMO was constructed for each of the 30 countries studied in PwC (2006). This scorecard considered 4 dimensions illustrative of the country readiness to adopt FMO:

1. Postal market characteristics favorable to efficiency gains and to the establishment of workable competition under FMO;
2. Current status and market orientation of postal regulatory institutions;
3. USP preparedness and adaptability for FMO;
4. Market alignment of the USO.

Several indicators were used to evaluate the state of the postal market and the USP in each country on each of these dimensions. Scores on these dimensions were combined using a geometric average of the 4 dimensions, normalized so that the average value was 100. Figures 17 and 18 show the result of this exercise.

Figure 17: Overall FMO “Readiness Index” for each country

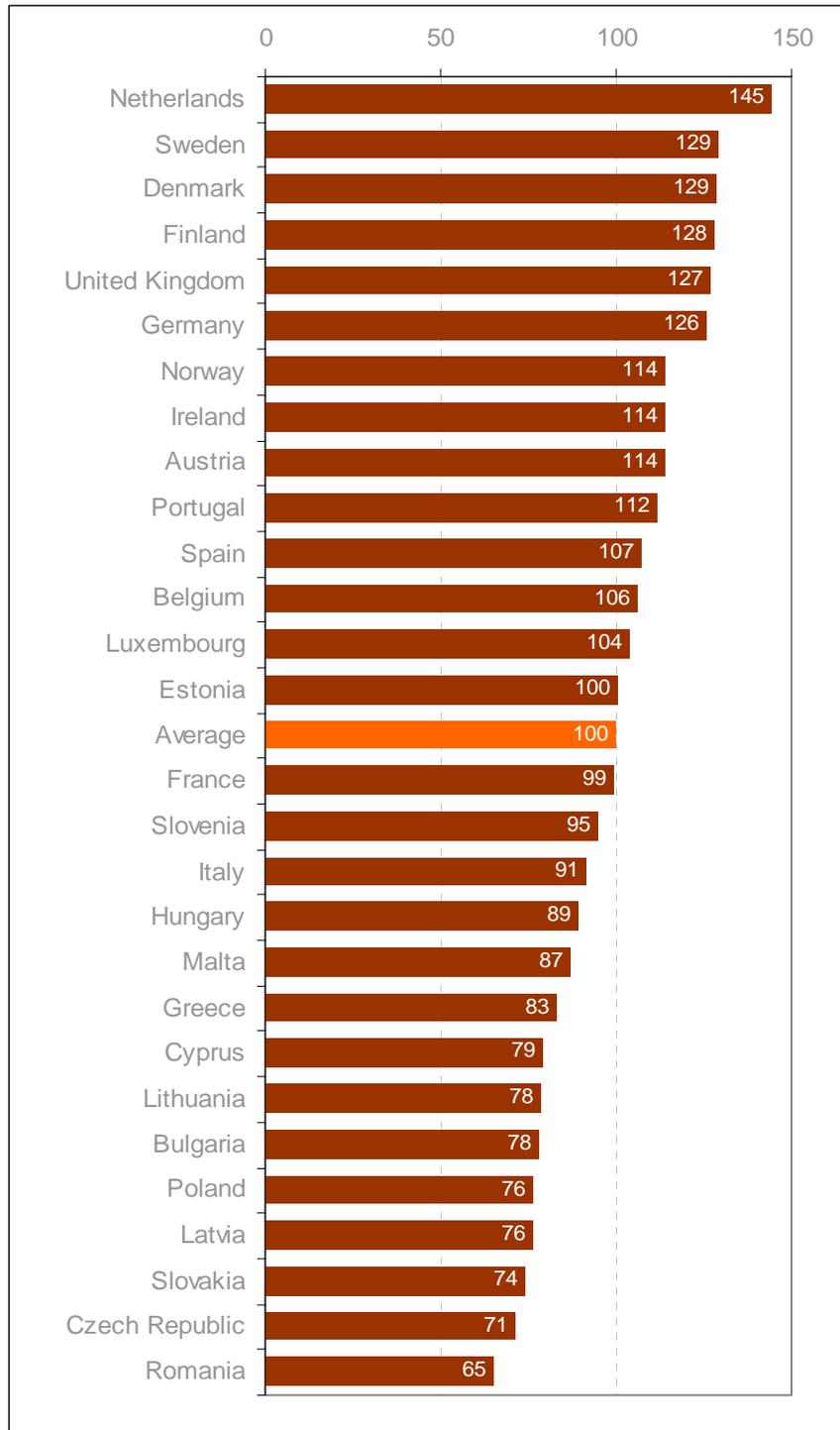
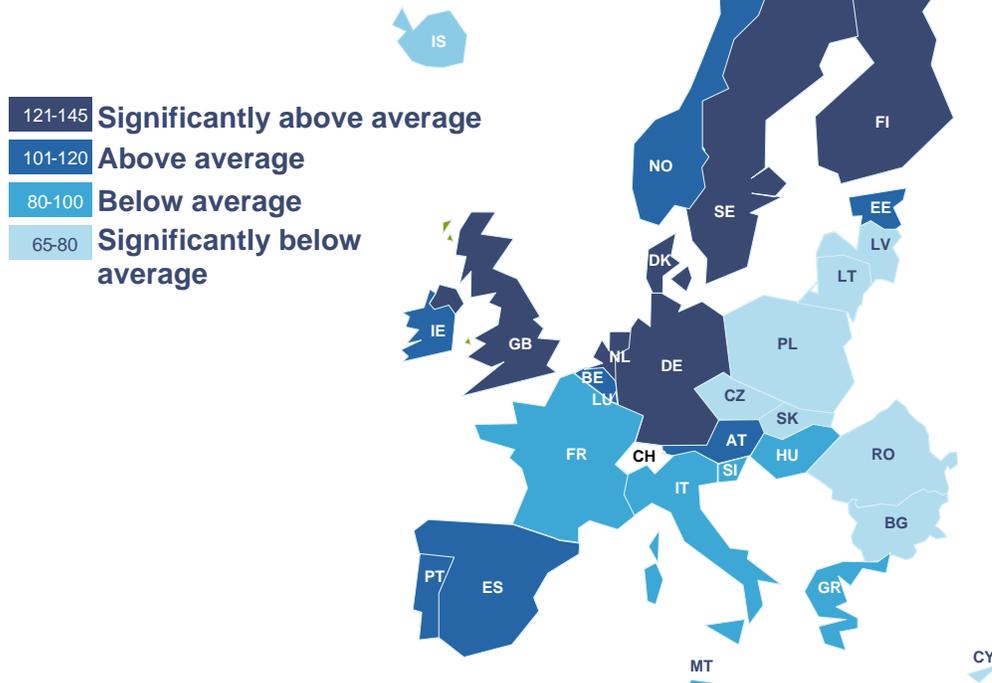


