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Mark Hirschey; James L. Pappas

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An important dispute persists in economics concerning the relevance of competing traditional and nontraditional theories of managerial objectives. For the most part, the battle has been waged over theoretical and empirical evidence in support of the profit versus sales maximization hypotheses. While managerial objectives are inherently unobservable, some inferences regarding the nature of these objectives can be gained by considering the pattern of managerial compensation. For example, if the pattern of managerial compensation is such that clear incentives are provided for profit as opposed to sales maximization, then it seems reasonable to infer that these profit maximizing incentives are consistent with an underlying managerial objective of profit maximization. Of course, if the pattern of managerial compensation is such that incentives for *both* profit and sales maximization are provided, then the simple model of managerial motivation implicit in compensation and performance studies isn't capable of distinguishing the comparative relevance of the profit versus sales maximization hypotheses.

As discussed in our earlier article [5], several recent studies have found that both profits and sales performance constitute important determinants of managerial compensation, and thereby suggest that something of a stalemate has been reached in the attempt to determine managerial objectives using simple models of compensation and performance. In order to resolve this dilemma, we considered both regulatory and life cycle influences as "environmental" factors with potentially important and predictable effects on managerial objectives. In our analysis we discovered that managers of large industrials have significant incentives for profit maximization, while managers of smaller industrials have similarly strong incentives to maximize sales. These findings are consistent with the notion that smaller firms maximize sales in order to gain the market share necessary for long run profit maximization. We concluded that the reconciliation of profit and sales maximizing behavior in the industrial sector via the life cycle theory of the firm would appear to have substantial empirical relevance. A similar interpretation of sales incentives in more heavily regulated sectors, however, is not possible. In particular, since the compensation for executives of regulated utilities is positively related to sales, but negatively related to total profits, we concluded that incentives for sales as opposed to profit maximization are operative in the public utility sector. This inference follows from the observation that the objective function for the sales maximizing utility executive will be positively related to sales, but negatively related to the absolute level of utility profits, given that the profit constraint is binding [5, 331-332].

While Crew and Kleindorfer [4] have no apparent quarrel with our sample, model or estimation procedure, they question the wisdom of making inferences regarding managerial objectives on the basis of compensation and performance data correlations for firms in the regulated public utility sector. They argue that regulatory induced inefficiencies will cause total labor expenditures and hence managerial compensation data to be positively correlated with sales data for both sales- and profit-maximizing public utilities. However,

their analysis in support of this argument is flawed and must be rejected on the grounds that it lacks general validity. In order to expose this flaw, it seems worthwhile to consider in some detail the implications of rate-of-return regulation for profit as opposed to sales maximizing public utilities.

In their pathbreaking analysis, Averch and Johnson [1] discovered that the profit-maximizing firm under rate-of-return regulation will tend to use a capital-labor ratio greater than that which minimizes cost for a given level of output when the allowed rate of return, s , exceeds the cost of capital, r .¹ After more than twenty-five years, this overcapitalization theorem stands as the principal result of their analysis and is widely referred to as the "A-J" effect of public utility regulation. As Averch and Johnson themselves pointed out, however, this result breaks down when the regulated rate of return coincides with the cost of capital. When $s = r$, the firm has no incentive to select the efficient capital-labor ratio or any other particular ratio. *Any* capital-labor ratio becomes as profitable to the regulated firm as any other. Paradoxically, as s approaches r the constrained profit maximizing quantity of capital will always increase, and the capital-labor ratio will depart further and further from its efficient value.² While this anomalous result is well-known, it is less appreciated that there is no similarly monotonic relationship between the profit-maximizing quantity of labor and the gap between s and r . The quantity of labor employed depends upon the quantity of capital and the nature of the firm's production function. Depending upon the marginal rate of substitution between capital and labor, the employment of labor may either increase or decrease as s approaches r [6]. If capital and labor are complements, the quantity of labor will increase as capital usage rises. But if labor and capital are substitutes, usage of each input will move in opposite directions. Thus, no generalization concerning the A-J effect, labor usage and the output level can be made beyond the simple observation that the A-J effect implies that the regulated firm will employ an inefficiently small relative quantity of labor for whatever level of output it chooses to produce. Therefore, our critics' main contention that regulatory induced inefficiencies will necessarily cause total labor expenditures and hence managerial compensation data to be positively correlated with sales data for profit-maximizing public utilities is not supported by the underlying theory.

