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# The impact of the USO on the profitability of postal service provision in Finland

Heli Koski\*

## **Abstract:**

This study aims at investigating the order of magnitude of financial burden of the universal service obligation for the universal service provider. Prior studies have adopted various different cost accounting methods to assess the order of magnitude of net costs arising from postal universal service provision. This study, instead, uses econometric approach for predicting hypothetical profits that the universal service provider had earned without the universal service obligation, and then calculates the net losses for the firm. The econometric model takes into account the impact of cost efficiency on a firm's profits and further the universal service provider's entitlement to reasonable profits on postal markets. The data from the firms active in the postal and courier activities sector in Finland during the years 2005-2012 indicate that the profitability of universal service provider was clearly lower than that of competitors during the sample time period. The annual loss due to the universal service obligation was about 5 – 8 percent of the turnover of the universal service provider.

**JEL Classification:** D22, K20, L50, L87

**Keywords:** universal service obligation, profitability, net cost, postal services

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## 1. Introduction

In the postal services sector, the universal service obligation (USO) sets the minimum requirements for the designated universal postal services that have to be permanently provided to all citizens of a country (e.g., concerning delivery frequency, quality and pricing of services). In Europe, the European Union law<sup>1</sup> provides framework for defining the universal service obligation but the scope and terms of the USO vary across countries. One of the fundamental obligations is that the universal service has to be guaranteed at least five working days a week throughout the country, though in some countries (e.g., the UK) the minimum is six working days per week. The demand for the traditional core business of mail delivery, volumes of and revenues from the addressed letters, has dramatically declined though (see, e.g., Geddes, 2011; Lindhjem and Pedersen, 2012). As the USO prevents postal firms to fully adjust their costs of the universal letter service provision as well as places restrictions to the service pricing, the universal service providers' financial performance has weakened.

According to the European Union law, the universal service provider is entitled to compensation if the USO generates net costs or unfair financial burden for it<sup>2</sup>. The net costs of universal service are the difference between universal service provider's net cost of operating with the universal service obligation and without the USO. The order of magnitude of the net cost of the USO is difficult to evaluate, however, as it is not possible for the evaluator to observe how the universal service provider would act without the USO. The assessment of net costs is typically based on hypothetical scenarios on postal markets without the USO and the consequent cost and revenue implications for the designated universal service provider.

Various different cost accounting methods have been developed for evaluating the order of magnitude of the net costs of the USO (see, e.g., Frontier Economics, 2013)<sup>3</sup>. The methodologies as such are straightforward but their use typically involves a relative large number of

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<sup>1</sup>Directive 2008/6/EC of the European parliament and of the council of 20 February 2008 amending Directive 97/67/EC with regard to the full accomplishment of the internal market of Community postal services.

<sup>2</sup> The literature does not present unambiguous criteria for how unfair financial burden is determined. For instance, Jaag (2011) uses the following four different criteria to assess the unfairness of the financial burden of the USO: i) the universal service provider's profit in relation to its profit without universal service provision, ii) the universal service provider's absolute profit level, iii) the universal service provider's profit compared to its competitors profits, and iv) changes in the universal service provider's and the competitors' profits due to the USO. According to the study of CERP (2008), financial burden of the USO is unfair only if the net costs of the USO exceed a certain threshold.

<sup>3</sup> The three major methodologies used for calculating the net costs of the USO are the deficit approach, the net avoidable cost method and the profitability cost approach. See (Frontier Economics, 2013) for detailed description of these methodologies.

(hypothetical) assumptions on firm/market behavior as well as rather burdensome evaluation and calculation process<sup>4</sup>. Some recent studies have further used a contingent valuation survey to evaluate customer preferences and to estimate the order of magnitude of social benefits of postal service provision (see Lindhjem and Petersen, 2012).

This study introduces a novel approach for assessing the order of magnitude of the net costs of the USO for the universal service provider. Instead of the accounting methods, it uses econometric modeling and analysis for evaluating the net costs of the USO. In the first stage of the analysis, profits are estimated as a function of the average costs and turnover among non-regulated firms on postal markets. In the second stage, the estimated competitive market parameters are used for forecasting the hypothetical profits of the universal service provider without the USO. The estimated econometric model explicitly takes into account cost efficiency and reasonable profits in determining the hypothetical profits of the universal service provider. The net costs of the USO can be calculated as the difference between the actual and estimated hypothetical profit of the universal service provider.

None of the previously used cost accounting approaches, unlike the econometric model adopted in this study, explicitly considers the universal service provider's entitlement to reasonable profits. Neither the European Union legislation nor the Finnish Postal Act provides definition for what is meant by "reasonable profits". Here, we use the approach of the economics of regulation: fair or reasonable return is defined by the returns required by investors as compensation for risk bearing, and it is *"most accurately measured by observing the returns to competitive firms in otherwise similar circumstances"* (see, e.g., Marshall et al., 1981). Consequently, we use the estimated (size-weighted) average profit margin of firms functioning in the postal and courier activities sector as a measure of the reasonable profits that the universal service provider is entitled to.

This study uses firm-level data from the universal service provider and other firms active in the postal and courier activities sector in Finland from the years 2005 – 2012 to estimate the net costs of the USO. It finds that the universal letter service provision generates a notable financial burden for the designated universal service provider in Finland. According to the estimations, the annual net costs of the USO cover about 5-8 percent of the universal service provider's turnover.

