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CLUSTERING IN THE FUTURES MARKET: EVIDENCE FROM S&P 500 FUTURES CONTRACTS

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We document trade price clustering in the futures markets. We find clustering at prices of x.00 and x.50 for S&P 500 futures contracts. While trade price clustering is evident throughout time to maturity of these contracts, there is a dramatic change when the S&P 500 futures contract is designated a front-month contract (decrease in clustering) and a back-month contract (increase in clustering). We find that trade price clustering is a positive function of volatility and a negative function of volume or open interest. In addition, we find a high degree of clustering in the daily opening and closing prices, but a lower degree of clustering in the settlement prices. © 2004 Wiley Periodicals, Inc. Jrl Fut Mark 24:000–000, 2004

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INTRODUCTION

Theoretical research suggests that transaction prices should be uniformly distributed across all possible pricing grids (Niederhoffer, 1965). But, empirical evidence refutes this uniform distribution by extensively documenting the clustering of transaction prices and quoted prices (see, for example, Harris, 1991; and Grossman, Miller, Cone, Fischel, & Ross, 1997).

Researchers provide possible explanations for price clustering in financial markets. Ball, Torous, and Tschoegel (1985) suggest the prices may cluster to reduce search costs. Harris (1991) suggests that clustering may reduce the cost of negotiation. Grossman et al. (1997) and Kleidon and Willig (1995) suggest that uncertainty in the price of a security may lead to a greater amount of price clustering.

Clustering of prices may be of interest to securities traders for several reasons. Investors who are aware of clustering tendencies may be able to trade at slightly better prices and may be able to place limit orders higher in time/price priority by avoiding the clustering points (see Jennings, 2001; and Edwards & Harris, 2002). Further, Mitchell (2001), states that clustering of prices indicates that traders may believe there is some relevant information in a particular pricing grid or possibly some particular pricing barriers.

Previous studies focus primarily on dealer and auction markets. In this paper, we examine price clustering of the S&P 500 futures contracts traded on the Chicago Mercantile Exchange. The Chicago Mercantile Exchange (CME) is primarily an open outcry market. The traders in the pit are usually buying and selling the "front month" contract of a particular commodity. Most of the time, the "front month" is the futures contract closest to expiration. When the current futures contract has about a week left until expiration, the next expiration in the cycle becomes the new front month. The old front month then is traded with other, less popular, expirations in the "back" pit.

Our study pioneers the investigation of clustering in open outcry markets. In addition to examining the clustering of futures prices, we determine if clustering differs as the futures contracts move toward expiration.

In a similar study, Kawaller, Koch, and Peterson (2001) document the microstructure changes in the S&P 500 futures contract as it switches from next-to-expire (lead) to second-to-expire (back) month contract. These authors find dramatic changes in volume when the contract moves from lead to back. After accounting for the change in volume, they find the higher volume lead contract experiences lower volatility.

Using tick-by-tick data for the S&P 500 futures contract in 1999 and 2000, we find clustering at pricing grids of x.00 and x.50. While clustering is evident throughout the life of the contract, clustering dramatically changes when the contract moves from lead to back month contract. Our findings add to the microstructure findings of Kawaller, Koch, and Peterson (2001) by showing that, not only does volume and volatility change, so do the transaction prices.

The article proceeds as follows. In the first section we review the clustering literature. We then detail the data used in the study and discuss clustering in the futures markets in the next two sections. After which, we split our results into front and back month designations, and then look at the determinants of clustering. Conclusions are presented in the last section.

CLUSTERING LITERATURE

Harris (1991) states that price clustering can be a result of human behavior, and can intentionally occur to decrease the cost of negotiation. Even so, Christie and Schultz (1994) sparked a renewed interest in clustering with the suggestion of implicit collusion among Nasdaq dealers. They find an absence of odd-eighth quotes for 70 of the 100 most actively traded Nasdaq stocks. Subsequently, Christie, Harris, and Schultz (1994), Barclay (1997), Bessembinder (1997), and Christie and Schultz (1999) find evidence consistent with the collusion argument. Yet, others argue that the higher frequency of even-eighth quotes in the equity markets does not imply collusion. Grossman et al. (1997) believe that clustering of prices may be a natural result of competitive markets. Similarly, Furbush (1995), Kleidon and Willig (1995), Laux (1995), Godek (1996), and Huang and Stoll (1996) argue that collision in a multiple dealer market with easy entry is highly improbable.

