BEFORE THE
POSTAL RATE COMMISSION
WASHINGTON, DC 20268-0001

EXPERIMENTAL CHANGES TO IMPLEMENT CAPITAL ONE NSA

Docket No. MC2002-2

REBUTTAL TESTIMONY
OF
B. KELLY EAKIN
ON BEHALF OF
UNITED STATES POSTAL SERVICE

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AUTOBIOGRAPHICAL SKETCH

My name is B. Kelly Eakin and I am a Vice President at Christensen Associates. I received a B.A. degree in history from the University of Texas at Austin in 1978 and a Ph.D. degree in economics from the University of North Carolina at Chapel Hill in 1986. My areas of economic expertise are in the regulation and organization of industry, the theory of production and cost, environmental economics, health economics and applied microeconomics in general. I have worked at Christensen Associates since 1994, where I have been primarily involved in economic issues facing the energy sector, particularly the electricity industry. Prior to joining Christensen Associates, I worked as an economist for the Economic Research Service of the U.S. Department of Agriculture from 1992 – 1994, where I developed expertise in environmental economics. From 1985 – 1992, I was an Assistant Professor of Economics at the University of Oregon. In this capacity I taught graduate and undergraduate courses in microeconomics, production economics, industrial organization, regulation of industry, and health economics. I also was active in the direction of research by graduate students in the Department of Economics and the College of Business. I have published several scholarly articles in refereed academic journals and in electricity trade journals. I have co-edited two books on pricing issues in the electricity industry. My curriculum vita is attached as Appendix 1.

I. PURPOSE OF TESTIMONY

I have been retained by the Postal Service to address economic issues raised, primarily by Professor Panzar (JCP-T-1, Tr. 8/1571-1790), in the proceedings concerning the negotiated service agreement with Capital One Services, Inc. (henceforth called the Capital One NSA or simply NSA). My testimony has four remaining sections. Section II deals with the economics of the Capital One NSA. Section III addresses theoretical issues and empirical questions that have arisen in these proceedings. Section IV discusses similar pricing arrangements and regulatory experiences in other regulated industries. Section V summarizes my observations about the Capital One NSA in the context of regulation and competition.

II. THE ECONOMICS OF THE CAPITAL ONE NSA

In this section of my testimony, I present my understanding of the Capital One NSA and the Postal Service's objectives in negotiating this agreement. I also comment on the economic structure of the NSA and assess how effective it will likely be in achieving the Postal Service's objectives. I discuss how the Capital One NSA terms are consistent with Professor Panzar's suggestion that NSAs should be an opportunity to improve the Postal Service's economic efficiency (Tr. 8/1645), and state why I believe the Capital One NSA is in the public interest.

II.A. Summary of the NSA Terms

My understanding of the Capital One NSA primarily comes from my reading of the proposed agreement and the direct testimonies of Postal Service Witnesses Plunkett (USPS-T-2) and Crum (USPS-T-3). As I understand it, the Capital One NSA has two

main provisions. First, the agreement calls for Capital One to receive electronic notification about its undeliverable First-Class Mail solicitations instead of physical return of the pieces. Second, the agreement provides a declining block rate structure for Capital One's presorted First-Class Mail[1] volume beyond an annual threshold level.

The main parameters of the declining block rate structure are the threshold level, the block sizes, and the block prices (or discounts). The threshold is the greater of 1.225 billion pieces of First-Class Mail or 90 percent of the average volume of Capital One's presorted First-Class mailings for FY2000, FY2001, and FY2002. The current presorted First-Class Mail rates would apply to all pieces of mail up to the threshold. The declining block structure begins with a 3.0 cent per-piece discount on the first block of 50 million pieces greater than the threshold of 1.225 billion pieces, followed by a series of *additional* 0.5 cent per piece discounts on additional blocks. The second and third blocks beyond the threshold are each sized at 50 million pieces of mail. The fourth, fifth, and sixth blocks are sized at 75 million pieces of mail. The seventh and final block, for all pieces of mail beyond 1.6 billion, receives a total discount of 6.0 cents per piece. If the threshold is greater than 1.225 billion pieces, then the current rates apply to all pieces up to the threshold, and additional pieces will be priced according to the discount schedule described above (i.e., the threshold has changed, but the other block boundaries remain the same).

My understanding is that the Postal Service's objectives in this NSA are to increase net revenues (i.e., contribution) and to retain and increase Capital One's First-

[1] Unless otherwise noted, all references to Capital One's First-Class Mail refer to First-Class Mail categories covered by the NSA.

Class Mail volume, with an increase in net revenues leading to a reduction in the overall burden on postal ratepayers. (USPS-T-2, p.1)

II.B. The Capital One NSA Incorporates Efficiency Features and Provides Correct Incentives for Increased Use of First-Class Mail

The Capital One NSA is economically sound. The NSA implements a customized product that preserves the benefits Capital One receives from using presorted First-Class Mail, while the Postal Service avoids the costs of a bundled attribute (physical return of pieces that are undeliverable-as-addressed) that apparently provides Capital One little or no value. The NSA also represents an efficiency-improving application of a non-linear pricing structure.

The opportunity for efficiency with declining block rates comes from the ability to move marginal prices in the direction of marginal costs. With a uniform tariff, as exemplified by existing postal rate schedules, the total contribution to the recovery of "fixed" (or institutional) costs from any given mailer is achieved by including a markup over marginal cost within the uniform price paid for each unit by that mailer (as well as all other mailers). At any given volume level for that mailer, the total contribution is simply the sum of the unit contribution for each piece mailed. In theory, at least, it would be possible to receive that same amount of total contribution as a lump sum payment from the mailer, and then charge the marginal rate on each unit mailed equal to the marginal cost. Such an arrangement would be expected to increase efficiency, because the mailer would be expected to generate volumes up to the level where the marginal value to the mailer of the last piece equals the marginal cost to the Postal Service of providing that unit of service. In contrast, under the uniform tariff, the mailer equates

marginal value of the last piece with the marginal cost of that unit *plus* the markup for contribution, which normally would lead to inefficiently low mail volumes.

In a declining block rate structure, there is no lump sum payment. But the total contribution generated from the units consumed by the mailer below the threshold at which the lower rates start can play the same role as a lump sum payment would in the above hypothetical rate structure. If the threshold is set exactly at the same given volume from which expected total contribution has been calculated under the status quo, the marginal rate beyond that could be dropped all the way to marginal cost, and the expected result on efficiency would be the same as under the lump sum payment structure hypothesized above.

If the threshold for declining block rates were to equal or exceed Capital One's "before rates" volume (i.e., that would have been mailed in the absence of the NSA), the contribution under the NSA from units below the baseline (before rates) volume equals the total contribution expected in the absence of the NSA. In the NSA, the threshold volume is less than the before rates volume, so the contribution from units below the baseline is less than the contribution on those volumes in the absence of the NSA by an amount called the "discount leakage" by Witness Crum. However, this is not the only source of contribution in the NSA. While the rates in the declining blocks under the Capital One NSA move in the direction of marginal costs, they are still materially above the level of marginal costs estimated by Witness Crum. Therefore, in contrast to the case where the marginal rate equals marginal cost, additional contribution would be generated by units above the threshold in the Capital One NSA. Moreover, it is my understanding

that the expected return cost savings from the Capital One NSA exceed the estimated discount leakage under Capital One's original volume forecast.

