

## **CHAPTER V**

### **CONCLUSION**

#### **A. Conclusion**

Based on analyses made, the research outcomes are as follows:

1. Fuzzy Inference System Forecasting model for Astra International Tbk. Company supported the hypothesis, which is:  
Ha: Fuzzy Inference System forecast stock price on the companies listed in LQ45
2. Fuzzy Inference System Forecasting model for Astra International Tbk can forecast the stock price fluctuation with low level of error based on MAD, MSE, MAPE and MPE.

#### **B. Limitation**

1. In the analysis, researcher used Fuzzy Inference System model that not the same with the previous research that using Adaptive Neuro-Fuzzy Inference System.
2. Based on the criteria (see also page 32-33), Astra International Company is selected as sample and this model can not be used for others companies since designing Fuzzy Inference System forecasting model is exclusive for any company and designed network is not applicable for other companies in Indonesian Capital Market.

3. The more Independent variables used in further research the more accurate the research.
4. In the analysis, Researcher does not take into account about the time value of money. Researcher only calculates from the historical data and not considering the time value of money.

### **C. Suggestion for Further Research**

1. Further research can use ANFIS TSK modeling to be more accurate in order to analyze the stock price fluctuation. It is known that TSK modeling in ANFIS is more complex, need a lot of time, and analysis but can provide researcher with more accurate outcome
2. In the next research, researcher also can wider the samples and windows period to analyze the stock price fluctuation.

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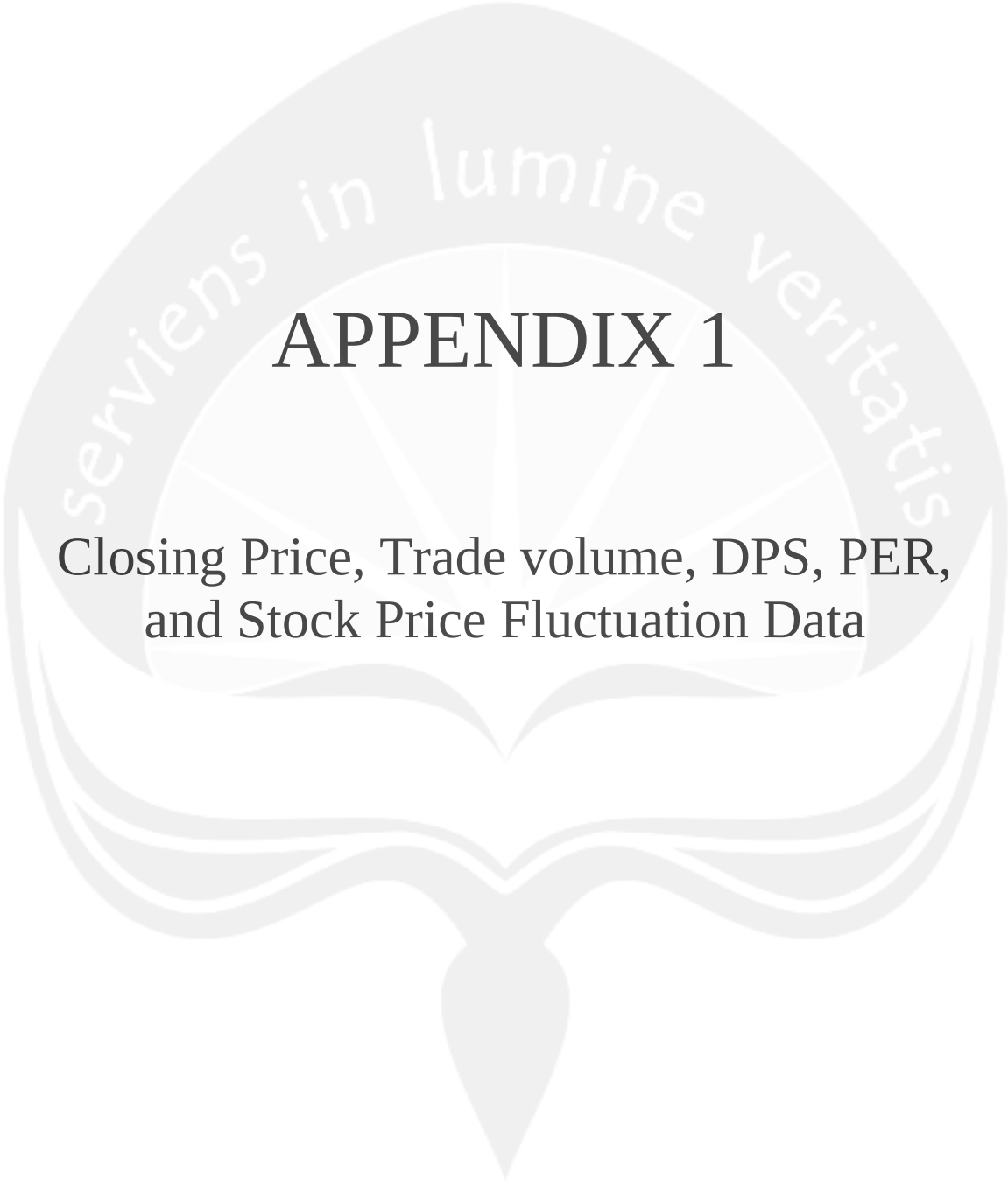
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# APPENDIX 1

Closing Price, Trade volume, DPS, PER,  
and Stock Price Fluctuation Data

| Date      | Closing Price | Trade Volume | DPS | PER      | Stock Price Fluctuation |
|-----------|---------------|--------------|-----|----------|-------------------------|
| 1/5/2000  | 3,725         | 8,400,500    | 0   | -0.05819 | -100                    |
| 1/6/2000  | 3,750         | 3,895,500    | 0   | -0.05819 | 25                      |
| 1/11/2000 | 4,075         | 29,286,500   | 0   | -0.05819 | 325                     |
| 1/12/2000 | 3,850         | 9,531,500    | 0   | -0.05819 | -225                    |
| 1/13/2000 | 3,900         | 5,965,000    | 0   | -0.05819 | 50                      |
| 1/14/2000 | 3,825         | 6,191,500    | 0   | -0.05819 | -75                     |
| 1/17/2000 | 3,900         | 6,745,500    | 0   | -0.05819 | 75                      |
| 1/18/2000 | 3,725         | 15,953,500   | 0   | -0.05819 | -175                    |
| 1/19/2000 | 3,550         | 14,952,500   | 0   | -0.05819 | -175                    |
| 1/20/2000 | 3,675         | 18,137,500   | 0   | -0.05819 | 125                     |
| 1/21/2000 | 3,600         | 13,658,500   | 0   | -0.05819 | -75                     |
| 1/24/2000 | 3,575         | 5,007,000    | 0   | -0.05819 | -25                     |
| 1/26/2000 | 3,475         | 6,020,000    | 0   | -0.05819 | -100                    |
| 1/27/2000 | 3,700         | 57,243,000   | 0   | -0.05819 | 225                     |
| 1/28/2000 | 3,625         | 24,761,500   | 0   | -0.05819 | -75                     |
| 1/31/2000 | 3,675         | 15,999,500   | 0   | -0.05819 | 50                      |
| 2/1/2000  | 3,600         | 31,891,000   | 0   | -0.05819 | -75                     |
| 2/2/2000  | 3,650         | 20,775,500   | 0   | -0.05819 | 50                      |
| 2/3/2000  | 3,600         | 7,445,000    | 0   | -0.05819 | -50                     |
| 2/4/2000  | 3,700         | 18,150,500   | 0   | -0.05819 | 100                     |
| 2/7/2000  | 3,825         | 24,287,000   | 0   | -0.05819 | 125                     |
| 2/8/2000  | 3,775         | 61,279,500   | 0   | -0.05819 | -50                     |
| 2/9/2000  | 3,700         | 25,535,500   | 0   | -0.05819 | -75                     |
| 2/10/2000 | 3,850         | 29,713,500   | 0   | -0.05819 | 150                     |
| 2/11/2000 | 3,750         | 17,926,500   | 0   | -0.05819 | -100                    |
| 2/14/2000 | 3,725         | 16,218,500   | 0   | -0.05819 | -25                     |
| 2/15/2000 | 3,750         | 15,136,000   | 0   | -0.05819 | 25                      |
| 2/16/2000 | 3,700         | 6,432,000    | 0   | -0.05819 | -50                     |
| 2/17/2000 | 3,675         | 14,290,500   | 0   | -0.05819 | -25                     |
| 2/18/2000 | 3,700         | 11,086,500   | 0   | -0.05819 | 25                      |
| 2/21/2000 | 3,750         | 4,801,500    | 0   | -0.05819 | 50                      |
| 2/22/2000 | 3,825         | 19,469,500   | 0   | -0.05819 | 75                      |
| 2/23/2000 | 3,725         | 20,139,000   | 0   | -0.05819 | -100                    |
| 2/24/2000 | 3,675         | 8,812,000    | 0   | -0.05819 | -50                     |
| 2/25/2000 | 3,650         | 3,908,000    | 0   | -0.05819 | -25                     |
| 2/28/2000 | 3,675         | 3,128,500    | 0   | -0.05819 | 25                      |
| 3/1/2000  | 3,625         | 4,989,000    | 0   | -0.05819 | -50                     |
| 3/2/2000  | 3,575         | 5,674,500    | 0   | -0.05819 | -50                     |
| 3/3/2000  | 3,525         | 7,548,000    | 0   | -0.05819 | -50                     |
| 3/6/2000  | 3,525         | 9,594,000    | 0   | -0.05819 | 0                       |
| 3/7/2000  | 3,525         | 4,703,000    | 0   | -0.05819 | 0                       |
| 3/8/2000  | 3,500         | 5,947,000    | 0   | -0.05819 | -25                     |
| 3/9/2000  | 3,600         | 7,312,000    | 0   | -0.05819 | 100                     |

|           |       |            |   |          |      |
|-----------|-------|------------|---|----------|------|
| 3/10/2000 | 3,650 | 5,083,000  | 0 | -0.05819 | 50   |
| 3/13/2000 | 3,700 | 9,172,000  | 0 | -0.05819 | 50   |
| 3/14/2000 | 3,750 | 6,591,500  | 0 | -0.05819 | 50   |
| 3/15/2000 | 3,775 | 4,798,000  | 0 | -0.05819 | 25   |
| 3/17/2000 | 3,775 | 8,162,500  | 0 | -0.05819 | 0    |
| 3/20/2000 | 3,800 | 9,709,500  | 0 | -0.05819 | 25   |
| 3/21/2000 | 3,750 | 10,556,000 | 0 | -0.05819 | -50  |
| 3/22/2000 | 3,725 | 16,351,500 | 0 | -0.05819 | -25  |
| 3/23/2000 | 3,725 | 15,716,500 | 0 | -0.05819 | 0    |
| 3/24/2000 | 3,650 | 42,883,500 | 0 | -0.05819 | -75  |
| 3/27/2000 | 3,750 | 11,290,500 | 0 | -0.05819 | 100  |
| 3/28/2000 | 3,700 | 5,194,000  | 0 | -0.05819 | -50  |
| 3/29/2000 | 3,675 | 5,241,500  | 0 | -0.05819 | -25  |
| 3/30/2000 | 3,625 | 5,162,000  | 0 | -0.05819 | -50  |
| 4/3/2000  | 3,575 | 2,416,500  | 0 | -0.05819 | -50  |
| 4/5/2000  | 3,475 | 4,925,000  | 0 | -0.05819 | -100 |
| 4/7/2000  | 3,650 | 3,899,500  | 0 | -0.05819 | 175  |
| 4/10/2000 | 3,600 | 930,500    | 0 | -0.05819 | -50  |
| 4/11/2000 | 3,575 | 1,733,000  | 0 | -0.05819 | -25  |
| 4/12/2000 | 3,575 | 931,000    | 0 | -0.05819 | 0    |
| 4/13/2000 | 3,600 | 1,447,500  | 0 | -0.05819 | 25   |
| 4/14/2000 | 3,525 | 2,402,000  | 0 | -0.05819 | -75  |
| 4/17/2000 | 3,350 | 6,911,500  | 0 | -0.05819 | -175 |
| 4/18/2000 | 3,350 | 3,676,000  | 0 | -0.05819 | 0    |
| 4/19/2000 | 3,325 | 2,445,000  | 0 | -0.05819 | -25  |
| 4/20/2000 | 3,325 | 1,112,500  | 0 | -0.05819 | 0    |
| 4/24/2000 | 3,350 | 1,277,000  | 0 | -0.05819 | 25   |
| 4/25/2000 | 3,225 | 2,927,500  | 0 | -0.05819 | -125 |
| 4/26/2000 | 3,250 | 5,997,000  | 0 | -0.05819 | 25   |
| 4/27/2000 | 3,250 | 1,251,500  | 0 | -0.05819 | 0    |
| 4/28/2000 | 3,200 | 2,535,000  | 0 | -0.05819 | -50  |
| 5/1/2000  | 3,300 | 1,858,000  | 0 | -0.05819 | 100  |
| 5/2/2000  | 3,350 | 4,259,000  | 0 | -0.05819 | 50   |
| 5/3/2000  | 3,450 | 8,393,500  | 0 | -0.05819 | 100  |
| 5/4/2000  | 3,400 | 3,558,000  | 0 | -0.05819 | -50  |
| 5/5/2000  | 3,400 | 3,028,000  | 0 | -0.05819 | 0    |
| 5/8/2000  | 3,375 | 3,584,500  | 0 | -0.05819 | -25  |
| 5/9/2000  | 3,375 | 2,235,000  | 0 | -0.05819 | 0    |
| 5/10/2000 | 3,400 | 6,292,000  | 0 | -0.05819 | 25   |
| 5/11/2000 | 3,325 | 4,619,500  | 0 | -0.05819 | -75  |
| 5/12/2000 | 3,400 | 8,539,500  | 0 | -0.05819 | 75   |
| 5/15/2000 | 3,375 | 4,106,500  | 0 | -0.05819 | -25  |
| 5/16/2000 | 3,175 | 12,350,500 | 0 | -0.05819 | -200 |
| 5/17/2000 | 2,975 | 43,712,500 | 0 | -0.05819 | -200 |
| 5/19/2000 | 3,000 | 9,640,000  | 0 | -0.05819 | 25   |
| 5/22/2000 | 2,925 | 5,856,000  | 0 | -0.05819 | -75  |
| 5/23/2000 | 2,875 | 8,701,000  | 0 | -0.05819 | -50  |

|           |       |            |   |          |      |
|-----------|-------|------------|---|----------|------|
| 5/24/2000 | 2,875 | 3,167,500  | 0 | -0.05819 | 0    |
| 5/25/2000 | 2,825 | 4,661,000  | 0 | -0.05819 | -50  |
| 5/26/2000 | 2,750 | 5,489,000  | 0 | -0.05819 | -75  |
| 5/29/2000 | 2,525 | 10,297,000 | 0 | -0.05819 | -225 |
| 5/30/2000 | 2,700 | 23,027,000 | 0 | -0.05819 | 175  |
| 5/31/2000 | 2,500 | 25,171,000 | 0 | -0.05819 | -200 |
| 6/2/2000  | 2,450 | 21,823,000 | 0 | -0.05819 | -50  |
| 6/5/2000  | 2,500 | 12,089,000 | 0 | -0.05819 | 50   |
| 6/6/2000  | 2,475 | 4,073,500  | 0 | -0.05819 | -25  |
| 6/7/2000  | 2,675 | 25,245,500 | 0 | -0.05819 | 200  |
| 6/8/2000  | 2,875 | 44,686,500 | 0 | -0.05819 | 200  |
| 6/9/2000  | 2,725 | 28,806,500 | 0 | -0.05819 | -150 |
| 6/12/2000 | 2,800 | 18,557,500 | 0 | -0.05819 | 75   |
| 6/13/2000 | 2,650 | 16,244,500 | 0 | -0.05819 | -150 |
| 6/14/2000 | 2,775 | 17,243,500 | 0 | -0.05819 | 125  |
| 6/16/2000 | 2,750 | 20,313,500 | 0 | -0.05819 | -25  |
| 6/19/2000 | 2,800 | 10,972,000 | 0 | -0.05819 | 50   |
| 6/20/2000 | 2,750 | 10,898,500 | 0 | -0.05819 | -50  |
| 6/21/2000 | 2,775 | 9,334,000  | 0 | -0.05819 | 25   |
| 6/22/2000 | 2,800 | 8,229,500  | 0 | -0.05819 | 25   |
| 6/23/2000 | 2,725 | 4,869,500  | 0 | -0.05819 | -75  |
| 6/26/2000 | 2,700 | 4,823,000  | 0 | -0.05819 | -25  |
| 6/27/2000 | 2,675 | 2,934,000  | 0 | -0.05819 | -25  |
| 6/28/2000 | 2,725 | 3,720,000  | 0 | -0.05819 | 50   |
| 6/29/2000 | 2,700 | 5,332,000  | 0 | -0.05819 | -25  |
| 6/30/2000 | 2,750 | 4,432,000  | 0 | -0.05819 | 50   |
| 7/3/2000  | 2,675 | 3,849,500  | 0 | -0.05819 | -75  |
| 7/4/2000  | 2,700 | 3,347,000  | 0 | -0.05819 | 25   |
| 7/5/2000  | 2,655 | 5,005,500  | 0 | -0.05819 | -45  |
| 7/6/2000  | 2,605 | 4,015,500  | 0 | -0.05819 | -50  |
| 7/7/2000  | 2,630 | 1,978,500  | 0 | -0.05819 | 25   |
| 7/10/2000 | 2,620 | 2,847,500  | 0 | -0.05819 | -10  |
| 7/11/2000 | 2,670 | 2,768,000  | 0 | -0.05819 | 50   |
| 7/12/2000 | 2,630 | 921,000    | 0 | -0.05819 | -40  |
| 7/13/2000 | 2,690 | 8,766,000  | 0 | -0.05819 | 60   |
| 7/14/2000 | 2,735 | 6,606,000  | 0 | -0.05819 | 45   |
| 7/17/2000 | 2,795 | 5,409,500  | 0 | -0.05819 | 60   |
| 7/18/2000 | 2,795 | 1,986,500  | 0 | -0.05819 | 0    |
| 7/19/2000 | 2,845 | 6,355,000  | 0 | -0.05819 | 50   |
| 7/20/2000 | 2,760 | 6,424,500  | 0 | -0.05819 | -85  |
| 7/21/2000 | 2,735 | 2,269,000  | 0 | -0.05819 | -25  |
| 7/24/2000 | 2,695 | 4,851,500  | 0 | -0.05819 | -40  |
| 7/25/2000 | 2,625 | 10,701,500 | 0 | -0.05819 | -70  |
| 7/26/2000 | 2,540 | 6,576,500  | 0 | -0.05819 | -85  |
| 7/27/2000 | 2,570 | 4,618,500  | 0 | -0.05819 | 30   |
| 7/28/2000 | 2,545 | 2,794,000  | 0 | -0.05819 | -25  |
| 7/31/2000 | 2,500 | 3,880,500  | 0 | -0.05819 | -45  |

|           |       |            |   |          |      |
|-----------|-------|------------|---|----------|------|
| 8/1/2000  | 2,490 | 6,619,000  | 0 | -0.05819 | -10  |
| 8/2/2000  | 2,455 | 5,188,000  | 0 | -0.05819 | -35  |
| 8/3/2000  | 2,565 | 7,503,500  | 0 | -0.05819 | 110  |
| 8/4/2000  | 2,680 | 11,197,500 | 0 | -0.05819 | 115  |
| 8/7/2000  | 2,620 | 3,436,000  | 0 | -0.05819 | -60  |
| 8/8/2000  | 2,500 | 11,377,000 | 0 | -0.05819 | -120 |
| 8/9/2000  | 2,500 | 2,426,000  | 0 | -0.05819 | 0    |
| 8/10/2000 | 2,590 | 9,312,500  | 0 | -0.05819 | 90   |
| 8/11/2000 | 2,670 | 11,690,000 | 0 | -0.05819 | 80   |
| 8/14/2000 | 2,670 | 8,989,500  | 0 | -0.05819 | 0    |
| 8/15/2000 | 2,645 | 2,683,500  | 0 | -0.05819 | -25  |
| 8/16/2000 | 2,650 | 3,640,500  | 0 | -0.05819 | 5    |
| 8/18/2000 | 2,645 | 1,913,500  | 0 | -0.05819 | -5   |
| 8/21/2000 | 2,690 | 8,381,500  | 0 | -0.05819 | 45   |
| 8/22/2000 | 2,840 | 26,826,000 | 0 | -0.05819 | 150  |
| 8/23/2000 | 2,840 | 9,310,000  | 0 | -0.05819 | 0    |
| 8/24/2000 | 2,625 | 29,948,000 | 0 | -0.05819 | -215 |
| 8/25/2000 | 2,650 | 6,112,500  | 0 | -0.05819 | 25   |
| 8/28/2000 | 2,675 | 7,559,500  | 0 | -0.05819 | 25   |
| 8/29/2000 | 2,590 | 6,081,000  | 0 | -0.05819 | -85  |
| 8/30/2000 | 2,655 | 8,525,500  | 0 | -0.05819 | 65   |
| 8/31/2000 | 2,630 | 11,872,000 | 0 | -0.05819 | -25  |
| 9/1/2000  | 2,650 | 5,927,500  | 0 | -0.05819 | 20   |
| 9/4/2000  | 2,705 | 5,489,500  | 0 | -0.05819 | 55   |
| 9/5/2000  | 2,715 | 7,864,500  | 0 | -0.05819 | 10   |
| 9/6/2000  | 2,775 | 15,200,000 | 0 | -0.05819 | 60   |
| 9/7/2000  | 2,705 | 6,635,500  | 0 | -0.05819 | -70  |
| 9/8/2000  | 2,700 | 4,805,000  | 0 | -0.05819 | -5   |
| 9/11/2000 | 2,645 | 1,603,500  | 0 | -0.05819 | -55  |
| 9/12/2000 | 2,545 | 8,786,000  | 0 | -0.05819 | -100 |
| 9/13/2000 | 2,450 | 12,574,500 | 0 | -0.05819 | -95  |
| 9/18/2000 | 2,145 | 30,657,500 | 0 | -0.05819 | -305 |
| 9/19/2000 | 2,310 | 21,730,500 | 0 | -0.05819 | 165  |
| 9/20/2000 | 2,235 | 12,037,000 | 0 | -0.05819 | -75  |
| 9/21/2000 | 2,280 | 6,151,500  | 0 | -0.05819 | 45   |
| 9/22/2000 | 2,260 | 9,886,500  | 0 | -0.05819 | -20  |
| 9/25/2000 | 2,305 | 10,418,500 | 0 | -0.05819 | 45   |
| 9/26/2000 | 2,295 | 3,160,000  | 0 | -0.05819 | -10  |
| 9/27/2000 | 2,290 | 1,405,000  | 0 | -0.05819 | -5   |
| 9/28/2000 | 2,315 | 5,161,000  | 0 | -0.05819 | 25   |
| 9/29/2000 | 2,320 | 5,570,000  | 0 | -0.05819 | 5    |
| 10/2/2000 | 2,390 | 5,172,000  | 0 | -0.05819 | 70   |
| 10/3/2000 | 2,315 | 8,286,000  | 0 | -0.05819 | -75  |
| 10/4/2000 | 2,325 | 6,587,500  | 0 | -0.05819 | 10   |
| 10/5/2000 | 2,370 | 8,257,000  | 0 | -0.05819 | 45   |
| 10/6/2000 | 2,345 | 718,500    | 0 | -0.05819 | -25  |
| 10/9/2000 | 2,315 | 1,123,000  | 0 | -0.05819 | -30  |

|            |       |            |   |          |      |
|------------|-------|------------|---|----------|------|
| 10/10/2000 | 2,300 | 1,222,500  | 0 | -0.05819 | -15  |
| 10/11/2000 | 2,300 | 1,158,000  | 0 | -0.05819 | 0    |
| 10/12/2000 | 2,330 | 9,191,000  | 0 | -0.05819 | 30   |
| 10/13/2000 | 2,375 | 6,740,500  | 0 | -0.05819 | 45   |
| 10/16/2000 | 2,450 | 3,302,000  | 0 | -0.05819 | 75   |
| 10/17/2000 | 2,430 | 2,339,000  | 0 | -0.05819 | -20  |
| 10/18/2000 | 2,355 | 3,484,000  | 0 | -0.05819 | -75  |
| 10/19/2000 | 2,410 | 3,379,500  | 0 | -0.05819 | 55   |
| 10/20/2000 | 2,300 | 16,384,500 | 0 | -0.05819 | -110 |
| 10/23/2000 | 2,275 | 6,547,500  | 0 | -0.05819 | -25  |
| 10/24/2000 | 2,275 | 4,509,000  | 0 | -0.05819 | 0    |
| 10/26/2000 | 2,250 | 3,625,500  | 0 | -0.05819 | -25  |
| 10/27/2000 | 2,250 | 3,435,000  | 0 | -0.05819 | 0    |
| 10/30/2000 | 2,150 | 6,910,500  | 0 | -0.05819 | -100 |
| 10/31/2000 | 2,150 | 5,731,500  | 0 | -0.05819 | 0    |
| 11/1/2000  | 2,175 | 14,580,500 | 0 | -0.05819 | 25   |
| 11/2/2000  | 2,150 | 5,135,000  | 0 | -0.05819 | -25  |
| 11/3/2000  | 2,125 | 7,047,500  | 0 | -0.05819 | -25  |
| 11/6/2000  | 2,200 | 5,389,000  | 0 | -0.05819 | 75   |
| 11/7/2000  | 2,175 | 3,110,500  | 0 | -0.05819 | -25  |
| 11/8/2000  | 2,200 | 14,183,000 | 0 | -0.05819 | 25   |
| 11/9/2000  | 2,200 | 3,073,500  | 0 | -0.05819 | 0    |
| 11/10/2000 | 2,175 | 9,664,000  | 0 | -0.05819 | -25  |
| 11/13/2000 | 2,150 | 3,154,000  | 0 | -0.05819 | -25  |
| 11/14/2000 | 2,150 | 11,018,500 | 0 | -0.05819 | 0    |
| 11/15/2000 | 2,100 | 11,204,500 | 0 | -0.05819 | -50  |
| 11/16/2000 | 2,075 | 3,004,000  | 0 | -0.05819 | -25  |
| 11/17/2000 | 2,050 | 2,719,000  | 0 | -0.05819 | -25  |
| 11/20/2000 | 2,100 | 6,030,000  | 0 | -0.05819 | 50   |
| 11/21/2000 | 2,100 | 729,000    | 0 | -0.05819 | 0    |
| 11/22/2000 | 2,350 | 66,217,000 | 0 | -0.05819 | 250  |
| 11/23/2000 | 2,250 | 30,835,000 | 0 | -0.05819 | -100 |
| 11/24/2000 | 2,300 | 14,851,500 | 0 | -0.05819 | 50   |
| 11/27/2000 | 2,300 | 3,052,000  | 0 | -0.05819 | 0    |
| 11/28/2000 | 2,275 | 2,990,500  | 0 | -0.05819 | -25  |
| 11/29/2000 | 2,275 | 1,783,500  | 0 | -0.05819 | 0    |
| 11/30/2000 | 2,275 | 7,053,000  | 0 | -0.05819 | 0    |
| 12/1/2000  | 2,200 | 3,137,500  | 0 | -0.05819 | -75  |
| 12/4/2000  | 2,225 | 2,795,500  | 0 | -0.05819 | 25   |
| 12/5/2000  | 2,225 | 902,500    | 0 | -0.05819 | 0    |
| 12/6/2000  | 2,250 | 5,622,000  | 0 | -0.05819 | 25   |
| 12/7/2000  | 2,250 | 1,379,500  | 0 | -0.05819 | 0    |
| 12/8/2000  | 2,200 | 899,500    | 0 | -0.05819 | -50  |
| 12/11/2000 | 2,150 | 5,841,000  | 0 | -0.05819 | -50  |
| 12/12/2000 | 2,075 | 16,333,000 | 0 | -0.05819 | -75  |
| 12/13/2000 | 2,075 | 9,022,000  | 0 | -0.05819 | 0    |
| 12/14/2000 | 2,075 | 5,293,000  | 0 | -0.05819 | 0    |

|            |       |            |   |          |      |
|------------|-------|------------|---|----------|------|
| 12/15/2000 | 2,075 | 3,067,000  | 0 | -0.05819 | 0    |
| 12/18/2000 | 2,025 | 6,878,000  | 0 | -0.05819 | -50  |
| 12/19/2000 | 2,025 | 2,108,000  | 0 | -0.05819 | 0    |
| 12/20/2000 | 2,025 | 5,757,000  | 0 | -0.05819 | 0    |
| 12/21/2000 | 2,025 | 1,797,000  | 0 | -0.05819 | 0    |
| 12/22/2000 | 2,000 | 3,332,000  | 0 | -0.05819 | -25  |
| 1/2/2001   | 1,900 | 4,153,500  | 0 | 0.013471 | -100 |
| 1/3/2001   | 1,775 | 5,692,500  | 0 | 0.013471 | -125 |
| 1/4/2001   | 1,950 | 15,882,500 | 0 | 0.013471 | 175  |
| 1/5/2001   | 1,925 | 15,991,000 | 0 | 0.013471 | -25  |
| 1/8/2001   | 1,925 | 5,338,500  | 0 | 0.013471 | 0    |
| 1/9/2001   | 1,950 | 20,515,000 | 0 | 0.013471 | 25   |
| 1/10/2001  | 1,950 | 7,543,500  | 0 | 0.013471 | 0    |
| 1/11/2001  | 1,900 | 8,731,000  | 0 | 0.013471 | -50  |
| 1/12/2001  | 1,875 | 1,450,500  | 0 | 0.013471 | -25  |
| 1/15/2001  | 1,950 | 4,696,500  | 0 | 0.013471 | 75   |
| 1/16/2001  | 2,075 | 33,592,500 | 0 | 0.013471 | 125  |
| 1/17/2001  | 2,025 | 25,110,500 | 0 | 0.013471 | -50  |
| 1/18/2001  | 2,075 | 11,912,000 | 0 | 0.013471 | 50   |
| 1/19/2001  | 2,025 | 8,614,000  | 0 | 0.013471 | -50  |
| 1/22/2001  | 2,125 | 21,848,000 | 0 | 0.013471 | 100  |
| 1/23/2001  | 2,100 | 17,667,000 | 0 | 0.013471 | -25  |
| 1/24/2001  | 2,125 | 1,917,000  | 0 | 0.013471 | 25   |
| 1/25/2001  | 2,125 | 4,271,500  | 0 | 0.013471 | 0    |
| 1/26/2001  | 2,100 | 4,325,500  | 0 | 0.013471 | -25  |
| 1/29/2001  | 2,075 | 12,374,500 | 0 | 0.013471 | -25  |
| 1/30/2001  | 2,050 | 1,932,000  | 0 | 0.013471 | -25  |
| 1/31/2001  | 2,125 | 20,698,000 | 0 | 0.013471 | 75   |
| 2/1/2001   | 2,175 | 33,175,000 | 0 | 0.013471 | 50   |
| 2/2/2001   | 2,450 | 79,187,000 | 0 | 0.013471 | 275  |
| 2/5/2001   | 2,675 | 98,669,000 | 0 | 0.013471 | 225  |
| 2/6/2001   | 2,575 | 26,691,000 | 0 | 0.013471 | -100 |
| 2/7/2001   | 2,475 | 24,968,500 | 0 | 0.013471 | -100 |
| 2/8/2001   | 2,400 | 18,643,500 | 0 | 0.013471 | -75  |
| 2/9/2001   | 2,250 | 25,294,000 | 0 | 0.013471 | -150 |
| 2/12/2001  | 2,175 | 17,386,500 | 0 | 0.013471 | -75  |
| 2/13/2001  | 2,150 | 15,139,000 | 0 | 0.013471 | -25  |
| 2/14/2001  | 2,100 | 9,526,000  | 0 | 0.013471 | -50  |
| 2/15/2001  | 2,275 | 43,222,500 | 0 | 0.013471 | 175  |
| 2/16/2001  | 2,200 | 27,556,500 | 0 | 0.013471 | -75  |
| 2/19/2001  | 2,200 | 13,926,500 | 0 | 0.013471 | 0    |
| 2/20/2001  | 2,225 | 6,447,500  | 0 | 0.013471 | 25   |
| 2/21/2001  | 2,250 | 18,221,000 | 0 | 0.013471 | 25   |
| 2/22/2001  | 2,200 | 11,664,500 | 0 | 0.013471 | -50  |
| 2/23/2001  | 2,200 | 10,907,000 | 0 | 0.013471 | 0    |
| 2/26/2001  | 2,125 | 14,771,500 | 0 | 0.013471 | -75  |
| 2/27/2001  | 2,125 | 4,506,500  | 0 | 0.013471 | 0    |

|           |       |            |   |          |      |
|-----------|-------|------------|---|----------|------|
| 2/28/2001 | 2,050 | 12,095,000 | 0 | 0.013471 | -75  |
| 3/1/2001  | 2,000 | 12,150,500 | 0 | 0.013471 | -50  |
| 3/2/2001  | 1,975 | 12,810,500 | 0 | 0.013471 | -25  |
| 3/6/2001  | 1,975 | 3,705,500  | 0 | 0.013471 | 0    |
| 3/7/2001  | 1,975 | 12,993,500 | 0 | 0.013471 | 0    |
| 3/8/2001  | 1,950 | 3,501,500  | 0 | 0.013471 | -25  |
| 3/9/2001  | 1,850 | 18,540,000 | 0 | 0.013471 | -100 |
| 3/12/2001 | 1,625 | 68,774,500 | 0 | 0.013471 | -225 |
| 3/13/2001 | 1,425 | 78,832,000 | 0 | 0.013471 | -200 |
| 3/15/2001 | 1,475 | 36,157,500 | 0 | 0.013471 | 50   |
| 3/16/2001 | 1,425 | 18,851,000 | 0 | 0.013471 | -50  |
| 3/19/2001 | 1,375 | 24,992,000 | 0 | 0.013471 | -50  |
| 3/20/2001 | 1,350 | 24,276,000 | 0 | 0.013471 | -25  |
| 3/21/2001 | 1,425 | 73,406,000 | 0 | 0.013471 | 75   |
| 3/22/2001 | 1,350 | 27,863,000 | 0 | 0.013471 | -75  |
| 3/23/2001 | 1,400 | 31,312,500 | 0 | 0.013471 | 50   |
| 3/27/2001 | 1,375 | 16,635,500 | 0 | 0.013471 | -25  |
| 3/28/2001 | 1,400 | 14,346,000 | 0 | 0.013471 | 25   |
| 3/29/2001 | 1,450 | 18,746,500 | 0 | 0.013471 | 50   |
| 3/30/2001 | 1,400 | 25,910,500 | 0 | 0.013471 | -50  |
| 4/2/2001  | 1,350 | 13,346,000 | 0 | 0.013471 | -50  |
| 4/3/2001  | 1,325 | 8,599,000  | 0 | 0.013471 | -25  |
| 4/4/2001  | 1,250 | 16,102,000 | 0 | 0.013471 | -75  |
| 4/5/2001  | 1,250 | 17,635,000 | 0 | 0.013471 | 0    |
| 4/6/2001  | 1,275 | 11,744,000 | 0 | 0.013471 | 25   |
| 4/9/2001  | 1,250 | 4,645,000  | 0 | 0.013471 | -25  |
| 4/10/2001 | 1,325 | 23,605,000 | 0 | 0.013471 | 75   |
| 4/11/2001 | 1,325 | 22,734,000 | 0 | 0.013471 | 0    |
| 4/12/2001 | 1,300 | 7,267,000  | 0 | 0.013471 | -25  |
| 4/16/2001 | 1,275 | 2,065,000  | 0 | 0.013471 | -25  |
| 4/17/2001 | 1,250 | 3,566,000  | 0 | 0.013471 | -25  |
| 4/18/2001 | 1,275 | 3,820,000  | 0 | 0.013471 | 25   |
| 4/19/2001 | 1,250 | 13,268,000 | 0 | 0.013471 | -25  |
| 4/20/2001 | 1,150 | 20,039,500 | 0 | 0.013471 | -100 |
| 4/23/2001 | 1,150 | 16,807,000 | 0 | 0.013471 | 0    |
| 4/24/2001 | 1,175 | 13,173,000 | 0 | 0.013471 | 25   |
| 4/25/2001 | 1,275 | 20,841,500 | 0 | 0.013471 | 100  |
| 4/26/2001 | 1,275 | 20,841,500 | 0 | 0.013471 | 0    |
| 4/27/2001 | 1,300 | 44,703,000 | 0 | 0.013471 | 25   |
| 4/30/2001 | 1,400 | 36,282,500 | 0 | 0.013471 | 100  |
| 5/1/2001  | 1,375 | 78,605,000 | 0 | 0.013471 | -25  |
| 5/2/2001  | 1,375 | 39,026,000 | 0 | 0.013471 | 0    |
| 5/3/2001  | 1,525 | 64,147,000 | 0 | 0.013471 | 150  |
| 5/4/2001  | 1,500 | 34,726,000 | 0 | 0.013471 | -25  |
| 5/8/2001  | 1,525 | 13,050,500 | 0 | 0.013471 | 25   |
| 5/9/2001  | 1,475 | 18,108,500 | 0 | 0.013471 | -50  |
| 5/10/2001 | 1,400 | 23,650,000 | 0 | 0.013471 | -75  |

|           |       |             |   |          |      |
|-----------|-------|-------------|---|----------|------|
| 5/11/2001 | 1,425 | 13,768,000  | 0 | 0.013471 | 25   |
| 5/14/2001 | 1,400 | 4,709,000   | 0 | 0.013471 | -25  |
| 5/15/2001 | 1,425 | 6,161,500   | 0 | 0.013471 | 25   |
| 5/16/2001 | 1,500 | 17,903,500  | 0 | 0.013471 | 75   |
| 5/17/2001 | 1,500 | 20,434,500  | 0 | 0.013471 | 0    |
| 5/18/2001 | 1,500 | 6,596,500   | 0 | 0.013471 | 0    |
| 5/21/2001 | 1,475 | 10,734,000  | 0 | 0.013471 | -25  |
| 5/22/2001 | 1,475 | 14,042,500  | 0 | 0.013471 | 0    |
| 5/23/2001 | 1,450 | 2,728,500   | 0 | 0.013471 | -25  |
| 5/25/2001 | 1,525 | 36,075,500  | 0 | 0.013471 | 75   |
| 5/28/2001 | 1,500 | 39,574,000  | 0 | 0.013471 | -25  |
| 5/29/2001 | 1,750 | 102,650,000 | 0 | 0.013471 | 250  |
| 5/30/2001 | 1,725 | 111,740,000 | 0 | 0.013471 | -25  |
| 5/31/2001 | 1,725 | 75,083,500  | 0 | 0.013471 | 0    |
| 6/1/2001  | 1,600 | 43,490,500  | 0 | 0.013471 | -125 |
| 6/5/2001  | 1,575 | 48,364,000  | 0 | 0.013471 | -25  |
| 6/6/2001  | 1,625 | 23,867,500  | 0 | 0.013471 | 50   |
| 6/7/2001  | 1,600 | 7,924,000   | 0 | 0.013471 | -25  |
| 6/8/2001  | 1,625 | 5,557,500   | 0 | 0.013471 | 25   |
| 6/11/2001 | 1,650 | 22,381,000  | 0 | 0.013471 | 25   |
| 6/12/2001 | 1,725 | 35,437,500  | 0 | 0.013471 | 75   |
| 6/13/2001 | 1,700 | 22,104,500  | 0 | 0.013471 | -25  |
| 6/14/2001 | 1,725 | 20,061,500  | 0 | 0.013471 | 25   |
| 6/15/2001 | 1,725 | 6,444,000   | 0 | 0.013471 | 0    |
| 6/18/2001 | 1,725 | 5,954,000   | 0 | 0.013471 | 0    |
| 6/19/2001 | 1,725 | 10,540,000  | 0 | 0.013471 | 0    |
| 6/20/2001 | 1,775 | 14,680,000  | 0 | 0.013471 | 50   |
| 6/21/2001 | 1,825 | 41,900,500  | 0 | 0.013471 | 50   |
| 6/22/2001 | 1,800 | 11,790,000  | 0 | 0.013471 | -25  |
| 6/25/2001 | 1,775 | 16,047,000  | 0 | 0.013471 | -25  |
| 6/26/2001 | 1,800 | 15,983,000  | 0 | 0.013471 | 25   |
| 6/27/2001 | 1,825 | 48,736,000  | 0 | 0.013471 | 25   |
| 6/28/2001 | 1,850 | 31,198,000  | 0 | 0.013471 | 25   |
| 6/29/2001 | 1,975 | 107,922,500 | 0 | 0.013471 | 125  |
| 7/2/2001  | 1,925 | 18,444,500  | 0 | 0.013471 | -50  |
| 7/3/2001  | 1,875 | 8,832,000   | 0 | 0.013471 | -50  |
| 7/4/2001  | 1,875 | 7,210,000   | 0 | 0.013471 | 0    |
| 7/5/2001  | 1,900 | 5,522,000   | 0 | 0.013471 | 25   |
| 7/6/2001  | 1,900 | 4,099,000   | 0 | 0.013471 | 0    |
| 7/9/2001  | 1,950 | 19,301,500  | 0 | 0.013471 | 50   |
| 7/10/2001 | 2,100 | 89,237,500  | 0 | 0.013471 | 150  |
| 7/11/2001 | 2,075 | 58,167,500  | 0 | 0.013471 | -25  |
| 7/12/2001 | 2,000 | 23,371,500  | 0 | 0.013471 | -75  |
| 7/13/2001 | 2,025 | 40,435,000  | 0 | 0.013471 | 25   |
| 7/16/2001 | 2,075 | 14,493,000  | 0 | 0.013471 | 50   |
| 7/17/2001 | 2,075 | 11,617,500  | 0 | 0.013471 | 0    |
| 7/18/2001 | 2,125 | 23,612,500  | 0 | 0.013471 | 50   |

|           |       |             |   |          |      |
|-----------|-------|-------------|---|----------|------|
| 7/19/2001 | 2,350 | 81,914,500  | 0 | 0.013471 | 225  |
| 7/20/2001 | 2,400 | 189,289,000 | 0 | 0.013471 | 50   |
| 7/23/2001 | 2,700 | 192,047,000 | 0 | 0.013471 | 300  |
| 7/24/2001 | 2,625 | 111,527,500 | 0 | 0.013471 | -75  |
| 7/25/2001 | 2,500 | 152,812,000 | 0 | 0.013471 | -125 |
| 7/26/2001 | 2,425 | 90,552,000  | 0 | 0.013471 | -75  |
| 7/27/2001 | 2,400 | 50,391,000  | 0 | 0.013471 | -25  |
| 7/30/2001 | 2,450 | 26,970,000  | 0 | 0.013471 | 50   |
| 7/31/2001 | 2,375 | 36,786,500  | 0 | 0.013471 | -75  |
| 8/1/2001  | 2,400 | 25,382,000  | 0 | 0.013471 | 25   |
| 8/2/2001  | 2,300 | 16,894,500  | 0 | 0.013471 | -100 |
| 8/3/2001  | 2,325 | 25,865,500  | 0 | 0.013471 | 25   |
| 8/6/2001  | 2,300 | 7,896,500   | 0 | 0.013471 | -25  |
| 8/7/2001  | 2,400 | 18,938,500  | 0 | 0.013471 | 100  |
| 8/8/2001  | 2,500 | 40,558,000  | 0 | 0.013471 | 100  |
| 8/9/2001  | 2,375 | 124,189,000 | 0 | 0.013471 | -125 |
| 8/10/2001 | 2,475 | 35,044,500  | 0 | 0.013471 | 100  |
| 8/13/2001 | 2,550 | 42,570,000  | 0 | 0.013471 | 75   |
| 8/14/2001 | 2,575 | 33,954,000  | 0 | 0.013471 | 25   |
| 8/15/2001 | 2,475 | 23,928,000  | 0 | 0.013471 | -100 |
| 8/16/2001 | 2,525 | 10,741,500  | 0 | 0.013471 | 50   |
| 8/20/2001 | 2,525 | 11,327,000  | 0 | 0.013471 | 0    |
| 8/21/2001 | 2,525 | 6,392,500   | 0 | 0.013471 | 0    |
| 8/22/2001 | 2,550 | 9,900,500   | 0 | 0.013471 | 25   |
| 8/23/2001 | 2,550 | 8,858,500   | 0 | 0.013471 | 0    |
| 8/24/2001 | 2,500 | 16,345,000  | 0 | 0.013471 | -50  |
| 8/27/2001 | 2,475 | 13,527,000  | 0 | 0.013471 | -25  |
| 8/28/2001 | 2,375 | 11,883,000  | 0 | 0.013471 | -100 |
| 8/29/2001 | 2,325 | 8,553,500   | 0 | 0.013471 | -50  |
| 8/30/2001 | 2,325 | 18,050,000  | 0 | 0.013471 | 0    |
| 8/31/2001 | 2,375 | 13,157,000  | 0 | 0.013471 | 50   |
| 9/3/2001  | 2,350 | 11,744,500  | 0 | 0.013471 | -25  |
| 9/4/2001  | 2,475 | 31,594,000  | 0 | 0.013471 | 125  |
| 9/5/2001  | 2,500 | 42,482,000  | 0 | 0.013471 | 25   |
| 9/6/2001  | 2,550 | 41,168,000  | 0 | 0.013471 | 50   |
| 9/7/2001  | 2,500 | 22,460,500  | 0 | 0.013471 | -50  |
| 9/10/2001 | 2,500 | 3,595,000   | 0 | 0.013471 | 0    |
| 9/11/2001 | 2,425 | 16,017,500  | 0 | 0.013471 | -75  |
| 9/12/2001 | 2,375 | 27,557,500  | 0 | 0.013471 | -50  |
| 9/13/2001 | 2,375 | 11,335,500  | 0 | 0.013471 | 0    |
| 9/14/2001 | 2,300 | 15,989,000  | 0 | 0.013471 | -75  |
| 9/17/2001 | 2,175 | 29,921,000  | 0 | 0.013471 | -125 |
| 9/18/2001 | 2,200 | 17,212,500  | 0 | 0.013471 | 25   |
| 9/19/2001 | 2,275 | 14,466,500  | 0 | 0.013471 | 75   |
| 9/20/2001 | 2,275 | 13,797,000  | 0 | 0.013471 | 0    |
| 9/21/2001 | 2,200 | 9,340,500   | 0 | 0.013471 | -75  |
| 9/25/2001 | 2,125 | 14,463,500  | 0 | 0.013471 | -75  |

|            |       |            |   |          |      |
|------------|-------|------------|---|----------|------|
| 9/26/2001  | 2,050 | 15,111,000 | 0 | 0.013471 | -75  |
| 9/27/2001  | 2,000 | 13,562,000 | 0 | 0.013471 | -50  |
| 10/1/2001  | 1,875 | 16,576,000 | 0 | 0.013471 | -125 |
| 10/2/2001  | 1,750 | 24,436,000 | 0 | 0.013471 | -125 |
| 10/3/2001  | 1,650 | 56,126,500 | 0 | 0.013471 | -100 |
| 10/4/2001  | 1,800 | 58,877,500 | 0 | 0.013471 | 150  |
| 10/5/2001  | 1,775 | 27,862,500 | 0 | 0.013471 | -25  |
| 10/8/2001  | 1,625 | 45,919,500 | 0 | 0.013471 | -150 |
| 10/9/2001  | 1,650 | 38,221,500 | 0 | 0.013471 | 25   |
| 10/10/2001 | 1,625 | 17,509,000 | 0 | 0.013471 | -25  |
| 10/11/2001 | 1,675 | 26,519,000 | 0 | 0.013471 | 50   |
| 10/12/2001 | 1,750 | 36,977,500 | 0 | 0.013471 | 75   |
| 10/16/2001 | 1,700 | 33,860,000 | 0 | 0.013471 | -50  |
| 10/17/2001 | 1,725 | 7,709,500  | 0 | 0.013471 | 25   |
| 10/18/2001 | 1,725 | 14,397,000 | 0 | 0.013471 | 0    |
| 10/19/2001 | 1,825 | 48,585,000 | 0 | 0.013471 | 100  |
| 10/22/2001 | 1,900 | 44,293,500 | 0 | 0.013471 | 75   |
| 10/23/2001 | 1,925 | 25,237,500 | 0 | 0.013471 | 25   |
| 10/24/2001 | 1,825 | 19,727,000 | 0 | 0.013471 | -100 |
| 10/25/2001 | 1,850 | 9,922,500  | 0 | 0.013471 | 25   |
| 10/26/2001 | 1,800 | 11,461,500 | 0 | 0.013471 | -50  |
| 10/29/2001 | 1,800 | 6,115,500  | 0 | 0.013471 | 0    |
| 10/30/2001 | 1,750 | 24,653,500 | 0 | 0.013471 | -50  |
| 10/31/2001 | 1,775 | 25,731,500 | 0 | 0.013471 | 25   |
| 11/1/2001  | 1,725 | 7,517,500  | 0 | 0.013471 | -50  |
| 11/2/2001  | 1,725 | 8,254,500  | 0 | 0.013471 | 0    |
| 11/5/2001  | 1,650 | 12,745,000 | 0 | 0.013471 | -75  |
| 11/6/2001  | 1,700 | 9,695,000  | 0 | 0.013471 | 50   |
| 11/7/2001  | 1,725 | 13,032,000 | 0 | 0.013471 | 25   |
| 11/8/2001  | 1,750 | 20,644,500 | 0 | 0.013471 | 25   |
| 11/12/2001 | 1,750 | 10,357,500 | 0 | 0.013471 | 0    |
| 11/13/2001 | 1,775 | 10,921,000 | 0 | 0.013471 | 25   |
| 11/14/2001 | 1,825 | 37,706,000 | 0 | 0.013471 | 50   |
| 11/15/2001 | 1,825 | 13,676,500 | 0 | 0.013471 | 0    |
| 11/16/2001 | 1,850 | 14,344,500 | 0 | 0.013471 | 25   |
| 11/19/2001 | 1,925 | 18,558,500 | 0 | 0.013471 | 75   |
| 11/20/2001 | 1,875 | 24,815,500 | 0 | 0.013471 | -50  |
| 11/21/2001 | 1,950 | 28,271,000 | 0 | 0.013471 | 75   |
| 11/22/2001 | 1,875 | 10,830,000 | 0 | 0.013471 | -75  |
| 11/23/2001 | 1,950 | 11,794,000 | 0 | 0.013471 | 75   |
| 11/26/2001 | 1,925 | 9,848,000  | 0 | 0.013471 | -25  |
| 11/27/2001 | 1,975 | 12,535,500 | 0 | 0.013471 | 50   |
| 11/28/2001 | 2,025 | 32,812,500 | 0 | 0.013471 | 50   |
| 11/29/2001 | 2,050 | 12,322,000 | 0 | 0.013471 | 25   |
| 11/30/2001 | 2,025 | 12,158,000 | 0 | 0.013471 | -25  |
| 12/3/2001  | 2,100 | 20,504,500 | 0 | 0.013471 | 75   |
| 12/4/2001  | 2,075 | 10,743,000 | 0 | 0.013471 | -25  |

