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BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268–0001

PERIODIC REPORTING (UPS PROPOSALS ONE, TWO, AND THREE)	Docket No. RM2016-2

RESPONSES OF THE UNITED STATES POSTAL SERVICE TO QUESTIONS 1-4 OF CHAIRMAN'S INFORMATION REQUEST NO. 2
(December 10, 2015)

The United States Postal Service hereby provides its responses to Questions 1-4 of Chairman's Information Request No. 2, issued November 20, 2015. On December 1, the Presiding Officer ruled to extend the due date to December 10. The questions are stated verbatim and followed by the response.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

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RESPONSE OF THE UNITED STATES POSTAL SERVICE
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1. UPS states that "[i]nframarginal costs are variable costs that exist in the many areas of operations in which the Postal Service enjoys economies of scale that take the form of a cost structure in which the unit cost of handling additional mail pieces declines as overall mail volumes increase." Petition, Report of Dr. Neels at 10. Please confirm that the Postal Service currently has increasing economies of scale and decreasing marginal costs.

RESPONSE:

Because the Postal Service is a multiproduct firm, it is important to discuss the concepts of economies of scale and decreasing marginal costs in a multiproduct firm setting. However, it is useful to start the discussion with the more familiar economics of a single product firm. In a single product firm, the existence of *economies of scale* in the cost function depends upon the existence of *increasing returns to scale* in the production function. The two concepts are mathematically related:[1]

> The concept of economies of scale is closely related to the concept of returns to scale introduced in Chapter 6. The returns to scale of the production function will determine how average cost varies with output and thus the existence of economies or diseconomies of scale.

Specifically, when the production function has *increasing* returns to scale, the cost function has *economies* of scale. In contrast, when the production function has *decreasing* returns to scale, the cost function has *diseconomies* of scale. To determine if a particular firm has economies or diseconomies of scale, one can calculate the output elasticity of total cost, which is the percentage response in total cost, C, for a

[1] See, Besanko, David and Braeutigam, Ronald R., Microeconomics: An Integrated Approach, at 318, John Wiley and Sons, Inc, New York, 2002, at 318.

given percentage change in output, Q. Mathematically, the output elasticity is expressed as:

$$\varepsilon_{C,Q} = \frac{\frac{\partial C}{C}}{\frac{\partial Q}{Q}} = \frac{\frac{\partial C}{\partial Q}}{\frac{C}{Q}} = \frac{MC}{AC}.$$

When the output elasticity is less than one, then the firm is experiencing economies of scale. The formula shows that this occurs when marginal cost is below average cost, so average cost decreases with additional output. Note that the conditions of increasing returns to scale and economies of scale exist whether a firm's output is rising or falling. When output is rising, economies of scale provide lower unit costs, other things equal; but when output is falling, economies of scale produce higher unit costs. In the latter case, higher unit costs occur because lower levels of output cause the firm to miss out on the benefits of larger scale.

In a multiproduct firm, one must account for the fact that a firm has the possibility of increasing the output of more than one good. Thus, the measurement of scale economies becomes a bit more subtle. For example, the concept of average cost does not exist for a multiproduct firm, so the metric from the single product firm (average cost falling when volume increases) cannot be used. There are two ways of dealing with the

multiproduct dimensionality. The first is to define a composite commodity and the second is to define product-specific returns to scale.[2]

If a bundle of the firm's outputs is defined as y^0, then a given level of output is defined by the number (t) of bundles produced: $y = t\ y^0$. With this definition, the degree of scale economies (S_n) for a particular cost surface C(y) is defined as:

$$S_n = \frac{C(y)}{\sum_{i=1}^{n} y_i C_i(y)}\ , \quad where: \quad C_i(y) \equiv \frac{\partial C(y)}{\partial y_i}.$$

Returns to scale are increasing as long as $S_n > 1$. Note that the denominator of this expression is an expression for volume variable costs, showing the Postal Service cost concepts are firmly based on well-known economic measures of cost. Because the total volume variable costs for the Postal Service are less than its total cost, it has increasing returns to scale.