The NSA provides the correct incentives to retain Capital One's First-Class Mail volume, and for Capital One to increase its usage by reducing Capital One's marginal price of First-Class Mail *relative* to other forms of solicitation. Thus, Capital One will have incentives to increase its use of First-Class Mail for solicitation and to defer any switch to electronic presentation of customer bills. In addition to providing the proper incentives, the NSA creates an overall efficiency gain by reducing the gap between the marginal price and the marginal cost of Capital One's First-Class Mail while increasing the expected contribution from Capital One as compared to the existing uniform rate structure. It is in that sense that the NSA represents an efficiency-improving application of a non-linear pricing structure. That is, more social value results from the NSA.

The Capital One NSA is in the public interest because the agreement creates value that is shared widely across groups of postal customers. The most significant source of value is the cost-reducing substitution of electronic notification for physical return of Capital One's undeliverable-as-addressed pieces. The other significant source of value comes from the more efficient pricing structure. Thus, following Professor Panzar's guidance to "look at the whole package" (Tr. 8/1685), the Capital One NSA has a positive expected contribution. The value created is shared between Capital One and the Postal Service. Because the Postal Service operates on a break-even basis, its gains are shared by all postal customers. (See also JCP-T-1 p. 5, Tr. 8/1580.)

III. THEORETICAL AND EMPIRICAL ISSUES

In this section of my testimony, I address several theoretical issues raised in this proceeding. Also, consistent with the Postal Rate Commission's questioning of other witnesses, I try to move from the theoretical to the empirical. I identify the relevant parameters needed to assess the financial impacts of the NSA, and, by a synthesis of the evidence already presented in this proceeding, I develop reasonable empirical bounds for the secondary or indirect impacts. Finally, in this section, I comment briefly on the alternative proposal put forth by OCA Witness Callow.

III.A. The Limited Relevance of Pareto Improvements and Pareto Optimality

The concepts of Pareto improvements and Pareto optimality have little direct relevance to the consideration of the Capital One NSA (or with other NSAs, for that matter). To constitute a Pareto improvement, a change in the Postal Service's rate structure must benefit at least one party and harm no one else. Professor Panzar concluded in his cross-examination that making a Pareto improvement is a "really extraordinary achievement in economic policy setting" (Tr. 8/1736). I would venture to say it would be an impossible achievement. With numerous interrelated parties, including the Postal Service's customers and competitors, any change in the Postal Service's rate structure will adversely impact at least one party and thus not be a Pareto improvement. Making Pareto improvement a criterion for changing pricing structures would literally paralyze the Postal Service with respect to price changes. Thus, these concepts are not relevant to consideration of the Capital One NSA because, in pragmatic terms, they are unattainable criteria. A more appropriate criterion, as Professor Panzar

noted in his oral testimony (Tr. 8/1764-1765), is whether the NSA will generate a net surplus that can broadly benefit mailers.

III.B. The Relevance of Interdependent Demands

In Professor Panzar's direct testimony, he raised market demand interdependence as a theoretical concern for evaluating the desirability of NSAs. He focuses on the fact that the demand curves faced by Capital One and each of its competitors for their respective final products cannot be assumed to be independent. Consequently, the derived demands by each of these firms for postal services would not generally be independent.

The interdependence of the demands among Capital One and its competitors implies a potential indirect financial revenue impact to the Postal Service from implementing the Capital One NSA. In his written testimony Professor Panzar described a situation in which, because of demand interdependence, the Capital One NSA would lead to a decrease in mail volumes from direct competitors of Capital One and that this would reduce the direct net revenue gain from the NSA, other things equal (JCP-T-1 pp. 15-16, Tr. 8/1590-1591). However, Professor Panzar has also recognized the advertising nature of solicitation mail to Capital One and its competitors, and concluded that it would be plausible that both Capital One and its competitors could consume more postal services as a result of the Capital One NSA (Tr. 8/1788-1789). In either case, the interdependency of the demands between Capital One and its competitors produces only a secondary or indirect financial impact. However, the net indirect effects may increase the net revenue generated by the NSA, not just reduce it.

Interdependent demands also exist among different postal services (e.g., First-Class Mail and Standard Mail), between alternative marketing media (e.g., postal services, telemarketing, other print media, internet), and between alternative delivery services (e.g., postal services, UPS, FedEx). These interdependent demands have received less discussion in this proceeding, but I believe they are the more relevant in evaluating the Capital One NSA.

Currently, mail volumes, and in particular high-contribution First-Class Mail volumes, are under increasing competition from alternative messaging media, especially from electronic media such as the Internet. Other more traditional messaging media, including television advertising, are also substitutes for credit card solicitation mail. Similarly, some portions of the First-Class mailstream, including credit card solicitations, face internal competition from the lower-contribution Standard Mail. Consequently, the Postal Service's central task of revenue management requires consideration of these interdependent demands when pricing initiatives such as NSAs are contemplated. The Capital One NSA recognizes the existence of these interdependencies, and creates the opportunity to respond to them appropriately. The Capital One NSA makes First-Class Mail pricing more competitive to Capital One while actually increasing the contribution received from this customer.

III.C. Quantifying the Financial Impacts of the Capital One NSA

I now address the question "Under what conditions would the Capital One NSA result in a net revenue gain to the Postal Service?" To answer this question, it is useful to decompose the financial impact of the Capital One NSA. There are five identifiable financial impacts from the Capital One NSA. These impacts are illustrated in Figures 1a and 1b. Figure 1a represents three direct financial impacts of the Capital One NSA on the Postal Service, which Postal Service Witness Crum identifies and analyzes (USPS-T-3). In this figure, P represents the average First-Class Mail rate without the NSA, P′ represents the NSA discounted rate applying to volume greater than the threshold quantity, C is the average variable cost (and also the marginal cost) of Capital One's First-Class Mail without the NSA and C′ is the average variable cost (and also the marginal cost) of Capital One's First-Class Mail under the NSA. The threshold volume where the declining block rates start is q_T. Capital One's "before rates" or baseline volume is q_0, and q_N is Capital One's "after rates" volume.

Area 1 represents lost contribution that occurs if the threshold quantity where declining block rates start is set below the baseline volume level Capital One would have mailed in the absence of the NSA. Postal Service Witness Crum has labeled this "discount leakage." Note that the Area 1 lost contribution is zero if the threshold is above the Capital One's baseline volume. Area 2 represents the cost savings resulting from replacing costly physical returns with less costly electronic information. Witness Crum has labeled this "ACS Return Cost Savings." Area 3 represents the incremental contribution that results from the increase in Capital One's mailing volume induced by the declining block price structure. Witness Crum calls this "Increased Contribution

from New Mail Volume." Figure 1b represents the secondary or indirect effects of the Capital One NSA, discussed above, from the reactions of Capital One's competitors. If the Capital One NSA causes competitor volume to decrease from Q_O to Q_N, then there is a "secondary leakage" represented by Area 4. On the other hand, if the NSA actually induces increased competitor volume from Q_O to Q'_N, then there is a "secondary contribution" represented by Area 5.

Now to answer the question, the Capital One NSA would result in a net revenue gain to the Postal Service if the Cost Savings (Area 2) plus the Direct Increased Contribution (Area 3) plus the Secondary Contribution (Area 5) is greater than the Discount Leakage (Area 1) plus Secondary Leakage (Area 4).

III.C.i. Estimation of the Direct Impacts

I now discuss the data and assumptions needed to quantify each of these impacts. To calculate Area 1 (Discount leakage), one needs to have values for the baseline quantity (q_0), the threshold quantity (q_T), the First-Class Mail rate without the NSA (P), and the discounted rate (P′). The NSA specifies the threshold quantity, the boundary quantities, and the prices. Only q_0 needs to be estimated. The estimation of q_0 may or may not require making assumptions about elasticities.

To calculate Area 2 (Cost Savings) one needs to have values for the baseline quantity (q_0), and the per-unit cost savings from changing the terms of the First-Class Mail service Capital One will receive to those of the NSA (C-C′).

