

BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, DC 20268-0001

Periodic Reporting)
(UPS Proposals One, Two, and Three))

Docket No. RM2016-2

**INITIAL COMMENTS OF THE
AMERICAN CATALOG MAILERS ASSOCIATION**

(January 27, 2016)

On October 8, 2015, the United Parcel Service, Inc. (UPS) filed a petition for a rulemaking to consider three proposals related to costing. In Order No. 2793 (October 29, 2015), the Commission established the instant docket and invited comments on UPS Proposals One and Two. The American Catalog Mailers Association (ACMA) is pleased to submit these comments.

ACMA believes that the costing proposals are unwarranted under the Postal Accountability and Enhancement Act (PAEA), do not reflect good costing principles, and are fraught with insurmountable difficulties. The following sections explain these concerns.

Section I explains that the existing costing system, while not without opportunity for improvement, is logical, causal, and suited to ratemaking.

Section II summarizes the extensive history of the current costing system, including input from eminent experts and review by the federal courts. The credentials of the system are tested and noteworthy.

Section III reviews the theory of the firm and the support it provides for the current costing system.

Section IV discusses the kinds of changes that the Postal Service might be expected to actually make, and how these relate to economic theory. In the end, the analysis must be USPS specific.

Section V focuses on the three “key” reasons UPS provides for attributing an inframarginal costs measure for cost components, and explains the infirmities of these reasons.

Section VI discusses the UPS proposal to draw on Shapley reasoning to support its proposal to develop costs at the level of cost components.

Section VII discusses the UPS proposal to add another layer of variabilities to the current costing system by regressing cost residuals on volume.

Section VIII is a Conclusion. Taken together, these sections explain why the current system should be affirmed and why the fundamental transformation proposed by UPS must be rejected.

I. The Existing Costing System is Logical, Causal, and Suited to Ratemaking.

The existing costing system is rooted in our understanding of economic efficiency and consumer welfare. It is designed to estimate costs that are relevant to the rates being set. It includes detailed attention to both direct and indirect costs, guided by causation. Its reliability stems from the fact that it is based on cost effects of quarter-to-quarter and year-to-year volume changes. These not only can be analyzed without great difficulty but are similar to the volume changes that would be caused by rate adjustments. Also, the analysis is guided much more by data than by assumptions.

The most basic of all guidance for ratemaking is that rates should be set in full understanding of their effects. If rates are increased, one effect will be a reduction in

volume, and the size of this effect is quantified by the elasticity of the demand.¹ The volume reduction will cause a reduction in cost, which is quantified by the marginal cost (a causal relationship), on which the current costing system focuses. The volume change and the cost change together will affect the net income of the Postal Service.

Changes in volume in response to rate adjustments are determined by mailer preferences, which are reflected in the elasticities. Businesses and consumers consider the increases (or decreases) in value or utility obtainable from purchasing additional (or fewer) units of products. If the prices are equal to the marginal costs, which are the values of the resources the Postal Service must take from the rest of the economy to produce additional volumes, then the mailers will adjust the volumes to equate the gains in value and utility to the losses of these resources. This balance makes marginal-cost prices efficient, which is the reason there is widespread agreement that marginal costs are the key cost of relevancy for ratesetting. Accordingly, the Postal Service and the Commission have long sought to estimate marginal costs. These costs are then marked up to obtain rates.² The marginal costs are indicators of the effects of rate

¹ A critical requirement is that the volume change must be a **rate-induced** volume change. For example, since an increase in the number of delivery points would not be caused by a rate change, the analysis must focus on the cost change associated with a change in volume for an unchanged set of delivery points. The current USPS analysis considers this.

² If the cost is 10 cents and the rate is 18 cents, the **markup** would be 80%. In parlance more common in postal proceedings, this markup would be expressed as a **cost coverage** of 180% (18 divided by 10). In Ramsey formulations, which focus specifically on welfare, the markup measure receiving direct attention is the **markup fraction**, which is the proportion of the rate that is markup (8 divided by 18). These three measures are reasonably interchangeable. That is, if one of the measures is known, the other two are determined. Further, they increase and decrease together.

changes on the Postal Service, and the relative markups become the link to efficiency.

Consider the Carrier Route category in the Standard class, and assume its marginal cost is estimated to be 20 cents.³ This is the additional cost caused by an additional weighted-average piece. It is definitely causal. Efficiency requires that it be the base for rates. But, supposing that a markup of 40 percent is deemed appropriate, much more is needed than that the rate should be 28 cents. This is so because there are upwards of 50 rate elements in Carrier Route. For this reason, rate development often begins (equivalently) with the **volume-variable** cost.⁴

If a product goes through more than one operation, each analyzed separately, its total volume-variable cost is the sum of its volume-variable costs from each of them. The focus on volume-variable cost allows this addition to take place and the workpapers to be laid out clearly and simply. This is preferable to focusing on the marginal costs of each operation, because the marginal costs of the operations cannot be added to obtain

³ The notion of a marginal cost for a category like Carrier Route, which is an amalgam of volume elements of different costs, relates to the effect of a volume change at a constant mix. Over time, mix changes occur, but they are often small. When they are large, their effects must be considered.

⁴ In Postal parlance, the marginal cost times the volume is defined to be the **volume-variable cost** (or, equivalently, the **total marginal cost**). This is not a cost that is observed in ordinary accounts but rather an amount that is the result of analyzing the costs in ordinary accounts.

If product-specific fixed costs are negligible, which they generally are, rates are tied to the volume-variable costs instead of to the marginal costs directly. The markup is applied to the volume-variable cost to yield the revenue requirement. Then, guided by the pertinent factors set out in section 3622(b) and (c), including attention to signals in the rates and notions of efficient component pricing, the rate elements can be designed to achieve that revenue.

the marginal cost of the product.⁵

Now consider a perfectly general operation in which an assembly of essentially similar employees is processing a group of related products. The total cost of the operation is obtained from ordinary accounting records, and is considered a cost **component** in postal costing.⁶ This is an **accrued** cost. Under current procedures, if an analysis shows that a 10 percent increase in the volume causes this cost to increase 8 percent, then the **variability** of the component is 80 percent, and the **volume-variable cost amount** for the operation is $0.80 \times$ the total cost. The **fixed cost amount** for the operation is defined as the total cost minus the volume-variable cost. Thus the fixed cost is a **residual**, dependent on a direct analysis of the volume variability of the total cost. That a 10 percent increase in volume causes only an 8 percent increase in cost reflects the **behavior** of the costs of the operation. In the next step, the volume-variable cost is distributed to the separate products. The marginal costs of the operation and the products can be found by dividing their volume-variable costs by their volumes.

⁵ Suppose that 30% of the pieces of a product go through an operation with a marginal cost of 5 cents and 70% of the pieces go through an operation with a marginal cost of 8 cents. The marginal cost of the product cannot be found by adding 5 cents and 8 cents. Rather, one would need to take 30% of 5 cents and 70% of 8 cents, i.e., a weighted average. These proportions, 30% and 70%, are **not** the distribution keys commonly used to distribute volume-variable costs, so attempting to work with the two marginal costs instead of the two associated volume-variable costs would require a separate data source.

⁶ For a discussion of cost segments and components, see Library Reference 9, USPS-FY15-9_Roadmap.pdf, at 5. Segments are disaggregated into components. Components relate to relatively narrow operations.

To the same end, one might develop a cost function by regressing the total cost on the volume, controlling for the influence of non-volume factors, taking a partial derivative with respect to volume, and thusly obtaining the marginal cost directly. It can then be multiplied by the volume to obtain the volume-variable cost. The results should not depend on whether the volume-variable cost or the marginal cost is found first.

The logic behind identifying one amount of cost as volume-variable and another amount of cost as fixed must be understood. These are reflections of behavior at the margin of current output. The 80-percent figure and the 20-percent figure quantify the **variability** and the **fixity** of the accrued costs. For small volume changes,⁷ the total cost behaves **as though** 80 percent of it is fully variable and 20 percent of it is fully fixed. But in the general case, the productive operation is a black box and it is not possible or sensible to point to certain categories of accrued costs within the component and call them “variable” or “fixed.” The employees work together as a producing mechanism. As separate or otherwise identifiable categories of accrued costs, variable and fixed costs simply do not exist. The analytical result that a certain cost amount is variable and another cost amount is fixed is based entirely on the observed behavior of the operation rather than on any accounting records or classification scheme.

