

Swing Options

By Robert Endres and Jarvis Cheung

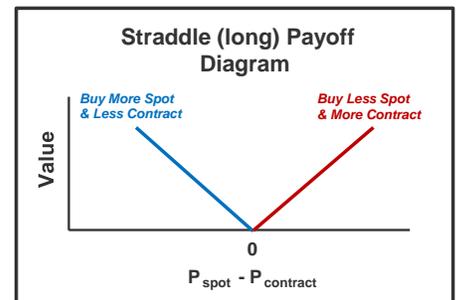
Introduction

Many commodity contracts afford the buyer some type of volume flexibility. Buyers have the right, with specified limits, to take more or less than a planned ratable volume (per period). As a seller, the intention here is to provide buyers with some degree of “operational flexibility”. However, when the buyer has alternative choices of supply at alternative pricing, such as spot market or through another supplier, there is value beyond operational flexibility. To a buyer, this flexibility may have more value as a financial option rather than as an operational option.

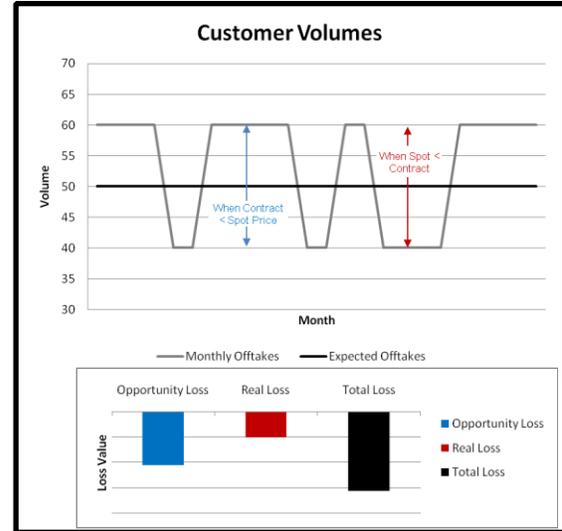
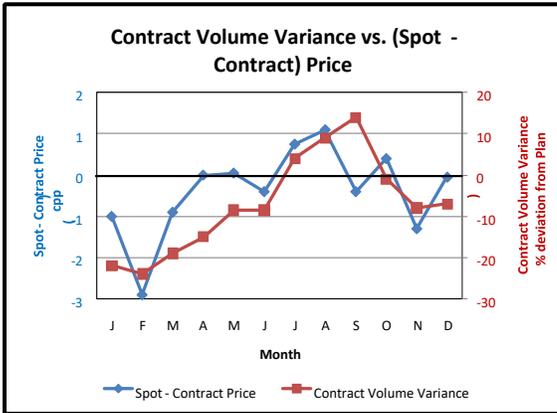
To a seller there is a cost to providing ‘operational flexibility’. The cost to manage a customer demand swing can be moderated with production scheduling and offsets with other customers’ demand in the portfolio. When a seller treats the volume flexibility like a financial option there is a more dramatic and hidden opportunity and real loss to the seller.

Value of a Swing Option

When the spot market price is higher than the buyer’s contract price, the Buyer can buy more than the planned contract volume to take advantage of the lower contract price. And when the spot market price is lower than Buyer’s contract price, they can purchase the minimum monthly requirement, knowing they can secure additional supply cheaper in the spot market or at a reduced contract price during next pricing period. Financially, the customer owns a ‘straddle’ (call option and a put option) at the spread between the spot and contracted price. As shown in the payoff diagram to the right, the owner (long position) of the straddle captures value when there is a difference between the spot and contract price (negative or positive).



This is not theory. Many buyers ‘monetize’ the swing options in their contracts. An actual example shown below, illustrates the value of a swing option for one chemical product sold by one supplier. For this particular chemical, the spot price can be above or below the customer’s contract price and with a correlation of 85%. Illustrated on the right, in the first half of the year the spot price was lower than the contract price, resulting in contract volumes lower than planned. In the last half of the year, the price relationship switched where the spot price was higher than the contract price, resulting in contract volumes higher than planned.



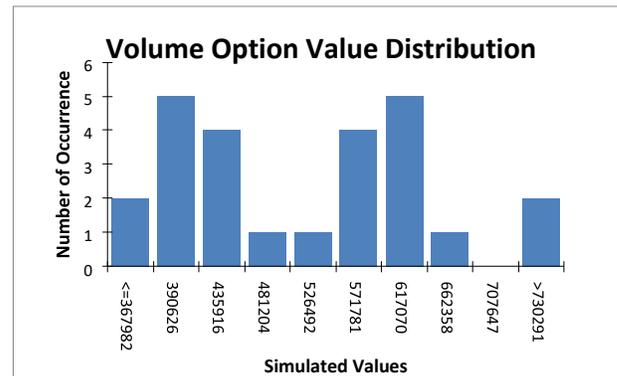
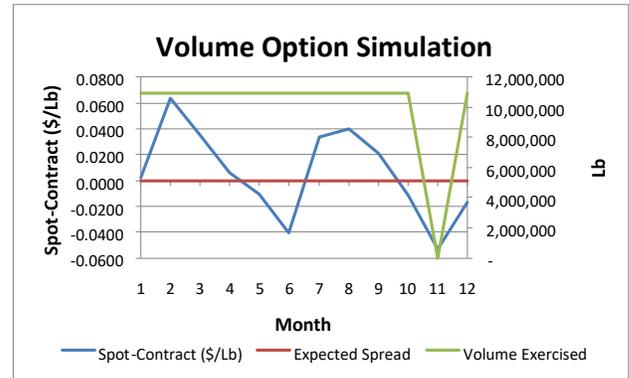
Swing options offered by one company to buyers (in aggregate and over all products) cost this Supplier over \$100MM per year. This cost was both an opportunity and real loss. An opportunity loss when the buyer could not sell volumes above plan in the higher priced spot market (since they were consumed by the customer at the contract price). A real loss when the unordered contract volumes had to be sold off in the spot market at a price lower than the contract price. These losses become magnified when there are other customers with swing options and behave in the same manner at the same time.

