



STRAIGHT FIXED VARIABLE RATE DESIGN

By John Wolfram

Almost all of the costs for building and maintaining a natural gas delivery system or an electric grid are fixed costs, i.e. costs that do not vary with user consumption. The most significant variable cost for gas utilities is the cost of natural gas, and for electric utilities is the cost of fuel and/or purchased power. For typical gas utilities in the U.S., gas delivery costs account for a much smaller portion of the total bill than the cost of the gas itself. However, gas utilities all across the country have adopted rate structures that fail to fully recognize this fact, by incorporating some of the fixed cost into the portion of the gas bill that is based on customer usage. Electric utilities have done the same thing; it is very common for a portion of the electric utility fixed costs to be included in the variable per-kilowatt-hour component of the electric rate. In these cases, why would utilities ever encourage customers to reduce their consumption? What can the utility do to remove the inconsistency between how costs are incurred and how they are paid for by the customers?

One way to do this is to adopt a *Straight Fixed Variable* rate design. Straight Fixed Variable rate design is a particular approach to the development of rates premised on the fundamental principle that fixed costs should be recovered through fixed charges (such as the monthly customer charge in \$), while variable costs are recovered through variable charges (such as the charge for natural gas in \$-per-MCF, or the charge for electric energy in \$-per-kWh).

Straight Fixed Variable rates segregate fixed costs (i.e. those costs which are incurred by the utility in order to be able to provide service, regardless of how much gas or electric energy is used) from those costs based on total usage (which are largely within the control of the consumer). In contrast, other common rate designs try to minimize the monthly fixed charge (often called a "customer charge" or "basic service charge") and incorporate almost all costs -- fixed and variable -- into the charge that applies to the amount of gas or electric energy used by the customer.

Straight Fixed Variable rate designs are far more common among natural gas utilities than among electric utilities. For this reason and for convenience, the remainder of this paper shall consider the Straight Fixed Variable issues solely for natural gas utilities. The issues for electric utilities are conceptually similar.

Fixed Costs

Fixed costs are costs that do not vary with the amount of gas that is sold by the utility. Unlike commodity-related costs, such as the cost of the gas commodity that a distribution company buys for its customers, a utility's fixed costs do not disappear if it sells less gas, but instead must be spread over a smaller sales volume, thus causing the utility rates to increase. For a local gas distribution company ("LDC"), essentially all of its storage and distribution costs are fixed. For example, depreciation expense, interest expenses, return on equity, income taxes, property taxes, insurance expenses, and essentially all non-gas operation and maintenance expenses associated with gas storage and distribution facilities do not vary with the amount of gas that the utility sells and are therefore fixed.

One non-gas expense that is readily identified is the cost of odorant, which is the chemical that is injected into the gas to give it the unique "gas smell" that customers associate with natural gas. (Natural gas is actually odorless and an odorant is added to the natural gas to make it noticeable to customers in the event of a leak.) The unit costs included in rates for odorant are de minimis.

For many utilities, the distribution costs are not only made up almost exclusively of fixed costs, but also are essentially the same for all residential customers. The utility typically installs the same basic facilities for all residential customers on the system. Any difference between serving one residential customer and another has more to do with geography and/or the timing of customer installations than any other factors. Although geography and vintage considerations can have a significant impact on the cost of serving residential customers, the amount of gas that a residential customer uses does not have any measurable impact on the cost of providing service to the customer. If residential customers were to use significantly more gas in a given period of time, then the LDC's storage and distribution costs (with the exception of the cost of odorant) would be the same as they would be if these same customers used significantly less gas. For this reason, the utility's distribution and storage costs are considered fixed costs.

Advantages

There are a number of potential advantages to the implementation of a Straight Fixed Variable rate design. Proponents of the design will typically claim the following:

1. A Straight Fixed Variable rate design is a simple form of decoupling, which many environmental and conservation advocates consider to be a keystone to the implementation of comprehensive energy conservation programs.

Under a rate design that recovers fixed costs through a volumetric charge, the LDC is rewarded through higher returns when customers buy more gas and is penalized through lower returns when customers buy less gas. Consequently, under rate designs common among natural gas utilities in the U.S. today, the LDC is not economically or

financially motivated to encourage customers to take actions to reduce their consumption of natural gas. In fact, the opposite is the case – the LDC is financially motivated to encourage customers to buy more, not less, natural gas. Because with a Straight Fixed Variable rate design all of its fixed distribution costs, including the return component of costs, would be recovered through a fixed monthly charge, the LDC's margins would no longer be affected by the amount of gas it sells. Therefore, the LDC's fixed cost recovery would be decoupled from its sales. While there are other, more complicated decoupling mechanism designs in the utility industry today, a Straight Fixed Variable rate design is arguably the simplest form of decoupling.

