GOOD GRAPES AND BAD LOBSTERS: APPLYING THE ALCHIAN AND ALLEN THEOREM

TYLER COWEN and ALEXANDER TABARROK*

We consider the well-known theorem of Alchian and Allen that adding a per unit charge to the price of two substitute goods increases the relative consumption of the higher price good. The current literature misspecifies the conditions under which the theorem holds. When applying the theorem the fixed cost should be applied on a per unit basis, rather than in terms of an entry fee for consumption. We state the necessary conditions for the theorem to hold when the consumers are shipped to the goods.

I. THE THEOREM

The Alchian and Allen theorem states that adding a common charge to the price of two substitute goods increases the relative consumption of the higher quality good, real income held constant. The classic example of this theorem is from Alchian and Allen's [1964, 75] textbook *University Economics.*

> Suppose that grapes are grown in California and that it costs 5 cents a pound to ship grapes to New York whether the grapes are "choice" or "standard" ... suppose further that in California the "choice" grapes sell for 10 cents a pound and the standard for 5 cents a pound... If grapes are shipped to New York, the shipping costs will raise the costs of "choice" grapes to 15 cents and of "standard" grapes to 10 cents. In New York the costs of "choice" grapes are lower relative to "standard" grapes (1.5 to 1) than in California (2 to 1)... New Yorkers faced with a lower price of "choice" grapes relative to "standard"

will consume relatively more "choice" grapes than Californians will.

Alchian and Allen's theorem is solely about relative price effects and does not rely upon income effects or selection effects. It assumes that those most willing to pay the fixed charge do not have systematically different preferences and incomes as those not paying the charge. Furthermore, the theorem does not hold for corner solutions where the high- and low-quality goods are consumed by different classes of consumers, or equivalently, each consumer purchases only one unit of the good in question. We must then consider the different rates at which consumers of high- and low-quality goods decrease consumption when price changes. Purchasers of high-quality items need not reap more consumer surplus than purchasers of low-quality items.[1]

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* Tyler Cowen is Associate Professor of Economics at George Mason University. Alex Tabarrok is Instructor of Economics at the University of Virginia. The authors wish to thank Thomas Borcherding, Tony Caporale, Amihai Glazer, Barbara McKiernan, and five anonymous referees for useful comments. Marc Poitras deserves special thanks for his many comments and stimulating discussion of the Alchian-Allen theorem.

1. Consumers are also effectively at a corner solution when the quantity of either high- or low-quality consumption is fixed, either optimally (perhaps we only wish to buy one car or one doctor) or through an exogenous constraint. Kaempfer and Brastow [1985] discuss the fixed quantities issue. On the separate issue of interaction effects with third goods, see Gould and Seagall [1969] and Borcherding and Silberberg [1978]. Leffler [1982] and Bohanon and Van Cott [1991] discuss the implicit assumptions about quantity-quality substitution behind the Alchian-Allen theorem.

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II. PER UNIT COSTS VERSUS FIXED AND SUNK COSTS

The Alchian and Allen theorem applies only when the costs are applied to each good on a per unit basis. Charging a single fee or fixed tax to allow consumption of the good to take place does not create a substitution effect. The fixed fee, once paid, is treated as a sunk cost and consumers face the same relative prices they faced initially. An increase in the cost of a "grape-shipping permit," for instance, will not have any direct effects on the quality of grapes.

Many of the examples of the Alchian-Allen theorem that have been given in the literature do not specify true per unit taxes. Umbeck [1980], for example, argues that an increase in the installation charge for phones will increase phone usage. But in this case the relevant charges are fixed. The installation or monthly service charge will increase current phone usage only if individuals are planning to go without a phone in future periods. In contrast, individuals who will continue phone service into the foreseeable future cannot minimize their monthly charges or their installation charges by increasing their phone usage now. Any change in behavior would be due to an income effect which is unpredictable.

A trickier problem is raised by Borcherding and Silberberg [1978, 133] who claim that

> it does not matter if the goods are shipped to the consumers or the consumers are shipped to the goods. Going to Maine or the country involves a transport cost to people not from Maine or the country. What [the Alchian-Allen theorem] predicts, therefore, is that tourists in Maine will consume, on average, higher quality lobsters than the natives and similarly for city versus rural dweller's purchases of produce at roadside stands...if people who make a special trip to Maine in fact choose to eat "truly delectable" instead of inferior quality lobsters sold there, this confirms Alchian and Allen's thesis. (emphasis added)

When the tourists are transported, the Alchian-Allen theorem applies only if (1) the tourists are planning both high-quality and low-quality trips in the future, and (2) "high-quality lobster" is strongly and positively related to a "high-quality vacation" in Maine. In this case the Alchian-Allen theorem does apply, *but it applies to the vacation and not to lobsters per se.* If a high-quality and low-quality vacation in Maine are the relevant commodities, an increase in the price of the airfare is a per unit tax vis-a-vis the vacation. Thus, an increase in the price of airfare to Maine will cause an increase in the proportion of tourists who consume high-quality vacations.[2]

From this we can immediately see one case where the quality of lobster consumed will increase: if the commodity "Maine vacation" consists of nothing more than lobster consumption, a higher quality vacation necessarily implies higher quality lobster. We refer to this as the case of the traveling gourmets.

