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The Effect of Flexible Pricing on Entry into the US Letter Market

Robert Cohen and Charles McBride
George Mason University

Introduction

In the GMU study¹ on the value of the letter monopoly, it was hypothesized that if the incumbent were given the freedom to adjust its prices for contestable mail, an entrant would be able to capture only a very limited amount of mail and the monopoly would be shown to have little value. This paper investigates that hypothesis by examining the effect of flexible pricing on efficient and inefficient entry into the US letter delivery market. The entrant's frequency of delivery and the amount of contestable mail in the market appear to be the most important variables (that we have modeled) in determining the success of the entrant. Consequently, the paper develops the sensitivity of the incumbent's loss of profits to both variables.

A delivery profit curve for the USPS was developed as part of the research for this paper.² It appeared that the results of the model were greatly influenced by the shape of the profit curve. An earlier paper (by the staffs of La Poste and the US Postal Regulatory Commission) compared the heterogeneity of delivery costs in France and the US found that the delivery costs of La Poste were more heterogeneous than that of the US Postal Service.³ The degree of heterogeneity would affect the shape of a profit curve. With much help from the staff of La Poste, a delivery profit curve was developed for La Poste.⁴ The paper compares the two delivery profit curves and shows the results of entry into the US market if the USPS had the La Poste profit curve.

¹ This paper is based in part on a study performed by George Mason University (GMU) School of Public Policy under contract to the Postal Regulatory Commission. We will refer to it as the USO study. It was titled "Study on Universal Service and the Postal Monopoly" and was published on the PRC web site as an appendix to the PRC's report to the Congress and on the GMU web site. The scope of the entire GMU study is much broader than the subjects addressed in this paper and includes a history of the USO in the U.S and, a history of the postal monopoly in the U.S (Jim Campbell), a theoretical discussion of the cost of the USO and the value of the US letter monopoly (John Panzar), an empirical analysis of the cost of the USO in the US (Robert Cohen and Charles McBride) and an empirical analysis of the value of the monopoly in the US (Robert Cohen), survey research on the subject of the USO, and several additional topics. The GMU web site contains the entire presentation of the USO study paper including the basis of the quantitative estimates, work papers and data sources. See: <http://digilib.gmu.edu:8080/dspace/handle/1920/3477>

² A delivery profit curve graphically arrays the profit (loss) of each delivery route from the least profitable to the most profitable.

³ "Delivery Cost Heterogeneity and Vulnerability to Entry, Stephan Bernard, et al., *Postal and Delivery Services: Delivering on Competition*, Eds. Michael A. Crew and Paul R. Kliendorfer (Boston, Ma: Kluwer Academic Publishers, 2002

⁴ The profit curves for the two posts were normalized to zero net profit.

There have been many non-empirical analyses of the issues covered here, but there have been few empirical studies. This is no doubt due to a lack of commercially sensitive data available. We are fortunate to have extensive data available from the US Postal Service and La Poste. We consider this paper to be an empirical analysis because it is based on empirical data to determine which mail is contestable and on actual delivery route data to determine whether an entrant could profitably deliver the contestable mail available on each route.

Description of the model

This analysis employs an updated model that was originally developed by the PRC staff and used in a staff paper to test the hypothesis that liberalization of the U.S. postal market would cause the USPS to enter a graveyard spiral.⁵ The model is one of a family belonging to the “entry pricing” methodology in the postal economic literature. It was used in the recent study on the value of the US letter mail monopoly.⁶

The letter monopoly in the U.S. is a delivery monopoly.⁷ Mailers or third parties are allowed to barcode, sort and transport mail as long as the Postal Service performs the delivery. Because of extensive worksharing the US has a competitive upstream market that greatly simplifies the analysis of the value of the US monopoly (i.e. the profits that the Postal Service would lose if the letter mail monopoly were eliminated.) Because the USPS already has a competitive upstream market, only the delivery portion of the postal value chain needs to be considered.

The model examines a delivery firm (or entrant) that attempts to cream-skin volume from the U.S. Postal Service. Very simply, the model examines data on USPS delivery routes to see if an entrant could profitably deliver the contestable mail (i.e. the mail for which an entrant could in practice compete) on the routes.⁸ The entrant only delivers mail but it does have to do the in-office activities required of letter carriers to prepare mail for delivery. It relies on workshared volumes that are presorted and entered locally by mailers or third parties. It is assumed that entry will occur wherever it is profitable. When it does occur, the entrant is said to have skimmed the route by capturing the contestable volume and the Postal Service loses both the volume and revenue of the

⁵ Cohen, R., Robinson, M., Sheehy, R., Waller, J. and Xenakis, S. “An Empirical Analysis of the Graveyard Spiral”; Competitive Transformation of the Postal and Delivery Sector; Eds. Michael A. Crew and Paul R. Kleindorfer; Kluwer Academic Publishers, 2003.