|            |       |            |   |          |      |
|------------|-------|------------|---|----------|------|
| 12/5/2001  | 2,050 | 3,115,000  | 0 | 0.013471 | -25  |
| 12/6/2001  | 2,025 | 9,977,000  | 0 | 0.013471 | -25  |
| 12/7/2001  | 1,975 | 9,565,500  | 0 | 0.013471 | -50  |
| 12/10/2001 | 1,925 | 16,526,500 | 0 | 0.013471 | -50  |
| 12/11/2001 | 1,900 | 20,849,500 | 0 | 0.013471 | -25  |
| 12/12/2001 | 1,850 | 18,407,500 | 0 | 0.013471 | -50  |
| 12/13/2001 | 1,850 | 6,288,000  | 0 | 0.013471 | 0    |
| 12/19/2001 | 1,850 | 6,811,500  | 0 | 0.013471 | 0    |
| 12/20/2001 | 1,875 | 2,588,000  | 0 | 0.013471 | 25   |
| 12/21/2001 | 1,900 | 6,942,000  | 0 | 0.013471 | 25   |
| 12/26/2001 | 1,900 | 1,293,000  | 0 | 0.013471 | 0    |
| 12/27/2001 | 1,875 | 2,145,500  | 0 | 0.013471 | -25  |
| 12/28/2001 | 1,950 | 11,592,500 | 0 | 0.013471 | 75   |
| 1/2/2002   | 1,875 | 2,264,000  | 0 | 0.007718 | -75  |
| 1/4/2002   | 1,975 | 46,490,500 | 0 | 0.007718 | 100  |
| 1/7/2002   | 2,100 | 65,407,500 | 0 | 0.007718 | 125  |
| 1/8/2002   | 2,050 | 33,809,500 | 0 | 0.007718 | -50  |
| 1/9/2002   | 2,125 | 29,524,000 | 0 | 0.007718 | 75   |
| 1/10/2002  | 2,150 | 18,113,000 | 0 | 0.007718 | 25   |
| 1/11/2002  | 2,175 | 64,894,500 | 0 | 0.007718 | 25   |
| 1/14/2002  | 2,175 | 27,605,500 | 0 | 0.007718 | 0    |
| 1/15/2002  | 2,225 | 28,432,500 | 0 | 0.007718 | 50   |
| 1/16/2002  | 2,250 | 69,211,000 | 0 | 0.007718 | 25   |
| 1/17/2002  | 2,200 | 19,876,000 | 0 | 0.007718 | -50  |
| 1/18/2002  | 2,225 | 11,481,500 | 0 | 0.007718 | 25   |
| 1/21/2002  | 2,225 | 7,594,000  | 0 | 0.007718 | 0    |
| 1/22/2002  | 2,225 | 6,924,500  | 0 | 0.007718 | 0    |
| 1/23/2002  | 2,300 | 10,114,000 | 0 | 0.007718 | 75   |
| 1/24/2002  | 2,425 | 60,188,000 | 0 | 0.007718 | 125  |
| 1/25/2002  | 2,425 | 22,551,500 | 0 | 0.007718 | 0    |
| 1/28/2002  | 2,400 | 22,576,500 | 0 | 0.007718 | -25  |
| 1/29/2002  | 2,550 | 31,437,000 | 0 | 0.007718 | 150  |
| 1/30/2002  | 2,525 | 7,482,500  | 0 | 0.007718 | -25  |
| 2/1/2002   | 2,600 | 11,533,000 | 0 | 0.007718 | 75   |
| 2/4/2002   | 2,600 | 6,951,500  | 0 | 0.007718 | 0    |
| 2/5/2002   | 2,675 | 10,039,000 | 0 | 0.007718 | 75   |
| 2/6/2002   | 2,575 | 10,694,000 | 0 | 0.007718 | -100 |
| 2/7/2002   | 2,475 | 12,736,500 | 0 | 0.007718 | -100 |
| 2/8/2002   | 2,525 | 46,775,500 | 0 | 0.007718 | 50   |
| 2/11/2002  | 2,575 | 10,169,000 | 0 | 0.007718 | 50   |
| 2/13/2002  | 2,575 | 5,607,500  | 0 | 0.007718 | 0    |
| 2/14/2002  | 2,600 | 3,576,000  | 0 | 0.007718 | 25   |
| 2/15/2002  | 2,725 | 32,801,000 | 0 | 0.007718 | 125  |
| 2/18/2002  | 2,975 | 64,388,500 | 0 | 0.007718 | 250  |
| 2/19/2002  | 2,975 | 48,885,000 | 0 | 0.007718 | 0    |
| 2/20/2002  | 2,925 | 21,041,500 | 0 | 0.007718 | -50  |
| 2/21/2002  | 2,950 | 7,754,500  | 0 | 0.007718 | 25   |

|           |       |            |   |          |      |
|-----------|-------|------------|---|----------|------|
| 2/25/2002 | 2,875 | 16,719,500 | 0 | 0.007718 | -75  |
| 2/26/2002 | 2,850 | 2,869,000  | 0 | 0.007718 | -25  |
| 2/27/2002 | 2,875 | 10,230,500 | 0 | 0.007718 | 25   |
| 2/28/2002 | 2,725 | 35,534,500 | 0 | 0.007718 | -150 |
| 3/1/2002  | 2,600 | 30,979,000 | 0 | 0.007718 | -125 |
| 3/4/2002  | 2,650 | 14,138,500 | 0 | 0.007718 | 50   |
| 3/5/2002  | 2,675 | 24,888,500 | 0 | 0.007718 | 25   |
| 3/6/2002  | 2,725 | 31,273,000 | 0 | 0.007718 | 50   |
| 3/7/2002  | 2,825 | 36,546,000 | 0 | 0.007718 | 100  |
| 3/8/2002  | 2,750 | 12,796,500 | 0 | 0.007718 | -75  |
| 3/11/2002 | 2,775 | 6,398,000  | 0 | 0.007718 | 25   |
| 3/12/2002 | 2,750 | 15,265,000 | 0 | 0.007718 | -25  |
| 3/13/2002 | 2,800 | 15,436,500 | 0 | 0.007718 | 50   |
| 3/14/2002 | 2,725 | 10,451,500 | 0 | 0.007718 | -75  |
| 3/18/2002 | 2,750 | 7,058,000  | 0 | 0.007718 | 25   |
| 3/19/2002 | 2,725 | 4,428,000  | 0 | 0.007718 | -25  |
| 3/20/2002 | 2,750 | 7,918,000  | 0 | 0.007718 | 25   |
| 3/21/2002 | 2,750 | 32,008,000 | 0 | 0.007718 | 0    |
| 3/22/2002 | 2,550 | 55,287,000 | 0 | 0.007718 | -200 |
| 3/25/2002 | 2,575 | 13,712,500 | 0 | 0.007718 | 25   |
| 3/26/2002 | 2,625 | 8,585,000  | 0 | 0.007718 | 50   |
| 3/27/2002 | 2,600 | 5,493,500  | 0 | 0.007718 | -25  |
| 3/28/2002 | 2,550 | 10,236,000 | 0 | 0.007718 | -50  |
| 4/1/2002  | 2,700 | 18,357,000 | 0 | 0.007718 | 150  |
| 4/2/2002  | 2,725 | 29,541,500 | 0 | 0.007718 | 25   |
| 4/3/2002  | 2,725 | 4,369,500  | 0 | 0.007718 | 0    |
| 4/4/2002  | 2,750 | 13,232,500 | 0 | 0.007718 | 25   |
| 4/5/2002  | 2,975 | 64,871,000 | 0 | 0.007718 | 225  |
| 4/8/2002  | 3,075 | 50,845,000 | 0 | 0.007718 | 100  |
| 4/9/2002  | 3,200 | 34,985,000 | 0 | 0.007718 | 125  |
| 4/10/2002 | 3,500 | 48,520,500 | 0 | 0.007718 | 300  |
| 4/11/2002 | 3,250 | 56,692,000 | 0 | 0.007718 | -250 |
| 4/12/2002 | 3,400 | 25,650,500 | 0 | 0.007718 | 150  |
| 4/15/2002 | 3,575 | 24,598,000 | 0 | 0.007718 | 175  |
| 4/16/2002 | 3,850 | 62,077,500 | 0 | 0.007718 | 275  |
| 4/17/2002 | 4,150 | 60,643,000 | 0 | 0.007718 | 300  |
| 4/18/2002 | 3,875 | 37,985,500 | 0 | 0.007718 | -275 |
| 4/19/2002 | 3,900 | 20,090,000 | 0 | 0.007718 | 25   |
| 4/22/2002 | 3,850 | 13,092,000 | 0 | 0.007718 | -50  |
| 4/23/2002 | 3,850 | 5,907,500  | 0 | 0.007718 | 0    |
| 4/24/2002 | 3,900 | 9,305,500  | 0 | 0.007718 | 50   |
| 4/25/2002 | 3,875 | 3,548,500  | 0 | 0.007718 | -25  |
| 4/26/2002 | 3,825 | 6,452,500  | 0 | 0.007718 | -50  |
| 4/29/2002 | 3,675 | 7,628,000  | 0 | 0.007718 | -150 |
| 4/30/2002 | 3,900 | 18,225,500 | 0 | 0.007718 | 225  |
| 5/1/2002  | 3,850 | 7,828,500  | 0 | 0.007718 | -50  |
| 5/2/2002  | 3,800 | 11,789,000 | 0 | 0.007718 | -50  |

|           |       |            |   |          |      |
|-----------|-------|------------|---|----------|------|
| 5/3/2002  | 3,925 | 19,461,500 | 0 | 0.007718 | 125  |
| 5/6/2002  | 3,875 | 5,737,500  | 0 | 0.007718 | -50  |
| 5/7/2002  | 3,900 | 3,388,000  | 0 | 0.007718 | 25   |
| 5/8/2002  | 4,000 | 18,479,500 | 0 | 0.007718 | 100  |
| 5/10/2002 | 4,200 | 22,133,000 | 0 | 0.007718 | 200  |
| 5/13/2002 | 4,200 | 19,604,000 | 0 | 0.007718 | 0    |
| 5/14/2002 | 4,225 | 13,291,500 | 0 | 0.007718 | 25   |
| 5/15/2002 | 4,150 | 5,253,500  | 0 | 0.007718 | -75  |
| 5/16/2002 | 4,175 | 7,701,000  | 0 | 0.007718 | 25   |
| 5/17/2002 | 4,250 | 9,446,000  | 0 | 0.007718 | 75   |
| 5/20/2002 | 4,200 | 10,204,500 | 0 | 0.007718 | -50  |
| 5/21/2002 | 4,200 | 4,951,000  | 0 | 0.007718 | 0    |
| 5/22/2002 | 4,000 | 8,267,500  | 0 | 0.007718 | -200 |
| 5/23/2002 | 3,800 | 17,778,500 | 0 | 0.007718 | -200 |
| 5/24/2002 | 3,850 | 4,539,000  | 0 | 0.007718 | 50   |
| 5/27/2002 | 3,900 | 2,187,000  | 0 | 0.007718 | 50   |
| 5/28/2002 | 4,000 | 9,216,500  | 0 | 0.007718 | 100  |
| 5/29/2002 | 4,275 | 20,052,000 | 0 | 0.007718 | 275  |
| 5/30/2002 | 4,400 | 25,952,500 | 0 | 0.007718 | 125  |
| 5/31/2002 | 4,425 | 19,028,000 | 0 | 0.007718 | 25   |
| 6/3/2002  | 4,325 | 4,436,000  | 0 | 0.007718 | -100 |
| 6/4/2002  | 4,400 | 9,606,500  | 0 | 0.007718 | 75   |
| 6/5/2002  | 4,325 | 4,516,500  | 0 | 0.007718 | -75  |
| 6/6/2002  | 4,150 | 5,435,000  | 0 | 0.007718 | -175 |
| 6/7/2002  | 4,175 | 4,478,500  | 0 | 0.007718 | 25   |
| 6/10/2002 | 4,200 | 3,831,000  | 0 | 0.007718 | 25   |
| 6/11/2002 | 4,350 | 18,705,000 | 0 | 0.007718 | 150  |
| 6/12/2002 | 4,525 | 24,747,500 | 0 | 0.007718 | 175  |
| 6/13/2002 | 4,725 | 35,933,000 | 0 | 0.007718 | 200  |
| 6/14/2002 | 5,000 | 18,761,000 | 0 | 0.007718 | 275  |
| 6/17/2002 | 4,900 | 8,578,000  | 0 | 0.007718 | -100 |
| 6/18/2002 | 4,725 | 5,154,000  | 0 | 0.007718 | -175 |
| 6/19/2002 | 4,600 | 3,744,000  | 0 | 0.007718 | -125 |
| 6/20/2002 | 4,575 | 4,517,500  | 0 | 0.007718 | -25  |
| 6/21/2002 | 4,525 | 2,872,500  | 0 | 0.007718 | -50  |
| 6/24/2002 | 4,600 | 4,307,500  | 0 | 0.007718 | 75   |
| 6/25/2002 | 4,500 | 7,231,000  | 0 | 0.007718 | -100 |
| 6/26/2002 | 4,225 | 9,357,500  | 0 | 0.007718 | -275 |
| 6/27/2002 | 4,275 | 12,698,000 | 0 | 0.007718 | 50   |
| 6/28/2002 | 4,250 | 4,372,500  | 0 | 0.007718 | -25  |
| 7/1/2002  | 3,975 | 10,413,000 | 0 | 0.007718 | -275 |
| 7/2/2002  | 4,175 | 15,365,500 | 0 | 0.007718 | 200  |
| 7/3/2002  | 4,250 | 4,757,500  | 0 | 0.007718 | 75   |
| 7/4/2002  | 4,250 | 7,481,000  | 0 | 0.007718 | 0    |
| 7/5/2002  | 4,175 | 3,297,500  | 0 | 0.007718 | -75  |
| 7/8/2002  | 4,025 | 5,403,000  | 0 | 0.007718 | -150 |
| 7/9/2002  | 3,850 | 6,364,500  | 0 | 0.007718 | -175 |

|           |       |            |   |          |      |
|-----------|-------|------------|---|----------|------|
| 7/10/2002 | 3,850 | 3,045,000  | 0 | 0.007718 | 0    |
| 7/11/2002 | 3,725 | 4,518,000  | 0 | 0.007718 | -125 |
| 7/12/2002 | 4,050 | 11,280,500 | 0 | 0.007718 | 325  |
| 7/15/2002 | 4,075 | 5,689,500  | 0 | 0.007718 | 25   |
| 7/16/2002 | 4,150 | 3,392,500  | 0 | 0.007718 | 75   |
| 7/17/2002 | 4,375 | 8,040,000  | 0 | 0.007718 | 225  |
| 7/18/2002 | 4,450 | 5,584,500  | 0 | 0.007718 | 75   |
| 7/19/2002 | 4,375 | 2,486,000  | 0 | 0.007718 | -75  |
| 7/22/2002 | 4,175 | 5,488,500  | 0 | 0.007718 | -200 |
| 7/23/2002 | 4,175 | 4,415,500  | 0 | 0.007718 | 0    |
| 7/24/2002 | 3,950 | 4,649,500  | 0 | 0.007718 | -225 |
| 7/25/2002 | 3,975 | 6,359,000  | 0 | 0.007718 | 25   |
| 7/26/2002 | 3,825 | 2,812,500  | 0 | 0.007718 | -150 |
| 7/29/2002 | 3,850 | 11,275,000 | 0 | 0.007718 | 25   |
| 7/30/2002 | 3,775 | 10,680,000 | 0 | 0.007718 | -75  |
| 7/31/2002 | 3,725 | 12,382,000 | 0 | 0.007718 | -50  |
| 8/1/2002  | 3,325 | 33,684,000 | 0 | 0.007718 | -400 |
| 8/2/2002  | 3,350 | 43,926,000 | 0 | 0.007718 | 25   |
| 8/5/2002  | 3,200 | 9,185,500  | 0 | 0.007718 | -150 |
| 8/6/2002  | 3,025 | 21,956,500 | 0 | 0.007718 | -175 |
| 8/7/2002  | 3,250 | 18,950,000 | 0 | 0.007718 | 225  |
| 8/8/2002  | 3,250 | 11,496,500 | 0 | 0.007718 | 0    |
| 8/9/2002  | 3,250 | 5,814,500  | 0 | 0.007718 | 0    |
| 8/12/2002 | 3,325 | 2,828,500  | 0 | 0.007718 | 75   |
| 8/13/2002 | 3,300 | 3,604,500  | 0 | 0.007718 | -25  |
| 8/14/2002 | 3,200 | 5,854,500  | 0 | 0.007718 | -100 |
| 8/15/2002 | 3,125 | 6,487,000  | 0 | 0.007718 | -75  |
| 8/16/2002 | 3,150 | 14,620,000 | 0 | 0.007718 | 25   |
| 8/19/2002 | 3,325 | 7,031,000  | 0 | 0.007718 | 175  |
| 8/20/2002 | 3,575 | 21,554,500 | 0 | 0.007718 | 250  |
| 8/21/2002 | 3,650 | 17,193,500 | 0 | 0.007718 | 75   |
| 8/22/2002 | 3,525 | 7,875,500  | 0 | 0.007718 | -125 |
| 8/26/2002 | 3,475 | 2,122,000  | 0 | 0.007718 | -50  |
| 8/27/2002 | 3,375 | 1,275,500  | 0 | 0.007718 | -100 |
| 8/28/2002 | 3,175 | 9,204,000  | 0 | 0.007718 | -200 |
| 8/29/2002 | 3,075 | 15,092,500 | 0 | 0.007718 | -100 |
| 8/30/2002 | 3,200 | 7,805,000  | 0 | 0.007718 | 125  |
| 9/2/2002  | 3,200 | 3,548,500  | 0 | 0.007718 | 0    |
| 9/3/2002  | 3,200 | 8,377,500  | 0 | 0.007718 | 0    |
| 9/4/2002  | 3,125 | 9,455,500  | 0 | 0.007718 | -75  |
| 9/5/2002  | 3,200 | 15,789,500 | 0 | 0.007718 | 75   |
| 9/6/2002  | 3,200 | 5,002,000  | 0 | 0.007718 | 0    |
| 9/9/2002  | 3,250 | 3,506,000  | 0 | 0.007718 | 50   |
| 9/10/2002 | 3,250 | 7,040,500  | 0 | 0.007718 | 0    |
| 9/11/2002 | 3,200 | 2,824,000  | 0 | 0.007718 | -50  |
| 9/12/2002 | 3,150 | 7,377,500  | 0 | 0.007718 | -50  |
| 9/13/2002 | 3,075 | 3,350,000  | 0 | 0.007718 | -75  |

|            |       |             |   |          |      |
|------------|-------|-------------|---|----------|------|
| 9/16/2002  | 3,050 | 2,070,500   | 0 | 0.007718 | -25  |
| 9/17/2002  | 3,150 | 6,646,000   | 0 | 0.007718 | 100  |
| 9/18/2002  | 3,050 | 5,454,500   | 0 | 0.007718 | -100 |
| 9/19/2002  | 2,575 | 42,531,500  | 0 | 0.007718 | -475 |
| 9/20/2002  | 2,425 | 29,430,000  | 0 | 0.007718 | -150 |
| 9/23/2002  | 2,500 | 16,747,500  | 0 | 0.007718 | 75   |
| 9/24/2002  | 2,500 | 10,540,500  | 0 | 0.007718 | 0    |
| 9/25/2002  | 2,625 | 11,757,500  | 0 | 0.007718 | 125  |
| 9/26/2002  | 2,700 | 16,113,500  | 0 | 0.007718 | 75   |
| 9/27/2002  | 2,750 | 16,588,000  | 0 | 0.007718 | 50   |
| 9/30/2002  | 2,675 | 8,174,500   | 0 | 0.007718 | -75  |
| 10/1/2002  | 2,650 | 2,199,500   | 0 | 0.007718 | -25  |
| 10/2/2002  | 2,600 | 7,603,500   | 0 | 0.007718 | -50  |
| 10/3/2002  | 2,625 | 2,491,500   | 0 | 0.007718 | 25   |
| 10/7/2002  | 2,425 | 10,079,500  | 0 | 0.007718 | -200 |
| 10/8/2002  | 2,275 | 25,712,500  | 0 | 0.007718 | -150 |
| 10/9/2002  | 2,100 | 27,014,500  | 0 | 0.007718 | -175 |
| 10/10/2002 | 2,125 | 24,917,500  | 0 | 0.007718 | 25   |
| 10/11/2002 | 2,100 | 11,624,500  | 0 | 0.007718 | -25  |
| 10/14/2002 | 1,800 | 33,331,500  | 0 | 0.007718 | -300 |
| 10/15/2002 | 1,700 | 184,072,000 | 0 | 0.007718 | -100 |
| 10/16/2002 | 1,700 | 85,493,000  | 0 | 0.007718 | 0    |
| 10/17/2002 | 1,725 | 32,273,000  | 0 | 0.007718 | 25   |
| 10/18/2002 | 1,825 | 42,729,000  | 0 | 0.007718 | 100  |
| 10/21/2002 | 1,950 | 32,322,000  | 0 | 0.007718 | 125  |
| 10/22/2002 | 1,900 | 30,142,500  | 0 | 0.007718 | -50  |
| 10/23/2002 | 1,925 | 18,884,000  | 0 | 0.007718 | 25   |
| 10/24/2002 | 1,900 | 2,568,500   | 0 | 0.007718 | -25  |
| 10/25/2002 | 1,900 | 8,023,500   | 0 | 0.007718 | 0    |
| 10/28/2002 | 2,000 | 11,069,500  | 0 | 0.007718 | 100  |
| 10/29/2002 | 2,125 | 29,327,500  | 0 | 0.007718 | 125  |
| 10/30/2002 | 2,075 | 17,534,500  | 0 | 0.007718 | -50  |
| 10/31/2002 | 2,075 | 25,744,000  | 0 | 0.007718 | 0    |
| 11/1/2002  | 2,075 | 27,148,000  | 0 | 0.007718 | 0    |
| 11/4/2002  | 2,100 | 23,006,000  | 0 | 0.007718 | 25   |
| 11/5/2002  | 2,050 | 21,715,500  | 0 | 0.007718 | -50  |
| 11/6/2002  | 1,925 | 24,689,500  | 0 | 0.007718 | -125 |
| 11/7/2002  | 1,900 | 15,411,000  | 0 | 0.007718 | -25  |
| 11/8/2002  | 1,825 | 16,427,500  | 0 | 0.007718 | -75  |
| 11/11/2002 | 1,825 | 8,850,500   | 0 | 0.007718 | 0    |
| 11/12/2002 | 1,925 | 12,004,500  | 0 | 0.007718 | 100  |
| 11/13/2002 | 1,875 | 10,627,000  | 0 | 0.007718 | -50  |
| 11/14/2002 | 1,900 | 8,885,500   | 0 | 0.007718 | 25   |
| 11/15/2002 | 1,925 | 17,734,500  | 0 | 0.007718 | 25   |
| 11/18/2002 | 1,725 | 35,248,000  | 0 | 0.007718 | -200 |
| 11/19/2002 | 1,825 | 32,817,500  | 0 | 0.007718 | 100  |
| 11/20/2002 | 1,975 | 40,184,000  | 0 | 0.007718 | 150  |

|            |       |            |          |          |      |
|------------|-------|------------|----------|----------|------|
| 11/21/2002 | 2,025 | 22,046,500 | 0        | 0.007718 | 50   |
| 11/22/2002 | 2,450 | 65,049,500 | 0        | 0.007718 | 425  |
| 11/25/2002 | 2,575 | 60,096,500 | 0        | 0.007718 | 125  |
| 11/26/2002 | 2,400 | 32,182,500 | 0        | 0.007718 | -175 |
| 11/27/2002 | 2,450 | 19,364,500 | 0        | 0.007718 | 50   |
| 11/28/2002 | 2,500 | 10,775,000 | 0        | 0.007718 | 50   |
| 11/29/2002 | 2,500 | 2,966,000  | 0        | 0.007718 | 0    |
| 12/3/2002  | 2,750 | 13,983,000 | 0        | 0.007718 | 250  |
| 12/4/2002  | 2,675 | 2,946,000  | 0        | 0.007718 | -75  |
| 12/11/2002 | 2,625 | 9,424,000  | 0        | 0.007718 | -50  |
| 12/12/2002 | 2,600 | 23,076,500 | 0        | 0.007718 | -25  |
| 12/13/2002 | 2,525 | 7,367,500  | 0        | 0.007718 | -75  |
| 12/16/2002 | 2,400 | 8,638,500  | 0        | 0.007718 | -125 |
| 12/17/2002 | 2,625 | 14,708,000 | 0        | 0.007718 | 225  |
| 12/18/2002 | 2,800 | 38,465,500 | 0        | 0.007718 | 175  |
| 12/19/2002 | 3,250 | 27,128,000 | 0        | 0.007718 | 450  |
| 12/20/2002 | 3,325 | 26,644,500 | 0        | 0.007718 | 75   |
| 12/23/2002 | 3,475 | 13,584,500 | 0        | 0.007718 | 150  |
| 12/27/2002 | 3,150 | 6,875,500  | 0        | 0.007718 | -325 |
| 1/2/2003   | 2,925 | 6,623,000  | 0.702479 | 0.016901 | -225 |
| 1/3/2003   | 3,150 | 8,621,500  | 0.702479 | 0.016901 | 225  |
| 1/6/2003   | 3,125 | 9,659,500  | 0.702479 | 0.016901 | -25  |
| 1/7/2003   | 3,000 | 9,515,500  | 0.702479 | 0.016901 | -125 |
| 1/8/2003   | 2,600 | 16,767,500 | 0.702479 | 0.016901 | -400 |
| 1/9/2003   | 2,850 | 20,003,500 | 0.702479 | 0.016901 | 250  |
| 1/10/2003  | 2,300 | 16,740,500 | 0.702479 | 0.016901 | -550 |
| 1/13/2003  | 2,200 | 10,273,000 | 0.702479 | 0.016901 | -100 |
| 1/14/2003  | 2,325 | 20,949,000 | 0.702479 | 0.016901 | 125  |
| 1/15/2003  | 2,375 | 16,041,000 | 0.702479 | 0.016901 | 50   |
| 1/16/2003  | 2,400 | 8,074,000  | 0.702479 | 0.016901 | 25   |
| 1/17/2003  | 2,425 | 10,331,500 | 0.702479 | 0.016901 | 25   |
| 1/20/2003  | 2,425 | 3,896,500  | 0.702479 | 0.016901 | 0    |
| 1/21/2003  | 2,350 | 3,291,000  | 0.702479 | 0.016901 | -75  |
| 1/22/2003  | 2,425 | 17,985,000 | 0.702479 | 0.016901 | 75   |
| 1/23/2003  | 2,450 | 6,919,000  | 0.702479 | 0.016901 | 25   |
| 1/24/2003  | 2,350 | 9,721,000  | 0.702479 | 0.016901 | -100 |
| 1/27/2003  | 2,200 | 9,337,500  | 0.702479 | 0.016901 | -150 |
| 1/28/2003  | 2,150 | 42,570,000 | 0.702479 | 0.016901 | -50  |
| 1/29/2003  | 2,100 | 17,654,000 | 0.702479 | 0.016901 | -50  |
| 1/30/2003  | 2,075 | 13,734,500 | 0.702479 | 0.016901 | -25  |
| 1/31/2003  | 2,100 | 7,157,000  | 0.702479 | 0.016901 | 25   |
| 2/3/2003   | 2,250 | 16,399,000 | 0.702479 | 0.016901 | 150  |
| 2/4/2003   | 2,375 | 15,374,000 | 0.702479 | 0.016901 | 125  |
| 2/5/2003   | 2,400 | 10,412,500 | 0.702479 | 0.016901 | 25   |
| 2/6/2003   | 2,425 | 15,854,500 | 0.702479 | 0.016901 | 25   |
| 2/7/2003   | 2,450 | 4,371,000  | 0.702479 | 0.016901 | 25   |
| 2/10/2003  | 2,375 | 4,418,500  | 0.702479 | 0.016901 | -75  |

|           |       |            |          |          |      |
|-----------|-------|------------|----------|----------|------|
| 2/11/2003 | 2,350 | 4,533,000  | 0.702479 | 0.016901 | -25  |
| 2/13/2003 | 2,400 | 13,895,000 | 0.702479 | 0.016901 | 50   |
| 2/14/2003 | 2,400 | 3,849,000  | 0.702479 | 0.016901 | 0    |
| 2/17/2003 | 2,425 | 13,720,500 | 0.702479 | 0.016901 | 25   |
| 2/18/2003 | 2,450 | 3,481,500  | 0.702479 | 0.016901 | 25   |
| 2/19/2003 | 2,400 | 7,297,000  | 0.702479 | 0.016901 | -50  |
| 2/20/2003 | 2,325 | 7,224,500  | 0.702479 | 0.016901 | -75  |
| 2/21/2003 | 2,375 | 6,267,000  | 0.702479 | 0.016901 | 50   |
| 2/24/2003 | 2,400 | 3,667,500  | 0.702479 | 0.016901 | 25   |
| 2/25/2003 | 2,350 | 6,446,000  | 0.702479 | 0.016901 | -50  |
| 2/26/2003 | 2,250 | 10,102,500 | 0.702479 | 0.016901 | -100 |
| 2/27/2003 | 2,300 | 6,291,000  | 0.702479 | 0.016901 | 50   |
| 2/28/2003 | 2,350 | 6,145,000  | 0.702479 | 0.016901 | 50   |
| 3/4/2003  | 2,350 | 3,906,000  | 0.702479 | 0.016901 | 0    |
| 3/5/2003  | 2,300 | 2,840,500  | 0.702479 | 0.016901 | -50  |
| 3/6/2003  | 2,325 | 3,455,000  | 0.702479 | 0.016901 | 25   |
| 3/7/2003  | 2,325 | 6,919,000  | 0.702479 | 0.016901 | 0    |
| 3/10/2003 | 2,275 | 14,943,500 | 0.702479 | 0.016901 | -50  |
| 3/11/2003 | 2,275 | 15,362,000 | 0.702479 | 0.016901 | 0    |
| 3/12/2003 | 2,300 | 2,397,500  | 0.702479 | 0.016901 | 25   |
| 3/13/2003 | 2,325 | 2,288,000  | 0.702479 | 0.016901 | 25   |
| 3/14/2003 | 2,325 | 3,764,000  | 0.702479 | 0.016901 | 0    |
| 3/17/2003 | 2,325 | 3,060,500  | 0.702479 | 0.016901 | 0    |
| 3/18/2003 | 2,325 | 6,506,500  | 0.702479 | 0.016901 | 0    |
| 3/19/2003 | 2,300 | 1,208,000  | 0.702479 | 0.016901 | -25  |
| 3/20/2003 | 2,400 | 14,722,500 | 0.702479 | 0.016901 | 100  |
| 3/21/2003 | 2,450 | 19,307,000 | 0.702479 | 0.016901 | 50   |
| 3/24/2003 | 2,425 | 15,223,500 | 0.702479 | 0.016901 | -25  |
| 3/25/2003 | 2,475 | 18,953,500 | 0.702479 | 0.016901 | 50   |
| 3/26/2003 | 2,475 | 19,828,000 | 0.702479 | 0.016901 | 0    |
| 3/27/2003 | 2,575 | 26,871,500 | 0.702479 | 0.016901 | 100  |
| 3/28/2003 | 2,600 | 10,932,500 | 0.702479 | 0.016901 | 25   |
| 3/31/2003 | 2,500 | 12,520,000 | 0.702479 | 0.016901 | -100 |
| 4/1/2003  | 2,550 | 4,602,500  | 0.702479 | 0.016901 | 50   |
| 4/3/2003  | 2,600 | 6,442,000  | 0.702479 | 0.016901 | 50   |
| 4/4/2003  | 2,725 | 13,360,000 | 0.702479 | 0.016901 | 125  |
| 4/7/2003  | 3,000 | 22,810,500 | 0.702479 | 0.016901 | 275  |
| 4/8/2003  | 2,950 | 14,900,500 | 0.702479 | 0.016901 | -50  |
| 4/9/2003  | 3,000 | 28,511,500 | 0.702479 | 0.016901 | 50   |
| 4/10/2003 | 3,050 | 12,043,000 | 0.702479 | 0.016901 | 50   |
| 4/11/2003 | 3,050 | 13,369,500 | 0.702479 | 0.016901 | 0    |
| 4/14/2003 | 3,000 | 4,980,500  | 0.702479 | 0.016901 | -50  |
| 4/15/2003 | 3,025 | 10,475,000 | 0.702479 | 0.016901 | 25   |
| 4/16/2003 | 3,150 | 35,645,000 | 0.702479 | 0.016901 | 125  |
| 4/17/2003 | 3,125 | 11,693,000 | 0.702479 | 0.016901 | -25  |
| 4/21/2003 | 3,100 | 4,403,000  | 0.702479 | 0.016901 | -25  |
| 4/22/2003 | 3,050 | 9,690,500  | 0.702479 | 0.016901 | -50  |

|           |       |            |          |          |      |
|-----------|-------|------------|----------|----------|------|
| 4/23/2003 | 3,050 | 12,397,500 | 0.702479 | 0.016901 | 0    |
| 4/24/2003 | 3,100 | 10,600,000 | 0.702479 | 0.016901 | 50   |
| 4/25/2003 | 2,925 | 24,875,500 | 0.702479 | 0.016901 | -175 |
| 4/28/2003 | 2,875 | 27,498,500 | 0.702479 | 0.016901 | -50  |
| 4/29/2003 | 3,050 | 14,324,500 | 0.702479 | 0.016901 | 175  |
| 4/30/2003 | 3,025 | 21,583,500 | 0.702479 | 0.016901 | -25  |
| 5/1/2003  | 3,050 | 11,359,000 | 0.702479 | 0.016901 | 25   |
| 5/2/2003  | 3,025 | 2,095,500  | 0.702479 | 0.016901 | -25  |
| 5/5/2003  | 3,125 | 17,611,000 | 0.702479 | 0.016901 | 100  |
| 5/6/2003  | 3,275 | 32,821,000 | 0.702479 | 0.016901 | 150  |
| 5/7/2003  | 3,475 | 32,421,500 | 0.702479 | 0.016901 | 200  |
| 5/8/2003  | 3,450 | 20,711,000 | 0.702479 | 0.016901 | -25  |
| 5/9/2003  | 3,400 | 17,160,000 | 0.702479 | 0.016901 | -50  |
| 5/12/2003 | 3,425 | 6,850,500  | 0.702479 | 0.016901 | 25   |
| 5/13/2003 | 3,400 | 10,935,000 | 0.702479 | 0.016901 | -25  |
| 5/14/2003 | 3,250 | 21,954,000 | 0.702479 | 0.016901 | -150 |
| 5/19/2003 | 3,050 | 24,863,500 | 0.702479 | 0.016901 | -200 |
| 5/20/2003 | 3,200 | 27,510,000 | 0.702479 | 0.016901 | 150  |
| 5/21/2003 | 3,175 | 20,441,000 | 0.702479 | 0.016901 | -25  |
| 5/22/2003 | 3,250 | 6,626,500  | 0.702479 | 0.016901 | 75   |
| 5/23/2003 | 3,350 | 16,449,000 | 0.702479 | 0.016901 | 100  |
| 5/26/2003 | 3,550 | 29,711,000 | 0.702479 | 0.016901 | 200  |
| 5/27/2003 | 3,600 | 14,490,000 | 0.702479 | 0.016901 | 50   |
| 5/28/2003 | 3,625 | 21,513,500 | 0.702479 | 0.016901 | 25   |
| 5/29/2003 | 3,600 | 12,280,500 | 0.702479 | 0.016901 | -25  |
| 6/2/2003  | 3,625 | 8,964,000  | 0.702479 | 0.016901 | 25   |
| 6/3/2003  | 3,550 | 9,933,000  | 0.702479 | 0.016901 | -75  |
| 6/4/2003  | 3,575 | 6,544,000  | 0.702479 | 0.016901 | 25   |
| 6/5/2003  | 3,600 | 14,220,500 | 0.702479 | 0.016901 | 25   |
| 6/6/2003  | 3,650 | 7,735,000  | 0.702479 | 0.016901 | 50   |
| 6/9/2003  | 3,750 | 11,843,500 | 0.702479 | 0.016901 | 100  |
| 6/10/2003 | 3,725 | 5,069,000  | 0.702479 | 0.016901 | -25  |
| 6/11/2003 | 3,625 | 16,498,000 | 0.702479 | 0.016901 | -100 |
| 6/12/2003 | 3,575 | 10,364,500 | 0.702479 | 0.016901 | -50  |
| 6/13/2003 | 3,625 | 7,962,000  | 0.702479 | 0.016901 | 50   |
| 6/16/2003 | 3,675 | 4,769,000  | 0.702479 | 0.016901 | 50   |
| 6/17/2003 | 3,525 | 11,032,000 | 0.702479 | 0.016901 | -150 |
| 6/18/2003 | 3,525 | 10,550,000 | 0.702479 | 0.016901 | 0    |
| 6/19/2003 | 3,650 | 11,272,000 | 0.702479 | 0.016901 | 125  |
| 6/20/2003 | 3,700 | 11,331,000 | 0.702479 | 0.016901 | 50   |
| 6/23/2003 | 3,650 | 6,619,000  | 0.702479 | 0.016901 | -50  |
| 6/24/2003 | 3,550 | 9,482,500  | 0.702479 | 0.016901 | -100 |
| 6/25/2003 | 3,500 | 6,791,500  | 0.702479 | 0.016901 | -50  |
| 6/26/2003 | 3,550 | 10,666,500 | 0.702479 | 0.016901 | 50   |
| 6/27/2003 | 3,650 | 11,189,000 | 0.702479 | 0.016901 | 100  |
| 6/30/2003 | 3,575 | 5,385,000  | 0.702479 | 0.016901 | -75  |
| 7/1/2003  | 3,600 | 3,031,500  | 0.702479 | 0.016901 | 25   |

|           |       |            |          |          |      |
|-----------|-------|------------|----------|----------|------|
| 7/2/2003  | 3,650 | 5,216,000  | 0.702479 | 0.016901 | 50   |
| 7/3/2003  | 3,575 | 10,991,000 | 0.702479 | 0.016901 | -75  |
| 7/4/2003  | 3,575 | 1,906,000  | 0.702479 | 0.016901 | 0    |
| 7/7/2003  | 3,650 | 6,465,000  | 0.702479 | 0.016901 | 75   |
| 7/8/2003  | 3,800 | 20,738,500 | 0.702479 | 0.016901 | 150  |
| 7/9/2003  | 3,825 | 6,296,000  | 0.702479 | 0.016901 | 25   |
| 7/10/2003 | 3,850 | 6,369,000  | 0.702479 | 0.016901 | 25   |
| 7/11/2003 | 4,100 | 19,057,500 | 0.702479 | 0.016901 | 250  |
| 7/14/2003 | 4,250 | 14,372,500 | 0.702479 | 0.016901 | 150  |
| 7/15/2003 | 4,250 | 13,850,000 | 0.702479 | 0.016901 | 0    |
| 7/16/2003 | 3,975 | 14,423,000 | 0.702479 | 0.016901 | -275 |
| 7/17/2003 | 3,875 | 13,021,500 | 0.702479 | 0.016901 | -100 |
| 7/18/2003 | 3,900 | 3,329,500  | 0.702479 | 0.016901 | 25   |
| 7/21/2003 | 3,925 | 7,966,000  | 0.702479 | 0.016901 | 25   |
| 7/22/2003 | 3,900 | 12,364,500 | 0.702479 | 0.016901 | -25  |
| 7/23/2003 | 3,850 | 7,294,500  | 0.702479 | 0.016901 | -50  |
| 7/24/2003 | 3,750 | 20,243,500 | 0.702479 | 0.016901 | -100 |
| 7/25/2003 | 3,750 | 7,743,500  | 0.702479 | 0.016901 | 0    |
| 7/28/2003 | 3,750 | 5,621,500  | 0.702479 | 0.016901 | 0    |
| 7/29/2003 | 3,750 | 3,898,500  | 0.702479 | 0.016901 | 0    |
| 7/30/2003 | 3,825 | 5,680,000  | 0.702479 | 0.016901 | 75   |
| 7/31/2003 | 3,800 | 3,277,500  | 0.702479 | 0.016901 | -25  |
| 8/1/2003  | 3,750 | 2,769,500  | 0.702479 | 0.016901 | -50  |
| 8/4/2003  | 3,725 | 4,552,000  | 0.702479 | 0.016901 | -25  |
| 8/5/2003  | 3,475 | 22,258,000 | 0.702479 | 0.016901 | -250 |
| 8/6/2003  | 3,650 | 28,101,000 | 0.702479 | 0.016901 | 175  |
| 8/7/2003  | 3,875 | 15,208,000 | 0.702479 | 0.016901 | 225  |
| 8/8/2003  | 3,825 | 4,105,500  | 0.702479 | 0.016901 | -50  |
| 8/11/2003 | 3,825 | 2,316,500  | 0.702479 | 0.016901 | 0    |
| 8/12/2003 | 3,825 | 1,478,000  | 0.702479 | 0.016901 | 0    |
| 8/13/2003 | 3,825 | 3,332,500  | 0.702479 | 0.016901 | 0    |
| 8/14/2003 | 3,700 | 8,826,500  | 0.702479 | 0.016901 | -125 |
| 8/15/2003 | 3,750 | 16,287,500 | 0.702479 | 0.016901 | 50   |
| 8/19/2003 | 3,750 | 23,109,500 | 0.702479 | 0.016901 | 0    |
| 8/20/2003 | 3,800 | 8,633,500  | 0.702479 | 0.016901 | 50   |
| 8/21/2003 | 3,800 | 14,668,000 | 0.702479 | 0.016901 | 0    |
| 8/22/2003 | 3,800 | 11,517,500 | 0.702479 | 0.016901 | 0    |
| 8/25/2003 | 3,800 | 2,883,000  | 0.702479 | 0.016901 | 0    |
| 8/26/2003 | 3,800 | 4,949,000  | 0.702479 | 0.016901 | 0    |
| 8/27/2003 | 3,800 | 14,970,000 | 0.702479 | 0.016901 | 0    |
| 8/28/2003 | 3,800 | 4,223,000  | 0.702479 | 0.016901 | 0    |
| 8/29/2003 | 3,800 | 13,159,500 | 0.702479 | 0.016901 | 0    |
| 9/1/2003  | 3,800 | 14,363,000 | 0.702479 | 0.016901 | 0    |
| 9/2/2003  | 3,850 | 18,919,000 | 0.702479 | 0.016901 | 50   |
| 9/3/2003  | 4,075 | 55,362,000 | 0.702479 | 0.016901 | 225  |
| 9/4/2003  | 4,225 | 34,800,500 | 0.702479 | 0.016901 | 150  |
| 9/5/2003  | 4,400 | 46,649,500 | 0.702479 | 0.016901 | 175  |

|            |       |            |          |          |      |
|------------|-------|------------|----------|----------|------|
| 9/8/2003   | 4,550 | 10,001,500 | 0.702479 | 0.016901 | 150  |
| 9/9/2003   | 4,450 | 7,628,500  | 0.702479 | 0.016901 | -100 |
| 9/10/2003  | 4,250 | 9,356,500  | 0.702479 | 0.016901 | -200 |
| 9/11/2003  | 4,150 | 8,959,000  | 0.702479 | 0.016901 | -100 |
| 9/12/2003  | 4,300 | 13,292,500 | 0.702479 | 0.016901 | 150  |
| 9/15/2003  | 4,125 | 8,918,500  | 0.702479 | 0.016901 | -175 |
| 9/16/2003  | 4,225 | 7,718,500  | 0.702479 | 0.016901 | 100  |
| 9/17/2003  | 4,275 | 12,474,500 | 0.702479 | 0.016901 | 50   |
| 9/18/2003  | 4,300 | 7,193,500  | 0.702479 | 0.016901 | 25   |
| 9/19/2003  | 4,300 | 1,474,500  | 0.702479 | 0.016901 | 0    |
| 9/23/2003  | 4,325 | 7,362,500  | 0.702479 | 0.016901 | 25   |
| 9/24/2003  | 4,375 | 16,695,000 | 0.702479 | 0.016901 | 50   |
| 9/25/2003  | 4,500 | 35,356,000 | 0.702479 | 0.016901 | 125  |
| 9/26/2003  | 4,550 | 38,358,500 | 0.702479 | 0.016901 | 50   |
| 9/29/2003  | 4,525 | 8,952,500  | 0.702479 | 0.016901 | -25  |
| 9/30/2003  | 4,525 | 12,616,000 | 0.702479 | 0.016901 | 0    |
| 10/1/2003  | 4,525 | 9,033,000  | 0.702479 | 0.016901 | 0    |
| 10/2/2003  | 4,675 | 26,235,500 | 0.702479 | 0.016901 | 150  |
| 10/3/2003  | 4,750 | 15,332,500 | 0.702479 | 0.016901 | 75   |
| 10/6/2003  | 4,725 | 10,251,000 | 0.702479 | 0.016901 | -25  |
| 10/7/2003  | 4,650 | 12,737,500 | 0.702479 | 0.016901 | -75  |
| 10/8/2003  | 4,675 | 7,281,500  | 0.702479 | 0.016901 | 25   |
| 10/9/2003  | 4,800 | 13,173,000 | 0.702479 | 0.016901 | 125  |
| 10/10/2003 | 4,825 | 10,874,000 | 0.702479 | 0.016901 | 25   |
| 10/13/2003 | 4,875 | 9,121,500  | 0.702479 | 0.016901 | 50   |
| 10/14/2003 | 4,775 | 9,698,500  | 0.702479 | 0.016901 | -100 |
| 10/15/2003 | 4,775 | 5,040,000  | 0.702479 | 0.016901 | 0    |
| 10/16/2003 | 4,700 | 9,937,500  | 0.702479 | 0.016901 | -75  |
| 10/17/2003 | 4,775 | 5,427,500  | 0.702479 | 0.016901 | 75   |
| 10/20/2003 | 4,775 | 4,473,500  | 0.702479 | 0.016901 | 0    |
| 10/21/2003 | 4,775 | 6,955,500  | 0.702479 | 0.016901 | 0    |
| 10/22/2003 | 4,800 | 6,330,000  | 0.702479 | 0.016901 | 25   |
| 10/23/2003 | 4,725 | 9,118,000  | 0.702479 | 0.016901 | -75  |
| 10/24/2003 | 4,675 | 4,283,000  | 0.702479 | 0.016901 | -50  |
| 10/27/2003 | 4,475 | 8,755,500  | 0.702479 | 0.016901 | -200 |
| 10/28/2003 | 4,400 | 7,833,500  | 0.702479 | 0.016901 | -75  |
| 10/29/2003 | 4,375 | 8,419,500  | 0.702479 | 0.016901 | -25  |
| 10/30/2003 | 4,375 | 4,916,000  | 0.702479 | 0.016901 | 0    |
| 10/31/2003 | 4,350 | 7,588,000  | 0.702479 | 0.016901 | -25  |
| 11/3/2003  | 4,275 | 6,571,500  | 0.702479 | 0.016901 | -75  |
| 11/4/2003  | 4,500 | 18,884,000 | 0.702479 | 0.016901 | 225  |
| 11/5/2003  | 4,625 | 24,605,000 | 0.702479 | 0.016901 | 125  |
| 11/6/2003  | 4,625 | 16,191,500 | 0.702479 | 0.016901 | 0    |
| 11/7/2003  | 4,600 | 2,746,000  | 0.702479 | 0.016901 | -25  |
| 11/10/2003 | 4,475 | 4,726,500  | 0.702479 | 0.016901 | -125 |
| 11/11/2003 | 4,550 | 9,095,500  | 0.702479 | 0.016901 | 75   |
| 11/12/2003 | 4,500 | 25,324,500 | 0.702479 | 0.016901 | -50  |