It is misleading to argue that once the traveling gourmets arrive they face the same relative prices as the natives do. Price is what must be laid out to obtain the desired good, which for the gourmets is "a periodic trip to Maine to consume lobster." It is true that the gourmet faces the same relative prices of high- and low-quality lobster as do the natives, but the relevant prices are those for high- and low-quality vacations, not lobsters.

We can illustrate the applicability of the Alchian-Allen theorem in this context with a more transparent analogy. I wish to purchase the high-rather than the low-quality good when the relative prices are $90 and $30, or three to one. Once I have

2. Note that for the Alchian-Allen theorem to apply to transportation of the tourists, the tourists (individually or as a group) must be initially planning to consume both "high-quality" trips and "low-quality" trips in the future. As explained above, the Alchian-Allen theorem does not apply to corner solutions.

counted out ten of the dollars, I do not switch my purchase, thinking that relative prices are now $80 to $20, or four to one. The opportunity cost of the high-quality good has not changed. If I am willing to pay $60 more for the high-quality good at the initial prices, then I am also willing to do so after I have handed over the first ten dollars. The analogy to the traveling gourmets is exact: after the gourmets hand over the airfare they do not face new relative prices for vacations.

But the quality of lobster consumption will not increase in all cases. The tourist who travels to Maine only to visit his sick mother (the dutiful son) will not increase his quality of lobster consumption. If the price of airfare goes up this person will take a higher quality trip, but the relevant notion of quality consists only of time with Mom. The traveler will bring a higher quality gift, but the flight to Maine is not part of the price of lobster consumption.

The traveler who goes to Maine both to see Mom and to eat lobster stands in an intermediate position. Like the travelers considered above, this person also will take a higher quality trip to Maine. But whether a higher quality trip translates into higher quality lobster consumption is uncertain. There will be a general move in the bundle of goods called a "vacation" towards higher quality and away from lower quality. Nonetheless, the quality of each component part of the package need not increase. It is well known from the characteristics approach to consumer theory of Lancaster [1971] that changes in the price of a bundle do not have determinate a priori effects on bundle characteristics not directly subject to the same price change. In other words, the person could have a higher quality trip without increasing the quality of lobster consumption, simply by increasing the quality of other contributing inputs. There is, however, still a general tendency for consumption quality to increase.

Bertonazzi, Maloney and McCormick [1993] recognize some of the complexities of the Alchian-Allen theorem when the consumers travel to the goods, but their attempted resolution introduces a spurious issue of time inconsistency. Bertonazzi et al. do not consistently recognize that when the consumer is transported, the Alchian-Allen theorem applies to the vacation rather than to the lobster.[3] Thus they are led to believe that tourists face one set of relative prices before paying the airfare and another set of prices when they arrive in Maine. To avoid the obvious problem of time inconsistency—choice would be different under the two sets of prices—they suggest that the tourist planning a trip to Maine will lock himself into high-quality lobster consumption (perhaps he will bring a jacket and tie rather than blue jeans).

In their view the "true" or choice-determining set of relative prices is the initial set, because of lock-in effects. Even within their own framework this choice is questionable since a rational tourist would look forward and make plans based upon the "second," post-arrival set of relative prices. But in any case, the issue of consumer lock-in is a red herring. Since there is only one choice-determining set of relative prices—the relative price of a high- versus a low-quality vacation—the issue of time inconsistency does not arise.

3. They do argue explicitly that consumers are buying a packaged bundle of characteristics, but they do not apply this insight consistently in their subsequent analysis. We also translate Bertonazzi et al.'s own example of cruise ship cabins into lobsters. Furthermore, Bertonazzi and his coauthors do not recognize that consumers must plan to travel more than once for the Alchian-Allen theorem to hold. The cabin example, as they state it, is a one-shot trip and so the Alchian-Allen theorem does not apply. We proceed by generalizing their argument into the many-trip case, where the Alchian-Allen theorem can apply.

REFERENCES

Alchian A., and W. Allen. *University Economics.* Belmont, Calif.: Wadsworth, 1964.

Barzel, Y. "An Alternative Approach to the Analysis of Taxation." *Journal of Political Economy,* 84(6), 1976, 1177–97.

Bertonazzi, E. P., M. T. Maloney, and R. E. McCormick. "Some Evidence on the Alchian and Allen Theorem: The Third Law of Demand?" *Economic Inquiry,* July 1993, 383–93.

Bohanon, C. E., and N. T. Van Cott. "Product Quality and Taxation: A Reconciliation." *Public Finance Quarterly,* April 1991, 233–37.

Borcherding, T., and E. Silberberg. "Shipping the Good Apples Out: The Alchian and Allen Theorem Reconsidered." *Journal of Political Economy,* February 1978, 131–38.

Gould, J., and J. Segall. "The Substitution Effects of Transportation Costs." *Journal of Political Economy,* January/February 1969, 130–37.

Kaempfer, W. H., and R. T. Brastow. "The Effect of Unit Fees on the Consumption of Quality." *Economic Inquiry,* April 1985, 341–48.

Lancaster, Kelvin. *Consumer Demand: A New Approach.* New York: Columbia University Press, 1971.

Leffler, K. B. "Ambiguous Changes in Product Quality." *American Economic Review,* December 1982, 956–67.

Umbeck, J. "Shipping the Good Apples Out: Some Ambiguities in the Interpretation of 'Fixed Charge.'" *Journal of Political Economy,* February 1980, 199–208.