

## Lightning In A Bottle

Are you ready for futures on services, such as visits to your doctor or lawyer? Of course not; while service industries comprise a huge segment of our economy, we draw upon them upon demand, sort of the ultimate in just-in-time inventory management. After all, you cannot store a doctor's visit: You are unlikely to stop in for an additional check-up just because your local MD decides to run a sale, and your demand for medical attention is likely to be fairly price-inelastic in times of emergency. Besides, while certain medical procedures are commoditized – just read the diagnostic codes on your next bill – we still like to pick our physicians on the basis of services provided.

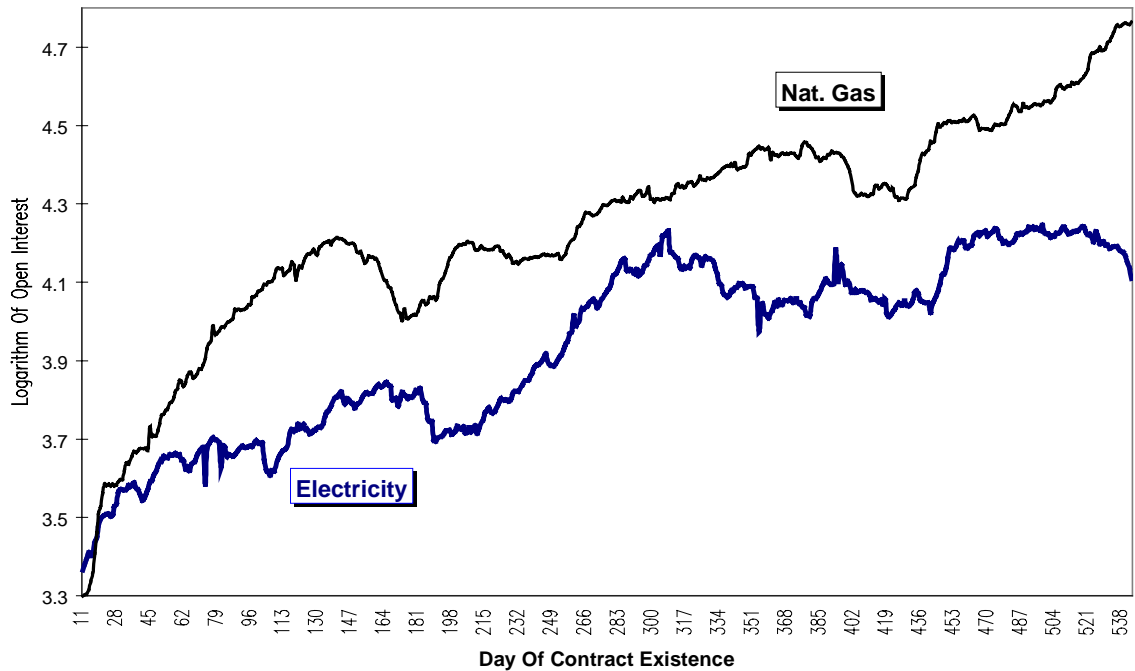
The futures industry has justifiable reason to be proud of its record of innovation over the past quarter-century. For example, financial futures and options made it possible for investors to lower the risk of their holdings, for borrowers to lower interest rate costs, and for lenders to increase the availability of funds. In some measure, futures exchanges have been the victims of their own success as traders and corporate managers became more sophisticated and created over-the-counter risk management products – which in turn utilized exchange instruments to offset residual risk.

Exchanges are embarking on another round of innovation, this time in electricity, a product as much of a service as a good. The NYMEX is building upon its two existing West Coast contracts with contracts at the Cinergy hub in Ohio, the Entergy hub in Louisiana, and plans to add a Pennsylvania-New Jersey-Maryland contract as soon as outstanding transmission tariff issues are resolved. The CBOT is adding contracts for the Commonwealth Edison hub and the Tennessee Valley Authority, and both the MGE and KCBOT have contracts in the works.