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<sup>4</sup> It is illustrative that the manual written by Copenhagen Economics (2008) for calculating the net costs of the USO has close to two hundred pages.

The rest of the paper is organized as follows. Section 2 first briefly discusses the characters of the postal services markets and the definition of the postal USO in Finland. It then sheds light on the evolution of the competition in the postal and courier activities sector from the year 2000 to 2012. Section 3 introduces the econometric model used in the empirical analysis and presents the estimation results. Section 4 concludes.

## 2. USO in Finland

### 2.1 Postal service markets and USO in Finland

The European Regulators Group for Postal Services (ERGP, 2012) reports that there are country-specific differences in the scope of services considered as postal services among the ERGP member countries, and that the scope of the universal service is also different from one country to another. In Finland, postal services are divided into the four major groups: addressed letters, unaddressed letters, newspapers, and parcels. In 2011, the market size of postal services exceeded 1.3 milliard euros (Ministry of Transport and Communications, 2013). Figure 1 shows the market sizes of different postal services groups in 2011. The share of addressed letters was 40 percent, parcels one third, newspapers one fifth, and the unaddressed letters 7 percent of the total value of postal services.

In Finland, the postal markets were fully opened up to the competition already in 1994. However, a license that is granted by the government for the maximum ten years is required for a firm functioning in the markets for addressed letters. So far, Itella has maintained its monopoly position in the delivery of addressed letters though two regional licenses have been granted<sup>5</sup>. The two companies active in the postal and courier activities sector that filed and were granted the licenses haven't so far entered the market for the addressed letters. Instead, competition has developed in other postal services of which provision do not require license, i.e. the delivery of unaddressed letters, newspapers, and parcels.

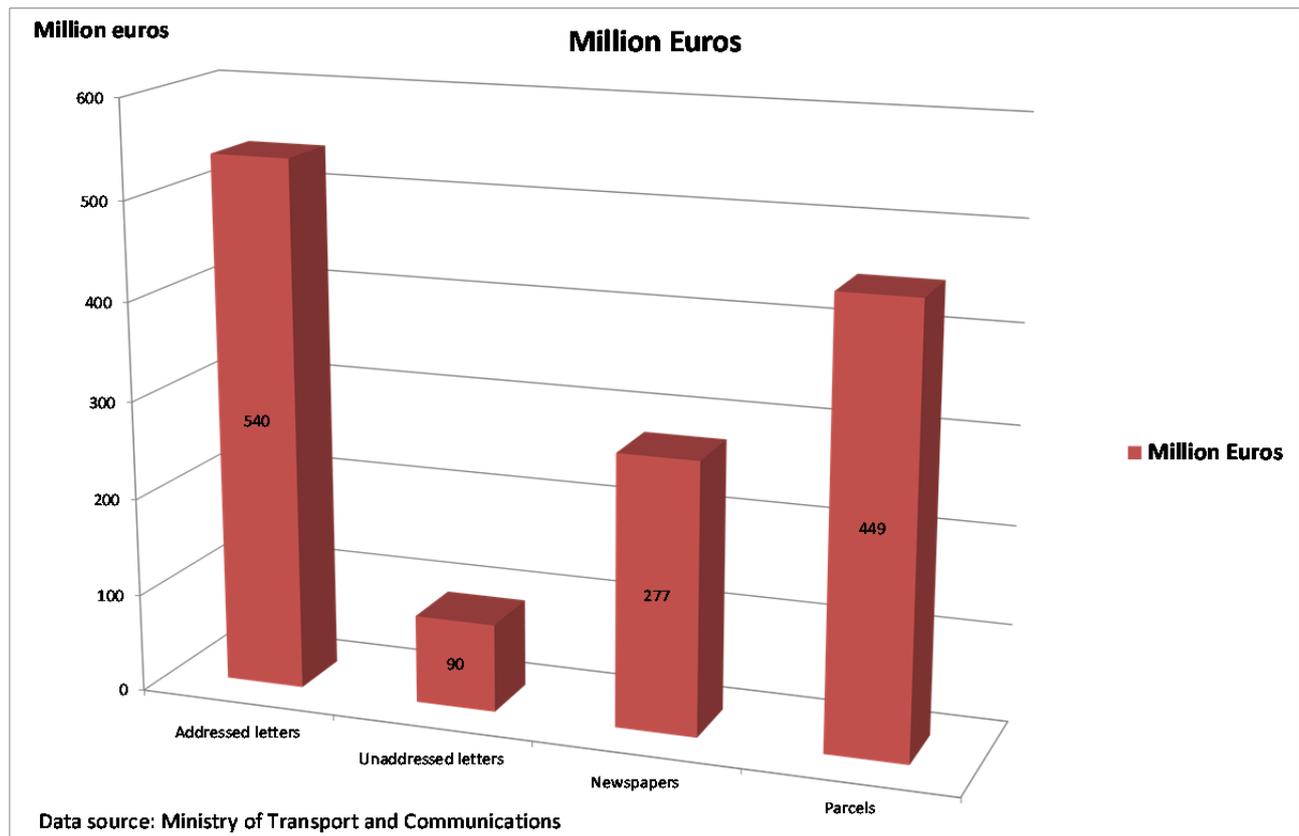
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<sup>5</sup> The government granted one 10-year license covering 15 municipalities in March 2012, and another similar license covering 11 municipalities in February 2012. These licenses also involve obligations such as delivery obligation at least three times per week, having at least one postal facility in each municipality covered by the license, and obligation to provide postal services with undiscriminating prices.

addressed letters though two regional licenses have been granted<sup>6</sup>. The two companies active in the postal and courier activities sector that filed and were granted the licenses haven't so far entered the market for the addressed letters. Instead, competition has developed in other postal services of which provision do not require license, i.e. the delivery of unaddressed letters, newspapers, and parcels.

