Electronic vs. Open Outcry Trading in Agricultural Commodities Futures Markets
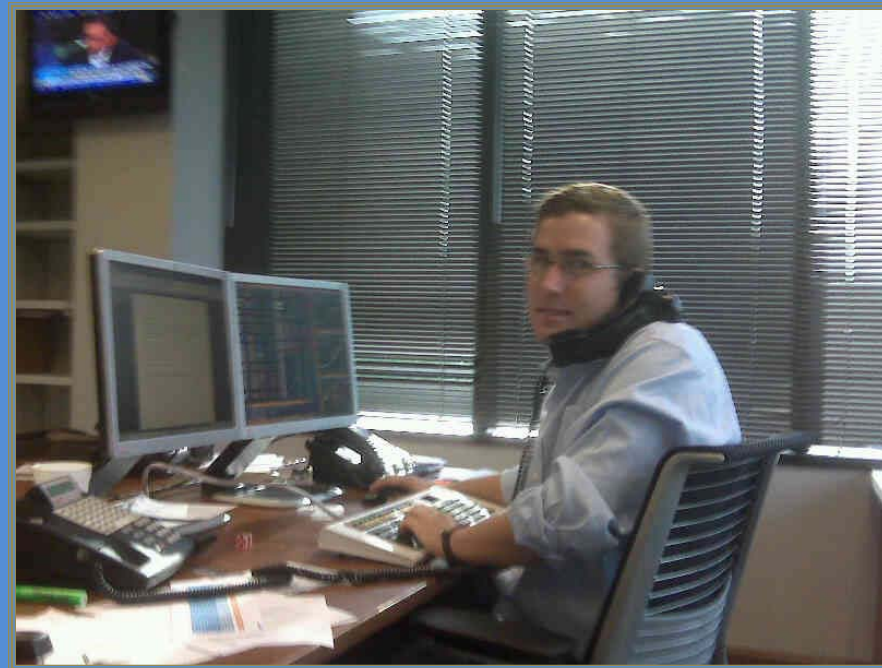
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Open Outcry

Electronic

Advantages of Electronic Trading

- **Less Cost to the Exchange**

- **Transparency**

- **Speed of Execution**

- **Anonymity**

- **Lower Cost to Trade?**

Purpose

- **Determine liquidity cost of the KCBT hard red winter wheat futures contract in open outcry and electronic markets**

What Is a Liquidity Cost?

- Difference between the price paid by an urgent buyer and the price received by an urgent seller

