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Real Estate Futures Prices as Predictors of Price Trends

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Abstract

To gauge market "expectations," real estate industry observers have increasingly referenced the Chicago Mercantile Exchange's nascent real estate futures market. This paper tests whether prices on that exchange have proved to be unbiased predictors of real estate prices. Empirical evidence suggests that prices for more distant contracts—futures contracts that expire in six months or more—have tended to predict larger home price declines than ultimately occurred. Prices for contracts that were closer to expiration, by contrast, were less susceptible to such bias.

Background

The Chicago Mercantile Exchange's real estate futures market, which trades futures contracts based on the value of the Standard and Poor's/Case-Shiller (S&P/CS) Home Price Index, has been the focus of a great deal of attention in recent months. Market observers and the media have frequently reported trading prices on that exchange, noting the relatively large "expected" price declines purportedly implied in the contract prices.[1]

For many commodities, futures markets provide informative, unbiased measures of anticipated prices for the underlying product. In mature futures markets with sufficient trading volume, contract prices will summarize overall market expectations of likely price patterns. Given the relative nascency of the real estate futures market[2] and the relatively thin trading volumes, however, it is reasonable to question whether futures prices on that market indeed provide reliable signals of market expectations and, ultimately, future prices. This paper studies whether, in the short history of the Chicago Mercantile Exchange (CME) real estate futures market, contract prices have proved to be unbiased signals of future prices. The primary finding is that, although implied price "forecasts" were reasonably accurate for the most recent round of expiring futures contracts, generally contract prices have tended to "overshoot" actual price declines by a significant margin. In other words, contract prices have generally presented an overly bleak forecast for the likely direction of prices.

Empirical Evidence of "Bias"

The attached graphs plot contract prices over time for specific futures issuances and compare those prices against the S&P/CS index values that ultimately were the settlement bases for the contracts. The individual futures contracts are unique to a specific time period and a particular geographic area. For example, a "Los Angeles-June 2007" contract is traded based on the Los Angeles S&P/CS Home Price Index value for Los Angeles for June 2007. Trading began for that particular contract twelve months prior to expiration and halted on the day of expiration. It should be noted that the S&P/CS index values for a given month are actually released two months after the end of the month and thus the June 2007 index value was published in August 2007. In this analysis, to avoid confusion, the futures contracts are identified by the dates of the relevant index value (June in the above case). Expiration dates remain important in the analysis, but they are not used in naming the contracts.

Figures 1 to 6 analyze the evolution of futures prices for Los Angeles and New York contracts as well as for a "Composite" index, which is a weighted average of ten U.S. city indexes. Los Angeles contracts are studied because they have been the most heavily traded of

[1] See, for example, Yoon, Al "Futures Traders See Deeper, Longer U.S. Housing Slump," Reuters, September 2007 and Markman, Jon, "For Home Builders, the Worst is to Come," MSN Money, October 4, 2007. Robert Shiller, economist and one of the developers of the real estate futures market, cited futures-based "predictions" in testimony before Congress on September 19, 2007 (see http://jec.senate.gov/Documents/Hearings/09.19.07%20Subprime%20Spillover/Testimony%20%20Robert%20Shiller.pdf) and again in an interview in late December 2007 (see Isidore, Chris, "How They Got Housing Wrong," CNNMoney.Com, December 28, 2007).

[2] Trading began on the Chicago Mercantile Exchange in the spring of 2006.

any of the city indexes. New York has lower trading volume, but the total value of the housing stock in that metropolitan area exceeds that of Los Angeles and all other cities.

Figures 1 to 4 plot prices over time for Los Angeles futures contracts for the four latest expiration dates. The only expired contracts not represented in these graphs were based on the September 2006 index. For Los Angeles and other cities, prices for those contracts generally evolved in a similar fashion as the December 2006 instruments and thus the presentation economizes by omitting those graphs.