Figure 1. Postal markets in Finland, 2011



The Finnish Communications Regulatory Authority<sup>7</sup> determines the coverage and holder of the universal obligation, and further supervises universal service provision and pricing in Finland. Currently, the universal service obligation concerns only Itella Corporation. Postal Act (29.4.2011/415) obligates the universal service holder to organize permanent provision of letters (max 2 kg) and parcels (max 10 kg) paid in cash throughout the country, inbound cross-border items (max 20 kg) and their registration and insurance

<sup>6</sup> The government granted one 10-year license covering 15 municipalities in March 2012, and another similar license covering 11 municipalities in February 2012. These licenses also involve obligations such as delivery obligation at least three times per week, having at least one postal facility in each municipality covered by the license, and obligation to provide postal services with undiscriminating prices.

<sup>7</sup> The Finnish Communications Regulatory Authority is an independent organization that is responsible for supervising the compliance with the Postal Act and related regulations.

services. The prices of services need to be reasonable and undiscriminating. Furthermore, there are minimum restrictions for mail collection and delivery of universal postal services: letters have to be collected and delivered at least five working days per week throughout the country<sup>8</sup>, and parcels within reasonable time. Also, the quality of the universal service provision is regulated. The universal service provider has to deliver minimum 80 percent of 1<sup>st</sup> class letter next working day, and 95 percent (98 percent) of 2<sup>nd</sup> class letter second (third) working day after posting. The coverage and location of postal facilities must further be in compliance with the USO (e.g., there has to be at least one postal facility in each municipality).

## 2.2 Competition in postal and courier activities sector in Finland

This study uses Asiakastieto<sup>9</sup> firm-level financial data from firms active in the postal and courier activities sector (NACE Rev. 2, 53) during the years 2000-2012. As we focus on postal service provision, we use data from Itella Mail Communications business group obtained from Itella Corporation (not Itella corporate level data<sup>10</sup>). Furthermore, as the reference group used in the empirical analysis should preferably primarily function in the postal services markets, those firms not clearly active in the same markets with Itella Mail Communications were removed from the database<sup>11</sup>.

We first shed light on the question how competition has evolved, or how firm profitability has changed, over time in the Finnish postal and courier activities sector. The industry-level change in profitability is composed of the change of profitability among continuing firms and restructuring. Continuing firms, annually, comprise those firms that have also been active in the postal and courier activities sector during the previous year. Restructuring increases (decreases) profitability when relatively more efficient (inefficient) firms enter industry, inefficient firms exit industry and/or market share of relatively more efficient (inefficient) firms increases. Industry-level change in profitability, or in the operating profit margin, between time t and t-1 can be calculated as follows:

$$\frac{\text{Operating profit of industry}_t}{\text{Turnover of industry}_t} - \frac{\text{Operating profit of industry}_{t-1}}{\text{Turnover of industry}_{t-1}} \quad (1)$$

<sup>8</sup>The law provides an exception to the minimum frequency of mail collection and delivery for the maximum 300 households located in the areas that are difficult to access.

<sup>9</sup> Asiakastieto is a Finnish company that collects, maintains and sells firm-specific financial and credit information.

<sup>10</sup> Itella Group comprises three major business groups: Itella Mail Communications, Itella Logistics and Itella Information. Itella Mail Communications provides postal services.

<sup>11</sup> For instance, taxi and ambulance service companies (and one restaurant) that were reported to be active in postal and courier services sector (NACE Rev. 2, 53) were removed from the database. Also, logistics firms competing with Itella Logistics business group were eliminated from the data.

Change in profitability among continuing firms using the firms' market shares as weights can be written as follows:

$$\sum \overline{ms}_i \left( \frac{\text{operating profit}_{i,t}}{\text{turnover}_{i,t}} - \frac{\text{operating profit}_{i,t-1}}{\text{turnover}_{i,t-1}} \right) \quad (2)$$

, where  $\overline{ms}_i$  is the average of a firm  $i$ 's market shares at times  $t$  and  $t-1$ .

Negative (positive) change in profitability among continuing firms indicates increase in competition. Upward (downward) trend in restructuring provides further support for this conclusion.