The logic behind this activity is compelling: Electricity is a \$250 billion-plus market, it is as indispensable as money to the modern economy, its price volatility exceeds even that of natural gas on a regular basis, (see "It's A Gas," *Futures*, June 1997) and the utility industry is undergoing deregulation on a piecemeal basis. Large customers smell blood in the water in terms of lower prices and greater services, and large producers see the potential for becoming a dominant player in an industry bound to consolidate and rationalize its structure. Just as the deregulation of the telecommunications industry has spawned the growth of wireless services and the Internet, the deregulation of electricity is bound to unleash waves of innovation; the electricity industry is at the same stage the telecommunication industry was when everyone had a black rotary-dial telephone. Opportunities abound, and the futures industry is right in trying to be a part of forthcoming changes.

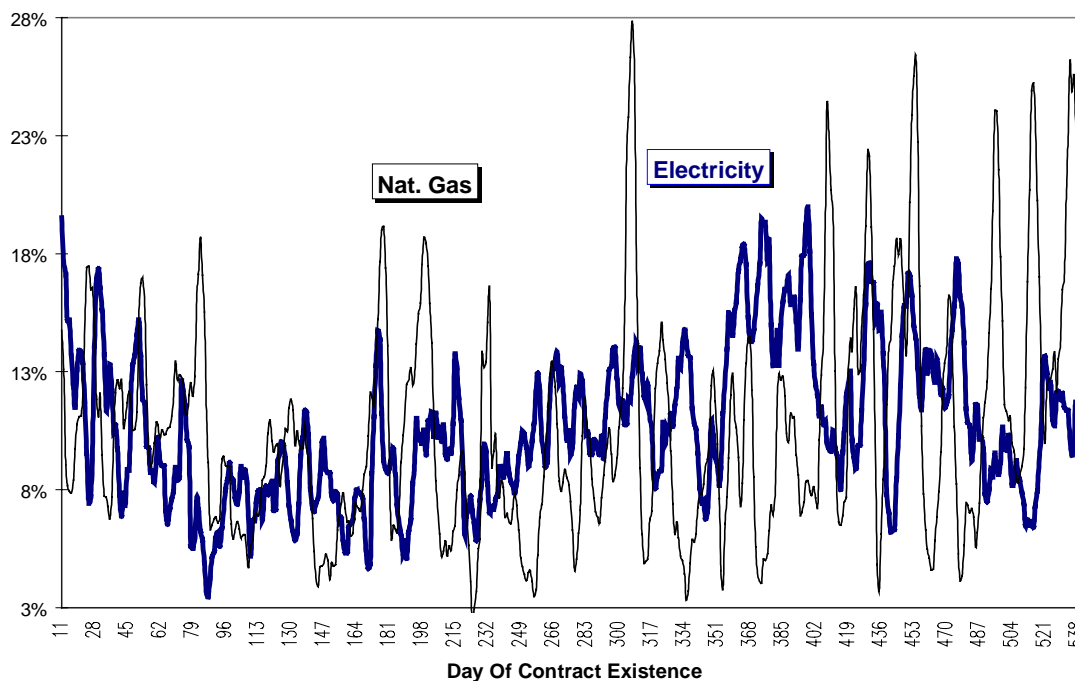
The experience of the two NYMEX contracts so far has been modestly disappointing. This can be illustrated in two comparisons to natural gas futures, the commodity to which electricity is most closely related. We can compare the open interest in the two contracts on a logarithmic basis to illustrate growth rates. After two years, open interest in natural gas was accelerating, and, more important, the Henry Hub contract established itself as a central price discovery mechanism in the industry. In electricity, the combined open interest of the California-Oregon Border and Palo Verde contracts has been stagnant for more than a year, and the contracts are commercially useful only in their regional markets.

Growth Of Open Interest In First Two Years  
Electricity And Natural Gas



A second, and more ominous comparison is the ratio of volume to open interest for the two contracts over rolling five-day windows for the first two years of natural gas and the combined electricity contracts. A pattern of spikes both up and down is visible in the natural gas series, with the spikes upward corresponding to “bid week” in the cash market and the spikes downward corresponding to the slow trade at the start of the month. In other words, commercial players quickly adopted natural gas futures to facilitate their cash market activities, the hallmark of a successful contract. No such pattern is visible in the electricity series, and the turnover ratio is generally lower than that for natural gas at a similar point in the contracts’ development. We should add that over the past two years natural gas, now a mature contract, has averaged volume of 24.0% of its open interest compared to a 10.7% ratio for electricity. Natural gas has become a speculative favorite as well.