⁷ Focusing on the effects of small volume changes is central to variability analyses and marginal costs, among others. Although calculus might be used in the analysis, which deals generally with changes that are infinitesimally small, the interest should be on volume changes of the size that might be caused by rate changes of the magnitude under consideration.

If one wanted to estimate the effect on costs of a 5 percent increase in volume, *ceteris paribus*,⁸ taking 5 percent to be reasonably small, an estimate could be obtained by saying that the volume-variable cost amount (80 percent of the accrued cost in the example) will increase 5 percent and the fixed cost amount (20 percent of the accrued cost in the example) will not change. But this can be done only for small volume changes and it is only an estimate. Other ways to make such an estimate exist as well.

Costing is hypothetical and quantifies what would be the firm's accommodation of a small volume change, *ceteris paribus*. A short-run marginal cost is the change in cost if the volume change is accommodated by adjusting *some* of the inputs; thus short-run results are *constrained*. A long-run marginal cost is the change in cost if the small volume change is accommodated by adjusting *all* of the inputs, as appropriate; thus long-run results are *unconstrained*. By definition, then, there are no categories of accrued costs that are not candidate for adjustment in long-run accommodations. However, even in a long-run analysis, it is entirely possible, indeed generally expected, that the proportionate change in the accrued cost will be smaller than the proportionate change in volume, leading to a finding of both volume-variable and fixed-cost **amounts**. Matters of short and long run will be discussed further in Sections III and IV.

In the long run, just as in the short run, it is not possible or sensible to identify certain categories of accrued costs as fixed. The essential feature of a long-run

⁸ When interest centers on the effect of a change in one particular variable, such as the effect on costs of a change in volume, *ceteris paribus* means that other relevant factors also affecting costs remain unchanged. When considering the effect of a change in volume on costs, for example, changes in factor prices are not allowed, or are accounted for in the analysis.

adjustment is **reconfiguration**. When all of the inputs are adjusted to accommodate the new volume level, the productive system is reconfigured consistent with that level. No category of cost is immune from adjustment. Both the variability and the fixity are reflections of behavior at a particular level of volume.

In the current costing system, volume-variable costs (and a small amount of costs called product-specific fixed) are attributed.⁹ But section 3622 of the PAEA does not limit ratesetting to attributable costs. It requires in addition that classes of market-dominant mail shall bear “that portion of all other costs of the Postal Service reasonably assignable to” them. If one is going to set rates at a level that will recover a particular portion of all other costs, the most relevant point of reference is the volume-variable cost. To increase the base to some higher level, such as to the level of the incremental cost, so that a smaller portion of all other costs would be assigned, would do little more than make ratesetting more complex and less reliable.¹⁰

⁹ The CRA Report, contained in Library Reference 1 of the Postal Service’s Annual Compliance Report, shows product-specific fixed costs. These are for **products**, not components. They are costs that are clearly fixed but which are understood to be caused directly by one specific product. As a proportion of the total attributable costs by product, these range from zero to 0.443 percent, the latter proportion being for Single-Piece Postcards. For all practical purposes, they are negligible.

¹⁰ The incremental cost of a product is normally defined as the savings if the entire product is withdrawn and the operations are reconfigured. As explained further on, estimating incremental costs is generally difficult and is usually dependent on assumptions.

UPS states repeatedly that Postal Service costing embodies assumptions that the long-run marginal cost curves are horizontal over all volume ranges.¹¹ To the contrary, no such assumptions have been made, whether in some accounting step or in the analysis of accrued costs. **Whether or not** the curves are horizontal, the volume-variable cost is defined as the marginal cost times the volume, and it is fully deliberate that the volume-variable costs are attributed and used as a reference point for ratesetting. Product-specific fixed costs are also attributed, but are negligible.¹²

UPS also seems not to understand that a cost amount viewed as fixed does not relate to a particular category of accrued cost that is in some sense inherently fixed. Rather, it refers to a **residual** that remains after the amount of cost that is volume-variable has been determined by analyzing the behavior of the productive system. The fact that the level of accrued costs is changed in both a short-run and a long-run adjustment does not mean that all of the accrued costs are variable in any meaningful sense.

Thus, it is possible to determine fixed-cost amounts only after positive analyses of volume variability. However, there can be productive operations where it is possible to understand the reason a fixed-cost amount exists. A good example of such an

¹¹ In its Petition, for example, UPS states: “Put another way, the Postal Service’s cost accounting methodologies **assume** that the cost of delivering *each* unit of its competitive products is equivalent to the cost of delivering only the *last* unit of those products.” Petition at 7-8 (emphasis added, italics in original).

¹² Docket No. RM2016-2, “Report of Dr. Kevin Neels Concerning UPS Proposals One, Two, and Three” (October 15, 2015) at 17 indicating that “product-specific fixed costs represent only a minute share of total attributable costs.” All references herein to Neels are to this report.

operation is carriers. Borrowing from a breakdown of operations of the kind industrial engineers often perform, we know that the time it takes a carrier to traverse a particular route is relatively fixed and that the time required to insert mail into boxes tends to change as volume changes. We can understand the fixity of the total cost by thinking about the route time. If the accounting system kept track of route time separately, we would have an accrued cost for it. Then we might point to this cost as being fixed.

But even this situation is not so clear cut. We know this because we understand that, at least on mounted routes, carriers drive faster near stops with no mail than near stops with mail. If a volume decline were to reduce the mail to a stop to zero, the carrier's average speed would increase and the route time would decrease, though by a small amount. So even the route time is not really fixed. It is still good analysis, however, to take the fixed-cost amount as the residual after the volume-variable cost of the carrier delivery system is found.

II. The Postal Service and the Commission Developed the Current Costing System over a Period Beginning in 1970, Based on Postal Service Analysis and Testimony from Eminent Experts on Rate Regulation.

The Postal Service that now exists is the result of the 1970 Reorganization of the Post Office Department. Before Reorganization, the costing systems of the Department were severely criticized. Principally, a Cost Ascertainment System distributed all costs,

on bases that had little or nothing to do with the behavior of the operations, and yielded results that were virtually useless for setting rates and for most other purposes.¹³

Under the Postal Reorganization Act (PRA), attention to costing matters has been specific and continual. An initial step was a costing task force at the Postal Service, which was told to break from the past and begin from basics. It was to consult with experts and to focus specifically on costs needed to support ratemaking. Costing for this purpose was housed in a division separate from accounting and corporate finance. Since then, costing matters have received ongoing attention, including detailed

¹³ According to the Kappel Commission Report, which provided much of the support for Reorganization:

The system of user rates and fees ... is disturbing in its irrationality. ...

Whether every class pays its 'proper' rate is a long-standing controversy which cannot be resolved in the absence of functional cost data which the current system does not generate. ... For determining costs it uses the 'fully-allocated' method through which every postal expense is charged to some class of mail or special service. A large segment of postal costs, however, does not result from handling a particular class of mail but is the cost of maintaining the postal system itself. The allocation of such institutional costs to specific postal products ... is not only arbitrary but uninformative.

Towards Postal Excellence: The Report of The President's Commission on Postal Organization, June 1968, at 29-30.

thought by a number of world-class economists.¹⁴ The Commission has presided over this process and approved the costing procedures at every stage. And under the PAEA, the Commission's role in regulating costing has become even more prominent.