- **Market and stop orders consume liquidity**

- **Limit orders provide liquidity**

Liquidity costs
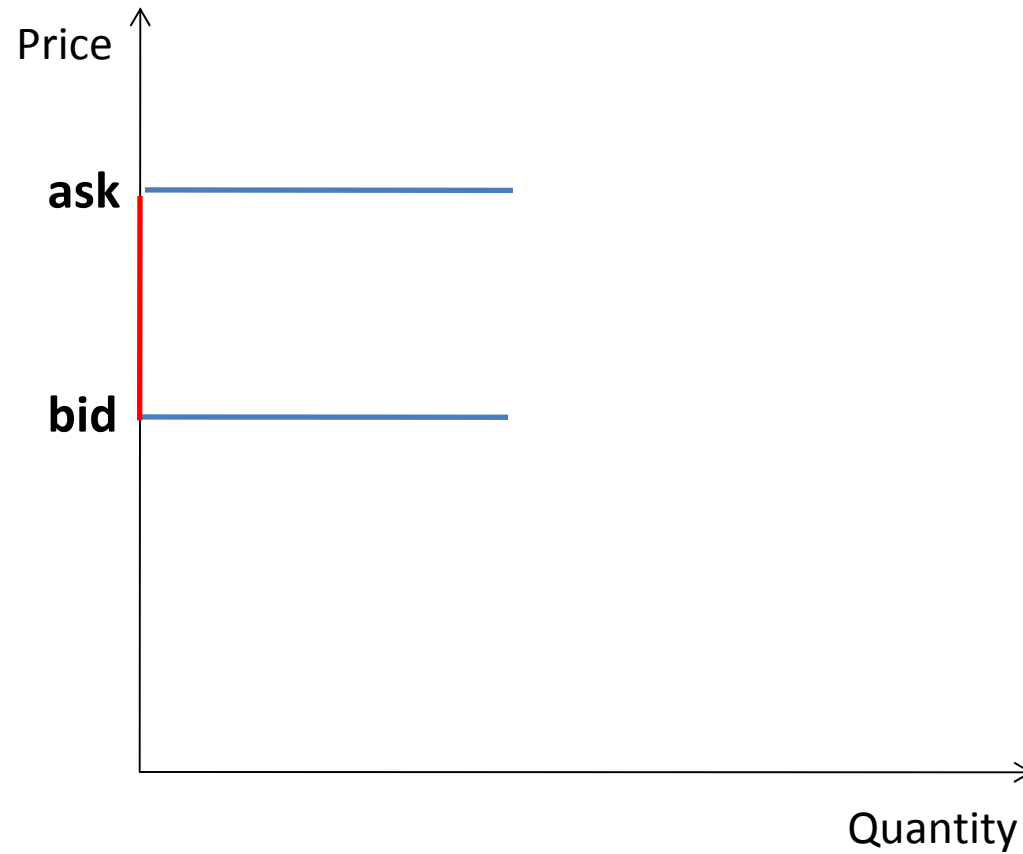
Previous Research

- **Liquidity costs lower in electronic market**
- **Trade size higher in open outcry**
- **↑ Volume $\Rightarrow$ ↓ Liquidity cost**
- **Natural Monopoly**

Why trade size larger with open outcry?

- Lower liquidity costs for larger trader

- Trade splitting in electronic markets

Kansas City Board of Trade (KCBT)

- Side-by-side trading on Globex began January 14, 2008
- Hard Red Winter Wheat
- Value – Line
- Electronic Option Trading

Goldman-Sachs Roll

- Index Fund
- Begins 5th Business Day
- Open-Outcry Only
- Perverse Incentives

Data

- Transaction Data

- www.kcbt.com

- 2008 – high volatility

- Minimum tick – 0.25 ¢/bu.