Figure 2. Profitability of postal and courier activities sector in Finland

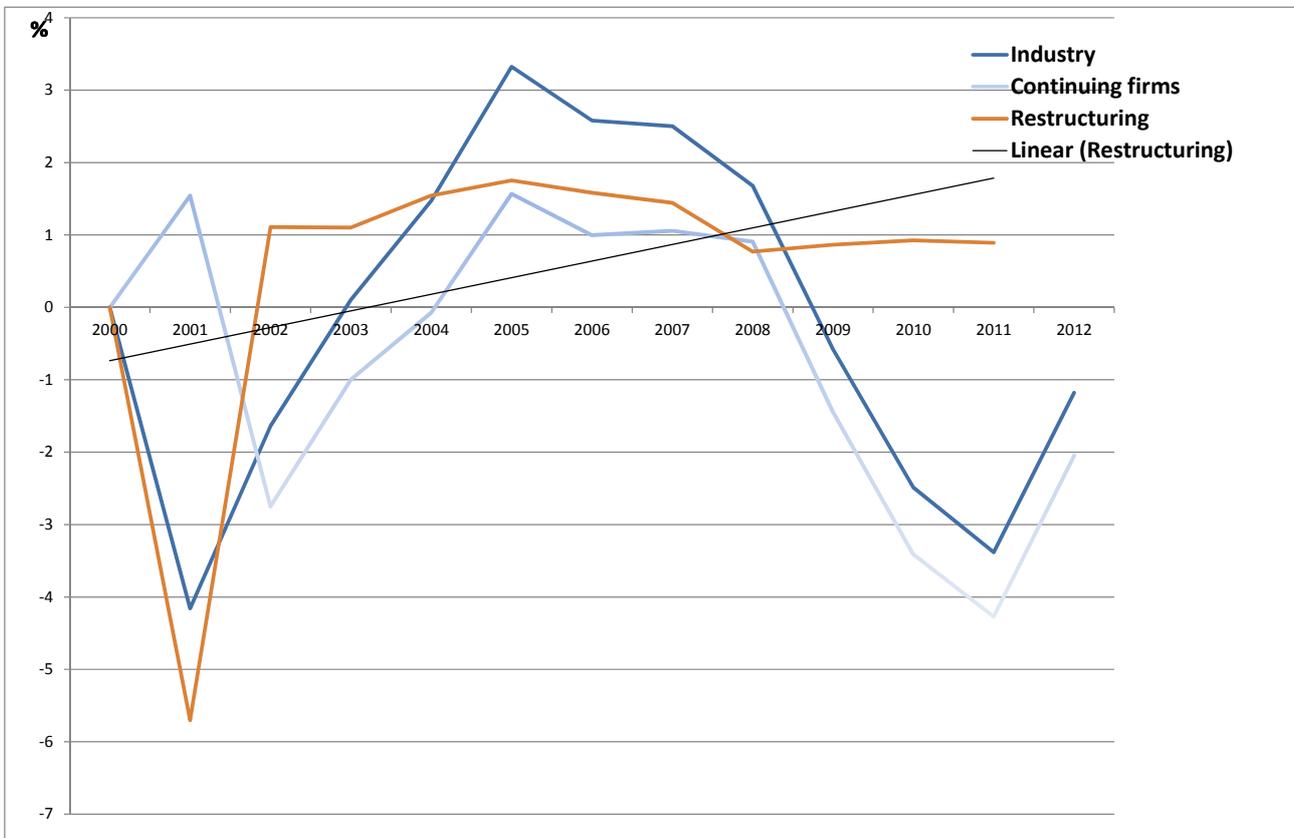
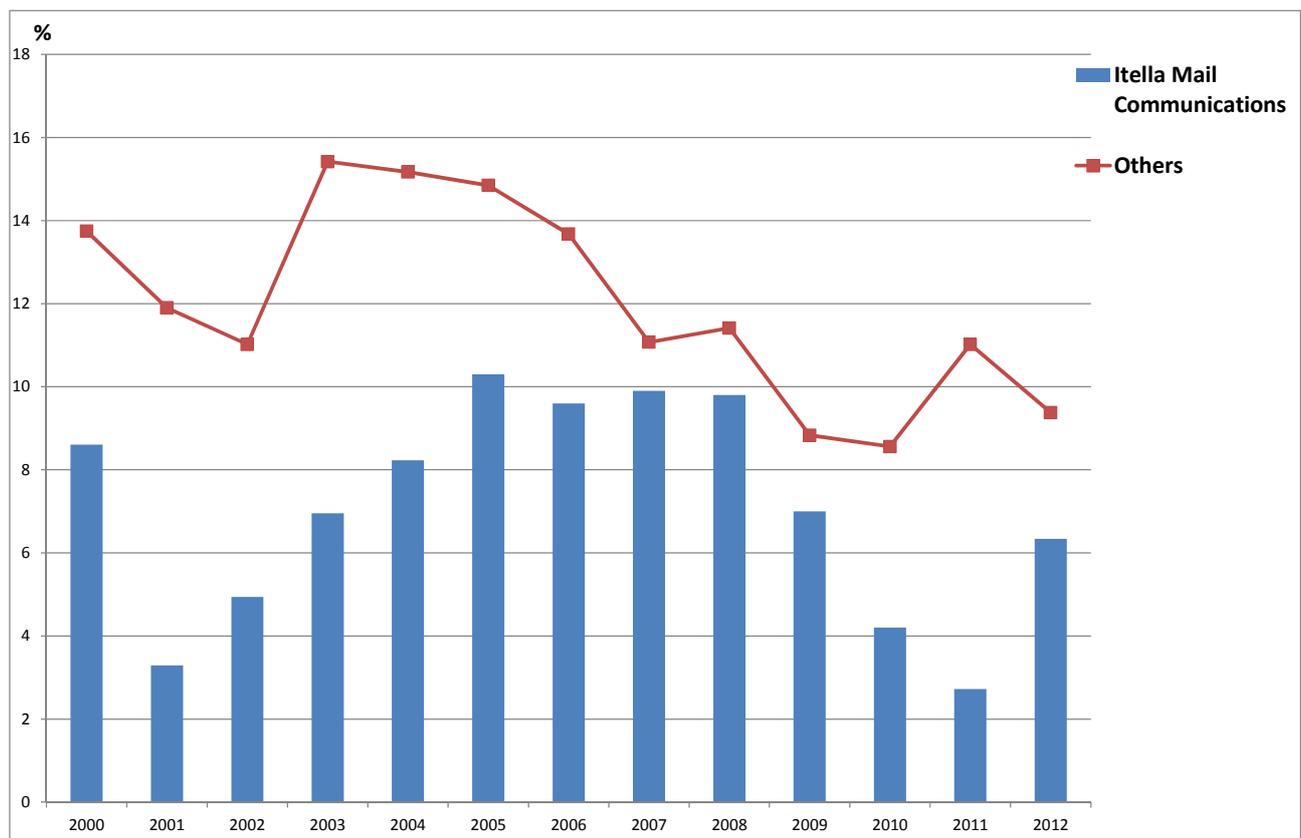