Further insight into the existence of scale economies for the Postal Service is accomplished through examination of product-specific scale economies in the multiproduct firm setting. One starts by defining incremental cost, which is the

[2] These approaches and the following explanation of them are taken from Baumol, William, J., Panzar, John C., and WIllig, Robert D., Contestable Markets and the Theory of Industry Structure, Harcourt Brace Jovanovich, Orlando FL, 1988, Chapters 3 and 4.

maximum total amount of cost caused by an individual product (or group of products) in a multiproduct firm:[3]

> As a matter of economic theory, the greatest amount of cost that can be causally related to an individual subclass is the incremental cost of that subclass.

The incremental cost of product "i," which is one of "N" products, is defined as:

$$IC_i(y) = C(y) - C(y_{N-i}),$$

where y_{N-i} includes all the products that are not product "i." Given the definition of incremental costs, it is straightforward to define the degree of product-specific returns to scale:

$$S_i(y) = \frac{IC_i(y)}{y_i C_i(y)}$$

Thus, the Postal Service has product-specific returns to scale for any product for which the incremental cost exceeds the volume variable cost and, consequently, $S_i(y) > 1$. . This formula can be rewritten as the ratio of the average incremental cost of a product to its marginal cost:

[3] See, Response of United States Postal Service Witness Panzar to First Commission Information Request Following Reopening of the Record, Docket No. R90-1 (Remand), July 29, 1994, at Question 19.

$$S_i(y) = \frac{AIC_i(y)}{C_i(y)}$$

This ratio will be greater than one as long as marginal cost is decreasing with volume. This condition holds for all Postal Service products, so that the Postal Service currently has the condition of decreasing marginal costs with volume. A note of clarity is appropriate here. In terms of its economic structure, the Postal Service has decreasing (with volume) marginal costs. But, because it has recently been experiencing volume declines for many products, scale economies have caused its marginal costs to increase for those products, other things equal.[4] This is because, as explained above, a firm with increasing returns to scale will experience rising marginal costs when volume declines.

[4] Of course, other factors such as changes in technologies, changes in mailer behavior, and/or changes in operational management may offset or reinforce the effects of scale economies on product costs.

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2. Please explain whether the Postal Service has ever attempted to distribute inframarginal costs to its products. If the Postal Service has made such attempts, please provide an explanation of the results, a description of the methodology used, and all supporting workpapers.

RESPONSE:

The Postal Service has attributed inframarginal costs to products in the only instance in which there is a reliably identified causal relationship between those inframarginal costs and the products that caused them. This occurs in the calculation of incremental costs. Any other effort to attribute inframarginal costs to products is not, and cannot be, based up on a causal relationship between products and the inframarginal costs. A description of the methodology to calculate incremental costs can be found in Direct Testimony of Michael D. Bradley on Behalf of the United States Postal Service, Docket No. R2000-1, January 12, 2000 (USPS-T-22). The supporting workpapers from that docket can be found in Library Reference USPS-LR-L-72, Supporting Materials Relating to Incremental Cost Model, Docket No. R2006-1, (May 3, /2006) and more recent similar materials can be found in USPS-FY14-NP10, FY2014 Competitive Product Incremental and Group Specific Costs, Docket No. ACR 2014 (December 29, 2014).

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3. In its Petition, UPS discusses the basis for its conclusion that Proposal One complies with the requirements of 39 U.S.C. § 3633. Petition, Proposal One at 12. UPS also notes that its proposals "necessarily implicate letter mail costs as well." Petition at 21.

a. Please discuss whether the Postal Service agrees with UPS's conclusion that Proposal One complies with the requirements of 39 U.S.C. § 3633, and why or why not.

b. Please discuss whether Proposal One also complies with the requirements of 39 U.S.C. § 3622, with particular emphasis on whether the proposal complies with the "reliably identified causal relationships" requirement of 39 U.S.C. § 3622(c)(2).

RESPONSE:

a. The Postal Service does not agree. Section 3633 prohibits the cross subsidization of competitive products by market dominant products, and requires that each competitive product covers its attributable cost.[5] The UPS proposal, based upon a set of *ad hoc,* loosely-constructed, cost measures by Dr. Kevin Neels does not satisfy Section 3633. First, it is superfluous. The Postal Service has already put forward, and the Commission has already accepted, the correct test for cross subsidy: the incremental cost test.[6] UPS's false and misleading allegations about the incremental cost test do

[5] Section 3633 also requires all competitive products collectively cover what the Commission determines to be an appropriate share of the institutional costs of the Postal Service. However, because the Commission is holding that issue in abeyance until UPS's Proposals One and Two are resolved, it will not be addressed in this response.