Following several early rate cases under the PRA, each a proceeding of at least 10 months, and major attention in the courts of appeals, costing matters were reviewed

¹⁴ In the early 1970s, William Vickrey, an economist specializing in regulation and a subsequent Nobel Prize laureate, worked with the Postal Service on costing and ratesetting, and was a witness before the Commission (Docket No. R74-1: USPS-RT-3). William J. Baumol was a witness in Dockets No. R84-1 (USPS-T-5), R87-1 (USPS-T-3), and R90-1 (USPS-REM-T-1). In 1999, in conjunction with an examination by the House Committee on Government Reform of the Postal Service Rate Regulation Process, pursuant to a joint agreement among the General Accounting Office, the Postal Service, and the Commission, a *Data Quality Study* was done. Its conclusion was:

In general, within the scope of the Study, the quality of the data provided by the Postal Service for rate making has been sufficiently complete and accurate to calculate sub-class costs, and thus, enable sub-class rates to be based on reasonably reliable data, considering the costs to collect the data. This conclusion is based on the Study Team's assessment that the Postal Service asks the appropriate economic questions, uses the best available data, and applies an economically sound approach grounded in activity based concepts to calculate its sub-class costs with reasonable statistical accuracy.

Data Quality Study, USPS Contract # 102590-97-B-1972, April 16, 1999, at 5.

by the United States Supreme Court, in 1983.¹⁵ The Court found:

We agree with the Rate Commission's consistent position that Congress did not dictate a specific method for identifying causal relationships between costs and classes of mail, but that the Act "envisions consideration of all appropriate costing approaches." PRC Op. R71-1, p. 46; see PRC Op. R74-1, pp. 92, 127; PRC Op. R80-1, pp. 129-133. The Rate Commission has held that, regardless of method, the Act requires the establishment of a sufficient causal nexus before costs may be attributed.

National Association of Greeting Card Publishers v. United States Postal Service,

462 U.S. 810, 826 (NAGCP IV). The Commission has exercised such judgment both prior to and since the Court's opinion.

Section 3622(c)(2) points to the attribution of both "direct and indirect" costs, a matter raised by UPS. This instruction has been carried out carefully, as evidenced by

¹⁵ Former § 3622(b)(3), the predecessor to the PAEA's § 3622(c)(2), required the Commission to

make a recommended decision on [a Postal Service] request for changes in rates or fees in each class of mail or type of service in accordance with . . . the requirement that each class of mail or type of mail service bear the direct and indirect postal costs attributable to that class or type plus that portion of all other costs of the Postal Service reasonably assignable to such class or type.

the continuing treatment of supervisors and the development of piggyback factors.¹⁶ Section 3622(c)(2) also points to “reliably identified causal relationships.” Volume-variable costs, as defined in Commission proceedings, are developed in analyses that focus on cost effects caused by volume variations that occur regularly.

UPS presents its work as “likely the first major critical analysis [of costing] since the passage of the PAEA.” Petition at 6. But the picture UPS paints is misleading. Costing work has been continual. It has not gone through periods of dormancy either before or after the time the PAEA was passed. And the costing guidance in the PAEA’s § 3622(c)(2) is essentially the same as that in the PRA’s § 3622(b)(3). In its Compliance Report for FY 2014, the Postal Service listed 16 costing changes implemented during the year, each approved in a rulemaking docket before the Commission. Report at 4-5. In its FY 2015 report it listed 18. Report at 4-6. In its Annual Compliance Determination (ACD) for FY 2014 (at 85), the Commission stated that “[t]he process and methodology by which the Postal Service attributes costs have been developed and revised through various Commission proceedings for more than 40 years.”

¹⁶ On the question of attributing equipment costs, the Commission explained recently:

Although it is complicated to decipher the process of attributing equipment costs to products through the spreadsheets, the process of allocating the costs of equipment maintenance, labor, parts and supplies, and equipment depreciation has been in place since the first rate case before the Commission. See Docket No. R71-1, Opinion and Recommended Decision, June 5, 1972.

Docket No. ACR2014, Annual Compliance Determination (May 27, 2015) at 85.

As noted above, UPS argues that “the Postal Service’s cost accounting methodologies assume that the cost of delivering each unit of its competitive products is equivalent to the cost of delivering only the *last* unit of those products.” Petition at 7-8.

UPS is factually wrong; no such assumption has been made, and UPS cites none.

Under Commission-approved procedures, the Postal Service attributes all volume-variable cost amounts, as well as product-specific fixed costs. The volume-variable costs have been constructed deliberately and clearly, with no sleight of hand.

Attributing costs in this way provides a meaningful foundation for assigning markups, within the generous scope of the statutory pricing factors. By retaining in the PAEA the language of the PRA respecting attributable and assignable costs, Congress indicated its approval of the Commission’s painstaking interpretation and application of that language.

III. Short-Run and Long-Run Cost Curves in The Theory of the Firm.

The branch of economic theory that focuses on the activity of firms is referred to loosely as “the theory of the firm.” In that body of theory, cost curves for “firms” are **presumed**. The intent is that the curves portray cost-volume relations that tend to be common to many firms, at least qualitatively, allowing further theoretical work. To

obtain cost curves for **specific** firms, however, **specific** cost studies **must** be done.¹⁷

A. Short-Run Curves

Short-run total cost curves show cost-volume relations for plants designed from the drawing board up to produce certain levels of volume.¹⁸ These levels of volume are the design capacities of the plants. That the plants are fixed once built explains the designation of the curves as **short-run**. Movements along such curves, which involve changing the volume level while keeping costs as low as possible, are properly viewed as changes in the rate of utilization of capacity. It is easy, by dividing by volume, to obtain **short-run average total cost curves**, and just as easy, by looking at their slopes, to obtain **short-run marginal cost curves**.

To allow attention to the difference between routine functioning and investment decisions, it is common in short-run analyses to **presume** that accrued costs can be

¹⁷ For example, see Joel Dean, a pioneer in the development of the field of managerial economics, *Statistical Cost Functions of a Hosiery Mill* (University of Chicago Press, 1941) at 34, finding a total cost curve that is well represented by a straight line, and average cost and marginal cost curves that are essentially horizontal over a wide range of volume levels.

Although theory provides a framework for thinking and can help firms understand what to think about, firms tell theory what their costs are, theory does not tell firms what their costs should be.

¹⁸ These costs are often referred to as “drawing board costs.” See John C. Panzar, “The Role of Costs for Postal Regulation,” 2014, at 4, n. 4, paper done under Commission contract. Unless otherwise noted, references herein to Panzar are to this paper.

Even here, specific situations need to be studied. For example, a plant that could produce for 10 cents per piece in the output range 50 to 100 might be preferred to a plant that could produce for 9 cents per piece in the output range 90 to 100 and 13 cents per piece in the output range 50 to 90. Reality can be quite different from simple curves.

divided into categories that change systematically with the rate of utilization of capacity and categories that do not. So divided, the former are sometimes called “variable” costs and the latter “fixed” costs. The extent to which these costs vary with volume, that is, their degree of volume variability, is not a matter of concern in the theory of the firm.

As a qualitative matter, it is common to **presume** that short-run average total cost curves and short-run average variable cost curves decline up to some point near practical capacity and then increase relatively rapidly to a point that is often called absolute capacity.¹⁹ By implication, the short-run marginal cost curve would also decline and then increase. Importantly, these declines and increases are **not** due to economies and diseconomies of scale, for the plant being modeled has only one scale. Rather, the declines and increases are due simply to the behavior of the productive resources as they work together to process the volume.

Transferring these **presumptions** to actual productive operations is not a simple matter, and it may not even be helpful. In his paper, Panzar says (at 6-7) that to “make this distinction [between variable and fixed] it is useful to *assume* that our basic cost function $C(Q)$ can be rewritten as follows: $C(Q) = F\{S\} + V(Q)$ ” (italics added). He has **assumed** (a) that the costs being analyzed can be represented by an equation with a fixed term that depends only on the set of products being produced, (b) that all other costs can be represented by a term with volume as an argument, and (c) that there is a simple additive relation between the fixed and variable terms. If he found it feasible to

¹⁹ The expectation of a rapid upturn in average total costs past design capacity is usually based on a presumptions that the firm will pay overtime, forgo routine maintenance, bring in untrained employees, and bring into service older, less-efficient equipment.

complete the specification of the model and fit a curve, he could ask about the degree of variability of the costs.