2. A Straight Fixed Variable rate design removes the incentive for the utility to encourage customers to use more natural gas.

The implementation of Straight Fixed Variable rates will remove the financial penalty that the utility realizes when customers take actions to reduce their natural gas consumption.

From a business perspective, the prospect for even more reductions in natural gas usage by residential customers presents conflicting objectives. On one hand, the utility and its management, like many citizens in the U.S., would like to see customers use less of this limited natural resource, but on the other hand, the utility wants to avoid earnings deterioration due to lower sales volumes. With a Straight Fixed Variable rate design, the conflicting objectives that currently exist can be alleviated by eliminating the volumetric component of delivery service and thus removing the financial and economic penalty brought upon the utility whenever customers conserve their natural gas usage. Relative to traditional rate designs, the Straight Fixed Variable rate design will create a far superior alignment of interests between the utility and its customers in effectuating reductions in natural gas usage.

3. A Straight Fixed Variable rate design reflects the cost of providing natural gas delivery service and sends the appropriate price signal to customers.

Straight Fixed Variable rates follow cost-causation principles and reduce a subsidy that exists under current rates. Traditional rate designs force residential customers whose usage is greater than the average to pay more than the cost required to serve them, while allowing customers whose usage is smaller than the average to underpay their cost-of-service. Customers who use more energy for reasons beyond their control (such as abnormal weather, quality of housing stock, etc.) will no longer have to pay more than their fair share of the costs.

Typically, a utility's storage and distribution costs do not vary with the amount of gas that a customer buys during the month. Consequently, recovering fixed costs through a volumetric charge sends an incorrect price signal to residential customers that the

more gas they use, the greater the cost of providing natural gas delivery service, which is contrary to the invariant nature of these costs. With a Straight Fixed Variable rate design, customers will not be misled into believing that reductions in consumption will allow them to avoid the fixed costs of the distribution system.

4. Because low-income customers on average often use more gas than the average customer, a Straight Fixed Variable rate design will remove the subsidy that low-income customers are providing to other residential customers.

It is common for residential low-income customers to use more energy per month than the average customer in the same rate class. If low-income customers use more natural gas than the average customer, their gas bills will be higher under the traditional rate design that includes a volumetric delivery charge than their gas bills would be under a Straight Fixed Variable rate design that does not include a volumetric delivery charge. Removing the fixed cost from the variable charge will eliminate this subsidization.

5. Through the implementation of a Straight Fixed Variable rate design, the volatility of customers' bills will be reduced.

During the winter heating months, customers use more natural gas. With a Straight Fixed Variable rate design, the volumetric component of the bill will be reduced, thus reducing monthly volatility in customers' bills. Other common rate structures create unnecessary volatility in customer bills by collecting a larger portion of customers' cost-of-service in the peak seasons, and a smaller portion of the cost of service in the shoulder or off-peak seasons.

6. A Straight Fixed Variable rate design is easy for customers to understand.

Customers will see the costs that do not vary with usage recovered through a flat monthly charge while the cost of the gas itself will be reflected in a volumetric charge. Customers are accustomed to fixed rate delivery services. Fixed rate pricing is common for other services that customers procure, including telephone service, internet service, garbage collection, television service, and certain overnight delivery services. Furthermore, fixed rate delivery service is likely easier for customers to understand than other forms of decoupling.

7. Adopting a Straight Fixed Variable rate design will enhance the economic viability of the utility's gas distribution business.

With large fixed costs and steadily declining sales volumes, it is difficult for gas utilities to maintain adequate rates of return on their investments. Consumers have made great strides toward conserving their natural gas usage. This is good news for

the customer, but may not be good news for the utility shareholder. On the positive side, this decline represents a significant reduction in the consumption of a limited natural resource and has also resulted in economic savings to customers. But, on the negative side, this decline in usage per customer means that utility fixed costs – including depreciation expense, interest expenses, return on equity, income taxes, property taxes, insurance expenses, and essentially all non-gas operation and maintenance expenses – must be spread over a shrinking sales volume. Stated differently, declining usage per customer places downward pressure on the utility's earnings and upward pressure on its need to increase base rates. Besides helping prevent the deterioration in the utility's earnings, Straight Fixed Variable rates will lessen the need for frequent rate increases to the extent those rate increases are driven by falling residential sales, which should also help reduce customer confusion and dissatisfaction resulting from frequent rate case filings by the utility.