Liquidity Cost Measures

- Bid-ask spread

- Roll's measure

- Average absolute price change

Roll's Measure

$$RM = 2\sqrt{-\operatorname{cov}(\Delta F_t, \Delta F_{t-1})}$$

Average absolute price change

$$= \frac{\sum_{t=2}^{T} \left| \Delta F_t \right|}{T - 2}$$

Weighted averages

No changes across days

Regression

$$\text{Liquidity Cost} =$$
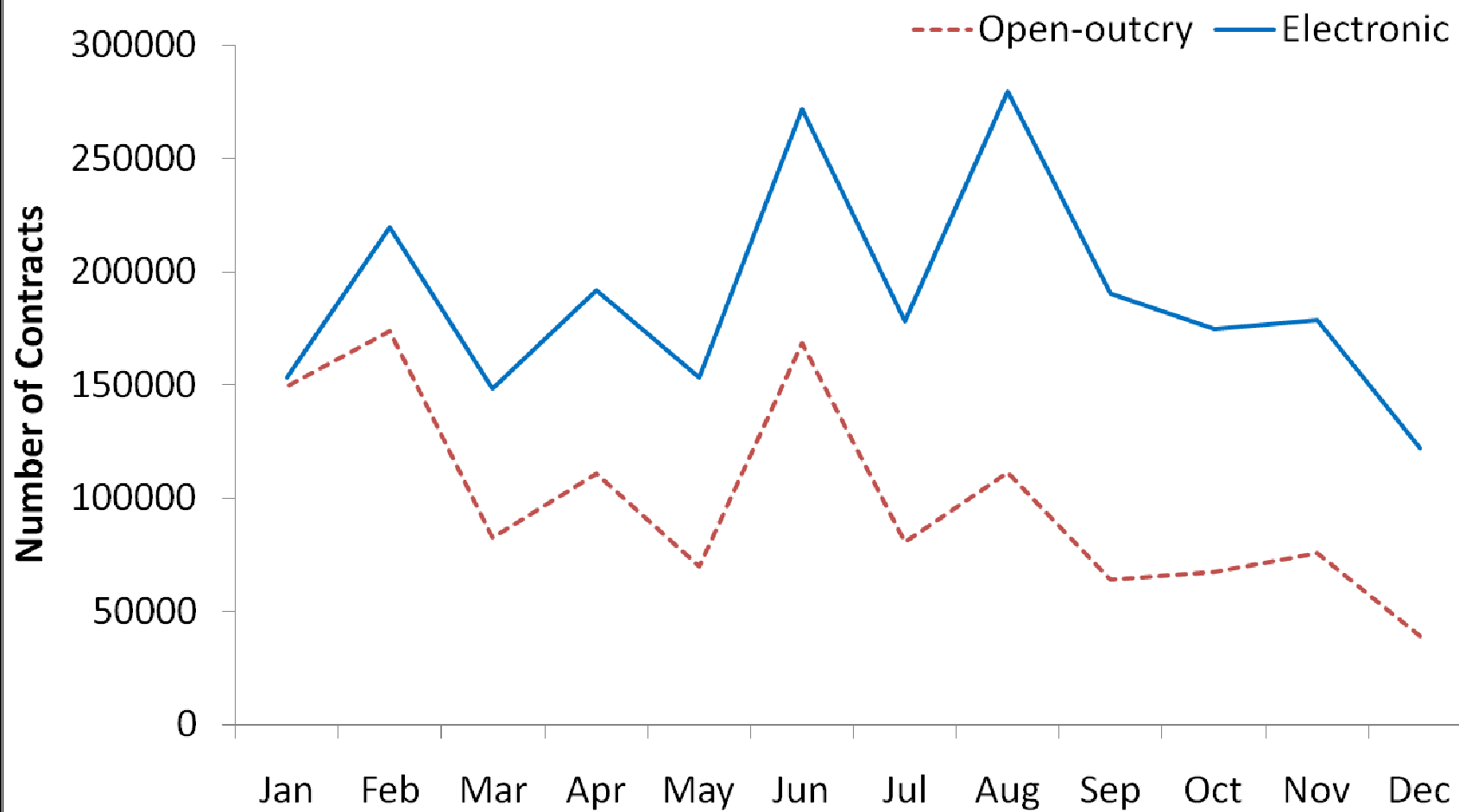$$\beta_0 + \beta_1 \text{ Size } + \beta_2 \text{ Volume} + \beta_3 \text{ Time}$$