Clustering of prices has been documented in a variety of market structures. Ball et al. (1985) document clustering of prices in the gold market. Sopranzetti and Datar (2002) find price clustering in the foreign exchange spot market. Colwell, Rushing, and Young (1994) and Palmon, Smith, and Sopranzetti (1998) find clustering on even pricing in real estate markets. Kahn, Pennacchi, and Sopranzetti (1999) find clustering in the banking market. Cooney, Van Ness, and Van Ness (2003) find that NYSE limit order traders tend to prefer even prices for submitted quotes.

There are several possible explanations for the observance of price clustering. Christie and Schultz (1994) argue collusion in the case of the Nasdaq dealers. Harris (1991) counters that price clustering can be a natural human behavior—reducing the cost of negotiation. Grossman et al. (1997) and Kleidon and Willig (1995) suggest that clustering may increase with price uncertainty.

Clustering is examined in areas outside of financial markets. Some marketing researchers attribute price clustering to cognitive accessibility—numbers that easily come to mind. Schindler and Wiman (1989) find that consumers tend to produce zero-ending numbers when recalling prices. Baird, Lewis, and Romer (1970), and Kaufman et al. (1949) find an overrepresentation of prices ending in the number 5. Schindler and Kirby (1997) state that the overrepresentation of the digit 9 in advertised prices may be related to the same psychological factors that account for the overrepresentation of the ending digits of 0 and 5.

Collusion in the open outcry markets of the futures exchange seems highly unlikely. Consequently, we believe that any observed clustering in futures prices will be more in line with the rationale of Harris (1991)—reducing the costs of negotiation—and/or Schindler and Wiman (1989)—consumers tendencies.

DATA

Most of the analyses in this study use tick-by-tick and daily trade data for S&P 500 futures contracts for the years 1999 and 2000. We also use data for Euro and Yen futures contracts in 1999 and 2000. All data is provided by the Chicago Mercantile Exchange.

The S&P 500 futures contract is offered with quarterly expirations: March, June, September, and December. The S&P contract trades in the pits from 8:30 a.m. to 3:15 p.m. central time, and from 3:45 p.m. to 8:15 a.m. on the GLOBEX. Trading in the S&P futures contract ceases the Thursday prior to the third Friday of the contract month. S&P futures contracts are priced at 250 times the quoted index value. Trading on S&P futures can occur in increments of $0.10, or $25 per contract.

The Yen and Euro futures contracts are traded by open outcry from 7:20 a.m. to 2:00 p.m. GLOBEX trading of these contracts starts at 4:00 p.m. and runs until 4:30 p.m. the following day, except on Sunday when trading begins at 5:30 p.m. For the Yen and Euro futures, trading ceases on the second business day preceding the third Wednesday of the contract month. Euro contracts represent 125,000 Euros. The yen futures contract is for 12,500,000 Yen. Prices are quoted in US$ per unit of the currency. Trading on the Yen can occur in increments of $0.000001 per yen. Normally, currency trades are reported with only the

TABLE I
S&P 500 Futures

	1999		2000	
Pricing Grid	*Number*	*%*	*Number*	*%*
x.00	202,998	20.2%	242,840	29.6%
x.10	30,430	3.0%	14,280	1.7%
x.20	124,197	12.4%	74,837	9.1%
x.30	118,958	11.9%	62,737	7.6%
x.40	26,839	2.7%	12,136	1.5%
x.50	205,145	20.4%	244,410	29.8%
x.60	33,184	3.3%	15,354	1.9%
x.70	101,694	10.1%	49,988	6.1%
x.80	137,111	13.7%	93,003	11.3%
x.90	22,859	2.3%	10,838	1.3%
Total	1,003,415		820,423	
% at x.00 & x.50		40.68%		59.39%
Average settlement	1,335.56		1,439.10	
High settlement	1,484.20		1,555.4	
Low settlement	1,219.00		1,279.6	
SD of settlement	58.89		58.17	