Figure 18: Comparative Assessment of European Postal Markets and USPs

Wide variety of country specific situations in terms of readiness for FMO



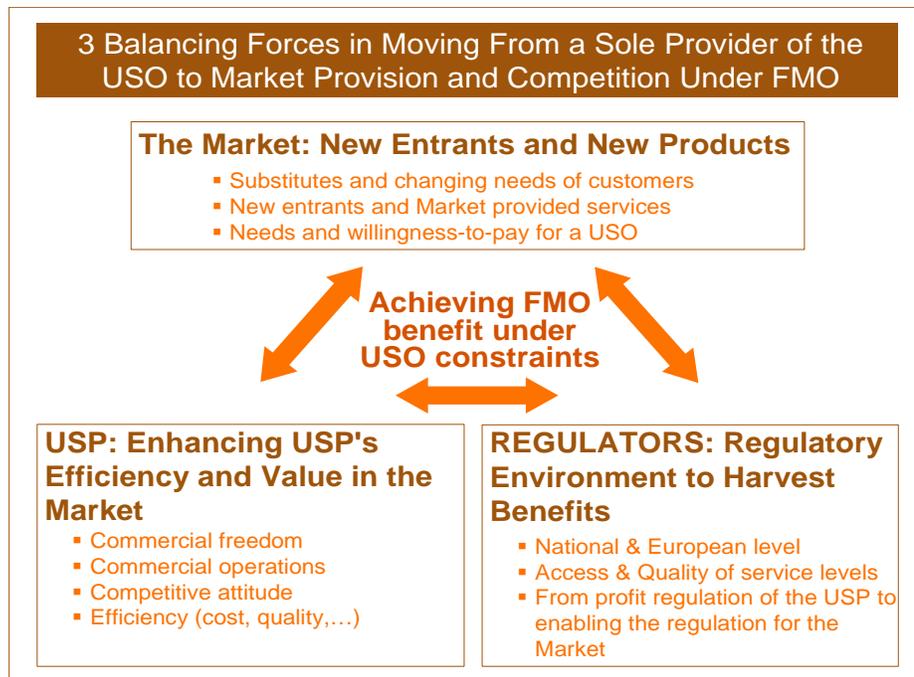
4.2: Conclusions on Postal Reform in the EU