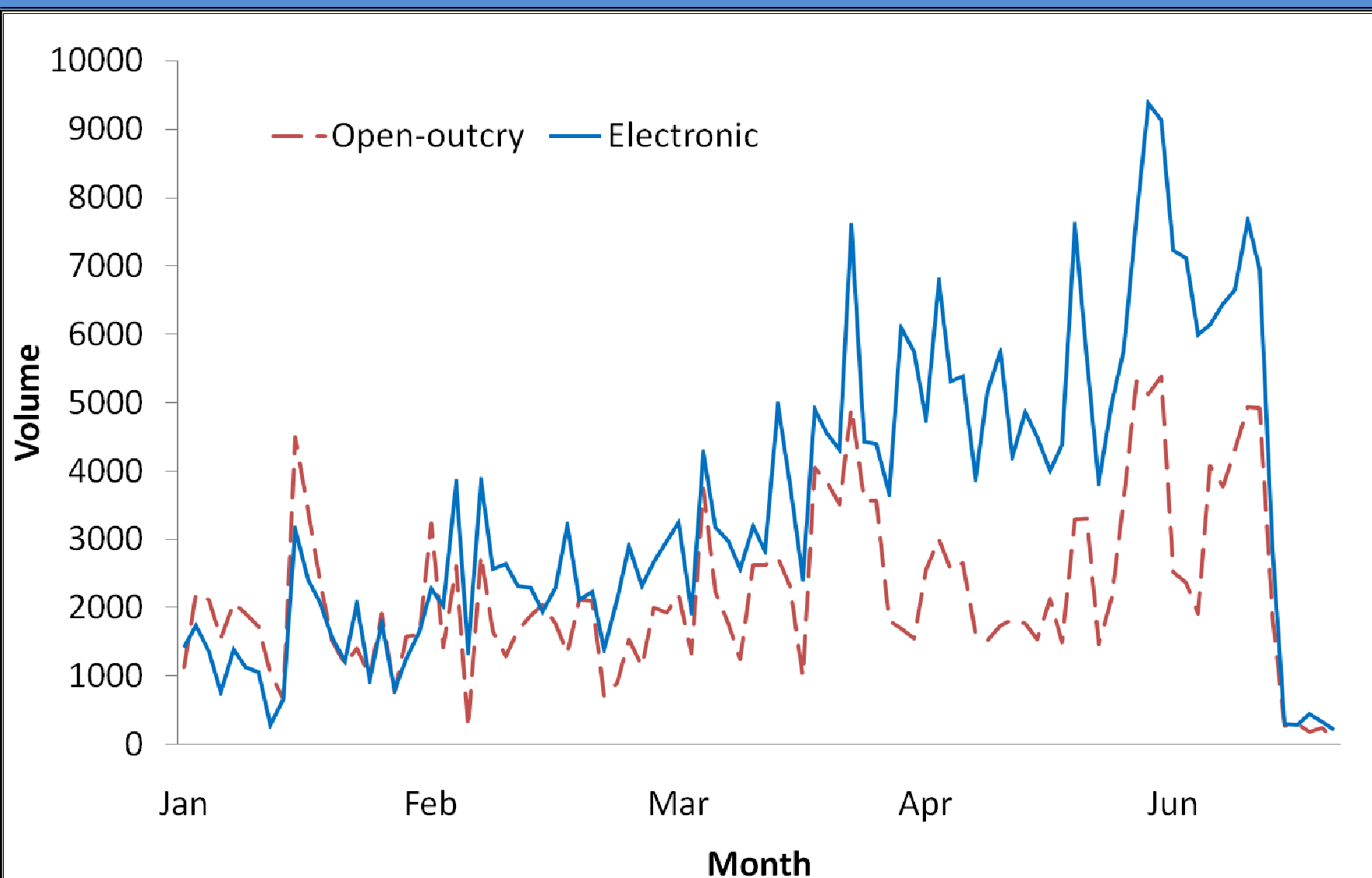**Figure 1. Monthly Volume of KCBT Wheat Futures Contract in 2008**

Figure 2. Daily volume of Electronic and Open-outcry July 2008 Wheat Futures Contracts at KCBT Exchange

Table 1. Descriptive Statistics of Wheat Futures Contracts Traded at KCBT in 2008

| Contract | | Open Outcry | | | | Electronic | |
	N	Average Trades per Day	Average Volume per Trade	N	Average Trades per Day	Average Volume per Trade
June	134	167.01	23.67	134	1194.60	3.67
Dec	241	72.04	33.97	241	991.13	3.62

Table 2. Measures of Liquidity Costs (cents/bushel) in Wheat Futures Contracts Traded at KCBT in 2008

Contract	Open Outcry		Electronic	
	Roll's	Average Absolute Price Change	Roll's	Average Absolute Price Change
June	1.18	1.23	0.63	0.41
Dec	1.56	1.44	0.29	0.30

Previous Estimates for KCBT HRW

Thompson et al. (1993)   1985 data

0.28 – 0.29¢/bu. High volume contacts

Shah and Brorsen (2009)   2007 data

0.49¢ /bu.

Table 3. Results of the Regressions with Roll's Measure of Open-Outcry Contracts as Dependent Variable

Contract	N	Intercept	Days to Maturity	Volume per Trade	Total Volume	R^2
March	28	7.8067	-0.0889*	-0.0105	-0.0003	0.2773
May	42	1.8970	-0.0055	-0.0039	0.0004*	0.2265
June	94	2.5528	-0.0081*	-0.0167	-0.0001	0.1126
Sep	95	0.5311	0.0161*	0.0237	-0.0005	0.2071
Dec	140	1.9639	0.0065	0.0124	-0.0008*	0.1315

Table 4. Results of the Regressions with Roll's Measure of Electronic Contracts as Dependent Variable