Note. This table shows the number and percentage of S&P 500 front month futures trades at each of the 10 cent intervals for 1999 and 2000. Additionally, the table shows the average, high, low and standard deviation (SD) of the settlement price for each year.

last four decimal places listed, so a price of $0.008494 per yen is quoted by the exchange as 8494. The trading increment on the Euro is $0.0001 per Euro. The smallest increment for either contract represents a change of $12.50 in the contract price.[1]

CLUSTERING IN THE FUTURES MARKET

The minimum tick size for the S&P 500 futures contract is 10 cents. So, there are 10 ticks, or potential prices, at which a trade can occur, i.e., x.00, x.10, x.20, etc. Table I shows the clustering of prices at the 10 potential prices for the S&P 500 futures. We find that the highest percentages of trades occur at prices of x.00 and x.50 in both 1999 (20.2% and 20.4%) and 2000 (29.6% and 29.8%). The percentage of trades that occur at the two most frequently used prices (x.00 and x.50) is 40.7% and 59.4% for 1999 and 2000, respectively. These percentages are not as great as those found in equity markets by Christie and Schultz (1994),

[1]Characteristics of the S&P 500, Yen, and Euro futures contracts are listed in the Appendix.

but they are larger than the historical price clustering in equity markets as documented by Harris (1991).[2]

To determine if the price clustering for the S&P 500 futures contract is typical of other futures contracts traded on the Chicago Mercantile Exchange, we examine the trades for the Euro and Yen futures contracts in 1999 and 2000. We look for clustering in the Euro and Yen futures contracts in the last digit of the quoted price. For the Euro contract, we consider clustering at $x.xxx0 and $x.xxx5. For the Yen contract, we study effectively the same type of clustering—at $0.00xxx0 and $0.00xxx5. The results are in Table II. Panel A provides the number and percentage of trades for both futures contracts in 1999 and Panel B provides similar statistics for 2000. Both the Euro and Yen futures contracts yield similar statistics—slight clustering at the 0 and 5 ending digit prices, but not to the extent that we find with the S&P 500 futures contract.

Figure 1 graphically compares trade price clustering for the S&P 500, Euro, and Yen futures contracts. The S&P 500 futures contract visually exhibits more clustering at the 0 and 5 ending digit prices than the other two contracts.

The intraday prices of the S&P 500 futures contracts exhibits a high degree of price clustering. Since the S&P 500 futures contracts specify a daily opening price, a closing price, and a settlement price, we examine whether those prices also exhibit similar clustering. We look at the 504 trading days in our sample—1999 and 2000 combined. The open and closing prices exhibit a much larger degree of price clustering than the settlement prices (Table III). We find that 91.1% of the opening prices and 85.1% of the closing prices take place at prices of x.00 and x.50, while the settlement prices occur at these prices 49.6% of the time. Figure 2 graphically depicts this trade price clustering.

The finding that opening prices tend to cluster to a greater degree than the intraday prices (59.7% for opening S&P futures prices of x.00, and 29.6% for intraday S&P futures prices in 2000) supports the notions of Ball et al. (1985) and Palmon et al. (1998). The greater the uncertainty of prices, the more likely they are to fall on round or common numbers. This may well explain why we see a greater amount of clustering for the open prices than the intraday prices.

[2]Harris (1991) shows historical price clustering on the NYSE from March 22 through April 15, 1854 for four securities: Parker Vein and Coal Company, Cumberland Coal Company, Erie Railroad, and New York Central Railroad. He finds price clustering on even pricing grids for these stocks in the 1800's. Prices at x.00 and x.50 vary from 18.9% to 30.2% and 13.8% to 31.7%, respectively.