The reality is that until an assumption is made about the total cost function and an analysis of an operation is performed, we have no idea what the cost levels in a “variable” term might be or how variable they are. The better course is simply to examine the behavior of the total accrued costs of the operation. We do this below in our discussion of Neel’s proposals. The total accrued costs contain all the information needed to analyze variability and to find the cost effects of volume changes, including marginal costs. Also, no cost information below the level of total accrued costs is available for analysis.

B. Extension to Long-Run

Further modeling, usually to the end of understanding trends and outcomes of competition, typically recognizes that firms can change their productive capacities. Such changes are called **long-run adjustments**.

Suppose a power company has a plant with a nameplate capacity of 3,400 MW (megawatts), and sees the need to double this capacity. It could build a second 3,400 MW plant, and put it near the current one. There would in this case be no increase in scale, except maybe in its managerial pyramid. Also, it could benefit from the previous investment and enjoy the flexibility inherent in having two plants.

Alternatively, the firm could ask its engineers to design and build, from the drawing board up, a 6,800 MW plant. This would involve an increase in scale. To get from the 3,400 MW plant to the 6,800 MW plant, all categories of costs would be candidate for adjustment, and most would probably be higher. There are no rules on

how much each might change. If significant economies of scale were available, the firm might choose this option.

Suppose technology is unchanged and the firm builds a unified, drawing-board 6,800 MW plant.²⁰ It could develop an **average** total cost curve for its new plant and compare it to the **average** total cost curve for the 3,400 plant. Both of these curves would be classed as short-run, one for a small plant and one for a large plant. Going further, we could think of an **average** total cost curve for a 2,000 MW plant, a 5,000 MW plant, and a 6,000 MW plant. The result is a family of average short-run curves. When a firm changes its output, it moves along its short-run curve.

Given this family of short-run curves, we could draw a curve under all of them, that touches each one once. This would be the **envelope** curve of the theory of the firm,²¹ which is generally called a long-run average cost curve. It is important to note that when the firm changes its output level, it does not move along this long-run curve. It is not an operating curve. Moving from one output level to another on a long-run curve involves moving from one drawing-board plant to another drawing-board plant. One might imagine that the firm **hops** from one plant to another, if it makes a long-run adjustment. In referring to the costs shown on a long-run cost curve, Panzar (at 4, n. 4)

²⁰ Both short-run and long-run curves are **point-in-time curves**, which implies a fixed technology. A change in technology is usually presumed to shift both curves downward. If, in a long-run adjustment, a firm builds a bigger, improved-technology plant, the cost decrease would not be the kind needed for rates. Said another way, a rate change would cause a change in volume but it would not cause a change in technology.

²¹ A drawing of an envelope curve may be found in most price theory texts. See Joel Dean, *Managerial Economics*, Prentice-Hall, Englewood Cliffs, 1951 at 297, where the envelope curve is referred to as a “Theoretical Long-Run Cost Curve.”

explains: "They are the expenditures that would be incurred to provide the specified vector of output quantities if the firm were able to 'start from scratch,' not burdened by legacy facilities or labor contracts."

Once an envelope curve is drawn, it is easy to draw the associated marginal cost curve. But the firm does not move on that curve either. And, when considering long-run curves, even more so than for the short-run curves discussed above, **there is no such thing as a category of accrued costs that is variable or a category of costs that is fixed.** When moving from a smaller plant to a larger plant, along a long-run curve, all categories of costs must be adjusted to levels determined by the larger plant. The whole idea of a new drawing-board plant, and thus of a long-run adjustment, is that all categories of costs are candidate for adjustment. However, to the extent that a long-run curve is taken to exist, it is sensible to ask about the variability of the costs in the face of volume changes.

After discussing some of these costing matters, William J. Baumol concluded:

My testimony has also sought to dispose of a number of widespread misunderstandings that beset the distinction between short run and long run costs. The latter is an idealized concept useful primarily for theoretical purposes, and refers to a state of affairs unachievable in reality, in which all plant, equipment and other commitments have been tailored perfectly to current circumstances, economic and technological. The costs directly pertinent to decisions in reality, that is, the actual cost consequences of those decisions, are, consequently, the costs somewhat misleadingly referred to as "short run." These are characteristically higher than the corresponding long run costs and therefore provide the more demanding tests of underpricing and cross subsidy.

Docket No. R87-1, Direct Testimony, USPS-T-3 (May 7, 1987) at 50. It is clear that the notion of a long-run cost curve, whether total, average, or marginal has a tenuous application to actual firms and to the adjustments actual firms would make. It is also clear that the notion of a cost being variable, particularly in long-run analyses, is not well-defined and may not be helpful.

IV. What Kinds of Changes Would the Postal Service Actually Make?

In the face of significant volume changes, what kinds of adjustments would the Postal Service actually make? The framework for thinking can be guided by the theory of the firm, but the answer must be practical and cannot be provided by textbooks. In routine operations, if non-volume factors do not change, including that technology remains unchanged, we know that the Postal Service moves along its short-run total cost curve and that changes in accrued costs are shown by a corresponding marginal cost curve.²² Predominantly, it is these kinds of cost adjustments that provide the input data for regression analyses.

However, we also know that the Postal Service reconfigures its plants and network to maintain efficiency and that volume changes contribute to reconfiguration needs. That is, the Postal Service makes adjustments that are longer-run in character.

²² As a practical matter, even the view that a complex firm moves on a short-run curve of the classical kind may not be applicable. This is because actual movements take place in operations that were built at different times and thus which may represent various technologies. The curves of theory are for one technology. This makes it all the more obvious that the costs used for rates should be for what actually happens.

It doesn't build new drawing-board plants, but it does reconfigure existing operations. Accordingly, the Postal Service and the Commission seek to estimate costs that reflect such adjustments. Accommodating an output change by reconfiguring basic operations moves along a curve that is **longer-run in character**, and the changes in costs are indicated by a marginal cost curve that is **longer-run in character**.²³

In a report entitled "Benchmarking of Costing Methodologies," the USPS Office of the Inspector General (OIG) agreed, explaining that the "[l]ong-run refers to a period that is long enough for costs to stabilize to reflect changes in volume" and that "[l]ong-run refers to costs that would exist if the postal operator or nonpostal business were optimizing the utilization of their assets."²⁴

Because long-run marginal costs refer to a situation of full adjustment and reconfiguration, the long-run marginal cost should ordinarily be *lower* than the short-run marginal cost. This is entirely logical, because the long-run is unconstrained and the short-run is constrained. In discussing these matters, Baumol said:

The term "long run marginal cost" does not refer to a particular length of time but instead refers to the marginal costs that would be incurred if all plant, equipment and labor were used in optimal configurations so that costs, for

²³ To help clarify that actual adjustments do not move on the long-run curves of theory, applicable curves have often been referred to in postal discussions as **longer-run** curves. For example, in discussing rural carrier costs in its R80-1 Recommended Decision, the Commission "found that time determines cost in the longer-run; thus, the Service's 'method of payment' short-run methodology was rejected and a functional approach, more reflective of longer-run cost variability, was adopted." Op. and Rec. Dec. upon Reconsideration on Bulk Third-Class Rates (April 18, 1983) at 23.

²⁴ OIG Report Number MS-MA-13-004, August 14, 2013 at 7.

whatever volume of service is supplied, are minimized. Thus, except when excess capacity is present, actual marginal costs (SRMC) are likely to exceed the ideally minimized long run marginal costs (LRMC).

Id., at 12. Similarly, in a paper entitled “Implications of Declining Mail Volumes for the Financial Sustainability of the Postal Service,” the OIG concluded: “Thus, a short run model like the GMU Enhanced Rollforward Model calculates an upper bound on the increase in unit cost and prices that would result from a large decline in volume.”²⁵

In current Postal Service costing, however, long-run costs are obtained by adding something onto short-run costs. This procedure is based on parsing costs that appear in the accounts, and is consistent with full-distribution techniques. It is flawed as a reliable measure of relevant costs. In adding something onto short-run costs, it fails to recognize the cost-reducing effects of the longer-run adjustments. In effect, long-run costs should be lower than short-run costs. Obtaining these cost-reducing effects is the reason for reconfiguring.

