

## The Other Natural Gas Market

*With apologies to J.J. Cale...*

*If you wanna hang out, you've got to take her out / Propane*

*If you wanna get down, down on the ground / Propane*

*Up in price, up in price, up in price / Propane*

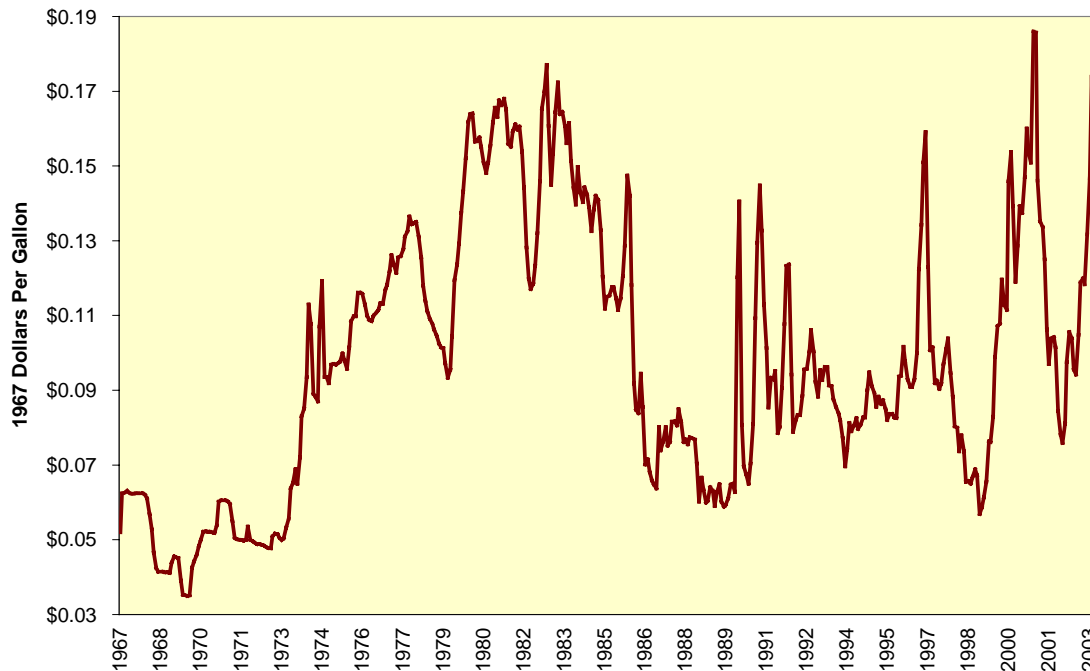
Organic chemistry, for those of you who never had the pleasure, has certain tinker-toy qualities. You can keep linking carbon atoms together in chains and rings and hanging things off the side to produce ever larger and more interesting molecules. But, just as is the case elsewhere in life, the simplest things are the most important.

The natural gas we are most familiar with is at least 96% methane, which has one carbon atom. The gasoline you pour into your Bronto SUV is a mixture centered on octane, which has eight carbon atoms. The petrochemical industry relies on the lighter, smaller molecules with 2-4 carbons, ethane, propane and butane, and their close derivatives. As these oscillate between their gas and liquid states depending on temperature and pressure, and as they are extracted from raw natural gas, they are called natural gas liquids, or NGLs. Of these, propane is the most important economically and serves as the principal price discovery mechanism.

### Carry The Torch

The price of NGLs is normally quite volatile, and both producers and consumers have developed hedging strategies to protect themselves as best as they can.