|            |       |            |          |          |      |
|------------|-------|------------|----------|----------|------|
| 11/13/2003 | 4,475 | 12,930,000 | 0.702479 | 0.016901 | -25  |
| 11/14/2003 | 4,475 | 6,954,500  | 0.702479 | 0.016901 | 0    |
| 11/17/2003 | 4,375 | 8,944,500  | 0.702479 | 0.016901 | -100 |
| 11/18/2003 | 4,400 | 3,954,500  | 0.702479 | 0.016901 | 25   |
| 11/19/2003 | 4,450 | 3,125,000  | 0.702479 | 0.016901 | 50   |
| 11/20/2003 | 4,475 | 1,503,500  | 0.702479 | 0.016901 | 25   |
| 11/21/2003 | 4,475 | 11,960,500 | 0.702479 | 0.016901 | 0    |
| 12/1/2003  | 4,525 | 14,942,500 | 0.702479 | 0.016901 | 50   |
| 12/2/2003  | 4,525 | 7,787,000  | 0.702479 | 0.016901 | 0    |
| 12/3/2003  | 4,550 | 11,458,500 | 0.702479 | 0.016901 | 25   |
| 12/4/2003  | 4,600 | 6,838,000  | 0.702479 | 0.016901 | 50   |
| 12/5/2003  | 4,550 | 2,290,000  | 0.702479 | 0.016901 | -50  |
| 12/8/2003  | 4,625 | 6,397,500  | 0.702479 | 0.016901 | 75   |
| 12/9/2003  | 4,575 | 7,494,000  | 0.702479 | 0.016901 | -50  |
| 12/10/2003 | 4,525 | 7,932,000  | 0.702479 | 0.016901 | -50  |
| 12/11/2003 | 4,550 | 4,575,000  | 0.702479 | 0.016901 | 25   |
| 12/12/2003 | 4,525 | 6,787,500  | 0.702479 | 0.016901 | -25  |
| 12/15/2003 | 4,575 | 5,817,000  | 0.702479 | 0.016901 | 50   |
| 12/16/2003 | 4,550 | 4,735,500  | 0.702479 | 0.016901 | -25  |
| 12/17/2003 | 4,550 | 1,160,500  | 0.702479 | 0.016901 | 0    |
| 12/18/2003 | 4,625 | 8,224,500  | 0.702479 | 0.016901 | 75   |
| 12/19/2003 | 4,750 | 13,452,000 | 0.702479 | 0.016901 | 125  |
| 12/22/2003 | 4,825 | 7,134,500  | 0.702479 | 0.016901 | 75   |
| 12/23/2003 | 4,875 | 7,939,500  | 0.702479 | 0.016901 | 50   |
| 12/29/2003 | 5,025 | 11,729,000 | 0.702479 | 0.016901 | 150  |
| 12/30/2003 | 5,000 | 10,547,500 | 0.702479 | 0.016901 | -25  |
| 1/2/2004   | 5,100 | 4,531,500  | 1.120332 | 0.03083  | 100  |
| 1/5/2004   | 5,400 | 15,162,500 | 1.120332 | 0.03083  | 300  |
| 1/6/2004   | 5,250 | 14,960,500 | 1.120332 | 0.03083  | -150 |
| 1/7/2004   | 5,350 | 13,397,500 | 1.120332 | 0.03083  | 100  |
| 1/8/2004   | 5,800 | 31,625,500 | 1.120332 | 0.03083  | 450  |
| 1/9/2004   | 5,650 | 10,007,000 | 1.120332 | 0.03083  | -150 |
| 1/12/2004  | 5,500 | 11,001,500 | 1.120332 | 0.03083  | -150 |
| 1/13/2004  | 5,500 | 6,809,500  | 1.120332 | 0.03083  | 0    |
| 1/14/2004  | 5,600 | 7,806,000  | 1.120332 | 0.03083  | 100  |
| 1/15/2004  | 5,750 | 12,134,000 | 1.120332 | 0.03083  | 150  |
| 1/16/2004  | 5,700 | 10,467,000 | 1.120332 | 0.03083  | -50  |
| 1/19/2004  | 5,550 | 10,255,000 | 1.120332 | 0.03083  | -150 |
| 1/20/2004  | 5,600 | 5,176,500  | 1.120332 | 0.03083  | 50   |
| 1/21/2004  | 5,550 | 5,874,000  | 1.120332 | 0.03083  | -50  |
| 1/23/2004  | 5,600 | 3,658,000  | 1.120332 | 0.03083  | 50   |
| 1/26/2004  | 5,450 | 11,085,500 | 1.120332 | 0.03083  | -150 |
| 1/27/2004  | 5,450 | 10,348,500 | 1.120332 | 0.03083  | 0    |
| 1/28/2004  | 5,350 | 4,708,500  | 1.120332 | 0.03083  | -100 |
| 1/29/2004  | 5,150 | 9,065,000  | 1.120332 | 0.03083  | -200 |
| 1/30/2004  | 5,200 | 5,442,500  | 1.120332 | 0.03083  | 50   |
| 2/3/2004   | 5,000 | 12,678,000 | 1.120332 | 0.03083  | -200 |

|           |       |            |          |         |      |
|-----------|-------|------------|----------|---------|------|
| 2/4/2004  | 4,950 | 12,157,000 | 1.120332 | 0.03083 | -50  |
| 2/5/2004  | 5,150 | 10,431,500 | 1.120332 | 0.03083 | 200  |
| 2/6/2004  | 5,350 | 18,176,500 | 1.120332 | 0.03083 | 200  |
| 2/9/2004  | 5,500 | 16,027,000 | 1.120332 | 0.03083 | 150  |
| 2/10/2004 | 5,450 | 4,461,500  | 1.120332 | 0.03083 | -50  |
| 2/11/2004 | 5,450 | 7,947,500  | 1.120332 | 0.03083 | 0    |
| 2/12/2004 | 5,300 | 17,155,000 | 1.120332 | 0.03083 | -150 |
| 2/13/2004 | 5,350 | 4,054,000  | 1.120332 | 0.03083 | 50   |
| 2/16/2004 | 5,400 | 5,590,000  | 1.120332 | 0.03083 | 50   |
| 2/17/2004 | 5,450 | 18,967,000 | 1.120332 | 0.03083 | 50   |
| 2/18/2004 | 5,550 | 19,508,000 | 1.120332 | 0.03083 | 100  |
| 2/19/2004 | 5,550 | 13,285,000 | 1.120332 | 0.03083 | 0    |
| 2/20/2004 | 5,550 | 13,097,000 | 1.120332 | 0.03083 | 0    |
| 2/24/2004 | 5,450 | 11,408,000 | 1.120332 | 0.03083 | -100 |
| 2/25/2004 | 5,400 | 4,731,000  | 1.120332 | 0.03083 | -50  |
| 2/26/2004 | 5,550 | 6,680,000  | 1.120332 | 0.03083 | 150  |
| 2/27/2004 | 5,400 | 8,054,000  | 1.120332 | 0.03083 | -150 |
| 3/1/2004  | 5,350 | 9,865,500  | 1.120332 | 0.03083 | -50  |
| 3/2/2004  | 5,700 | 23,376,500 | 1.120332 | 0.03083 | 350  |
| 3/3/2004  | 5,700 | 3,090,500  | 1.120332 | 0.03083 | 0    |
| 3/4/2004  | 5,600 | 3,232,000  | 1.120332 | 0.03083 | -100 |
| 3/5/2004  | 5,700 | 10,749,000 | 1.120332 | 0.03083 | 100  |
| 3/8/2004  | 5,600 | 5,024,000  | 1.120332 | 0.03083 | -100 |
| 3/9/2004  | 5,600 | 8,895,000  | 1.120332 | 0.03083 | 0    |
| 3/10/2004 | 5,300 | 10,380,000 | 1.120332 | 0.03083 | -300 |
| 3/11/2004 | 5,250 | 7,059,500  | 1.120332 | 0.03083 | -50  |
| 3/12/2004 | 5,350 | 7,398,500  | 1.120332 | 0.03083 | 100  |
| 3/15/2004 | 5,300 | 3,257,000  | 1.120332 | 0.03083 | -50  |
| 3/16/2004 | 5,200 | 5,711,000  | 1.120332 | 0.03083 | -100 |
| 3/17/2004 | 5,250 | 5,696,500  | 1.120332 | 0.03083 | 50   |
| 3/18/2004 | 5,300 | 2,938,500  | 1.120332 | 0.03083 | 50   |
| 3/19/2004 | 5,400 | 2,167,500  | 1.120332 | 0.03083 | 100  |
| 3/23/2004 | 5,300 | 4,340,500  | 1.120332 | 0.03083 | -100 |
| 3/24/2004 | 5,300 | 4,940,500  | 1.120332 | 0.03083 | 0    |
| 3/25/2004 | 5,250 | 3,654,000  | 1.120332 | 0.03083 | -50  |
| 3/26/2004 | 5,150 | 10,595,500 | 1.120332 | 0.03083 | -100 |
| 3/29/2004 | 5,150 | 3,260,500  | 1.120332 | 0.03083 | 0    |
| 3/30/2004 | 5,350 | 13,887,500 | 1.120332 | 0.03083 | 200  |
| 3/31/2004 | 5,350 | 17,420,500 | 1.120332 | 0.03083 | 0    |
| 4/1/2004  | 5,350 | 10,381,500 | 1.120332 | 0.03083 | 0    |
| 4/2/2004  | 5,600 | 13,217,500 | 1.120332 | 0.03083 | 250  |
| 4/6/2004  | 5,750 | 29,601,500 | 1.120332 | 0.03083 | 150  |
| 4/7/2004  | 5,550 | 16,208,000 | 1.120332 | 0.03083 | -200 |
| 4/8/2004  | 5,600 | 11,026,500 | 1.120332 | 0.03083 | 50   |
| 4/12/2004 | 5,500 | 2,043,500  | 1.120332 | 0.03083 | -100 |
| 4/13/2004 | 5,500 | 5,550,000  | 1.120332 | 0.03083 | 0    |
| 4/14/2004 | 5,500 | 3,061,500  | 1.120332 | 0.03083 | 0    |

|           |       |            |          |         |      |
|-----------|-------|------------|----------|---------|------|
| 4/15/2004 | 5,600 | 9,587,500  | 1.120332 | 0.03083 | 100  |
| 4/16/2004 | 5,300 | 12,892,000 | 1.120332 | 0.03083 | -300 |
| 4/19/2004 | 5,350 | 13,136,500 | 1.120332 | 0.03083 | 50   |
| 4/20/2004 | 5,800 | 30,518,500 | 1.120332 | 0.03083 | 450  |
| 4/21/2004 | 5,950 | 37,313,500 | 1.120332 | 0.03083 | 150  |
| 4/22/2004 | 6,050 | 7,646,000  | 1.120332 | 0.03083 | 100  |
| 4/23/2004 | 6,100 | 7,823,500  | 1.120332 | 0.03083 | 50   |
| 4/26/2004 | 6,050 | 4,714,500  | 1.120332 | 0.03083 | -50  |
| 4/27/2004 | 6,050 | 2,265,500  | 1.120332 | 0.03083 | 0    |
| 4/28/2004 | 6,100 | 2,708,500  | 1.120332 | 0.03083 | 50   |
| 4/29/2004 | 5,800 | 13,652,500 | 1.120332 | 0.03083 | -300 |
| 4/30/2004 | 5,700 | 10,801,000 | 1.120332 | 0.03083 | -100 |
| 5/4/2004  | 6,000 | 18,322,500 | 1.120332 | 0.03083 | 300  |
| 5/5/2004  | 5,650 | 20,742,000 | 1.120332 | 0.03083 | -350 |
| 5/6/2004  | 5,500 | 20,509,000 | 1.120332 | 0.03083 | -150 |
| 5/7/2004  | 5,550 | 6,991,500  | 1.120332 | 0.03083 | 50   |
| 5/10/2004 | 5,400 | 16,178,500 | 1.120332 | 0.03083 | -150 |
| 5/11/2004 | 5,600 | 9,654,500  | 1.120332 | 0.03083 | 200  |
| 5/12/2004 | 5,850 | 11,446,000 | 1.120332 | 0.03083 | 250  |
| 5/13/2004 | 5,750 | 3,690,000  | 1.120332 | 0.03083 | -100 |
| 5/14/2004 | 5,750 | 17,726,000 | 1.120332 | 0.03083 | 0    |
| 5/17/2004 | 5,100 | 13,211,000 | 1.120332 | 0.03083 | -650 |
| 5/18/2004 | 5,400 | 16,659,500 | 1.120332 | 0.03083 | 300  |
| 5/19/2004 | 5,700 | 9,142,000  | 1.120332 | 0.03083 | 300  |
| 5/21/2004 | 5,800 | 12,417,000 | 1.120332 | 0.03083 | 100  |
| 5/24/2004 | 5,800 | 3,148,000  | 1.120332 | 0.03083 | 0    |
| 5/25/2004 | 5,800 | 7,385,500  | 1.120332 | 0.03083 | 0    |
| 5/26/2004 | 5,650 | 7,932,000  | 1.120332 | 0.03083 | -150 |
| 5/27/2004 | 5,750 | 6,166,000  | 1.120332 | 0.03083 | 100  |
| 5/28/2004 | 5,750 | 2,644,500  | 1.120332 | 0.03083 | 0    |
| 5/31/2004 | 5,800 | 2,907,500  | 1.120332 | 0.03083 | 50   |
| 6/1/2004  | 5,750 | 2,423,500  | 1.120332 | 0.03083 | -50  |
| 6/2/2004  | 5,600 | 7,277,000  | 1.120332 | 0.03083 | -150 |
| 6/4/2004  | 5,450 | 40,246,500 | 1.120332 | 0.03083 | -150 |
| 6/7/2004  | 5,600 | 13,365,500 | 1.120332 | 0.03083 | 150  |
| 6/8/2004  | 5,600 | 2,969,000  | 1.120332 | 0.03083 | 0    |
| 6/9/2004  | 5,550 | 8,850,000  | 1.120332 | 0.03083 | -50  |
| 6/10/2004 | 5,450 | 3,937,000  | 1.120332 | 0.03083 | -100 |
| 6/11/2004 | 5,450 | 2,449,000  | 1.120332 | 0.03083 | 0    |
| 6/14/2004 | 5,450 | 2,061,000  | 1.120332 | 0.03083 | 0    |
| 6/15/2004 | 5,450 | 1,829,000  | 1.120332 | 0.03083 | 0    |
| 6/16/2004 | 5,500 | 2,181,000  | 1.120332 | 0.03083 | 50   |
| 6/17/2004 | 5,500 | 3,269,000  | 1.120332 | 0.03083 | 0    |
| 6/18/2004 | 5,500 | 1,385,000  | 1.120332 | 0.03083 | 0    |
| 6/21/2004 | 5,500 | 646,000    | 1.120332 | 0.03083 | 0    |
| 6/22/2004 | 5,450 | 3,494,000  | 1.120332 | 0.03083 | -50  |
| 6/23/2004 | 5,500 | 9,865,000  | 1.120332 | 0.03083 | 50   |

|           |       |            |          |         |      |
|-----------|-------|------------|----------|---------|------|
| 6/24/2004 | 5,550 | 4,661,500  | 1.120332 | 0.03083 | 50   |
| 6/25/2004 | 5,650 | 8,350,500  | 1.120332 | 0.03083 | 100  |
| 6/28/2004 | 5,600 | 5,315,500  | 1.120332 | 0.03083 | -50  |
| 6/29/2004 | 5,600 | 4,647,500  | 1.120332 | 0.03083 | 0    |
| 6/30/2004 | 5,500 | 5,833,000  | 1.120332 | 0.03083 | -100 |
| 7/1/2004  | 5,600 | 1,551,000  | 1.120332 | 0.03083 | 100  |
| 7/2/2004  | 5,750 | 8,794,500  | 1.120332 | 0.03083 | 150  |
| 7/6/2004  | 5,850 | 20,923,500 | 1.120332 | 0.03083 | 100  |
| 7/7/2004  | 5,850 | 17,440,500 | 1.120332 | 0.03083 | 0    |
| 7/8/2004  | 5,650 | 5,443,000  | 1.120332 | 0.03083 | -200 |
| 7/9/2004  | 5,700 | 3,705,500  | 1.120332 | 0.03083 | 50   |
| 7/12/2004 | 5,650 | 4,576,000  | 1.120332 | 0.03083 | -50  |
| 7/13/2004 | 5,650 | 4,003,500  | 1.120332 | 0.03083 | 0    |
| 7/14/2004 | 5,600 | 7,577,500  | 1.120332 | 0.03083 | -50  |
| 7/15/2004 | 5,550 | 6,158,500  | 1.120332 | 0.03083 | -50  |
| 7/16/2004 | 5,650 | 9,954,000  | 1.120332 | 0.03083 | 100  |
| 7/19/2004 | 5,650 | 3,964,000  | 1.120332 | 0.03083 | 0    |
| 7/20/2004 | 5,600 | 6,664,000  | 1.120332 | 0.03083 | -50  |
| 7/21/2004 | 5,650 | 5,303,500  | 1.120332 | 0.03083 | 50   |
| 7/22/2004 | 5,800 | 13,092,000 | 1.120332 | 0.03083 | 150  |
| 7/23/2004 | 5,850 | 11,726,500 | 1.120332 | 0.03083 | 50   |
| 7/26/2004 | 5,750 | 8,600,000  | 1.120332 | 0.03083 | -100 |
| 7/27/2004 | 5,700 | 2,639,000  | 1.120332 | 0.03083 | -50  |
| 7/28/2004 | 5,650 | 4,789,500  | 1.120332 | 0.03083 | -50  |
| 7/29/2004 | 5,550 | 13,827,000 | 1.120332 | 0.03083 | -100 |
| 7/30/2004 | 5,550 | 11,394,000 | 1.120332 | 0.03083 | 0    |
| 8/2/2004  | 5,550 | 2,894,500  | 1.120332 | 0.03083 | 0    |
| 8/3/2004  | 5,650 | 17,590,000 | 1.120332 | 0.03083 | 100  |
| 8/4/2004  | 5,650 | 6,296,000  | 1.120332 | 0.03083 | 0    |
| 8/5/2004  | 5,700 | 4,832,000  | 1.120332 | 0.03083 | 50   |
| 8/6/2004  | 5,650 | 6,231,000  | 1.120332 | 0.03083 | -50  |
| 8/9/2004  | 5,600 | 3,422,000  | 1.120332 | 0.03083 | -50  |
| 8/10/2004 | 5,650 | 2,090,000  | 1.120332 | 0.03083 | 50   |
| 8/11/2004 | 5,800 | 19,835,500 | 1.120332 | 0.03083 | 150  |
| 8/12/2004 | 5,750 | 4,510,000  | 1.120332 | 0.03083 | -50  |
| 8/13/2004 | 5,800 | 6,285,000  | 1.120332 | 0.03083 | 50   |
| 8/16/2004 | 5,800 | 5,627,500  | 1.120332 | 0.03083 | 0    |
| 8/18/2004 | 5,850 | 8,641,000  | 1.120332 | 0.03083 | 50   |
| 8/19/2004 | 5,800 | 1,756,500  | 1.120332 | 0.03083 | -50  |
| 8/20/2004 | 5,750 | 4,015,000  | 1.120332 | 0.03083 | -50  |
| 8/23/2004 | 5,850 | 9,155,500  | 1.120332 | 0.03083 | 100  |
| 8/24/2004 | 5,900 | 12,298,000 | 1.120332 | 0.03083 | 50   |
| 8/25/2004 | 5,800 | 4,588,000  | 1.120332 | 0.03083 | -100 |
| 8/26/2004 | 6,100 | 17,090,500 | 1.120332 | 0.03083 | 300  |
| 8/27/2004 | 6,400 | 14,045,500 | 1.120332 | 0.03083 | 300  |
| 8/30/2004 | 6,350 | 4,476,000  | 1.120332 | 0.03083 | -50  |
| 8/31/2004 | 6,350 | 4,202,000  | 1.120332 | 0.03083 | 0    |

|            |       |            |          |         |      |
|------------|-------|------------|----------|---------|------|
| 9/1/2004   | 6,800 | 13,264,000 | 1.120332 | 0.03083 | 450  |
| 9/2/2004   | 6,650 | 6,743,000  | 1.120332 | 0.03083 | -150 |
| 9/3/2004   | 6,600 | 7,316,000  | 1.120332 | 0.03083 | -50  |
| 9/6/2004   | 6,600 | 1,855,500  | 1.120332 | 0.03083 | 0    |
| 9/7/2004   | 6,600 | 6,050,500  | 1.120332 | 0.03083 | 0    |
| 9/8/2004   | 6,550 | 8,678,500  | 1.120332 | 0.03083 | -50  |
| 9/9/2004   | 6,550 | 30,318,500 | 1.120332 | 0.03083 | 0    |
| 9/10/2004  | 6,750 | 13,921,000 | 1.120332 | 0.03083 | 200  |
| 9/14/2004  | 6,750 | 16,281,000 | 1.120332 | 0.03083 | 0    |
| 9/15/2004  | 6,850 | 12,354,000 | 1.120332 | 0.03083 | 100  |
| 9/16/2004  | 6,800 | 4,867,000  | 1.120332 | 0.03083 | -50  |
| 9/17/2004  | 6,950 | 11,680,500 | 1.120332 | 0.03083 | 150  |
| 9/21/2004  | 6,900 | 22,276,500 | 1.120332 | 0.03083 | -50  |
| 9/22/2004  | 6,850 | 6,110,500  | 1.120332 | 0.03083 | -50  |
| 9/23/2004  | 6,700 | 8,869,500  | 1.120332 | 0.03083 | -150 |
| 9/24/2004  | 6,700 | 4,135,500  | 1.120332 | 0.03083 | 0    |
| 9/27/2004  | 6,750 | 4,258,000  | 1.120332 | 0.03083 | 50   |
| 9/28/2004  | 6,650 | 3,667,000  | 1.120332 | 0.03083 | -100 |
| 9/29/2004  | 6,750 | 977,500    | 1.120332 | 0.03083 | 100  |
| 9/30/2004  | 6,850 | 11,468,500 | 1.120332 | 0.03083 | 100  |
| 10/1/2004  | 7,000 | 8,212,000  | 1.120332 | 0.03083 | 150  |
| 10/4/2004  | 7,450 | 26,177,000 | 1.120332 | 0.03083 | 450  |
| 10/5/2004  | 7,650 | 19,188,500 | 1.120332 | 0.03083 | 200  |
| 10/6/2004  | 7,600 | 10,253,500 | 1.120332 | 0.03083 | -50  |
| 10/7/2004  | 7,550 | 10,064,000 | 1.120332 | 0.03083 | -50  |
| 10/8/2004  | 7,650 | 24,148,500 | 1.120332 | 0.03083 | 100  |
| 10/11/2004 | 7,750 | 8,937,000  | 1.120332 | 0.03083 | 100  |
| 10/12/2004 | 7,900 | 19,153,500 | 1.120332 | 0.03083 | 150  |
| 10/13/2004 | 7,950 | 17,941,000 | 1.120332 | 0.03083 | 50   |
| 10/14/2004 | 7,950 | 6,461,500  | 1.120332 | 0.03083 | 0    |
| 10/15/2004 | 7,950 | 4,475,500  | 1.120332 | 0.03083 | 0    |
| 10/18/2004 | 7,950 | 5,964,000  | 1.120332 | 0.03083 | 0    |
| 10/19/2004 | 7,900 | 12,239,500 | 1.120332 | 0.03083 | -50  |
| 10/20/2004 | 7,900 | 37,978,500 | 1.120332 | 0.03083 | 0    |
| 10/21/2004 | 7,850 | 4,277,500  | 1.120332 | 0.03083 | -50  |
| 10/22/2004 | 7,950 | 9,239,000  | 1.120332 | 0.03083 | 100  |
| 10/25/2004 | 7,950 | 3,748,500  | 1.120332 | 0.03083 | 0    |
| 10/26/2004 | 7,850 | 8,214,500  | 1.120332 | 0.03083 | -100 |
| 10/27/2004 | 7,700 | 6,534,000  | 1.120332 | 0.03083 | -150 |
| 10/28/2004 | 7,900 | 10,229,500 | 1.120332 | 0.03083 | 200  |
| 10/29/2004 | 7,850 | 4,167,500  | 1.120332 | 0.03083 | -50  |
| 11/1/2004  | 7,900 | 4,862,500  | 1.120332 | 0.03083 | 50   |
| 11/2/2004  | 7,950 | 14,541,500 | 1.120332 | 0.03083 | 50   |
| 11/3/2004  | 8,050 | 10,930,500 | 1.120332 | 0.03083 | 100  |
| 11/4/2004  | 7,850 | 4,767,500  | 1.120332 | 0.03083 | -200 |
| 11/5/2004  | 8,150 | 12,063,000 | 1.120332 | 0.03083 | 300  |
| 11/8/2004  | 8,250 | 4,780,500  | 1.120332 | 0.03083 | 100  |

|            |        |            |          |          |      |
|------------|--------|------------|----------|----------|------|
| 11/9/2004  | 8,600  | 14,416,500 | 1.120332 | 0.03083  | 350  |
| 11/10/2004 | 8,500  | 8,585,500  | 1.120332 | 0.03083  | -100 |
| 11/11/2004 | 8,450  | 4,042,500  | 1.120332 | 0.03083  | -50  |
| 11/12/2004 | 8,550  | 12,985,000 | 1.120332 | 0.03083  | 100  |
| 11/22/2004 | 8,450  | 17,175,000 | 1.120332 | 0.03083  | -100 |
| 11/23/2004 | 8,600  | 13,559,000 | 1.120332 | 0.03083  | 150  |
| 11/24/2004 | 8,800  | 21,791,500 | 1.120332 | 0.03083  | 200  |
| 11/25/2004 | 8,600  | 15,205,000 | 1.120332 | 0.03083  | -200 |
| 11/26/2004 | 8,600  | 4,240,500  | 1.120332 | 0.03083  | 0    |
| 11/29/2004 | 8,750  | 7,303,000  | 1.120332 | 0.03083  | 150  |
| 11/30/2004 | 9,000  | 17,393,000 | 1.120332 | 0.03083  | 250  |
| 12/1/2004  | 9,050  | 12,644,000 | 1.120332 | 0.03083  | 50   |
| 12/2/2004  | 9,400  | 10,007,500 | 1.120332 | 0.03083  | 350  |
| 12/3/2004  | 9,300  | 7,851,500  | 1.120332 | 0.03083  | -100 |
| 12/6/2004  | 9,350  | 3,335,000  | 1.120332 | 0.03083  | 50   |
| 12/7/2004  | 9,600  | 9,195,000  | 1.120332 | 0.03083  | 250  |
| 12/8/2004  | 9,850  | 11,988,500 | 1.120332 | 0.03083  | 250  |
| 12/9/2004  | 9,700  | 10,182,000 | 1.120332 | 0.03083  | -150 |
| 12/10/2004 | 9,450  | 9,991,000  | 1.120332 | 0.03083  | -250 |
| 12/13/2004 | 9,250  | 12,087,500 | 1.120332 | 0.03083  | -200 |
| 12/14/2004 | 9,000  | 9,953,500  | 1.120332 | 0.03083  | -250 |
| 12/15/2004 | 9,400  | 8,027,000  | 1.120332 | 0.03083  | 400  |
| 12/16/2004 | 9,550  | 5,692,000  | 1.120332 | 0.03083  | 150  |
| 12/17/2004 | 9,650  | 3,943,000  | 1.120332 | 0.03083  | 100  |
| 12/20/2004 | 9,500  | 4,367,000  | 1.120332 | 0.03083  | -150 |
| 12/21/2004 | 9,550  | 2,684,000  | 1.120332 | 0.03083  | 50   |
| 12/22/2004 | 9,700  | 2,004,000  | 1.120332 | 0.03083  | 150  |
| 12/23/2004 | 9,700  | 1,503,500  | 1.120332 | 0.03083  | 0    |
| 12/27/2004 | 9,700  | 1,745,500  | 1.120332 | 0.03083  | 0    |
| 12/28/2004 | 9,600  | 3,219,500  | 1.120332 | 0.03083  | -100 |
| 12/29/2004 | 9,750  | 3,009,000  | 1.120332 | 0.03083  | 150  |
| 12/30/2004 | 9,600  | 4,242,000  | 1.120332 | 0.03083  | -150 |
| 1/3/2005   | 9,600  | 1,068,000  | 1.399177 | 0.028395 | 0    |
| 1/4/2005   | 9,750  | 5,454,000  | 1.399177 | 0.028395 | 150  |
| 1/5/2005   | 9,700  | 9,190,000  | 1.399177 | 0.028395 | -50  |
| 1/6/2005   | 9,700  | 8,790,000  | 1.399177 | 0.028395 | 0    |
| 1/7/2005   | 9,800  | 7,096,500  | 1.399177 | 0.028395 | 100  |
| 1/10/2005  | 9,750  | 3,157,000  | 1.399177 | 0.028395 | -50  |
| 1/11/2005  | 9,550  | 7,061,000  | 1.399177 | 0.028395 | -200 |
| 1/12/2005  | 9,550  | 1,521,000  | 1.399177 | 0.028395 | 0    |
| 1/13/2005  | 9,950  | 11,359,000 | 1.399177 | 0.028395 | 400  |
| 1/14/2005  | 10,000 | 4,061,000  | 1.399177 | 0.028395 | 50   |
| 1/17/2005  | 10,400 | 7,109,500  | 1.399177 | 0.028395 | 400  |
| 1/18/2005  | 10,300 | 2,447,500  | 1.399177 | 0.028395 | -100 |
| 1/19/2005  | 10,350 | 2,290,500  | 1.399177 | 0.028395 | 50   |
| 1/20/2005  | 10,450 | 1,995,500  | 1.399177 | 0.028395 | 100  |
| 1/24/2005  | 10,150 | 5,662,000  | 1.399177 | 0.028395 | -300 |

|           |        |            |          |          |      |
|-----------|--------|------------|----------|----------|------|
| 1/25/2005 | 10,000 | 5,681,000  | 1.399177 | 0.028395 | -150 |
| 1/26/2005 | 10,100 | 4,936,500  | 1.399177 | 0.028395 | 100  |
| 1/27/2005 | 10,000 | 5,254,000  | 1.399177 | 0.028395 | -100 |
| 1/28/2005 | 10,000 | 3,616,500  | 1.399177 | 0.028395 | 0    |
| 1/31/2005 | 10,050 | 2,949,000  | 1.399177 | 0.028395 | 50   |
| 2/1/2005  | 10,050 | 2,978,500  | 1.399177 | 0.028395 | 0    |
| 2/2/2005  | 10,500 | 7,197,000  | 1.399177 | 0.028395 | 450  |
| 2/3/2005  | 10,150 | 4,732,000  | 1.399177 | 0.028395 | -350 |
| 2/4/2005  | 10,500 | 2,196,500  | 1.399177 | 0.028395 | 350  |
| 2/7/2005  | 10,300 | 1,526,500  | 1.399177 | 0.028395 | -200 |
| 2/8/2005  | 10,200 | 927,500    | 1.399177 | 0.028395 | -100 |
| 2/11/2005 | 10,150 | 1,833,000  | 1.399177 | 0.028395 | -50  |
| 2/14/2005 | 10,050 | 6,768,500  | 1.399177 | 0.028395 | -100 |
| 2/15/2005 | 10,400 | 5,386,500  | 1.399177 | 0.028395 | 350  |
| 2/16/2005 | 10,700 | 7,105,500  | 1.399177 | 0.028395 | 300  |
| 2/17/2005 | 10,800 | 3,016,500  | 1.399177 | 0.028395 | 100  |
| 2/18/2005 | 11,200 | 6,899,500  | 1.399177 | 0.028395 | 400  |
| 2/21/2005 | 11,100 | 2,985,000  | 1.399177 | 0.028395 | -100 |
| 2/22/2005 | 11,150 | 5,095,500  | 1.399177 | 0.028395 | 50   |
| 2/23/2005 | 11,250 | 3,823,000  | 1.399177 | 0.028395 | 100  |
| 2/24/2005 | 11,750 | 6,897,500  | 1.399177 | 0.028395 | 500  |
| 2/25/2005 | 11,250 | 5,296,500  | 1.399177 | 0.028395 | -500 |
| 2/28/2005 | 10,800 | 10,068,000 | 1.399177 | 0.028395 | -450 |
| 3/1/2005  | 11,000 | 9,527,500  | 1.399177 | 0.028395 | 200  |
| 3/2/2005  | 10,850 | 2,437,000  | 1.399177 | 0.028395 | -150 |
| 3/3/2005  | 10,650 | 5,395,500  | 1.399177 | 0.028395 | -200 |
| 3/4/2005  | 10,700 | 6,887,500  | 1.399177 | 0.028395 | 50   |
| 3/7/2005  | 10,900 | 5,227,000  | 1.399177 | 0.028395 | 200  |
| 3/8/2005  | 11,000 | 3,796,000  | 1.399177 | 0.028395 | 100  |
| 3/9/2005  | 10,950 | 1,027,000  | 1.399177 | 0.028395 | -50  |
| 3/10/2005 | 10,900 | 1,530,000  | 1.399177 | 0.028395 | -50  |
| 3/14/2005 | 10,650 | 9,409,500  | 1.399177 | 0.028395 | -250 |
| 3/15/2005 | 10,500 | 6,408,000  | 1.399177 | 0.028395 | -150 |
| 3/16/2005 | 10,700 | 5,190,000  | 1.399177 | 0.028395 | 200  |
| 3/17/2005 | 11,000 | 13,508,500 | 1.399177 | 0.028395 | 300  |
| 3/18/2005 | 10,950 | 3,204,500  | 1.399177 | 0.028395 | -50  |
| 3/21/2005 | 10,900 | 3,399,000  | 1.399177 | 0.028395 | -50  |
| 3/22/2005 | 10,850 | 5,983,000  | 1.399177 | 0.028395 | -50  |
| 3/23/2005 | 10,850 | 4,946,500  | 1.399177 | 0.028395 | 0    |
| 3/24/2005 | 10,800 | 9,660,000  | 1.399177 | 0.028395 | -50  |
| 3/28/2005 | 10,800 | 4,198,500  | 1.399177 | 0.028395 | 0    |
| 3/29/2005 | 10,300 | 6,934,500  | 1.399177 | 0.028395 | -500 |
| 3/30/2005 | 10,400 | 4,459,500  | 1.399177 | 0.028395 | 100  |
| 3/31/2005 | 10,500 | 3,292,000  | 1.399177 | 0.028395 | 100  |
| 4/1/2005  | 10,850 | 1,811,000  | 1.399177 | 0.028395 | 350  |
| 4/4/2005  | 10,900 | 1,843,500  | 1.399177 | 0.028395 | 50   |
| 4/5/2005  | 10,850 | 227,000    | 1.399177 | 0.028395 | -50  |

|           |        |           |          |          |      |
|-----------|--------|-----------|----------|----------|------|
| 4/6/2005  | 10,800 | 691,000   | 1.399177 | 0.028395 | -50  |
| 4/7/2005  | 10,850 | 5,668,000 | 1.399177 | 0.028395 | 50   |
| 4/8/2005  | 10,750 | 4,055,500 | 1.399177 | 0.028395 | -100 |
| 4/11/2005 | 10,800 | 2,304,500 | 1.399177 | 0.028395 | 50   |
| 4/12/2005 | 10,950 | 3,912,000 | 1.399177 | 0.028395 | 150  |
| 4/13/2005 | 11,100 | 3,194,000 | 1.399177 | 0.028395 | 150  |
| 4/14/2005 | 11,100 | 4,418,000 | 1.399177 | 0.028395 | 0    |
| 4/15/2005 | 11,000 | 2,987,000 | 1.399177 | 0.028395 | -100 |
| 4/18/2005 | 10,600 | 7,233,000 | 1.399177 | 0.028395 | -400 |
| 4/19/2005 | 10,700 | 4,990,500 | 1.399177 | 0.028395 | 100  |
| 4/20/2005 | 10,900 | 591,500   | 1.399177 | 0.028395 | 200  |
| 4/21/2005 | 10,800 | 3,396,000 | 1.399177 | 0.028395 | -100 |
| 4/25/2005 | 10,600 | 4,574,500 | 1.399177 | 0.028395 | -200 |
| 4/26/2005 | 10,650 | 1,963,000 | 1.399177 | 0.028395 | 50   |
| 4/27/2005 | 10,700 | 3,980,000 | 1.399177 | 0.028395 | 50   |
| 4/28/2005 | 10,600 | 1,974,000 | 1.399177 | 0.028395 | -100 |
| 4/29/2005 | 10,550 | 4,827,000 | 1.399177 | 0.028395 | -50  |
| 5/2/2005  | 10,700 | 447,500   | 1.399177 | 0.028395 | 150  |
| 5/3/2005  | 10,700 | 2,729,000 | 1.399177 | 0.028395 | 0    |
| 5/4/2005  | 10,750 | 2,457,000 | 1.399177 | 0.028395 | 50   |
| 5/6/2005  | 10,850 | 6,017,500 | 1.399177 | 0.028395 | 100  |
| 5/9/2005  | 10,900 | 6,749,500 | 1.399177 | 0.028395 | 50   |
| 5/10/2005 | 11,100 | 3,513,000 | 1.399177 | 0.028395 | 200  |
| 5/11/2005 | 11,000 | 2,494,000 | 1.399177 | 0.028395 | -100 |
| 5/12/2005 | 11,150 | 2,984,000 | 1.399177 | 0.028395 | 150  |
| 5/13/2005 | 11,200 | 2,265,000 | 1.399177 | 0.028395 | 50   |
| 5/16/2005 | 11,300 | 4,452,000 | 1.399177 | 0.028395 | 100  |
| 5/17/2005 | 11,250 | 1,467,500 | 1.399177 | 0.028395 | -50  |
| 5/18/2005 | 10,900 | 1,699,000 | 1.399177 | 0.028395 | -350 |
| 5/19/2005 | 11,150 | 1,619,000 | 1.399177 | 0.028395 | 250  |
| 5/20/2005 | 11,050 | 2,452,500 | 1.399177 | 0.028395 | -100 |
| 5/23/2005 | 10,700 | 4,045,000 | 1.399177 | 0.028395 | -350 |
| 5/25/2005 | 10,800 | 3,179,500 | 1.399177 | 0.028395 | 100  |
| 5/26/2005 | 11,000 | 849,000   | 1.399177 | 0.028395 | 200  |
| 5/27/2005 | 11,350 | 5,371,500 | 1.399177 | 0.028395 | 350  |
| 5/30/2005 | 11,250 | 1,187,500 | 1.399177 | 0.028395 | -100 |
| 5/31/2005 | 11,700 | 7,470,500 | 1.399177 | 0.028395 | 450  |
| 6/1/2005  | 12,000 | 5,765,500 | 1.399177 | 0.028395 | 300  |
| 6/2/2005  | 12,400 | 6,508,500 | 1.399177 | 0.028395 | 400  |
| 6/3/2005  | 12,450 | 5,234,500 | 1.399177 | 0.028395 | 50   |
| 6/6/2005  | 12,700 | 6,119,500 | 1.399177 | 0.028395 | 250  |
| 6/7/2005  | 12,550 | 1,855,500 | 1.399177 | 0.028395 | -150 |
| 6/8/2005  | 12,500 | 1,472,500 | 1.399177 | 0.028395 | -50  |
| 6/9/2005  | 12,650 | 1,873,000 | 1.399177 | 0.028395 | 150  |
| 6/10/2005 | 12,450 | 1,767,000 | 1.399177 | 0.028395 | -200 |
| 6/13/2005 | 12,550 | 4,407,500 | 1.399177 | 0.028395 | 100  |
| 6/14/2005 | 12,500 | 3,432,500 | 1.399177 | 0.028395 | -50  |

|           |        |            |          |          |      |
|-----------|--------|------------|----------|----------|------|
| 6/15/2005 | 13,100 | 4,210,000  | 1.399177 | 0.028395 | 600  |
| 6/16/2005 | 13,600 | 3,721,500  | 1.399177 | 0.028395 | 500  |
| 6/17/2005 | 13,150 | 1,403,500  | 1.399177 | 0.028395 | -450 |
| 6/20/2005 | 12,850 | 2,572,500  | 1.399177 | 0.028395 | -300 |
| 6/21/2005 | 13,000 | 4,455,500  | 1.399177 | 0.028395 | 150  |
| 6/22/2005 | 13,000 | 1,555,500  | 1.399177 | 0.028395 | 0    |
| 6/23/2005 | 13,000 | 1,016,000  | 1.399177 | 0.028395 | 0    |
| 6/24/2005 | 13,050 | 2,943,000  | 1.399177 | 0.028395 | 50   |
| 6/27/2005 | 12,800 | 1,724,000  | 1.399177 | 0.028395 | -250 |
| 6/28/2005 | 12,900 | 3,510,500  | 1.399177 | 0.028395 | 100  |
| 6/29/2005 | 12,800 | 2,794,500  | 1.399177 | 0.028395 | -100 |
| 6/30/2005 | 12,700 | 3,931,000  | 1.399177 | 0.028395 | -100 |
| 7/1/2005  | 13,000 | 2,695,000  | 1.399177 | 0.028395 | 300  |
| 7/4/2005  | 12,800 | 1,978,500  | 1.399177 | 0.028395 | -200 |
| 7/5/2005  | 12,700 | 745,000    | 1.399177 | 0.028395 | -100 |
| 7/6/2005  | 12,700 | 2,086,000  | 1.399177 | 0.028395 | 0    |
| 7/7/2005  | 12,200 | 6,319,500  | 1.399177 | 0.028395 | -500 |
| 7/8/2005  | 12,200 | 1,885,000  | 1.399177 | 0.028395 | 0    |
| 7/11/2005 | 12,650 | 3,857,000  | 1.399177 | 0.028395 | 450  |
| 7/12/2005 | 12,950 | 2,397,500  | 1.399177 | 0.028395 | 300  |
| 7/13/2005 | 12,650 | 2,801,500  | 1.399177 | 0.028395 | -300 |
| 7/14/2005 | 12,500 | 4,896,500  | 1.399177 | 0.028395 | -150 |
| 7/15/2005 | 12,200 | 6,086,000  | 1.399177 | 0.028395 | -300 |
| 7/18/2005 | 12,300 | 857,000    | 1.399177 | 0.028395 | 100  |
| 7/19/2005 | 12,300 | 3,721,000  | 1.399177 | 0.028395 | 0    |
| 7/20/2005 | 12,600 | 1,882,000  | 1.399177 | 0.028395 | 300  |
| 7/21/2005 | 12,650 | 5,453,500  | 1.399177 | 0.028395 | 50   |
| 7/22/2005 | 12,900 | 7,322,500  | 1.399177 | 0.028395 | 250  |
| 7/25/2005 | 12,950 | 3,389,000  | 1.399177 | 0.028395 | 50   |
| 7/26/2005 | 13,150 | 5,736,500  | 1.399177 | 0.028395 | 200  |
| 7/27/2005 | 13,150 | 4,209,500  | 1.399177 | 0.028395 | 0    |
| 7/28/2005 | 13,000 | 2,813,000  | 1.399177 | 0.028395 | -150 |
| 7/29/2005 | 13,200 | 3,082,000  | 1.399177 | 0.028395 | 200  |
| 8/1/2005  | 13,250 | 8,940,500  | 1.399177 | 0.028395 | 50   |
| 8/2/2005  | 13,200 | 4,252,000  | 1.399177 | 0.028395 | -50  |
| 8/3/2005  | 12,850 | 4,694,000  | 1.399177 | 0.028395 | -350 |
| 8/4/2005  | 12,600 | 6,012,000  | 1.399177 | 0.028395 | -250 |
| 8/5/2005  | 12,350 | 4,840,000  | 1.399177 | 0.028395 | -250 |
| 8/8/2005  | 11,800 | 22,720,500 | 1.399177 | 0.028395 | -550 |
| 8/9/2005  | 11,700 | 7,881,500  | 1.399177 | 0.028395 | -100 |
| 8/10/2005 | 11,850 | 14,528,000 | 1.399177 | 0.028395 | 150  |
| 8/11/2005 | 11,500 | 9,435,500  | 1.399177 | 0.028395 | -350 |
| 8/12/2005 | 11,400 | 6,388,000  | 1.399177 | 0.028395 | -100 |
| 8/15/2005 | 11,150 | 4,991,000  | 1.399177 | 0.028395 | -250 |
| 8/16/2005 | 10,800 | 14,705,500 | 1.399177 | 0.028395 | -350 |
| 8/18/2005 | 10,700 | 12,650,500 | 1.399177 | 0.028395 | -100 |
| 8/19/2005 | 10,300 | 13,265,500 | 1.399177 | 0.028395 | -400 |

|            |        |            |          |          |      |
|------------|--------|------------|----------|----------|------|
| 8/22/2005  | 10,400 | 9,507,000  | 1.399177 | 0.028395 | 100  |
| 8/23/2005  | 10,300 | 8,202,000  | 1.399177 | 0.028395 | -100 |
| 8/24/2005  | 10,300 | 16,399,000 | 1.399177 | 0.028395 | 0    |
| 8/25/2005  | 10,650 | 16,456,500 | 1.399177 | 0.028395 | 350  |
| 8/26/2005  | 10,500 | 13,859,000 | 1.399177 | 0.028395 | -150 |
| 8/29/2005  | 9,600  | 18,325,000 | 1.399177 | 0.028395 | -900 |
| 8/30/2005  | 10,050 | 26,259,000 | 1.399177 | 0.028395 | 450  |
| 8/31/2005  | 10,150 | 16,462,500 | 1.399177 | 0.028395 | 100  |
| 9/1/2005   | 10,000 | 10,386,500 | 1.399177 | 0.028395 | -150 |
| 9/5/2005   | 9,800  | 5,141,500  | 1.399177 | 0.028395 | -200 |
| 9/6/2005   | 10,000 | 7,306,500  | 1.399177 | 0.028395 | 200  |
| 9/7/2005   | 10,000 | 3,795,500  | 1.399177 | 0.028395 | 0    |
| 9/8/2005   | 10,400 | 11,100,000 | 1.399177 | 0.028395 | 400  |
| 9/9/2005   | 10,900 | 17,788,500 | 1.399177 | 0.028395 | 500  |
| 9/12/2005  | 11,150 | 19,690,500 | 1.399177 | 0.028395 | 250  |
| 9/13/2005  | 11,050 | 16,985,000 | 1.399177 | 0.028395 | -100 |
| 9/14/2005  | 10,650 | 16,789,000 | 1.399177 | 0.028395 | -400 |
| 9/15/2005  | 10,300 | 19,723,500 | 1.399177 | 0.028395 | -350 |
| 9/16/2005  | 10,150 | 12,356,500 | 1.399177 | 0.028395 | -150 |
| 9/19/2005  | 10,150 | 9,156,000  | 1.399177 | 0.028395 | 0    |
| 9/20/2005  | 9,900  | 8,956,500  | 1.399177 | 0.028395 | -250 |
| 9/21/2005  | 9,500  | 12,572,500 | 1.399177 | 0.028395 | -400 |
| 9/22/2005  | 9,050  | 16,877,000 | 1.399177 | 0.028395 | -450 |
| 9/23/2005  | 9,050  | 14,219,000 | 1.399177 | 0.028395 | 0    |
| 9/26/2005  | 9,350  | 19,700,000 | 1.399177 | 0.028395 | 300  |
| 9/27/2005  | 9,150  | 7,415,000  | 1.399177 | 0.028395 | -200 |
| 9/28/2005  | 8,850  | 18,261,500 | 1.399177 | 0.028395 | -300 |
| 9/29/2005  | 9,100  | 11,881,000 | 1.399177 | 0.028395 | 250  |
| 9/30/2005  | 9,750  | 30,350,500 | 1.399177 | 0.028395 | 650  |
| 10/3/2005  | 9,600  | 22,960,000 | 1.399177 | 0.028395 | -150 |
| 10/4/2005  | 9,500  | 25,075,000 | 1.399177 | 0.028395 | -100 |
| 10/5/2005  | 9,800  | 17,504,500 | 1.399177 | 0.028395 | 300  |
| 10/6/2005  | 9,500  | 10,660,500 | 1.399177 | 0.028395 | -300 |
| 10/7/2005  | 9,400  | 4,861,500  | 1.399177 | 0.028395 | -100 |
| 10/10/2005 | 9,350  | 3,293,500  | 1.399177 | 0.028395 | -50  |
| 10/11/2005 | 9,300  | 2,380,000  | 1.399177 | 0.028395 | -50  |
| 10/12/2005 | 9,300  | 10,414,500 | 1.399177 | 0.028395 | 0    |
| 10/13/2005 | 9,100  | 10,839,500 | 1.399177 | 0.028395 | -200 |
| 10/14/2005 | 9,450  | 12,250,000 | 1.399177 | 0.028395 | 350  |
| 10/17/2005 | 9,500  | 6,153,500  | 1.399177 | 0.028395 | 50   |
| 10/18/2005 | 9,650  | 5,837,500  | 1.399177 | 0.028395 | 150  |
| 10/19/2005 | 9,350  | 9,397,000  | 1.399177 | 0.028395 | -300 |
| 10/20/2005 | 9,350  | 6,357,000  | 1.399177 | 0.028395 | 0    |
| 10/21/2005 | 9,400  | 5,348,500  | 1.399177 | 0.028395 | 50   |
| 10/24/2005 | 9,200  | 2,812,500  | 1.399177 | 0.028395 | -200 |
| 10/25/2005 | 9,100  | 5,460,000  | 1.399177 | 0.028395 | -100 |
| 10/26/2005 | 9,100  | 9,402,000  | 1.399177 | 0.028395 | 0    |