The effects of rate-of-return regulation are starkly different, however, if the regulated firm maximizes sales rather than profits. Bailey and Malone [2] have shown that the inefficiency discovered by Averch and Johnson is reversed in the case of sales maximization. That is, when $s > r$ the sales maximizing firm is motivated to use a capital-labor ratio *less* than that which minimizes cost for the output level it chooses to produce. Here rate-of-return regulation will result in under- rather than overcapitalization.³ Therefore, the theory does predict a positive correlation between labor expenditures and sales data as a result of regulatory induced inefficiencies, but only for firms with an underlying objective of sales-maximization. Thus, a positive correlation between managerial compensation and sales data, accompanied by a strong negative correlation between managerial compensation

1. Averch and Johnson assume that if $s < r$, then the regulated firm will be incapable of surviving.

2. Thus increasing regulatory vigilance in setting the firm's "fair" rate of return ever close, but not exactly equal, to the true opportunity cost of capital will result in increasing input inefficiency if the rise in the use of capital is not matched by an appropriate increase in the quantity of labor employed.

3. In the event that $s = r$, a firm objective of sales or output maximization will yield both ideal output and an efficient input combination [3].

and total profits, can be taken as convincing evidence of managerial objectives of sales- rather than profit-maximization. Given an opposite result for the less regulated industrial sector, we suggest that current methods of rate-of-return regulation may be responsible for enhancing if not creating such sales maximizing objectives in the public utility sector.

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References

1. Averch, Harvey and Leland L. Johnson, "Behavior of the Firm Under Regulatory Constraint." *American Economic Review*, December 1962, 1053-69.
2. Bailey, Elizabeth and John C. Malone, "Resource Allocation and the Regulated Firm." *Bell Journal of Economics and Management Science*, Spring 1970, 129-42.
3. Baumol, William J. and Alvin K. Klevorick, "Input Choices and Rate-of-Return Regulation: An Overview of the Discussion." *Bell Journal of Economics and Management Science*, Autumn 1970, 162-90.
4. Crew, Michael A. and Paul R. Kleindorfer, "Regulatory Influences on Managerial Incentives: Comment." *Southern Economic Journal*, July 1983.
5. Hirschey, Mark and James L. Pappas, "Regulatory and Life Cycle Influences on Managerial Incentives." *Southern Economic Journal*, October 1981, 327-34.
6. Takayama, Akira, "Behavior of the Firm Under Regulatory Constraint." *American Economic Review*, June 1969, 255-60.

LINKED CITATIONS

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³ **Input Choices and Rate-of-Return Regulation: An Overview of the Discussion**

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References

¹ **Behavior of the Firm Under Regulatory Constraint**

Harvey Averch; Leland L. Johnson

The American Economic Review, Vol. 52, No. 5. (Dec., 1962), pp. 1052-1069.

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² **Resource Allocation and the Regulated Firm**

Elizabeth E. Bailey; John C. Malone

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⁴ **Regulatory Influences on Managerial Incentives: Comment**

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⁵ **Regulatory and Life Cycle Influences on Managerial Incentives**

Mark Hirschey; James L. Pappas

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⁶ **Behavior of the Firm Under Regulatory Constraint**

Akira Takayama

The American Economic Review, Vol. 59, No. 3. (Jun., 1969), pp. 255-260.

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<http://links.jstor.org/sici?sici=0002-8282%28196906%2959%3A3%3C255%3ABOTFUR%3E2.0.CO%3B2-J>