In each figure, average prices are shown for each month beginning with the month on which contract trading began. Months are shown relative to the date of expiration, so that twelve months prior to expiration is denoted as "E(xpiration)-12", eleven months prior to expiration is "E-11," etc. Also plotted is the contemporary index value for each month, that is, the most recently released index value as of that month.[3] The vertical difference between a given month's average contract price and the corresponding index values represents the extent to which the futures market "expected" prices to decline in the period before expiration. The vertical difference between the final index point (the index value used for settlement) and the series of futures contract prices reflects the extent to which the futures market had a systematic "bias" in forecasting prices.

Figures 1 to 4 reveal that, for Los Angeles, futures prices generally tended to overestimate the size of measured price declines, particularly for distant expirations. For example, Figure 1 shows that, in the period six to eight months prior to contract expiration, prices for the December 2006 index contract traded at prices close to 265. With contemporary index values ranging from 270 to 273, the associated implied price declines were between 1.8 to 2.6 percent. When the December 2006 index value was ultimately released, its value was 270.03. This amounted to an average decline of only about 0.7 percent relative to the prior periods.

As evident in Figure 2, the March 2007 contracts exhibited the same phenomenon. In the period six to eight months prior to expiration, the implied price declines for that contract ranged from about 4.9 to 5.9 percent. With the release of the March 2007 index, the actual measured decline relative to the prior periods was about 3.5 percent.

It should be noted that a negative bias was not present for the latest Los Angeles contract, which was based on the September 2007 index; unlike the prior four contracts,[4] trading prices for the September 2007 instrument were above the ultimate settlement prices for the entire trading period. The graphs also collectively show that, when negative bias was present, the extent of such bias tended to shrink considerably in periods closer the expiration dates. Trading prices in the three months just prior to expiration showed no discernible bias and were at times very close to the ultimate settlement index value.

[3] To illustrate: the March 2007 futures contracts actually expired in May 2007 and thus the month prior to expiration was April. The most contemporary index value released in April (which reflected February prices) was 266.6.
[4] The four contracts include the three other graphed dates and the September 2006 contracts (not shown).

Results for other geographic areas are generally consistent with the Los Angeles figures, indicating that futures prices have tended to "overshoot" price declines for distant periods but have less bias for closer-in periods. Figures 5-6 plot the evolution of futures prices for New York and for the Composite-10 weighted average index. The information is condensed vis-à-vis Figures 1-4; four graphs (corresponding to the four futures expirations) are shown in each figure.

When the time horizon exceeds several months before expiration, both sets of price profiles generally indicated much larger price declines than were ultimately measured. For instance, six to eight months prior to expiration, the average implied price decline for the December 2006, March 2007 and June 2007 New York contracts was 3.4 percent. The average actual price decline (according to the S&P/Case-Shiller index) over the subsequent periods was 1.2 percent. For the Composite-10 index, the implied price declines averaged 3.6 percent, while the average measured declines were only 2.3 percent.[5]

As with the Los Angeles futures, the most recent index contracts for New York and the Composite-10 did not evidence such significant "overshooting." Indeed, the settlement index values ultimately were quite close (within one index point) of trading prices prevalent eight months prior to expiration. The New York and Composite-10 contracts also generally exhibited the same type of price "convergence" toward the settlement index value as was evident for the Los Angeles contracts.

These results are necessarily based on limited data. Total monthly trading volumes have been plotted on all of the graphs in Figures 1-6. The volumes, which are quantified on the secondary y-axis, are the total number of contracts traded in the month. The graphs reveal that trading volumes are still extremely low. Monthly trading volumes rarely exceeded fifty contracts and the number of monthly trades was frequently below twenty.

Conclusion

The limited trading volumes indicate that the futures markets are still relatively immature and thus the failure of futures prices to provide consistently unbiased predictions of index values is not particularly surprising. When volumes are so low, prices may be disproportionately influenced by the types of investors participating in the market. In this case, prices reflect relatively intense activity of hedgers as opposed to speculators.