|            |        |            |          |          |      |
|------------|--------|------------|----------|----------|------|
| 10/27/2005 | 9,350  | 3,311,500  | 1.399177 | 0.028395 | 250  |
| 10/28/2005 | 9,050  | 4,646,500  | 1.399177 | 0.028395 | -300 |
| 10/31/2005 | 9,300  | 3,233,500  | 1.399177 | 0.028395 | 250  |
| 11/1/2005  | 9,250  | 7,854,000  | 1.399177 | 0.028395 | -50  |
| 11/9/2005  | 9,050  | 16,129,500 | 1.399177 | 0.028395 | -200 |
| 11/10/2005 | 8,800  | 14,512,000 | 1.399177 | 0.028395 | -250 |
| 11/11/2005 | 8,550  | 6,769,000  | 1.399177 | 0.028395 | -250 |
| 11/14/2005 | 8,300  | 11,411,000 | 1.399177 | 0.028395 | -250 |
| 11/15/2005 | 8,450  | 6,831,000  | 1.399177 | 0.028395 | 150  |
| 11/16/2005 | 8,450  | 2,455,000  | 1.399177 | 0.028395 | 0    |
| 11/17/2005 | 8,700  | 7,473,000  | 1.399177 | 0.028395 | 250  |
| 11/18/2005 | 9,050  | 8,083,500  | 1.399177 | 0.028395 | 350  |
| 11/21/2005 | 9,150  | 5,754,000  | 1.399177 | 0.028395 | 100  |
| 11/22/2005 | 9,350  | 9,480,500  | 1.399177 | 0.028395 | 200  |
| 11/23/2005 | 9,100  | 7,343,000  | 1.399177 | 0.028395 | -250 |
| 11/24/2005 | 9,250  | 2,813,500  | 1.399177 | 0.028395 | 150  |
| 11/25/2005 | 9,250  | 3,957,000  | 1.399177 | 0.028395 | 0    |
| 11/28/2005 | 9,150  | 3,449,500  | 1.399177 | 0.028395 | -100 |
| 11/29/2005 | 9,100  | 12,929,000 | 1.399177 | 0.028395 | -50  |
| 11/30/2005 | 9,100  | 9,768,000  | 1.399177 | 0.028395 | 0    |
| 12/1/2005  | 9,250  | 7,739,500  | 1.399177 | 0.028395 | 150  |
| 12/2/2005  | 9,550  | 7,929,000  | 1.399177 | 0.028395 | 300  |
| 12/5/2005  | 9,400  | 3,552,000  | 1.399177 | 0.028395 | -150 |
| 12/6/2005  | 9,650  | 10,168,500 | 1.399177 | 0.028395 | 250  |
| 12/7/2005  | 10,000 | 18,754,000 | 1.399177 | 0.028395 | 350  |
| 12/8/2005  | 10,000 | 14,153,500 | 1.399177 | 0.028395 | 0    |
| 12/9/2005  | 10,300 | 11,276,000 | 1.399177 | 0.028395 | 300  |
| 12/12/2005 | 10,600 | 8,798,000  | 1.399177 | 0.028395 | 300  |
| 12/13/2005 | 10,300 | 3,022,000  | 1.399177 | 0.028395 | -300 |
| 12/14/2005 | 10,600 | 10,886,000 | 1.399177 | 0.028395 | 300  |
| 12/15/2005 | 10,300 | 6,459,500  | 1.399177 | 0.028395 | -300 |
| 12/16/2005 | 10,050 | 3,951,500  | 1.399177 | 0.028395 | -250 |
| 12/19/2005 | 10,150 | 1,816,000  | 1.399177 | 0.028395 | 100  |
| 12/20/2005 | 10,250 | 3,144,000  | 1.399177 | 0.028395 | 100  |
| 12/21/2005 | 10,150 | 2,628,500  | 1.399177 | 0.028395 | -100 |
| 12/22/2005 | 10,200 | 5,663,500  | 1.399177 | 0.028395 | 50   |
| 12/23/2005 | 10,350 | 5,049,500  | 1.399177 | 0.028395 | 150  |
| 12/27/2005 | 10,400 | 341,500    | 1.399177 | 0.028395 | 50   |
| 12/28/2005 | 10,400 | 977,500    | 1.399177 | 0.028395 | 0    |
| 12/29/2005 | 10,200 | 3,782,000  | 1.399177 | 0.028395 | -200 |
| 1/3/2006   | 10,200 | 5,182,500  | 1.841004 | 0.018201 | 0    |
| 1/4/2006   | 10,500 | 8,319,000  | 1.841004 | 0.018201 | 300  |
| 1/5/2006   | 10,750 | 18,195,000 | 1.841004 | 0.018201 | 250  |
| 1/6/2006   | 10,900 | 5,300,500  | 1.841004 | 0.018201 | 150  |
| 1/9/2006   | 11,250 | 14,985,000 | 1.841004 | 0.018201 | 350  |
| 1/11/2006  | 11,450 | 17,976,000 | 1.841004 | 0.018201 | 200  |
| 1/12/2006  | 11,450 | 12,698,000 | 1.841004 | 0.018201 | 0    |

|           |        |            |          |          |      |
|-----------|--------|------------|----------|----------|------|
| 1/13/2006 | 11,100 | 4,183,500  | 1.841004 | 0.018201 | -350 |
| 1/16/2006 | 10,850 | 4,608,500  | 1.841004 | 0.018201 | -250 |
| 1/17/2006 | 10,700 | 8,115,000  | 1.841004 | 0.018201 | -150 |
| 1/18/2006 | 10,400 | 3,614,000  | 1.841004 | 0.018201 | -300 |
| 1/19/2006 | 10,850 | 2,454,500  | 1.841004 | 0.018201 | 450  |
| 1/20/2006 | 10,950 | 4,711,000  | 1.841004 | 0.018201 | 100  |
| 1/23/2006 | 10,300 | 9,371,500  | 1.841004 | 0.018201 | -650 |
| 1/24/2006 | 10,300 | 6,850,000  | 1.841004 | 0.018201 | 0    |
| 1/25/2006 | 10,500 | 6,729,500  | 1.841004 | 0.018201 | 200  |
| 1/26/2006 | 10,350 | 5,195,500  | 1.841004 | 0.018201 | -150 |
| 1/27/2006 | 10,450 | 4,189,000  | 1.841004 | 0.018201 | 100  |
| 1/30/2006 | 10,400 | 489,000    | 1.841004 | 0.018201 | -50  |
| 2/1/2006  | 10,600 | 6,132,000  | 1.841004 | 0.018201 | 200  |
| 2/2/2006  | 10,450 | 4,525,000  | 1.841004 | 0.018201 | -150 |
| 2/6/2006  | 10,600 | 5,630,500  | 1.841004 | 0.018201 | 150  |
| 2/7/2006  | 10,850 | 5,501,500  | 1.841004 | 0.018201 | 250  |
| 2/8/2006  | 10,250 | 22,382,000 | 1.841004 | 0.018201 | -600 |
| 2/9/2006  | 10,350 | 5,679,000  | 1.841004 | 0.018201 | 100  |
| 2/10/2006 | 10,300 | 2,286,000  | 1.841004 | 0.018201 | -50  |
| 2/13/2006 | 10,300 | 2,707,000  | 1.841004 | 0.018201 | 0    |
| 2/14/2006 | 9,800  | 25,849,000 | 1.841004 | 0.018201 | -500 |
| 2/15/2006 | 9,650  | 19,582,000 | 1.841004 | 0.018201 | -150 |
| 2/16/2006 | 9,350  | 13,441,500 | 1.841004 | 0.018201 | -300 |
| 2/17/2006 | 9,450  | 11,084,000 | 1.841004 | 0.018201 | 100  |
| 2/20/2006 | 9,750  | 7,148,500  | 1.841004 | 0.018201 | 300  |
| 2/21/2006 | 9,550  | 4,311,000  | 1.841004 | 0.018201 | -200 |
| 2/22/2006 | 9,550  | 3,704,500  | 1.841004 | 0.018201 | 0    |
| 2/23/2006 | 9,700  | 8,775,500  | 1.841004 | 0.018201 | 150  |
| 2/24/2006 | 9,500  | 4,511,500  | 1.841004 | 0.018201 | -200 |
| 2/27/2006 | 9,700  | 5,642,500  | 1.841004 | 0.018201 | 200  |
| 2/28/2006 | 9,800  | 7,030,500  | 1.841004 | 0.018201 | 100  |
| 3/1/2006  | 9,800  | 7,056,500  | 1.841004 | 0.018201 | 0    |
| 3/2/2006  | 9,900  | 5,897,500  | 1.841004 | 0.018201 | 100  |
| 3/3/2006  | 10,200 | 14,019,000 | 1.841004 | 0.018201 | 300  |
| 3/6/2006  | 10,450 | 12,290,000 | 1.841004 | 0.018201 | 250  |
| 3/7/2006  | 10,100 | 9,389,000  | 1.841004 | 0.018201 | -350 |
| 3/8/2006  | 9,800  | 9,808,000  | 1.841004 | 0.018201 | -300 |
| 3/9/2006  | 9,950  | 4,406,500  | 1.841004 | 0.018201 | 150  |
| 3/10/2006 | 10,150 | 6,620,000  | 1.841004 | 0.018201 | 200  |
| 3/13/2006 | 10,000 | 2,539,000  | 1.841004 | 0.018201 | -150 |
| 3/14/2006 | 10,000 | 1,293,000  | 1.841004 | 0.018201 | 0    |
| 3/15/2006 | 10,150 | 2,380,500  | 1.841004 | 0.018201 | 150  |
| 3/16/2006 | 10,550 | 19,580,500 | 1.841004 | 0.018201 | 400  |
| 3/17/2006 | 11,000 | 30,684,000 | 1.841004 | 0.018201 | 450  |
| 3/20/2006 | 11,400 | 26,780,000 | 1.841004 | 0.018201 | 400  |
| 3/21/2006 | 11,300 | 12,455,000 | 1.841004 | 0.018201 | -100 |
| 3/22/2006 | 10,800 | 6,690,000  | 1.841004 | 0.018201 | -500 |

|           |        |            |          |          |      |
|-----------|--------|------------|----------|----------|------|
| 3/23/2006 | 10,800 | 4,641,000  | 1.841004 | 0.018201 | 0    |
| 3/24/2006 | 11,200 | 6,199,000  | 1.841004 | 0.018201 | 400  |
| 3/27/2006 | 10,900 | 1,115,500  | 1.841004 | 0.018201 | -300 |
| 3/28/2006 | 11,450 | 14,191,500 | 1.841004 | 0.018201 | 550  |
| 3/29/2006 | 11,250 | 2,967,000  | 1.841004 | 0.018201 | -200 |
| 4/3/2006  | 11,200 | 4,324,000  | 1.841004 | 0.018201 | -50  |
| 4/4/2006  | 11,400 | 4,850,000  | 1.841004 | 0.018201 | 200  |
| 4/5/2006  | 11,400 | 5,880,500  | 1.841004 | 0.018201 | 0    |
| 4/6/2006  | 10,950 | 5,950,000  | 1.841004 | 0.018201 | -450 |
| 4/7/2006  | 10,850 | 10,514,500 | 1.841004 | 0.018201 | -100 |
| 4/11/2006 | 11,250 | 8,067,500  | 1.841004 | 0.018201 | 400  |
| 4/12/2006 | 11,250 | 5,584,500  | 1.841004 | 0.018201 | 0    |
| 4/13/2006 | 11,850 | 20,798,500 | 1.841004 | 0.018201 | 600  |
| 4/17/2006 | 11,850 | 1,606,000  | 1.841004 | 0.018201 | 0    |
| 4/18/2006 | 12,250 | 10,300,500 | 1.841004 | 0.018201 | 400  |
| 4/19/2006 | 12,950 | 24,745,000 | 1.841004 | 0.018201 | 700  |
| 4/20/2006 | 12,400 | 6,280,500  | 1.841004 | 0.018201 | -550 |
| 4/21/2006 | 11,950 | 8,030,500  | 1.841004 | 0.018201 | -450 |
| 4/24/2006 | 11,600 | 5,605,500  | 1.841004 | 0.018201 | -350 |
| 4/25/2006 | 12,200 | 12,603,500 | 1.841004 | 0.018201 | 600  |
| 4/26/2006 | 12,600 | 7,522,000  | 1.841004 | 0.018201 | 400  |
| 4/27/2006 | 12,350 | 7,100,500  | 1.841004 | 0.018201 | -250 |
| 4/28/2006 | 11,950 | 5,723,500  | 1.841004 | 0.018201 | -400 |
| 5/1/2006  | 11,800 | 3,749,000  | 1.841004 | 0.018201 | -150 |
| 5/2/2006  | 11,800 | 4,501,500  | 1.841004 | 0.018201 | 0    |
| 5/3/2006  | 11,750 | 9,281,000  | 1.841004 | 0.018201 | -50  |
| 5/4/2006  | 11,550 | 6,520,000  | 1.841004 | 0.018201 | -200 |
| 5/5/2006  | 11,500 | 3,342,500  | 1.841004 | 0.018201 | -50  |
| 5/8/2006  | 11,750 | 8,059,000  | 1.841004 | 0.018201 | 250  |
| 5/9/2006  | 12,400 | 14,743,500 | 1.841004 | 0.018201 | 650  |
| 5/10/2006 | 12,100 | 8,296,000  | 1.841004 | 0.018201 | -300 |
| 5/11/2006 | 12,100 | 5,130,000  | 1.841004 | 0.018201 | 0    |
| 5/12/2006 | 11,650 | 13,064,000 | 1.841004 | 0.018201 | -450 |
| 5/15/2006 | 10,850 | 14,548,500 | 1.841004 | 0.018201 | -800 |
| 5/16/2006 | 10,750 | 17,189,500 | 1.841004 | 0.018201 | -100 |
| 5/17/2006 | 11,050 | 10,949,500 | 1.841004 | 0.018201 | 300  |
| 5/18/2006 | 10,450 | 10,645,500 | 1.841004 | 0.018201 | -600 |
| 5/19/2006 | 10,650 | 4,461,500  | 1.841004 | 0.018201 | 200  |
| 5/22/2006 | 10,050 | 13,833,500 | 1.841004 | 0.018201 | -600 |
| 5/23/2006 | 10,300 | 6,608,000  | 1.841004 | 0.018201 | 250  |
| 5/24/2006 | 9,900  | 10,964,000 | 1.841004 | 0.018201 | -400 |
| 5/29/2006 | 9,800  | 13,640,000 | 1.841004 | 0.018201 | -100 |
| 5/30/2006 | 10,200 | 6,767,500  | 1.841004 | 0.018201 | 400  |
| 5/31/2006 | 9,800  | 10,140,500 | 1.841004 | 0.018201 | -400 |
| 6/1/2006  | 9,450  | 9,760,000  | 1.841004 | 0.018201 | -350 |
| 6/2/2006  | 9,700  | 10,208,000 | 1.841004 | 0.018201 | 250  |
| 6/5/2006  | 9,500  | 6,903,500  | 1.841004 | 0.018201 | -200 |

|           |        |            |          |          |      |
|-----------|--------|------------|----------|----------|------|
| 6/6/2006  | 9,450  | 17,212,500 | 1.841004 | 0.018201 | -50  |
| 6/7/2006  | 9,350  | 11,846,000 | 1.841004 | 0.018201 | -100 |
| 6/8/2006  | 9,100  | 13,153,000 | 1.841004 | 0.018201 | -250 |
| 6/9/2006  | 9,350  | 6,657,500  | 1.841004 | 0.018201 | 250  |
| 6/12/2006 | 9,150  | 8,273,500  | 1.841004 | 0.018201 | -200 |
| 6/13/2006 | 8,750  | 22,488,000 | 1.841004 | 0.018201 | -400 |
| 6/14/2006 | 8,750  | 16,233,000 | 1.841004 | 0.018201 | 0    |
| 6/15/2006 | 9,000  | 9,816,000  | 1.841004 | 0.018201 | 250  |
| 6/16/2006 | 9,500  | 19,056,000 | 1.841004 | 0.018201 | 500  |
| 6/19/2006 | 9,400  | 4,917,500  | 1.841004 | 0.018201 | -100 |
| 6/20/2006 | 9,550  | 8,740,000  | 1.841004 | 0.018201 | 150  |
| 6/21/2006 | 9,550  | 4,365,000  | 1.841004 | 0.018201 | 0    |
| 6/22/2006 | 9,500  | 3,259,000  | 1.841004 | 0.018201 | -50  |
| 6/23/2006 | 9,600  | 2,074,000  | 1.841004 | 0.018201 | 100  |
| 6/26/2006 | 9,350  | 4,884,000  | 1.841004 | 0.018201 | -250 |
| 6/27/2006 | 9,350  | 6,166,500  | 1.841004 | 0.018201 | 0    |
| 6/28/2006 | 9,350  | 1,862,000  | 1.841004 | 0.018201 | 0    |
| 6/29/2006 | 9,500  | 1,918,500  | 1.841004 | 0.018201 | 150  |
| 6/30/2006 | 9,750  | 8,347,000  | 1.841004 | 0.018201 | 250  |
| 7/3/2006  | 10,400 | 15,784,000 | 1.841004 | 0.018201 | 650  |
| 7/4/2006  | 10,650 | 7,230,000  | 1.841004 | 0.018201 | 250  |
| 7/5/2006  | 10,650 | 5,594,500  | 1.841004 | 0.018201 | 0    |
| 7/6/2006  | 10,450 | 3,170,500  | 1.841004 | 0.018201 | -200 |
| 7/7/2006  | 10,150 | 9,783,000  | 1.841004 | 0.018201 | -300 |
| 7/10/2006 | 9,900  | 7,302,000  | 1.841004 | 0.018201 | -250 |
| 7/11/2006 | 9,850  | 4,392,000  | 1.841004 | 0.018201 | -50  |
| 7/12/2006 | 9,750  | 6,775,500  | 1.841004 | 0.018201 | -100 |
| 7/13/2006 | 9,650  | 6,352,000  | 1.841004 | 0.018201 | -100 |
| 7/14/2006 | 9,500  | 5,961,000  | 1.841004 | 0.018201 | -150 |
| 7/17/2006 | 9,500  | 6,181,500  | 1.841004 | 0.018201 | 0    |
| 7/18/2006 | 9,250  | 3,509,000  | 1.841004 | 0.018201 | -250 |
| 7/19/2006 | 9,300  | 2,550,000  | 1.841004 | 0.018201 | 50   |
| 7/20/2006 | 9,500  | 12,235,500 | 1.841004 | 0.018201 | 200  |
| 7/21/2006 | 9,500  | 8,524,000  | 1.841004 | 0.018201 | 0    |
| 7/24/2006 | 9,150  | 11,802,000 | 1.841004 | 0.018201 | -350 |
| 7/25/2006 | 9,250  | 7,440,500  | 1.841004 | 0.018201 | 100  |
| 7/26/2006 | 9,350  | 9,595,500  | 1.841004 | 0.018201 | 100  |
| 7/27/2006 | 9,600  | 13,131,000 | 1.841004 | 0.018201 | 250  |
| 7/28/2006 | 9,650  | 6,903,000  | 1.841004 | 0.018201 | 50   |
| 7/31/2006 | 9,600  | 9,893,000  | 1.841004 | 0.018201 | -50  |
| 8/1/2006  | 9,900  | 10,995,500 | 1.841004 | 0.018201 | 300  |
| 8/2/2006  | 9,950  | 12,338,500 | 1.841004 | 0.018201 | 50   |
| 8/3/2006  | 10,200 | 24,372,500 | 1.841004 | 0.018201 | 250  |
| 8/4/2006  | 10,500 | 14,708,500 | 1.841004 | 0.018201 | 300  |
| 8/7/2006  | 10,500 | 15,172,500 | 1.841004 | 0.018201 | 0    |
| 8/8/2006  | 10,700 | 18,107,000 | 1.841004 | 0.018201 | 200  |
| 8/9/2006  | 10,950 | 5,810,500  | 1.841004 | 0.018201 | 250  |

|            |        |            |          |          |      |
|------------|--------|------------|----------|----------|------|
| 8/10/2006  | 10,800 | 21,599,000 | 1.841004 | 0.018201 | -150 |
| 8/11/2006  | 10,850 | 3,301,500  | 1.841004 | 0.018201 | 50   |
| 8/14/2006  | 11,300 | 13,549,000 | 1.841004 | 0.018201 | 450  |
| 8/15/2006  | 11,400 | 8,209,500  | 1.841004 | 0.018201 | 100  |
| 8/16/2006  | 11,900 | 13,484,000 | 1.841004 | 0.018201 | 500  |
| 8/22/2006  | 11,950 | 14,541,000 | 1.841004 | 0.018201 | 50   |
| 8/23/2006  | 11,950 | 5,728,000  | 1.841004 | 0.018201 | 0    |
| 8/24/2006  | 11,400 | 5,240,500  | 1.841004 | 0.018201 | -550 |
| 8/25/2006  | 10,950 | 7,723,000  | 1.841004 | 0.018201 | -450 |
| 8/28/2006  | 11,250 | 2,484,000  | 1.841004 | 0.018201 | 300  |
| 8/29/2006  | 11,300 | 2,422,500  | 1.841004 | 0.018201 | 50   |
| 8/30/2006  | 11,200 | 1,064,000  | 1.841004 | 0.018201 | -100 |
| 8/31/2006  | 11,100 | 6,413,000  | 1.841004 | 0.018201 | -100 |
| 9/1/2006   | 11,500 | 5,577,500  | 1.841004 | 0.018201 | 400  |
| 9/4/2006   | 11,950 | 11,602,500 | 1.841004 | 0.018201 | 450  |
| 9/5/2006   | 12,000 | 9,046,500  | 1.841004 | 0.018201 | 50   |
| 9/6/2006   | 11,950 | 6,289,500  | 1.841004 | 0.018201 | -50  |
| 9/7/2006   | 12,000 | 6,496,000  | 1.841004 | 0.018201 | 50   |
| 9/8/2006   | 12,000 | 5,031,500  | 1.841004 | 0.018201 | 0    |
| 9/11/2006  | 11,750 | 2,255,000  | 1.841004 | 0.018201 | -250 |
| 9/12/2006  | 11,550 | 4,381,000  | 1.841004 | 0.018201 | -200 |
| 9/13/2006  | 11,850 | 3,320,500  | 1.841004 | 0.018201 | 300  |
| 9/14/2006  | 12,000 | 7,266,500  | 1.841004 | 0.018201 | 150  |
| 9/15/2006  | 11,900 | 3,280,000  | 1.841004 | 0.018201 | -100 |
| 9/18/2006  | 12,000 | 2,536,500  | 1.841004 | 0.018201 | 100  |
| 9/19/2006  | 12,100 | 10,837,000 | 1.841004 | 0.018201 | 100  |
| 9/20/2006  | 12,150 | 5,872,000  | 1.841004 | 0.018201 | 50   |
| 9/21/2006  | 12,600 | 9,436,500  | 1.841004 | 0.018201 | 450  |
| 9/22/2006  | 12,650 | 4,359,000  | 1.841004 | 0.018201 | 50   |
| 9/25/2006  | 12,600 | 1,669,000  | 1.841004 | 0.018201 | -50  |
| 9/26/2006  | 12,550 | 2,583,000  | 1.841004 | 0.018201 | -50  |
| 9/27/2006  | 12,450 | 2,929,000  | 1.841004 | 0.018201 | -100 |
| 9/28/2006  | 12,450 | 2,466,500  | 1.841004 | 0.018201 | 0    |
| 9/29/2006  | 12,450 | 3,387,500  | 1.841004 | 0.018201 | 0    |
| 10/2/2006  | 12,200 | 4,274,500  | 1.841004 | 0.018201 | -250 |
| 10/3/2006  | 12,450 | 5,020,500  | 1.841004 | 0.018201 | 250  |
| 10/4/2006  | 12,700 | 4,787,500  | 1.841004 | 0.018201 | 250  |
| 10/5/2006  | 12,750 | 6,053,500  | 1.841004 | 0.018201 | 50   |
| 10/6/2006  | 12,800 | 7,047,500  | 1.841004 | 0.018201 | 50   |
| 10/9/2006  | 13,000 | 7,367,500  | 1.841004 | 0.018201 | 200  |
| 10/11/2006 | 13,550 | 5,972,000  | 1.841004 | 0.018201 | 550  |
| 10/12/2006 | 13,600 | 5,849,000  | 1.841004 | 0.018201 | 50   |
| 10/13/2006 | 13,800 | 5,235,000  | 1.841004 | 0.018201 | 200  |
| 10/16/2006 | 13,150 | 10,164,500 | 1.841004 | 0.018201 | -650 |
| 10/17/2006 | 13,150 | 3,965,000  | 1.841004 | 0.018201 | 0    |
| 10/18/2006 | 13,200 | 3,757,500  | 1.841004 | 0.018201 | 50   |
| 10/19/2006 | 13,350 | 1,928,500  | 1.841004 | 0.018201 | 150  |

|            |        |            |          |          |      |
|------------|--------|------------|----------|----------|------|
| 10/20/2006 | 13,500 | 1,504,500  | 1.841004 | 0.018201 | 150  |
| 10/30/2006 | 13,500 | 10,653,500 | 1.841004 | 0.018201 | 0    |
| 10/31/2006 | 13,400 | 10,485,000 | 1.841004 | 0.018201 | -100 |
| 11/1/2006  | 13,550 | 7,152,000  | 1.841004 | 0.018201 | 150  |
| 11/2/2006  | 13,850 | 4,401,500  | 1.841004 | 0.018201 | 300  |
| 11/3/2006  | 13,950 | 2,714,500  | 1.841004 | 0.018201 | 100  |
| 11/6/2006  | 14,200 | 3,335,000  | 1.841004 | 0.018201 | 250  |
| 11/7/2006  | 14,900 | 9,031,500  | 1.841004 | 0.018201 | 700  |
| 11/8/2006  | 14,450 | 7,517,000  | 1.841004 | 0.018201 | -450 |
| 11/9/2006  | 14,850 | 6,363,000  | 1.841004 | 0.018201 | 400  |
| 11/10/2006 | 14,500 | 2,209,000  | 1.841004 | 0.018201 | -350 |
| 11/13/2006 | 14,200 | 4,925,000  | 1.841004 | 0.018201 | -300 |
| 11/14/2006 | 14,400 | 3,867,500  | 1.841004 | 0.018201 | 200  |
| 11/15/2006 | 14,750 | 5,762,500  | 1.841004 | 0.018201 | 350  |
| 11/16/2006 | 14,700 | 6,336,000  | 1.841004 | 0.018201 | -50  |
| 11/17/2006 | 14,700 | 4,695,000  | 1.841004 | 0.018201 | 0    |
| 11/20/2006 | 15,300 | 7,034,000  | 1.841004 | 0.018201 | 600  |
| 11/21/2006 | 15,550 | 2,769,000  | 1.841004 | 0.018201 | 250  |
| 11/22/2006 | 15,500 | 1,464,000  | 1.841004 | 0.018201 | -50  |
| 11/23/2006 | 15,400 | 1,376,000  | 1.841004 | 0.018201 | -100 |
| 11/24/2006 | 15,550 | 490,500    | 1.841004 | 0.018201 | 150  |
| 11/27/2006 | 16,250 | 3,992,500  | 1.841004 | 0.018201 | 700  |
| 11/28/2006 | 15,700 | 4,197,000  | 1.841004 | 0.018201 | -550 |
| 11/29/2006 | 15,650 | 4,770,500  | 1.841004 | 0.018201 | -50  |
| 11/30/2006 | 15,950 | 5,692,500  | 1.841004 | 0.018201 | 300  |
| 12/1/2006  | 15,950 | 2,038,500  | 1.841004 | 0.018201 | 0    |
| 12/4/2006  | 15,950 | 4,057,500  | 1.841004 | 0.018201 | 0    |
| 12/5/2006  | 16,700 | 3,612,000  | 1.841004 | 0.018201 | 750  |
| 12/6/2006  | 16,850 | 8,570,500  | 1.841004 | 0.018201 | 150  |
| 12/7/2006  | 16,350 | 6,001,500  | 1.841004 | 0.018201 | -500 |
| 12/8/2006  | 16,450 | 5,118,000  | 1.841004 | 0.018201 | 100  |
| 12/11/2006 | 16,400 | 9,176,000  | 1.841004 | 0.018201 | -50  |
| 12/12/2006 | 16,400 | 4,730,500  | 1.841004 | 0.018201 | 0    |
| 12/13/2006 | 16,250 | 4,242,500  | 1.841004 | 0.018201 | -150 |
| 12/14/2006 | 15,850 | 5,900,500  | 1.841004 | 0.018201 | -400 |
| 12/15/2006 | 15,950 | 3,860,000  | 1.841004 | 0.018201 | 100  |
| 12/18/2006 | 15,900 | 2,204,500  | 1.841004 | 0.018201 | -50  |
| 12/19/2006 | 15,500 | 3,336,500  | 1.841004 | 0.018201 | -400 |
| 12/20/2006 | 15,700 | 6,783,500  | 1.841004 | 0.018201 | 200  |
| 12/21/2006 | 16,000 | 1,913,500  | 1.841004 | 0.018201 | 300  |
| 12/22/2006 | 15,800 | 924,500    | 1.841004 | 0.018201 | -200 |
| 12/26/2006 | 15,600 | 687,000    | 1.841004 | 0.018201 | -200 |
| 12/27/2006 | 15,800 | 759,500    | 1.841004 | 0.018201 | 200  |
| 12/28/2006 | 15,700 | 2,490,000  | 1.841004 | 0.018201 | -100 |
| 1/2/2007   | 16,350 | 2,934,500  | 0.6639   | 0.061535 | 650  |
| 1/3/2007   | 16,400 | 3,969,000  | 0.6639   | 0.061535 | 50   |
| 1/4/2007   | 16,500 | 3,068,000  | 0.6639   | 0.061535 | 100  |

|           |        |            |        |          |      |
|-----------|--------|------------|--------|----------|------|
| 1/5/2007  | 16,750 | 2,759,000  | 0.6639 | 0.061535 | 250  |
| 1/8/2007  | 16,150 | 3,695,500  | 0.6639 | 0.061535 | -600 |
| 1/9/2007  | 15,700 | 4,945,500  | 0.6639 | 0.061535 | -450 |
| 1/10/2007 | 15,050 | 11,890,500 | 0.6639 | 0.061535 | -650 |
| 1/11/2007 | 14,850 | 5,099,500  | 0.6639 | 0.061535 | -200 |
| 1/12/2007 | 15,000 | 9,370,500  | 0.6639 | 0.061535 | 150  |
| 1/15/2007 | 15,300 | 6,209,000  | 0.6639 | 0.061535 | 300  |
| 1/16/2007 | 15,600 | 4,071,500  | 0.6639 | 0.061535 | 300  |
| 1/17/2007 | 15,400 | 3,017,000  | 0.6639 | 0.061535 | -200 |
| 1/18/2007 | 15,650 | 4,771,000  | 0.6639 | 0.061535 | 250  |
| 1/19/2007 | 16,100 | 9,300,000  | 0.6639 | 0.061535 | 450  |
| 1/22/2007 | 16,050 | 5,279,500  | 0.6639 | 0.061535 | -50  |
| 1/23/2007 | 15,800 | 6,896,000  | 0.6639 | 0.061535 | -250 |
| 1/24/2007 | 15,800 | 1,800,500  | 0.6639 | 0.061535 | 0    |
| 1/25/2007 | 15,550 | 6,221,500  | 0.6639 | 0.061535 | -250 |
| 1/26/2007 | 15,400 | 3,943,500  | 0.6639 | 0.061535 | -150 |
| 1/29/2007 | 15,250 | 2,961,000  | 0.6639 | 0.061535 | -150 |
| 1/30/2007 | 15,000 | 5,168,500  | 0.6639 | 0.061535 | -250 |
| 1/31/2007 | 14,850 | 4,718,000  | 0.6639 | 0.061535 | -150 |
| 2/1/2007  | 14,550 | 6,100,500  | 0.6639 | 0.061535 | -300 |
| 2/2/2007  | 15,100 | 13,834,500 | 0.6639 | 0.061535 | 550  |
| 2/5/2007  | 14,600 | 3,746,000  | 0.6639 | 0.061535 | -500 |
| 2/6/2007  | 14,450 | 21,639,500 | 0.6639 | 0.061535 | -150 |
| 2/7/2007  | 14,900 | 15,501,000 | 0.6639 | 0.061535 | 450  |
| 2/8/2007  | 14,750 | 9,332,000  | 0.6639 | 0.061535 | -150 |
| 2/9/2007  | 15,150 | 4,438,500  | 0.6639 | 0.061535 | 400  |
| 2/12/2007 | 15,100 | 7,666,000  | 0.6639 | 0.061535 | -50  |
| 2/13/2007 | 14,800 | 1,562,500  | 0.6639 | 0.061535 | -300 |
| 2/14/2007 | 14,900 | 2,237,500  | 0.6639 | 0.061535 | 100  |
| 2/15/2007 | 14,950 | 4,782,000  | 0.6639 | 0.061535 | 50   |
| 2/16/2007 | 15,000 | 2,375,000  | 0.6639 | 0.061535 | 50   |
| 2/20/2007 | 15,100 | 216,500    | 0.6639 | 0.061535 | 100  |
| 2/21/2007 | 14,800 | 4,138,000  | 0.6639 | 0.061535 | -300 |
| 2/22/2007 | 14,950 | 3,774,000  | 0.6639 | 0.061535 | 150  |
| 2/23/2007 | 14,350 | 6,981,500  | 0.6639 | 0.061535 | -600 |
| 2/26/2007 | 14,000 | 5,631,000  | 0.6639 | 0.061535 | -350 |
| 2/27/2007 | 13,900 | 9,109,500  | 0.6639 | 0.061535 | -100 |
| 2/28/2007 | 14,050 | 10,805,000 | 0.6639 | 0.061535 | 150  |
| 3/1/2007  | 13,800 | 5,818,500  | 0.6639 | 0.061535 | -250 |
| 3/2/2007  | 14,000 | 8,128,500  | 0.6639 | 0.061535 | 200  |
| 3/5/2007  | 13,600 | 7,023,000  | 0.6639 | 0.061535 | -400 |
| 3/6/2007  | 13,850 | 7,428,500  | 0.6639 | 0.061535 | 250  |
| 3/7/2007  | 14,150 | 4,127,500  | 0.6639 | 0.061535 | 300  |
| 3/8/2007  | 14,500 | 3,538,500  | 0.6639 | 0.061535 | 350  |
| 3/9/2007  | 14,450 | 6,365,500  | 0.6639 | 0.061535 | -50  |
| 3/12/2007 | 14,650 | 4,169,500  | 0.6639 | 0.061535 | 200  |
| 3/13/2007 | 14,250 | 6,069,000  | 0.6639 | 0.061535 | -400 |

|           |        |            |        |          |      |
|-----------|--------|------------|--------|----------|------|
| 3/14/2007 | 13,900 | 8,565,500  | 0.6639 | 0.061535 | -350 |
| 3/15/2007 | 13,650 | 6,950,500  | 0.6639 | 0.061535 | -250 |
| 3/16/2007 | 13,450 | 5,801,500  | 0.6639 | 0.061535 | -200 |
| 3/20/2007 | 13,100 | 11,459,500 | 0.6639 | 0.061535 | -350 |
| 3/21/2007 | 13,300 | 10,233,000 | 0.6639 | 0.061535 | 200  |
| 3/22/2007 | 13,550 | 8,881,500  | 0.6639 | 0.061535 | 250  |
| 3/23/2007 | 13,200 | 14,274,000 | 0.6639 | 0.061535 | -350 |
| 3/26/2007 | 13,150 | 5,353,500  | 0.6639 | 0.061535 | -50  |
| 3/27/2007 | 13,050 | 9,695,000  | 0.6639 | 0.061535 | -100 |
| 3/28/2007 | 12,650 | 21,210,000 | 0.6639 | 0.061535 | -400 |
| 3/29/2007 | 13,300 | 13,203,500 | 0.6639 | 0.061535 | 650  |
| 3/30/2007 | 13,200 | 12,369,500 | 0.6639 | 0.061535 | -100 |
| 4/2/2007  | 13,200 | 10,222,000 | 0.6639 | 0.061535 | 0    |
| 4/3/2007  | 13,800 | 16,152,000 | 0.6639 | 0.061535 | 600  |
| 4/4/2007  | 13,950 | 23,097,500 | 0.6639 | 0.061535 | 150  |
| 4/5/2007  | 13,500 | 8,987,000  | 0.6639 | 0.061535 | -450 |
| 4/9/2007  | 13,700 | 2,951,500  | 0.6639 | 0.061535 | 200  |
| 4/10/2007 | 13,550 | 5,108,000  | 0.6639 | 0.061535 | -150 |
| 4/11/2007 | 13,700 | 5,200,000  | 0.6639 | 0.061535 | 150  |
| 4/12/2007 | 13,550 | 4,701,500  | 0.6639 | 0.061535 | -150 |
| 4/13/2007 | 13,500 | 3,842,000  | 0.6639 | 0.061535 | -50  |
| 4/16/2007 | 13,550 | 11,583,500 | 0.6639 | 0.061535 | 50   |
| 4/17/2007 | 13,800 | 7,946,000  | 0.6639 | 0.061535 | 250  |
| 4/18/2007 | 14,300 | 25,222,500 | 0.6639 | 0.061535 | 500  |
| 4/19/2007 | 13,800 | 19,523,000 | 0.6639 | 0.061535 | -500 |
| 4/20/2007 | 14,000 | 8,410,000  | 0.6639 | 0.061535 | 200  |
| 4/23/2007 | 14,050 | 6,732,000  | 0.6639 | 0.061535 | 50   |
| 4/24/2007 | 14,200 | 10,664,000 | 0.6639 | 0.061535 | 150  |
| 4/26/2007 | 14,950 | 23,010,000 | 0.6639 | 0.061535 | 750  |
| 4/27/2007 | 14,900 | 5,767,500  | 0.6639 | 0.061535 | -50  |
| 4/30/2007 | 14,400 | 8,659,000  | 0.6639 | 0.061535 | -500 |
| 5/1/2007  | 14,750 | 3,629,500  | 0.6639 | 0.061535 | 350  |
| 5/2/2007  | 14,950 | 13,424,000 | 0.6639 | 0.061535 | 200  |
| 5/3/2007  | 15,100 | 6,833,500  | 0.6639 | 0.061535 | 150  |
| 5/4/2007  | 15,700 | 13,493,500 | 0.6639 | 0.061535 | 600  |
| 5/7/2007  | 15,850 | 6,088,000  | 0.6639 | 0.061535 | 150  |
| 5/8/2007  | 15,750 | 12,126,500 | 0.6639 | 0.061535 | -100 |
| 5/9/2007  | 15,800 | 4,984,000  | 0.6639 | 0.061535 | 50   |
| 5/10/2007 | 16,200 | 14,459,500 | 0.6639 | 0.061535 | 400  |
| 5/11/2007 | 15,950 | 8,482,500  | 0.6639 | 0.061535 | -250 |
| 5/14/2007 | 16,000 | 3,149,000  | 0.6639 | 0.061535 | 50   |
| 5/15/2007 | 15,600 | 6,513,000  | 0.6639 | 0.061535 | -400 |
| 5/16/2007 | 15,900 | 3,508,000  | 0.6639 | 0.061535 | 300  |
| 5/21/2007 | 16,150 | 7,323,500  | 0.6639 | 0.061535 | 250  |
| 5/22/2007 | 16,200 | 3,749,000  | 0.6639 | 0.061535 | 50   |
| 5/23/2007 | 16,850 | 14,376,500 | 0.6639 | 0.061535 | 650  |
| 5/24/2007 | 16,550 | 1,796,000  | 0.6639 | 0.061535 | -300 |

|           |        |            |        |          |      |
|-----------|--------|------------|--------|----------|------|
| 5/25/2007 | 16,150 | 3,968,500  | 0.6639 | 0.061535 | -400 |
| 5/28/2007 | 16,300 | 2,786,000  | 0.6639 | 0.061535 | 150  |
| 5/29/2007 | 16,300 | 2,665,000  | 0.6639 | 0.061535 | 0    |
| 5/30/2007 | 16,100 | 2,515,500  | 0.6639 | 0.061535 | -200 |
| 5/31/2007 | 16,400 | 2,868,000  | 0.6639 | 0.061535 | 300  |
| 6/4/2007  | 16,600 | 4,990,000  | 0.6639 | 0.061535 | 200  |
| 6/5/2007  | 16,750 | 2,388,500  | 0.6639 | 0.061535 | 150  |
| 6/6/2007  | 16,750 | 2,902,500  | 0.6639 | 0.061535 | 0    |
| 6/7/2007  | 16,250 | 4,117,000  | 0.6639 | 0.061535 | -500 |
| 6/8/2007  | 15,850 | 6,846,000  | 0.6639 | 0.061535 | -400 |
| 6/11/2007 | 16,000 | 1,292,500  | 0.6639 | 0.061535 | 150  |
| 6/12/2007 | 16,500 | 3,973,000  | 0.6639 | 0.061535 | 500  |
| 6/13/2007 | 16,150 | 3,029,000  | 0.6639 | 0.061535 | -350 |
| 6/14/2007 | 16,400 | 4,638,500  | 0.6639 | 0.061535 | 250  |
| 6/15/2007 | 16,500 | 1,506,000  | 0.6639 | 0.061535 | 100  |
| 6/18/2007 | 16,400 | 2,743,000  | 0.6639 | 0.061535 | -100 |
| 6/19/2007 | 16,450 | 2,405,500  | 0.6639 | 0.061535 | 50   |
| 6/20/2007 | 16,700 | 6,059,500  | 0.6639 | 0.061535 | 250  |
| 6/21/2007 | 16,550 | 3,973,000  | 0.6639 | 0.061535 | -150 |
| 6/22/2007 | 16,900 | 2,643,000  | 0.6639 | 0.061535 | 350  |
| 6/25/2007 | 16,750 | 3,237,000  | 0.6639 | 0.061535 | -150 |
| 6/26/2007 | 17,100 | 7,697,500  | 0.6639 | 0.061535 | 350  |
| 6/27/2007 | 16,700 | 10,190,500 | 0.6639 | 0.061535 | -400 |
| 6/28/2007 | 16,700 | 5,472,000  | 0.6639 | 0.061535 | 0    |
| 6/29/2007 | 16,900 | 8,284,000  | 0.6639 | 0.061535 | 200  |
| 7/2/2007  | 17,050 | 4,397,000  | 0.6639 | 0.061535 | 150  |
| 7/3/2007  | 17,000 | 5,291,000  | 0.6639 | 0.061535 | -50  |
| 7/4/2007  | 16,950 | 3,063,500  | 0.6639 | 0.061535 | -50  |
| 7/5/2007  | 17,000 | 4,776,000  | 0.6639 | 0.061535 | 50   |
| 7/6/2007  | 18,000 | 11,341,000 | 0.6639 | 0.061535 | 1000 |
| 7/9/2007  | 19,150 | 10,198,500 | 0.6639 | 0.061535 | 1150 |
| 7/10/2007 | 19,150 | 8,364,500  | 0.6639 | 0.061535 | 0    |
| 7/11/2007 | 18,350 | 5,715,000  | 0.6639 | 0.061535 | -800 |
| 7/12/2007 | 18,100 | 2,709,000  | 0.6639 | 0.061535 | -250 |
| 7/13/2007 | 18,000 | 2,862,500  | 0.6639 | 0.061535 | -100 |
| 7/17/2007 | 18,600 | 11,559,000 | 0.6639 | 0.061535 | 600  |
| 7/18/2007 | 18,600 | 9,313,000  | 0.6639 | 0.061535 | 0    |
| 7/19/2007 | 18,700 | 6,377,000  | 0.6639 | 0.061535 | 100  |
| 7/20/2007 | 19,250 | 3,931,000  | 0.6639 | 0.061535 | 550  |
| 7/23/2007 | 19,050 | 2,662,500  | 0.6639 | 0.061535 | -200 |
| 7/24/2007 | 19,450 | 5,439,500  | 0.6639 | 0.061535 | 400  |
| 7/25/2007 | 18,850 | 7,219,500  | 0.6639 | 0.061535 | -600 |
| 7/26/2007 | 18,850 | 4,836,500  | 0.6639 | 0.061535 | 0    |
| 7/27/2007 | 18,150 | 8,960,000  | 0.6639 | 0.061535 | -700 |
| 7/31/2007 | 18,750 | 2,905,500  | 0.6639 | 0.061535 | 600  |
| 8/1/2007  | 18,250 | 8,741,500  | 0.6639 | 0.061535 | -500 |
| 8/2/2007  | 18,500 | 4,007,000  | 0.6639 | 0.061535 | 250  |

|            |        |            |        |          |       |
|------------|--------|------------|--------|----------|-------|
| 8/3/2007   | 18,450 | 2,542,500  | 0.6639 | 0.061535 | -50   |
| 8/6/2007   | 17,400 | 9,288,500  | 0.6639 | 0.061535 | -1050 |
| 8/7/2007   | 17,050 | 6,393,500  | 0.6639 | 0.061535 | -350  |
| 8/8/2007   | 17,800 | 4,929,000  | 0.6639 | 0.061535 | 750   |
| 8/9/2007   | 17,750 | 3,377,500  | 0.6639 | 0.061535 | -50   |
| 8/10/2007  | 17,350 | 5,338,500  | 0.6639 | 0.061535 | -400  |
| 8/14/2007  | 17,000 | 7,888,500  | 0.6639 | 0.061535 | -350  |
| 8/15/2007  | 16,250 | 8,908,000  | 0.6639 | 0.061535 | -750  |
| 8/16/2007  | 15,450 | 10,375,000 | 0.6639 | 0.061535 | -800  |
| 8/20/2007  | 16,200 | 11,135,000 | 0.6639 | 0.061535 | 750   |
| 8/21/2007  | 16,000 | 8,577,500  | 0.6639 | 0.061535 | -200  |
| 8/22/2007  | 16,500 | 5,714,000  | 0.6639 | 0.061535 | 500   |
| 8/23/2007  | 17,350 | 7,270,500  | 0.6639 | 0.061535 | 850   |
| 8/24/2007  | 17,300 | 2,761,000  | 0.6639 | 0.061535 | -50   |
| 8/27/2007  | 17,650 | 2,740,500  | 0.6639 | 0.061535 | 350   |
| 8/28/2007  | 17,400 | 4,477,500  | 0.6639 | 0.061535 | -250  |
| 8/29/2007  | 17,200 | 7,337,000  | 0.6639 | 0.061535 | -200  |
| 8/30/2007  | 17,450 | 4,083,500  | 0.6639 | 0.061535 | 250   |
| 8/31/2007  | 17,850 | 3,408,000  | 0.6639 | 0.061535 | 400   |
| 9/3/2007   | 17,900 | 3,201,000  | 0.6639 | 0.061535 | 50    |
| 9/4/2007   | 18,100 | 6,043,500  | 0.6639 | 0.061535 | 200   |
| 9/5/2007   | 18,000 | 1,330,500  | 0.6639 | 0.061535 | -100  |
| 9/6/2007   | 17,950 | 5,373,000  | 0.6639 | 0.061535 | -50   |
| 9/7/2007   | 18,000 | 589,000    | 0.6639 | 0.061535 | 50    |
| 9/10/2007  | 17,800 | 11,980,000 | 0.6639 | 0.061535 | -200  |
| 9/11/2007  | 17,800 | 2,731,500  | 0.6639 | 0.061535 | 0     |
| 9/12/2007  | 17,950 | 5,907,000  | 0.6639 | 0.061535 | 150   |
| 9/13/2007  | 18,000 | 845,500    | 0.6639 | 0.061535 | 50    |
| 9/14/2007  | 18,000 | 4,294,500  | 0.6639 | 0.061535 | 0     |
| 9/17/2007  | 18,500 | 12,077,000 | 0.6639 | 0.061535 | 500   |
| 9/18/2007  | 18,400 | 4,207,000  | 0.6639 | 0.061535 | -100  |
| 9/19/2007  | 19,150 | 8,141,500  | 0.6639 | 0.061535 | 750   |
| 9/20/2007  | 19,100 | 3,870,000  | 0.6639 | 0.061535 | -50   |
| 9/21/2007  | 19,300 | 2,515,500  | 0.6639 | 0.061535 | 200   |
| 9/24/2007  | 19,500 | 3,326,000  | 0.6639 | 0.061535 | 200   |
| 9/25/2007  | 19,000 | 3,739,000  | 0.6639 | 0.061535 | -500  |
| 9/26/2007  | 19,400 | 2,898,500  | 0.6639 | 0.061535 | 400   |
| 9/27/2007  | 19,500 | 2,406,000  | 0.6639 | 0.061535 | 100   |
| 9/28/2007  | 19,250 | 2,442,500  | 0.6639 | 0.061535 | -250  |
| 10/1/2007  | 19,300 | 2,934,000  | 0.6639 | 0.061535 | 50    |
| 10/2/2007  | 20,100 | 10,052,500 | 0.6639 | 0.061535 | 800   |
| 10/3/2007  | 20,450 | 6,201,500  | 0.6639 | 0.061535 | 350   |
| 10/4/2007  | 20,800 | 4,766,000  | 0.6639 | 0.061535 | 350   |
| 10/5/2007  | 21,000 | 7,297,000  | 0.6639 | 0.061535 | 200   |
| 10/8/2007  | 20,350 | 4,335,000  | 0.6639 | 0.061535 | -650  |
| 10/9/2007  | 21,250 | 7,414,500  | 0.6639 | 0.061535 | 900   |
| 10/10/2007 | 22,200 | 5,970,000  | 0.6639 | 0.061535 | 950   |