TABLE II
Euro and Yen Futures Contracts

	Euro		Yen	
Panel A: 1999				
xxx0	10,868	13.00%	29,611	12.13%
xxx1	7,308	8.74%	21,479	8.80%
xxx2	8,586	10.27%	24,947	10.22%
xxx3	8,127	9.72%	23,948	9.81%
xxx4	7,917	9.47%	22,595	9.26%
xxx5	9,405	11.25%	27,158	11.13%
xxx6	7,894	9.45%	22,941	9.40%
xxx7	7,790	9.32%	23,602	9.67%
xxx8	8,483	10.15%	26,101	10.69%
xxx9	7,195	8.61%	21,709	8.89%
Total	83,573		244,091	
% at xxx0 & xxx5		24.26%		23.26%
Mean	$1.066		$0.888	
SD	$0.039		$0.056	
High	$1.187		$0.996	
Low	$1.003		$0.807	
Panel B: 2000				
xxx0	27,689	12.36%	22,264	12.04%
xxx1	19,280	8.61%	16,341	8.84%
xxx2	22,699	10.13%	19,117	10.34%
xxx3	21,576	9.63%	18,189	9.84%
xxx4	21,107	9.42%	17,631	9.54%
xxx5	25,324	11.30%	20,672	11.18%
xxx6	21,952	9.80%	17,691	9.57%
xxx7	21,162	9.45%	17,719	9.58%
xxx8	23,541	10.51%	19,263	10.42%
xxx9	19,713	8.80%	16,015	8.66%
total	224,043		184,902	
% at xxx0 & xxx5		21.72%		23.22%
Mean	$0.925		$0.935	
SD	$0.051		$0.019	
High	$1.037		$0.996	
Low	$0.830		$0.884	

Note. This table shows the number of trades and percentage of trades that occur at each of the ten prices for the Euro and Yen futures contracts. Panel A shows the year 1999 and Panel B shows the year 2000. Additionally, the mean, standard deviation (Std. Dev.), high and low prices of the futures contracts are provided for each of the years.

The S&P 500 futures contract has different trading hours than the underlying assets. The trading hours of The New York Stock Exchange (NYSE) and Nasdaq are from 9:30 a.m. until 4:00 p.m., Eastern standard time. The S&P 500 futures contract trades during that time, but futures trading can take place for an additional 15 minutes after the

FIGURE 1
Trade price clustering on futures contracts for the year 2000.

TABLE III
S&P 500 Futures Open, Close, and Settlement Prices

	Open Price		*Close Price*		*Settle Price*	
	Number	*%*	*Number*	*%*	*Number*	*%*
x.00	301	59.72%	232	46.03%	127	25.20%
x.10	13	2.58%	6	1.19%	10	1.98%
x.20	4	0.79%	19	3.77%	61	12.10%
x.30	4	0.79%	11	2.18%	46	9.13%
x.40	2	0.40%	7	1.39%	13	2.58%
x.50	158	31.35%	197	39.09%	123	24.40%
x.60	4	0.79%	4	0.79%	20	3.97%
x.70	7	1.39%	4	0.79%	43	8.53%
x.80	6	1.19%	11	2.18%	47	9.33%
x.90	5	0.99%	13	2.58%	14	2.78%
Total	504		504		504	
% at x.00 & x.50		91.07%		85.12%		49.60%

Note. This table shows the number of trades and percentage of trades, at each of the 10 possible prices, for the open, close and settlement prices of the S&P futures contract for eight quarters.

close of trading of the NYSE and Nasdaq. We determine the number of trades and examine trade price clustering of the S&P 500 futures contract during the time the NYSE and Nasdaq are open and when these markets are closed. Table IV provides these statistics. We find clustering both when the underlying asset (spot) market is open and when it is closed. There is a slight increase in clustering of futures contract prices