How to Value Swing Options

There are many value drivers with swing options. Below are some important ones to consider:

- Decision Time Window – A customer has a timeline where they must make decisions on volumes to nominate. If the two prices become visible (i.e., the spot and contract price) prior to making the nomination decision, the value of option is higher since there is a higher certainty of making the correct nomination decision
- Volume Flexibility – the amount of volume flexibility by period is an important driver of value since the greater volume flexibility the more volume a Buyer can swing to the lower price. Other volume constraints, such as annual minimums, need to be considered in conjunction with the period to period flexibility
- Spread Relationship – the relationship between the contract price and alternative price (e.g., spot) drives the amount of value for every volume unit swing. Below are some price relationship factors to consider:
 - Correlation – are price relationships constant or variable? The higher the variability, the greater the value.
 - Starting Spread – how far apart are the prices? The closer the prices are to each other in the beginning, the higher the probability that the price relationships change from a positive to a negative spread and vice versa
 - Reversion Speed – when the spread between the two prices move, how quickly do they revert back to a mean? The slower the price moves back to the mean, the more time a swing option will be open to monetize value.

A volume option model is useful to determine the value of a swing option. Parameters on volume flexibility can be set and spread behavior may be simulated based on different scenarios. By changing different aspects of the spread behavior, volume flexibility, different scenarios can be created resulting in a more complete understanding of the potential loss with a swing option. In the example to the right, we simulate the value of a swing option where a buyer had +/- 10% flexibility, the starting spread was 5 cents per pound with a mean reversion rate of x.

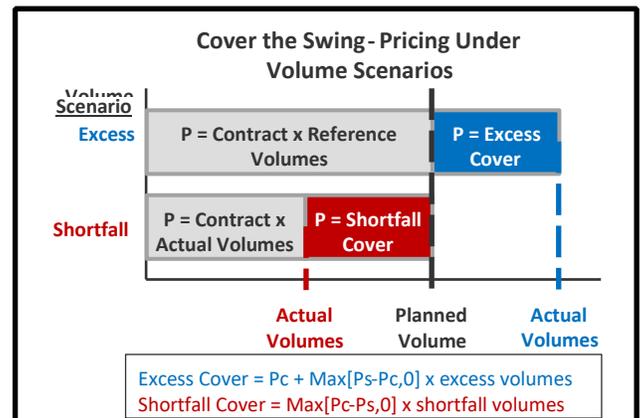


What can Suppliers do?

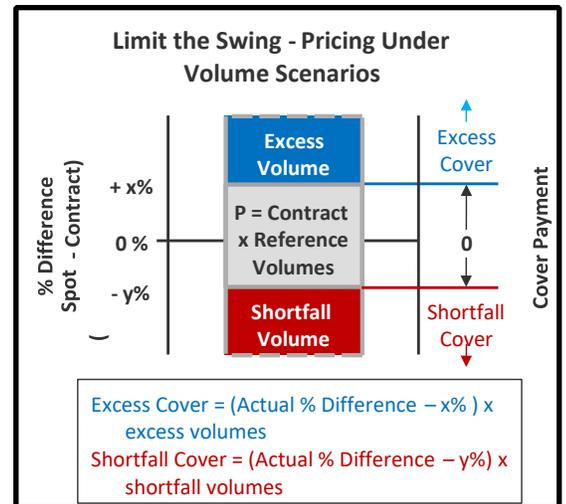
First, understand the value of swing options you embed in your contracts. Many times people in sales are compensated on sold margin and ignore the loss value from the swing option. Consider offsetting this lost value in the margin calculation to incentivize the segmenting of their customers into those who monetize swing options for financial gain (and move them to firm volumes) and those who use it for a genuine operating flexibility.

If your content to or are forced to provide volume swing to buyers, attempt to eliminate or reduce the value of the swing. Some ideas are:

- Cover the Swing** - If a customer purchases more than the planned contract volume (i.e., excess), the higher of contract or spot pricing would apply to the excess volumes. This covers the seller against an opportunity loss of not selling in the spot market. Conversely, if the customer, for some operational issue, cannot take the planned contract volume, they would be charged a cover in addition to the contract price times the actual volume. This covers the seller against the real loss of selling the shortfall amounts at a reduced price in the spot market.



- Reduce the Swing** - Allow the customer to swing, but set a tolerance differential between the spot and contract price. If the spot/contract price differential exceeds a predefined % (e.g., x%) an excess cover payment is applied to excess volume. If the spot/contract price differential exceeds a predefined negative % (e.g., -y%) the customer must pay a shortfall cover in addition to the base cost (actual volumes x contract price). In other words, if the customer wishes to take more or less volume at contract pricing, they can, provided the difference between spot and contract pricing is within a tolerance band (e.g., x% and -y%).



- Acquire a Volume 'Make-Up' Option** - Some customers may be averse to paying a shortfall 'penalty' in the ideas above. If this is the case, acquire a Volume Make-Up Option whereby the seller has the option to sell shortfall volumes in a future period (with the period being the seller's option) at the higher of the spot price in the shortfall period or the spot price in the future period. This makes the seller the masters of their own destiny and provides the customer an unknown consequence (something they will think twice about).

About Synaptic Decisions

Synaptic Decisions is a specialty consultancy focused on helping clients achieve step change improvements in business results through integration of strategy, risk management, negotiations, and contracting.