|            |        |            |        |          |       |
|------------|--------|------------|--------|----------|-------|
| 10/11/2007 | 22,500 | 6,034,500  | 0.6639 | 0.061535 | 300   |
| 10/17/2007 | 23,600 | 3,876,000  | 0.6639 | 0.061535 | 1100  |
| 10/18/2007 | 22,950 | 3,446,000  | 0.6639 | 0.061535 | -650  |
| 10/19/2007 | 22,500 | 2,874,000  | 0.6639 | 0.061535 | -450  |
| 10/22/2007 | 21,550 | 3,116,000  | 0.6639 | 0.061535 | -950  |
| 10/23/2007 | 22,800 | 6,454,000  | 0.6639 | 0.061535 | 1250  |
| 10/24/2007 | 22,200 | 4,824,000  | 0.6639 | 0.061535 | -600  |
| 10/25/2007 | 24,500 | 6,073,000  | 0.6639 | 0.061535 | 2300  |
| 10/26/2007 | 25,500 | 5,948,500  | 0.6639 | 0.061535 | 1000  |
| 10/29/2007 | 26,500 | 1,800,000  | 0.6639 | 0.061535 | 1000  |
| 10/30/2007 | 26,650 | 4,224,000  | 0.6639 | 0.061535 | 150   |
| 10/31/2007 | 25,600 | 8,316,000  | 0.6639 | 0.061535 | -1050 |
| 11/1/2007  | 26,550 | 8,708,000  | 0.6639 | 0.061535 | 950   |
| 11/2/2007  | 26,550 | 3,595,500  | 0.6639 | 0.061535 | 0     |
| 11/5/2007  | 25,150 | 4,174,000  | 0.6639 | 0.061535 | -1400 |
| 11/6/2007  | 24,350 | 11,287,000 | 0.6639 | 0.061535 | -800  |
| 11/7/2007  | 25,100 | 8,047,000  | 0.6639 | 0.061535 | 750   |
| 11/8/2007  | 24,400 | 3,036,500  | 0.6639 | 0.061535 | -700  |
| 11/9/2007  | 24,350 | 1,567,500  | 0.6639 | 0.061535 | -50   |
| 11/12/2007 | 23,250 | 7,268,000  | 0.6639 | 0.061535 | -1100 |
| 11/13/2007 | 23,000 | 7,626,000  | 0.6639 | 0.061535 | -250  |
| 11/14/2007 | 24,000 | 8,688,500  | 0.6639 | 0.061535 | 1000  |
| 11/15/2007 | 24,050 | 4,360,000  | 0.6639 | 0.061535 | 50    |
| 11/16/2007 | 23,550 | 1,917,000  | 0.6639 | 0.061535 | -500  |
| 11/19/2007 | 23,850 | 3,082,000  | 0.6639 | 0.061535 | 300   |
| 11/20/2007 | 24,050 | 5,390,000  | 0.6639 | 0.061535 | 200   |
| 11/21/2007 | 23,000 | 4,798,000  | 0.6639 | 0.061535 | -1050 |
| 11/22/2007 | 22,400 | 5,808,000  | 0.6639 | 0.061535 | -600  |
| 11/23/2007 | 23,200 | 2,515,500  | 0.6639 | 0.061535 | 800   |
| 11/26/2007 | 24,500 | 4,734,000  | 0.6639 | 0.061535 | 1300  |
| 11/27/2007 | 24,350 | 3,423,000  | 0.6639 | 0.061535 | -150  |
| 11/28/2007 | 24,850 | 7,617,500  | 0.6639 | 0.061535 | 500   |
| 11/29/2007 | 25,800 | 7,661,500  | 0.6639 | 0.061535 | 950   |
| 11/30/2007 | 25,000 | 4,212,000  | 0.6639 | 0.061535 | -800  |
| 12/3/2007  | 26,800 | 2,652,500  | 0.6639 | 0.061535 | 1800  |
| 12/4/2007  | 27,500 | 4,198,500  | 0.6639 | 0.061535 | 700   |
| 12/5/2007  | 26,700 | 7,979,500  | 0.6639 | 0.061535 | -800  |
| 12/6/2007  | 26,450 | 4,458,500  | 0.6639 | 0.061535 | -250  |
| 12/7/2007  | 26,850 | 5,175,500  | 0.6639 | 0.061535 | 400   |
| 12/10/2007 | 28,500 | 8,137,000  | 0.6639 | 0.061535 | 1650  |
| 12/11/2007 | 27,750 | 3,318,500  | 0.6639 | 0.061535 | -750  |
| 12/12/2007 | 28,350 | 5,199,000  | 0.6639 | 0.061535 | 600   |
| 12/13/2007 | 27,450 | 3,166,000  | 0.6639 | 0.061535 | -900  |
| 12/14/2007 | 27,450 | 2,844,500  | 0.6639 | 0.061535 | 0     |
| 12/17/2007 | 26,550 | 4,147,500  | 0.6639 | 0.061535 | -900  |
| 12/18/2007 | 25,750 | 7,116,000  | 0.6639 | 0.061535 | -800  |
| 12/19/2007 | 26,100 | 5,073,500  | 0.6639 | 0.061535 | 350   |

|            |        |            |          |          |       |
|------------|--------|------------|----------|----------|-------|
| 12/26/2007 | 26,300 | 4,048,000  | 0.6639   | 0.061535 | 200   |
| 12/27/2007 | 26,800 | 3,012,000  | 0.6639   | 0.061535 | 500   |
| 12/28/2007 | 27,300 | 3,210,500  | 0.6639   | 0.061535 | 500   |
| 1/2/2008   | 26,600 | 1,293,500  | 3.686441 | 0.0675   | -700  |
| 1/3/2008   | 26,100 | 2,567,500  | 3.686441 | 0.0675   | -500  |
| 1/4/2008   | 26,400 | 2,382,500  | 3.686441 | 0.0675   | 300   |
| 1/7/2008   | 26,400 | 4,153,000  | 3.686441 | 0.0675   | 0     |
| 1/8/2008   | 27,650 | 8,839,500  | 3.686441 | 0.0675   | 1250  |
| 1/9/2008   | 29,050 | 12,551,500 | 3.686441 | 0.0675   | 1400  |
| 1/14/2008  | 29,600 | 10,924,000 | 3.686441 | 0.0675   | 550   |
| 1/15/2008  | 28,000 | 10,186,500 | 3.686441 | 0.0675   | -1600 |
| 1/16/2008  | 26,250 | 15,265,500 | 3.686441 | 0.0675   | -1750 |
| 1/17/2008  | 26,500 | 11,211,000 | 3.686441 | 0.0675   | 250   |
| 1/18/2008  | 26,900 | 10,490,500 | 3.686441 | 0.0675   | 400   |
| 1/21/2008  | 24,900 | 8,418,000  | 3.686441 | 0.0675   | -2000 |
| 1/22/2008  | 22,500 | 11,268,500 | 3.686441 | 0.0675   | -2400 |
| 1/23/2008  | 25,000 | 11,682,000 | 3.686441 | 0.0675   | 2500  |
| 1/24/2008  | 25,900 | 10,663,500 | 3.686441 | 0.0675   | 900   |
| 1/25/2008  | 26,700 | 10,938,500 | 3.686441 | 0.0675   | 800   |
| 1/28/2008  | 26,200 | 3,999,500  | 3.686441 | 0.0675   | -500  |
| 1/29/2008  | 27,100 | 9,876,000  | 3.686441 | 0.0675   | 900   |
| 1/30/2008  | 27,050 | 5,261,000  | 3.686441 | 0.0675   | -50   |
| 1/31/2008  | 27,250 | 5,291,000  | 3.686441 | 0.0675   | 200   |
| 2/1/2008   | 26,800 | 5,288,000  | 3.686441 | 0.0675   | -450  |
| 2/4/2008   | 26,950 | 4,413,000  | 3.686441 | 0.0675   | 150   |
| 2/5/2008   | 26,600 | 2,412,000  | 3.686441 | 0.0675   | -350  |
| 2/6/2008   | 25,550 | 5,933,500  | 3.686441 | 0.0675   | -1050 |
| 2/11/2008  | 24,800 | 6,519,000  | 3.686441 | 0.0675   | -750  |
| 2/12/2008  | 24,800 | 5,034,500  | 3.686441 | 0.0675   | 0     |
| 2/13/2008  | 25,450 | 4,454,000  | 3.686441 | 0.0675   | 650   |
| 2/14/2008  | 27,000 | 9,656,000  | 3.686441 | 0.0675   | 1550  |
| 2/15/2008  | 27,250 | 3,417,500  | 3.686441 | 0.0675   | 250   |
| 2/18/2008  | 26,800 | 1,776,500  | 3.686441 | 0.0675   | -450  |
| 2/19/2008  | 27,200 | 3,049,500  | 3.686441 | 0.0675   | 400   |
| 2/20/2008  | 27,500 | 11,781,000 | 3.686441 | 0.0675   | 300   |
| 2/21/2008  | 27,700 | 7,179,500  | 3.686441 | 0.0675   | 200   |
| 2/22/2008  | 27,900 | 7,032,000  | 3.686441 | 0.0675   | 200   |
| 2/25/2008  | 27,950 | 3,975,000  | 3.686441 | 0.0675   | 50    |
| 2/26/2008  | 28,150 | 4,114,000  | 3.686441 | 0.0675   | 200   |
| 2/27/2008  | 27,950 | 2,167,000  | 3.686441 | 0.0675   | -200  |
| 2/28/2008  | 28,250 | 3,139,500  | 3.686441 | 0.0675   | 300   |
| 2/29/2008  | 27,850 | 4,472,000  | 3.686441 | 0.0675   | -400  |
| 3/3/2008   | 27,150 | 4,736,500  | 3.686441 | 0.0675   | -700  |
| 3/4/2008   | 26,200 | 6,425,500  | 3.686441 | 0.0675   | -950  |
| 3/5/2008   | 26,150 | 5,156,000  | 3.686441 | 0.0675   | -50   |
| 3/6/2008   | 26,000 | 3,843,500  | 3.686441 | 0.0675   | -150  |
| 3/10/2008  | 24,500 | 10,208,000 | 3.686441 | 0.0675   | -1500 |

|           |        |            |          |        |       |
|-----------|--------|------------|----------|--------|-------|
| 3/11/2008 | 24,800 | 9,349,000  | 3.686441 | 0.0675 | 300   |
| 3/12/2008 | 25,300 | 6,777,000  | 3.686441 | 0.0675 | 500   |
| 3/13/2008 | 23,550 | 8,218,000  | 3.686441 | 0.0675 | -1750 |
| 3/14/2008 | 22,100 | 10,969,500 | 3.686441 | 0.0675 | -1450 |
| 3/18/2008 | 22,450 | 9,185,500  | 3.686441 | 0.0675 | 350   |
| 3/19/2008 | 22,750 | 7,206,000  | 3.686441 | 0.0675 | 300   |
| 3/25/2008 | 23,950 | 6,324,000  | 3.686441 | 0.0675 | 1200  |
| 3/26/2008 | 24,100 | 2,850,000  | 3.686441 | 0.0675 | 150   |
| 3/27/2008 | 24,200 | 5,254,000  | 3.686441 | 0.0675 | 100   |
| 3/28/2008 | 23,900 | 2,790,000  | 3.686441 | 0.0675 | -300  |
| 3/31/2008 | 24,250 | 6,925,500  | 3.686441 | 0.0675 | 350   |
| 4/1/2008  | 22,950 | 6,059,000  | 3.686441 | 0.0675 | -1300 |
| 4/2/2008  | 21,450 | 16,734,000 | 3.686441 | 0.0675 | -1500 |
| 4/3/2008  | 19,800 | 19,600,000 | 3.686441 | 0.0675 | -1650 |
| 4/4/2008  | 19,500 | 20,669,000 | 3.686441 | 0.0675 | -300  |
| 4/7/2008  | 19,200 | 23,943,500 | 3.686441 | 0.0675 | -300  |
| 4/8/2008  | 18,350 | 12,990,000 | 3.686441 | 0.0675 | -850  |
| 4/9/2008  | 17,650 | 30,495,500 | 3.686441 | 0.0675 | -700  |
| 4/10/2008 | 18,900 | 26,082,500 | 3.686441 | 0.0675 | 1250  |
| 4/11/2008 | 20,200 | 17,000,500 | 3.686441 | 0.0675 | 1300  |
| 4/14/2008 | 20,150 | 11,708,000 | 3.686441 | 0.0675 | -50   |
| 4/15/2008 | 20,300 | 13,464,500 | 3.686441 | 0.0675 | 150   |
| 4/16/2008 | 20,800 | 11,838,500 | 3.686441 | 0.0675 | 500   |
| 4/17/2008 | 20,300 | 11,309,000 | 3.686441 | 0.0675 | -500  |
| 4/18/2008 | 20,150 | 13,318,500 | 3.686441 | 0.0675 | -150  |
| 4/21/2008 | 19,700 | 22,134,500 | 3.686441 | 0.0675 | -450  |
| 4/22/2008 | 19,150 | 9,597,000  | 3.686441 | 0.0675 | -550  |
| 4/23/2008 | 19,150 | 11,284,000 | 3.686441 | 0.0675 | 0     |
| 4/24/2008 | 19,350 | 8,670,000  | 3.686441 | 0.0675 | 200   |
| 4/25/2008 | 19,350 | 8,148,000  | 3.686441 | 0.0675 | 0     |
| 4/28/2008 | 19,400 | 7,556,000  | 3.686441 | 0.0675 | 50    |
| 4/29/2008 | 20,050 | 8,462,500  | 3.686441 | 0.0675 | 650   |
| 4/30/2008 | 20,000 | 4,033,500  | 3.686441 | 0.0675 | -50   |
| 5/2/2008  | 21,050 | 16,181,000 | 3.686441 | 0.0675 | 1050  |
| 5/5/2008  | 21,500 | 11,926,500 | 3.686441 | 0.0675 | 450   |
| 5/6/2008  | 20,700 | 10,191,500 | 3.686441 | 0.0675 | -800  |
| 5/7/2008  | 21,250 | 8,750,000  | 3.686441 | 0.0675 | 550   |
| 5/8/2008  | 20,450 | 6,837,500  | 3.686441 | 0.0675 | -800  |
| 5/9/2008  | 20,150 | 5,549,500  | 3.686441 | 0.0675 | -300  |
| 5/12/2008 | 20,400 | 2,441,000  | 3.686441 | 0.0675 | 250   |
| 5/13/2008 | 20,950 | 5,622,500  | 3.686441 | 0.0675 | 550   |
| 5/14/2008 | 21,500 | 6,318,500  | 3.686441 | 0.0675 | 550   |
| 5/15/2008 | 21,300 | 5,390,000  | 3.686441 | 0.0675 | -200  |
| 5/16/2008 | 21,450 | 3,722,500  | 3.686441 | 0.0675 | 150   |
| 5/19/2008 | 22,000 | 3,470,000  | 3.686441 | 0.0675 | 550   |
| 5/21/2008 | 21,750 | 5,616,500  | 3.686441 | 0.0675 | -250  |
| 5/22/2008 | 21,150 | 4,356,500  | 3.686441 | 0.0675 | -600  |

|           |        |            |          |        |      |
|-----------|--------|------------|----------|--------|------|
| 5/23/2008 | 20,600 | 6,912,000  | 3.686441 | 0.0675 | -550 |
| 5/26/2008 | 19,650 | 9,729,500  | 3.686441 | 0.0675 | -950 |
| 5/27/2008 | 19,750 | 9,419,000  | 3.686441 | 0.0675 | 100  |
| 5/28/2008 | 20,350 | 4,506,500  | 3.686441 | 0.0675 | 600  |
| 5/29/2008 | 21,050 | 5,427,500  | 3.686441 | 0.0675 | 700  |
| 5/30/2008 | 21,000 | 5,243,500  | 3.686441 | 0.0675 | -50  |
| 6/2/2008  | 21,250 | 6,266,500  | 3.686441 | 0.0675 | 250  |
| 6/3/2008  | 21,400 | 6,039,000  | 3.686441 | 0.0675 | 150  |
| 6/4/2008  | 21,100 | 3,575,000  | 3.686441 | 0.0675 | -300 |
| 6/5/2008  | 20,200 | 10,869,500 | 3.686441 | 0.0675 | -900 |
| 6/6/2008  | 19,800 | 11,542,000 | 3.686441 | 0.0675 | -400 |
| 6/10/2008 | 19,250 | 11,294,000 | 3.686441 | 0.0675 | -550 |
| 6/11/2008 | 19,300 | 7,472,000  | 3.686441 | 0.0675 | 50   |
| 6/12/2008 | 19,400 | 4,073,500  | 3.686441 | 0.0675 | 100  |
| 6/13/2008 | 19,700 | 3,154,500  | 3.686441 | 0.0675 | 300  |
| 6/16/2008 | 20,050 | 4,926,500  | 3.686441 | 0.0675 | 350  |
| 6/17/2008 | 19,900 | 2,341,000  | 3.686441 | 0.0675 | -150 |
| 6/18/2008 | 20,000 | 2,960,500  | 3.686441 | 0.0675 | 100  |
| 6/19/2008 | 19,650 | 2,242,000  | 3.686441 | 0.0675 | -350 |
| 6/20/2008 | 19,700 | 1,925,000  | 3.686441 | 0.0675 | 50   |
| 6/23/2008 | 19,450 | 2,281,000  | 3.686441 | 0.0675 | -250 |
| 6/24/2008 | 19,200 | 6,496,500  | 3.686441 | 0.0675 | -250 |
| 6/25/2008 | 19,300 | 3,166,000  | 3.686441 | 0.0675 | 100  |
| 6/26/2008 | 19,450 | 2,745,500  | 3.686441 | 0.0675 | 150  |
| 6/27/2008 | 19,250 | 3,999,000  | 3.686441 | 0.0675 | -200 |
| 6/30/2008 | 19,250 | 2,217,000  | 3.686441 | 0.0675 | 0    |
| 7/1/2008  | 19,400 | 4,295,500  | 3.686441 | 0.0675 | 150  |
| 7/2/2008  | 19,500 | 3,603,000  | 3.686441 | 0.0675 | 100  |
| 7/3/2008  | 19,300 | 5,690,500  | 3.686441 | 0.0675 | -200 |
| 7/4/2008  | 19,300 | 2,737,500  | 3.686441 | 0.0675 | 0    |
| 7/7/2008  | 19,350 | 2,096,500  | 3.686441 | 0.0675 | 50   |
| 7/8/2008  | 19,500 | 2,804,000  | 3.686441 | 0.0675 | 150  |
| 7/9/2008  | 20,200 | 10,090,500 | 3.686441 | 0.0675 | 700  |
| 7/10/2008 | 20,450 | 6,849,500  | 3.686441 | 0.0675 | 250  |
| 7/11/2008 | 19,900 | 1,795,500  | 3.686441 | 0.0675 | -550 |
| 7/14/2008 | 20,250 | 1,843,500  | 3.686441 | 0.0675 | 350  |
| 7/15/2008 | 19,750 | 2,175,500  | 3.686441 | 0.0675 | -500 |
| 7/16/2008 | 19,350 | 2,867,500  | 3.686441 | 0.0675 | -400 |
| 7/17/2008 | 19,900 | 6,364,000  | 3.686441 | 0.0675 | 550  |
| 7/18/2008 | 20,900 | 9,092,000  | 3.686441 | 0.0675 | 1000 |
| 7/21/2008 | 20,250 | 4,162,500  | 3.686441 | 0.0675 | -650 |
| 7/22/2008 | 20,500 | 2,020,000  | 3.686441 | 0.0675 | 250  |
| 7/23/2008 | 21,600 | 6,272,500  | 3.686441 | 0.0675 | 1100 |
| 7/24/2008 | 22,550 | 8,766,500  | 3.686441 | 0.0675 | 950  |
| 7/25/2008 | 22,350 | 2,518,000  | 3.686441 | 0.0675 | -200 |
| 7/28/2008 | 22,000 | 2,035,000  | 3.686441 | 0.0675 | -350 |
| 7/29/2008 | 22,200 | 1,303,500  | 3.686441 | 0.0675 | 200  |

|            |        |            |          |        |       |
|------------|--------|------------|----------|--------|-------|
| 7/31/2008  | 22,550 | 5,191,500  | 3.686441 | 0.0675 | 350   |
| 8/1/2008   | 22,050 | 2,048,500  | 3.686441 | 0.0675 | -500  |
| 8/4/2008   | 21,600 | 3,012,000  | 3.686441 | 0.0675 | -450  |
| 8/5/2008   | 21,850 | 1,851,000  | 3.686441 | 0.0675 | 250   |
| 8/6/2008   | 21,900 | 4,462,000  | 3.686441 | 0.0675 | 50    |
| 8/7/2008   | 21,900 | 1,941,000  | 3.686441 | 0.0675 | 0     |
| 8/8/2008   | 21,850 | 1,672,000  | 3.686441 | 0.0675 | -50   |
| 8/11/2008  | 21,700 | 1,171,000  | 3.686441 | 0.0675 | -150  |
| 8/12/2008  | 20,300 | 1,946,000  | 3.686441 | 0.0675 | -1400 |
| 8/13/2008  | 20,000 | 2,878,000  | 3.686441 | 0.0675 | -300  |
| 8/14/2008  | 19,800 | 3,589,500  | 3.686441 | 0.0675 | -200  |
| 8/15/2008  | 19,850 | 2,962,000  | 3.686441 | 0.0675 | 50    |
| 8/19/2008  | 20,000 | 1,388,500  | 3.686441 | 0.0675 | 150   |
| 8/20/2008  | 19,800 | 1,072,000  | 3.686441 | 0.0675 | -200  |
| 8/21/2008  | 19,800 | 1,260,500  | 3.686441 | 0.0675 | 0     |
| 8/22/2008  | 19,650 | 4,748,500  | 3.686441 | 0.0675 | -150  |
| 8/25/2008  | 20,000 | 919,500    | 3.686441 | 0.0675 | 350   |
| 8/26/2008  | 19,800 | 754,500    | 3.686441 | 0.0675 | -200  |
| 8/27/2008  | 19,850 | 1,651,500  | 3.686441 | 0.0675 | 50    |
| 8/28/2008  | 20,200 | 2,907,000  | 3.686441 | 0.0675 | 350   |
| 8/29/2008  | 20,800 | 2,854,000  | 3.686441 | 0.0675 | 600   |
| 9/1/2008   | 21,000 | 2,029,000  | 3.686441 | 0.0675 | 200   |
| 9/2/2008   | 21,200 | 4,174,500  | 3.686441 | 0.0675 | 200   |
| 9/3/2008   | 21,300 | 2,796,500  | 3.686441 | 0.0675 | 100   |
| 9/4/2008   | 20,500 | 1,097,500  | 3.686441 | 0.0675 | -800  |
| 9/5/2008   | 20,000 | 4,150,500  | 3.686441 | 0.0675 | -500  |
| 9/8/2008   | 19,850 | 3,016,500  | 3.686441 | 0.0675 | -150  |
| 9/9/2008   | 19,550 | 10,463,500 | 3.686441 | 0.0675 | -300  |
| 9/10/2008  | 19,300 | 3,980,500  | 3.686441 | 0.0675 | -250  |
| 9/11/2008  | 17,350 | 6,796,500  | 3.686441 | 0.0675 | -1950 |
| 9/12/2008  | 15,600 | 14,458,500 | 3.686441 | 0.0675 | -1750 |
| 9/15/2008  | 15,200 | 7,063,000  | 3.686441 | 0.0675 | -400  |
| 9/16/2008  | 16,200 | 10,715,000 | 3.686441 | 0.0675 | 1000  |
| 9/17/2008  | 16,950 | 11,585,000 | 3.686441 | 0.0675 | 750   |
| 9/18/2008  | 16,800 | 4,086,500  | 3.686441 | 0.0675 | -150  |
| 9/19/2008  | 18,100 | 5,486,000  | 3.686441 | 0.0675 | 1300  |
| 9/22/2008  | 18,200 | 3,182,500  | 3.686441 | 0.0675 | 100   |
| 9/23/2008  | 17,300 | 5,572,500  | 3.686441 | 0.0675 | -900  |
| 9/24/2008  | 17,600 | 2,901,500  | 3.686441 | 0.0675 | 300   |
| 9/25/2008  | 17,400 | 2,135,000  | 3.686441 | 0.0675 | -200  |
| 9/26/2008  | 17,500 | 2,257,500  | 3.686441 | 0.0675 | 100   |
| 9/29/2008  | 17,100 | 2,233,000  | 3.686441 | 0.0675 | -400  |
| 10/6/2008  | 16,500 | 7,483,500  | 3.686441 | 0.0675 | -600  |
| 10/7/2008  | 16,000 | 6,420,000  | 3.686441 | 0.0675 | -500  |
| 10/8/2008  | 12,800 | 2,504,000  | 3.686441 | 0.0675 | -3200 |
| 10/14/2008 | 14,200 | 5,414,000  | 3.686441 | 0.0675 | 1400  |
| 10/15/2008 | 14,100 | 6,942,000  | 3.686441 | 0.0675 | -100  |

|            |        |            |          |        |       |
|------------|--------|------------|----------|--------|-------|
| 10/16/2008 | 13,350 | 6,020,000  | 3.686441 | 0.0675 | -750  |
| 10/17/2008 | 12,050 | 3,778,500  | 3.686441 | 0.0675 | -1300 |
| 10/20/2008 | 11,150 | 9,193,500  | 3.686441 | 0.0675 | -900  |
| 10/21/2008 | 11,500 | 7,584,000  | 3.686441 | 0.0675 | 350   |
| 10/22/2008 | 10,750 | 7,434,000  | 3.686441 | 0.0675 | -750  |
| 10/23/2008 | 10,000 | 6,044,000  | 3.686441 | 0.0675 | -750  |
| 10/24/2008 | 9,000  | 11,505,000 | 3.686441 | 0.0675 | -1000 |
| 10/27/2008 | 8,100  | 1,381,500  | 3.686441 | 0.0675 | -900  |
| 10/28/2008 | 7,300  | 11,658,000 | 3.686441 | 0.0675 | -800  |
| 10/29/2008 | 7,100  | 11,116,000 | 3.686441 | 0.0675 | -200  |
| 10/30/2008 | 7,800  | 10,166,500 | 3.686441 | 0.0675 | 700   |
| 10/31/2008 | 9,350  | 9,578,000  | 3.686441 | 0.0675 | 1550  |
| 11/3/2008  | 11,200 | 2,661,000  | 3.686441 | 0.0675 | 1850  |
| 11/4/2008  | 12,400 | 12,103,500 | 3.686441 | 0.0675 | 1200  |
| 11/5/2008  | 11,500 | 10,824,000 | 3.686441 | 0.0675 | -900  |
| 11/6/2008  | 10,350 | 8,799,000  | 3.686441 | 0.0675 | -1150 |
| 11/7/2008  | 10,300 | 14,805,000 | 3.686441 | 0.0675 | -50   |
| 11/10/2008 | 9,950  | 8,534,000  | 3.686441 | 0.0675 | -350  |
| 11/11/2008 | 10,150 | 6,140,500  | 3.686441 | 0.0675 | 200   |
| 11/12/2008 | 10,100 | 3,206,000  | 3.686441 | 0.0675 | -50   |
| 11/13/2008 | 9,400  | 5,912,000  | 3.686441 | 0.0675 | -700  |
| 11/14/2008 | 9,100  | 4,909,500  | 3.686441 | 0.0675 | -300  |
| 11/17/2008 | 8,800  | 6,992,000  | 3.686441 | 0.0675 | -300  |
| 11/18/2008 | 8,550  | 12,097,000 | 3.686441 | 0.0675 | -250  |
| 11/19/2008 | 8,500  | 6,528,500  | 3.686441 | 0.0675 | -50   |
| 11/20/2008 | 8,400  | 4,665,000  | 3.686441 | 0.0675 | -100  |
| 11/21/2008 | 8,400  | 7,701,000  | 3.686441 | 0.0675 | 0     |
| 11/24/2008 | 8,200  | 3,179,000  | 3.686441 | 0.0675 | -200  |
| 11/25/2008 | 8,150  | 11,058,000 | 3.686441 | 0.0675 | -50   |
| 11/26/2008 | 8,650  | 6,055,000  | 3.686441 | 0.0675 | 500   |
| 11/27/2008 | 9,650  | 8,601,000  | 3.686441 | 0.0675 | 1000  |
| 11/28/2008 | 10,200 | 5,458,500  | 3.686441 | 0.0675 | 550   |
| 12/1/2008  | 9,500  | 4,895,500  | 3.686441 | 0.0675 | -700  |
| 12/2/2008  | 8,950  | 4,203,000  | 3.686441 | 0.0675 | -550  |
| 12/3/2008  | 8,950  | 3,199,000  | 3.686441 | 0.0675 | 0     |
| 12/4/2008  | 8,800  | 7,007,000  | 3.686441 | 0.0675 | -150  |
| 12/5/2008  | 9,150  | 8,815,500  | 3.686441 | 0.0675 | 350   |
| 12/9/2008  | 9,700  | 20,444,000 | 3.686441 | 0.0675 | 550   |
| 12/10/2008 | 10,400 | 17,575,500 | 3.686441 | 0.0675 | 700   |
| 12/11/2008 | 10,650 | 22,396,000 | 3.686441 | 0.0675 | 250   |
| 12/12/2008 | 9,700  | 10,566,000 | 3.686441 | 0.0675 | -950  |
| 12/15/2008 | 10,600 | 16,737,500 | 3.686441 | 0.0675 | 900   |
| 12/16/2008 | 10,250 | 7,272,000  | 3.686441 | 0.0675 | -350  |
| 12/17/2008 | 10,950 | 10,346,500 | 3.686441 | 0.0675 | 700   |
| 12/18/2008 | 11,100 | 9,544,500  | 3.686441 | 0.0675 | 150   |
| 12/19/2008 | 10,850 | 3,106,000  | 3.686441 | 0.0675 | -250  |
| 12/22/2008 | 11,100 | 4,619,500  | 3.686441 | 0.0675 | 250   |

|            |        |           |          |          |      |
|------------|--------|-----------|----------|----------|------|
| 12/23/2008 | 10,400 | 5,152,500 | 3.686441 | 0.0675   | -700 |
| 12/24/2008 | 10,600 | 1,829,500 | 3.686441 | 0.0675   | 200  |
| 12/26/2008 | 10,550 | 391,500   | 3.686441 | 0.0675   | -50  |
| 12/30/2008 | 10,550 | 2,514,500 | 3.686441 | 0.0675   | 0    |
| 1/5/2009   | 12,200 | 8,070,500 | 3.443983 | 0.066307 | 1650 |
| 1/6/2009   | 12,550 | 5,317,500 | 3.443983 | 0.066307 | 350  |
| 1/7/2009   | 13,500 | 7,710,500 | 3.443983 | 0.066307 | 950  |
| 1/8/2009   | 12,950 | 4,790,000 | 3.443983 | 0.066307 | -550 |
| 1/9/2009   | 12,450 | 7,500,500 | 3.443983 | 0.066307 | -500 |
| 1/12/2009  | 12,950 | 6,361,000 | 3.443983 | 0.066307 | 500  |
| 1/13/2009  | 12,750 | 3,537,000 | 3.443983 | 0.066307 | -200 |
| 1/14/2009  | 12,900 | 4,634,000 | 3.443983 | 0.066307 | 150  |
| 1/15/2009  | 12,500 | 5,864,000 | 3.443983 | 0.066307 | -400 |
| 1/16/2009  | 12,450 | 2,740,000 | 3.443983 | 0.066307 | -50  |
| 1/19/2009  | 12,500 | 3,932,500 | 3.443983 | 0.066307 | 50   |
| 1/20/2009  | 12,550 | 8,312,500 | 3.443983 | 0.066307 | 50   |
| 1/21/2009  | 12,650 | 6,908,500 | 3.443983 | 0.066307 | 100  |
| 1/22/2009  | 12,550 | 3,191,500 | 3.443983 | 0.066307 | -100 |
| 1/23/2009  | 12,400 | 1,780,000 | 3.443983 | 0.066307 | -150 |
| 1/27/2009  | 13,100 | 3,878,500 | 3.443983 | 0.066307 | 700  |
| 1/28/2009  | 12,900 | 2,004,500 | 3.443983 | 0.066307 | -200 |
| 1/29/2009  | 12,900 | 3,147,000 | 3.443983 | 0.066307 | 0    |
| 1/30/2009  | 13,000 | 4,215,000 | 3.443983 | 0.066307 | 100  |
| 2/2/2009   | 12,750 | 2,821,000 | 3.443983 | 0.066307 | -250 |
| 2/3/2009   | 12,450 | 3,956,500 | 3.443983 | 0.066307 | -300 |
| 2/4/2009   | 11,700 | 8,490,000 | 3.443983 | 0.066307 | -750 |
| 2/5/2009   | 11,850 | 3,390,000 | 3.443983 | 0.066307 | 150  |
| 2/6/2009   | 11,900 | 3,165,000 | 3.443983 | 0.066307 | 50   |
| 2/9/2009   | 11,950 | 2,192,000 | 3.443983 | 0.066307 | 50   |
| 2/10/2009  | 11,650 | 3,383,000 | 3.443983 | 0.066307 | -300 |
| 2/11/2009  | 10,900 | 8,667,000 | 3.443983 | 0.066307 | -750 |
| 2/12/2009  | 11,050 | 4,099,000 | 3.443983 | 0.066307 | 150  |
| 2/13/2009  | 10,950 | 3,164,500 | 3.443983 | 0.066307 | -100 |
| 2/16/2009  | 11,100 | 4,431,500 | 3.443983 | 0.066307 | 150  |
| 2/17/2009  | 10,800 | 4,701,000 | 3.443983 | 0.066307 | -300 |
| 2/18/2009  | 10,950 | 2,851,000 | 3.443983 | 0.066307 | 150  |
| 2/19/2009  | 11,100 | 2,971,500 | 3.443983 | 0.066307 | 150  |
| 2/20/2009  | 10,900 | 2,165,000 | 3.443983 | 0.066307 | -200 |
| 2/23/2009  | 10,950 | 2,369,500 | 3.443983 | 0.066307 | 50   |
| 2/24/2009  | 10,950 | 1,804,000 | 3.443983 | 0.066307 | 0    |
| 2/25/2009  | 11,350 | 6,435,000 | 3.443983 | 0.066307 | 400  |
| 2/26/2009  | 11,350 | 3,946,500 | 3.443983 | 0.066307 | 0    |
| 2/27/2009  | 11,300 | 5,519,000 | 3.443983 | 0.066307 | -50  |
| 3/2/2009   | 10,850 | 3,019,500 | 3.443983 | 0.066307 | -450 |
| 3/3/2009   | 10,800 | 3,156,500 | 3.443983 | 0.066307 | -50  |
| 3/4/2009   | 11,000 | 2,885,000 | 3.443983 | 0.066307 | 200  |
| 3/5/2009   | 11,150 | 4,242,000 | 3.443983 | 0.066307 | 150  |

|           |        |            |          |          |       |
|-----------|--------|------------|----------|----------|-------|
| 3/6/2009  | 11,250 | 2,711,000  | 3.443983 | 0.066307 | 100   |
| 3/10/2009 | 11,300 | 2,747,000  | 3.443983 | 0.066307 | 50    |
| 3/11/2009 | 11,900 | 9,389,000  | 3.443983 | 0.066307 | 600   |
| 3/12/2009 | 12,450 | 8,346,500  | 3.443983 | 0.066307 | 550   |
| 3/13/2009 | 13,000 | 6,853,500  | 3.443983 | 0.066307 | 550   |
| 3/16/2009 | 13,100 | 2,544,000  | 3.443983 | 0.066307 | 100   |
| 3/17/2009 | 12,600 | 3,422,000  | 3.443983 | 0.066307 | -500  |
| 3/18/2009 | 13,400 | 4,949,000  | 3.443983 | 0.066307 | 800   |
| 3/19/2009 | 14,350 | 8,156,000  | 3.443983 | 0.066307 | 950   |
| 3/20/2009 | 13,700 | 3,689,500  | 3.443983 | 0.066307 | -650  |
| 3/23/2009 | 14,900 | 4,111,000  | 3.443983 | 0.066307 | 1200  |
| 3/24/2009 | 15,250 | 5,025,500  | 3.443983 | 0.066307 | 350   |
| 3/25/2009 | 15,250 | 2,913,000  | 3.443983 | 0.066307 | 0     |
| 3/27/2009 | 15,800 | 5,508,000  | 3.443983 | 0.066307 | 550   |
| 3/30/2009 | 14,250 | 8,041,500  | 3.443983 | 0.066307 | -1550 |
| 3/31/2009 | 14,250 | 6,371,000  | 3.443983 | 0.066307 | 0     |
| 4/1/2009  | 15,450 | 5,776,500  | 3.443983 | 0.066307 | 1200  |
| 4/2/2009  | 15,700 | 6,917,500  | 3.443983 | 0.066307 | 250   |
| 4/3/2009  | 15,600 | 9,975,500  | 3.443983 | 0.066307 | -100  |
| 4/6/2009  | 15,250 | 4,843,500  | 3.443983 | 0.066307 | -350  |
| 4/7/2009  | 14,650 | 7,199,500  | 3.443983 | 0.066307 | -600  |
| 4/8/2009  | 14,500 | 11,123,000 | 3.443983 | 0.066307 | -150  |
| 4/13/2009 | 15,250 | 5,521,500  | 3.443983 | 0.066307 | 750   |
| 4/14/2009 | 15,500 | 6,417,000  | 3.443983 | 0.066307 | 250   |
| 4/15/2009 | 15,450 | 6,414,000  | 3.443983 | 0.066307 | -50   |
| 4/16/2009 | 15,850 | 7,310,000  | 3.443983 | 0.066307 | 400   |
| 4/17/2009 | 15,800 | 6,081,500  | 3.443983 | 0.066307 | -50   |
| 4/20/2009 | 15,950 | 4,588,000  | 3.443983 | 0.066307 | 150   |
| 4/21/2009 | 15,500 | 1,953,000  | 3.443983 | 0.066307 | -450  |
| 4/22/2009 | 15,300 | 5,150,000  | 3.443983 | 0.066307 | -200  |
| 4/23/2009 | 15,650 | 4,837,000  | 3.443983 | 0.066307 | 350   |
| 4/24/2009 | 15,450 | 3,778,000  | 3.443983 | 0.066307 | -200  |
| 4/27/2009 | 15,100 | 2,512,500  | 3.443983 | 0.066307 | -350  |
| 4/28/2009 | 15,200 | 2,906,000  | 3.443983 | 0.066307 | 100   |
| 4/29/2009 | 15,750 | 9,292,000  | 3.443983 | 0.066307 | 550   |
| 4/30/2009 | 18,000 | 13,283,500 | 3.443983 | 0.066307 | 2250  |
| 5/1/2009  | 17,700 | 5,085,000  | 3.443983 | 0.066307 | -300  |
| 5/4/2009  | 18,550 | 4,664,000  | 3.443983 | 0.066307 | 850   |
| 5/5/2009  | 19,000 | 9,674,500  | 3.443983 | 0.066307 | 450   |
| 5/6/2009  | 18,950 | 5,662,000  | 3.443983 | 0.066307 | -50   |
| 5/7/2009  | 19,000 | 7,690,000  | 3.443983 | 0.066307 | 50    |
| 5/8/2009  | 21,550 | 4,848,500  | 3.443983 | 0.066307 | 2550  |
| 5/11/2009 | 19,750 | 8,526,000  | 3.443983 | 0.066307 | -1800 |
| 5/12/2009 | 19,300 | 5,136,500  | 3.443983 | 0.066307 | -450  |
| 5/13/2009 | 19,150 | 6,459,000  | 3.443983 | 0.066307 | -150  |
| 5/14/2009 | 18,350 | 5,289,000  | 3.443983 | 0.066307 | -800  |
| 5/15/2009 | 18,300 | 3,348,500  | 3.443983 | 0.066307 | -50   |

|           |        |            |          |          |       |
|-----------|--------|------------|----------|----------|-------|
| 5/18/2009 | 18,100 | 7,624,500  | 3.443983 | 0.066307 | -200  |
| 5/19/2009 | 19,750 | 11,375,000 | 3.443983 | 0.066307 | 1650  |
| 5/20/2009 | 20,000 | 10,257,000 | 3.443983 | 0.066307 | 250   |
| 5/22/2009 | 19,750 | 7,063,500  | 3.443983 | 0.066307 | -250  |
| 5/25/2009 | 19,650 | 2,486,000  | 3.443983 | 0.066307 | -100  |
| 5/26/2009 | 19,100 | 2,690,500  | 3.443983 | 0.066307 | -550  |
| 5/27/2009 | 20,750 | 8,946,500  | 3.443983 | 0.066307 | 1650  |
| 5/28/2009 | 21,750 | 6,419,000  | 3.443983 | 0.066307 | 1000  |
| 5/29/2009 | 20,800 | 6,055,000  | 3.443983 | 0.066307 | -950  |
| 6/1/2009  | 21,950 | 3,925,500  | 3.443983 | 0.066307 | 1150  |
| 6/2/2009  | 22,150 | 4,725,500  | 3.443983 | 0.066307 | 200   |
| 6/3/2009  | 22,100 | 3,257,500  | 3.443983 | 0.066307 | -50   |
| 6/4/2009  | 22,600 | 3,684,000  | 3.443983 | 0.066307 | 500   |
| 6/5/2009  | 24,150 | 6,721,000  | 3.443983 | 0.066307 | 1550  |
| 6/8/2009  | 23,700 | 5,358,500  | 3.443983 | 0.066307 | -450  |
| 6/9/2009  | 24,700 | 7,259,000  | 3.443983 | 0.066307 | 1000  |
| 6/10/2009 | 24,500 | 4,848,500  | 3.443983 | 0.066307 | -200  |
| 6/11/2009 | 23,600 | 4,304,000  | 3.443983 | 0.066307 | -900  |
| 6/12/2009 | 23,900 | 4,700,500  | 3.443983 | 0.066307 | 300   |
| 6/15/2009 | 23,700 | 6,880,500  | 3.443983 | 0.066307 | -200  |
| 6/16/2009 | 23,200 | 4,946,000  | 3.443983 | 0.066307 | -500  |
| 6/17/2009 | 23,300 | 5,260,500  | 3.443983 | 0.066307 | 100   |
| 6/18/2009 | 21,200 | 5,637,500  | 3.443983 | 0.066307 | -2100 |
| 6/19/2009 | 22,050 | 5,879,500  | 3.443983 | 0.066307 | 850   |
| 6/22/2009 | 22,900 | 4,337,000  | 3.443983 | 0.066307 | 850   |
| 6/23/2009 | 22,750 | 6,664,500  | 3.443983 | 0.066307 | -150  |
| 6/24/2009 | 23,350 | 9,703,500  | 3.443983 | 0.066307 | 600   |
| 6/25/2009 | 23,550 | 5,346,500  | 3.443983 | 0.066307 | 200   |
| 6/26/2009 | 23,950 | 4,267,000  | 3.443983 | 0.066307 | 400   |
| 6/29/2009 | 24,000 | 1,676,000  | 3.443983 | 0.066307 | 50    |
| 6/30/2009 | 23,800 | 2,191,000  | 3.443983 | 0.066307 | -200  |
| 7/1/2009  | 23,750 | 1,728,000  | 3.443983 | 0.066307 | -50   |
| 7/2/2009  | 23,250 | 3,199,000  | 3.443983 | 0.066307 | -500  |
| 7/3/2009  | 23,450 | 2,795,000  | 3.443983 | 0.066307 | 200   |
| 7/6/2009  | 23,250 | 1,676,000  | 3.443983 | 0.066307 | -200  |
| 7/7/2009  | 23,500 | 5,626,500  | 3.443983 | 0.066307 | 250   |
| 7/9/2009  | 25,650 | 11,479,000 | 3.443983 | 0.066307 | 2150  |
| 7/10/2009 | 25,050 | 3,629,500  | 3.443983 | 0.066307 | -600  |
| 7/13/2009 | 25,000 | 12,331,000 | 3.443983 | 0.066307 | -50   |
| 7/14/2009 | 25,050 | 1,453,500  | 3.443983 | 0.066307 | 50    |
| 7/15/2009 | 26,900 | 5,090,000  | 3.443983 | 0.066307 | 1850  |
| 7/16/2009 | 27,500 | 6,384,500  | 3.443983 | 0.066307 | 600   |
| 7/17/2009 | 27,250 | 6,105,500  | 3.443983 | 0.066307 | -250  |
| 7/21/2009 | 27,200 | 12,115,000 | 3.443983 | 0.066307 | -50   |
| 7/22/2009 | 26,350 | 4,360,500  | 3.443983 | 0.066307 | -850  |
| 7/23/2009 | 27,400 | 4,062,000  | 3.443983 | 0.066307 | 1050  |
| 7/24/2009 | 27,600 | 2,844,500  | 3.443983 | 0.066307 | 200   |

|           |        |            |          |          |       |
|-----------|--------|------------|----------|----------|-------|
| 7/27/2009 | 27,050 | 3,693,500  | 3.443983 | 0.066307 | -550  |
| 7/28/2009 | 26,800 | 4,565,500  | 3.443983 | 0.066307 | -250  |
| 7/29/2009 | 27,100 | 5,226,000  | 3.443983 | 0.066307 | 300   |
| 7/30/2009 | 28,100 | 7,856,000  | 3.443983 | 0.066307 | 1000  |
| 7/31/2009 | 29,300 | 8,384,500  | 3.443983 | 0.066307 | 1200  |
| 8/3/2009  | 30,400 | 6,466,000  | 3.443983 | 0.066307 | 1100  |
| 8/4/2009  | 31,050 | 5,290,500  | 3.443983 | 0.066307 | 650   |
| 8/5/2009  | 29,950 | 5,448,500  | 3.443983 | 0.066307 | -1100 |
| 8/6/2009  | 30,000 | 4,045,500  | 3.443983 | 0.066307 | 50    |
| 8/7/2009  | 31,000 | 5,420,500  | 3.443983 | 0.066307 | 1000  |
| 8/10/2009 | 31,500 | 5,747,500  | 3.443983 | 0.066307 | 500   |
| 8/11/2009 | 31,300 | 4,255,000  | 3.443983 | 0.066307 | -200  |
| 8/12/2009 | 30,950 | 2,783,500  | 3.443983 | 0.066307 | -350  |
| 8/13/2009 | 31,000 | 3,837,500  | 3.443983 | 0.066307 | 50    |
| 8/14/2009 | 29,850 | 6,504,500  | 3.443983 | 0.066307 | -1150 |
| 8/18/2009 | 28,800 | 10,098,000 | 3.443983 | 0.066307 | -1050 |
| 8/19/2009 | 28,600 | 8,636,000  | 3.443983 | 0.066307 | -200  |
| 8/20/2009 | 28,600 | 3,281,000  | 3.443983 | 0.066307 | 0     |
| 8/21/2009 | 28,600 | 3,541,500  | 3.443983 | 0.066307 | 0     |
| 8/24/2009 | 29,500 | 3,599,500  | 3.443983 | 0.066307 | 900   |
| 8/25/2009 | 29,450 | 2,702,500  | 3.443983 | 0.066307 | -50   |
| 8/26/2009 | 29,150 | 1,731,500  | 3.443983 | 0.066307 | -300  |
| 8/27/2009 | 29,700 | 1,674,000  | 3.443983 | 0.066307 | 550   |
| 8/28/2009 | 30,000 | 5,596,000  | 3.443983 | 0.066307 | 300   |
| 8/31/2009 | 30,150 | 3,645,000  | 3.443983 | 0.066307 | 150   |
| 9/1/2009  | 30,600 | 2,143,000  | 3.443983 | 0.066307 | 450   |
| 9/2/2009  | 29,300 | 2,847,500  | 3.443983 | 0.066307 | -1300 |
| 9/3/2009  | 29,050 | 2,389,000  | 3.443983 | 0.066307 | -250  |
| 9/4/2009  | 29,400 | 1,410,500  | 3.443983 | 0.066307 | 350   |
| 9/7/2009  | 29,500 | 1,359,000  | 3.443983 | 0.066307 | 100   |
| 9/8/2009  | 29,950 | 2,006,000  | 3.443983 | 0.066307 | 450   |
| 9/9/2009  | 30,250 | 3,397,000  | 3.443983 | 0.066307 | 300   |
| 9/10/2009 | 31,200 | 8,355,000  | 3.443983 | 0.066307 | 950   |
| 9/11/2009 | 31,600 | 1,328,000  | 3.443983 | 0.066307 | 400   |
| 9/14/2009 | 31,450 | 1,682,000  | 3.443983 | 0.066307 | -150  |
| 9/15/2009 | 33,850 | 4,828,500  | 3.443983 | 0.066307 | 2400  |
| 9/16/2009 | 32,900 | 2,980,500  | 3.443983 | 0.066307 | -950  |
| 9/17/2009 | 32,200 | 2,856,000  | 3.443983 | 0.066307 | -700  |
| 9/24/2009 | 31,800 | 8,138,000  | 3.443983 | 0.066307 | -400  |
| 9/25/2009 | 31,300 | 2,976,000  | 3.443983 | 0.066307 | -500  |
| 9/28/2009 | 30,050 | 6,568,500  | 3.443983 | 0.066307 | -1250 |
| 9/29/2009 | 31,900 | 3,684,500  | 3.443983 | 0.066307 | 1850  |
| 9/30/2009 | 33,350 | 5,226,500  | 3.443983 | 0.066307 | 1450  |
| 10/1/2009 | 33,500 | 3,549,000  | 3.443983 | 0.066307 | 150   |
| 10/2/2009 | 32,650 | 2,494,500  | 3.443983 | 0.066307 | -850  |
| 10/5/2009 | 32,200 | 5,583,500  | 3.443983 | 0.066307 | -450  |
| 10/6/2009 | 34,600 | 6,657,500  | 3.443983 | 0.066307 | 2400  |