[6] See, Order No. 399, Order Accepting Analytical Principles Used In Periodic Reporting (Proposals Twenty-Two Through Twenty-Five), Docket RM2010-4 at 2 (January 27, 2010).

not in any way alter the bedrock fact that the incremental cost test is widely accepted by economists and regulators as the appropriate test for cross-subsidy.[7]

> It is now standard in the regulatory economics literature that avoiding cross-subsidization means that the customers of each product (or group of products) pay more to the firm in revenues than the incremental cost of said product (or group of products)

Second, unlike Dr. Neels's *ad hoc* cost measures, incremental costs are firmly grounded in economic theory and are based upon a reliable causal relationship between volume and cost. In fact, in the very report cited by Dr. Neels, Professor Panzar clearly states that:[8]

> The economic concept of incremental costs is central to any notion of *cost causality*. To say that service (or group of services) *X causes* an expenditure *Y* is *equivalent* to saying that *Y* is the Incremental Cost of *X*. (Emphasis in original)

Because Dr. Neels's approach assigns more cost to individual products than their actual incremental costs, it cannot be said to have a reliable causal basis and thus does not satisfy Section 3633. The maximum amount of cost caused by a product (or group of products) is its incremental cost. An allocation of cost above that value is necessarily non-causal.

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[7] See, Panzar, John C., "The Role of Costs for Postal Regulation," at 15.

[8] Id. at 6.

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b. Proposal One does not comply with section 3622, and, in particular, it does not comply with subsection 3622(c)(2). That subsection requires each class of mail or type of mail service bear the direct and indirect postal costs attributable to that class or type of mail service through reliably identified causal relationships. As explained in the response to part a, above, the cost measures relied upon by UPS do not have a reliable causal basis.

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4. Please provide an explanation of the methodology the Postal Service uses to determine whether costs are fixed.

RESPONSE:

Accurate calculation of product costs for the Postal Service does not require identification of fixed costs, which are defined as the costs that would remain if the Postal Service handled no volume whatsoever. The calculation of marginal and incremental costs requires identifying those costs that vary with volume at current levels of volume, along with those costs that do not. This latter group of costs is known as institutional cost, and is a mix of fixed and variable costs.

It is true that the Postal Service (along with the Postal Regulatory Commission) uses operational and engineering analyses to identify cost pools that have a zero volume variability, meaning the costs do not change with variations in the amount of volume handled. A good example is provided by rural carriers. By contract, the compensation for rural carriers depends upon the evaluated times for the activities they perform. According to the agreed-upon standards, some of those activities are volume-related and others are route-related, such as the route mileage and the numbers of rural boxes served. Based upon the engineering and operational analyses that set the standards, the evaluated times required for completion of route-related activities is unaffected by route volume.

The volume variability for the route-related activities is clearly zero, as the carrier performs those same activities every day, regardless of the volume delivered. But if the Postal Service had no volume whatsoever, then it is not clear that it would need rural carriers, and all rural carrier costs, including those for route-related activities could disappear.[9] If so, these costs are not purely "fixed" costs in the textbook sense. But, they are fixed with respect to changes in volume, and are not caused by any individual product or group of products. They cannot be accurately attributed to an individual product or group of products, save the group of all products.

It is also important to note that these route-related activities may change through time as the Postal Service changes its rural carrier network and modifies the compensation it provides rural carriers. For example, if the Postal Service were to negotiate a labor contract that allowed it to reduce the average wage paid to rural carriers, the cost for route activities would decrease. That is why they are measured on an annual basis for inclusion in the Postal Service's product cost models. In sum, there is no need for the Postal Service to determine which of its costs are fixed, and it does not do so.

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[9] Although they are straightforward in theory, fixed costs can be difficult to identify in practice. The rural carrier example illustrates why. Identifying fixed costs requires determining which costs would remain if the Postal Service handled no volume. It thus requires answering difficult counterfactual questions like, "if the Postal Service had no volume, would it require rural carriers to run their routes anyway?" Fortunately, identification of fixed costs is not required for accurately measuring product costs.