⁶ This paper extends a portion of the analysis done for the congressionally mandated USO study cited above. In particular, the paper extends the empirical work done on the value of the monopoly in the US. While Mr. Cohen is the sole author of the GMU empirical analysis on the value of the monopoly, Mr. McBride reprogrammed the model after the study was completed so that it was more user friendly. This allowed the issues discussed in this paper to be analyzed. The reprogramming was done under a grant from George Mason University and we wish to express our appreciation for the support that GMU has provided. Both authors participated in the analyses contained in this paper.

⁷ The US has both a letter monopoly and a mail box monopoly. When we analyze the impact of lifting the letter monopoly in this paper we assume that the mail box monopoly would also be lifted. The GMU study on the USO contains a separate analysis of the value of the mail box monopoly assuming that the letter mail monopoly is left in place.

⁸ See the Appendix for a description of the data sources used for the entry point model.

skimmed mail. The Postal Service has to continue to deliver the non-contestable mail on the route. The model uses a single entrant, but there is no *a priori* reason why there could not be multiple entrants. The model assumes that the entrant has access to the mail box.

The model examines each route in its data set. After taking into consideration the entrant's cost advantage and its price discount, the model calculates whether the revenue from the contestable volume on the route covers the entrant's costs. If not, the model goes on to the next route. If yes, the route is said to be skimmed by the entrant and the model goes on to the next route.^{9,10}

Sensitivity to changing values of the input variables

The model input variables and base case values are: entrant's price discount (10%), entrant's cost advantage (10%), number of delivery days per week (3), and the percentage of contestable volume (100%). The base case value of the monopoly is \$3.48 billion.¹¹ Total USPS revenue for 2007 was \$75 billion. The sensitivity of the result is shown in Table 1 for the full range of each input variable while holding the other variables to their base case values. The table shows that the value of the monopoly is most sensitive to contestable volume and the number of delivery days per week. The other two variables are far less important.

⁹ More specifically, the entrant's variable delivery cost for each class of mail is assumed to be the same as the Services' adjusted for its cost advantage. The variable delivery cost is computed for the contestable volumes on the route. Next the entrant's fixed cost for the route is computed. Here the model starts with the Postal Services fixed costs and takes into account the number of days per week that the entrant is delivering and the entrant's cost advantage. The entrant's total delivery cost for the route is the sum of its fixed and variable cost. Because the entrant is simply delivering mail, it has no non-delivery costs. The revenue for each contestable subclass of the entrant is the product of the unit delivery price of the USPS for each contestable subclass times a discount factor (which is an input variable) and the contestable subclass volumes on the route. The fixed cost of the entrant is proportional to the number of days a week that it delivers. The revenue for the skimmed mail is summed to compute the entrant's total revenue on the route. The delivery price for each subclass is the average price minus the average upstream attributable cost. Because the Postal Services worksharing discounts are equal to avoidable upstream costs, this produces a good estimate of delivery prices.

¹⁰ When using the model to calculate the value of the monopoly, only one iteration of the model is employed. (see, The USO paper, Appendix F Section 1, Efforts to Calculate the Cost of the USO and the Value of the Postal Monopoly in the US and Abroad, by John Panzar) When the model was used (previously) to analyze the graveyard spiral issue, multiple iterations of the model were employed to determine if the incumbent would be driven out of business..

¹¹ In 2007 volume was 212 billion pieces and revenue was \$75 billion. . In 2009 volume was 177 billion pieces and revenue was \$68) billion.

Table 1
Sensitivity of the Monopoly Value to Changes in Value of Input Variables

Input Variable	Range of Values	Range of Monopoly Value (\$billions)
Entrant's Discount	0%-20%	\$3.9-\$3.1
Delivery Days/Week	1-6 Days	\$5.1-\$1.6
Cost Advantage	0%-30%	\$3.1-\$4.3
Contestable Volumes	50%,100%,\$150%	\$0.8-\$5.9

The amount of contestable volume can be thought of as the size of a pie and the other variables can be thought of as determining how large a portion of the pie will be captured by the entrant. It will be seen that the results are decidedly non-linear with respect to the amount of contestable volume. The number of days that the entrant delivers is the next most sensitive variable. Of course, it is the way that an entrant can control its fixed cost to gain some advantage over the incumbent. Our analysis does not take into account the elasticity of demand with respect to delivery owing to a lack of data on the subject.