To calculate Area 3 (Direct Increased Contribution) one needs to have values for the discounted prices (P′), the baseline quantity (q_0), the boundary quantities that separate the blocks, the average variable cost under the NSA (C′), and the quantity that Capital

One would mail under the NSA (q_N). The NSA specifies the discounted prices and the boundary quantities. The baseline quantity needs to be estimated, but may not require making assumptions about elasticities. The "after rates" quantity q_N also needs to be estimated, which can be done by combining an assumption about Capital One's price elasticity of demand for First-Class Mail with data on P, P′, and q_0.

Areas 1, 2, and 3 are estimated in Witness Crum's testimony (USPS-T-3 at 2-6). Those estimates are: Discount Leakage (Area 1) = $6.7 million; Cost Savings (Area 2) = $13.1 million; and Direct Increased Contribution (Area 3) = $1.8 million. It is from these estimates that the Postal Service arrives at its estimated $8.2 million increase in contribution resulting from the Capital One NSA (USPS-T-2 p. 5, USPS-T-3 p. 6).

III.C.ii. Discussion of the Secondary Impacts

Witness Crum's estimate of total contribution gain implicitly assumes a zero value for the secondary impacts represented by Area 4 and Area 5. As discussed in this section, such an assumption is a reasonable one to make.

Calculating point estimates for these secondary impacts is problematic, but plausible bounds can be estimated. In attempting to place reasonable bounds on the secondary impacts, it is useful to distinguish between "customer mail" sent by credit card companies and "solicitation mail."[2] Customer mail refers to business correspondence with an existing customer (e.g., monthly statements) and as such could be described as "production" inputs. Solicitation mail refers to marketing mail designed to secure new accounts (e.g., invitations/applications sent out). I believe that secondary leakage (Area

[2] This distinction was also made by Witness Elliott in his calculation of volume growth resulting from the NSA. See Tr. 2/205 and Tr. 2/212.

4) mainly involves customer mail, while secondary contribution (Area 5) mainly involves solicitation mail.

The secondary leakage described by Professor Panzar occurs when the decrease in marginal mailing costs to Capital One leads to a reduction in the final market price for credit services (JCP-T-1 pp. 14-19, Tr. 8/1589-94). Such a price drop would normally increase the net quantity demanded of credit services, and consequently increase the net quantity demanded of postal services, assuming postal services are a "normal" input. However, the net increase would involve a shift of customers to Capital One products from Capital One competitors. Because the underlying cause of the secondary leakage (Area 4) is the shift in customers, I expect it would mainly involve customer mail.

Secondary contribution (Area 5), in contrast, would arise through the strategic response of Capital One's competitors to an increase in Capital One's advertising. Industrial economics theory suggests that Capital One's increasing solicitation mail (or advertising) is likely to induce competitors to respond with similar increases of their own (Tr. 8/1751-1755 and Tr. 8/1787-1789). Thus, secondary contribution would mainly involve solicitation mail, as well as mail volumes resulting from the generation of new accounts by Capital One's competitors.

Neoclassical production theory tells us that the extent of secondary leakage depends on the production technologies used by Capital One and its competitors in providing credit card services, the prices received by Capital One and by its competitors for credit card services, the prices paid by Capital One and its competitors for production inputs, and the extent of direct competition between Capital One and other firms in the market for credit card services. Much of the information needed to construct a point

estimate of the secondary leakage would be private information of Capital One's competitors. However, it is possible to set bounds because under competitive assumptions, a complete offset of Capital One's customer mail volume increase is the limiting "worst case" of the secondary leakage. In actuality, the offset is likely to be less than the increase in Capital One's First-Class customer mail, in part because Capital One's increased solicitation mail is likely to induce some customers to obtain an additional credit card rather than merely switching credit card companies.

The factors that determine the secondary contribution are also difficult to precisely quantify. They include the extent of competition in the market for credit cards and the strategic dispositions of Capital One and its competitors. Again, some data needed to calculate secondary contribution are not likely to be available for proprietary reasons. Detailed analysis of the forecasted interdependent demands is unlikely to provide insights valuable enough to warrant the cost and delay generated by such analysis.

The bad news is that calculating Area 4 and Area 5 is problematic. The good news is that the secondary leakage and the secondary contribution effects depicted in Figure 1b tend to offset each other. Given the advertising nature of the mail volumes in question, the decline in some competitors' volumes in response to any increases in solicitation mail by Capital One would likely be offset by increased volume by other competitors who respond to Capital One's increased volumes with additional advertising mail of their own. Thus, these secondary effects are not likely to significantly affect the net financial impact of the NSA negatively. The Postal Service has taken a pragmatic

approach to evaluating the NSA by weighing the sum of Area 1 against the sum of Area 2 and Area 3 (implicitly assigning the sum of Area 4 and Area 5 a value of zero).

III.C.iii. Estimation of the Secondary Impacts

The Postal Rate Commission and others in this case have asked for guidance on establishing bounds for these secondary effects. (See, for example, Tr. 8/1760-1761 and Tr. 8/1773.) Using data put forth by the Postal Service and Capital One in this proceeding (USPS-T-3, COS-T-2), I am able to establish such bounds for Area 4 and Area 5. In doing so, I identify the variables determining the results and the assumptions made about the values of these variables.

Area 4 represents the secondary leakage that could result from Capital One competitors reducing customer mail as the credit card industry re-establishes equilibrium after the NSA is implemented. Since customer mail is business correspondence with existing customers, I assume the mail volumes at issue, for both Capital One and its competitors, are presorted First-Class Mail. Furthermore, I assume that Capital One's competitors pay Capital One's average rate for First-Class Mail prescribed by the existing uniform tariff.

Witness Elliott (COS-T-2, Exhibits 6 and 7, Tr. 2/211-212) offers two methods for estimating by how much Capital One will expand its First-Class customer mail under the NSA. In one scenario – the source of the 15.5 million piece incremental after rates volume for Capital One – Witness Elliott applies the –0.071 own-price elasticity for workshared First-Class Mail to the baseline customer mail volume, resulting in an increase of 7 million pieces of customer mail (Tr. 2/211). In the alternative scenario, Witness Elliot assumes Capital One's pre-existing customer mail volumes are perfectly

price inelastic, but that the –0.388 Standard Mail elasticity is applicable to Capital One's First-Class Mail solicitation volume. He then derives the increment of customer mail by estimating the new accounts generated by the additional solicitations and pieces mailed per account, resulting in an estimate of 1.92 million pieces of additional customer mail (Tr. 2/212). For purposes of establishing a "worst case scenario" for the secondary leakage, I am using the 7 million piece estimate for the increase in Capital One's customer mail from the NSA.

The largest possible offset under competitive market assumptions is an exactly offsetting reduction of customer mail by Capital One's competitors. If this were the case, then the Postal Service would have secondary leakage of about $1.1 million dollars as Capital One's discounted First-Class Mail displaces its competitors' undiscounted First-Class Mail.[3] The "best case scenario" for Area 4 is that the offset is essentially zero. This could occur under a variety of imperfect competition situations, for instance if the effect of the Capital One NSA on the price of credit card services was too trivial to induce competitors' customers to switch to Capital One. In this case, the secondary impact would be $0. The middle case is that there is 50 percent offset, in which case the resulting leakage would be about $550,000. It should be noted that in Witness Elliot's method 1, to generate 7 million additional pieces of customer mail from 8.432 million additional solicitations would require a response rate of 12.8 percent, more than 20 times the industry average of 0.6 percent used in Witness Elliot's alternative method. Thus, even in the full offset case, I would expect the secondary leakage to be well below the $1.1 million figure. Using the 1.92 million piece alternative estimate, for instance, the secondary leakage under the worst case full offset scenario is only $307,000.