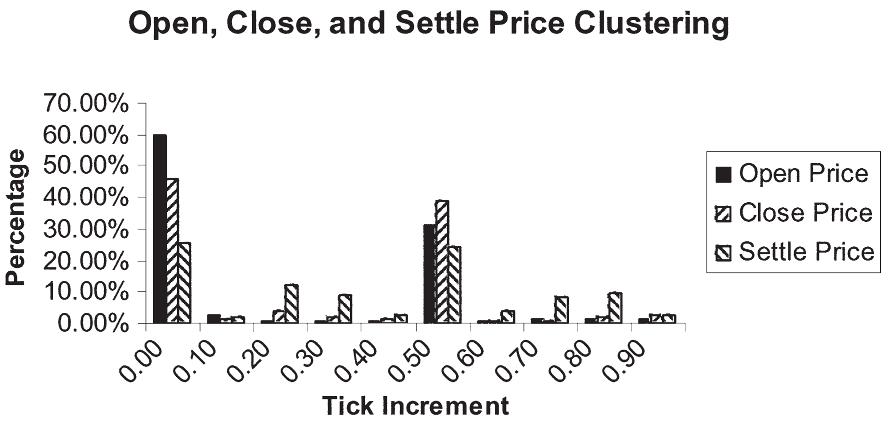

FIGURE 2
Trade price clustering of daily opening, closing, and settle prices for S&P 500 futures contracts for 1999 and 2000.

after the close of the spot market, but this increase is not substantial. The comparative results are similar for 1999 and 2000.

CLUSTERING—FRONT MONTH AND BACK MONTH

A change occurs the last few days before the quarterly expiration of the S&P 500 futures contract. Trading volume shifts away from the next-to-expire (front-month) contract to the second-to-expire (back-month) contract. This shift results in a dramatic increase in trading activity in the previously designated back-month contract and a decrease in activity in what was the front month contract.[3] We expand upon the findings of Kawaller et al. (2001) around the redesignation of the front- and back-month futures contract by examining changes in price clustering at this event. An examination of the volume and open interest shows peaks at 8 days and 98 days to maturity (see Fig. 3).[4] These peaks are the effect of the change in front-month and back-month futures contracts.

[3]Kawaller et al. (2001) document significant volume and volatility changes surrounding this change. Our findings of volume and volatility support theirs.
[4]The figure shows open interest (and some volume) after the last day of trading. Conversations with a representative of the Chicago Mercantile Exchange explain this as normal—and can show up in data for up to a week. This is a result of traders having several days after the close of trading to resolve/clear settlement issues.

TABLE IV
S&P 500 Futures

	Spot Markets Open		*Spot Markets Closed*		
	Number	*%*	*Number*	*%*	*% Difference*
Panel A: 1999					
x.00	194,169	20.11%	8,829	23.44%	−3.33%
x.10	29,454	3.05%	976	2.59%	0.46%
x.20	120,253	12.45%	3,944	10.47%	1.98%
x.30	115,384	11.95%	3,574	9.49%	2.46%
x.40	25,720	2.66%	1,119	2.97%	−0.31%
x.50	196,602	20.36%	8,543	22.68%	−2.32%
x.60	31,900	3.30%	1,284	3.41%	−0.11%
x.70	98,361	10.18%	3,333	8.85%	1.34%
x.80	132,103	13.68%	5,008	13.29%	0.38%
x.90	21,799	2.26%	1,060	2.81%	−0.56%
Total	965,745		37,670		
% at x.00 & x.50		40.46%		46.12%	
Panel B: 2000					
x.00	232,807	29.49%	10,033	32.36%	−2.87%
x.10	13,654	1.73%	626	2.02%	−0.29%
x.20	72,534	9.19%	2,303	7.43%	1.76%
x.30	61,003	7.73%	1,734	5.59%	2.14%
x.40	11,349	1.44%	787	2.54%	−1.10%
x.50	234,575	29.72%	9,835	31.72%	−2.00%
x.60	14,688	1.86%	666	2.15%	−0.29%
x.70	48,617	6.16%	1,371	4.42%	1.74%
x.80	90,095	11.41%	2,908	9.38%	2.03%
x.90	10,093	1.28%	745	2.40%	−1.12%
Total	789,415		31,008		
% at x.00 & x.50		59.21%		64.07%	

Note. This table shows the number of trades and percentage of trades, at each of the 10 possible prices while the spot markets (NYSE and Nasdaq) are open and after the spot markets are closed for 1999 and 2000. Additionally, we show the difference between the open and close percentage of trades at each possible price.