Figure 2 compares the profitability of firms active in the postal and courier activities sector to their profitability in the year 2000. In other words, the profitability indicators of Figure 2 get value 0 in the year 2000 and each annual observation tells a *percentage point change* in profitability compared to the year 2000. It shows that since the mid-2010s both the profitability of continuing firms and industry-level profitability have decreased, while the restructuring trend-line is upward.

This means that either the market shares of relatively efficient firms have increased, and/or relatively inefficient (efficient) firms have exited (entered) the markets for postal services. These observations generally reflect increase in competition.

Figure 3. Operating profit margin: Itella Mail Communications vs. other postal and courier service providers



How is then the profitability of the universal service provider evolved in comparison to that of the average firm in the sector? Figure 3 compares the operating profit margin of Itella Mail Communications and other postal and courier service providers during the years 2000 – 2012. It clearly shows that the profitability of Itella Mail Communications has been lower than the other firms' profitability on average.

### 3. Empirical analysis

#### 3.1 Econometric model

Empirical exploration of the net costs or the profitability impact of the USO is challenging as the evaluator does not observe how the universal service provider would act without the universal service obligation. According to the European Union law, the net costs of universal service should be calculated “...as the difference between the net costs of a designated universal service provider operating under a universal service obligation and not operating under a universal service obligation”.<sup>12</sup> Furthermore, the assessment of the net costs should take into account incentives for cost efficiency, the entitlement for a reasonable profit, and any intangible or market benefits accruing from the universal service provision. The empirical method applied in this study aims at complying with the EU law principles in the calculation of the net costs of the postal USO. The econometric model explicitly takes into account cost efficiency and reasonable profits but not necessarily all intangible or market benefits arising from the universal service provision. Potential impact of these benefits on the net costs of the USO will be separately evaluated.

Here, we adopt a two stage approach to assess the impact of the USO on the profitability or the net costs of the universal service provider. In the first stage, we estimate the model for profit elasticity among the firms active in the postal and courier activities sector without the USO. In the second stage, we use the estimated parameters from the competitive markets to forecast the annual operating profits of the universal service provider if it acted on postal markets without the USO. Then, the net costs of USO are calculated as the difference between the forecasted annual operating profits of the universal service provider in competitive markets without the USO and its actual annual operating profits.

The econometric model used for estimating profit elasticity is adopted in various prior empirical studies focusing on changes in competition and firm profitability (see, e.g., Creusen et al., 2006; Bikker and Leuvensteijn, 2008). The dependent variable of the model is a firm’s profit margin, and the primary independent variable is the average variable cost of a firm. The proxy for the average variable cost is obtained by dividing a firm’s short-term variable and fixed costs by its turnover. Log-log –specification incorporating only the average variable cost variable on the right hand side

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<sup>12</sup> Directive 2008/6/EC of the European parliament and of the council of 20 February 2008 amending Directive 97/67/EC with regard to the full accomplishment of the internal market of Community postal services.

equation is quite widely used specification in the literature for estimating profit elasticity (see, e.g., Amadore and Soares, 2012). To avoid bias arising from the elimination of all loss-making firms (i.e., those with negative operating profits), we estimate the model at levels.

Also, we include a firm's turnover as the independent variable. This variable captures how the average industry operating profit changes in relation to the firm size. The idea is to control the reasonable profits that the universal service provider is entitled to. Reasonable profits are measured here by the average profit margin of competitive firms functioning in the postal and courier activities sector. Some prior studies further address that controlling firm size is important for obtaining accurate estimates for the profit elasticity (see, e.g., Peroni and Ferreira, 2012). Table 1 provides the descriptive statistics of the key variables used in the estimations.