Contestable Mail

The estimate of contestable volumes is based on an analysis of how mailers and third party consolidators presort and dropship mail in the competitive upstream market. Not all the 212 billion pieces delivered by the Postal Service in 2007 could be captured by a delivery entrant. For example, single piece First-Class mail could not be captured because by definition, a delivery entrant does not have an upstream infrastructure to collect, consolidate, sort and transport mail. For the purpose of this analysis, mail is contestable if it is presorted and dropshipped locally (within about thirty to fifty miles) so that it needs no upstream processing or inter-city transportation prior to preparation for delivery. If the mail does not reach this stage of the network before being tendered to the USPS by mailers or third parties, it is less costly to tender it to the Service at an earlier upstream stage and even if there had been a delivery competitor it would not have been available to a local delivery firm with no upstream infrastructure in a competitive market.¹² Thus, it is not contestable. The contestable volumes computed for this study

¹² This analysis assumes that if the monopolies were lifted, cost based transportation discounts would be offered for First Class. Much First Class five-digit and carrier route presorted and bar-coded mail is not for local delivery and we don't know how much of this mail could be drop shipped and the question is made even more difficult because of the time value of First Class mail. This analysis assumes that half of the five-digit and carrier route presorted First Class mail would be drop shipped if cost based discounts were offered. Current Periodicals dropship discounts exclude the avoided cost of the weight of the editorial portion of the pieces. Again, assuming that full cost based discounts would be offered in a liberalized environment, the model assumes that the same percentage of carrier route presorted Periodicals would be

equaled 26 percent of the total mail for 2007.¹³ Their composition is shown in Table 2 below. From the standpoint of an entrant, it is the total quantity of mail that is available for it to compete and not the percentage of total mail that is important.

One factor that distinguishes the US market from European markets is its geographic size. The US is almost 18 times the size of France and has 36 cities with more than a half million people. Significant volumes of mail originate in most of them (and in some smaller cities as well.). Thus, drop shipping would be a very important factor in determining the amount of mail for which an entrant could compete. If it were not for the fact that mailers (and third parties) can presort mail to the 5 digit level or carrier route level *and* drop ship that mail locally, there would be very little contestable mail for a firm that delivers mail and has no upstream infrastructure.

Table 2
Contestable Volumes

Subclass	Contestable Volume (billions)
First Class Presort Letters	10.0
First Class Presort Cards	0.8
Periodicals	2.9
Standard Regular*	13.3
Standard ECR**	28.3
Bulk Parcel Post	0.2
Total	55.3

* Bulk advertising mail

** Standard mail sorted to the carrier route.

The calculated amount of contestable mail is an upper bound

Our entry point model simply allows the entrant to skim all the contestable mail when it is profitable for the entrant to do so. But this is unrealistic since some mailers would not use a new competitor (to the established postal provider) right away even if offered a discount. Brand loyalty, inertia, the need to prove quality and other factors affect whether a mailer would shift to an entrant or at the very least affect the pace at which mailers would shift mail to an entrant.¹⁴

drop shipped as carrier route presorted flats in Standard Mail. Finally, parcel post (Parcel Select) volume that is drop shipped to the DDU is considered contestable.

¹³ See the original GMU study for a fuller explanation and quantification of contestable mail. Study on Universal Service and the Postal Monopoly, Appendix F, Section 4, Quantitative Value of the Postal and Mail Box Monopolies.

¹⁴ See the PRC staff paper Cohen, R., Robinson, M., Sheehy, R., Waller, J. and Xenakis, S. "Will Entrants into a Liberalized Postal Market Attract Investors"; Regulatory and Economic Challenges in the Postal and Delivery Sector, Eds. Michael A. Crew and Paul R. Kleindorfer; Kluwer Academic Publishers, 2005. In an email to the authors from a spokesman at City Mail (Sweden Post's main competitor in its liberalized postal market) has observed that capturing "volume in this market is a very slow process ... one can expect

The fact that an entrant must deliver fewer days per week than the incumbent would also effectively reduce the amount of contestable volume. Many mailers consider time to delivery important and many First Class and periodical pieces are time sensitive. In addition some advertising mailers strive for delivery on a particular day to coincide with a sale or to coordination with other advertising media. This cannot usually be accomplished with delivery frequency less than daily.

