The paradox of value: Water rates and the law of diminishing marginal utility

Why is it that diamonds, shiny and nice as a fashion statement, are valued more highly than water, a prerequisite for sustaining life? Could it be that water’s less-valuable uses of cleaning the car or washing down the driveway have a dampening effect on its value?

Rarely do we think about the disparity of price among the myriad products that surround us. Apples-to-apples, it’s obvious that a Kia Sorento doesn’t hold a candle to the Rolls-Royce Phantom. But apples-to-oranges, why such a chasm between cool blue water and hot blue diamonds? (Ironically, diamonds are often referred to as “ice.”)

Economists tell us that the law of diminishing marginal utility dictates that consumers place a greater value on diamonds than on life-giving water. It’s just the way consumers prioritize price—by a product’s “least-value usage.” Water may save your life in the desert, but even the lowliest of industrial diamonds carries a certain sexiness that invariably outstrips the redoubtable H2O.

And a precision-cut marquise diamond. . .! Well, let’s just concede that the value of water pales in comparison in most eyes, literally spiraling down the storm drain. Few people would ever capriciously discard a diamond, yet water flows down our gutters every hour of every day. And if gutter runoff is the worst face of water—that is, its least-value usage—that explains its low prestige among economists—and, by extension, average consumers.

OBJECTIVE VS. SUBJECTIVE VALUE

Two schools of economic thought drive the discussion about the value of a product: the intrinsic and the subjective schools. The first holds that the price or value of anything is objective. The second school says it depends on our subjective perception of the value of goods or services. Most of us—economists, retailers and consumers alike—function in this subjective mode; thus we give little or no value to an object unless it’s perceived by a consumer to satisfy a human need or want. What does it cost to bring a product to market? Irrelevant. What are the variable costs for larger quantities? Meaningless.

If the consumer doesn’t covet your Pet Rock or Beanie Baby, you may as well try selling snowballs to the Inuit in Alaska. Objectively speaking, delivering snowballs intact to the shores of the Bering Strait surely involves massive cost (labor, packaging, transportation, and the like). What price could you possibly hope to expect from the Inuit in return for your investment and efforts? Subjectively speaking, zero. But offer that same product in liquid form and voila! . . .the lowly H2O is viewed in a new light. Think pipeline. Think bottled water.
In either case, objective value is irrelevant to the consumer. Economists would point to the economic value—simply put, what a product is worth to the person who wants to buy it rather than how much the seller will give it up for.

THE DIAMOND–WATER PARADOX AND THE LAW OF DIMINISHING MARGINAL UTILITY

Adam Smith is the father of the contemporary Western definition of economic value. More than two centuries ago, the Wealth of Nations author mulled the conundrum that, even though life cannot exist without water and we can easily subsist without diamonds, diamonds are, pound-for-pound, vastly more “valuable” than water. This paradox endures today.

Figure 1 illustrates the law of diminishing marginal utility in the “diamond–water paradox,” showing the marginal utility of diamonds and water as a function of the amount consumed. As a person buys or consumes more diamonds or water, each additional unit of diamonds or water results in a lower marginal utility. At low levels of consumption, water has a higher marginal utility than diamonds and thus is more valuable. People usually consume water at much higher levels than they buy diamonds; thus the marginal utility and price of water are lower than the marginal utility and price of diamonds.

Let’s return to our Far North water marketplace. Suppose we deliver five pallets of bottled water to the small town of Barrows, Alaska. That shipment might last the entire winter as a supplement to the residents’ existing water source. Beyond that, however, their willingness to purchase more pallets of water almost certainly decreases. The law of diminishing marginal utility kicks in and the law of diminishing returns looms over any subsequent transaction you might propose.

Basically, as you buy more, you are less inclined to shell out your hard-earned dollars for each incremental unit you might purchase. As your need approaches saturation, your wallet starts to go back in your pocket. And when you don’t need any more of something, that wallet is zipped tight and it disappears into your pocket’s deepest recesses.

Ironically, you save your marginal purchasing power for . . . yes . . . a rainy day. And while an Inuk’s definition of a rainy day might be the off-chance that a day will come when his sled dogs get thirsty and he’s run out of pallets as the spring thaw nears, it’s far more likely his wallet would next be opened to buy more money-making sled dogs.

Similarly, once a family is satiated by the gallons of water it needs for personal consumption, additional outside water becomes less valuable. Put another way, water has a diminishing marginal utility once personal-use needs are met.

Throw in one more paradox: In the world of water transmission, the price of water goes up with usage (increasing tier rates). This is ingeniously engineered to encourage water conservation. Yet at the core, the price of water is geysering upward exactly at the time consumer demand is flowing down the sidewalk.

In The Wealth of Nations, Adam Smith insightfully noted that “Nothing is more useful than water; but it will purchase scarce any thing.” In analyzing Smith’s seminal work, P.J. O’Rourke tried to clear up any confusion with a humorous illustration: “With an additional eight ounces of water, all we get is a trip to the bathroom in the middle of the night. With an additional eight ounces of gold, we get the upfront payment to lease a Lexus. Marginal Utility explains why gold, vital to the life of no one except hip-hop performers and fiancés, is so high-priced.”

ESTABLISHING THE VALUE OF TAP WATER

Here’s the point: The value of any product, water included, is established subjectively by the consumer’s perception of its importance. Thus, to establish the value of tap water, we must also include its diminishing marginal utility—that is, how it is being used, how much is being used, and for how long it will be needed or demanded.
In the dual-pipe system, outside (nonpotable) and inside (potable) water usages are separated, so the rates are different. This system has the luxury of fitting within the two very different perceptions of value. A utility in a new development may carry potable water in one line and nonpotable water in another. Rates for untreated water are less than those for tap water, and the billing statement carries two line items to objectify the very subjective way most consumers value water. It also works well for separating out increasing tier rates. In this case, consumers can align the quality of water with its usage—there is, after all, no need to irrigate with treated water.

Alas, a dual-pipe system is rare, and most utilities cannot segregate indoor from outdoor water usage. So what happens? As the average consumer's personal needs for water are met, the diminishing marginal utility of water decreases. At the same time, water rates are unchanged, or even go up with usage if increasing tier rates are employed. This flies in the face of the very natural question that many consumers have: Why is the first, most valuable gallon of water the cheapest, but the last and least valuable gallon the most expensive?

People value water less with the more they use, so perhaps visual clues are in order to emphasize the differences on the billing statement. By parsing the billing statement in this way—indicating the first tier of water would represent the average indoor usage for a household—utilities could begin leveraging a huge educational tool.

Generally, people don’t like paying more when they use more, especially because many of those last 1,000 gallons flowed down the driveway. Perhaps the value of water could become more of a straight line rather than a plunging roller coaster that largely ignores the relationship between consumption and marginal utility. Current industry best practices emphasize environmentally friendly pricing, but increasing evidence indicates skepticism among consumers about pricing strategies that conflict with their own values.

One must ask, is it time to rethink how pricing strategies that, in real life, may or may not encourage water conservation in favor of framing those same rates to recognize how most people value water by its usage?

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REFERENCES


FIGURE 1  The law of diminishing marginal utility

http://dx.doi.org/10.5942/jawwa.2013.105.0147
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