*Table 1. Descriptive statistics*

	Mean (s.d.)	Obs.
Operating profit, million euros	1.95 (13.50)	482
Average variable costs	0.89 (0.14)	482
Turnover, million euros	23.59 (157.60)	485

The estimated Fixed Effects model<sup>13</sup> for the profit elasticity can be written as follows:

$$\pi_{it} = \alpha_i + \beta_1 AVC_{it} + \beta_2 S_{it} + \beta_t Year_t + \varepsilon_{it} \quad (3)$$

where  $\pi_{it}$  is the operating profit for a firm  $i$  at time  $t$ ,  $AVC$  denotes the average variable costs of a firm,  $S$  is the sales or turnover of the firm, and the variable  $YEAR$  comprises a vector of annual dummy variables for the years 2006-2012. The data used in the estimations is restricted to the years 2005-2012 due to the limited availability of required financial data separated into the USO and non-USO activities from Itella Mail Communications.

<sup>13</sup> The estimations of the random effects model and the fixed effects model, and the consequent Hausman test suggested that the time-invariant unobserved effects are correlated with the other regressors of the model. Thus, the random effects model may produce biased estimates, and the fixed effects model was used in the estimations. The fixed effects model has further the advantage that the estimated coefficient  $\alpha_i$  captures the impact of firm-specific characteristics on profits.

The estimated coefficient  $\beta_1$  captures the relationship between a firm's relative cost efficiency and its profits. In competitive markets, the coefficient should be negative as higher average variable costs (i.e., less efficiency) mean lower profits for a firm. The lower the estimated value of  $\beta_1$ , the more the relative cost inefficiency punishes firm by reducing its profits. The more competitive the markets for postal services are - i.e., the lower is the estimated coefficient  $\beta_1$  - the more the model "punishes" the universal service provider for relative inefficiency. In other words, the higher (lower) the universal service provider's average variable costs relative to its competitors, the lower (higher) hypothetical profits the model predicts for it. Thus, the calculated net costs of the USO – i.e., the difference between the estimated hypothetical profits and materialized profits – are higher for a more efficient universal service provider, other things kept equal. In other words, the model rewards cost efficiency by producing a higher estimate of financial burden for more efficient universal service provider.

The estimated coefficient  $\beta_2$  captures the change in the order of magnitude of operating profits in relation to a firm's turnover, on average. It defines the universal provider's entitlement to reasonable profits on postal markets consistently with the economics of regulation literature. Reasonable returns are defined to be those required by investors as compensation for risk bearing and best measured by "*returns to competitive firms in otherwise similar circumstances*" (see, e.g, Marshall et al. 1981). Here, we use the estimated (size-weighted) average profit margin of firms functioning in the postal and courier activities sector as a measure of the reasonable profits that the universal service provider is entitled to.

The model is estimated using 3-year moving averages of the variables to smooth short-term fluctuations in data. We first estimate the model unweighted, letting each firm have equal weight in the parameter estimates. Second, we estimate the model using turnover-weights. This gives more weight to larger firms in the parameter estimates, and is thus likely to produce more applicable parameters for forecasting hypothetical profits of large, incumbent universal service provider. The size-weighted estimations importantly take into account that the firm profit margin may vary by firm size as some previous reports indicate (see, e.g., OECD, 2013).<sup>14</sup>

In the second stage of the analysis, the estimated parameters from the first stage are used for forecasting profits of the universal service provider if it had operated in postal markets without

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<sup>14</sup> The OECD (2013) report using data from the United States shows that the profit margins of small firms tend to be higher than those of the larger ones.

the USO. In Finland, the markets for postal parcels are competitive and only a marginal share of Itella Communications' revenues is generated from universal parcel services. Therefore, the net cost of the USO primarily arises from the provision of universal letter services. This empirical study aims at detecting the order of magnitude of the net costs of the universal letter service provision for the universal service provider. To do that, we assume that in the hypothetical scenario of competitive markets, Itella wouldn't provide universal letter services at all. For the estimation of profit forecast, Itella Mail Communications' annual turnover in competitive markets is generated by deducting from the total turnover of Itella Mail Communications its turnover from universal letter services. Correspondingly, to obtain average variable costs of non-USO services, the annual revenues and costs from the universal letter provision are not included into the calculation of the average variable costs of Itella Mail Communications<sup>15</sup>.

### 3.2 Estimation results

Table 2 presents the estimation results of equation 3. The estimated unweighted fixed effects model for profit elasticity among non-regulated firms explains about 64 percent of variation in the firms' profit levels, while the explanatory power of turnover-weighted model is higher: 78 percent. The size-weighted estimations produce statistically more precise forecasts for the universal service provider's hypothetical profits than the unweighted estimations. Based on the unweighted estimations, the average net cost of the USO during the sample years was 71 million euros. The 95 % confidence interval of the estimate was rather wide, i.e. 40-100 million euros.

Using the size-weighted estimations, the average net cost of the universal letter service provision for Itella Mail Communications during the years 2005–2012 was about 76 million euros. The average annual net cost covered almost 7 percent of Itella Mail Communications' turnover during the sample years. The 95 % confidence interval was about 62–95 million euros (or about 5–8 percent of the universal service provider's turnover). In 2012, the estimated net cost of universal letter service obligation was about 90 million euros, and the 95 % confidence interval 74–107 million euros.

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<sup>15</sup> Data (separating non-USO and USO activities) to calculate the average costs of non-USO services of Itella Mail Communications were available only for the years 2010-2012. Therefore, the average costs of all activities were used as a proxy of the average costs of non-USO services for the years 2005-2009.