Several lessons can be drawn from the studies and analysis undertaken to inform the postal reform and liberalization initiatives in the EU. First, assessing the impact of FMO in postal markets is a complex exercise because of the number of interacting factors that need to be taken into account to predict market outcomes, and the variability of these factors across countries.

The figure below shows the main forces centered on the USO and FMO in the EU. At the top are the key forces associated with market opening. At the heart of the ensuing competition are customer communication needs, which can be met by both traditional postal products as well as from substitutes. A second critical area of importance is the current national PO, which also acts in all Member States as the current USP. What happens to these POs is not just an abstract matter to be calculated on a spreadsheet. These POs embody broad historical mandates that have served their publics well over a long period of time. A key concern in the EU policy debate has been to ensure that these POs have the opportunity and the motivation to remain viable and to prosper in the new market environment.

The third key set of actors and balancing forces in the figure are regulators (both national and EU level). Their policies will be important in determining the nature of the interaction between entrants, the USP and customers, and they will structure the incentives and the means by which participants in these markets interact and the cash flows that they pay or receive.

Figure 19: USO, USP and Interacting Market Forces under FMO



The key question addressed in the debates beginning with the Postal Green Paper in 1992 and continuing through the Third Postal Directive in 2008 has been how to structure the interactions among these three main forces in the new era of FMO so as to assure that the USO, adapted to market conditions, can continue to be guaranteed and financed to all citizens in every Member State. The findings of various studies reviewed in this paper addressing this question have identified several general conclusions.

First and foremost, by increasing competition FMO embodies considerable advantages as a source of discipline and innovation for USPs and as a source of new value for customers in European postal markets. The impacts of FMO can be expected to be three-fold. First, there will be natural alignment of price, value and cost of postal products and significant pressures wherever there is mis-alignment in these attributes. USO products will also face these pressures and there will be limits on regulators' ability to resist these pressures, which arise from competitive entry, without adversely affecting the financial viability of USPs. Second, there will be great pressures on national POs as USPs to become more commercial and market-oriented, and to restructure their own products and processes to achieve this. Third, there will be changes for postal customers, with greater attention to market-driven needs.

In considering these impacts of FMO, studies have also noted that there are large differences across the EU Member States in terms of the current status of their markets and their USP and the likely consequences of FMO on consumer well-being, on the sustainability of the historical USO, and on the ability of the USP to sustain FMO without external support, specific financial compensation or restrictions on the speed and scope of introduction of FMO. There are also large commonalities across Member States, and these include the necessity to implement a sensible New Regulatory Model compatible with FMO, and not anchored in the past pre-FMO vision, which focused on a single USP rather than on the

overall efficiency of the postal market. Several important characteristics of this New Regulatory Model were noted.

Key drivers of the financial impact of FMO on USPs include cost differences between the USP and likely entrants, the level and stability of USP demand, and structural factors that underlie postal costs. These structural factors are related to the country demographic, urbanistic and geographic characteristics, as these interact with postal demand. There are also key internal or endogenous factors, driven by the preparedness of the USP for FMO, that will affect the outcomes of FMO in significant ways. In short, some USPs are better prepared to face FMO than others and this was one of the key areas of debate leading to the two-stage implementation dates of 2011 and 2013 in the Third Postal Directive.