The source of this imbalance is not obvious, but it may be due to motivational differences: hedgers may have been much more eager to learn about these new markets than speculators. Also, some of the marketing literature associated with the futures exchange appears to be more directed at hedgers than speculators.[6] Over time, the familiarity with these relatively new products may increase among speculators. Whether that leads to perfectly balanced

[5] Note that the "actual" declines are calculated using the first estimate of the expiration date index value. If trading prices are compared with subsequent (revised) estimates, the qualitative finding does not change.

[6] See, for example, the S&P/Case-Shiller Home Price Indices Futures and Options: Introductory Guide:

> " CME real estate products provide opportunities for protection in down markets, and extend to the real estate industry the same financial tools that previous CME innovations have brought to agriculture and finance. By providing a means of hedging exposure to real estate prices, they can diffuse the potential impact of sustained declines in real estate prices."

predictions of future prices is not clear, but it would likely reduce the frequent bias in “market expectations” reflected in trading prices.

Figure 1: Evolution of Futures Price and Index Value

December 2006 Index--Los Angeles

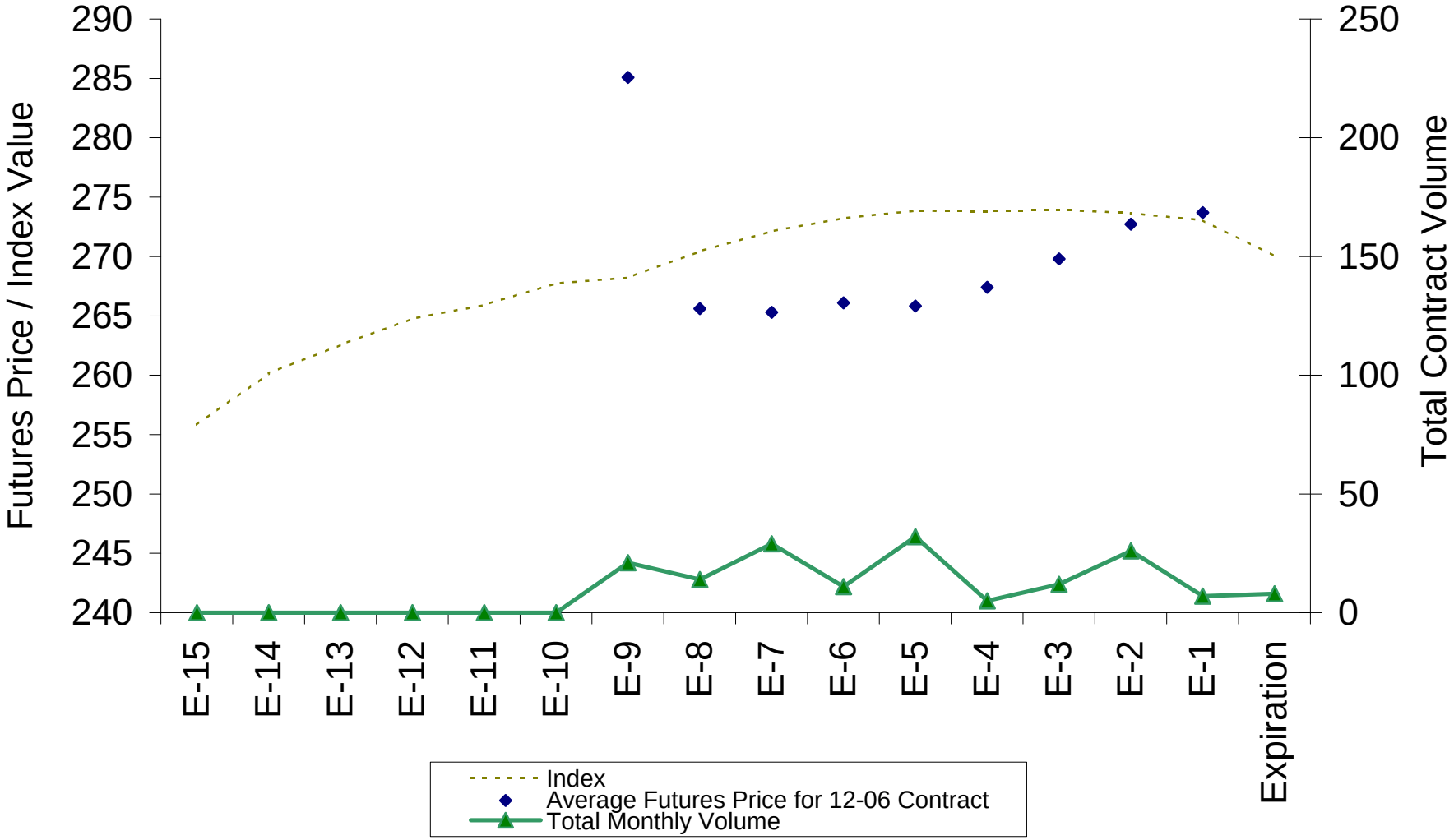


Figure 2: Evolution of Futures Price and Index Value

March 2007 Index--Los Angeles

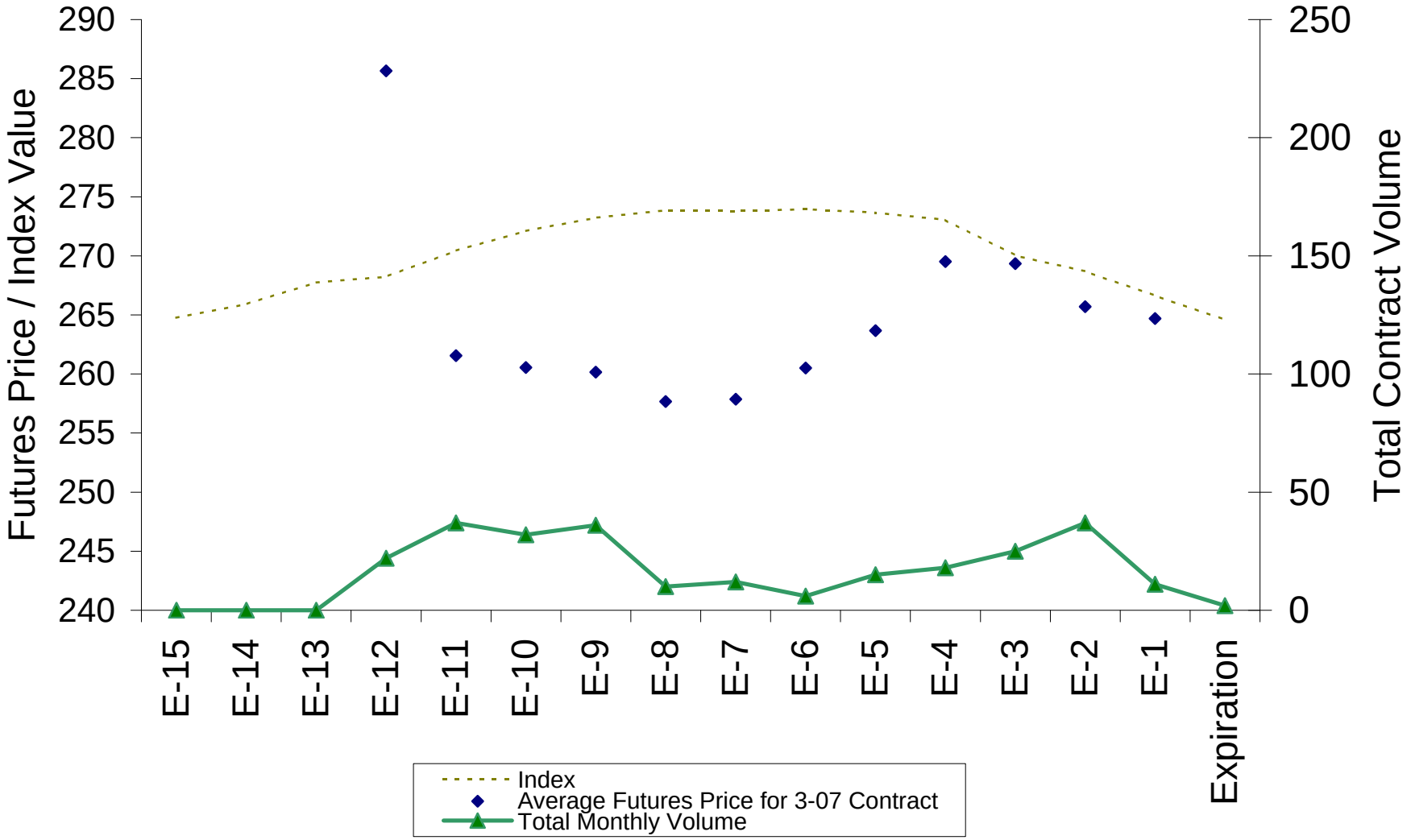


