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Market quality and price discovery: Introduction of the E-mini energy futures

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Abstract

In mid-June 2002, the New York Mercantile Exchange (NYMEX) introduced E-mini futures contracts on natural gas and crude oil, a natural response to information technology developments and investor interest. The transition data allow examination of the effects of the new contracts on market quality and price discovery. Bid–ask spreads on the regular futures have been reduced significantly since introduction of the E-mini futures, showing improved market quality from competition effects. The E-mini market contributes more than 30% to the price discovery process, although it represents less than 1% of the volume of the regular futures with the same underlying. E-mini futures have several advantageous characteristics over regular futures, which should explain these significant results.

JEL classification: G15
Keywords: E-mini futures; Price discovery

1. Introduction

Energy products and energy markets have played essential roles in the U.S. economy since the Industrial Revolution. Energy markets have been much more volatile than the stock markets in recent years. During the 5-year period of 1997 through 2001, the variances of daily returns of natural gas and cruel oil were 0.00230 and 0.00071, while that of the stock index was only 0.00016 (source: Commodity Systems Inc. (CSI) daily market files). Gas and oil prices since

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deregulation in the 1970s have been considerably more volatile than other commodity prices at most times.[1]

Gas and oil prices are volatile because they are affected by many supply and demand factors, such as compacts among the Organization of Petroleum Exporting Countries (OPEC) and other oil-producing countries, the general economic environment, season of the year, storage circumstances, regulatory changes and so on. Susmel and Thompson (1997) find that broad regulatory changes from the 1980s through the 1990s had great impacts in the natural gas spot market, including increased volatility of prices and risks of market participation. In the 1970s, OPEC cut oil production significantly, which led to the so-called energy crisis or oil crisis. More recently, investors have worried about labor strife and subsequent supply disruptions in Venezuela and Nigeria. The possibility of terrorist attacks targeting energy facilities, natural incidents such as Hurricane Lily in 2002, and Middle East conditions in 2003 have also greatly affected production and storage.

Economic entities such as energy producers, distributors, and financial institutions depend on efficient spot and futures markets for risk management and price discovery. Energy futures contracts were introduced at the New York Mercantile Exchange (NYMEX) after the 1970s mainly to hedge increasing energy risks. Futures exchanges constantly introduce new financial products in response to developments in information technology and to meet the various needs of investors. A recent innovation is the use of E-mini futures, including equity index futures like E-mini SP 500, Nasdaq 100 and Dow 30 as well as commodity futures. An E-mini futures contract is smaller than a regular futures contract with exactly the same underlying pool of assets, and is usually traded electronically.

On June 17, 2002, NYMEX and the Chicago Mercantile Exchange (CME) introduced two smaller sized energy futures, natural gas E-mini and light sweet crude oil E-mini futures [called e-miNY Energy Futures(SM)]. E-mini natural gas and crude oil futures contracts are 40% of the size of the regular futures contracts; that is, 2.5 E-mini futures contracts equal one regular futures contract. They are traded through CME's electronic trading platform (GLOBEX), and not on the open outcry market where regular futures are traded.[2]

According to NYMEX, the smaller sized E-mini futures were designed to appeal to individual speculators–not NYMEX's typical customer–in the energy markets. The margin requirements of E-mini futures are smaller than those for the regular contracts. Therefore, E-mini futures are more affordable to individual investors who were previously unable to trade at NYMEX. Unlike their regular counterparts, the E-mini contracts are cash-settled. Some commercial entitles may use the E-mini futures for hedging odd lots. The appendix provides detailed specifications of the two futures contracts and two news articles by Securities Week (2002a, 2002b) describe the benefits of E-mini futures to individual investors.

We examine the impact of introduction of E-mini futures on the regular futures. E-mini products might have multiple effects on the regular products since E-minis are both electronically traded and smaller in size. Whether market quality will be improved through competing trading systems depends on two opposite effects: competition and fragmentation

[1] During the same 5-year period, the variances of gold, live cattle, and soybean daily returns are 0.00007, 0.00014, and 0.00018, respectively. The gas markets are also more volatile than other commodities and the S&P index during the longer period of 1990 through 2001. Results are available upon request.

[2] Members of the NYMEX and CME have access to one another's electronic system for E-mini trading. CME members are granted access to NYMEX ACCESS® to trade NYMEX Division products. Those trades receive discounts and are guaranteed by a NYMEX clearing firm. Similarly, NYMEX members receive trade access, discounts, and clearing guarantees for products listed on CME's GLOBEX.