|            |        |           |          |          |       |
|------------|--------|-----------|----------|----------|-------|
| 10/7/2009  | 34,750 | 1,822,000 | 3.443983 | 0.066307 | 150   |
| 10/8/2009  | 33,850 | 4,589,500 | 3.443983 | 0.066307 | -900  |
| 10/9/2009  | 33,550 | 4,480,000 | 3.443983 | 0.066307 | -300  |
| 10/12/2009 | 33,600 | 3,196,000 | 3.443983 | 0.066307 | 50    |
| 10/13/2009 | 33,550 | 2,965,000 | 3.443983 | 0.066307 | -50   |
| 10/14/2009 | 33,950 | 3,702,500 | 3.443983 | 0.066307 | 400   |
| 10/15/2009 | 33,700 | 2,172,500 | 3.443983 | 0.066307 | -250  |
| 10/16/2009 | 32,900 | 3,578,000 | 3.443983 | 0.066307 | -800  |
| 10/19/2009 | 33,000 | 3,654,000 | 3.443983 | 0.066307 | 100   |
| 10/20/2009 | 33,200 | 4,100,000 | 3.443983 | 0.066307 | 200   |
| 10/21/2009 | 32,500 | 4,392,000 | 3.443983 | 0.066307 | -700  |
| 10/22/2009 | 31,350 | 7,188,000 | 3.443983 | 0.066307 | -1150 |
| 10/23/2009 | 32,650 | 6,210,500 | 3.443983 | 0.066307 | 1300  |
| 10/26/2009 | 33,100 | 2,046,500 | 3.443983 | 0.066307 | 450   |
| 10/27/2009 | 32,950 | 1,970,500 | 3.443983 | 0.066307 | -150  |
| 10/28/2009 | 31,950 | 5,547,500 | 3.443983 | 0.066307 | -1000 |
| 10/29/2009 | 32,000 | 9,222,500 | 3.443983 | 0.066307 | 50    |
| 10/30/2009 | 31,300 | 5,019,500 | 3.443983 | 0.066307 | -700  |
| 11/2/2009  | 31,050 | 4,300,000 | 3.443983 | 0.066307 | -250  |
| 11/3/2009  | 30,250 | 5,383,500 | 3.443983 | 0.066307 | -800  |
| 11/4/2009  | 30,200 | 7,928,500 | 3.443983 | 0.066307 | -50   |
| 11/5/2009  | 29,800 | 6,992,500 | 3.443983 | 0.066307 | -400  |
| 11/6/2009  | 30,350 | 5,157,500 | 3.443983 | 0.066307 | 550   |
| 11/9/2009  | 31,600 | 5,376,000 | 3.443983 | 0.066307 | 1250  |
| 11/10/2009 | 31,050 | 4,026,000 | 3.443983 | 0.066307 | -550  |
| 11/11/2009 | 31,000 | 2,327,500 | 3.443983 | 0.066307 | -50   |
| 11/12/2009 | 32,750 | 7,189,000 | 3.443983 | 0.066307 | 1750  |
| 11/13/2009 | 32,700 | 1,496,500 | 3.443983 | 0.066307 | -50   |
| 11/16/2009 | 33,550 | 2,773,500 | 3.443983 | 0.066307 | 850   |
| 11/17/2009 | 33,650 | 2,883,000 | 3.443983 | 0.066307 | 100   |
| 11/18/2009 | 34,250 | 7,067,000 | 3.443983 | 0.066307 | 600   |
| 11/19/2009 | 33,250 | 4,683,000 | 3.443983 | 0.066307 | -1000 |
| 11/20/2009 | 33,250 | 3,365,500 | 3.443983 | 0.066307 | 0     |
| 11/23/2009 | 33,150 | 2,306,000 | 3.443983 | 0.066307 | -100  |
| 11/24/2009 | 33,350 | 2,398,000 | 3.443983 | 0.066307 | 200   |
| 11/25/2009 | 32,900 | 1,372,500 | 3.443983 | 0.066307 | -450  |
| 11/26/2009 | 32,000 | 3,845,000 | 3.443983 | 0.066307 | -900  |
| 11/30/2009 | 32,350 | 7,194,500 | 3.443983 | 0.066307 | 350   |
| 12/1/2009  | 32,600 | 2,369,500 | 3.443983 | 0.066307 | 250   |
| 12/2/2009  | 32,550 | 8,086,500 | 3.443983 | 0.066307 | -50   |
| 12/3/2009  | 32,650 | 3,064,000 | 3.443983 | 0.066307 | 100   |
| 12/4/2009  | 33,200 | 2,692,500 | 3.443983 | 0.066307 | 550   |
| 12/7/2009  | 33,400 | 4,075,500 | 3.443983 | 0.066307 | 200   |
| 12/8/2009  | 33,850 | 1,869,000 | 3.443983 | 0.066307 | 450   |
| 12/9/2009  | 33,100 | 2,218,500 | 3.443983 | 0.066307 | -750  |
| 12/10/2009 | 33,250 | 1,987,000 | 3.443983 | 0.066307 | 150   |
| 12/11/2009 | 34,000 | 2,737,500 | 3.443983 | 0.066307 | 750   |

|            |        |           |          |          |       |
|------------|--------|-----------|----------|----------|-------|
| 12/14/2009 | 33,950 | 2,669,500 | 3.443983 | 0.066307 | -50   |
| 12/15/2009 | 34,100 | 2,008,000 | 3.443983 | 0.066307 | 150   |
| 12/16/2009 | 34,500 | 2,616,500 | 3.443983 | 0.066307 | 400   |
| 12/17/2009 | 35,000 | 4,355,000 | 3.443983 | 0.066307 | 500   |
| 12/21/2009 | 33,900 | 3,256,000 | 3.443983 | 0.066307 | -1100 |
| 12/22/2009 | 34,100 | 1,885,500 | 3.443983 | 0.066307 | 200   |
| 12/23/2009 | 34,000 | 999,500   | 3.443983 | 0.066307 | -100  |
| 12/28/2009 | 34,200 | 823,500   | 3.443983 | 0.066307 | 200   |
| 12/29/2009 | 33,950 | 835,000   | 3.443983 | 0.066307 | -250  |
| 12/30/2009 | 34,700 | 2,147,000 | 3.443983 | 0.066307 | 750   |
| 1/4/2010   | 35,300 | 2,867,500 | 4.612245 | 0.073878 | 600   |
| 1/5/2010   | 35,500 | 3,133,500 | 4.612245 | 0.073878 | 200   |
| 1/6/2010   | 35,300 | 2,141,500 | 4.612245 | 0.073878 | -200  |
| 1/7/2010   | 34,200 | 2,858,000 | 4.612245 | 0.073878 | -1100 |
| 1/8/2010   | 34,400 | 3,973,000 | 4.612245 | 0.073878 | 200   |
| 1/11/2010  | 34,950 | 4,240,000 | 4.612245 | 0.073878 | 550   |
| 1/12/2010  | 35,400 | 3,673,500 | 4.612245 | 0.073878 | 450   |
| 1/13/2010  | 35,100 | 2,276,000 | 4.612245 | 0.073878 | -300  |
| 1/14/2010  | 35,550 | 2,605,000 | 4.612245 | 0.073878 | 450   |
| 1/15/2010  | 36,200 | 2,883,500 | 4.612245 | 0.073878 | 650   |
| 1/18/2010  | 36,000 | 1,747,500 | 4.612245 | 0.073878 | -200  |
| 1/19/2010  | 36,250 | 2,231,500 | 4.612245 | 0.073878 | 250   |
| 1/20/2010  | 35,800 | 2,334,500 | 4.612245 | 0.073878 | -450  |
| 1/21/2010  | 35,250 | 1,879,000 | 4.612245 | 0.073878 | -550  |
| 1/22/2010  | 33,800 | 7,729,500 | 4.612245 | 0.073878 | -1450 |
| 1/25/2010  | 33,400 | 3,082,500 | 4.612245 | 0.073878 | -400  |
| 1/26/2010  | 33,850 | 3,941,500 | 4.612245 | 0.073878 | 450   |
| 1/27/2010  | 34,350 | 3,144,500 | 4.612245 | 0.073878 | 500   |
| 1/28/2010  | 36,000 | 6,552,500 | 4.612245 | 0.073878 | 1650  |
| 1/29/2010  | 35,950 | 5,445,500 | 4.612245 | 0.073878 | -50   |
| 2/1/2010   | 35,400 | 3,200,500 | 4.612245 | 0.073878 | -550  |
| 2/2/2010   | 36,000 | 3,574,000 | 4.612245 | 0.073878 | 600   |
| 2/3/2010   | 35,650 | 2,201,000 | 4.612245 | 0.073878 | -350  |
| 2/4/2010   | 35,350 | 2,513,500 | 4.612245 | 0.073878 | -300  |
| 2/5/2010   | 34,350 | 5,591,000 | 4.612245 | 0.073878 | -1000 |
| 2/8/2010   | 33,700 | 9,984,500 | 4.612245 | 0.073878 | -650  |
| 2/9/2010   | 34,150 | 5,759,500 | 4.612245 | 0.073878 | 450   |
| 2/10/2010  | 34,250 | 5,339,000 | 4.612245 | 0.073878 | 100   |
| 2/11/2010  | 34,300 | 1,515,500 | 4.612245 | 0.073878 | 50    |
| 2/12/2010  | 35,300 | 3,116,000 | 4.612245 | 0.073878 | 1000  |
| 2/15/2010  | 34,950 | 599,500   | 4.612245 | 0.073878 | -350  |
| 2/16/2010  | 35,700 | 2,318,000 | 4.612245 | 0.073878 | 750   |
| 2/17/2010  | 36,250 | 4,357,000 | 4.612245 | 0.073878 | 550   |
| 2/18/2010  | 36,000 | 3,174,000 | 4.612245 | 0.073878 | -250  |
| 2/19/2010  | 36,150 | 928,000   | 4.612245 | 0.073878 | 150   |
| 2/22/2010  | 36,550 | 2,089,000 | 4.612245 | 0.073878 | 400   |
| 2/23/2010  | 36,900 | 2,901,000 | 4.612245 | 0.073878 | 350   |

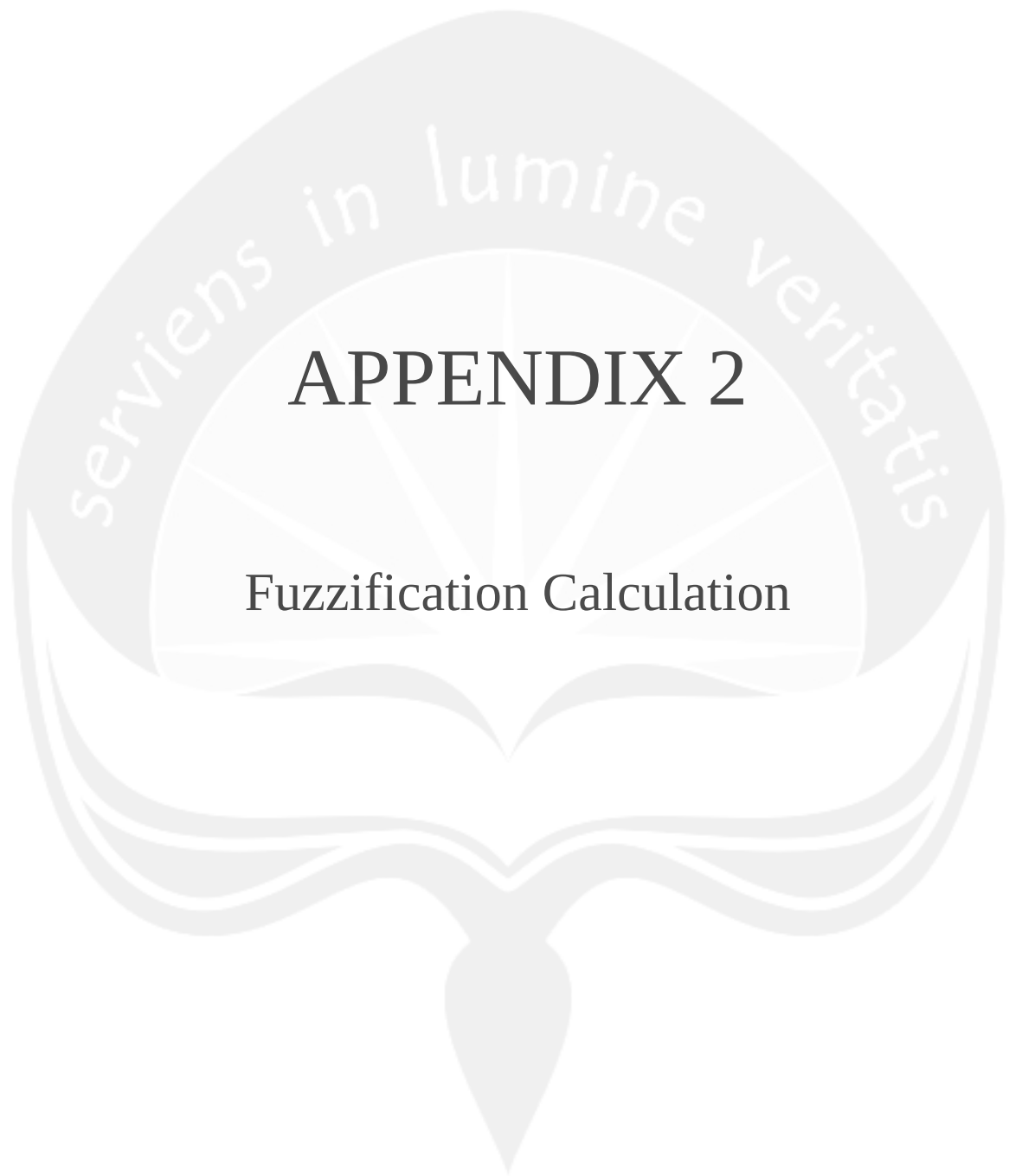
|           |        |           |          |          |       |
|-----------|--------|-----------|----------|----------|-------|
| 2/24/2010 | 36,800 | 1,819,500 | 4.612245 | 0.073878 | -100  |
| 2/25/2010 | 36,250 | 2,770,000 | 4.612245 | 0.073878 | -550  |
| 3/1/2010  | 36,850 | 6,345,500 | 4.612245 | 0.073878 | 600   |
| 3/2/2010  | 36,200 | 4,014,500 | 4.612245 | 0.073878 | -650  |
| 3/3/2010  | 36,150 | 2,021,500 | 4.612245 | 0.073878 | -50   |
| 3/4/2010  | 36,050 | 2,814,500 | 4.612245 | 0.073878 | -100  |
| 3/5/2010  | 36,800 | 5,961,500 | 4.612245 | 0.073878 | 750   |
| 3/8/2010  | 39,000 | 7,463,500 | 4.612245 | 0.073878 | 2200  |
| 3/9/2010  | 40,250 | 4,420,000 | 4.612245 | 0.073878 | 1250  |
| 3/10/2010 | 39,950 | 2,322,500 | 4.612245 | 0.073878 | -300  |
| 3/11/2010 | 39,600 | 2,279,000 | 4.612245 | 0.073878 | -350  |
| 3/12/2010 | 39,000 | 2,027,500 | 4.612245 | 0.073878 | -600  |
| 3/15/2010 | 38,650 | 3,013,500 | 4.612245 | 0.073878 | -350  |
| 3/17/2010 | 40,850 | 5,221,500 | 4.612245 | 0.073878 | 2200  |
| 3/18/2010 | 40,200 | 5,797,000 | 4.612245 | 0.073878 | -650  |
| 3/19/2010 | 40,100 | 3,561,500 | 4.612245 | 0.073878 | -100  |
| 3/22/2010 | 40,200 | 1,674,500 | 4.612245 | 0.073878 | 100   |
| 3/23/2010 | 40,800 | 3,337,500 | 4.612245 | 0.073878 | 600   |
| 3/24/2010 | 41,800 | 2,596,500 | 4.612245 | 0.073878 | 1000  |
| 3/25/2010 | 43,000 | 6,253,000 | 4.612245 | 0.073878 | 1200  |
| 3/26/2010 | 43,150 | 1,916,500 | 4.612245 | 0.073878 | 150   |
| 3/29/2010 | 42,600 | 2,641,500 | 4.612245 | 0.073878 | -550  |
| 3/30/2010 | 42,400 | 2,557,000 | 4.612245 | 0.073878 | -200  |
| 3/31/2010 | 41,900 | 3,499,000 | 4.612245 | 0.073878 | -500  |
| 4/1/2010  | 44,500 | 4,320,000 | 4.612245 | 0.073878 | 2600  |
| 4/5/2010  | 46,700 | 4,199,000 | 4.612245 | 0.073878 | 2200  |
| 4/6/2010  | 45,300 | 3,833,000 | 4.612245 | 0.073878 | -1400 |
| 4/7/2010  | 45,500 | 2,943,000 | 4.612245 | 0.073878 | 200   |
| 4/8/2010  | 43,800 | 6,424,500 | 4.612245 | 0.073878 | -1700 |
| 4/9/2010  | 43,450 | 2,739,000 | 4.612245 | 0.073878 | -350  |
| 4/12/2010 | 44,550 | 2,869,000 | 4.612245 | 0.073878 | 1100  |
| 4/13/2010 | 43,900 | 2,287,000 | 4.612245 | 0.073878 | -650  |
| 4/14/2010 | 43,350 | 3,789,000 | 4.612245 | 0.073878 | -550  |
| 4/15/2010 | 43,450 | 1,714,000 | 4.612245 | 0.073878 | 100   |
| 4/16/2010 | 42,900 | 2,908,500 | 4.612245 | 0.073878 | -550  |
| 4/19/2010 | 43,100 | 2,907,500 | 4.612245 | 0.073878 | 200   |
| 4/20/2010 | 43,900 | 3,640,000 | 4.612245 | 0.073878 | 800   |
| 4/21/2010 | 45,150 | 4,975,500 | 4.612245 | 0.073878 | 1250  |
| 4/22/2010 | 45,450 | 1,830,000 | 4.612245 | 0.073878 | 300   |
| 4/23/2010 | 45,800 | 2,686,500 | 4.612245 | 0.073878 | 350   |
| 4/26/2010 | 47,000 | 3,158,500 | 4.612245 | 0.073878 | 1200  |
| 4/27/2010 | 46,200 | 2,715,000 | 4.612245 | 0.073878 | -800  |
| 4/28/2010 | 45,550 | 4,073,000 | 4.612245 | 0.073878 | -650  |
| 4/29/2010 | 46,100 | 2,551,500 | 4.612245 | 0.073878 | 550   |
| 4/30/2010 | 47,150 | 3,899,000 | 4.612245 | 0.073878 | 1050  |
| 5/3/2010  | 46,400 | 2,089,500 | 4.612245 | 0.073878 | -750  |
| 5/4/2010  | 45,550 | 2,667,500 | 4.612245 | 0.073878 | -850  |

|           |        |            |          |          |       |
|-----------|--------|------------|----------|----------|-------|
| 5/5/2010  | 43,450 | 6,130,500  | 4.612245 | 0.073878 | -2100 |
| 5/6/2010  | 41,900 | 11,350,000 | 4.612245 | 0.073878 | -1550 |
| 5/7/2010  | 40,200 | 12,465,000 | 4.612245 | 0.073878 | -1700 |
| 5/10/2010 | 42,600 | 12,459,500 | 4.612245 | 0.073878 | 2400  |
| 5/11/2010 | 42,700 | 9,051,500  | 4.612245 | 0.073878 | 100   |
| 5/12/2010 | 42,700 | 3,086,500  | 4.612245 | 0.073878 | 0     |
| 5/14/2010 | 42,600 | 1,785,500  | 4.612245 | 0.073878 | -100  |
| 5/17/2010 | 41,900 | 5,166,000  | 4.612245 | 0.073878 | -700  |
| 5/18/2010 | 41,500 | 3,694,000  | 4.612245 | 0.073878 | -400  |
| 5/19/2010 | 39,600 | 12,138,500 | 4.612245 | 0.073878 | -1900 |
| 5/20/2010 | 38,450 | 7,759,500  | 4.612245 | 0.073878 | -1150 |
| 5/21/2010 | 38,000 | 9,360,000  | 4.612245 | 0.073878 | -450  |
| 5/24/2010 | 37,900 | 4,753,000  | 4.612245 | 0.073878 | -100  |
| 5/25/2010 | 36,400 | 5,966,000  | 4.612245 | 0.073878 | -1500 |
| 5/26/2010 | 40,050 | 9,533,000  | 4.612245 | 0.073878 | 3650  |
| 5/27/2010 | 41,500 | 6,734,500  | 4.612245 | 0.073878 | 1450  |
| 5/31/2010 | 43,150 | 6,499,000  | 4.612245 | 0.073878 | 1650  |
| 6/1/2010  | 42,750 | 6,443,000  | 4.612245 | 0.073878 | -400  |
| 6/2/2010  | 42,500 | 3,418,000  | 4.612245 | 0.073878 | -250  |
| 6/3/2010  | 44,100 | 4,946,500  | 4.612245 | 0.073878 | 1600  |
| 6/4/2010  | 44,950 | 5,513,500  | 4.612245 | 0.073878 | 850   |
| 6/7/2010  | 43,800 | 3,907,000  | 4.612245 | 0.073878 | -1150 |
| 6/8/2010  | 43,250 | 2,831,000  | 4.612245 | 0.073878 | -550  |
| 6/9/2010  | 43,150 | 2,188,500  | 4.612245 | 0.073878 | -100  |
| 6/10/2010 | 42,750 | 1,463,500  | 4.612245 | 0.073878 | -400  |
| 6/11/2010 | 43,000 | 2,010,000  | 4.612245 | 0.073878 | 250   |
| 6/14/2010 | 44,250 | 2,680,000  | 4.612245 | 0.073878 | 1250  |
| 6/15/2010 | 46,000 | 7,430,000  | 4.612245 | 0.073878 | 1750  |
| 6/16/2010 | 46,450 | 3,906,500  | 4.612245 | 0.073878 | 450   |
| 6/17/2010 | 46,650 | 4,989,500  | 4.612245 | 0.073878 | 200   |
| 6/18/2010 | 48,550 | 6,521,500  | 4.612245 | 0.073878 | 1900  |
| 6/21/2010 | 48,250 | 4,609,000  | 4.612245 | 0.073878 | -300  |
| 6/22/2010 | 48,350 | 2,013,500  | 4.612245 | 0.073878 | 100   |
| 6/23/2010 | 47,600 | 3,184,500  | 4.612245 | 0.073878 | -750  |
| 6/24/2010 | 48,100 | 2,347,000  | 4.612245 | 0.073878 | 500   |
| 6/25/2010 | 48,400 | 2,032,000  | 4.612245 | 0.073878 | 300   |
| 6/28/2010 | 48,100 | 1,094,000  | 4.612245 | 0.073878 | -300  |
| 6/29/2010 | 47,500 | 2,729,000  | 4.612245 | 0.073878 | -600  |
| 6/30/2010 | 48,300 | 4,172,500  | 4.612245 | 0.073878 | 800   |
| 7/1/2010  | 47,500 | 3,439,000  | 4.612245 | 0.073878 | -800  |
| 7/2/2010  | 46,300 | 4,940,500  | 4.612245 | 0.073878 | -1200 |
| 7/5/2010  | 46,700 | 909,000    | 4.612245 | 0.073878 | 400   |
| 7/6/2010  | 46,850 | 2,507,500  | 4.612245 | 0.073878 | 150   |
| 7/7/2010  | 46,250 | 2,185,000  | 4.612245 | 0.073878 | -600  |
| 7/8/2010  | 47,000 | 6,385,000  | 4.612245 | 0.073878 | 750   |
| 7/9/2010  | 47,350 | 2,844,000  | 4.612245 | 0.073878 | 350   |
| 7/12/2010 | 47,300 | 3,260,500  | 4.612245 | 0.073878 | -50   |

|           |        |            |          |          |       |
|-----------|--------|------------|----------|----------|-------|
| 7/13/2010 | 48,200 | 2,969,000  | 4.612245 | 0.073878 | 900   |
| 7/14/2010 | 49,450 | 3,952,500  | 4.612245 | 0.073878 | 1250  |
| 7/15/2010 | 49,850 | 2,479,000  | 4.612245 | 0.073878 | 400   |
| 7/16/2010 | 49,750 | 1,348,500  | 4.612245 | 0.073878 | -100  |
| 7/19/2010 | 49,300 | 1,876,000  | 4.612245 | 0.073878 | -450  |
| 7/20/2010 | 49,800 | 4,139,500  | 4.612245 | 0.073878 | 500   |
| 7/21/2010 | 49,850 | 5,516,500  | 4.612245 | 0.073878 | 50    |
| 7/22/2010 | 49,750 | 1,840,000  | 4.612245 | 0.073878 | -100  |
| 7/23/2010 | 50,100 | 2,443,000  | 4.612245 | 0.073878 | 350   |
| 7/26/2010 | 49,800 | 2,079,000  | 4.612245 | 0.073878 | -300  |
| 7/27/2010 | 50,500 | 2,542,500  | 4.612245 | 0.073878 | 700   |
| 7/28/2010 | 51,200 | 1,939,000  | 4.612245 | 0.073878 | 700   |
| 7/29/2010 | 52,750 | 2,808,500  | 4.612245 | 0.073878 | 1550  |
| 7/30/2010 | 50,700 | 4,338,000  | 4.612245 | 0.073878 | -2050 |
| 8/2/2010  | 49,950 | 4,107,000  | 4.612245 | 0.073878 | -750  |
| 8/3/2010  | 47,500 | 13,777,500 | 4.612245 | 0.073878 | -2450 |
| 8/4/2010  | 46,500 | 14,199,500 | 4.612245 | 0.073878 | -1000 |
| 8/5/2010  | 48,750 | 10,512,500 | 4.612245 | 0.073878 | 2250  |
| 8/6/2010  | 48,800 | 4,850,000  | 4.612245 | 0.073878 | 50    |
| 8/9/2010  | 48,800 | 2,678,000  | 4.612245 | 0.073878 | 0     |
| 8/10/2010 | 47,500 | 5,248,500  | 4.612245 | 0.073878 | -1300 |
| 8/11/2010 | 46,800 | 3,951,500  | 4.612245 | 0.073878 | -700  |
| 8/12/2010 | 47,600 | 4,313,000  | 4.612245 | 0.073878 | 800   |
| 8/13/2010 | 48,300 | 3,804,500  | 4.612245 | 0.073878 | 700   |
| 8/16/2010 | 48,300 | 1,826,000  | 4.612245 | 0.073878 | 0     |
| 8/18/2010 | 48,300 | 3,300,500  | 4.612245 | 0.073878 | 0     |
| 8/19/2010 | 48,800 | 4,566,000  | 4.612245 | 0.073878 | 500   |
| 8/20/2010 | 48,800 | 1,600,000  | 4.612245 | 0.073878 | 0     |
| 8/23/2010 | 49,750 | 3,456,000  | 4.612245 | 0.073878 | 950   |
| 8/24/2010 | 49,000 | 3,262,500  | 4.612245 | 0.073878 | -750  |
| 8/25/2010 | 48,650 | 3,038,500  | 4.612245 | 0.073878 | -350  |
| 8/26/2010 | 48,400 | 2,679,500  | 4.612245 | 0.073878 | -250  |
| 8/27/2010 | 47,500 | 4,285,000  | 4.612245 | 0.073878 | -900  |
| 8/30/2010 | 47,800 | 2,063,500  | 4.612245 | 0.073878 | 300   |
| 8/31/2010 | 47,600 | 3,779,500  | 4.612245 | 0.073878 | -200  |
| 9/1/2010  | 49,400 | 6,027,500  | 4.612245 | 0.073878 | 1800  |
| 9/2/2010  | 50,050 | 6,142,500  | 4.612245 | 0.073878 | 650   |
| 9/3/2010  | 50,000 | 4,158,000  | 4.612245 | 0.073878 | -50   |
| 9/6/2010  | 52,400 | 6,315,500  | 4.612245 | 0.073878 | 2400  |
| 9/7/2010  | 53,500 | 3,048,000  | 4.612245 | 0.073878 | 1100  |
| 9/15/2010 | 57,800 | 9,139,000  | 4.612245 | 0.073878 | 4300  |
| 9/16/2010 | 55,300 | 5,308,000  | 4.612245 | 0.073878 | -2500 |
| 9/17/2010 | 54,700 | 3,844,000  | 4.612245 | 0.073878 | -600  |
| 9/20/2010 | 54,500 | 2,624,500  | 4.612245 | 0.073878 | -200  |
| 9/21/2010 | 55,200 | 4,179,000  | 4.612245 | 0.073878 | 700   |
| 9/22/2010 | 55,000 | 1,916,500  | 4.612245 | 0.073878 | -200  |
| 9/23/2010 | 54,850 | 1,977,500  | 4.612245 | 0.073878 | -150  |

|            |        |           |          |          |       |
|------------|--------|-----------|----------|----------|-------|
| 9/24/2010  | 56,000 | 3,818,000 | 4.612245 | 0.073878 | 1150  |
| 9/27/2010  | 58,100 | 3,589,000 | 4.612245 | 0.073878 | 2100  |
| 9/28/2010  | 56,950 | 6,053,500 | 4.612245 | 0.073878 | -1150 |
| 9/29/2010  | 56,150 | 3,463,500 | 4.612245 | 0.073878 | -800  |
| 9/30/2010  | 56,700 | 2,401,000 | 4.612245 | 0.073878 | 550   |
| 10/1/2010  | 59,600 | 3,192,500 | 4.612245 | 0.073878 | 2900  |
| 10/4/2010  | 60,000 | 3,483,000 | 4.612245 | 0.073878 | 400   |
| 10/5/2010  | 58,950 | 2,617,500 | 4.612245 | 0.073878 | -1050 |
| 10/6/2010  | 58,950 | 2,428,500 | 4.612245 | 0.073878 | 0     |
| 10/7/2010  | 58,450 | 2,628,500 | 4.612245 | 0.073878 | -500  |
| 10/8/2010  | 56,950 | 5,555,000 | 4.612245 | 0.073878 | -1500 |
| 10/11/2010 | 56,400 | 5,748,000 | 4.612245 | 0.073878 | -550  |
| 10/12/2010 | 57,150 | 2,680,500 | 4.612245 | 0.073878 | 750   |
| 10/13/2010 | 57,500 | 2,543,500 | 4.612245 | 0.073878 | 350   |
| 10/14/2010 | 57,600 | 4,398,000 | 4.612245 | 0.073878 | 100   |
| 10/15/2010 | 56,250 | 7,800,500 | 4.612245 | 0.073878 | -1350 |
| 10/18/2010 | 55,950 | 2,896,500 | 4.612245 | 0.073878 | -300  |
| 10/19/2010 | 56,100 | 3,365,500 | 4.612245 | 0.073878 | 150   |
| 10/20/2010 | 56,300 | 2,491,000 | 4.612245 | 0.073878 | 200   |
| 10/21/2010 | 56,150 | 3,192,500 | 4.612245 | 0.073878 | -150  |
| 10/22/2010 | 56,150 | 1,837,500 | 4.612245 | 0.073878 | 0     |
| 10/25/2010 | 57,300 | 3,404,500 | 4.612245 | 0.073878 | 1150  |
| 10/26/2010 | 56,950 | 2,681,500 | 4.612245 | 0.073878 | -350  |
| 10/27/2010 | 56,800 | 2,195,000 | 4.612245 | 0.073878 | -150  |
| 10/28/2010 | 56,450 | 1,519,500 | 4.612245 | 0.073878 | -350  |
| 10/29/2010 | 57,000 | 2,381,000 | 4.612245 | 0.073878 | 550   |
| 11/1/2010  | 57,450 | 2,654,000 | 4.612245 | 0.073878 | 450   |
| 11/2/2010  | 56,550 | 2,244,000 | 4.612245 | 0.073878 | -900  |
| 11/3/2010  | 55,600 | 5,503,000 | 4.612245 | 0.073878 | -950  |
| 11/4/2010  | 55,100 | 5,760,500 | 4.612245 | 0.073878 | -500  |
| 11/5/2010  | 56,700 | 4,522,500 | 4.612245 | 0.073878 | 1600  |
| 11/8/2010  | 57,400 | 3,333,500 | 4.612245 | 0.073878 | 700   |
| 11/9/2010  | 58,150 | 5,911,000 | 4.612245 | 0.073878 | 750   |
| 11/10/2010 | 57,450 | 3,026,000 | 4.612245 | 0.073878 | -700  |
| 11/11/2010 | 56,500 | 2,921,500 | 4.612245 | 0.073878 | -950  |
| 11/12/2010 | 56,800 | 4,343,000 | 4.612245 | 0.073878 | 300   |
| 11/15/2010 | 56,250 | 1,512,500 | 4.612245 | 0.073878 | -550  |
| 11/16/2010 | 56,000 | 4,836,000 | 4.612245 | 0.073878 | -250  |
| 11/18/2010 | 54,900 | 5,622,000 | 4.612245 | 0.073878 | -1100 |
| 11/19/2010 | 55,300 | 5,104,500 | 4.612245 | 0.073878 | 400   |
| 11/22/2010 | 55,000 | 2,887,500 | 4.612245 | 0.073878 | -300  |
| 11/23/2010 | 54,200 | 5,413,500 | 4.612245 | 0.073878 | -800  |
| 11/24/2010 | 53,750 | 3,511,500 | 4.612245 | 0.073878 | -450  |
| 11/25/2010 | 55,450 | 3,139,000 | 4.612245 | 0.073878 | 1700  |
| 11/26/2010 | 54,150 | 2,628,500 | 4.612245 | 0.073878 | -1300 |
| 11/29/2010 | 54,350 | 3,048,500 | 4.612245 | 0.073878 | 200   |
| 11/30/2010 | 51,900 | 8,721,000 | 4.612245 | 0.073878 | -2450 |

|            |        |            |          |          |       |
|------------|--------|------------|----------|----------|-------|
| 12/1/2010  | 52,450 | 4,301,500  | 4.612245 | 0.073878 | 550   |
| 12/2/2010  | 54,050 | 4,618,500  | 4.612245 | 0.073878 | 1600  |
| 12/3/2010  | 52,750 | 5,952,000  | 4.612245 | 0.073878 | -1300 |
| 12/6/2010  | 52,900 | 4,700,500  | 4.612245 | 0.073878 | 150   |
| 12/8/2010  | 54,550 | 7,870,000  | 4.612245 | 0.073878 | 1650  |
| 12/9/2010  | 54,550 | 4,968,000  | 4.612245 | 0.073878 | 0     |
| 12/10/2010 | 53,900 | 3,786,500  | 4.612245 | 0.073878 | -650  |
| 12/13/2010 | 53,000 | 3,014,000  | 4.612245 | 0.073878 | -900  |
| 12/14/2010 | 52,800 | 3,242,000  | 4.612245 | 0.073878 | -200  |
| 12/15/2010 | 52,800 | 4,296,500  | 4.612245 | 0.073878 | 0     |
| 12/16/2010 | 49,900 | 12,475,500 | 4.612245 | 0.073878 | -2900 |
| 12/17/2010 | 50,300 | 6,336,000  | 4.612245 | 0.073878 | 400   |
| 12/20/2010 | 51,250 | 3,433,000  | 4.612245 | 0.073878 | 950   |
| 12/21/2010 | 52,450 | 5,504,500  | 4.612245 | 0.073878 | 1200  |
| 12/22/2010 | 52,400 | 2,765,500  | 4.612245 | 0.073878 | -50   |
| 12/23/2010 | 52,550 | 1,682,500  | 4.612245 | 0.073878 | 150   |
| 12/27/2010 | 53,500 | 2,192,500  | 4.612245 | 0.073878 | 950   |
| 12/28/2010 | 53,450 | 1,016,000  | 4.612245 | 0.073878 | -50   |
| 12/29/2010 | 54,000 | 1,794,500  | 4.612245 | 0.073878 | 550   |
| 12/30/2010 | 54,550 | 4,060,000  | 4.612245 | 0.073878 | 550   |



## APPENDIX 2

### Fuzzification Calculation

Because of this fuzzification need newest data in order to make it up to date, in this section the data of closing price, trade volume and stock price fluctuation gathered from the last 5 months in order to make the Low, Med, High criteria with up to date data. For the PER and DPS uses all of the data. This research uses quartile function in the Microsoft Excel.

*Last 5 months data*

| Date       | Closing Price | Trade Volume | Stock Price Fluctuation |
|------------|---------------|--------------|-------------------------|
| 02/08/2010 | 49950         | 4107000      | -750                    |
| 03/08/2010 | 47500         | 13777500     | -2450                   |
| 04/08/2010 | 46500         | 14199500     | -1000                   |
| 05/08/2010 | 48750         | 10512500     | 2250                    |
| 06/08/2010 | 48800         | 4850000      | 50                      |
| 09/08/2010 | 48800         | 2678000      | 0                       |
| 10/08/2010 | 47500         | 5248500      | -1300                   |
| 11/08/2010 | 46800         | 3951500      | -700                    |
| 12/08/2010 | 47600         | 4313000      | 800                     |
| 13/08/2010 | 48300         | 3804500      | 700                     |
| 16/08/2010 | 48300         | 1826000      | 0                       |
| 18/08/2010 | 48300         | 3300500      | 0                       |
| 19/08/2010 | 48800         | 4566000      | 500                     |
| 20/08/2010 | 48800         | 1600000      | 0                       |
| 23/08/2010 | 49750         | 3456000      | 950                     |
| 24/08/2010 | 49000         | 3262500      | -750                    |
| 25/08/2010 | 48650         | 3038500      | -350                    |
| 26/08/2010 | 48400         | 2679500      | -250                    |
| 27/08/2010 | 47500         | 4285000      | -900                    |
| 30/08/2010 | 47800         | 2063500      | 300                     |
| 31/08/2010 | 47600         | 3779500      | -200                    |
| 01/09/2010 | 49400         | 6027500      | 1800                    |
| 02/09/2010 | 50050         | 6142500      | 650                     |
| 03/09/2010 | 50000         | 4158000      | -50                     |
| 06/09/2010 | 52400         | 6315500      | 2400                    |
| 07/09/2010 | 53500         | 3048000      | 1100                    |
| 15/09/2010 | 57800         | 9139000      | 4300                    |
| 16/09/2010 | 55300         | 5308000      | -2500                   |
| 17/09/2010 | 54700         | 3844000      | -600                    |
| 20/09/2010 | 54500         | 2624500      | -200                    |

|            |       |         |       |
|------------|-------|---------|-------|
| 21/09/2010 | 55200 | 4179000 | 700   |
| 22/09/2010 | 55000 | 1916500 | -200  |
| 23/09/2010 | 54850 | 1977500 | -150  |
| 24/09/2010 | 56000 | 3818000 | 1150  |
| 27/09/2010 | 58100 | 3589000 | 2100  |
| 28/09/2010 | 56950 | 6053500 | -1150 |
| 29/09/2010 | 56150 | 3463500 | -800  |
| 30/09/2010 | 56700 | 2401000 | 550   |
| 01/10/2010 | 59600 | 3192500 | 2900  |
| 04/10/2010 | 60000 | 3483000 | 400   |
| 05/10/2010 | 58950 | 2617500 | -1050 |
| 06/10/2010 | 58950 | 2428500 | 0     |
| 07/10/2010 | 58450 | 2628500 | -500  |
| 08/10/2010 | 56950 | 5555000 | -1500 |
| 11/10/2010 | 56400 | 5748000 | -550  |
| 12/10/2010 | 57150 | 2680500 | 750   |
| 13/10/2010 | 57500 | 2543500 | 350   |
| 14/10/2010 | 57600 | 4398000 | 100   |
| 15/10/2010 | 56250 | 7800500 | -1350 |
| 18/10/2010 | 55950 | 2896500 | -300  |
| 19/10/2010 | 56100 | 3365500 | 150   |
| 20/10/2010 | 56300 | 2491000 | 200   |
| 21/10/2010 | 56150 | 3192500 | -150  |
| 22/10/2010 | 56150 | 1837500 | 0     |
| 25/10/2010 | 57300 | 3404500 | 1150  |
| 26/10/2010 | 56950 | 2681500 | -350  |
| 27/10/2010 | 56800 | 2195000 | -150  |
| 28/10/2010 | 56450 | 1519500 | -350  |
| 29/10/2010 | 57000 | 2381000 | 550   |
| 01/11/2010 | 57450 | 2654000 | 450   |
| 02/11/2010 | 56550 | 2244000 | -900  |
| 03/11/2010 | 55600 | 5503000 | -950  |
| 04/11/2010 | 55100 | 5760500 | -500  |
| 05/11/2010 | 56700 | 4522500 | 1600  |
| 08/11/2010 | 57400 | 3333500 | 700   |
| 09/11/2010 | 58150 | 5911000 | 750   |
| 10/11/2010 | 57450 | 3026000 | -700  |
| 11/11/2010 | 56500 | 2921500 | -950  |
| 12/11/2010 | 56800 | 4343000 | 300   |
| 15/11/2010 | 56250 | 1512500 | -550  |
| 16/11/2010 | 56000 | 4836000 | -250  |
| 18/11/2010 | 54900 | 5622000 | -1100 |
| 19/11/2010 | 55300 | 5104500 | 400   |
| 22/11/2010 | 55000 | 2887500 | -300  |
| 23/11/2010 | 54200 | 5413500 | -800  |

|            |       |          |       |
|------------|-------|----------|-------|
| 24/11/2010 | 53750 | 3511500  | -450  |
| 25/11/2010 | 55450 | 3139000  | 1700  |
| 26/11/2010 | 54150 | 2628500  | -1300 |
| 29/11/2010 | 54350 | 3048500  | 200   |
| 30/11/2010 | 51900 | 8721000  | -2450 |
| 01/12/2010 | 52450 | 4301500  | 550   |
| 02/12/2010 | 54050 | 4618500  | 1600  |
| 03/12/2010 | 52750 | 5952000  | -1300 |
| 06/12/2010 | 52900 | 4700500  | 150   |
| 08/12/2010 | 54550 | 7870000  | 1650  |
| 09/12/2010 | 54550 | 4968000  | 0     |
| 10/12/2010 | 53900 | 3786500  | -650  |
| 13/12/2010 | 53000 | 3014000  | -900  |
| 14/12/2010 | 52800 | 3242000  | -200  |
| 15/12/2010 | 52800 | 4296500  | 0     |
| 16/12/2010 | 49900 | 12475500 | -2900 |
| 17/12/2010 | 50300 | 6336000  | 400   |
| 20/12/2010 | 51250 | 3433000  | 950   |
| 21/12/2010 | 52450 | 5504500  | 1200  |
| 22/12/2010 | 52400 | 2765500  | -50   |
| 23/12/2010 | 52550 | 1682500  | 150   |
| 27/12/2010 | 53500 | 2192500  | 950   |
| 28/12/2010 | 53450 | 1016000  | -50   |
| 29/12/2010 | 54000 | 1794500  | 550   |
| 30/12/2010 | 54550 | 4060000  | 550   |

For PER and DPS

| DPS      | PER      |
|----------|----------|
| 0        | -0,05819 |
| 0        | 0,01249  |
| 0        | 0,007126 |
| 0,651341 | 0,01567  |
| 1,030534 | 0,028359 |
| 1,307692 | 0,026538 |
| 1,774194 | 0,01754  |
| 0,6639   | 0,061535 |
| 3,686441 | 0,0675   |
| 3,443983 | 0,066307 |
| 4,612245 | 0,073878 |

# Quartile Calculation

Quartile Function: QUARTILE(array;quart)

=QUARTILE(C2:C56;0)

=QUARTILE(C2:C56;1)

=QUARTILE(C2:C56;2)

=QUARTILE(C2:C56;3)

=QUARTILE(C2:C56;4)

## 1. Closing Price Quartile:

| File Edit View Insert Format Tools MegaStat Data Window Help |              |          |       |          |          |   |   |   |   |   |
|--------------------------------------------------------------|--------------|----------|-------|----------|----------|---|---|---|---|---|
| 100% Arial B I U                                             |              |          |       |          |          |   |   |   |   |   |
| fx ClosingPrice                                              |              |          |       |          |          |   |   |   |   |   |
|                                                              | A            | B        | C     | D        | E        | F | G | H | I | J |
| 1                                                            | ClosingPrice | Volume   | Fluct | DPS      | PER      |   |   |   |   |   |
| 2                                                            | 52450        | 4301500  | 550   | 0        | -0,05819 |   |   |   |   |   |
| 3                                                            | 54050        | 4618500  | 1600  | 0        | 0,013471 |   |   |   |   |   |
| 4                                                            | 52750        | 5952000  | -1300 | 0        | 0,007718 |   |   |   |   |   |
| 5                                                            | 52900        | 4700500  | 150   | 0,702479 | 0,016901 |   |   |   |   |   |
| 6                                                            | 54550        | 7870000  | 1650  | 1,120332 | 0,03083  |   |   |   |   |   |
| 7                                                            | 54550        | 4968000  | 0     | 1,399177 | 0,028395 |   |   |   |   |   |
| 8                                                            | 53900        | 3786500  | -650  | 1,841004 | 0,018201 |   |   |   |   |   |
| 9                                                            | 53000        | 3014000  | -900  | 0,8639   | 0,061535 |   |   |   |   |   |
| 10                                                           | 52800        | 3242000  | -200  | 3,686441 | 0,0675   |   |   |   |   |   |
| 11                                                           | 52800        | 4296500  | 0     | 3,443983 | 0,066307 |   |   |   |   |   |
| 12                                                           | 49900        | 12475500 | -2900 | 4,612245 | 0,073878 |   |   |   |   |   |
| 13                                                           | 56250        | 7800500  | -1350 |          |          |   |   |   |   |   |
| 14                                                           | 55950        | 2896500  | -300  |          |          |   |   |   |   |   |
| 15                                                           | 56100        | 3365500  | 150   |          |          |   |   |   |   |   |
| 16                                                           | 56300        | 2491000  | 200   |          |          |   |   |   |   |   |
| 17                                                           | 56150        | 3192500  | -150  |          |          |   |   |   |   |   |
| 18                                                           | 56150        | 1837500  | 0     |          |          |   |   |   |   |   |
| 19                                                           | 57300        | 3404500  | 1150  |          |          |   |   |   |   |   |
| 20                                                           | 56950        | 2681500  | -350  |          |          |   |   |   |   |   |
| 21                                                           | 56800        | 2195000  | -150  |          |          |   |   |   |   |   |
| 22                                                           | 56450        | 1519500  | -350  |          |          |   |   |   |   |   |
| 23                                                           | 57000        | 2381000  | 550   |          |          |   |   |   |   |   |
| 24                                                           | 48300        | 1826000  | 0     |          |          |   |   |   |   |   |
| 25                                                           | 48300        | 3300500  | 0     |          |          |   |   |   |   |   |
| 26                                                           | 48800        | 4566000  | 500   |          |          |   |   |   |   |   |
| 27                                                           | 48800        | 1600000  | 0     |          |          |   |   |   |   |   |
| 28                                                           | 49750        | 3456000  | 950   |          |          |   |   |   |   |   |
| 29                                                           | 49000        | 3262500  | -750  |          |          |   |   |   |   |   |
| 30                                                           | 48650        | 3038500  | -350  |          |          |   |   |   |   |   |
| 31                                                           | 48400        | 2679500  | -250  |          |          |   |   |   |   |   |
| 32                                                           | 47500        | 4285000  | -900  |          |          |   |   |   |   |   |
| 33                                                           | 47800        | 2063500  | 300   |          |          |   |   |   |   |   |
| 34                                                           | 47600        | 3779500  | -200  |          |          |   |   |   |   |   |

|    |       |         |       |  |  |  |  |  |  |
|----|-------|---------|-------|--|--|--|--|--|--|
| 35 | 57450 | 2654000 | 450   |  |  |  |  |  |  |
| 36 | 56550 | 2244000 | -900  |  |  |  |  |  |  |
| 37 | 56600 | 5503000 | -950  |  |  |  |  |  |  |
| 38 | 55100 | 5760500 | -500  |  |  |  |  |  |  |
| 39 | 56700 | 4522500 | 1600  |  |  |  |  |  |  |
| 40 | 57400 | 3333500 | 700   |  |  |  |  |  |  |
| 41 | 58150 | 5911000 | 750   |  |  |  |  |  |  |
| 42 | 57450 | 3026000 | -700  |  |  |  |  |  |  |
| 43 | 56500 | 2921500 | -950  |  |  |  |  |  |  |
| 44 | 56800 | 4343000 | 300   |  |  |  |  |  |  |
| 45 | 56250 | 1512500 | -550  |  |  |  |  |  |  |
| 46 | 49400 | 6027500 | 1800  |  |  |  |  |  |  |
| 47 | 50050 | 6142500 | 650   |  |  |  |  |  |  |
| 48 | 50000 | 4158000 | -50   |  |  |  |  |  |  |
| 49 | 52400 | 6315500 | 2400  |  |  |  |  |  |  |
| 50 | 53500 | 3048000 | 1100  |  |  |  |  |  |  |
| 51 | 57800 | 9139000 | 4300  |  |  |  |  |  |  |
| 52 | 55300 | 5308000 | -2500 |  |  |  |  |  |  |
| 53 | 54700 | 3844000 | -600  |  |  |  |  |  |  |
| 54 | 54500 | 2624500 | -200  |  |  |  |  |  |  |
| 55 | 55200 | 4179000 | 700   |  |  |  |  |  |  |
| 56 | 55000 | 1916500 | -200  |  |  |  |  |  |  |
| 57 |       |         |       |  |  |  |  |  |  |
| 58 |       |         |       |  |  |  |  |  |  |
| 59 |       |         |       |  |  |  |  |  |  |
| 60 |       |         |       |  |  |  |  |  |  |