The calculation of the bounds for Area 5, secondary contribution, is a little more involved, but still relatively straightforward. Secondary contribution primarily represents changes in competitors' solicitation mail that could result in response to increased solicitation mailings by Capital One resulting from the NSA. The basic calculation of this impact requires multiplying the induced increase in competitors' solicitation mail volume by the average margin on that volume. Estimating the increase in competitors' solicitation volume requires an estimate of Capital One's increase in solicitation mail as a result of the NSA, a model of how competitors react in response to increased solicitation mailings by Capital One (ignore, partial match, exactly match, more than match), and the unit contribution on the competitors' solicitation mail. Thus, my estimates of the Area 5 bounds are given by the following equation:

$$\text{Secondary Contribution (Area 5)} = m * \Delta q_s * \alpha * \mu$$

where m is the unit margin (contribution) on competitors' increased solicitation mail, Δq_s is the increase in Capital One's solicitation mail as a result of the NSA, α is a parameter indicating how competitors respond in terms of increased advertising in reaction to increased solicitation mailings by Capital One, and μ is a parameter indicating how the competitors' advertising response translates into mail volumes. While the exact values of the α and μ terms would be difficult to measure, primarily because they would depend on private information of Capital One's competitors, it is possible to set reasonable bounds on them using some basic economics.

The α parameter mainly captures a strategic response of Capital One's competitors, and would thus depend on Capital One's market share and the concentration

[3] The $1.1 million figure is derived in Table 1, attached to the end of the testimony.

of the credit card industry. This effect will normally be positive and will tend to be larger to the extent Capital One and some of its competitors are large enough to take each other's actions into account. For example, α=0 implies no interactions, α=1 implies a matching advertising response by competitors, and α>1 implies a more-than-matching response as would occur in an advertising "war."

The μ parameter will be positive if mail is a "normal" advertising input—i.e., if the total amount of advertising increases, mail advertising will increase to some extent. Just as Capital One has choices in the advertising media it may employ to solicit new customers, competitors also have many alternative advertising media to choose among in responding to increased solicitation mailing by Capital One. Thus, $\mu = 0$ implies no response in the form of increased solicitation mail, and $\mu = 1$ implies that the response is entirely in the form of mail.

I assume that the average margin on this volume is 12 cents (implying a blend of First-Class Mail and Standard Mail). An assumption about the price elasticity of demand is needed to calculate Δq_s, in order to estimate the change in Capital One's solicitation volume to which competitors would be responding. As was the case with the secondary leakage, I employ Dr. Elliott's estimates to quantify Δq_s. Two values have been put forth by Dr. Elliott. The "low" estimate is 8.4 million additional Capital One solicitations from Dr. Elliott's Exhibit 6 (Tr. 2/211), and the "high" estimate is 51.2 million additional Capital One solicitations from his Exhibit 7 (Tr. 2/212). I construct "worst case," "best case," and "middle case" scenarios using each of Dr. Elliott's values of Δq_s.

The "worst case scenario" for secondary contribution (Area 5) is for there to be no competitor mail response ($\alpha = 0$ and/or μ=0) in which case Area 5 would equal $0

independent of Capital One's increased solicitation volume. The "best case scenario" for Area 5 assumes the high estimate for Capital One's solicitation mail volume increase, and exact matching of solicitation mail by competitors ($\alpha = 1$ and $\mu=1$).[4] In this best case, Area 5 would be $6.144 million. The two middle cases assume a 50 percent match by competitors ($\alpha \times \mu = 0.5$). In the low volume "middle case" Area 5 would be $504,000. In the high volume "middle case" Area 5 would be about $3.1 million.

Combining the bounds and middle cases for Area 4 and Area 5 provide the empirical bounds and middle cases for the secondary effects, which have heretofore only been presented as theoretical possibilities. Given the assumptions identified above, the lower bound is –$1.1 million for the Area 4 and Area 5 secondary impacts represented in Figure 1b. The upper bound estimate for the Area 4 and Area 5 impacts is about $6.1 million in additional contribution. The more realistic middle case estimates are about -$46,000 and $2.55 million. Incorporating the worst and best case scenarios for the secondary impacts into the Postal Service estimates of the direct impacts creates a range of $7.1 million to $14.3 million for the increase in total contribution resulting from the Capital One NSA, as summarized in Table 1.

The lower bound estimate for the secondary impact presented above is fairly-well established as a worst case. To occur, it would require complete offset of competitors' First-Class customer mail, and also would require no competitive response to increased solicitation mail by Capital One. The values for the middle cases and the upper bound depend on demand elasticity estimates, as well as values for m, α and μ. The margin m

[4] It is possible that an acceleration in a solicitation mail war could occur, in which the "best case scenario" would be one in which $\alpha > 1$ and $\mu=1$. This results in the secondary contribution being even greater than that given in the case of $\alpha = 1$. Given the difficulty in determining whether the credit card market

and Capital One's volume response should be subject to measurement or econometric estimation in principle, but it is unlikely that sufficient information would be available to estimate α and μ.

III.C.iv. Effect of Secondary Impacts on the Contribution Estimate

The "worst case" adjustment to account for secondary impacts would reduce the contribution gain from the Capital One NSA to about $7.1 million. A more realistic "middle case" would range from approximately zero to a modest positive secondary impact on total contribution. Thus, the Postal Service's estimate of $8.2 million of increased contribution can be viewed as a reasonable middle case estimate.

III.D. Assessment of the Alternative Put Forth by OCA Witness Callow

My understanding of Witness Callow's alternative proposal is that it has two main thrusts. First, it calls for making the terms similar to those of the Capital One NSA available to any presorted First-Class Mail customers approved by the Postal Service (Tr. 7/1361). For the declining block rate structure proposed by Witness Callow, the threshold level would be based on the customer's volume or other publicly available data employed by the Postal Service, and the discount block boundaries would be scaled according to the threshold volume level. Second, Witness Callow's proposal bounds the incremental volume that receives the discounted rate at 15 percent of the threshold volume.

The economic properties of Witness Callow's proposal are not as desirable as those of the Capital One NSA. There is considerable financial risk in the broad offering of an optional tariff. Optional tariffs are subject to an "adverse selection" problem that

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conditions would lead to this acceleration scenario, I have not considered it as the "best case scenario" in this analysis.

has the potential of eroding revenues and harming other ratepayers (see Section IV.A.ii, below). Mailers with pre-existing plans to increase their volumes would have the strongest incentives to obtain the declining block discounts, but those plans would usually be private information. So, it is far from clear how the Postal Service would set the threshold values to avoid unnecessary revenue erosion without resorting to negotiation or private information.

Another significant problem with Witness Callow's proposed tariff is that, in bounding the number of pieces eligible for the block discounts, it establishes an *increasing* block pricing structure beyond 15 percent of the customer-specific threshold. This occurs because the marginal discount is first reduced, and eventually eliminated, as volumes increase beyond 15 percent of the threshold (Tr. 7/1494). Thus, once the maximum discount is reached under Witness Callow's proposal, the marginal price reverts to the uniform price. While the volume increment at which these effects occur is large relative to the projected volume increase for Capital One, it may not be the case for all mailers who might seek to take part in the rates proposed by Witness Callow. The discount limit is undesirable from a pricing efficiency standpoint, as it undoes the marginal incentives for additional mail volumes and the efficiency gains from reducing the difference between price and marginal cost.