There are complex interactions between cost, demand and structural factors in terms of their impact on key outcomes of interest, including financial consequences and requirements for the USP, price changes for various market segments likely to follow FMO, and the possibility that workable competition will follow FMO for particular Member States and, more broadly, across the EU.

USPs and national regulatory agencies in different Member States are at various levels of preparedness for FMO. Some began preparing for FMO more than a decade ago. Some have still barely begun. There are, nonetheless, some generally applicable principles related to pricing and access regulation that can be recommended across Member States that will allow a smoother and more efficient confluence with FMO. These include the pricing flexibility and incentives associated with price-cap regulation and the efficiency benefits of cost-based and negotiated access pricing.

The impact of FMO is likely to be that both competitors and incumbent national POs will begin to understand better the true quality preferences of customers of various sizes, the cost and profit consequences of alternative methods of serving these, and there will be a better alignment over time between the costs of providing services, including those understood to be a part of the USO, and the prices paid for them. This implies that to the extent that some customers are currently receiving some services at a subsidized level as part of the USO, there will be continuing tensions to either increase these prices or decrease the costs and scope of those elements of the USO until the alignment of prices and costs is achieved. Regulatory policy clearly plays an important supportive role in this process.

The approach taken at the EU level to assure FMO has also focused on establishing a level playing field for all participants in the market. Level playing field arguments will play an important role in assuring that entry which does occur is efficient. These arguments include abolition of the VAT exemption for all providers in the postal market, pricing flexibility for incumbents, as well as transparent and non-discriminatory access conditions to leverage the incumbent PO's network. Much remains to be done to implement the letter and the spirit of the Third Postal Directive, but it is very clear that liberalization of markets and commercialization of POs have both entered irreversible paths in Europe.

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* The present paper is forthcoming in M. Crew, P. Kleindorfer and J. Campbell (eds), *Handbook of Worldwide Postal Reform*, Edward Elgar, 2008. This paper relies significantly on the earlier PricewaterhouseCoopers study PwC (2006), in which all of the authors participated. This study, commissioned by the EC, was a prospective study on the sustainability of the postal Universal Service in each Member State and on how competition would impact the future provision of this Universal Service in a fully liberalized market.

¹ National POs of the 27 member states of the EU accounted for total sales of well over \$125 billion and employment of over 1.1 million people, with much larger aggregate sales and employment if one includes

worksharing/mail preparation organizations, newspaper distribution and the logistics sector. For details, see http://ec.europa.eu/internal_market/post/facts_en.htm.

² For details on the demand specification used, see d'Alcantara and Amerlynck (2006).

³ More generally, as analyzed by d'Alcantara and Gautier (2008), the cost structure of routes, driven by urbanization rate, scale and other factors, has come to be recognized as a critical driver of market share losses to entrants and the sustainability of the USO by the incumbent USP under competition.

⁴ In the absence of reliable and comparable postal data we used the percentage of urban population following United Nations, Department of Economic and Social Affairs, Population Division, Urban and Rural Areas

See http://www.un.org/esa/population/publications/wup2003/2003Urban_Rural.pdf

⁵ Concerning bulk mail volumes, for example, this is heavily triggered by the ratio of Direct Mail to total mail: in Italy for example a small proportion of mail - that is 19% - is composed of Direct Mail whereas in Germany the same proportion reaches 62%.

⁶ As is the case, for example, in Switzerland, and as has been proposed in Germany. See Dieke and Wojtek (2008) for a discussion of such sector-wide constraints.

⁷ See Ambrosini et al. (2006) for a comparative discussion of the scope of the USO.

⁸ See Bergum (2008) and Panzar (2008a) for a discussion of approaches to measurement of the cost of the USO. See Eccles (2008) and Panzar (2008b) for a discussion of the issues competition law and their interaction with the cost of the USO.

⁹ See http://www.psc.gov.uk/postcomm/live/about-the-mail-market/international-market-reviews/european-comparisons--letter-prices/2008_01_stamp_price_comparison_by_country.pdf.

¹⁰ See Felisberto (2008) for a discussion of the impact of anticipated liberalization on the speed of adoption of various of these efficiency measures in EU POs.

¹¹ Of course, there are revenue and quality benefits as well as cost effects from increased counter density. See the Trinkner et al. (2008) for an analysis.

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