Volume As A Percentage Of Open Interest  
Electricity And Natural Gas



In order for electricity to duplicate the natural gas experience, it will need to establish itself as a central price discovery mechanism. Natural gas was able to achieve this since Henry Hub served a significant percentage of the national pipeline system; none of the later natural gas contracts designed to serve the remainder of the pipeline system has been successful even though they were logical from both a commercial and an engineering standpoint. Since there is no national transmission grid for electricity, each regional grid is a separate market. The approach of the futures industry to serve each of these islands with a separate futures contract is a major gamble; experience shows that separate futures contracts can coexist only when there is an active arbitrage market between the two, (IPE Brent and NYMEX West Texas Intermediate crude oil, for example) or when one contract is in the process of eclipsing the other, such as has been the case between the LIFFE and DTB German bond contracts. Seven futures contracts not linked by arbitrage will fragment trader interest to the point where illiquidity will threaten the viability of a majority of them, especially in the critical early stages. Unlike cicadas, futures contracts do not lay dormant for years prior to bursting into noisy glory, they just die.

A second requirement for success will be commercial acceptance. John Wengler of SAVA Risk Management notes that utilities will be more than ready to sell large blocks of power forward into the futures market whenever this price exceeds their marginal costs of generation and transmission, and that the electricity futures contract can be traded as a “swing swap” against cash market prices, with the additional feature of being a European option due its single expiration date. One would assume that large customers would find futures useful for the standard array of risk management reasons. Both sides are faced with uncertainty over the short-term load forecast, which is a function of weather, day-of-week, time-of-day, and a host of other factors (see “What’s The Buzz”, *Futures*, July 1996). Supply forecasting for hydroelectric power, a critical component for both the Northeast and the West Coast is equally variable. Overlay this with very inelastic demand curves, and the result is a world of very short-term massive price fluctuations – 200% volatility is not unusual – that looks very different from the 30-day on-peak strip of fixed-price electricity (a “rectangular load shape” in industry parlance) offered by the existing futures contracts. While demand for risk management generally rises with volatility, at some point the

relationship reverses: do equity index options become more or less liquid in times of a stock market crash?

A third requirement for success may be the most unattainable, and that is creating a futures market for a non-storable service. Goods can be stored, and futures market arose in grains to provide a pricing mechanism for storage. If a flour mill does not use all of the wheat it purchased, it can store the unused portion at the cost of its capital and facilities. A factory that contracts for a fixed delivery schedule of electricity is in a take-or-pay situation; it cannot store electricity for later use. Utilities, as FIMAT's Henry Lichtenstein points out, will always be long electricity for longer-dated horizons, but may need to be buyers in the short-term to meet their spot delivery commitments. Of what use will futures, with their rectangular load shape for the next month, be in this situation?

Industries have many ways of handling supply uncertainty and price volatility. One traditional approach is vertical integration, owning all phases of an operation from raw materials to finished goods. Technological innovations such as micro-turbines and cogeneration facilities may allow more industrial and municipal customers to become vertically integrated in electricity by producing their own requirements. A second method, already developed to a large extent in foreign exchange, is to engage in long-term cash market hedging strategies. A third method, long used in such electricity-intensive industries as aluminum production, is to shift plant and equipment to low-cost electricity zones when justified economically. A final method, seen in many industries, is for producers to converge on an oligopoly price and then compete upon services. None of these strategies require frequent trades over a thirty to ninety day horizon.

Electricity will be a huge and active cash market, and like the foreign exchange market, one that will employ a large number of traders. Unless the industry designs products of use to both commercial players and speculators – contracts with high liquidity, arbitrage potential, central price discovery, and the capacity for integration into existing cash market practices – these traders will not be active in futures.