IV. EXPERIENCES FROM OTHER REGULATED INDUSTRIES

In this section I draw on my knowledge of other regulated industries to provide examples of pricing structures similar to the Capital One NSA. I also provide insights

from the regulatory processes in these industries, including the pragmatism of pilot or experimental programs when introducing a new pricing arrangement.

IV.A. Pricing Structures in Other Regulated Industries

Other regulated (network) industries have pricing structures similar to the Capital One NSA. The Capital One NSA actually embodies three related features that are found in pricing arrangements in other industries. These features are the optional tariff, the negotiated or specialized contract, and the application of a non-linear pricing structure. There are numerous pricing examples from other regulated industries of each of these features, as well as combinations of these features. Other regulated industries with these types of pricing structures include electricity, local telephone service, water, and other utilities.

These other regulated industries are similar to the Postal Service in that they all have a diverse mix of customers (e.g., residential, industrial, business, government) who rely on their services. Also like the Postal Service, these industries all have network features, a relatively high fixed cost structure (reflective in part of the network costs), relatively low marginal costs, and a history of average embedded cost pricing. Consequently, prices in these industries must be significantly greater than marginal costs (often by a factor of 2 or more) for firms to breakeven financially. Furthermore, the services in these industries have traditionally been standardized products that only recently are being considered in terms of the cost of the bundled attributes compared to the benefits perceived by the customers. Creating customized product bundles based on customer value, and pricing them with incentives to increase volume, benefits all customers. This is the spirit of the Capital One NSA.

IV.A.i. Examples of Non-Linear Pricing

Non-linear pricing refers to a broad family of pricing structures in which the marginal price paid does not equal the average price paid. In contrast, uniform (or linear) pricing has a constant per-unit price.

Several examples of non-linear pricing can be found in regulated and unregulated industries. Most regulated utilities (electricity, water, local phone service) have a basic bill structure that includes *a customer charge and a usage charge*. The customer charge can offset some of the overhead and reduce the per-unit markup of marginal cost required to break even.

Block pricing structures have been a common pricing structure in the electricity pricing industry the last thirty or so years. With declining block pricing, the customer faces a series of price decreases on incremental usage. The desirability of this structure is that gains can be obtained from more efficient marginal pricing (i.e., the marginal price is closer to the marginal cost) while maintaining the collection of fixed costs fairly across customers. There have also been some instances of *increasing* block pricing in electricity and water pricing. The rationales for this type of structure have been to encourage conservation and to shift the collection of fixed cost contribution to larger customers and away from small residential customers. The disadvantage of increasing block-pricing structures is that, for the most part, they result in more inefficient pricing (i.e., they increase the difference between marginal price and marginal cost). In principle, the desired reallocation of fixed cost contributions can be achieved more efficiently with pricing structures other than increasing block pricing.

Two-part real-time pricing is a dynamic pricing structure in electricity that appeals to large industrial and commercial customers that have some flexibility in their usage patterns. As suggested by the name, with two-part real-time pricing the customer's bill has two parts. First, the customer is billed for hourly baseline usage at the standard tariff. The baseline typically is the customer's one- to three-year historical average usage in a given hour. The second part of the customer's bill is incremental or decremental usage in each hour priced at an hourly "real-time" price that closely reflects dynamic hourly marginal cost. The customer's incremental usage is billed at the real-time price. For decremental usage, the customer receives a per unit credit at the real-time price. Adders are typically included in the real-time price for incremental usage, thus generating additional contribution.

Georgia Power and Duke Power have the largest two-part real time electricity pricing programs in the United States, and they are the programs with which I am most familiar. These programs have three strong similarities to the Capital One NSA. First, they are optional. Customers can always choose to stay with the standard tariff. Second, the baseline load is customer-specific and billed out at the existing rate. This guarantees existing contribution is maintained. Third, the product is "unbundled" of an attribute that costs more than the value received by the customer. In the case of electricity, the standard product is the commodity electricity along with price insurance (i.e., the price is guaranteed). Two-part real-time pricing essentially unbundles the price insurance from the electricity product. Those who choose two-part real-time pricing would rather self-insure against price risk than pay the premium included in the standard tariff.

The fixed bill, common in local telephone service and now being introduced to residential electricity and gas customers, is a limiting case of non-linear pricing. With the fixed bill, there is a flat fee and no per unit charge. In local telephone service, the flat fee is typically the same to everyone in a customer class (e.g., residential). With gas and electricity service, the fixed bill is determined on a customer-specific basis. The fixed bill product includes a price premium that covers both the induced usage (sometimes called "moral hazard") and the usage uncertainty (primarily weather driven). The rationale for this product is to provide the customer with a simple product and insure them against the bill impacts of extreme weather. The product somewhat disconnects the marginal usage decision from marginal cost, but the customer is willing to pay more than the actuarially-fair price for the convenience and bill certainty. Thus, the introduction of this product is value creating.

IV.A.ii. Examples of Optional Tariffs

As Professor Panzar concisely stated in his written testimony, optional tariffs "allow customers to choose between an established tariff and an alternative outlay schedule" (JCP-T-1, p. 3). Optional tariffs are common in other regulated industries. They have the appeal that the well-informed customer likely cannot be made worse off if the new tariff is voluntary. However, the flipside of the optional tariff coin is that "adverse selection" could lead to revenue erosion and ultimately harm other ratepayers who must make up the lost revenue. This is why it is important to verify that the optional tariff is indeed likely to increase net revenue.

One example of an optional tariff is the alternative bill plans commonly offered for local telephone service. One plan might have a low monthly charge (say $5) and a

per call charge (say 7.5 cents). The alternative plan might have a flat monthly charge (say $20). Given these pricing parameters, the customer who expects to average less than 200 calls per month would choose the per call plan, while the customer who expects to average more than 200 calls per month would choose the flat fee plan.

Several other examples can be found in the electricity industry. Most of the innovative pricing programs in the electricity industry are also voluntary or optional tariffs. These voluntary pricing programs include *declining block pricing, time-of-day pricing, two-part real-time pricing, fixed bill pricing programs*, and *special contracts* (analogous to NSAs).

IV.A.iii. Examples of Negotiated Contracts

Negotiated contracts have become more common in the electricity industry over the past two decades. I am familiar with examples in Colorado, Florida, Georgia, Missouri, and New York.[5] I believe it very likely that they exist in many more, if not most states. In the Colorado examples, the special contracts are filed with the Public Service Commission, similar to the process underway with the Capital One NSA. In the examples from the other states, a special tariff or rider gives the utility the authority to engage in negotiating special contracts. Typically the details of the special contract are confidential, but subject to regulatory oversight. In each case, eligibility requirements are specified and in some cases the objectives and contract criteria are made explicit.

[5] The specialized contract tariffs and riders can be found at the following websites: Colorado (Xcel Energy) http://www.xcelenergy.com/docs/corpcomm/psco_elec_entire_tariff03_01_24.pdf pp. 209-228; Florida (Gulf Power) http://www.southerncompany.com/gulfpower/pricing/pdf/cis.pdf pp.1 -3; Georgia (Georgia Power) http://www.southerncompany.com/gapower/pricing/gpc-pdf/section-g.pdf (1 page); Missouri (Kansas City Power and Light)http://www.kcpl.com/motariff.pdf pp. 99-103; and New York: (Niagara Mohawk) http://www.dps.state.ny.us/ets/pdf/1004_207c1_990929_effective.pdf pp. 744-748.

Customers eligible for special contracts tend to be non-residential customers and the customers with these special contracts typically are larger industrial enterprises. The contracts generally have had a definite or limited duration.