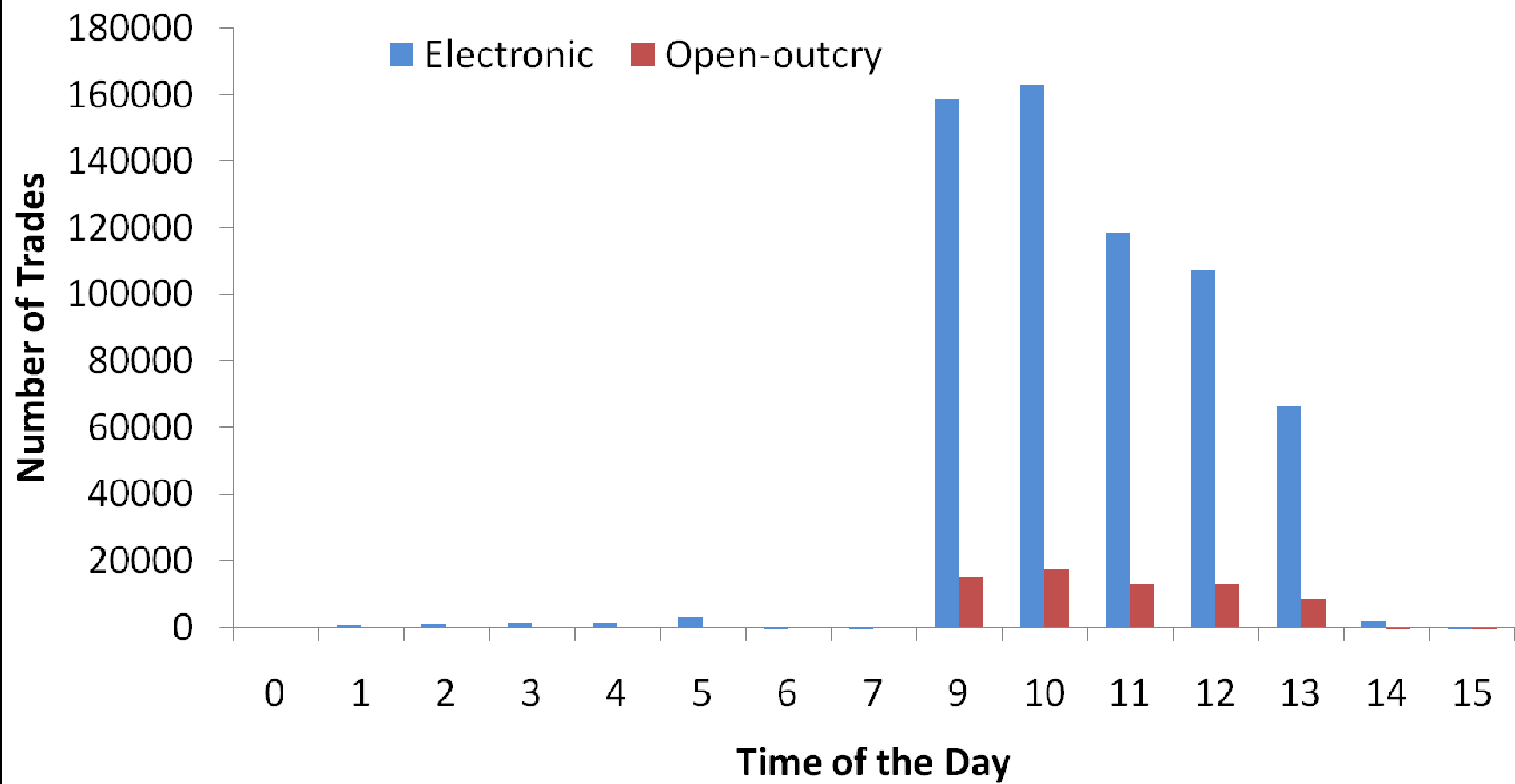| Contract	N	Intercept	Days to Maturity	Volume per Trade	Total Volume	R^2
March	38	7.2840	-0.0603*	-0.0110*	-0.0007*	0.5314
May	61	3.7360	-0.0125	-0.0017	-0.0005	0.0517
June	125	0.2668	0.0017*	0.1243*	-0.0001*	0.3401
Sep	71	2.3866	-.0140*	-0.0248	-0.0002*	0.4230
Dec	189	1.2634	-0.0004	0.0799	-0.0002*	0.1439