Table 2. The estimation results of the fixed effects model---5-year moving average

Dependent variable: Operating profit		
	FE	FE weighted
Average variable cost	-0.87** (0.45)	-6.38 (3.89)
Turnover	0.15*** (0.01)	0.16*** (0.01)
Year_2006	-0.02 (0.03)	0.09 (0.23)
Year_2007	-0.11*** (0.03)	-0.55*** (0.14)
Year_2008	-0.20*** (0.07)	-1.20*** (0.38)
Year_2009	-0.18** (0.08)	-1.34*** (0.41)
Year_2010	-0.18*** (0.07)	-1.13*** (0.30)
Year_2011	-0.17*** (0.06)	-1.01*** (0.24)
Year_2012	-0.19** (0.08)	-1.30*** (0.29)
Constant	0.63 (0.41)	2.96 (3.89)
Observations	484	402
Firms	106	76
R-square	0.64	0.78

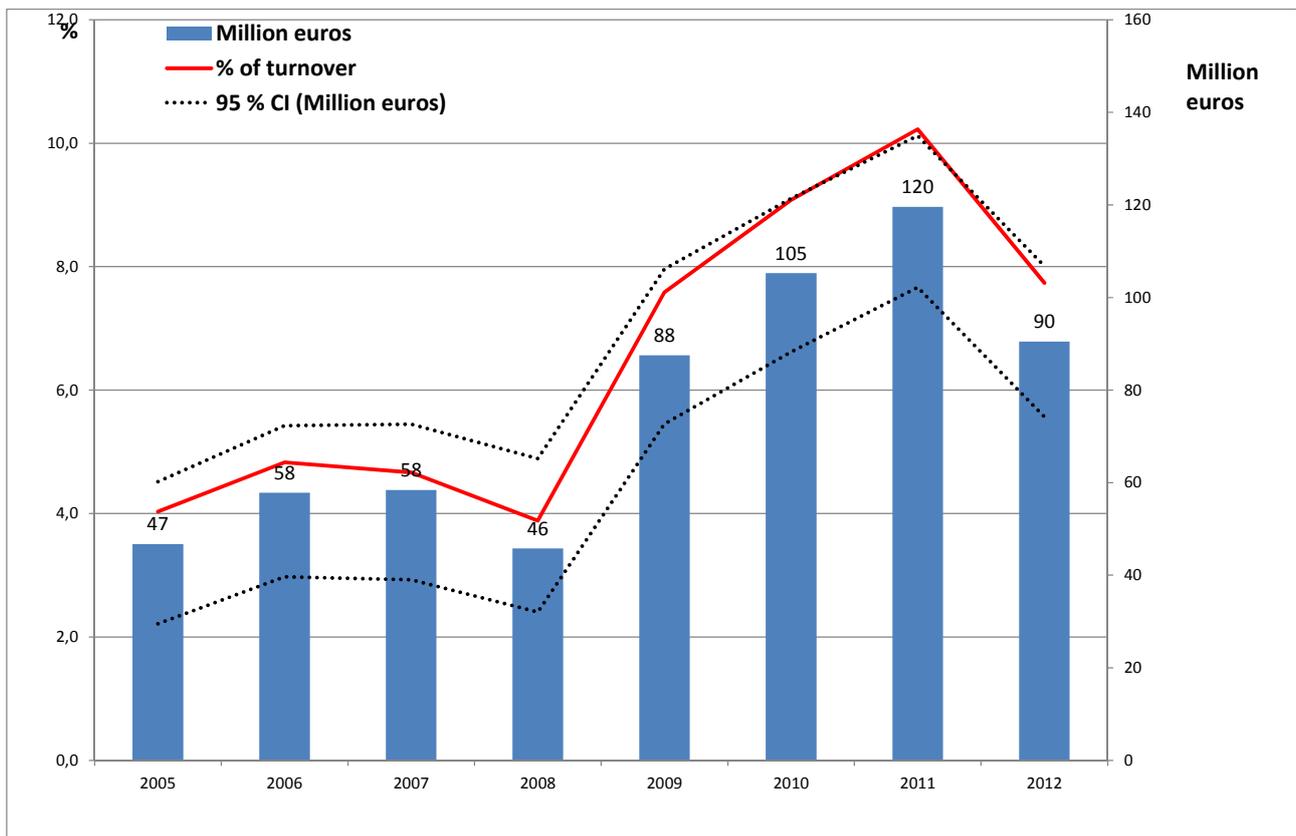
The robust firm cluster-specific standard errors are reported in the parentheses. Significance levels are reported on superscripts, where \*\*\* denotes significance level of 1%, \*\* significance level of 5% and \* significance level of 10%.

The turnover-weighted estimation of the fixed effect model provides more precise estimates of the net costs of the USO than the weighted estimations. Figure 4 thus summarizes the size-weighted estimated annual net costs of universal letter service obligation for the universal service provider.

The reported empirical analysis explicitly takes into account the universal service provider's entitlement to reasonable profits and incentives for cost efficiency but it does not necessarily capture all intangible and market benefits of the USO. Intangible and market benefits of the USO are those that intrinsically and directly relate to having the USO, but not those benefits that the universal service provider would continue having without the USO (e.g., benefits accruing to the universal service provider from historical reasons). According to the assessment of Copenhagen

Economics (2011), in Finland, there are three potentially relevant intangible and market benefits of the postal USO: i) the value—added tax (i.e., VAT) exemption, ii) consumer preferences for the universal service provider, and iii) exemptions from customs and excise legislation.