In this analysis the delivery route data made available to the PRC by the Postal Service lacked postal code information, making it impossible to determine the geographic proximity of the skimmed routes. This is important because entry would only take place if there were a critical mass of routes (or really addresses) that were profitable to serve. It can be expected that there are some relatively isolated skimmed routes that do not meet the critical mass test. We know that the profitability of routes depends on volume and that volume is primarily related to the income of the addresses served. Further we know from Census data that relatively high income people tend to live in different neighborhoods than relatively lower income groups.¹⁵ Consequently, a large majority of the skimmed routes would be in geographic clusters and would likely form a critical mass. To the extent that a number of skimmed routes are relatively isolated and are not in areas that form a critical mass, the model predicts entry where it is unlikely to occur. Where there is a lack of a critical mass of delivery routes in an area contestable mail according to our criteria could not actually be contested by an entrant. This provides still another reason why the nominal amount of contestable mail is an upper bound.

Given the model's sensitivity to the amount of contestable mail, a realistic estimate is very important to an analysis of the value of the monopoly. The actual amount of contestable volume on a route is the most important variable in determining whether it is profitable for an entrant to serve that route.

The impact of pricing flexibility on the value of the monopoly

Before entry the Postal Service's initial delivery price for contestable mail (and for all workshared mail) is the average end-to-end price minus the average upstream attributable cost. This is because the Postal Service's worksharing discounts are equal to avoidable upstream costs.

The term "flexible pricing" in this analysis refers to the ability of the incumbent to change prices for contestable mail in response to entry. Moreover, the incumbent may charge prices on a route by route basis. This simulates (as closely as we can given the inherent limitations of our entry point model) the type of market that we observe in Sweden where we believe that the price of virtually all large mailings of contestable mail is negotiated. Our model tracks competition for contestable mail on delivery routes. In

a lot of conservatism among the customers. This is especially true about administrative mail (bank account statements, invoices, etc.). It takes time to prove your quality."

¹⁵ See the Appendix to Cohen, R., Ferguson, W., Waller, J. and Xenakis, S. "An Analysis of the Potential for Cream Skimming in the U.S. Residential Delivery Market"; Emerging Competition In Postal and Delivery Systems; Eds. M. Crew and P. Kleindorfer; Kluwer Academic Publishers, 1999.

Sweden the competition is for contestable mail (called “industrial mail”) destined for areas where CityMail delivers.

In the age of computers it is feasible to price contestable mail on a route by route basis when it is carrier route presorted by a computer prior to printing. Prices could be read in real time by the computer as it is determining whether to use the incumbent or entrant for the route.¹⁶ The computer would indicate to which delivery firm the mail for the route should be transported. Mail for some routes in a local area could be transported to the entrant while the remaining mail could be transported to the incumbent based on their respective prices. In this way the mailer would receive the lowest price on a route by route basis. The incumbent is market dominant in the noncontestable categories of mail, and we assume that it would be subject to some sort of price control on upward price movements. It would have no incentive to lower prices on noncontestable mail.

The incumbent’s strategy for routes that would not be captured by the entrant because the routes have negative profit involves reducing the discount for contestable mail to the level where it just pays mailers to presort to the carrier route level and to drop ship the mail locally. Generally, this would amount to an increase of less than 30 percent of the price prior to competition. The incumbent’s strategy for routes that could be captured by the entrant is to lower contestable mail prices to the point of the entrant’s cost or USPS’s attributable cost, whichever is higher.¹⁷ The attributable cost floor is generally about 50 percent lower than contestable mail prices prior to competition. The amount differs from subclass to subclass, but we use the values of a 30 percent price increase and a 50 percent decrease to simplify the presentation.

For the purposes of presentation we conceptualize the competition as a two step process where the incumbent starts with uniform prices for contestable mail and the entrant captures contestable mail from those routes where it can profitably do so. In the second step, the incumbent responds by changing its prices so that it recaptures as many routes as possible, subject to its constraints on the maximum allowable upward and downward price changes.¹⁸

Table 3 shows the results of this process for the Postal Service assuming that its revenue and cost from its delivery routes were at breakeven and the entrant delivers 3 days per week with a ten percent price discount and with a ten percent cost advantage (i.e. our base case.) Initially the entrant reduces the USPS profit by \$2.48 billion (which is also to say that the value of the monopoly is \$2.48 billion). In the GMU study the value of the monopoly was \$3.48 and the delivery routes made approximately \$5 billion profit. Here

¹⁶ Mailers in the US currently analyze their mail at a very detailed basis. For example, when presorting a mailing, if a group of pieces in a mailing is one or two pieces short of meeting the threshold for the next level of presort, the mailer may add a piece or two addressed to someone who would not otherwise be included in a mailing of advertising pieces.