This error infects the UPS Petition before its analysis even starts, in that UPS builds on the current results and uses them, as though they reflect full adjustment, to estimate inframarginal costs, a matter discussed further below.

One more aspect of moving (or hopping) along long-run marginal cost curves should be recognized. Many production processes have the characteristic that moving to a substantially higher volume level does not really involve a change in scale. Said

²⁵ OIG Report Number RARC-WP-10-006 (September 29, 2010) at 8.

another way, many plant configurations and production processes can adjust relatively easily to a wide range of volume levels, without a change in the basic design of the process.²⁶ To the extent that this characteristic exists, a new drawing-board plant can be created without tearing down the old one, and a long-run curve becomes a simple extension of a short-run curve.

It turns out that the Postal Service tends to have the characteristic that scale changes do not occur, and thus that the short-run curves, possibly with some adjustment downward, can be taken as long-run curves. Mail sorting machines are an example—a reconfiguration to a lower volume level would mean using fewer machines, not using smaller machines.²⁷ Similarly, a reduction in the volume on the carrier delivery system, which must continue to go by each address each day, would involve, simply, a reduction in the number of pieces to be cased and in the number of pieces handled at each stop, not a change in the basic scheme. In such cases, the marginal

²⁶ On this matter, Baumol said: “If capital resources can be readjusted rapidly, as is, for example, true of purchased transportation equipment, LRMC must approximate SRMC.” *Id.*

²⁷ OIG Report RARC-WP-15-002, done under contract with John C. Panzar, states:

The reason the prospect of a Postal Service constrained to outsource all of its sorting is seriously discussed is the belief that the mail processing activities of the Postal Service can be carried out at **essentially constant long run marginal costs**. ... It is straightforward to examine this issue in the context of the current model, where it is assumed that the Postal Service can provide any desired amount of mail processing activity **at the constant long run marginal (and average incremental) cost** of t .

“The ‘First and Last Mile’ Strategy: A Critical Assessment” (December 8, 2014) at 20, emphasis added.

cost curve would not decline with increasing volume, nor would it increase with declining volume. It would be relatively constant over wide ranges of volume.

And even if a scale change might reduce costs, with reconfiguration, no one would expect the Postal Service to tear down its existing system and ask its engineers to build a new one. Rather, the lowest-cost way to achieve a reconfigured system would be to make adjustments to the existing system. These considerations force a marked departure from expectations based on the presumption of scale economies, even when a larger-scale drawing-board plant is imaginable. That is, replacing the existing plant with a new drawing-board plant is not a credible option for the Postal Service. Further, there are political constraints on the kinds of adjustments the Postal Service can make.

All this means that, for moderate to substantial changes in volume, even under the assumption of reconfiguration, the Postal Service would be expected to move along a somewhat modified short-run marginal cost curve, and that this curve might be nearly horizontal over most of the volume axis. And it bears emphasizing that adjustments along a marginal cost curve that is horizontal or nearly horizontal are generally inconsistent with presumptions that the productive operation would be characterized by

a constant degree of variability.²⁸ Specific empirical support should be required to support any such presumptions.

V. Neels's Reasons for Attributing Inframarginal Costs Are Infirm.

Inframarginal costs, whether for products or cost components, are difficult to quantify. Calculated according to a long-run total cost function, they are the difference in cost between two volume levels, minus a corresponding volume-variable cost. As explained above, these functions, which must model reconfiguration, have a tenuous existence.

McBride “develop[s] and appl[ies] methodologies for calculating inframarginal costs **by cost component**,” not by product.²⁹ In the main, he **assumes constant-elasticity** cost functions.³⁰ He does not address how well these functions model the behavior of Postal Service costs. His justification (at 5) for assuming them is that they

²⁸ The non-constancy of degrees of variability is an important issue in Postal Service costing. It is easy to see, for example, that a 50 percent reduction of volume in a carrier system would reduce many handling costs but leave route costs nearly the same, thus bringing about a degree of volume variability that is much lower. A good cost analysis should provide a graph of percent variability vs. volume.

²⁹ Charles McBride, “The Calculation of Postal Inframarginal Costs,” 2014 at 1 (emphasis added), paper done under PRC contract. All references herein to McBride are to this paper.

³⁰ $C = b * V^e$, where C = cost, b = constant, V = volume, and e = elasticity exponent, is the **constant-elasticity cost function** that McBride assumes. It has a **constant variability** (percent change in cost/percent change in volume) equal to “e.” $C = a + b * V^e$, where a = positive constant, also has “e” as an exponent but would not have a **constant variability**. It would have an intercept = a, which might be considered a fixed cost.

are “simple one-parameter function[s] that can reflect the economies of scale and scope.” He provides no evidence on the degree to which such economies exist. With graphs, he shows (at 3-5) that these functions **always** goes through the origin, and thus that they cannot accommodate fixed costs of the kind that would exist when the volume is zero. Therefore, without regard for the actual behavior of the costs, he forces full distribution of total component costs (including Panzar’s startup costs).³¹

Neels (at 10) makes it clear that he too focuses on cost components, not products, and that he uses McBride’s results (updated to FY 2014). On the question of the cost function, he refers (at 10, n. 8) to “cost segments in which the elasticity of costs with respect to changes in volume is constant.” Similarly, in response to CHIR No. 4, Question 7, UPS refers to using a “constant elasticity curve ... [that] **imposes** the assumption that a given percentage change in volume ... will result in a certain lower percentage of additional costs ... at **any** level of volume” (emphasis added).³² Both of

³¹ Panzar states (at 10): “Component fixed costs are ‘start-up’ costs that must be incurred to provide even an arbitrarily small level of driver activity.”

McBride notes (at 6, n. 10) that he might use a constant-elasticity cost function for a component that has “a volume variability that is considered constant over time even though there are fixed costs.” This is puzzling because a constant-volume-variability curve drawn through a cost-volume point always goes through the origin.

In cases where costs are 100 percent variable or 100 percent fixed throughout, of course, no assumption of a cost curve is needed.

³² In the same response, UPS goes on to suggest that “[e]ven if [a component] had a marginal cost curve that differed from the constant elasticity curve, the entirety of the cost component is variable [and] ... should be attributed to individual products.” That is, regardless of the shape of the curves, full distribution of component costs to products is required. Neels’s interest in FDC is unabashedly clear.

these references are to curves with a constant degree of volume variability, which implies that the curves go through the origin.

It would seem that both McBride and Neels should want to use cost curves that allow for the possibility of fixed costs since the purpose of their papers is to inquire into the level of fixed costs. However, both forcibly disallow the possibility of such costs.³³

Neels (at 16, initial caps dropped) asks: "Why should inframarginal costs be attributed to products?" He proffers three "key" reasons. In our discussion of these reasons, we will, except as noted, presume a cost curve that allows for the possibility of fixed costs, i.e., that can have an intercept. This presumption allows a balanced consideration of the matters at stake.

A. Key Reason One: "Inframarginal Costs are Variable Costs."

Neels (at 16) states that "[t]he simplest reason that inframarginal costs should be attributed is because they are variable costs." But, in line with direction from Congress, the Postal Service and the Commission have been very particular about how variability is gauged and about associated bases for attribution. Inframarginal costs are not categories of costs whose behavior can be examined. Rather, they are differences in

³³ "Component fixed costs" should not be confused with "product-specific fixed costs," which are currently attributed. When a component includes the processing of more than one product, there is no principled basis for attributing any fixed costs of the component to any of the products that are processed in that component.

accrued costs over the maximum volume range,³⁴ with volume-variable cost then subtracted out, estimated by assuming a long-run cost curve. We have noted that such curves are tenuous. Further, the meaning of being variable is not well defined, particularly under longer-run accommodation where all categories of accrued costs are candidate for adjustment.

Neels draws a declining marginal cost curve that shows the slope of a long-run total cost curve for a processing **operation**. The context makes it clear that the operation produces more than one product. Neels then defines the inframarginal cost (IMC) of the component to = {(the total accrued cost at the current volume level) – (the total accrued cost at a volume level of zero)} – {the component volume-variable cost},³⁵ and he observes that the IMC would be higher if the current volume were higher. On that basis, he designates the IMC as “variable” and proposes (at 11, 16) that it be distributed to products and then attributed.