We examine the number (and percentage) of trades that occur at prices of x.00 and x.50 for the S&P 500 futures contract through time (i.e., as a function of time to maturity). We find that trade price clustering changes when the contract is designated front month (see Fig. 4). Trade price clustering at x.00 and x.50 is 87.7% at the inception of trading (≥99 days to maturity). Price clustering falls to 49% from 98 days to maturity until 8 days out—when the contract is designated a front contract. Table V presents the number and percentage of trades that occur at each of the 10 ticks. There is a substantial price clustering

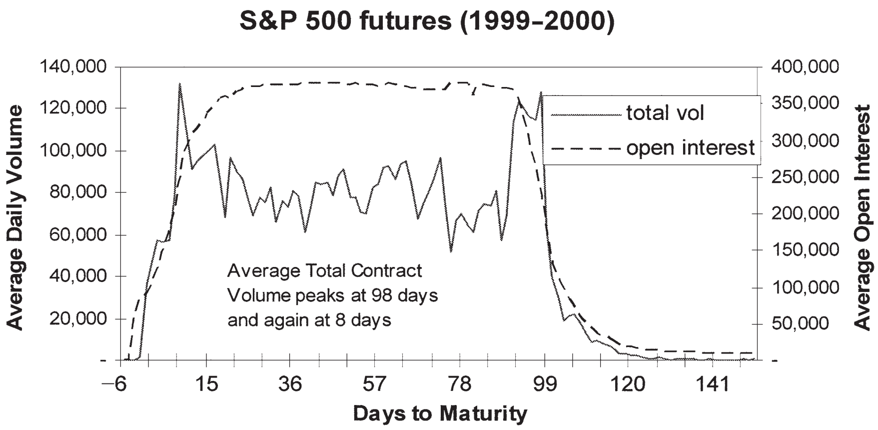

FIGURE 3
The total volume and open interest as a function of days to maturity for S&P 500 futures contracts.

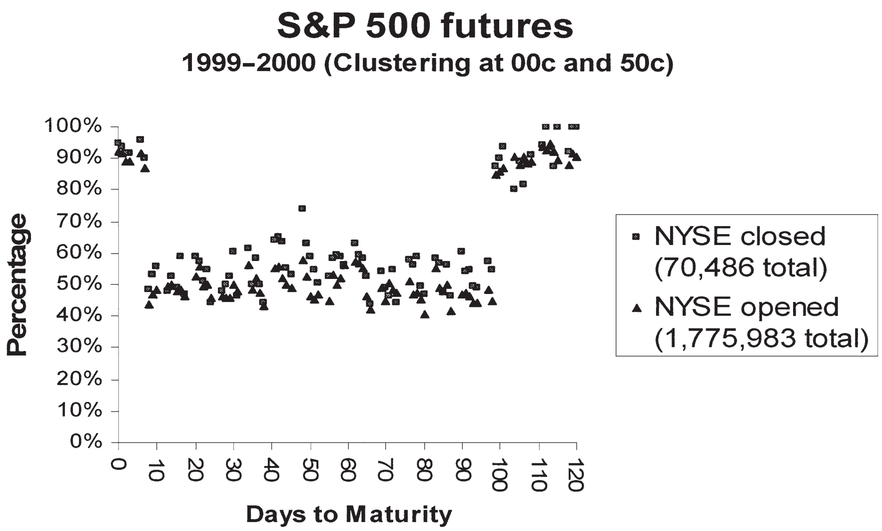

FIGURE 4
Trade price clustering for S&P 500 futures as a function of days to maturity while the spot markets (NYSE and Nasdaq) are open and when the spot markets are closed.

effect with 99 or more days and 7 to 1 days until maturity, and on the expiration day (more than 50% of trades occurring at a price of x.00). This finding supports Harris (1991)—clustering decreases with transaction frequency. There is substantial trade price clustering (at x.00 and x.50) during the "front-month" trading of the S&P 500 futures contract, but this clustering is much lower than for the other time periods.