### A Tiger In The Tank

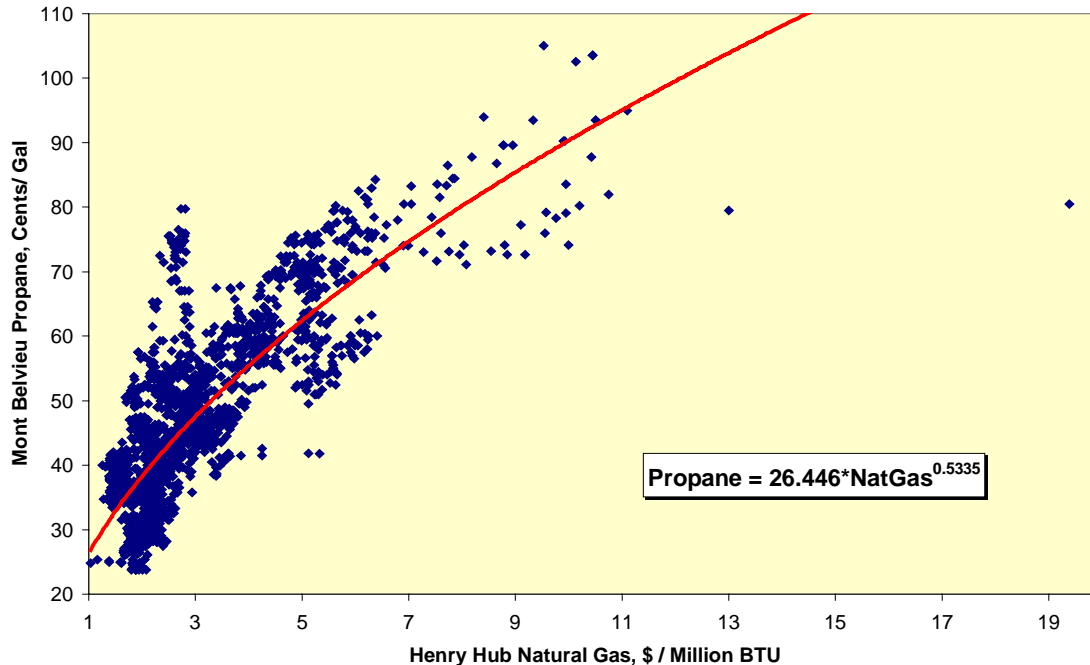


But earthquake insurance is much cheaper in Chicago than it is in Los Angeles, and the cost of hedging any commodity that tripled in real-dollar prices between 1999 and 2001, and then fell and half and redoubled again going into 2003 must reflect that volatility. Moreover, regardless of the price of propane at Mont Belvieu, Texas, the delivered price to any user outside of the Gulf Coast likely will reflect transportation costs more than material costs. As a result of this volatility/location combination, the New York Mercantile Exchange's propane futures contract has never had more than trivial volume.

Hedging propane with natural gas - a common technique known as cross hedging - does not solve the problem, either. The relationship is decidedly non-linear, and for good reason: Much of the natural gas market is destined for

non-interruptible uses such as residential heating, and customers are decidedly not price-sensitive when the choice becomes pay more or freeze to death (sorry, commodities are not pretty). In addition, few residential customers have available storage in their back yards. Commercial propane use is more interruptible; the consumer can reduce demand in the face of higher prices. Finally, many propane customers have a storage tank on site.

### A Non-Linear Hedge



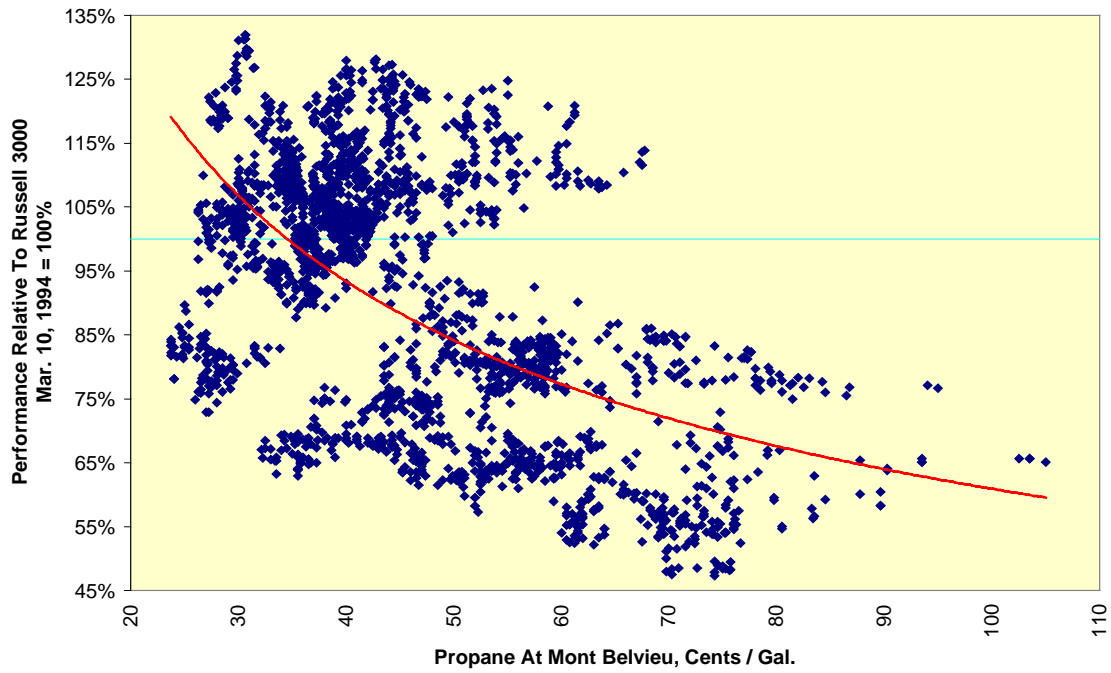
This last point is one reason why fuels such as gasoline, diesel, and jet kerosene are always going to be tough to replace. They are liquids, which means they take the shape of their container and flow under their own pressure. Gasoline can be dangerous enough when you get rear-ended - our good friends at Ford Motor are unlikely to build a statue of the ill-fated Pinto, with or without a butane lighter (four carbon atoms while we're at it) - anytime soon. Having a pressurized tank of compressed natural gas underneath your derriere is quite a concept.

### Risky Assets Are Worth Less

Any petrochemical producer who does not hedge their propane commitments is short a call option on a very volatile commodity. This means the value of the firm is the ongoing value of its operations less the price of the propane call. One solution, adopted by many over the years, is vertical integration. The major oil companies all have petrochemical subsidiaries, and these can be highly profitable at various points in the cycle. A second solution is when chemical producers buy NGL production assets; DuPont bought Conoco in the early 1980s when oil prices were at record highs in real dollars and spun the firm off in the mid-1990s when oil prices were considerably lower. ConocoPhillips, the successor firm, is a major producer of natural gas and NGLs.

DuPont has a decidedly negative relationship with propane. If we take its performance relative to the broad-based Russell 3000 index as a function of propane prices, we see a trend curve much like a put option. This confirms the presence of a short call option on propane within DuPont's "real option" corporate profile.

### DuPont As A Put Option on Propane



Of course, DuPont is far more than one single option, it is a bundle of options on hundreds of costs and prices. But until it and other petrochemical producers can find an efficient way of controlling the short call options within their cost structure, they are going to be hurt if propane prices continue higher, and the betting here is they will over the next several years.