¹⁷ We assume that mailers would choose the incumbent over the entrant when prices of both are the same.

¹⁸ In actuality the incumbent would change its prices as soon as it was permissible and the entrant would then skim those routes that it could do so profitably. It w

we are looking at the case where the delivery route profits are set to breakeven so that the results for the USPS can be compared to La Poste later in the paper.

In this table we assume that 100 percent of the contestable mail is available to the entrant. The three rows show the sensitivity of the results to differing limits on the incumbent's flexible pricing changes. The last two columns show the initial number of captured routes and the number of routes that can be recaptured though flexible pricing. It can be seen that most of the recaptured profit comes from raising prices on unskimmed routes. With a cap of 50 percent on its price changes, the incumbent restores virtually all of its lost profits and regains more than 85 percent of the initially skimmed routes.

Table 3. USPS Flexible Pricing Results (Initial USPS Profit = 0)
Base case: entrant delivers 3 days a week, cost advantage = 10%, entrant's initial price discount = 10%
(\$ billion)

Case	USPS Profit Loss from Skimming	Percent of Contestable volume	Maximum Price Change (%)	USPS Profit After Raising Prices on Unskimmed Routes	USPS Profit After Lowering Prices on Skimmed Routes	Total Gain from Flexible Pricing	Initial Skimmed Routes	Reclaimed Routes	Inefficient Skimmed Routes
1	2.48	100	10	0.46	0.00	0.46	45,505	10	33,252
2	2.48	100	30	1.21	0.47	1.68	45,505	27,917	8,125
3	2.48	100	50	1.79	0.57	2.36	45,505	39,289	1,171

Inefficient entry

This type of entry falls under the rubric of cream skimming. Inefficient entry occurs when the entrant's cost is higher than the incumbents but its price is lower because of constraints on the incumbent's price. Inefficient entry raises the cost of mail delivery to society. A uniform price constraint on an incumbent in a competitive world would create a considerable amount of inefficient entry. In the following example where the Postal Service has no pricing flexibility. Over 95 percent all of the skimmed routes are the result of inefficient entry.

USPS Results with no pricing flexibility (initial USPS Profit= 0)
Base case in \$ billions

USPS Profit Loss from Skimming	Percent of Contestable Volume	Maximum Price Change (%)	Skimmed Routes	Inefficiently Skimmed Routes
2.48	100	0	34,900	33,262

Assuming the reason to end the monopoly is to encourage the incumbent to lower its costs; inefficient entry would run counter to the goal. All entry would (at least initially) raise the cost to society because it creates two sets of fixed delivery cost where formally there was only the incumbent's fixed cost. Entry can only lower society's cost of delivery if it creates enough efficiency in the incumbent's operations, that it offsets the increase in

fixed delivery cost. Delivery costs are the largest element of costs in a post and the fixed portion of delivery is in excess of 50 percent of total delivery costs.¹⁹

It can be seen from Table 3 that with a 10 or 30 percent limit on the incumbent's price changes, most of the routes that are skimmed by the entrant are a result of inefficient entry which in turn is the result of limits on the incumbent's price changes. As the maximum price change allowed the incumbent is increased, the number of inefficiently skimmed routes drops rapidly but does not disappear entirely unless all pricing constraints are removed. The more pricing flexibility the incumbent is allowed, the fewer the number of inefficiently skimmed routes. Thus, inefficient entry can be largely but not entirely prevented with pricing flexibility. As the entrant delivers fewer days and cuts its fixed cost, the impact of flexible pricing on inefficiently skimmed diminishes.

Sensitivity of results to the volume of contestable mail

Table 4 displays the sensitivity of the results to the amount of contestable mail. It can be seen that the USPS profit loss is reduced as the amount of contestable mail is reduced. The loss of profit is not linear with the amount of contestable mail. Moreover at these levels of contestable mail, the Postal Service can gain more from flexible pricing than it loses to the entrant. This suggests that in countries with low levels of contestable mail, regulators may wish to be careful about how much if any pricing flexibility should be granted to the incumbent.