Figure 3: Evolution of Futures Price and Index Value

June 2007 Index--Los Angeles

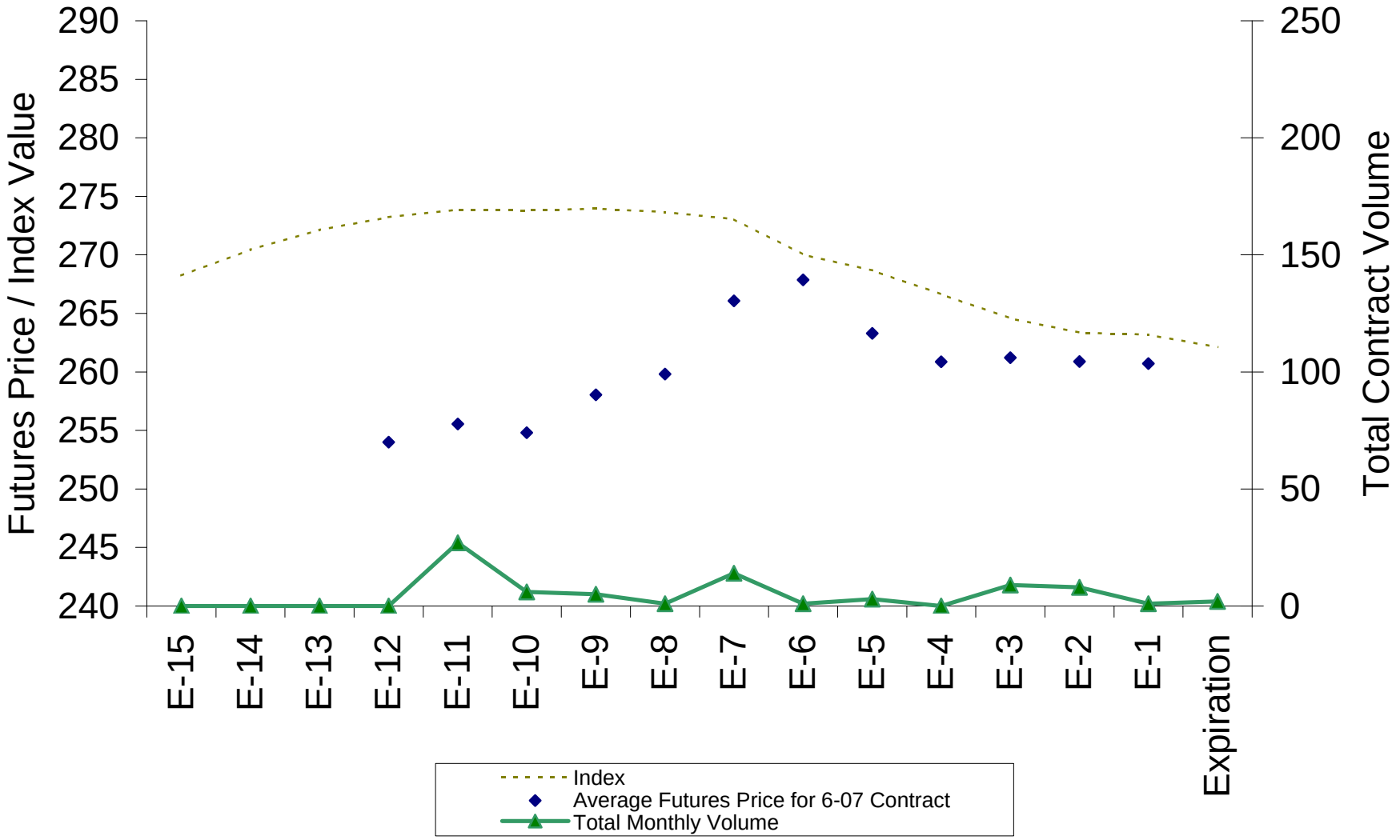


Figure 4: Evolution of Futures Price and Index Value

September 2007 Index--Los Angeles

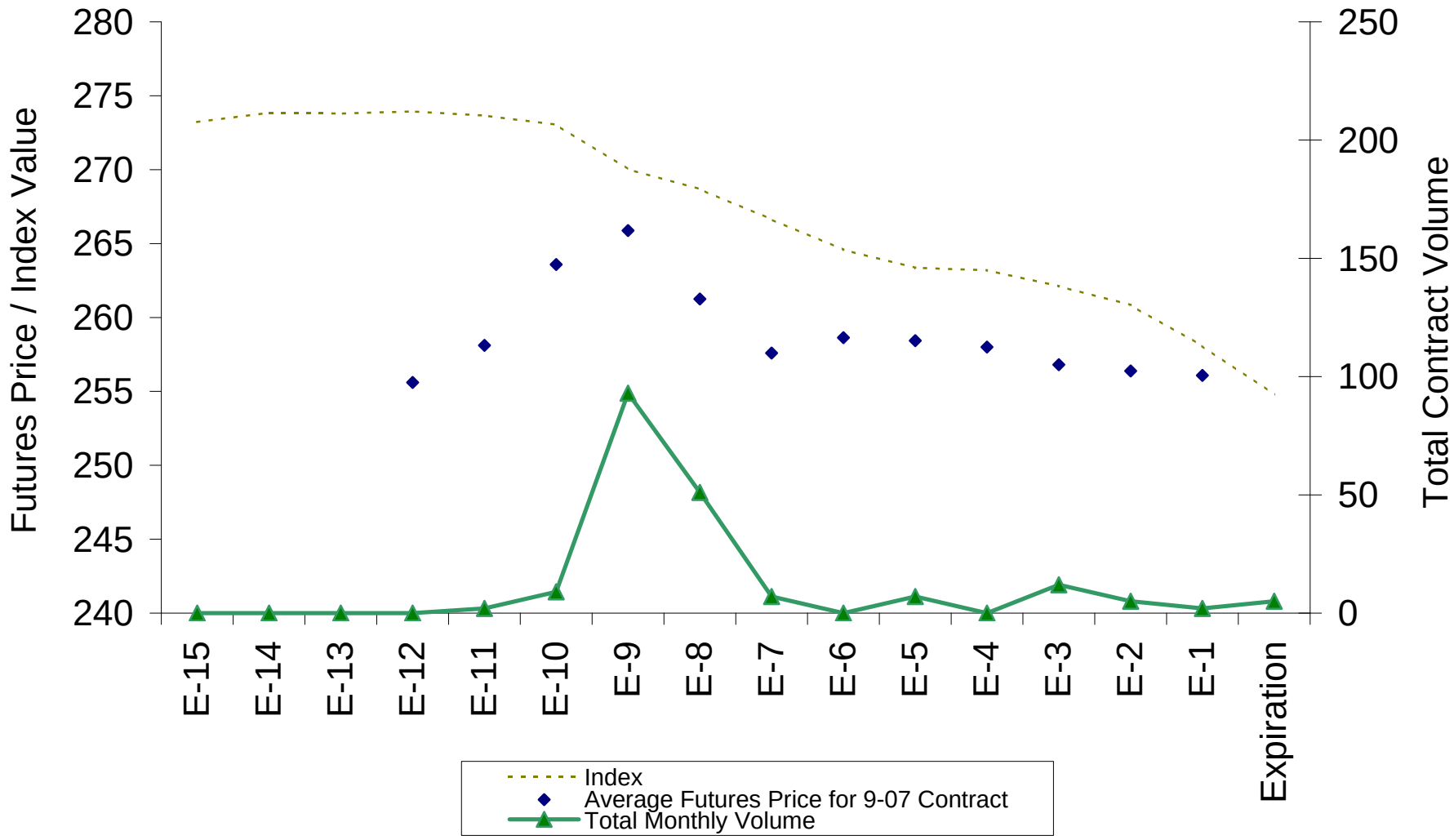
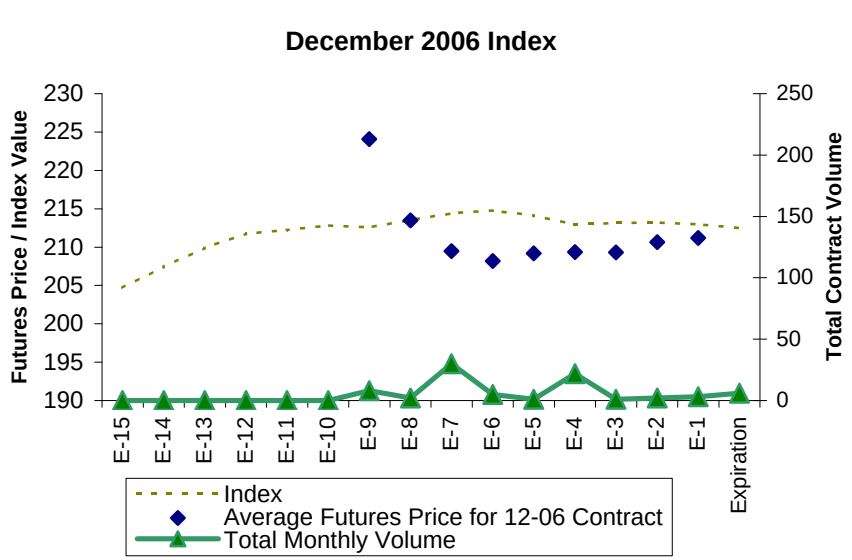
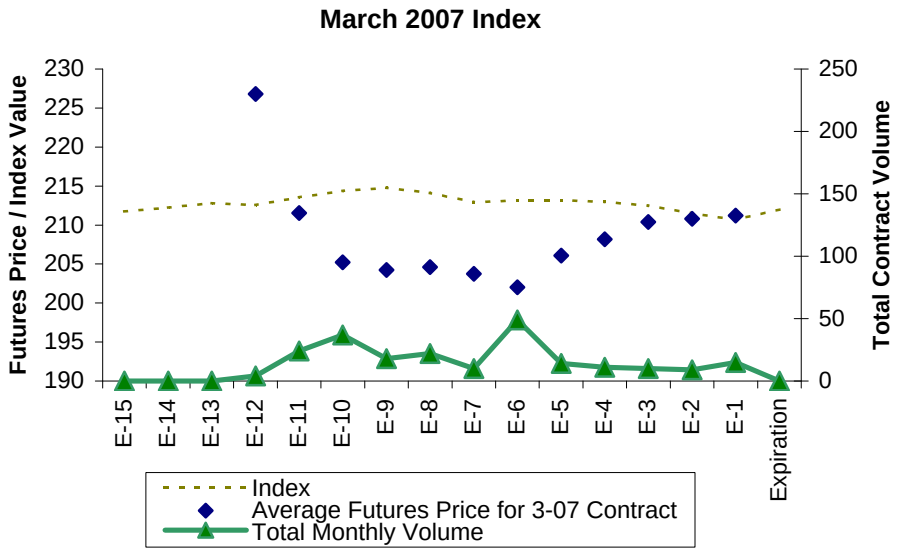
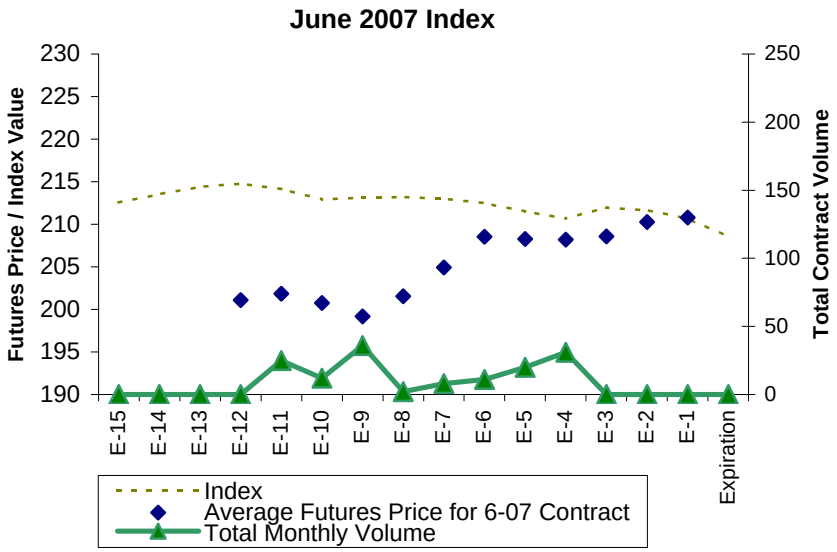