In these special contracts, the objective of the customer is mainly to lower their average cost of electricity. The primary objective of the utility is to maintain as much contribution as possible from the customer. The utility offers the special contract to respond to a customer's specific needs, and as a vehicle for responding to competitive pricing situations in the increasingly competitive energy services market. As with the NSA, contribution can be enhanced through increased usage and by reductions in the cost to serve the customer. A secondary, yet significant, objective of the utility and the regulator is to retain the customer because of the general regional economic benefits the customer provides, such as employment and the ripple effect from other support businesses. Because of the contribution-maintaining characteristic, two-part pricing structures often provide the framework for the contracting parties to pursue their objectives. As a result, many of the specialized contracts in the electricity industry involve two-part pricing.

While the details of the special electricity contracts are typically confidential between the contracting parties, the contracts in the states mentioned have been subject to regulatory approval. Historically, retail electricity markets have been regulated and remain so in most states. Some states have open (competitive) retail markets with little or no regulatory oversight of special contracts. However, the trend toward open retail markets has stalled in the last three years. So, regulators by and large still scrutinize

negotiated contracts and optional tariffs in electricity. Likewise, specialized contracts for local telephone service remains subject to state regulation.

IV.B. The Regulatory Experience in Other Industries

State regulatory bodies face issues similar to those faced by the Postal Rate Commission in the Capital One NSA case. The state regulators of these other industries typically are concerned with both the economics and the fairness of new rates schedules and specialized contracts. Consequently, they seek answers to the following types of questions:

a. What is the effect on the utility's net revenue?

b. What are the impacts on the utility's other ratepayers?

c. What is the justification for the proposed pricing schedule?

d. How does the proposed pricing schedule impact efficiency?

e. How does the proposed pricing schedule balance the need for pricing and product flexibility with the need for protecting the captive customer?

I believe several pragmatic lessons can be drawn from the regulatory experiences in these other industries. First, *establish the relevant reference case*. The status quo might not be the relevant reference case. While a customer's historic usage provides an obvious focal point for a reference case, there are reasons why it might not represent what would occur in the absence of the proposed pricing agreement. A customer might have a competitive alternative. In the case of electricity, this competitive alternative can range from fuel-switching to self-generation to physical relocation of the plant to another service territory. Alternatively, the customer may have plans to expand or contract usage, even if no change in price structure is implemented. Uncertainty and asymmetric information rest at the core of the problem of the relevant reference case. Uncertainty

can be dealt with through scenario analysis. Asymmetric information, however, remains an inherent problem, for the customer may have incentives for not revealing all it knows in the negotiating process. Nevertheless, regulators do need to make some best guess about the relevant reference case.

Second, *conduct simple comparative impact tests using the relevant reference case*. This involves calculating the various financial impacts of introducing a new pricing structure or implementing a special contract. For the Capital One NSA, this would involve quantifying the areas identified in Figure 1a (which the Postal Service has done) and Figure 1b. Some of the impacts (e.g., Area 4 and Area 5 in Figure 1b) might be secondary and difficult to quantify. For these amounts, educated assumptions may have to suffice.

Third, *establish workable evaluation criteria*. A likely first criterion, as suggested by Professor Panzar (Tr. 8/1764-1765) would be that total economic value increases. A second screening criterion could be that no customer group be adversely affected by more than a certain amount.

Finally, *use experimental or pilot programs*. There will undoubtedly be a lack of precision and disagreements on the financial impacts of a new price structure. Under a pilot or experimental program, a seemingly beneficial program can advance, while additional relevant information can be collected and analyzed. There are three main benefits of a pilot program. One, it allows a beneficial program to be put into place in a timely manner. Two, it provides a safeguard against making a big mistake. If the program turns out to be unwise, it can be cancelled. And three, it provides a cost-

effective method of obtaining market research measures that allow refinement of the program prior to making it permanent.

During the pilot, the Postal Service should attempt to collect data relevant to quantifying the financial impacts illustrated in Figures 1a and 1b. Most important are: securing historical data on Capital One's First-Class Mail and Standard Mail volumes and Capital One's percentage of returned First-Class Mail prior to the NSA; measuring changes in Capital One's First-Class Mail and Standard Mail volumes after the NSA is implemented; measuring changes in Capital One's percentage of undeliverable First-Class Mail after the NSA is implemented. Additionally, to the extent possible, it would be desirable to monitor trends in solicitation mail volumes by the credit card industry as a whole.

V. OBSERVATIONS ON THE CAPITAL ONE NSA

I conclude my testimony by making five observations about the Capital One NSA in the context of regulation and competition.

1. *The Capital One NSA appears to be in the public interest.* The Capital One NSA creates value that can be shared widely across all postal customers. A conservative, middle-of-the road estimate of the created value retained by the Postal Service is $8.2 million. While this is a seemingly modest amount, this represents about a 3 – 4 percent increase in the total contribution received from Capital One's First-Class Mail volume. The Postal Service's financial situation would be dramatically improved if this level of contribution increase could be achieved from all customers.

2. *The Capital One NSA displays both product and price flexibility.* Product and price flexibility are quintessential attributes of a nimble business entity. The Capital One NSA creates a new product (First-Class Mail with electronic notification in lieu of return) and effectively applies a non-linear pricing structure to maintain and increase First-Class Mail volume. Product and price flexibility, subject to pragmatic regulatory oversight, are essential for the Postal Service to respond to the increasing competitive pressures it faces.
3. *Other Postal Service customers are likely to request similar NSAs.* It seems likely that other customers, especially competitors of Capital One, will request similar NSAs. This fact alone provides a strong incentive for the Postal Service to be aggressive in pursuing increased contribution from the Capital One NSA. The Postal Service needs to be prepared for these requests. Requests for similar NSAs present the Postal Service with additional value-creating opportunities in the public interest. If the Postal Service can negotiate increases in contribution similar to those implied by the Capital One NSA, then the Postal Service should be looking forward to additional NSA requests.
4. *NSAs and innovative pricing structures are important in regulated industries.* Two key challenges facing a regulated industry are obtaining the greatest value from the industry's resources (i.e., static efficiency), and, over time, increasing the value obtainable from those resources through process and product innovations (i.e., dynamic efficiency). The history of regulation shows that when regulation denies firms price and product flexibility, these

challenges are not met, the industry ultimately suffers overall, and becomes severely handicapped against unregulated alternatives. However, by allowing customized service and innovative pricing, pragmatic regulation can help regulated industries replicate the desirable features of competition while protecting the public interest. Pricing structures that get price closer to the marginal cost result in static efficiency. NSAs or specialized contracts provide a vehicle for both cost and product innovation. The Capital One NSA displays all three of these desirable features—improved pricing efficiency, cost innovation, and product innovation.

5. *The Capital One NSA compares favorably to similar arrangements in other industries.* As in other regulated industries, the Postal Service is facing increasing competitive pressure from competitive alternatives. In these other industries, the objective often turns out to be how to minimize the loss of contribution and the negotiation process is one of concession. However, the Postal Service has turned the competitive challenge into an opportunity. Because of the Capital One NSA, the Postal Service significantly increases the contribution received from one of its largest customers; that customer receives more total value from its use of the postal services, and that customer is more likely to retain and expand volume (and contribution).

In summary, the Capital One NSA creatively introduces a value-creating new product and effectively applies non-linear pricing. It has the potential of achieving the objectives of increasing net revenues, and maintaining and possibly increasing First-Class

Mail volume. The end result is greater efficiency so that Postal Service resources yield more social value.