Table 4. Sensitivity of Flexible Pricing Results to the Amount of Contestable mail (Initial USPS Profit = 0)
Base case: entrant delivers 3 days a week, cost advantage = 10%, entrant's initial price discount = 10%
(\$ billion)

Case	USPS Profit Loss from Skimming	Percent of Contestable Volume	Maximum Price Change (%)	USPS Profit After Raising Prices on Unskimmed Routes	USPS Profit After Lowering Prices on Skimmed Routes	Total Gain from Flexible Pricing	Initial Skimmed Routes	Reclaimed Routes
4	1.38	75	10	0.57	0.00	0.57	23,500	0
5	1.38	75	30	1.53	0.18	1.71	23,500	14,719
6	1.38	75	50	2.32	0.19	2.51	23,500	18,311
7	0.50	50	10	0.66	0.00	0.66	8,480	0
8	0.50	50	30	1.89	0.03	1.92	8,480	4,119
9	0.50	50	50	2.99	0.03	3.01	8,480	4,119

Sensitivity of results to frequency of delivery

Table 5 shows the results for delivering two days per week (cases 10-12) and one day per week (cases 13-15). The initial profit loss for the incumbent is greater than when delivery takes place every other day with 100 percent of the contestable mail (see Table 3). More significantly, the incumbent's gain from flexible pricing falls far short of the initial profit

¹⁹ Delivery as a portion of total cost is inversely related to per capita volume. Similarly, the percentage of delivery costs that are fixed is inversely related to volume. Recently the USPS had about 670 pieces per capita and its fixed portion of its delivery cost was about 50 percent.

loss from skimming (unlike what is shown in Table 3.) It is clear that the fewer days the incumbent delivers, the more profitable it is. This is similar to CityMail's experience in Sweden. Its profitability improved greatly when it shifted from delivery two days per week to each address to delivery every third business day to each address. Obviously its savings in fixed cost offset mailers reduced demand due to the decline in delivery frequency. Finally, far more routes are skimmed by the entrant when it delivers fewer days and a much smaller percentage of lost profits is reclaimed as a result of flexible pricing.

It is important to note that in the case of every other day delivery with 100 percent of contestable mail, the incumbent reclaims 95 percent of its initial lost profits with flexible pricing. In the case of delivery two times a week, the incumbent reclaims two thirds of its initial lost profits. Finally, in the case of delivery only once a week, the incumbent reclaims just 28 percent of its lost profits. This suggests that it becomes more difficult for an incumbent to reclaim its routes as the entrant's fixed cost of delivery decreases as its delivery frequency decreases.

Table 5. Sensitivity of Flexible Pricing Results to the Amount of Contestable mail (Initial USPS Profit = 0)
Cases 10-12 - entrant delivers 2 days a week, Cases 13-15 - entrant delivers 1 day a week
Entrant cost advantage = 10%, entrant initial price discount = 10%
(\$ billion)

Case	USPS Profit Loss from Skimming	Percent of Contestable Volume	Maximum Price Change (%)	USPS Profit After Raising Prices on Unskimmed Routes	USPS Profit After Lowering Prices on Skimmed Routes	Total Gain from Flexible Pricing	Initial Skimmed Routes	Reclaimed Routes
10	3.27	100	10	0.34	0.00	0.34	72,264	0
11	3.27	100	30	1.96	0.8	1.55	72,264	45,947
12	3.27	100	50	1.24	0.91	2.15	72,264	70,447
13	3.97	100	10	0.12	0.00	0.12	152,958	59
14	3.97	100	30	0.26	0.58	0.85	152,958	59,944
15	3.97	100	50	0.34	1.12	1.46	152,958	143,614

Profit Curves

We have developed a diagram of the profits of the 238,000 delivery routes in the US.²⁰ La Poste has provided us with data so that we are able to present a diagram of the profits from its X,000 delivery routes.²¹ The two curves are shown in Figure 1 below. The profits for each post have been normalized to breakeven so that a meaningful comparison can be made. It can be seen that the La Poste curve is more skewed than the USPS curve indicating a greater vulnerability to entry. While this is an important factor, the amount of contestable mail is also important.

All data in Figure 1 are shown in terms of percentages to protect the confidentiality of the La Poste data. The USPS and La Poste curves show by route semidecile the ratio of route

²⁰ The profit of a delivery route is the revenue from the mail delivered on the route minus the upstream attributable cost of the mail delivered minus the total cost of the route.

²¹ See Appendix for a description of the USPS and LP data used for the profit curves.

profit and route cost by route, with the routes ordered by this ratio. It can be seen that the La Poste curve is much steeper than the USPS curve, suggesting that La Poste is more vulnerable to loss of profits due to an entrant's capture of contestable mail.