Figure 4. Loss in profits due to USO (% of turnover and euros)



In Finland, legislation granting the VAT exemption for universal postal services sold by the designated universal service provider came into a force in June 2011. Currently, VAT for postal services is 24 percent. Thus, the VAT exemption provides a notable benefit for the postal universal service provider. The analysis, however, already takes into account the benefit accruing from the VAT exemption to the universal service provider: a firm’s turnover in accounts used in the analysis comprises firm sales net of VAT.<sup>16</sup> Thus, the materialized operating profit of Itella, to which it’s

<sup>16</sup>The benefit from the VAT exemption for Itella concerns only the years 2011 and 2012 when the law providing VAT exemption for universal postal services was in force.

estimated hypothetical operating profit is compared to, is the order of magnitude of VAT benefit lower than it would be without the VAT exemption.

Consumer preferences for the universal service provider comprise only those benefits directly arising from the universal service provider status (i.e., from consumers choosing Itella due to its universal service provider status). The postal service survey of Ministry of Transport and Communication (2013b) gives some information on the Finnish consumers' postal service preferences. The survey indicates that particularly lower prices and higher quality would induce customers to switch from the postal universal service provider to its competitor if it were available. Only relatively small share of households (i.e., 13 percent) and companies (i.e., 9 percent) reported that they wouldn't switch on any condition or that they didn't see any reason to switch from the current universal service provider to its competitor. This survey does not, however, reveal what share of the respondents wouldn't switch from Itella to use its competitor for its universal service provider status only.

Itella is the designated operator in the Universal Postal Union (UPU) agreement, giving it certain special privileges in customs clearances (e.g., simplified documentation). This may speed up the international mail of Itella Mail Communications compared to its competitors, and consequently it may be the preferred postal firm of the customers for providing international mail services. The customs privileges concern only international mail to and from the countries that do not belong to the free-trade area with Finland (i.e., Itella cannot obtain any custom privileges for the international mail sent within the European Economic Area). This represents a minor share of the total mail, and thus the potential benefit from customs privileges for Itella is likely to be negligible.

#### **4. Conclusions**

This study introduces a new approach to assess the order of magnitude of financial burden of the universal service obligation for the universal service provider. It uses an econometric model explicitly taking into account the universal service provider's entitlement to reasonable profits and its cost efficiency in determining the net costs of the USO. The Finnish data suggest that the average annual net costs of universal letter service provision during the years 2005-2012 was about 76 million euros, or almost 7 percent of the universal service provider's turnover. The confidence interval of this point estimate was between 60 and 92 million euros. The net cost of

the universal service provision was thus about 5-8 percent of the universal service provider's turnover.

Previous evaluations of the net costs of the postal USO have adopted different cost calculation methods. In the United States, PRC (2008) calculated that the postal USO was about 6-10 percent of the turnover of the United States Postal Service. This estimate is rather close to the one obtained in this study. On the other hand, Copenhagen Economics (2008) concluded that the net costs of the postal USO in Denmark were negligible. Substantial differences in the net costs of the postal USO between densely populated countries (such as Denmark) and sparsely populated countries (such as Finland) seem reasonable.

This study has not aimed at evaluating how the universal service provider would have changed its behavior in the markets for addressed letter services without the USO, or how increased competition in the markets for universal letter services would affect the universal service provider's profits. According to the reported analysis, the universal letter service provision in Finland is unprofitable for the designated universal service provider. Whether the universal service provider would function in competitive markets without the USO, it would thus either make profitability increasing changes in its addressed letter services (e.g., via pricing and changing the frequency of collection and delivery of letters) or discontinue unprofitable letter services. In both cases, the net costs of the letter USO would be at least as high as reported in this study. The reported estimates of the net costs of the USO thus represent the lower bound of the net costs of the USO.

Clearly, there is need for more research on the empirical assessment of the net costs of the USO. The econometric approach adopted in this study has not previously been used for the evaluation of the order of magnitude of the USO. Further tests using data from different countries, or possibly different regulated network industries such as telecommunications sector, would be needed to evaluate the accuracy of the used econometric model for estimating the net costs of the USO. Also, the comparison of the results from the econometric analysis to the calculated net costs obtained using the previously adopted cost accounting methodologies would be interesting.

The used econometric model takes into account the impact of cost efficiency on firm profits as well as the universal service provider's entitlement for reasonable profits but it does not explicitly take into account the role of intangible assets. Continuing e-substitution of traditional letters

changes the markets for postal services as well as postal service business models, and induces firms to develop innovative service solutions. This further enhances the role and importance of intangible assets for postal service firms. The role of intangible assets - both contemporarily and how it has changed due to the digitalization of services - in the firm's profitability in the postal services sector would be an intriguing topic for the future research.

Also, the application of the econometric model in this study neglects strategic behavior of the universal service provider and indirect demand effects that might affect the outcome in the competitive markets without the USO. The next steps in further developing the econometric approach to assess the net cost of the USO would benefit from the inclusion of such factors into the analysis.

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