Figure 1a. Analysis of NSA Effects on Capital One Contribution

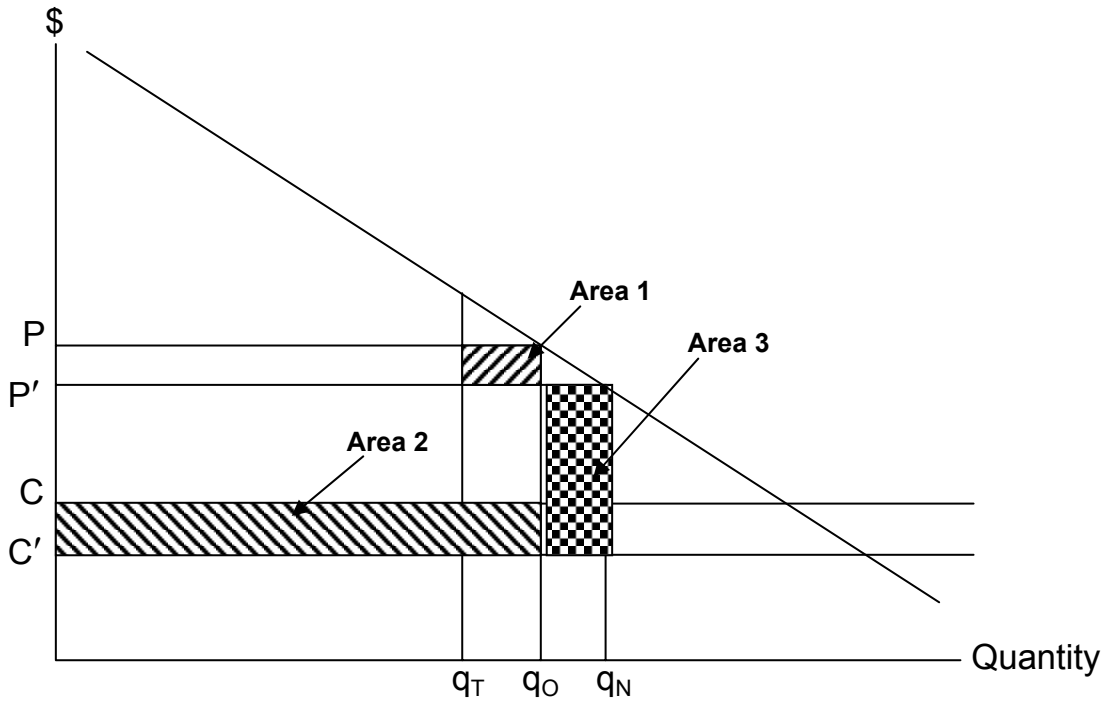

Figure 1b. Analysis of NSA Effects on Contribution from Capital One Competitors

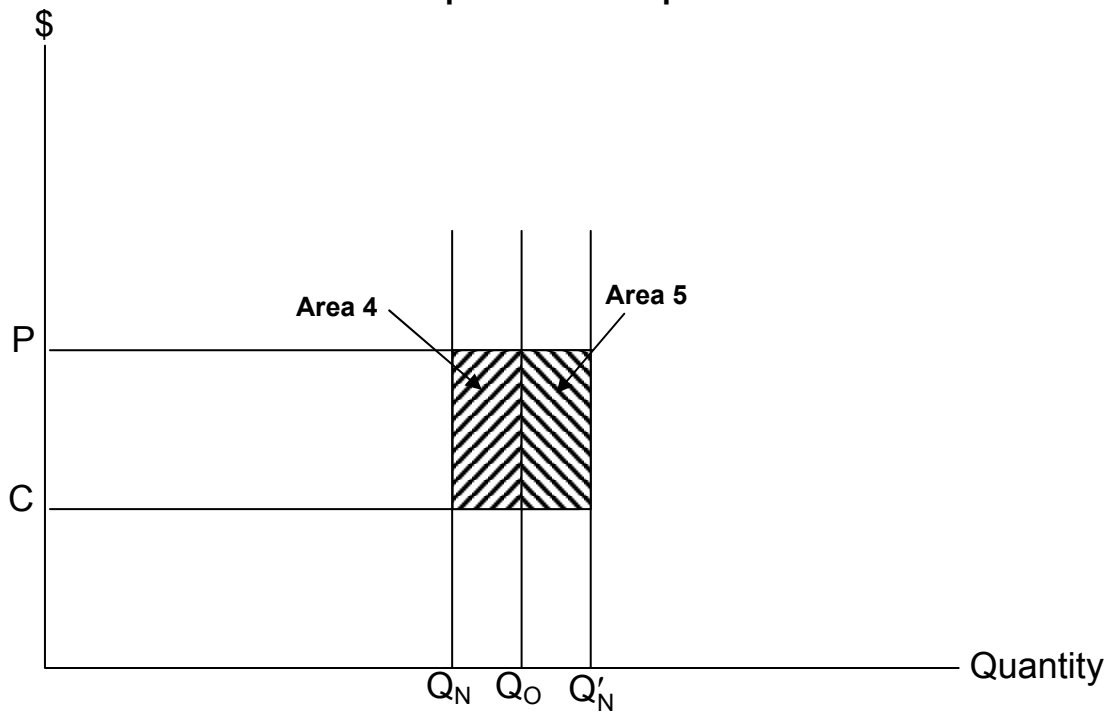

Table 1: Estimates of Total Contribution of the Capital One NSA, Including Secondary Effects (all figures in millions)

	Worst Case Scenario	Middle Case Scenario	Best Case Scenario
Secondary Leakage (Area 4)[1]	-$1.1	-$0.55	$0.0
Secondary Contribution (Area 5)[2]	$0.0	$0.5 (low elasticity) $3.1 (high elasticity)	$6.1
Total Secondary Effects[3]	-$1.1	-$0.05 (low elasticity) $2.6 (high elasticity)	$6.1
Discount Leakage (Area 1)[4]	-$6.7	-$6.7	-$6.7
Cost Savings (Area 2)[5]	$13.1	$13.1	$13.1
Direct Contribution (Area 3)[6]	$1.8	$1.8	$1.8
Total Contribution[7]	$7.1	$8.2 (low elasticity) $10.8 (high elasticity)	$14.3

[1]Worst Case = 7,000,000 * (0.291 - 0.1359); Middle Case = 3,500,000 * (0.291-0.1359); Best Case = 0 * (0.291-0.1359); where 0.291 is the First-Class per unit revenue from Capital One (USPS-T-3, Attachment A, page 1), and 0.1359 is the average variable (marginal cost) paid by Capital One (USPS-T-3, Attachment A, page 2).
[2]Worst Case = 0.12 * 8,400,000 * 0; Middle Case (low) = 0.12 * 8,400,000 * 0.5; Middle Case (high) = 0.12 * 51,200,000 * 0.5; Best Case = 0.12 * 51,200,000 * 1 * 1; where the 0.12 margin is obtained by taking a weighted average of the First-Class and Standard Mail margins = 0.15 * (2/3) + 0.1 * (1/3).
[3]Secondary Leakage + Secondary Contribution.
[4]USPS-T-3, Attachment B, page 3.
[5]USPS-T-3, Attachment B, page 2.
[6]USPS-T-3, Attachment B, page 1.
[7]Discount Leakage + Cost Savings + Direct Contribution + Total Secondary Effects.

Appendix 1. Curriculum Vitae

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RESUME

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Academic Background:

Ph.D., University of North Carolina at Chapel Hill, 1986, Economics
Dissertation: Estimating Allocative Inefficiency with a Non-Minimum Cost Function: An Application to U.S. Hospitals
B.A., University of Texas at Austin, 1978, History

Positions Held:

Vice President, Laurits R. Christensen Associates, Inc., 1997-present
Senior Economist, Laurits R. Christensen Associates, Inc., 1994-1997
Economist, U.S. Department of Agriculture, Washington, DC, 1992-1994
Assistant Professor, Department of Economics, University of Oregon, 1985-1992

Fields of Specialization:

Microeconomics, Industrial Organization, Regulation, Environmental and Resource Economics, Health Economics

Professional Experience:

I specialize in the economic and financial aspects of competitive product pricing. I have experience with the organization and regulation of industry, and environmental economics. My major projects in the energy industry include the development of innovative pricing and service designs, assessment of customer price responsiveness and product choice, and analysis of competitive impacts of restructuring proposals.