Table 6 shows the results using the La Poste route profit curve and USPS contestable mail data²² along with the comparable USPS profit curve results. Cases 16-18 are based on the La Poste profit curve applied to the USPS route data. Cases 1-3 in Table 3 are the ones for the USPS that are directly comparable to cases 16-18. When we compare them we see that the La Poste profit curve (run with USPS data) has greater losses from the initial skimming and reclaims fewer profits from raising prices on unprofitable routes and reclaims fewer profits from decreasing prices on profitable routes. More of the routes using the La Poste profit curve are skimmed initially and fewer are reclaimed from flexible pricing. It is important to note that we have assumed that La Poste has the same amount of contestable mail as the USPS, since we did not have this information from La Poste.

Table 6. La Poste Flexible Pricing Results Using USPS Contestable Volumes

(Initial USPS Profit = 0)

Base case: entrant delivers 3 days a week, cost advantage = 10%, entrant's initial price discount = 10%

(\$ billion)

Case	La Poste Profit Loss from Skimming	Percent of Contestable volume	Maximum Price Change (%)	La Poste Profit After Raising Prices on Unskimmed Routes	La Poste Profit After Lowering Prices on Skimmed Routes	Total Gain from Flexible Pricing	Initial Skimmed Routes	Reclaimed Routes	Inefficient Skimmed Routes
16	3.11	100	10	0.37	0.00	.37	57,744	0	57,149
17	3.11	100	30	1.03	0.24	1.27	57,744	11,784	45,365
18	3.11	100	50	1.62	0.54	2.16	57,744	29,252	27,897

USPS Flexible Pricing Results (Initial USPS Profit = 0)

Base case: entrant delivers 3 days a week, cost advantage = 10%, entrant's initial price discount = 10%

(\$ billion)

Case	USPS Profit Loss from Skimming	Percent of Contestable volume	Maximum Price Change (%)	USPS Profit After Raising Prices on Unskimmed Routes	USPS Profit After Lowering Prices on Skimmed Routes	Total Gain from Flexible Pricing	Initial Skimmed Routes	Reclaimed Routes	Inefficient Skimmed Routes
1	2.48	100	10	0.46	0.00	0.46	45,503	10	33,253
2	2.48	100	30	1.21	0.47	1.68	45,503	27,917	8,125
3	2.48	100	50	1.79	0.57	2.36	45,503	39,289	1,171

²² See Appendix for a summary of the method used to simulate LP flexible pricing results using USPS data.

Conclusions

Flexible pricing

For the base case where the entrant delivers three days per week, all the contestable mail is available to it and the incumbent's only price constraints on contestable mail are not raising its price above the level where the mailer would find it more cost effective to prepare its mail at less than carrier route presorted or drop shipped at the local level. The incumbent can limit entry so that it loses only about \$100 million in delivery profits. The entrant skims the contestable mail from about 6,000 routes out of a total of 238,000 routes.

Inefficient entry

The fewer the constraints placed on flexible pricing, the fewer inefficiently skimmed routes there will be. This is because inefficiently skimmed routes are caused by pricing constraints.

Contestable mail

Under the above conditions, but **with** only 50 or 75 percent of the contestable mail ~~is~~ available to the entrant, the incumbent can actually increase its delivery profits using flexible pricing over and above the level before entry. When 75 percent of the contestable mail is available to the entrant, it skims about 5,000 routes and when 50 percent of the contestable mail is available, it skims fewer than 5,000 routes.

Frequency of delivery

When the entrant delivers only two days per week and 100 percent of the contestable mail is available to it, the incumbent regains about two-thirds of its initial lost profits of \$3.27 billion after it responds using flexible prices with a 50 percent cap. The entrant still skims about 70,000 routes.

When the entrant delivers only one day per week and 100 percent of the contestable mail is available to it, the incumbent regains about one-third of its initial lost profits of \$3.97 billion after it responds using flexible prices with a 50% cap. The entrant still skims about 145,000 routes.