The array or range of closing price data is A2 until A56, after that we insert the quartile function:

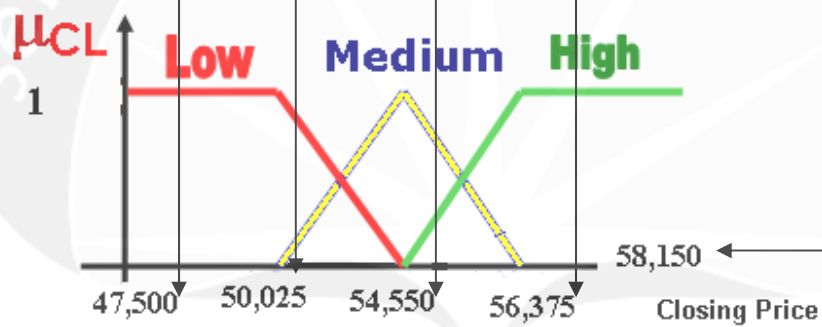
```
=QUARTILE(A2:A56;0)
=QUARTILE(A2:A56;1)
=QUARTILE(A2:A56;2)
=QUARTILE(A2:A56;3)
=QUARTILE(A2:A56;4)
```

And the result as follow:



G2       $\text{fx}$  =QUARTILE(A2:A56;0)

|    | A            | B       | C     | D        | E         | F | G     |
|----|--------------|---------|-------|----------|-----------|---|-------|
| 1  | ClosingPrice | Volume  | Fluct | DPS      | PER       |   |       |
| 2  | 52450        | 4301500 | 550   | 0        | -0,05819  |   | 47500 |
| 3  | 54050        | 4618500 | 1600  | 0        | 0,013471  |   | 50025 |
| 4  | 52750        | 5952000 | -1300 | 0        | -0,007718 |   | 54550 |
| 5  | 52900        | 4700500 | 150   | 0,702479 | 0,016901  |   | 56375 |
| 6  | 54550        | 7870000 | 1650  | 1,120332 | 0,03083   |   | 58150 |
| 7  | 54550        | 4968000 | 0     | 1,399177 | 0,028395  |   |       |
| 8  | 53900        | 3786500 | -650  | 1,841004 | 0,018201  |   |       |
| 9  | 53000        | 3014000 | -900  | 0,6639   | 0,061535  |   |       |
| 10 | 52800        | 3242000 | -200  | 3,686441 | 0,0675    |   |       |
| 11 | 52800        | 4296500 | 0     | 3,443983 | 0,066307  |   |       |
| 12 | 49900        | 2475500 | -2900 | 4,612245 | 0,073878  |   |       |
| 13 | 56250        | 7800500 | -1350 |          |           |   |       |

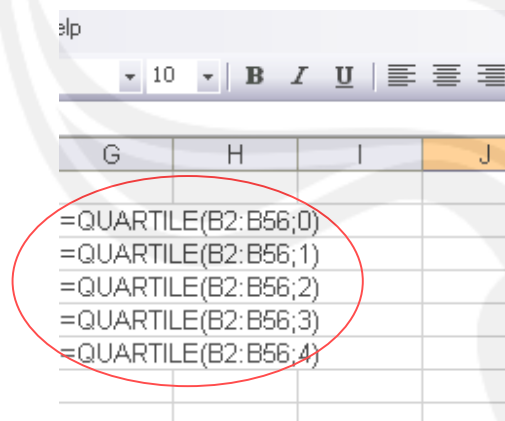


## 2. Trade Volume Quartile

|    | A            | B        | C     | D        | E        | F | G |
|----|--------------|----------|-------|----------|----------|---|---|
| 1  | ClosingPrice | Volume   | Fluct | DPS      | PER      |   |   |
| 2  | 52450        | 4301500  | 550   | 0        | -0,05819 |   |   |
| 3  | 54050        | 4618500  | 1600  | 0        | 0,013471 |   |   |
| 4  | 52750        | 5952000  | -1300 | 0        | 0,007718 |   |   |
| 5  | 52900        | 4700500  | 150   | 0,702479 | 0,016901 |   |   |
| 6  | 54550        | 7870000  | 1650  | 1,120332 | 0,03083  |   |   |
| 7  | 54550        | 4968000  | 0     | 1,399177 | 0,028395 |   |   |
| 8  | 53900        | 3786500  | -650  | 1,841004 | 0,018201 |   |   |
| 9  | 53000        | 3014000  | -900  | 0,6639   | 0,061535 |   |   |
| 10 | 52800        | 3242000  | -200  | 3,686441 | 0,0675   |   |   |
| 11 | 52800        | 4296500  | 0     | 3,443983 | 0,066307 |   |   |
| 12 | 49900        | 12475500 | -2900 | 4,612245 | 0,073878 |   |   |
| 13 | 56250        | 7800500  | -1350 |          |          |   |   |
| 14 | 55950        | 2896500  | -300  |          |          |   |   |
| 15 | 56100        | 3365500  | 150   |          |          |   |   |
| 16 | 56300        | 2491000  | 200   |          |          |   |   |
| 17 | 56150        | 3192500  | -150  |          |          |   |   |
| 18 | 56150        | 1837500  | 0     |          |          |   |   |
| 19 | 57300        | 3404500  | 1150  |          |          |   |   |
| 20 | 56950        | 2681500  | -350  |          |          |   |   |
| 21 | 56800        | 2195000  | -150  |          |          |   |   |
| 22 | 56450        | 1519500  | -350  |          |          |   |   |
| 23 | 57000        | 2381000  | 550   |          |          |   |   |
| 24 | 48300        | 1826000  | 0     |          |          |   |   |
| 25 | 48300        | 3300500  | 0     |          |          |   |   |
| 26 | 48800        | 4566000  | 500   |          |          |   |   |
| 27 | 48800        | 1600000  | 0     |          |          |   |   |
| 28 | 49750        | 3456000  | 950   |          |          |   |   |
| 29 | 49000        | 3262500  | -750  |          |          |   |   |
| 30 | 48650        | 3038500  | -350  |          |          |   |   |
| 31 | 48400        | 2679500  | -250  |          |          |   |   |
| 32 | 47500        | 4285000  | -900  |          |          |   |   |
| 33 | 47800        | 2063500  | 300   |          |          |   |   |

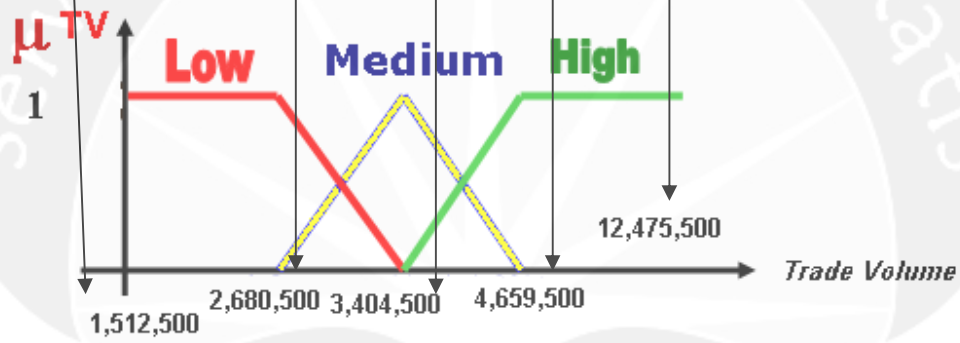
|    |       |         |       |  |  |  |  |
|----|-------|---------|-------|--|--|--|--|
| 34 | 47600 | 3779500 | -200  |  |  |  |  |
| 35 | 57450 | 2654000 | 450   |  |  |  |  |
| 36 | 56550 | 2244000 | -900  |  |  |  |  |
| 37 | 55600 | 5503000 | -950  |  |  |  |  |
| 38 | 55100 | 5760500 | -500  |  |  |  |  |
| 39 | 56700 | 4522500 | 1600  |  |  |  |  |
| 40 | 57400 | 3333500 | 700   |  |  |  |  |
| 41 | 58150 | 5911000 | 750   |  |  |  |  |
| 42 | 57450 | 3026000 | -700  |  |  |  |  |
| 43 | 56500 | 2921500 | -950  |  |  |  |  |
| 44 | 56800 | 4343000 | 300   |  |  |  |  |
| 45 | 56250 | 1512500 | -550  |  |  |  |  |
| 46 | 49400 | 6027500 | 1800  |  |  |  |  |
| 47 | 50050 | 6142500 | 650   |  |  |  |  |
| 48 | 50000 | 4158000 | -50   |  |  |  |  |
| 49 | 52400 | 6315500 | 2400  |  |  |  |  |
| 50 | 53500 | 3048000 | 1100  |  |  |  |  |
| 51 | 57800 | 9139000 | 4300  |  |  |  |  |
| 52 | 55300 | 5308000 | -2500 |  |  |  |  |
| 53 | 54700 | 3844000 | -600  |  |  |  |  |
| 54 | 54500 | 2624500 | -200  |  |  |  |  |
| 55 | 55200 | 4179000 | 700   |  |  |  |  |
| 56 | 55000 | 1916500 | -200  |  |  |  |  |
| 57 |       |         |       |  |  |  |  |

The array or range of closing price data is B2 until B56, after that we insert the quartile function:



And the result as follow:

|        |          |        |                                                                                                                                                                                                  |
|--------|----------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Window |          | Help   |                                                                                                                                                                                                  |
|        |          | ▼ 10 ▼ | <b>B</b> <i>I</i> <u>U</u>     |
| F      | G        | H      | I                                                                                                                                                                                                |
|        | 1512500  |        |                                                                                                                                                                                                  |
|        | 2680500  |        |                                                                                                                                                                                                  |
|        | 3404500  |        |                                                                                                                                                                                                  |
|        | 4659500  |        |                                                                                                                                                                                                  |
|        | 12475500 |        |                                                                                                                                                                                                  |



### 3. Stock Price Fluctuation Quartile

|    | A            | B        | C     | D        | E        | F | G | H |
|----|--------------|----------|-------|----------|----------|---|---|---|
| 1  | ClosingPrice | Volume   | Fluct | DPS      | PER      |   |   |   |
| 2  | 52450        | 4301500  | 550   | 0        | -0,05819 |   |   |   |
| 3  | 54050        | 4618500  | 1600  | 0        | 0,013471 |   |   |   |
| 4  | 52750        | 5952000  | -1300 | 0        | 0,007718 |   |   |   |
| 5  | 52900        | 4700500  | 150   | 0,702479 | 0,016901 |   |   |   |
| 6  | 54550        | 7870000  | 1650  | 1,120332 | 0,03083  |   |   |   |
| 7  | 54550        | 4968000  | 0     | 1,399177 | 0,028395 |   |   |   |
| 8  | 53900        | 3786500  | -650  | 1,841004 | 0,018201 |   |   |   |
| 9  | 53000        | 3014000  | -900  | 0,6639   | 0,061535 |   |   |   |
| 10 | 52800        | 3242000  | -200  | 3,686441 | 0,0675   |   |   |   |
| 11 | 52800        | 4296500  | 0     | 3,443983 | 0,066307 |   |   |   |
| 12 | 49900        | 12475500 | -2900 | 4,612245 | 0,073878 |   |   |   |
| 13 | 56250        | 7800500  | -1350 |          |          |   |   |   |
| 14 | 55950        | 2896500  | -300  |          |          |   |   |   |
| 15 | 56100        | 3365500  | 150   |          |          |   |   |   |
| 16 | 56300        | 2491000  | 200   |          |          |   |   |   |
| 17 | 56150        | 3192500  | -150  |          |          |   |   |   |
| 18 | 56150        | 1837500  | 0     |          |          |   |   |   |
| 19 | 57300        | 3404500  | 1150  |          |          |   |   |   |
| 20 | 56950        | 2681500  | -350  |          |          |   |   |   |
| 21 | 56800        | 2195000  | -150  |          |          |   |   |   |
| 22 | 56450        | 1519500  | -350  |          |          |   |   |   |
| 23 | 57000        | 2381000  | 550   |          |          |   |   |   |
| 24 | 48300        | 1826000  | 0     |          |          |   |   |   |
| 25 | 48300        | 3300500  | 0     |          |          |   |   |   |
| 26 | 48800        | 4566000  | 500   |          |          |   |   |   |
| 27 | 48800        | 1600000  | 0     |          |          |   |   |   |
| 28 | 49750        | 3456000  | 950   |          |          |   |   |   |
| 29 | 49000        | 3262500  | -750  |          |          |   |   |   |
| 30 | 48650        | 3038500  | -350  |          |          |   |   |   |
| 31 | 48400        | 2679500  | -250  |          |          |   |   |   |
| 32 | 47500        | 4285000  | -900  |          |          |   |   |   |

|    |       |         |       |
|----|-------|---------|-------|
| 33 | 47800 | 2063500 | 300   |
| 34 | 47600 | 3779500 | -200  |
| 35 | 57450 | 2654000 | 450   |
| 36 | 56550 | 2244000 | -900  |
| 37 | 55600 | 5503000 | -950  |
| 38 | 55100 | 5760500 | -500  |
| 39 | 56700 | 4522500 | 1600  |
| 40 | 57400 | 3333500 | 700   |
| 41 | 58150 | 5911000 | 750   |
| 42 | 57450 | 3026000 | -700  |
| 43 | 56500 | 2921500 | -950  |
| 44 | 56800 | 4343000 | 300   |
| 45 | 56250 | 1512500 | -550  |
| 46 | 49400 | 6027500 | 1800  |
| 47 | 50050 | 6142500 | 650   |
| 48 | 50000 | 4158000 | -50   |
| 49 | 52400 | 6315500 | 2400  |
| 50 | 53500 | 3048000 | 1100  |
| 51 | 57800 | 9139000 | 4300  |
| 52 | 55300 | 5308000 | -2500 |
| 53 | 54700 | 3844000 | -600  |
| 54 | 54500 | 2624500 | -200  |
| 55 | 55200 | 4179000 | 700   |
| 56 | 55000 | 1916500 | -200  |

The array or range of closing price data is C2 until C56, after that we insert the quartile function:

=QUARTILE(C2:C56;0)

=QUARTILE(C2:C56;1)

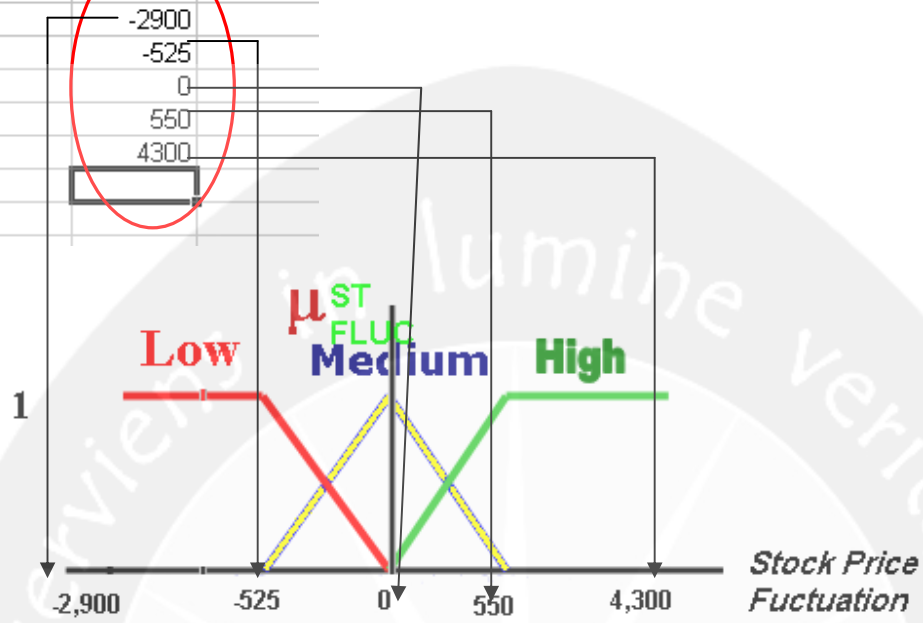
=QUARTILE(C2:C56;2)

=QUARTILE(C2:C56;3)

=QUARTILE(C2:C56;4)

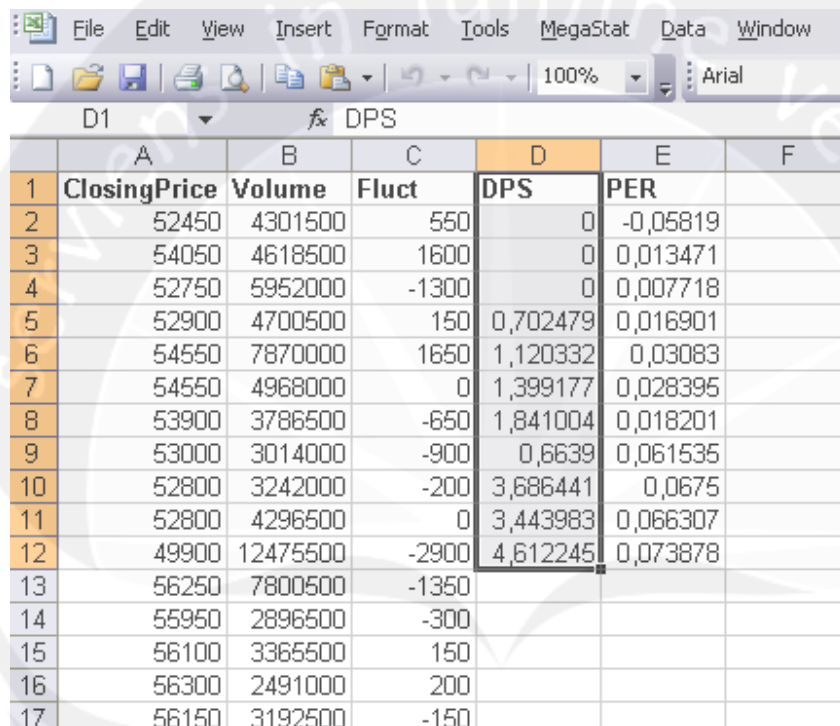
And the result as follow:

| F | G | H |
|---|---|---|
|   |   |   |
|   |   |   |
|   |   |   |
|   |   |   |
|   |   |   |
|   |   |   |
|   |   |   |
|   |   |   |
|   |   |   |
|   |   |   |



#### 4. DPS

For DPS and PER are not used last 5 months data because if the research used that kind of data, the data is always the same because DPS and PER calculated every once a year. Therefore, DPS and PER used all of the data during 2000-2010

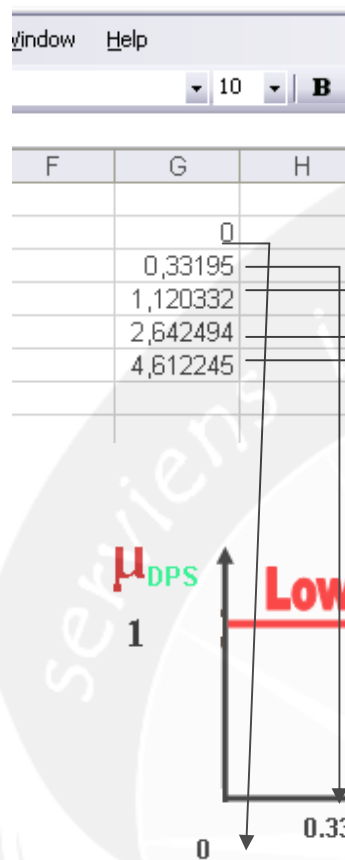


|    | A            | B        | C     | D        | E        | F |
|----|--------------|----------|-------|----------|----------|---|
| 1  | ClosingPrice | Volume   | Fluct | DPS      | PER      |   |
| 2  | 52450        | 4301500  | 550   | 0        | -0,05819 |   |
| 3  | 54050        | 4618500  | 1600  | 0        | 0,013471 |   |
| 4  | 52750        | 5952000  | -1300 | 0        | 0,007718 |   |
| 5  | 52900        | 4700500  | 150   | 0,702479 | 0,016901 |   |
| 6  | 54550        | 7870000  | 1650  | 1,120332 | 0,03083  |   |
| 7  | 54550        | 4968000  | 0     | 1,399177 | 0,028395 |   |
| 8  | 53900        | 3786500  | -650  | 1,841004 | 0,018201 |   |
| 9  | 53000        | 3014000  | -900  | 0,6639   | 0,061535 |   |
| 10 | 52800        | 3242000  | -200  | 3,686441 | 0,0675   |   |
| 11 | 52800        | 4296500  | 0     | 3,443983 | 0,066307 |   |
| 12 | 49900        | 12475500 | -2900 | 4,612245 | 0,073878 |   |
| 13 | 56250        | 7800500  | -1350 |          |          |   |
| 14 | 55950        | 2896500  | -300  |          |          |   |
| 15 | 56100        | 3365500  | 150   |          |          |   |
| 16 | 56300        | 2491000  | 200   |          |          |   |
| 17 | 56150        | 3192500  | -150  |          |          |   |

The array or range of closing price data is D2 until D12, after that we insert the quartile function:

```
=QUARTILE(D2:D12;0)  
=QUARTILE(D2:D12;1)  
=QUARTILE(D2:D12;2)  
=QUARTILE(D2:D12;3)  
=QUARTILE(D2:D12;4)
```

And the result as follow:



## 5. *PER*

For DPS and PER are not used last 5 months data because if the research used that kind of data, the data is always the same because DPS and PER calculated every once a year. Therefore, DPS and PER used all of the data during 2000-2010

| E1      fx PER |              |          |       |          |          |   |
|----------------|--------------|----------|-------|----------|----------|---|
|                | A            | B        | C     | D        | E        | F |
| 1              | ClosingPrice | Volume   | Fluct | DPS      | PER      |   |
| 2              | 52450        | 4301500  | 550   | 0        | -0,05819 |   |
| 3              | 54050        | 4618500  | 1600  | 0        | 0,013471 |   |
| 4              | 52750        | 5952000  | -1300 | 0        | 0,007718 |   |
| 5              | 52900        | 4700500  | 150   | 0,702479 | 0,016901 |   |
| 6              | 54550        | 7870000  | 1650  | 1,120332 | 0,03083  |   |
| 7              | 54550        | 4968000  | 0     | 1,399177 | 0,028395 |   |
| 8              | 53900        | 3786500  | -650  | 1,841004 | 0,018201 |   |
| 9              | 53000        | 3014000  | -900  | 0,6639   | 0,061535 |   |
| 10             | 52800        | 3242000  | -200  | 3,686441 | 0,0675   |   |
| 11             | 52800        | 4296500  | 0     | 3,443983 | 0,066307 |   |
| 12             | 49900        | 12475500 | -2900 | 4,612245 | 0,073878 |   |
| 13             | 56250        | 7800500  | -1350 |          |          |   |
| 14             | 55950        | 2896500  | -300  |          |          |   |
| 15             | 56100        | 3365500  | 150   |          |          |   |
| 16             | 56300        | 2491000  | 200   |          |          |   |
| 17             | 56150        | 3192500  | -150  |          |          |   |
| 18             | 56150        | 1837500  | 0     |          |          |   |
| 19             | 57300        | 3404500  | 1150  |          |          |   |

The array or range of closing price data is E2 until E12, after that we insert the quartile function:

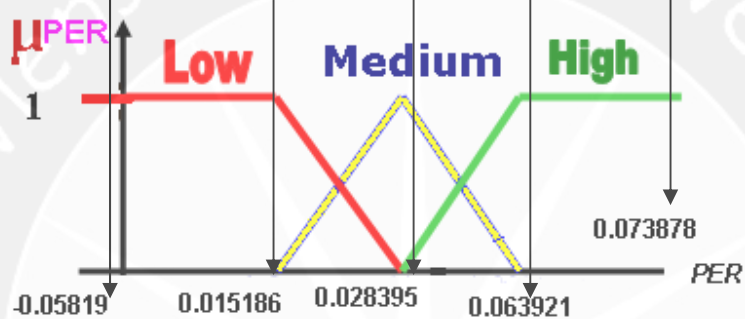
```
=QUARTILE(E2:E12;0)
=QUARTILE(E2:E12;1)
=QUARTILE(E2:E12;2)
=QUARTILE(E2:E12;3)
=QUARTILE(E2:E12;4)
```

And the result as follow:

naow [help](#)

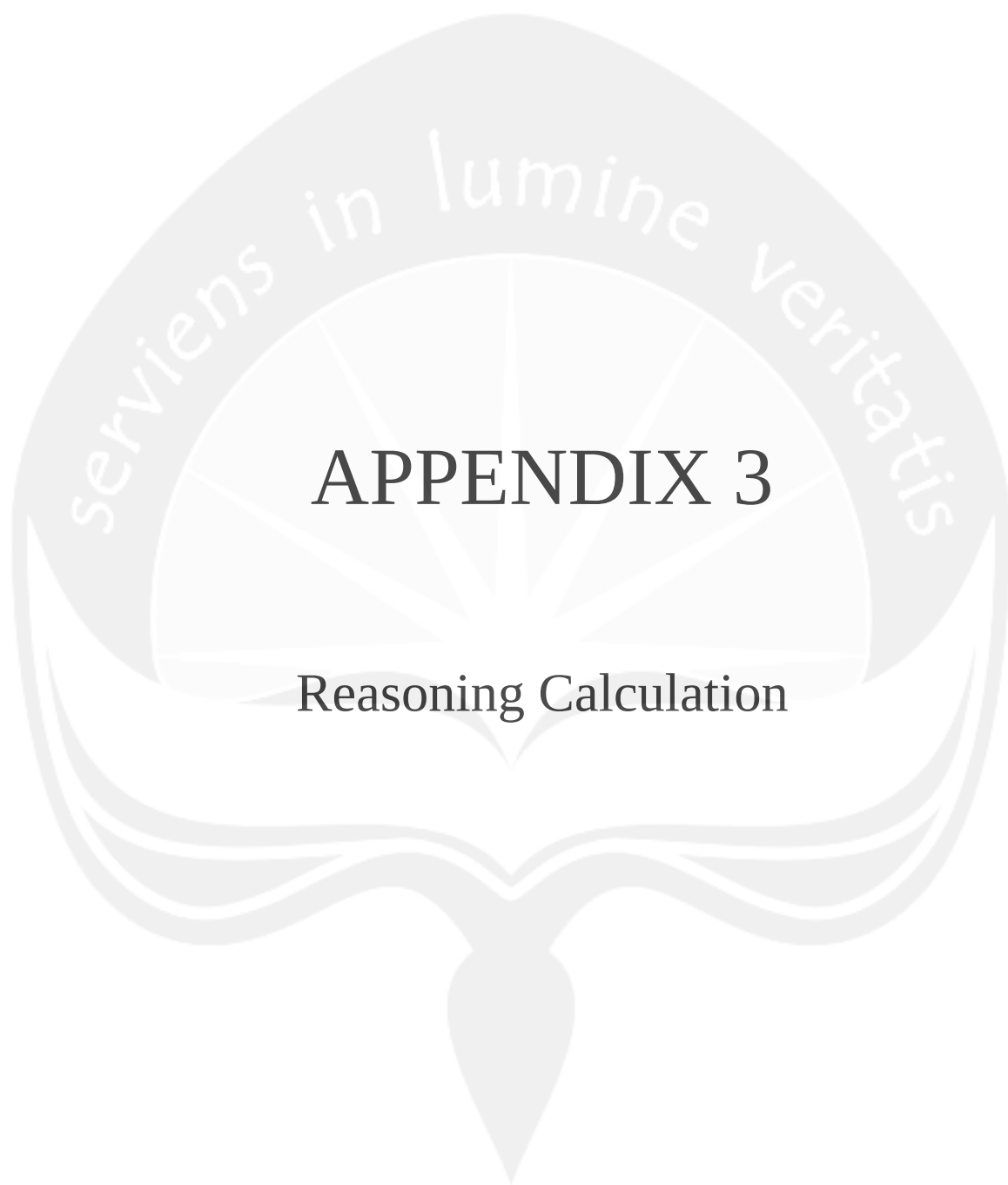
10 **B**

| F | G        | H |
|---|----------|---|
|   | -0,05819 |   |
|   | 0,015186 |   |
|   | 0,028395 |   |
|   | 0,063921 |   |
|   | 0,073878 |   |
|   |          |   |
|   |          |   |



Result:

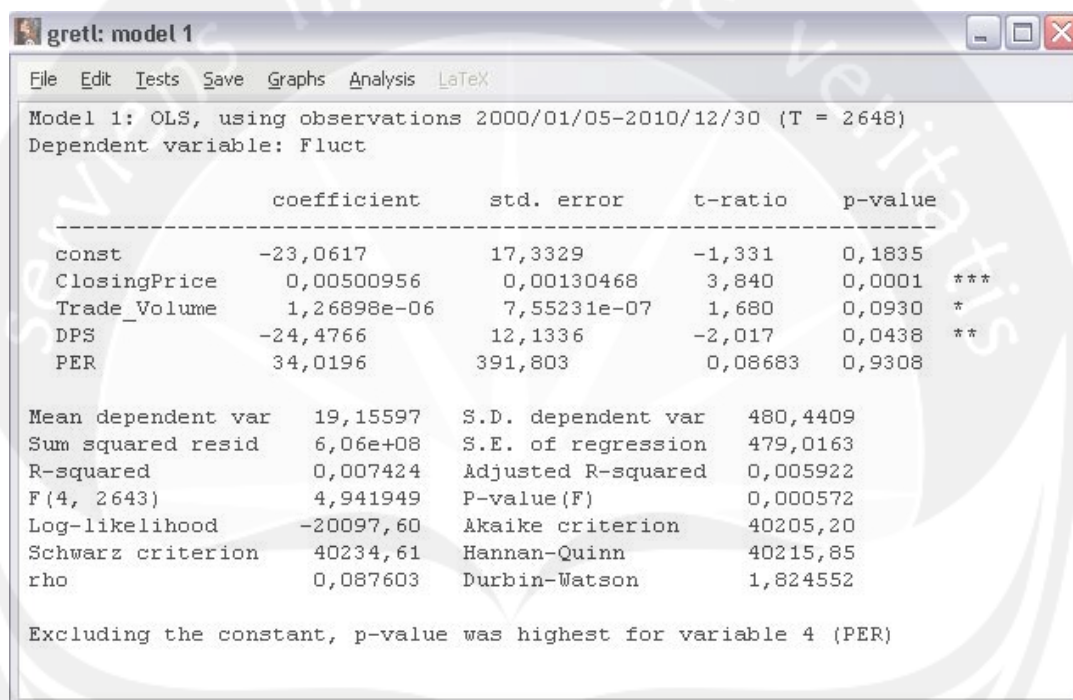
| Closing Price | Trade Volume | DPS      | PER      | Stock Price Fluctuation | Quartile |
|---------------|--------------|----------|----------|-------------------------|----------|
| 47,500        | 1,512,500    | 0        | -0.05819 | -2,900                  | 0        |
| 50,025        | 2,680,500    | 0.32567  | 0.01408  | -525                    | 1        |
| 54,550        | 3,404,500    | 1.030534 | 0.026538 | 0                       | 2        |
| 56,375        | 4,659,500    | 2.609088 | 0.063921 | 550                     | 3        |
| 58,150        | 12,475,500   | 4.612245 | 0.073878 | 4,300                   | 4        |



# APPENDIX 3

## Reasoning Calculation

Regress all of the data from 2000 until 2010. This calculation using multiple regression, however the classical test is not considered because this research not focus on the regression analysis focus on the Fuzzy Inference System analysis , and regression only help a little part in the reasoning steps.



Model 1: OLS, using observations 2000/01/05-2010/12/30 (T = 2648)  
Dependent variable: Fluct

|              | coefficient | std. error  | t-ratio | p-value |     |
|--------------|-------------|-------------|---------|---------|-----|
| const        | -23,0617    | 17,3329     | -1,331  | 0,1835  |     |
| ClosingPrice | 0,00500956  | 0,00130468  | 3,840   | 0,0001  | *** |
| Trade_Volume | 1,26898e-06 | 7,55231e-07 | 1,680   | 0,0930  | *   |
| DPS          | -24,4766    | 12,1336     | -2,017  | 0,0438  | **  |
| PER          | 34,0196     | 391,803     | 0,08683 | 0,9308  |     |

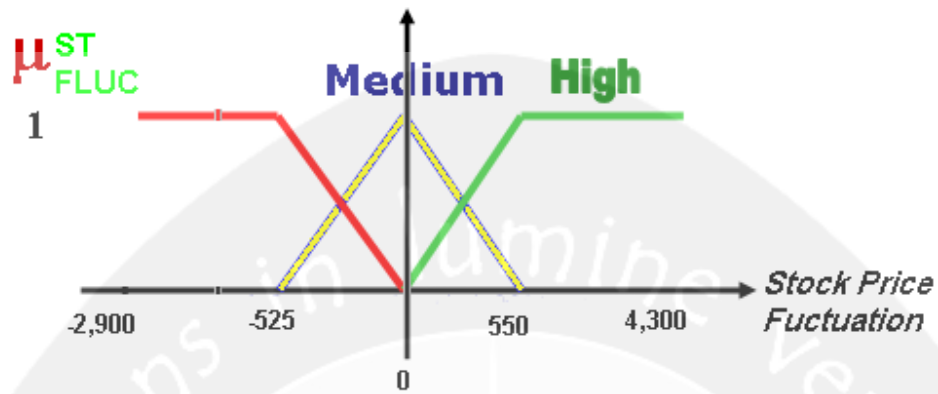
|                    |           |                    |          |
|--------------------|-----------|--------------------|----------|
| Mean dependent var | 19,15597  | S.D. dependent var | 480,4409 |
| Sum squared resid  | 6,06e+08  | S.E. of regression | 479,0163 |
| R-squared          | 0,007424  | Adjusted R-squared | 0,005922 |
| F(4, 2643)         | 4,941949  | P-value(F)         | 0,000572 |
| Log-likelihood     | -20097,60 | Akaike criterion   | 40205,20 |
| Schwarz criterion  | 40234,61  | Hannan-Quinn       | 40215,85 |
| rho                | 0,087603  | Durbin-Watson      | 1,824552 |

Excluding the constant, p-value was highest for variable 4 (PER)

Stock Price Fluctuation = -23.0617 + 0.00500956 Closing Price + 0.0000012689

Trade Volume – 24.4766 DPS + 34.0196 PER

Example: If Closing Price High and Trade Volume High and DPS High and PER High then Stock Fluctuation= -23.0617 + 0.00500956 (57,000) + 0.0000012689 (7,000,000) – 24.4766 (4) + 34.0196 (0,07) = 182.634707



182.634707 include as Medium stock price fluctuation

### Calculation use criteria:

Closing Price:

High : 57,000

Medium : 54,550

Low : 50,000

Trade Volume:

High : 7,000,000

Medium : 3,404,500

Low : 2,000,000

DPS:

High : 4

Medium : 1.030534

Low : 0

PER:

High : 0.07

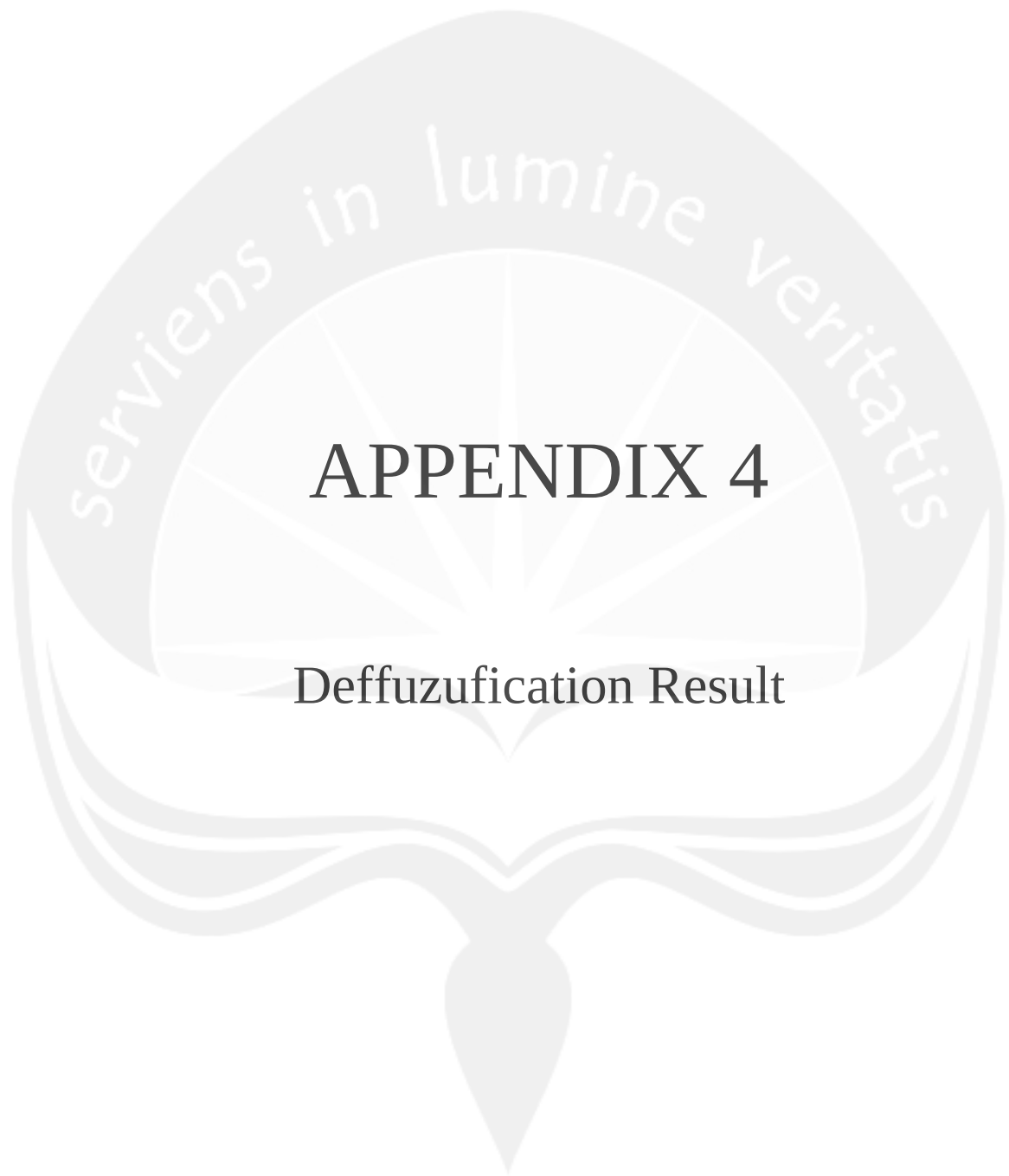
Medium : 0.026538

Low : 0

| If Closing Price | If Trade Volume | If DPS | If PER | then | Stock Fluctuation | H/M/L    |
|------------------|-----------------|--------|--------|------|-------------------|----------|
| H                | H               | H      | H      |      | 182,186           | <b>M</b> |
| H                | H               | H      | M      |      | 174,3625          | <b>M</b> |
| H                | H               | H      | L      |      | 173,4597          | <b>M</b> |
| H                | H               | L      | H      |      | 273,7475          | <b>M</b> |
| H                | H               | L      | M      |      | 272,2689          | <b>M</b> |
| H                | H               | L      | L      |      | 271,3661          | <b>M</b> |
| H                | H               | M      | H      |      | 248,5235          | <b>M</b> |
| H                | H               | M      | M      |      | 246,8225          | <b>M</b> |
| H                | H               | M      | L      |      | 246,1421          | <b>M</b> |
| H                | L               | H      | H      |      | 169,4962          | <b>M</b> |
| H                | L               | H      | M      |      | 167,7952          | <b>M</b> |
| H                | L               | H      | L      |      | 167,1148          | <b>M</b> |
| H                | L               | L      | H      |      | 267,4026          | <b>M</b> |
| H                | L               | L      | M      |      | 265,7016          | <b>M</b> |
| H                | L               | L      | L      |      | 265,0212          | <b>M</b> |
| H                | L               | M      | H      |      | 242,1786          | <b>M</b> |
| H                | L               | M      | M      |      | 240,4776          | <b>M</b> |
| H                | L               | M      | L      |      | 239,7972          | <b>M</b> |

|   |   |   |   |  |           |          |
|---|---|---|---|--|-----------|----------|
| H | M | H | H |  | 171,2784  | <b>M</b> |
| H | M | H | M |  | 169,5775  | <b>M</b> |
| H | M | H | L |  | 168,8971  | <b>M</b> |
| H | M | L | H |  | 269,1848  | <b>M</b> |
| H | M | L | M |  | 267,4839  | <b>M</b> |
| H | M | L | L |  | 266,8035  | <b>M</b> |
| H | M | M | H |  | 243,9609  | <b>M</b> |
| H | M | M | M |  | 242,2599  | <b>M</b> |
| H | M | M | L |  | 241,5795  | <b>M</b> |
| L | H | H | H |  | 125,7455  | <b>M</b> |
| L | H | H | L |  | 123,3641  | <b>M</b> |
| L | H | H | M |  | 124,0445  | <b>M</b> |
| L | H | L | H |  | 223,6519  | <b>M</b> |
| L | H | L | L |  | 221,2705  | <b>M</b> |
| L | H | L | M |  | 222,2911  | <b>M</b> |
| L | H | M | H |  | 198,4279  | <b>M</b> |
| L | H | M | L |  | 196,0465  | <b>M</b> |
| L | H | M | M |  | 196,7269  | <b>M</b> |
| L | L | H | H |  | -526,345  | <b>L</b> |
| L | L | H | L |  | -525,377  | <b>L</b> |
| L | L | H | M |  | -525,825  | <b>L</b> |
| L | L | L | H |  | 216,6725  | <b>M</b> |
| L | L | L | L |  | 214,2911  | <b>M</b> |
| L | L | L | M |  | 214,9715  | <b>M</b> |
| L | L | M | H |  | 191,4485  | <b>M</b> |
| L | L | M | L |  | 189,0671  | <b>M</b> |
| L | L | M | M |  | 189,7475  | <b>M</b> |
| L | M | H | H |  | -550,346  | <b>L</b> |
| L | M | H | L |  | .-542,986 | <b>L</b> |
| L | M | H | M |  | -539,123  | <b>L</b> |
| L | M | L | H |  | 219,0892  | <b>M</b> |
| L | M | L | L |  | 216,7079  | <b>M</b> |
| L | M | L | M |  | 217,3883  | <b>M</b> |
| L | M | M | H |  | 193,8653  | <b>M</b> |
| L | M | M | L |  | 191,4839  | <b>M</b> |
| L | M | M | M |  | 192,1643  | <b>M</b> |
| M | H | H | M |  | 161,8667  | <b>M</b> |
| M | H | H | L |  | 161,1863  | <b>M</b> |
| M | H | H | H |  | 163,5676  | <b>M</b> |
| M | H | L | L |  | 259,0927  | <b>M</b> |
| M | H | L | M |  | 259,7731  | <b>M</b> |

|   |   |   |   |  |          |          |
|---|---|---|---|--|----------|----------|
| M | H | L | H |  | 261,474  | <b>M</b> |
| M | H | M | M |  | 234,5491 | <b>M</b> |
| M | H | M | L |  | 233,8687 | <b>M</b> |
| M | H | M | H |  | 236,2501 | <b>M</b> |
| M | L | H | H |  | 157,2227 | <b>M</b> |
| M | L | H | L |  | 154,8414 | <b>M</b> |
| M | L | H | M |  | 155,5218 | <b>M</b> |
| M | L | L | H |  | 255,1291 | <b>M</b> |
| M | L | L | L |  | 252,7478 | <b>M</b> |
| M | L | L | M |  | 253,4282 | <b>M</b> |
| M | L | M | H |  | 229,9052 | <b>M</b> |
| M | L | M | L |  | 227,5238 | <b>M</b> |
| M | L | M | M |  | 228,2042 | <b>M</b> |
| M | M | H | H |  | 159,005  | <b>M</b> |
| M | M | H | L |  | 156,6236 | <b>M</b> |
| M | M | H | M |  | 157,304  | <b>M</b> |
| M | M | L | H |  | 256,9114 | <b>M</b> |
| M | M | L | L |  | 254,53   | <b>M</b> |
| M | M | L | M |  | 255,2104 | <b>M</b> |
| M | M | M | H |  | 231,6874 | <b>M</b> |
| M | M | M | L |  | 229,3061 | <b>M</b> |
| M | M | M | M |  | 229,9865 | <b>M</b> |