TABLE V
Trade Price Cluster for the S&P 500 Futures Contract as a Function of Time to Expiration

	Time to Maturity							
	≥99 Days		*8 to 98 Days*		*7 Days to 1 Day*		*Expiration Day*	
	Number	*%*	*Number*	*%*	*Number*	*%*	*Number*	*%*
x.00	6,799	52.24%	445,838	24.45%	6,247	51.41%	742	57.43%
x.10	147	1.13%	44,710	2.45%	115	0.95%	7	0.54%
x.20	365	2.80%	199,034	10.91%	322	2.65%	28	2.17%
x.30	268	2.06%	181,695	9.96%	167	1.37%	12	0.93%
x.40	70	0.54%	38,975	2.14%	65	0.53%	1	0.08%
x.50	4,621	35.50%	449,555	24.65%	4,637	38.16%	455	35.22%
x.60	67	0.51%	48,538	2.66%	107	0.88%	5	0.39%
x.70	165	1.27%	151,682	8.32%	159	1.31%	9	0.70%
x.80	383	2.94%	230,114	12.62%	252	2.07%	28	2.17%
x.90	131	1.01%	33,697	1.85%	81	0.67%	5	0.39%
Total	13,016		1,823,838		12,152		1,292	
% at x.00 & x.50		87.74%		49.09%		89.57%		92.65%

Note. This table shows the number and percentage of trades that occur at each of the 10 possible prices. The data is portioned between days when the contract is designated a front-month contract (8 to 98 days) and a back-month contract (greater than or equal to 99 days, 7 days to 1 day, and the expiration day).

DETERMINANTS OF CLUSTERING

What determines trade price clustering in the S&P 500 futures contract? Ball et al. (1985) show that the degree of clustering in the gold market depends on the amount of information in the market. Similarly, Sopranzetti and Datar (2002) find that volatility and volume are determinants of clustering in the foreign exchange spot markets. We examine the relationship between trade price clustering, volume, volatility, and open interest.[5] Table VI shows the correlations between volume, volatility, open interest, and clustering of prices at x.00 and x.50.

We regress the percentage[6] of trades that occur at x.00 and x.50 against volatility of the S&P 500 futures contract (we measure volatility as the difference in the high and low prices for the day) and volume or open interest. Table VII contains the results of the regression analyses. We find that volume (or open interest) and volatility significantly influence clustering of futures prices (regressions 1 & 3). Trade price

[5]Open interest and volume are highly correlated in the futures market.
[6]Our measure of clustering is bounded by 0% and 100%. Consequently, we transform our clustering variable. We use the inverse of the standard normal cumulative distribution.

TABLE VI
Correlations

	Trade Price Clustering	*Volatility*	*Volume*	*Open Interest*
Clustering	1.0000			
Volatility	0.2361	1.0000		
Volume	−0.5897	0.1024	1.0000	
Open Interest	−0.6774	0.0537	0.9425	1.0000

Note. This table shows the correlation of trade price clustering (the percentage of trades at x.00 and x.50), volatility (the difference in the high price and low price for the day), volume (the total daily volume), and open interest (the daily open interest), for the S&P 500 futures contract.