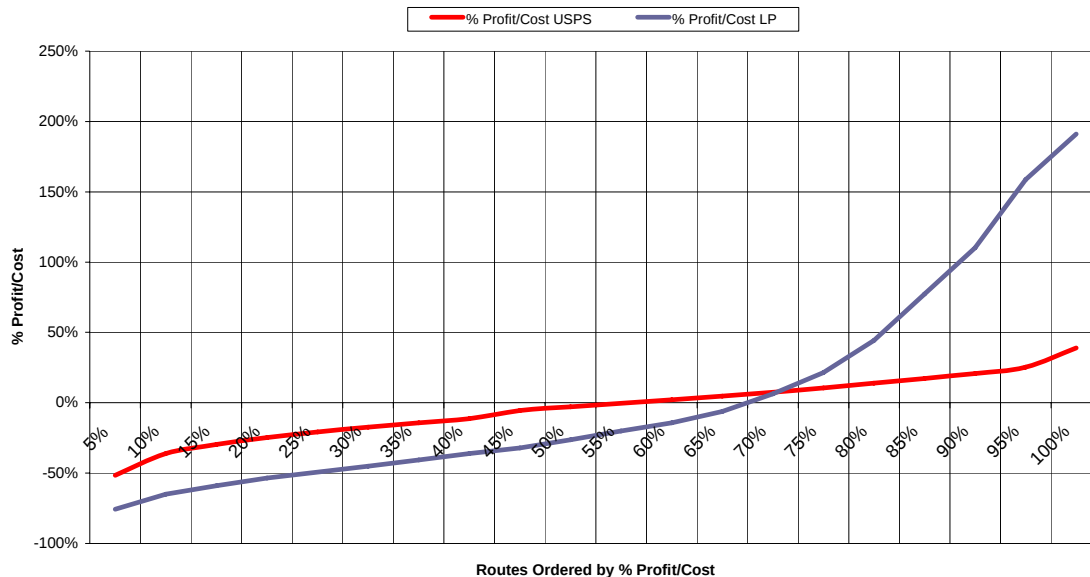
Route profit curve

~~It can be seen from Figure 1 that~~ The La Poste delivery route profit is more skewed than the USPS curve owing to the fact that it has many routes that are far more profitable than the most profitable USPS routes and it also has a greater share of unprofitable routes than the USPS. Recall that the curves have been normalized to show zero total delivery profits.

Effect of entry on the USPS if had the same normalized profit curve as La Poste

The USPS would initially lose 25 percent more delivery profits in the every other day delivery scenario. After repricing by the incumbent, the USPS would lose about \$950 million with the La Poste profit curve versus \$80 million using its own curve. With La

Figure 1. % Profit/Cost of USPS Routes versus LP routes
Profits normalized. Volumes of La Poste do not include "delivery" via PO boxes (firm holdouts) and "B&A routes".



Poste profit curve, it would lose 18,000 routes to the entrant. With its own profit curve it would lose about 6,000 routes.

APPENDIX

Entry Point Model Input Data The model makes use of Fiscal Year 2007 data on 97 percent of rural routes taken from the USPS Rural Carrier Cost System and a 10 percent sample of city routes taken from the USPS City Carrier Cost System. All told, there are data on 81,430 sampled routes, representing a total of about 238,000 rural and city routes.

For each sampled route, data from the two carrier cost systems include cost and volumes by major rate category that are being delivered on the day the data is recorded. This data is merged with other FY 2007 financial data to obtain data on revenue, fixed costs, variable delivery costs, and variable nondelivery cost by major category of mail for each sampled route. This data set has been converted to an Excel 2007 workbook, which was used for the analyses described in this paper.²³

Profit Curves from La Poste and USPS

The La Poste and USPS profit curves shown in Figure 1 were constructed as follows. The authors sent a condensed version of the Excel workbook (mentioned above) containing 81,430 sampled routes with detailed cost, revenue, and volume data to our La Poste colleagues. The La Poste team first normalized the total delivery revenue to match total delivery costs for each post, so that the normalized profit was zero. They then sorted the USPS and their own route data by profit per route, normalized the total number of routes for each post to 100% for comparability, then divided the ordered routes into semideciles. The La Poste analysts then provided us, separately for the USPS and

²³ For further details on the entry point model and its input data, see the Appendix F4 section from the Appendices and Workpapers of the PRC Report on Universal Postal Services and the Postal Monopoly, which is available on the PRC web site <http://www.prc.gov>.

France, the percentages of total cost and total revenue for each route semidecile. The authors then reordered this route semidecile data by the ratio of profit to cost, since this measure is a simple proxy for return on investment, and would likely be of more interest to a potential entrant than the amount of profit on each route. The La Poste and USPS profit curves in the above chart are the result of this process.

Simulating the Effects of La Poste Flexible Pricing Using USPS Data

To study the effects of flexible pricing using La Poste's profit curve (see Figure 1), the more detailed USPS route-based revenue and cost data were simply scaled by the comparable semi-decile revenue and cost percentages from La Poste. In other words, the 84,430 USPS route samples were ordered by profit and divided into semideciles, then the revenue and cost for all USPS routes in each semidecile were scaled by the ratio of the percentage of total La Poste revenue or cost divided by the corresponding USPS percentage of revenue or cost. Then the USPS entry point parameters were applied to the simulated La Poste route data for each run of the model.