Major Projects:

Project Manager, Load Resources and Customer Price Responsiveness Study for the Public Utilities Commission of Texas

Project Manager, comprehensive pricing strategy project for a retail energy provider in a deregulating Canadian market.

Project Manager, New strategies for electricity product development and wholesale pricing for a public power entity.

Co-Author, "A New Strategic Direction in Retail Electricity Product Development and Pricing."

Project Manager, Developing an analytical tool for retail product design and pricing.

Project Manager, Costing and pricing of ancillary services.

Project Manager, Real Time Pricing at three major U.S. utilities.

Recent Conference Presentations and Workshops:

Connecting Wholesale and Retail Electricity Markets, Conference Organizer and Chair, Electric Utilities Consultants, Denver, 2002.

"Effective Demand Response," Electric Utility Consultants conference on Connecting Wholesale and Retail Markets, Denver August 2002.

Retail Strategies that Connect Wholesale and Retail Market, Workshop Organizer and Instructor, Electric Utility Consultants conference on Connecting Wholesale and Retail Markets, Denver August 2002.

"What Do We Expect Electricity Markets to Achieve?" Edison Electric Institute Market Design School, Madison, WI, July 2002.

The Price Builder's Workshop, Developer, Coordinator, and Co-presenter of EPRI Workshop, December 2001.

"Connecting Retail and Wholesale Electricity Markets," Edison Electric Institute Conference of Market Restructuring, Washington, DC, September 2000.

Retail Pricing for Competitive Power Markets: The Fundamentals of Unbundled Pricing (Course 1), and *Designing Market-Based Retail Prices* (Course 2), Course Developer and Co-presenter, Infocast Conference, September 2000.

The Unbundling and Restructuring of Electricity Prices, Developer and Presenter of EPRI Workshop, July 2000.

"The Challenge of Low Cost Power," presentation at EPRI International Energy Pricing Conference, July 2000.

The Energy Service Provider in a Competitive Retail Market, Developer, Coordinator and Co-presenter of EPRI Workshop, May 2000.

Postal Service Regulatory Reform, Session Organizer and Chair, American Economic Association Meeting, January 2000.

Market-Based Pricing and the Product Mix Model, Developer, Coordinator and Co-presenter of EPRI Workshop, October 1999.

Pricing for Retail Markets, Developer and Co-presenter of pre-conference workshop, The Center for Business Intelligence Conference on *Pricing Power Products and Services*, October 1999.

"Building a Retail Portfolio to Meet Diverse Customer Needs," presentation at The Center for Business Intelligence Conference on *Pricing Power Products and Services*, October 1999.

"Strategic Pricing of Retail Products in a Competitive Industry," presentation at American Public Power Association (APPA) *Business and Financial Workshop*, September 1999.

Pricing a Retail Product Mix, Developer, Coordinator and Lead Presenter of EPRI Workshops, June and September 1997; February, March, June, and October 1998; April 1999.

"Risk Based Pricing: Creating Value by Sharing Risk," International Business Communication Conference on *Unbundling Retail Rates*, Cambridge MA, September 1998.

"Creating a Profitable Product Mix," Electric Utility Consultants *Electric Utility Business Environment Conference*, Denver June 1998.

"Retail Applications of the Forward Price Curve," presentations at EPRI Forward Price Curve Workshops, May and September 1997; February 1998.

"Product Differentiation, Customer Segmentation and risk-Based Pricing," EPRI Power Markets and Resource Management, *Making Money in Energy Markets*, Houston, October 1997.

"Products, Contracts and Profits," EPRI Power Markets and Resource Management, *Achieving Success in Evolving Electricity Markets*, Indianapolis, 1996.

"Forward Plus Spot, Alias Two-Part Real Timer Pricing," EPRI Power Markets and Resource Management, *Advanced Market-Based Products Workshop: Constructing Advanced Pricing Products*, Atlanta, October 1996.

Real Time Pricing, Co-developer and Presenter of EPRI Workshops, May and June 1995.

Publications:

"Demand Response and the FERC Standard Market Design NOPR," *EnergyPulse*, January 8, 2003 (with S. Braithwait).

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Academic Papers and Invited Seminars Presented:

"Restructuring Electricity Markets," Maxwell School of Public Policy, Syracuse University, November 2000.

"Duality Properties of Regulatory Cost Functions," Georgia Productivity Workshop, University of Georgia, November 1996.

"Efficient Pricing of Back Up Electricity Services," Southern Economic Association Meetings, November 1995.

"Environmental Accounting: The Impacts of Agriculture," Association of Environmental and Resource Economists, Boulder, CO, June 1994.

"Using the Bootstrap to Derive the Allocative Inefficiency Measure," Southern Economic Association Meetings, Washington, DC, November 1992; Atlantic Economic Society, ASSA Meetings, Anaheim, CA, January 1993.

"Union Algebra: Evidence on Labor Intensity Restrictions," Southern Economic Association Meetings, New Orleans, LA, November 1990, Winter Meetings of the Econometric Society, Anaheim, CA, January 1993.

"Cost Effects of Chemical-Use Restrictions in Agriculture," Atlantic Economic Association Meetings, Philadelphia, PA, October 1993; Southern Economic Association Meetings, New Orleans, LA, November 1993; Association of Environmental and Resource Economists, Boston, MA, January 1994; Seminars at the University of Wyoming, March 1994, Indiana University, January 1996, and Tulane University, March 1996.

"Do Physicians Minimize Cost? A Comparison of Group and Solo Practices," Southern Economic Association Meetings, San Antonio, TX, November 1998; Atlantic Economic Society, ASSA Meetings, New Orleans, LA, January 1992.

"The Self-Employed Utility-Maximizing Physician," Southern Economic Association Meetings, Nashville, TN, November 1991.

"Non-Negative and Second Best Thoughts about Allocative Inefficiency," Atlantic Economic Association Meetings, Washington, DC, October 1991; Southern Economic Association Meetings, Nashville, TN, November 1991.

"Virtual Prices and a General Theory of the Owner-Operated Firm," Southern Economic Association Meetings, New Orleans, LA, November 1990.

"Modelling and Measuring Biased and Induced Technological Change," Conference on Current Issues in Productivity, Graduate School of Management, Rutgers University, December 1989.

"Constructing Confidence Intervals Using the Bootstrap: An Application to a Multi-Product Cost Function," Southern Economic Association Meetings, San Antonio, TX, November 1988; Winter Meetings of the Econometric Society, Atlanta, GA, December 1989.

"Factor Adjustment Costs in Banking: Evidence from a Dynamic Cost Function," Atlantic Economic Society, ASSA Meetings, New York, NY, December 1988.

"Branching Restrictions and Banking Costs," Seminar at Oregon State University, November 1987; Southern Economic Association Meetings, Washington, DC, November 1987; Seminar at The Federal Reserve Bank of Cleveland, December 1987.

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"Allocative Inefficiency in the Production of Hospital Services," North American Summer Meetings of the Econometric Society, Duke University, June 1986.

Referee:

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Contemporary Policy Issues
Economic Inquiry
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Journal of Human Resources
Journal of Industrial Economics
Journal of Productivity Analysis
National Science Foundation
Southern Economic Journal
U.S. Dept. of Health and Human Services, Agency for Health Care Policy and Research