Disadvantages

There are a number of arguments against the implementation of a Straight Fixed Variable rate design. Opponents of the design will typically claim the following:

1. The Straight Fixed Variable rate design fails to recognize the cost differences between small and large customers.

For regulated natural monopolies, cost causation dictates that payments for service should be proportionate to the benefits received. Thus, those customers that receive more benefits should pay more in total than those customers who receive fewer benefits. With respect to natural gas usage, the volume of consumption is the most direct indicator of benefits received. Thus, volumetric pricing is the most equitable pricing mechanism for customers and for the utility.

The Straight Fixed Variable rate design may fail to recognize the cost differences between small and large customers. This is so because the Straight Fixed Variable rate design does not recognize the significance of demand-related costs – costs that are not variable in a strict sense but that do relate to the size of the customer with respect to the capacity requirements. Demand charges and customer charges are not the same thing, and the Straight Fixed Variable rate design essentially shoe-horns three different cost components (energy charges, demand charges, and customer charges) into two (variable and fixed). This distorts the price signal and forces high-demand and low-demand customers to pay the same amount of fixed costs even though the demand characteristics of these customers are different.

It is possible that some residential customers may permanently disconnect their gas service as a result of the implementation of Straight Fixed Variable rates. Although many residential gas customers use natural gas for heating, water heating, and cooking, a number of customers use natural gas solely for more limited purposes, such as for decorative fireplace logs, decorative lighting, and outdoor grills. Increasing the monthly fixed charge may result in some of these customers disconnecting their gas service, because the low consumption does not justify the cost.

2. Relative to volumetric pricing, the Straight Fixed Variable rate design promotes additional consumption, because the volumetric charges are lower with a Straight Fixed Variable rate design than they would otherwise be under a traditional rate design.
3. The Straight Fixed Variable rate design harms the customers who are in most need of financial assistance, because the rates reduce the ability of the customers to manage their bills. The higher fixed cost per month cannot be mitigated by consumer behavior, so the design penalizes the customers who most need to manage their bills by conserving energy.
4. Straight Fixed Variable rate design is not consistent with competitive market-based pricing models.

Economic theory dictates that efficient price signals result when prices are equal to long-run marginal costs. It can be argued that in the long-run, all utility costs are variable and, hence, efficient pricing results from the incremental variability of costs even though a utility's short-run cost structure may include a high level of fixed costs. Even though utilities are natural monopolies, the public is best served if the utility pricing structure mirrors that of a competitive market. Although there are exceptions, competitive market-based prices are generally structured based on usage.

5. Straight Fixed Variable rates provide the utility with an incentive to promote conservation, but that incentive may already exist in the form of a Demand Side Management ("DSM") rate mechanism.

Many DSM rate mechanisms include a "lost revenue" component that permits the utility to recover the revenues otherwise lost by customer conservation. A few DSM rate mechanisms also include an incentive component, which makes the use of Straight Fixed Variable rates even more superfluous.

6. Straight Fixed Variable rate design is not needed to enhance the viability of the utility business.

For decades, the pricing structures of utilities have been largely volume-based. The utilities have remained viable and have achieved reasonable returns on their

investments with traditional volumetric-based rates. The Straight Fixed Variable rate design is simply not needed to make the utility business more viable.

Conclusion

Proponents of Straight Fixed Variable rates claim that this design aligns the interests of the utility and its customers in promoting conservation by removing all incentives for the utility to encourage customers to increase their consumption. Straight Fixed Variable rates also send the appropriate price signal to customers, remove the subsidy that low-income customers are providing to other residential customers, reduce the volatility in customers' bills, are easy for customers to understand, are more consistent with accepted ratemaking principles, and will help make the utility distribution operations a more viable business. Opponents of the rate design claim that it sends inappropriate price signals, promotes additional consumption, provides additional incentives to the utility where sufficient incentives already exist, and reduces the ability of the customers to manage their bills.

While the Straight Fixed Variable rate design may not be appropriate for all utilities in all cases, it should be considered in the broad set of ratemaking alternatives available to utilities, and may prove beneficial in many cases for utility customers and shareholders alike.

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