TABLE VII
Regression—IClustering = Volatility + Log (Volume) + Dummy (Front/Back Month)

	Regression 1	*Regression 2*	*Regression 3*	*Regression 4*
Intercept	7.1293	3.0700	11.6283	6.5813
	(23.47)*	(8.21)*	(25.03)*	(8.51)*
Volatility	0.0264	0.0249	0.0206	0.0213
	(5.16)*	(6.56)*	(4.10)*	(5.58)*
Log (volume)	−0.6695	−0.3212		
	(23.78)*	(9.91)*		
Log (open interest)			−0.9413	−0.5513
			(24.71)*	(9.24)*
Dummy		0.8122		0.7670
		(9.23)*		(4.47)*
Adj. R^2	42.68%	50.65%	44.55%	49.90%
F-stat	286.51	263.45	309.12	255.67

Note. Trade price clustering is measured as the percentage of trades that occur at pricing increments of x.00 and x.50. We use the inverse of the standard normal cumulative distribution to transform the trade price clustering variable, which we will call IClustering. We regress IClustering against volatility (the high price minus the low price of the day), and the log of volume (or the log of open interest). The dummy variable is equal to 1 when the futures contract is designated back-month, and 0 when designated front-month.
*Statistically significant at the 5% level.

clustering is a positive function of price volatility and a negative function of volume or open interest.

Our previous analyses showed a different degree of trade price clustering for front-month contracts and back-month contracts. We further our regression analysis by noting whether the contract is designated front-month or back-month—a contract is designated front-month if the time to expiration is between eight and 98 days. We use a dummy variable of 1 when the contract is designated as a back-month contract. We find that, in addition to volatility and volume or open interest, front-month/back-month designation significantly influences trade price clustering.

CONCLUSION

We examine trade price clustering in the open outcry futures markets. We find that the S&P 500 futures contract prices tend to cluster at pricing increments of x.00 and x.50 during the trading day. Also, we find higher clustering in the opening prices and closing prices than the settlement prices. There is a dramatic change in the degree of trade price clustering when a contract moves from being designated a front-month contract (8–98 days until expiration) to being designated a back-month contract. We find that trade price clustering is a positive function of volatility and a negative function of volume or open interest.

APPENDIX

Specifics on Futures Markets Contracts[a]

	S&P 500 Futures	*Euro Futures*	*Yen Futures*
Contract size	$250 times S&P 500 futures price	125,000 Euro	12,500,000 Japanese yen
Regular trading hours	8:30 a.m.–3:15 p.m. GLOBEX: 3:45 p.m.–8:15 a.m.	Monday through Friday GLOBEX: 4:30 p.m.–4:00 p.m. the following day; on Sunday trading begins at 5:30 p.m. Open outcry: 7:20 a.m.–2:00 p.m.	Monday through Friday GLOBEX: 4:30 p.m.–4:00 p.m. the following day; on Sunday trading begins at 5:30 p.m. Open outcry: 7:20 a.m.–2:00 p.m.
Minimum price fluctuation (Tick)	0.10 index points = $25 per contract (Futures calendar spreads: .05 index points = $12.50 per contract)	Trading can occur in $.0001 per Euro increments ($12.50/contract). Also, trades can occur in $.00005 per Euro increments ($6.25/contract) for Euro FX futures intra-currency spreads executed on the trading floor and on GLOBEX, and for all-or-none (AON) transactions.	Trading can occur in $.000001 per Japanese yen increments ($12.50/contract). Also, trades can occur in $.0000005 per Japanese yen increments ($6.25/contract) for Japanese yen futures intra-currency spreads executed on the trading floor and on GLOBEX, and for all-or-none (AON) transactions.
Contract months listings	Mar, Jun, Sept, Dec	6 Months in the March quarterly cycle—Mar, Jun, Sept, Dec.	6 Months in the March quarterly cycle—Mar, Jun, Sept, Dec.
Last day trading	The Thursday prior to the third Friday of the contract month	Trading ceases at 9:16 a.m. Central Standard Time on the second business day immediately preceding the third Wednesday of the contract month (usually Monday).	Trading ceases at 9:16 a.m. Central Standard Time on the second business day immediately preceding the third Wednesday of the contract month (usually Monday).

[a]This information is obtained from the Chicago Mercantile Exchange web site (http://www.cme.com).

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