Figure 5: Evolution of Futures Prices for New York S&P/Case-Shiller Index







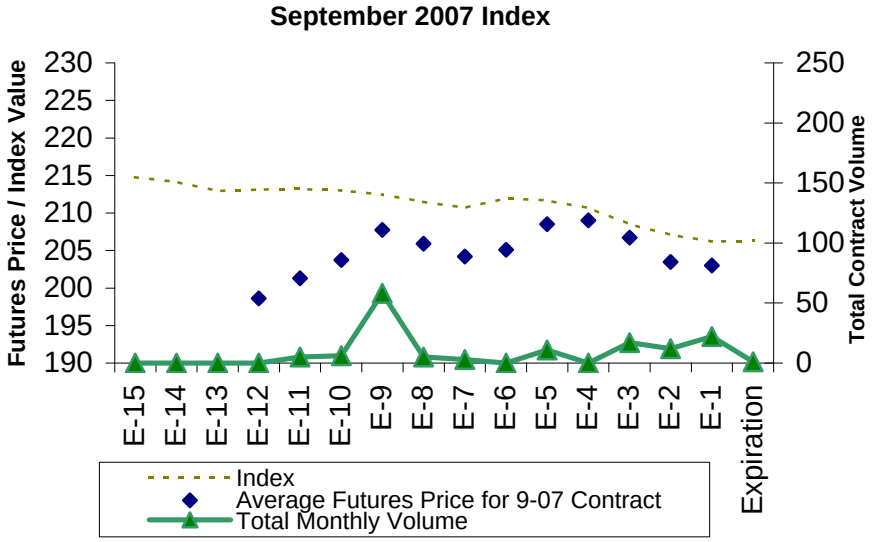


Figure 6: Evolution of Futures Prices for Composite-10 Index