As a matter of geometry, Neels is correct that his IMC quantity would be higher if the current volume were higher, assuming the cost curve he assumes. But:

³⁴ By “over the maximum volume range,” we mean from the current volume level all the way down to a volume of zero. The cost at a volume of zero would be one measure of the fixed costs of the component.

³⁵ The total cost at a volume of zero would equal the intercept, consistent with Panzar’s explanation (at 8) that the fixed costs “are the significant levels of costs that must be incurred in order to produce even a vanishingly small level of output” (footnote omitted).

1. In and of itself, an observation that the quantity Neels constructs would be larger if the volume were larger is not a reason for attribution, particularly under reconfiguration and longer-run adjustment. If it were, there would be no end to the costs that could be attributed, and the result would be fully distributed costs (FDC).³⁶
2. Neels's IMCs are developed for **components**, not **products**. Accordingly, the simplest reason that they should **not** be attributed is that they were not found pursuant to any notion of the cost of a product. And section 3622(c)(2) does not ask for the attributable costs of **operations**.
3. The cost curve assumed by Neels does not allow for the existence of fixed costs. Therefore, it cannot be used to inquire into the amount of costs that might be fixed.
4. As is clear from the equation above, Neels's constructs his IMC quantity and designates it as variable based on no information about its behavior, its variability, or its relevance to ratemaking.
5. The size of Neels's IMC quantity is a residual after subtracting the volume-variable cost, so it is not an independent cost amount that can be analyzed.
6. The size of Neels's IMC, and specifically the extent that it is higher than the volume-variable cost, depends very much on the shape of the cost curve he assumed, which is just supposition.

Under both the PRA and the PAEA, the Commission and the Postal Service have taken great pains over 45 years to avoid FDC. Such costing was described as arbitrary

³⁶ The downward-sloping marginal cost curve on which Neels relies (at 11, Figure 4) could result from a constant-elasticity total cost curve or any one of an infinite number of other total cost curves. McBride applied constant-elasticity curves for most components, as noted earlier. Since constant-elasticity curves always go through the origin, there can be no fixed costs implied, thus the costs of the component are always fully distributed.

and irrational by the Kappel Commission and held to be outside the bounds of what is permitted under the attribution provision of the statute by the Supreme Court in NAGCP IV. It is understood to provide faulty direction for ratemaking and to lead to inefficient rates.³⁷

To justify attributing his IMC, Neels notes (at 16) “that the legal framework under which the Postal Service operates requires attribution of direct and indirect costs.” But, as explained in Section II, the Commission has properly interpreted the “direct and indirect costs” referred to in the statute’s attribution requirement to refer to costs **caused** by the relevant subclasses or products. These costs are developed in the current costing system, in steps that trace cost effects carefully and apply piggyback factors. Neels does not point to weaknesses in these steps. In short, the attribution requirement

³⁷ See Kappel Commission Report at 30; and NAGCP IV at 826, 829 (“[T]he Rate Commission has refused to use general ‘accounting principles’ based on distribution keys without an established causal basis. . . . The Rate Commission . . . acted consistently with the statutory mandate and Congress’ policy objectives in refusing to use distribution keys or other accounting principles lacking an established causal basis”). In a footnote to the sentence just quoted, the Court observed:

Petitioner United Parcel Service argues that extended use of cost-of-service principles is necessary to avoid subsidization of those classes of mail for which the Postal Service has competition, such as parcel post, by other classes of mail for which the Postal Service enjoys a statutory monopoly, such as first class. Congress’ concern about such crosssubsidies, of course, was one motive for including the rate floor established in § 3622(b)(3). But Congress adopted the Kappel Commission’s conclusion that, unless a reliable connection is established between a class of service and a cost, allocation of costs on cost-of-service principles is entirely arbitrary.

Id. at 829, n. 24.

has been met, and Neels provides no argument for a change in attribution principles.³⁸

B. Neels’s Key Reason Two: “Inframarginal Costs Can Be Reliably Shown to Be Caused by Individual Products.”

To achieve attribution, which must be product specific, Neels needs to link his IMCs for processing operations to specific products. He states (at 17-18) that “the total amount of inframarginal cost in a component ... can be reliably linked to individual products” by applying the “[d]istribution keys [currently] used ... to attribute volume-variable costs to products.” But the **availability** of a distribution key does not show causation or justify using it to distribute a cost.³⁹

Neels says that the reliability of his approach is high. He has it backwards. Due mainly to the unbounded volume range (from zero up to the current level) and the nature of the cost curve that he assumes, the reliability of his approach is anything but high. His IMC estimates add onto associated volume-variability results that have significant weaknesses caused by the presence of excess capacity and erroneous estimates of the degrees of variability. His IMC estimates depend on assumptions about the specific formulas of the long-run cost curves that are unlikely to be valid,

³⁸ ACMA has pointed to apparently anomalous and otherwise questionable outcomes of the current costing system. See Docket No. ACR2014, Initial Comments of ACMA (February 2, 2015). The presence of anomalous outcomes does not mean that the costing methods are misaligned with good costing principles, but rather that more work needs to be done.

³⁹ In cases where the marginal cost is rising, perhaps due to the operation approaching capacity, the marginal cost can be high and the unit incremental cost can be **below** it. This is the reason, at a point of introducing incremental costs, Panzar said: “In general, there is no guaranteed relationship between the marginal cost of the last unit of service provided and the average incremental cost of the service.” Docket No. R90-1, USPS-REM-T-2 at 4-5.

including that that their elasticity or variability is the same at all volume levels. In the two dominate cost categories, mail processing and delivery, it is arguable, as we have explained, that the long-run marginal cost curves are horizontal, or nearly horizontal, over wide volume ranges, making the IMCs much smaller than Neels estimates. Before assumed curves can be used reliably, some proof of their applicability is needed, and Neels provides none.

The question of using curves outside the range of the data used to estimate them came up in connection with estimating **product-incremental** costs in Docket No.

R97-1. In a list of “major weaknesses,” the Commission found:

The approach depends upon the accuracy of assumed or fitted cost functions over considerable ranges. This is a weakness because the ranges usually involve extrapolations. In the case of econometrically estimated cost equations, the functions are often being evaluated outside the bounds of the sample used to fit them. In the case of assumed functional forms, the cost functions may have to be evaluated where the assumed form is no longer providing an acceptable approximation.

Id. at 249-50. Nothing has been done to alleviate this concern. It is an issue for accurately estimating product-incremental costs and a much larger issue for Neels’s component-inframarginal costs. Therefore, even if there were a basis for analyzing components, and we see none, the low reliability argues against any reliance on Neels’s results.

The problems do not go away if the analysis is done for products instead of components. Attributing IMCs of products, in addition to their volume-variable costs, is the same as attributing their incremental costs. Except in his discussion of Shapley

Values, discussed further below, Neels does not discuss attributing the incremental costs of products.

First, unit incremental costs for products have the weakness that they are a **non-unique** reference point. More particularly, they can be made nearly equal to marginal costs, or significantly above marginal costs, just by changing the definitions of the products. A change of this kind has nothing to do with the costs of the products. This matter is different from being inaccurate.

For example, suppose costs are wanted for zoned parcels and dropshipped parcels, and these categories account for 20 percent and 50 percent respectively of the parcels going through a processing operation. Under the usual procedure for estimating incremental costs, the unit incremental cost of zoned parcels would be **slightly** above marginal cost, while the unit incremental cost of dropshipped parcels would be **moderately** above marginal cost. And if the two were considered to be one product, its unit incremental cost would be further above marginal cost, in non-linear degree. The narrower the product category, which would normally be a prescription for costing relevancy, the closer the incremental cost is to the volume-variable cost.⁴⁰ In the limit,

⁴⁰ Panzar explored the closeness of incremental costs to volume-variable costs. Presuming constant variability cost curves, he states (at 24): “Consider, for example, a product that accounted for a 40% share of cost driver activity in a cost component with a cost elasticity of 0.8. Its actual incremental cost would exceed its measured attributable cost by an amount equal to 1.55% of **total component variable cost**” (emphasis added). He presents a table showing that this proportion declines as the share of the volume becomes smaller. An implication of these small effects is that the effect of unreliability could be larger than the difference between the estimates of the incremental costs and the volume-variable costs.

then, the volume-variable cost becomes ideal and the meaning of the incremental costs becomes questionable.