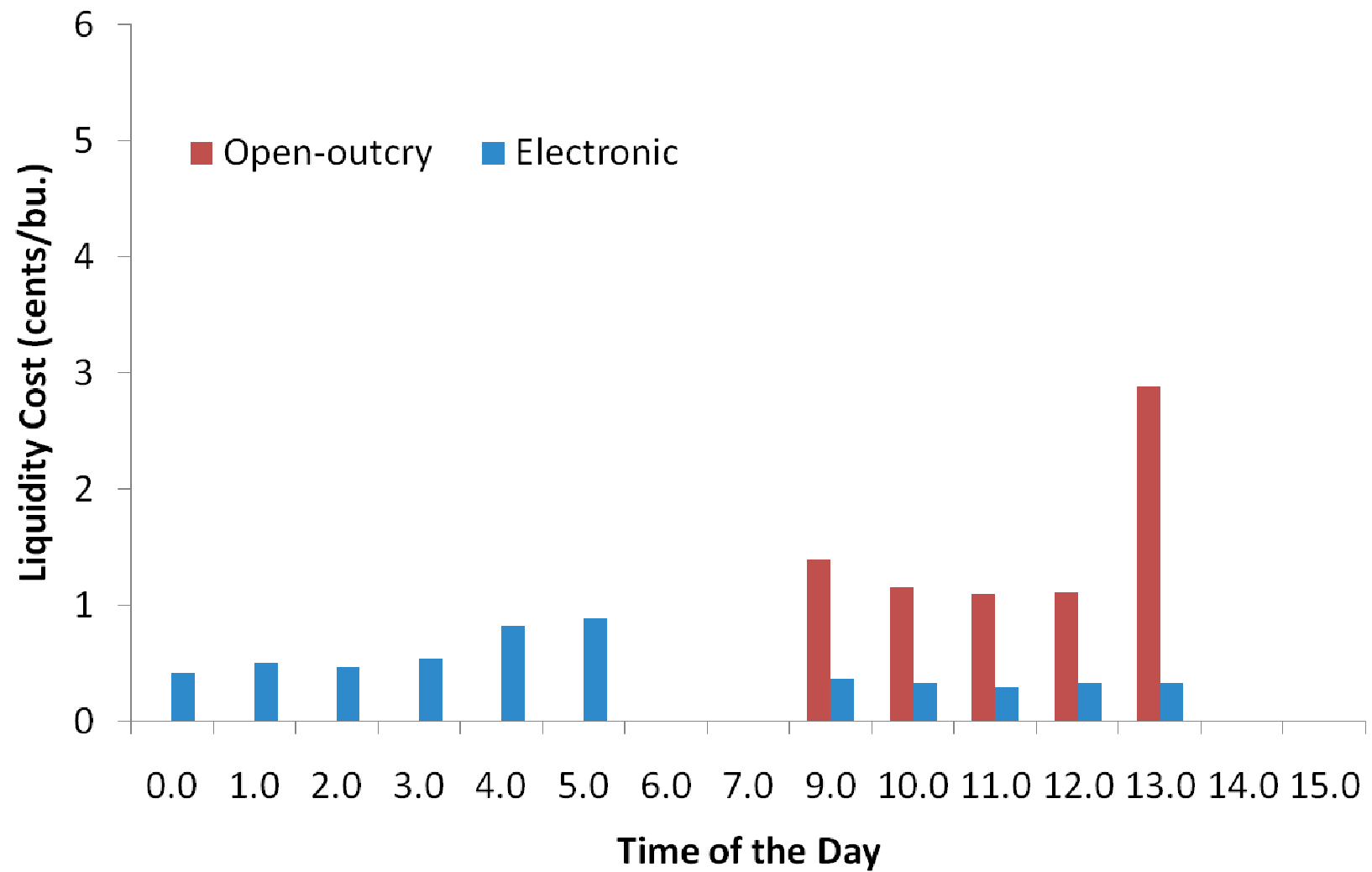Figure 3. Number of Trades at Different Time of the Day at KCBT in 2008