Second, ICs cannot be added. Suppose products A and B are parts of a product group. The IC of product A is the amount saved if product A is withdrawn, *ceteris paribus*. The IC of product B is a similar *ceteris paribus* amount. Then the cost of the product group is the amount saved if the group is withdrawn. But the ICs of A and B cannot be added to obtain the IC of the group, because doing so would violate both *ceteris paribus* constraints. It is awkward to show product cost figures that cannot be added to obtain meaningful costs for groups or classes, or for the overall Postal Service. Also, the incremental costs of groups of products can include fixed costs that are not incremental to products. There is no non-arbitrary way to distribute these fixed costs.

C. Key Reason Three: “Failure to Attribute Inframarginal Costs Distorts Competition.”

Neels notes (at 18-19) that the current practice of attributing the volume-variable costs of **products**, which are reflections of the marginal costs of the products, “provides the Postal Service with an artificial cost advantage.” He reasons that competition would be **fairer** if, in addition to the volume-variable costs, the inframarginal costs were attributed, and he prefers the inframarginal costs of **components**. This would increase the costs of parcels significantly and, as he sees it, help “level [the] playing field.”

Fairness always lies in the eye of the beholder. Neels sees it as an unfair advantage that the Postal Service has a large delivery network that can offer a parcel service to the American people at low rates, and he wants to take this advantage away.

But Congress has made its own judgments about fairness and has incorporated them in the terms of the PAEA. At the time the PAEA was enacted, it was recognized that the Postal Service had accumulated an enormous burden of unfunded liability in the quarter century since the passage of the PRA. (In 1991, a study by the Institute for Public Administration estimated the Postal Service's unfunded liability at that time as \$86 billion.) Congress expected the Postal Service under the PAEA to earn enough to pay off that obligation. The PAEA encourages the Postal Service to leverage its strengths to help generate earnings. By substituting inflation-based price caps for the PRA's breakeven requirement, Congress intended to create an incentive for the Postal Service to restrain costs, so that it would be able to retain as profit the difference between its lowered costs and the revenues generated from inflation-adjusted rates. Congress also intended that USPS competitive products would earn at least enough to pay their own attributable costs and make an "appropriate" contribution to the institutional costs of the Postal Service. And it left the Postal Service free to make profits above this level, within the constraints of a cost-recovery provision applicable to each product, payment of federal income taxes, the applicability of federal antitrust statutes, and regulatory oversight by the Commission.

UPS wants to outlaw Postal Service reliance on these strengths. But UPS does not want to give up any strengths of its own: a better labor contract; a processing and distribution network tailored specifically to the handling of parcels; freedom to enter into contracts with customers, selectively, without regulatory oversight; freedom to craft the levels and universality of its service, and freedom to do such things as offer loss-leaders.

And at the same time, UPS wants to avail itself of low last-mile costs for selected parcels by contracting with the Postal Service.

It should also be emphasized that the costing changes proposed by UPS would have no effect on the levels of rates that would be the most profitable for the Postal Service. Profit maximization formulas can be written and they are understood to involve elasticities and marginal costs—the exact marginal costs that are available now. The formulas do not involve any of the cost figures that UPS wants to impose. Thus the UPS cost figures could only constrain, not help.

The playing field is suitably level. Competition, which is flourishing, should not be suppressed.

VI. Neels's Appeal to Shapley Values Should Be Rejected as Unreliable and Unwarranted.

Neels has argued that estimates of inframarginal costs in cost components should be attributed, partly to help remove what he sees as a Postal Service advantage. But he understands that there is no logical link from these cost estimates to any concept of the cost of a product.⁴¹ In search of a link, he looks into ways that joint gains have been distributed.

Neels observes that the **subsidy** question for a product would normally ask whether the cost savings from withdrawing it from a current operating position are larger

⁴¹ Neels at 24 (“There is no principled way to determine where along this continuum any class of products, individual product or individual mail piece belongs”).

than the revenue lost.⁴² The savings would be the product-incremental cost, calculated as the difference in cost along a long-run cost curve between (a) the current volume and (b) the current volume less the volume of the product. These product-incremental costs would include a limited portion of the inframarginal costs of the component.

But Neels believes that this traditional method of determining incremental costs, in which a product is withdrawn *first* (i.e., withdrawn from the current operating position *ceteris paribus*, giving it an incremental cost that is little above the volume-variable cost), is arbitrary, and that it would be just as fair to withdraw the product *last* (i.e., after withdrawing all other products and leaving them withdrawn, giving it a much higher incremental cost).⁴³ His argument fails immediately. The procedure he criticizes is grounded in a logical development, relevant to the subsidy question, laid out in literature he cites. It is anything but arbitrary.

Nevertheless, to understand Neels's reasoning, suppose there are three products, P, Q, and R, and that P is parcels. Under accepted procedures, the incremental cost of P is the savings if P is withdrawn as a product, *ceteris paribus*, that is, while leaving both Q and R in place. Neels sees this as arbitrary, as it would be just

⁴² Neels at 21-22 (referring to “whether the Postal Service would be better off financially if it were to exit” the product, and to “a hypothetical world where [subject] products and services are not provided”). He cites the seminal paper on this subject, Gerald R. Faulhaber, “Cross-Subsidization: Pricing in Public Enterprises,” *The American Economic Review*, Vol. 65, No. 5 (1975) at 966-977.

⁴³ See Neels at 22 (“there is no principled basis for ordering products along the marginal cost curve ... the use of an ordered methodology ... would implicitly and arbitrarily make some units of the cost driver more expensive”).

as reasonable (although inconsistent with the way the subsidy question is normally addressed) to withdraw both Q and R, keep them withdrawn, and **then** withdraw P. This would give a much higher incremental cost for P. In fact, if estimated on a component by component basis, it would include the volume-variable cost of P, most of any inframarginal costs in the components, and all of the fixed costs of the components.

At this point Neels argues that it would be a fair compromise to recognize all possible orders of withdrawal by averaging the incremental savings for each. For P, Q, and R, he would average six orders of withdrawal, P-Q-R, P-R-Q, Q-P-R, Q-R-P, R-P-Q, and R-Q-P.⁴⁴ He points to support for his procedure in the work of Lloyd Shapley.⁴⁵

The conclusion of Neels is that Shapley reasoning applied to estimates of the inframarginal costs in components supports distributing these costs to products by using traditional distribution keys. That is, this splits up the costs in the same way that Shapley distributes gains achieved by game players from cooperating with each other.

As discussed above, the inframarginal costs are elevated because they move up a sloping marginal cost curve (of questionable validity), and they are unreliable because they extend the curve over the widest possible volume range. But even if reliable,

⁴⁴ The number of orders of withdrawal is equal to the factorial of the number of products. If there were 10 products, there would be 3,628,800 orders.

⁴⁵ Neels (at 22) explains that Shapley Values were developed by Lloyd Shapley “as a solution concept in cooperative game theory ... [that] concentrates on the division of gains ... [i]n the context of cooperation across different products” (footnotes omitted). At no point does he explain what gains the Postal Service might obtain if its various products “cooperat[ed]” with each other, what cooperation actually means, or how Shapley Values can be reconciled with the ratemaking provisions of the PAEA. It appears that they are more a constraint than a help.

applying the Shapley allocations to them does not link them in a meaningful way to products. Essentially, Shapley Values are an exercise in full distribution. They do not answer the question of what the cost of the product is. They are not useful for ratemaking. They would not help set workshare discounts or justify NSAs. They do not tell whether additional volume would add to profits. They have not been shown to be relevant to anything important. They should be rejected.