Figure 4. Liquidity Cost at Different Time of the Day at KCBT in 2008
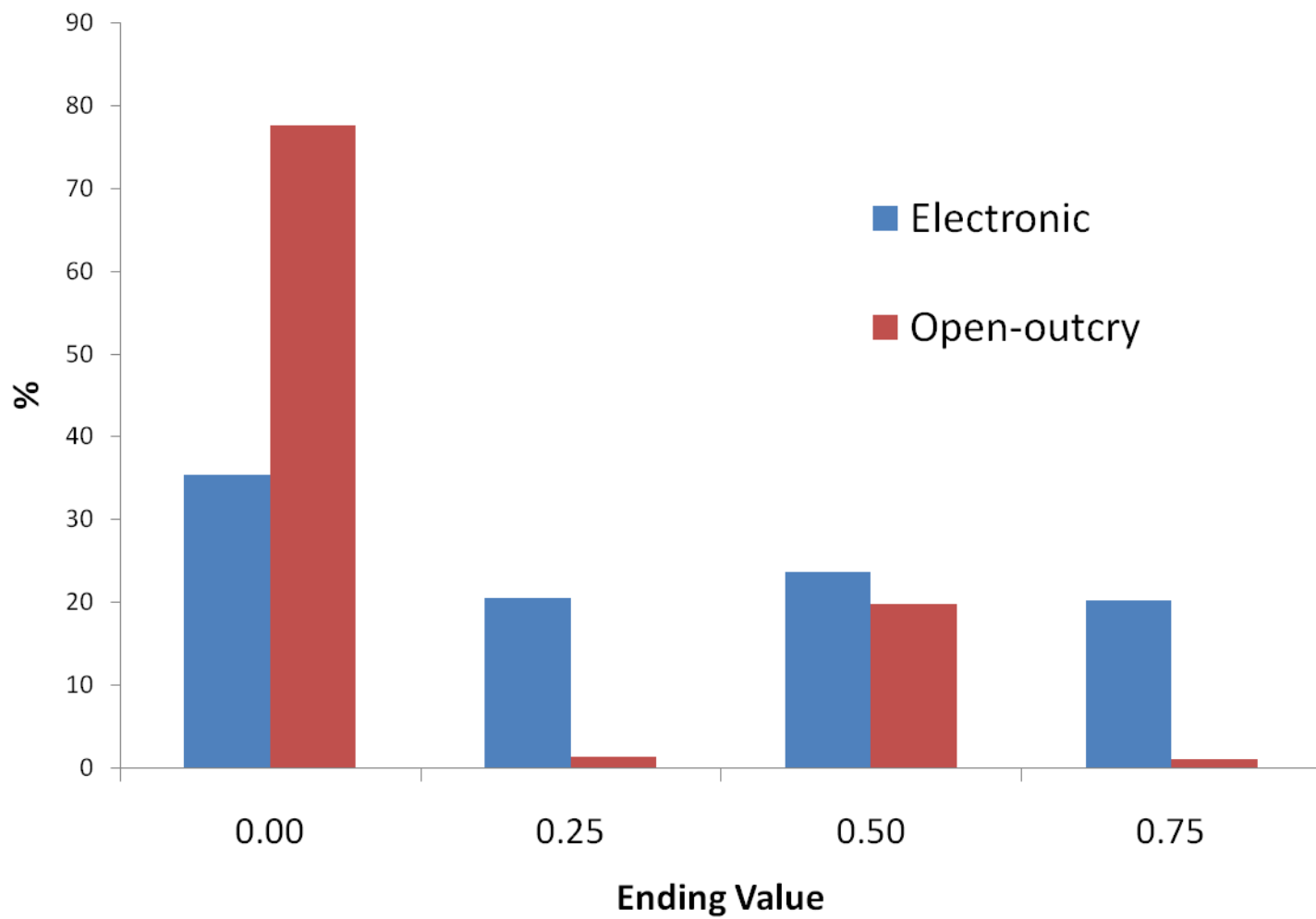
Figure 5. Ending Values of Trade Price in Electronic and Open Out-cry Markets at KCBT in 2008

Conclusions

- **Electronic trading $\Rightarrow \downarrow$ Liquidity cost**

- **Open outcry $\Rightarrow \uparrow$ Trading size**

- **More electronic trading**