VII. Neels's Argument in Favor of UPS Proposal Two Is Based on a Fundamental Misunderstanding of the Cost Analyses of the Postal Service and the Commission.

As a foundation for UPS Proposal Two, Neels observes that “the Postal Service has experienced historic changes in volume, revenue[,] and the mix of products it handles.” Then, despite his note that the Service’s costing analyses are stale, he argues (at 31) that these changes should be used as a “great ‘natural experiment’” to test the costing procedures.⁴⁶

But even if all of the studies were up-to-date, the experiment would not be suitable for the testing he proposes. Specifically, it is clear that the Postal Service: (a) has had great difficulty adjusting to the unexpected volume reductions of recent years, (b) would not be expected to reconfigure when a substantial portion of the volume might return post-recession, and (c) has been forced to make service and

⁴⁶ Neels at 31 and 37-38 (stating that USPS cost analyses “generally rely upon parameters drawn from infrequently updated econometric or engineering studies[,] [m]any [of which] appear to be seriously out of date” and “there is a lot of variation across components in the relative ‘staleness’ of the underlying studies”).

network modifications in an effort to come closer to breaking even under the constraints of the new law. And all the while, adjustments associated with the FSS have been occurring, including route restructuring. Neels (at 39) does acknowledge “cost cutting initiatives and productivity improvements,” but writes them off as unable to “account for the increases in fixed cost that have occurred.”

So, undeterred, Neels proceeds:

Postal Service costing procedures ... have clear implications for how costs should change **over time**. If these procedures are accurate, it should be the case that in response to **historic declines in mail volumes**, variable costs decline, while fixed costs remain fixed.

Id. at 31 (emphasis added). This seriously misconceives the analysis of the Postal Service. As explained above, the Postal Service’s procedures do not identify categories or amounts of costs that are inherently variable or fixed in the face of “historic declines” in volume. Rather, the procedures analyze the **behavior** of costs for volume changes in the neighborhood of a current volume (i.e., for small volume changes), in order to estimate their degrees of variability and fixity.

To bridge the gap between the Postal Service’s analyses and his tests, Neels (at 32) subtracts the McBride inframarginal costs **for components** from the corresponding institutional costs, obtaining costs that he says should be “truly fixed” if the existing costing procedures are accurate (and importantly we add, if McBride’s use of the results

of those procedures is supported).⁴⁷ These “truly-fixed” costs are then regressed on volumes to see if they are correlated. He finds many of them to be correlated positively, and proposes to attribute a variable portion. Attributable costs, then, according to Neels, would equal the component volume-variable cost + any product-specific fixed costs in the component + the component-inframarginal costs + a variable portion of “truly fixed” costs—all distributed to products. This would include any fixed costs in the components that are not product-specific.

If product-specific fixed costs in components are negligible, which they generally are, the Neels regressions are identical to regressing {(total accrued costs for components) – (component volume-variable costs) – (estimates of component-inframarginal costs)} on volume. Careful review of these regressions is warranted, and would be even if the adjustments during the period of the experiment could be viewed as indicative of the inherent behavioral characteristics of the productive system, which they cannot.

One problem with these regressions is that Neels and McBride have taken scale economies to justify the curve used to estimate the inframarginal costs. (1) If scale means simply that the slope of the total cost curve declines with increasing volume (which is the same as saying that the marginal cost declines), then it is the case that an

⁴⁷ Under a finding that a candidate “truly fixed” cost is not fixed, and should be lower, Neels would, effectively, increase the variability for the component, which would yield a higher volume-variable cost and a higher component inframarginal cost, and thus a lower fixed-cost residual. A finding that a residual is somehow wrong implicates the procedure used to estimate the inframarginal cost (the McBride procedure) just as much or more than the Postal Service’s costing procedure.

infinite number of suitable curves could be drawn through any operating point, and each would have its own intercept. Virtually no basis has been provided for selecting one of these curves. (2) It is not clear that the Postal Service is experiencing meaningful scale economies. Asked about whether it “has” scale economies, the Postal Service responded that it “has product-specific returns to scale for any product for which the incremental cost exceeds the volume variable cost.”⁴⁸ But since the incremental cost will exceed the volume-variable cost only if the long-run marginal cost curve declines with increasing volume, which is the matter at issue here (and concerning which there is little evidence), this answer begs the question. Furthermore, as discussed earlier, a case can be made that many operations have nearly horizontal marginal cost curves over considerable volume ranges. The presence of these problems may explain McBride’s “*serious reservations*” about using a constant-elasticity function to calculate component-inframarginal costs. McBride at 6, n. 13 (emphasis in original).⁴⁹

The difficulties here are endless.

1. The Postal Service analyses, on which Neels relies, were done at current volume levels, far from zero volume, and they focused on the effects of small volume changes.

⁴⁸ Docket No. RM2016-2, Response to Q1 of CHIR No. 2, December 10, 2015.

⁴⁹ McBride’s justification for using his approach is that the Postal Service used it “before FY 2007.” *Id.* This usage by the Postal Service appears to go back to Bradley’s testimony in Docket No. R2000-1, USPS-T-22 (January 12, 2000). A reading of Bradley makes clear that he adopted this approach because he viewed it as consistent with a Commission position that variabilities are not a function of volume. Especially since Neels extends the variability all the way to a volume of zero, and not just for products but also for processing operations, that matter is at issue in the instant docket. It cannot be assumed away.

2. It is unlikely that actual adjustments to the volume changes are captured by using the Postal Service analyses as Neels does. As we discussed earlier, estimation of long-run cost curves is difficult at best, and, unless there is excess capacity, they should be below short-run costs.
3. Since it is likely that the Postal Service experiences nearly constant returns to scale over considerable volume ranges, it is unlikely that the variability remains constant over those ranges.
4. Even if scale economies are realized, many curves modeling them are possible. A constant variability curve is only one of the possibilities. Also, there is no reason for believing that the effect of any scale economies would be progressive and smooth over the entire volume range.
5. The factors affecting costs go beyond the inflation corrections on which Neels concentrates.
6. The period, FY 2007 through FY 2014, is unusual and unrepresentative. Also, in terms of what is needed for convincing statistical analyses, it is rather short.
7. The relevance of the intercept to ratesetting remains unclear.
8. The inframarginal cost being distributed, even if correct, is for an operation, not a product. It was not found by following any concept of the cost of a product, and thus cannot be considered so.

Under these circumstances, Neels's proposal should be rejected.

Relying on an intercept, far removed from current volume, having nothing to do with current operations, reached by assuming a long-run cost curve, is not warranted. Questions about the quality and defensibility of the analysis of any component should be addressed with a proposal for a new analysis, as has been done by the Postal Service in a series of rulemakings, not through backdoor regressions on residuals. And the focus should be on the costs of a product, not on the costs of a component.

VIII. Conclusion.

These comments have explained the bases for the current costing system, and why the changes proposed by UPS are flawed. A related proposal was considered in Docket No. R90-1. It stopped short of suggesting attribution of incremental costs for entire cost segments, but involved a similar range of basic matters. Panzar's testimony for the Postal Service explained "several fundamental principles of ... cost attribution ... attribut[ion] based on (the best available estimates of) marginal costs rather than incremental costs ... and [] the theoretical equivalence between marginal costs and the unit volume variable costs."⁵⁰ He covered some of the same ground we cover here. Following a section headed "[t]he advantages of marginal cost as an attribution standard," he stated: "The previous section has explained in some detail why marginal cost is a better attribution standard on which to base rates than incremental cost." *Id.* at 6, 14. In response to a Commission Information Request, Panzar confirmed that he

⁵⁰ Docket No. R90-1, Direct Testimony of John C. Panzar, Docket No. R90-1, USPS-REM-T-2 (June 23, 1994) at 2.

believes “that volume variability gives a reliable causal relationship that is appropriate to attribute costs.”⁵¹ That conclusion was correct, and it cannot be reconciled with the UPS proposal.

Respectfully submitted,

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⁵¹ Docket No. R90-1, Additional Responses of USPS Witness Panzar to First CIR Following Reopening of the Record, Docket No. R90-1, Question 31 (August 1, 1994).