## APPENDIX 4

Deffuzufication Result

## Table of the Rules

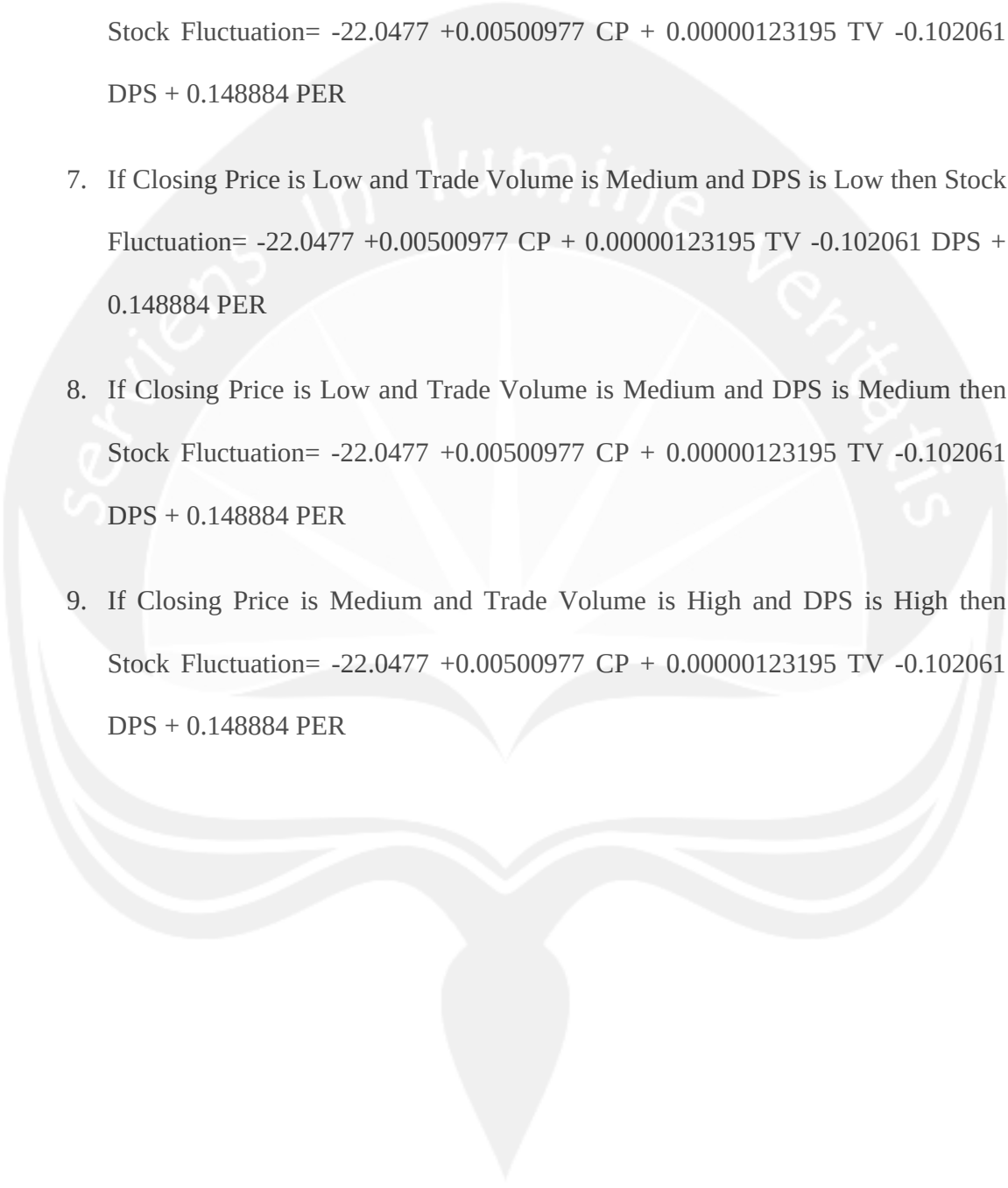
| No | If Closing Price | If Trade Volume | If DPS | If PER | then | H/M/L    |
|----|------------------|-----------------|--------|--------|------|----------|
| 1  | H                | H               | H      | H      |      | <i>M</i> |
| 2  | H                | H               | H      | M      |      | <i>M</i> |
| 3  | H                | H               | H      | L      |      | <i>M</i> |
| 4  | H                | H               | L      | H      |      | <i>M</i> |
| 5  | H                | H               | L      | M      |      | <i>M</i> |
| 6  | H                | H               | L      | L      |      | <i>M</i> |
| 7  | H                | H               | M      | H      |      | <i>M</i> |
| 8  | H                | H               | M      | M      |      | <i>M</i> |
| 9  | H                | H               | M      | L      |      | <i>M</i> |
| 10 | H                | L               | H      | H      |      | <i>M</i> |
| 11 | H                | L               | H      | M      |      | <i>M</i> |
| 12 | H                | L               | H      | L      |      | <i>M</i> |
| 13 | H                | L               | L      | H      |      | <i>M</i> |
| 14 | H                | L               | L      | M      |      | <i>M</i> |
| 15 | H                | L               | L      | L      |      | <i>M</i> |
| 16 | H                | L               | M      | H      |      | <i>M</i> |
| 17 | H                | L               | M      | M      |      | <i>M</i> |
| 18 | H                | L               | M      | L      |      | <i>M</i> |
| 19 | H                | M               | H      | H      |      | <i>M</i> |
| 20 | H                | M               | H      | M      |      | <i>M</i> |
| 21 | H                | M               | H      | L      |      | <i>M</i> |
| 22 | H                | M               | L      | H      |      | <i>M</i> |
| 23 | H                | M               | L      | M      |      | <i>M</i> |
| 24 | H                | M               | L      | L      |      | <i>M</i> |
| 25 | H                | M               | M      | H      |      | <i>M</i> |
| 26 | H                | M               | M      | M      |      | <i>M</i> |
| 27 | H                | M               | M      | L      |      | <i>M</i> |
| 28 | L                | H               | H      | H      |      | <i>M</i> |
| 29 | L                | H               | H      | L      |      | <i>M</i> |
| 30 | L                | H               | H      | M      |      | <i>M</i> |
| 31 | L                | H               | L      | H      |      | <i>M</i> |
| 32 | L                | H               | L      | L      |      | <i>M</i> |
| 33 | L                | H               | L      | M      |      | <i>M</i> |
| 34 | L                | H               | M      | H      |      | <i>M</i> |
| 35 | L                | H               | M      | L      |      | <i>M</i> |

|    |   |   |   |   |  |                 |
|----|---|---|---|---|--|-----------------|
| 36 | L | H | M | M |  | <b><i>M</i></b> |
| 37 | L | L | H | H |  | <b><i>L</i></b> |
| 38 | L | L | H | L |  | <b><i>L</i></b> |
| 39 | L | L | H | M |  | <b><i>L</i></b> |
| 40 | L | L | L | H |  | <b><i>M</i></b> |
| 41 | L | L | L | L |  | <b><i>M</i></b> |
| 42 | L | L | L | M |  | <b><i>M</i></b> |
| 43 | L | L | M | H |  | <b><i>M</i></b> |
| 44 | L | L | M | L |  | <b><i>M</i></b> |
| 45 | L | L | M | M |  | <b><i>M</i></b> |
| 46 | L | M | H | H |  | <b><i>L</i></b> |
| 47 | L | M | H | L |  | <b><i>L</i></b> |
| 48 | L | M | H | M |  | <b><i>L</i></b> |
| 49 | L | M | L | H |  | <b><i>M</i></b> |
| 50 | L | M | L | L |  | <b><i>M</i></b> |
| 51 | L | M | L | M |  | <b><i>M</i></b> |
| 52 | L | M | M | H |  | <b><i>M</i></b> |
| 53 | L | M | M | L |  | <b><i>M</i></b> |
| 54 | L | M | M | M |  | <b><i>M</i></b> |
| 55 | M | H | H | M |  | <b><i>M</i></b> |
| 56 | M | H | H | L |  | <b><i>M</i></b> |
| 57 | M | H | H | H |  | <b><i>M</i></b> |
| 58 | M | H | L | L |  | <b><i>M</i></b> |
| 59 | M | H | L | M |  | <b><i>M</i></b> |
| 60 | M | H | L | H |  | <b><i>M</i></b> |
| 61 | M | H | M | M |  | <b><i>M</i></b> |
| 62 | M | H | M | L |  | <b><i>M</i></b> |
| 63 | M | H | M | H |  | <b><i>M</i></b> |
| 64 | M | L | H | H |  | <b><i>M</i></b> |
| 65 | M | L | H | L |  | <b><i>M</i></b> |
| 66 | M | L | H | M |  | <b><i>M</i></b> |
| 67 | M | L | L | H |  | <b><i>M</i></b> |
| 68 | M | L | L | L |  | <b><i>M</i></b> |
| 69 | M | L | L | M |  | <b><i>M</i></b> |
| 70 | M | L | M | H |  | <b><i>M</i></b> |
| 71 | M | L | M | L |  | <b><i>M</i></b> |
| 72 | M | L | M | M |  | <b><i>M</i></b> |
| 73 | M | M | H | H |  | <b><i>M</i></b> |
| 74 | M | M | H | L |  | <b><i>M</i></b> |
| 75 | M | M | H | M |  | <b><i>M</i></b> |
| 76 | M | M | L | H |  | <b><i>M</i></b> |

|    |   |   |   |   |  |          |
|----|---|---|---|---|--|----------|
| 77 | M | M | L | L |  | <b>M</b> |
| 78 | M | M | L | M |  | <b>M</b> |
| 79 | M | M | M | H |  | <b>M</b> |
| 80 | M | M | M | L |  | <b>M</b> |
| 81 | M | M | M | M |  | <b>M</b> |

After we get the rules, it will classify into several rules:

1. If Closing Price is High then Stock Fluctuation=  $-22.0477 + 0.00500977 \text{ CP} + 0.00000123195 \text{ TV} - 0.102061 \text{ DPS} + 0.148884 \text{ PER}$
2. If Trade Volume is Low and Trade Volume is High then Stock Fluctuation=  $-22.0477 + 0.00500977 \text{ CP} + 0.00000123195 \text{ TV} - 0.102061 \text{ DPS} + 0.148884 \text{ PER}$
3. If Closing Price is Low and Trade Volume is Low and DPS is High then Stock Fluctuation=  $-22.0477 + 0.00500977 \text{ CP} + 0.00000123195 \text{ TV} - 0.102061 \text{ DPS} + 0.148884 \text{ PER}$
4. If Closing Price is Low and Trade Volume is Low and DPS is Low then Stock Fluctuation=  $-22.0477 + 0.00500977 \text{ CP} + 0.00000123195 \text{ TV} - 0.102061 \text{ DPS} + 0.148884 \text{ PER}$
5. If Closing Price is Low and Trade Volume is Low and DPS is Medium then Stock Fluctuation=  $-22.0477 + 0.00500977 \text{ CP} + 0.00000123195 \text{ TV} - 0.102061 \text{ DPS} + 0.148884 \text{ PER}$

- 
6. If Closing Price is Low and Trade Volume is Medium and DPS is High then  
Stock Fluctuation=  $-22.0477 + 0.00500977 \text{ CP} + 0.00000123195 \text{ TV} - 0.102061 \text{ DPS} + 0.148884 \text{ PER}$
7. If Closing Price is Low and Trade Volume is Medium and DPS is Low then Stock  
Fluctuation=  $-22.0477 + 0.00500977 \text{ CP} + 0.00000123195 \text{ TV} - 0.102061 \text{ DPS} + 0.148884 \text{ PER}$
8. If Closing Price is Low and Trade Volume is Medium and DPS is Medium then  
Stock Fluctuation=  $-22.0477 + 0.00500977 \text{ CP} + 0.00000123195 \text{ TV} - 0.102061 \text{ DPS} + 0.148884 \text{ PER}$
9. If Closing Price is Medium and Trade Volume is High and DPS is High then  
Stock Fluctuation=  $-22.0477 + 0.00500977 \text{ CP} + 0.00000123195 \text{ TV} - 0.102061 \text{ DPS} + 0.148884 \text{ PER}$

## Calculation

- [R1] If Closing Price is High then Stock Fluctuation = Medium
- [R2] If Closing Price is Low and Trade Volume is High then Stock Fluctuation= Medium
- [R3] If Closing Price is Low and Trade Volume is Low and DPS is High then Stock Fluctuation= Low
- [R4] If Closing Price is Low and Trade Volume is Low and DPS is Low then Stock Fluctuation= Medium
- [R5] If Closing Price is Low and Trade Volume is Low and DPS is Medium then Stock Fluctuation= Medium
- [R6] If Closing Price is Low and Trade Volume is Medium and DPS is High then Stock Fluctuation= Low
- [R7] If Closing Price is Low and Trade Volume is Medium and DPS is Low then Stock Fluctuation= Medium
- [R8] If Closing Price is Low and Trade Volume is Medium and DPS is Medium then Stock Fluctuation= Medium

[R9] If Closing Price is Medium and Trade Volume is High and DPS is High then

Stock Fluctuation= Medium

**Deffuzification Sample:**

| No | Data       | Closing Price | Trade Volume | DPS       | PER        |
|----|------------|---------------|--------------|-----------|------------|
| 1  | 16/08/2010 | 48300         | 1826000      | 4.6122449 | 0.07387755 |
| 2  | 18/08/2010 | 48300         | 3300500      | 4.6122449 | 0.07387755 |
| 3  | 19/08/2010 | 48800         | 4566000      | 4.6122449 | 0.07387755 |
| 4  | 20/08/2010 | 48800         | 1600000      | 4.6122449 | 0.07387755 |
| 5  | 23/08/2010 | 49750         | 3456000      | 4.6122449 | 0.07387755 |
| 6  | 24/08/2010 | 49000         | 3262500      | 4.6122449 | 0.07387755 |
| 7  | 25/08/2010 | 48650         | 3038500      | 4.6122449 | 0.07387755 |
| 8  | 26/08/2010 | 48400         | 2679500      | 4.6122449 | 0.07387755 |
| 9  | 27/08/2010 | 47500         | 4285000      | 4.6122449 | 0.07387755 |
| 10 | 30/08/2010 | 47800         | 2063500      | 4.6122449 | 0.07387755 |
| 11 | 1/9/2010   | 49400         | 6027500      | 4.6122449 | 0.07387755 |
| 12 | 2/9/2010   | 50050         | 6142500      | 4.6122449 | 0.07387755 |
| 13 | 3/9/2010   | 50000         | 4158000      | 4.6122449 | 0.07387755 |
| 14 | 6/9/2010   | 52400         | 6315500      | 4.6122449 | 0.07387755 |

|    |            |       |         |           |            |
|----|------------|-------|---------|-----------|------------|
| 15 | 7/9/2010   | 53500 | 3048000 | 4.6122449 | 0.07387755 |
| 16 | 15/10/2010 | 56250 | 7800500 | 4.6122449 | 0.07387755 |
| 17 | 18/10/2010 | 55950 | 2896500 | 4.6122449 | 0.07387755 |
| 18 | 19/10/2010 | 56100 | 3365500 | 4.6122449 | 0.07387755 |
| 19 | 20/10/2010 | 56300 | 2491000 | 4.6122449 | 0.07387755 |
| 20 | 21/10/2010 | 56150 | 3192500 | 4.6122449 | 0.07387755 |
| 21 | 1/11/2010  | 57450 | 2654000 | 4.6122449 | 0.07387755 |
| 22 | 2/11/2010  | 56550 | 2244000 | 4.6122449 | 0.07387755 |
| 23 | 3/11/2010  | 55600 | 5503000 | 4.6122449 | 0.07387755 |
| 24 | 4/11/2010  | 55100 | 5760500 | 4.6122449 | 0.07387755 |
| 25 | 5/11/2010  | 56700 | 4522500 | 4.6122449 | 0.07387755 |
| 26 | 1/12/2010  | 52450 | 4301500 | 4.6122449 | 0.07387755 |
| 27 | 2/12/2010  | 54050 | 4618500 | 4.6122449 | 0.07387755 |
| 28 | 3/12/2010  | 52750 | 5952000 | 4.6122449 | 0.07387755 |
| 29 | 6/12/2010  | 52900 | 4700500 | 4.6122449 | 0.07387755 |
| 30 | 8/12/2010  | 54550 | 7870000 | 4.6122449 | 0.07387755 |

### ***Sampling no. 1***

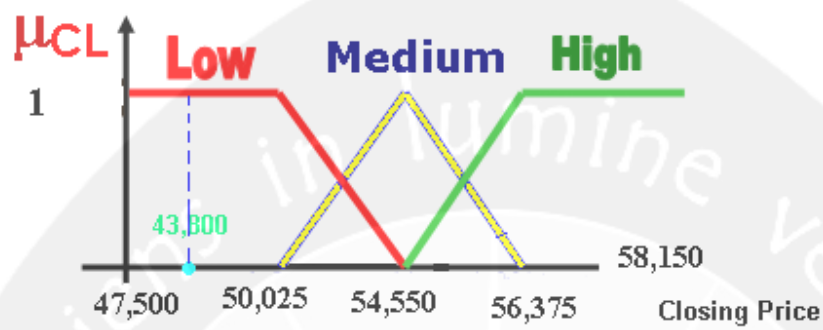
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

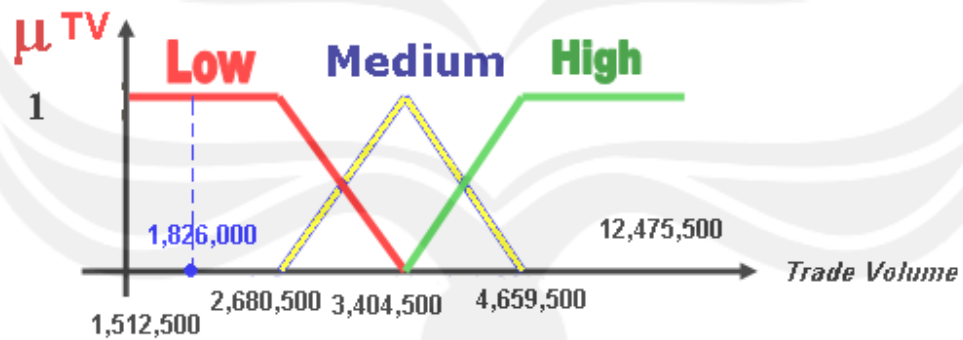
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 48,300               | 1,826,000           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



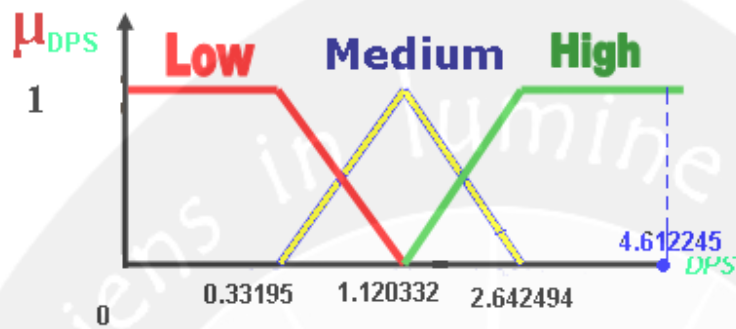
Closing Price Low:  $\mu = 1$

### B. Trade Volume Variable



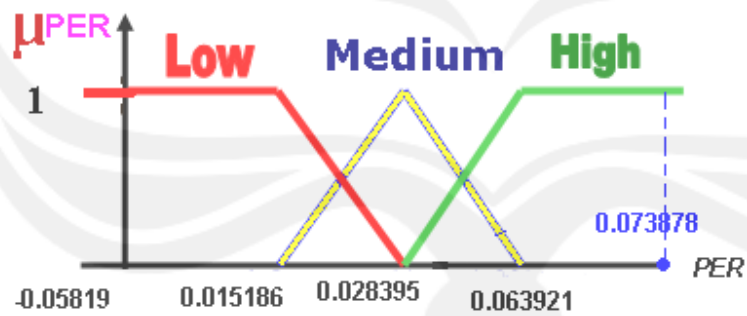
Trade Volume Low:  $\mu = 1$

### C. DPS Variable



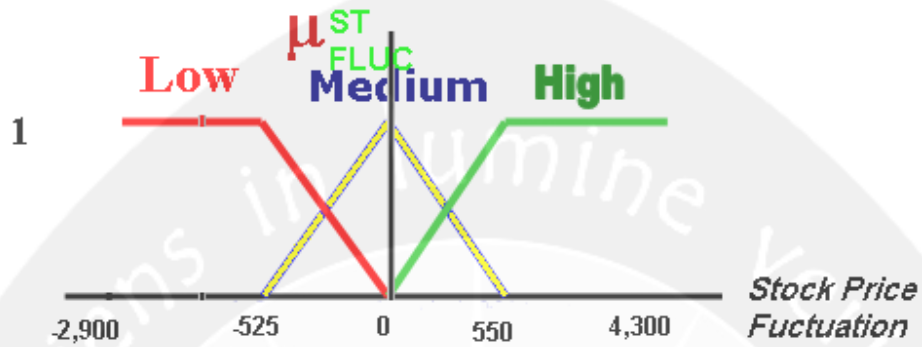
DPS High:  $\mu = 1$

### D. PER Variable



PER High:  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 2. Fuzzy operator application: Match with the rules

[R3] If Closing Price is Low and Trade Volume is Low and DPS is High then

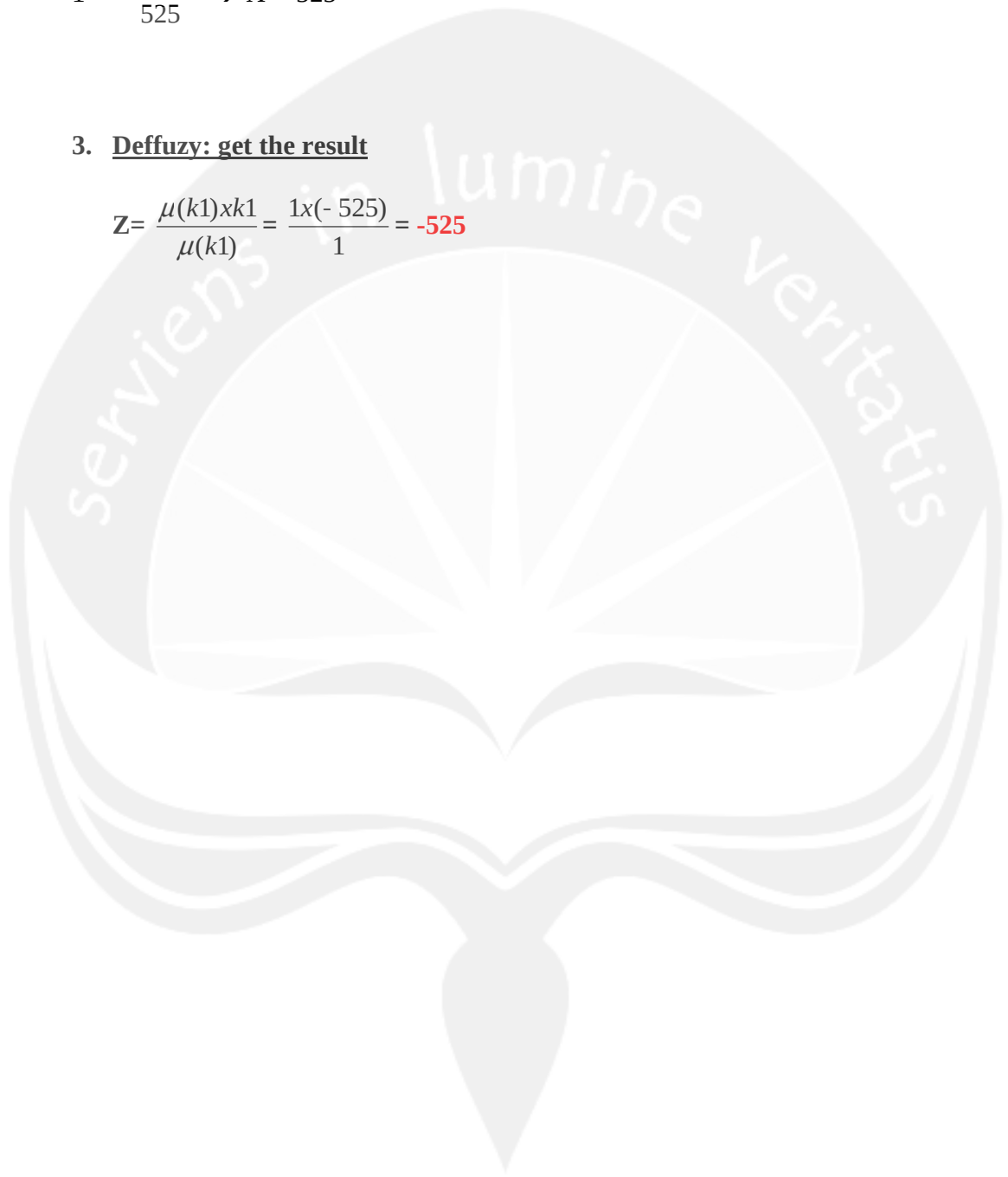
Stock Fluctuation= Low

$$\text{Low} = \frac{(0 - X)}{525}$$

$$1 = \frac{(0 - X)}{525} \rightarrow X = -525$$

3. **Defuzzy: get the result**

$$Z = \frac{\mu(k1) \times k1}{\mu(k1)} = \frac{1 \times (-525)}{1} = -525$$



## ***Sampling no. 2***

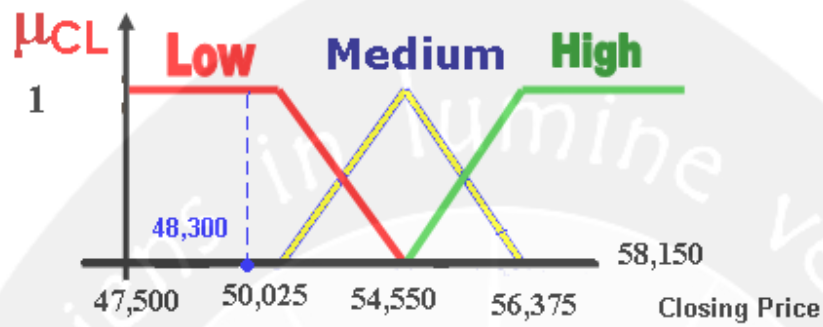
### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

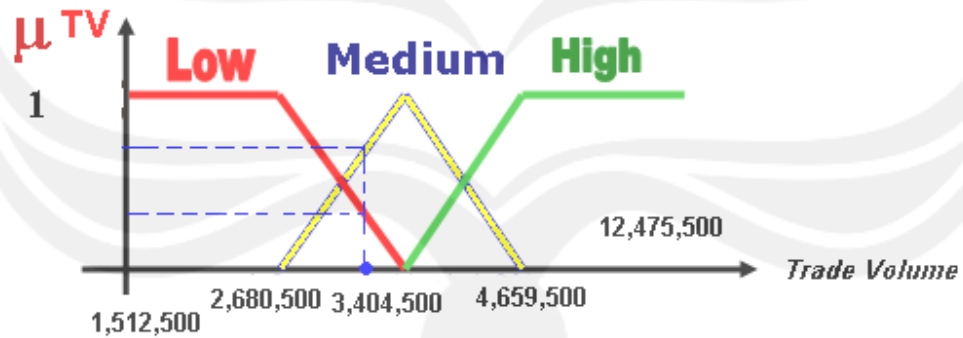
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 48,300               | 3,300,500           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



Closing Price Low:  $\mu = 1$

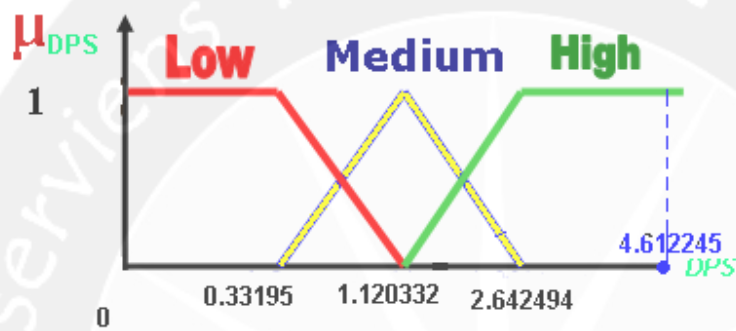
### B. Trade Volume Variable



$$\text{Trade Volume Low: } \frac{(D - X)}{(D - C)} = \frac{3,404,500 - 3,300,500}{3,404,500 - 2,680,500} = 0.1436$$

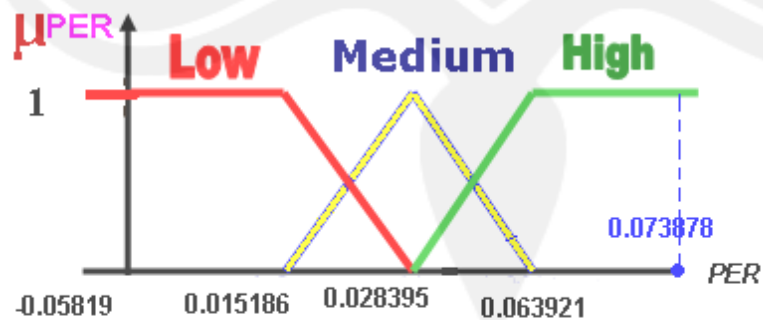
$$\text{Trade Volume Med: } \frac{(X - A)}{(B - A)} = \frac{3,300,500 - 2,680,500}{3,404,500 - 2,680,500} = 0.8564$$

### C. DPS Variable



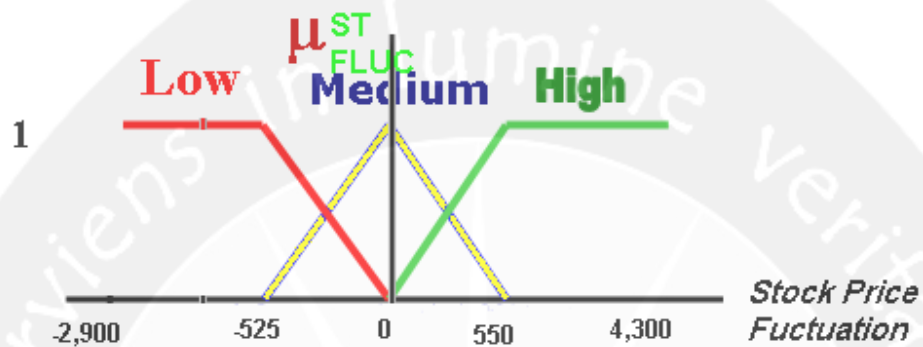
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

#### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

#### 2. Fuzzy operator application: Match with the rules

[R3] If Closing Price is Low and Trade Volume is Low and DPS is High then

Stock Fluctuation= Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}], \mu [\text{DPS}])$$

$$= \min(1; 0.1436; 1) = 0.1436$$

$$\text{Low} = \frac{(0 - X)}{525}$$

$$0.1436 = \frac{(0 - X)}{525} \rightarrow X = -75.39$$

[R6] If Closing Price is Low and Trade Volume is Medium and DPS is High then  
Stock Fluctuation= Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}], \mu [\text{DPS}])$$

$$= \min(1; 0.8564; 1) = 0.8564$$

$$0.8564 = \frac{(0 - X)}{525} \rightarrow X = -449.61$$

3. **Defuzzy: get the result**

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2}{\mu(k1) + \mu(k2)} = \frac{[0.1436 \times (-75.39)] + [0.8564 \times (-449.61)]}{0.1436 + 0.8564} = \textcolor{red}{-396}$$



### ***Sampling no. 3***

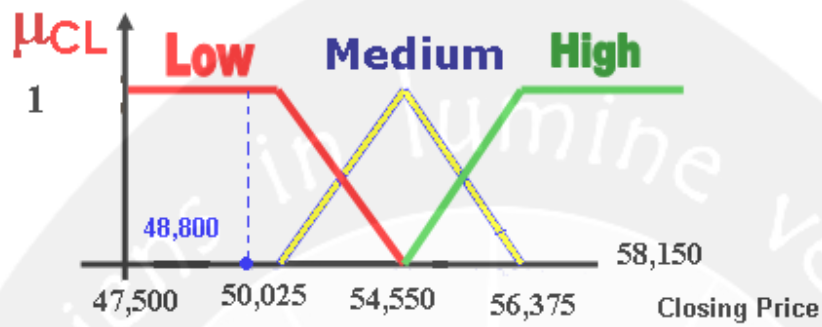
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

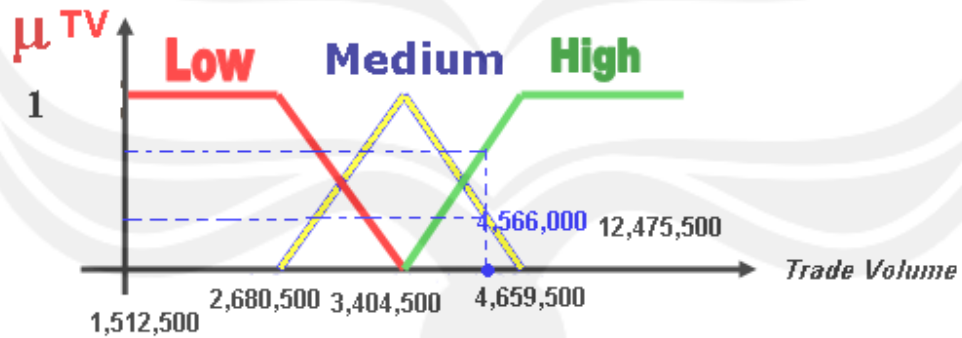
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 48,800               | 4,566,000           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



Closing Price Low:  $\mu = 1$

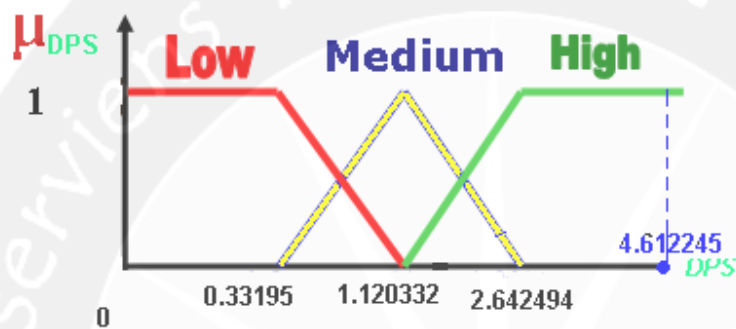
### B. Trade Volume Variable



$$\text{Trade Volume Med: } \frac{(C - X)}{(C - B)} = \frac{4,659,000 - 4,566,000}{4,659,000 - 3,404,500} = 0.074502$$

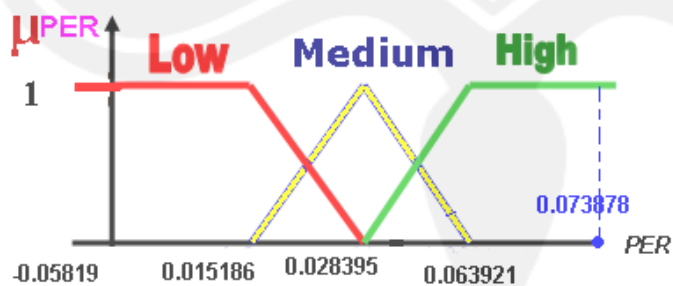
$$\text{Trade Volume High: } \frac{(X - A)}{(B - A)} = \frac{4,566,000 - 3,404,500}{4,659,000 - 3,404,500} = 0.9255$$

### C. DPS Variable



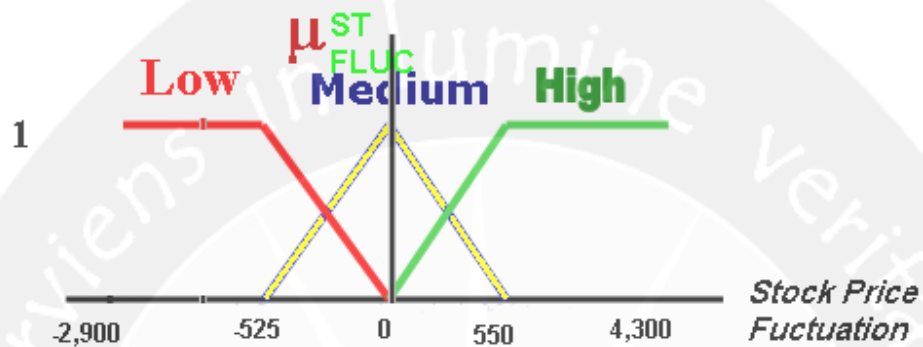
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 2. Fuzzy operator application: Match with the rules

[R2] If Trade Volume is Low and Trade Volume is High then Stock Fluctuation=

Medium

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}])$$

$$= \min(1; 0.9255) = 0.9255$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$0.9255 = \frac{X + 525}{525} \rightarrow X_1 = -39.1125$$

$$0.9255 = \frac{550 - X}{550} \rightarrow X_2 = 40.975$$

### 3. Defuzzy: get the result

$$Z = \frac{\mu(k_1) \times k_1 + \mu(k_2) \times k_2}{\mu(k_1) + \mu(k_2)} = \frac{[0.9255X (-39.1125)] + [0.9255X 40.975]}{0.9255 + 0.9255} = \mathbf{0.9313}$$

#### ***Sampling no. 4***

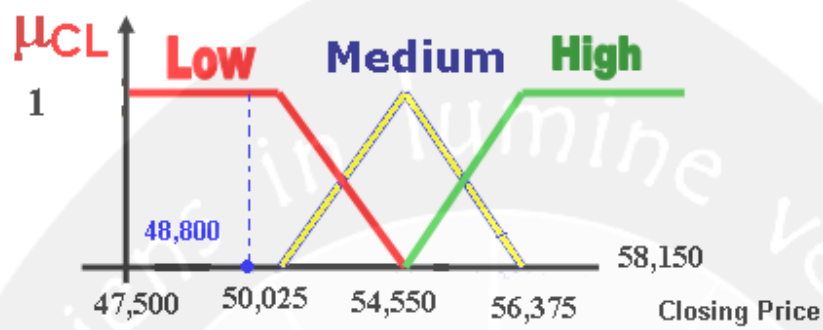
##### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

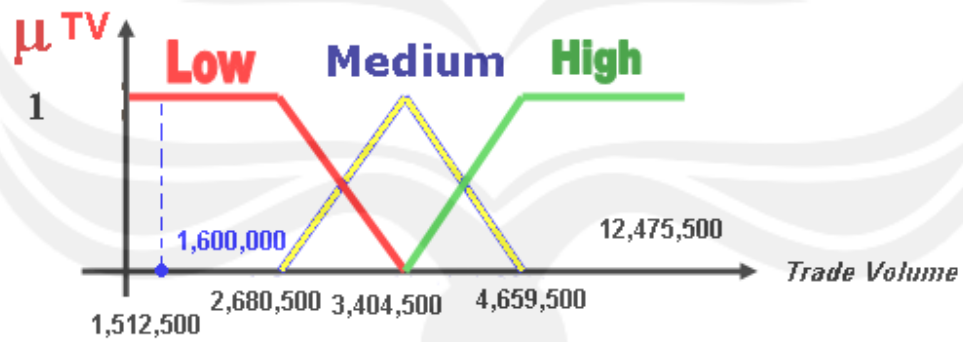
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 48,800               | 1,00,000            | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



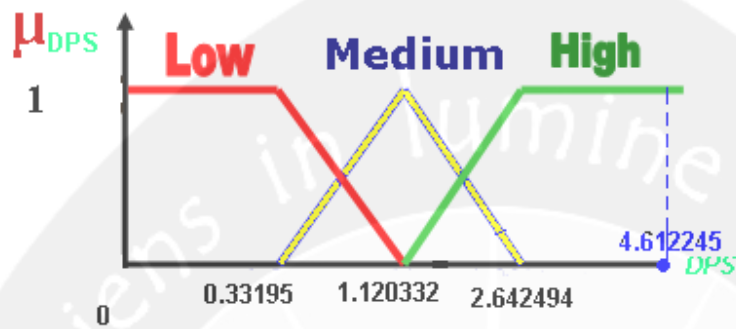
Closing Price Low:  $\mu = 1$

### B. Trade Volume Variable



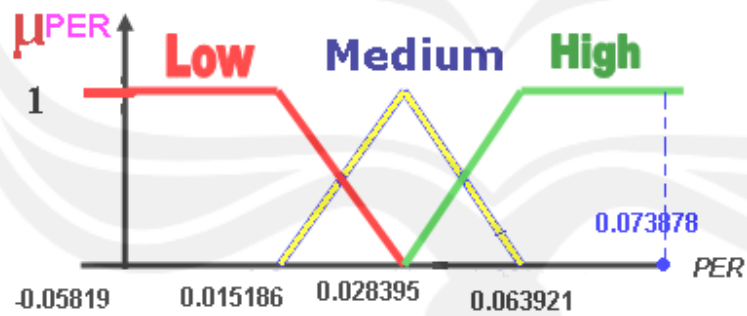
Trade Volume Low:  $\mu = 1$

### C. DPS Variable



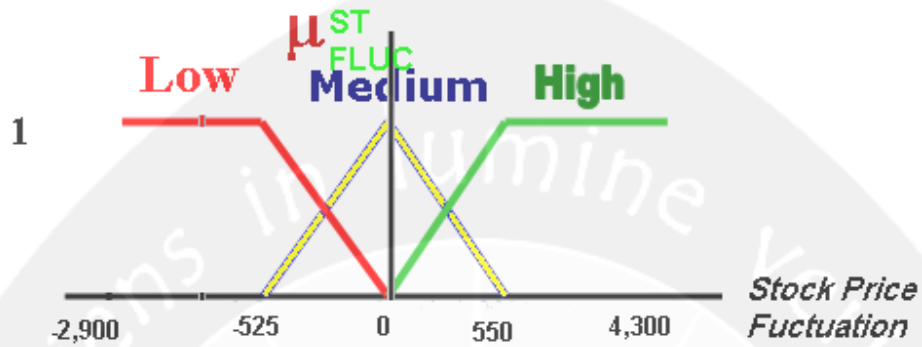
DPS High:  $\mu = 1$

### D. PER Variable



PER High:  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 2. Fuzzy operator application: Match with the rules

[R3] If Closing Price is Low and Trade Volume is Low and DPS is High then

Stock Fluctuation= Low

$$\text{Low} = \frac{(0 - X)}{525}$$

$$1 = \frac{(0 - X)}{525} \rightarrow X = -525$$

3. **Defuzzy: get the result**

$$Z = \frac{\mu(k1)xk1}{\mu(k1)} = \frac{1x(-525)}{1} = -525$$

### ***Sampling no. 5***

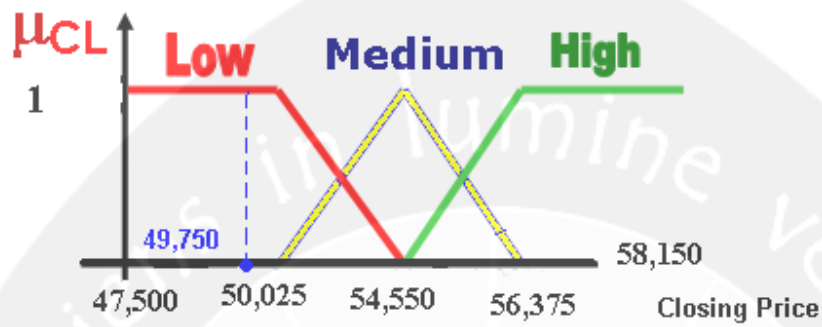
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

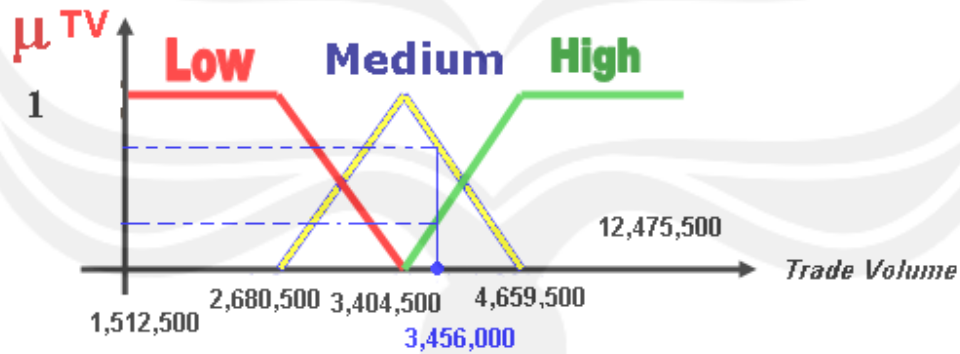
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 49,750               | 3,456,000           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



Closing Price Low:  $\mu = 1$

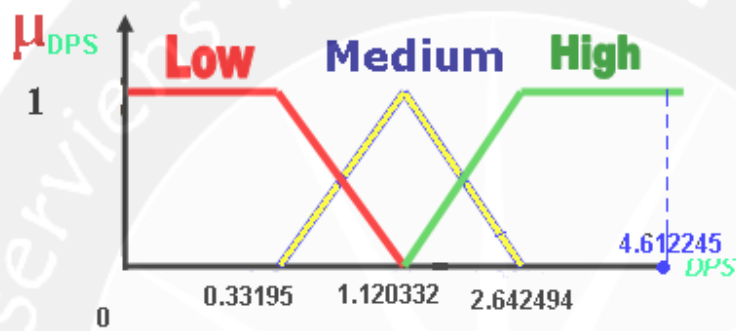
### B. Trade Volume Variable



$$\text{Trade Volume Med: } \frac{(C - X)}{(C - B)} = \frac{4,659,000 - 3,456,000}{4,659,000 - 3,404,500} = 0.9589$$

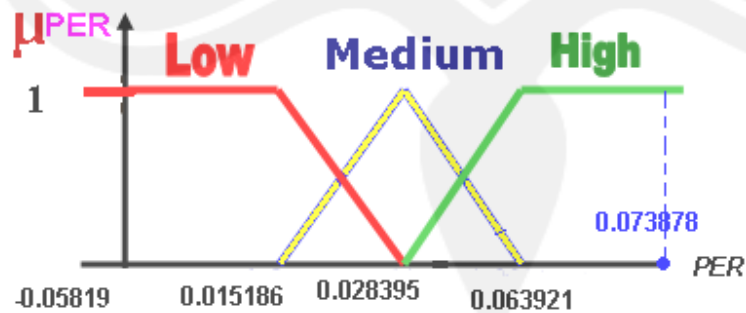
$$\text{Trade Volume High: } \frac{(X - A)}{(B - A)} = \frac{3,456,000 - 3,404,500}{4,659,000 - 3,404,500} = 0.041$$

### C. DPS Variable



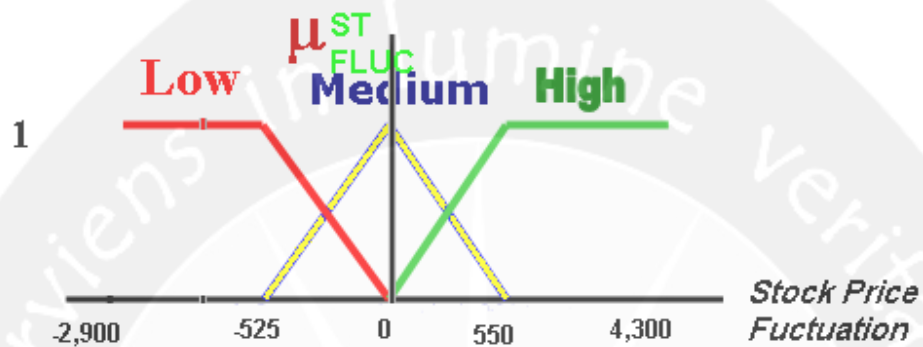
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 2. Fuzzy operator application: Match with the rules

[R2] If Trade Volume is Low and Trade Volume is High then Stock Fluctuation=

Medium

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}])$$

$$= \min(1; 0.041) = 0.041$$

$$0.041 = \frac{(Z + 525)}{525} \rightarrow X1 = -503.475$$

$$0.041 = \frac{(550 - X)}{550} \rightarrow X2 = 527.45$$

[R6] If Closing Price is Low and Trade Volume is Medium and DPS is High then  
Stock Fluctuation = Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}])$$

$$= \min(1; 0.9589) = 0.9589$$

$$0.9589 = \frac{(0 - X)}{525} \rightarrow X = -503.4225$$

### 3. Defuzzy: get the result

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3}{\mu(k1) + \mu(k2) + \mu(k3)}$$
$$= \frac{[0.041 \times (-503.475)] + [0.041 \times 527.45] + [0.9589 \times (-503.4225)]}{0.041 + 0.041 + 0.9589} = -475$$

### ***Sampling no. 6***

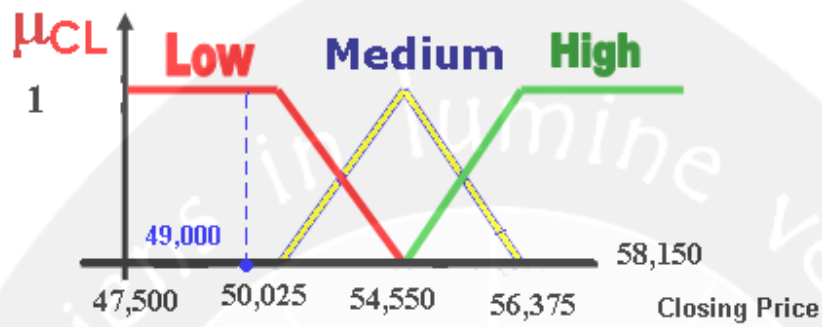
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

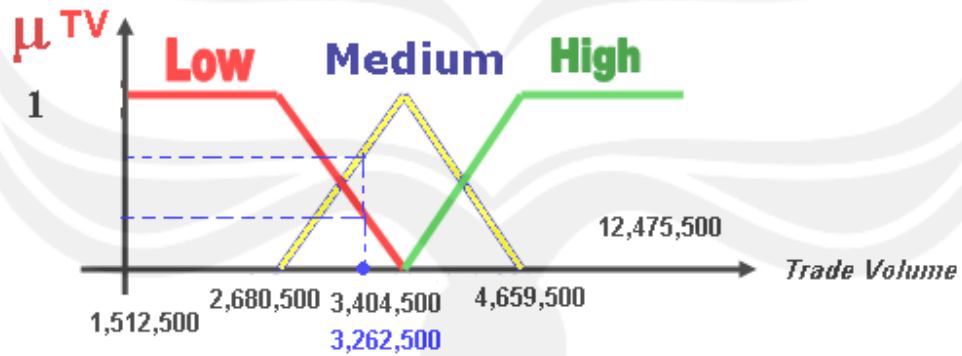
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 49,000               | 3,262,500           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



Closing Price Low:  $\mu = 1$

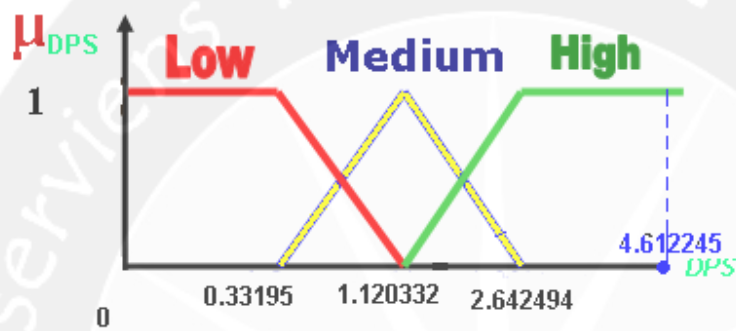
### B. Trade Volume Variable



$$\text{Trade Volume Low: } \frac{(D - X)}{(D - C)} = \frac{3,404,500 - 3,262,500}{3,404,500 - 2,680,500} = 0.1961$$

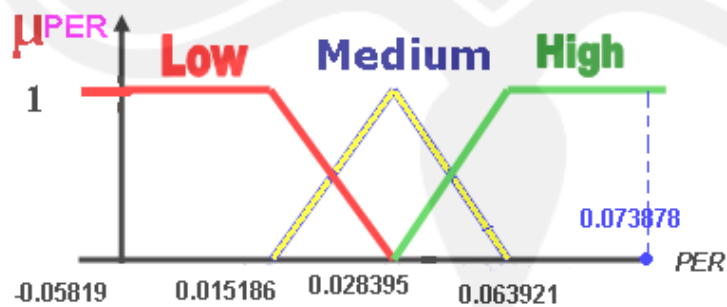
$$\text{Trade Volume Med: } \frac{(X - A)}{(B - A)} = \frac{3,262,500 - 2,680,500}{3,404,500 - 2,680,500} = 0.8039$$

### C. DPS Variable



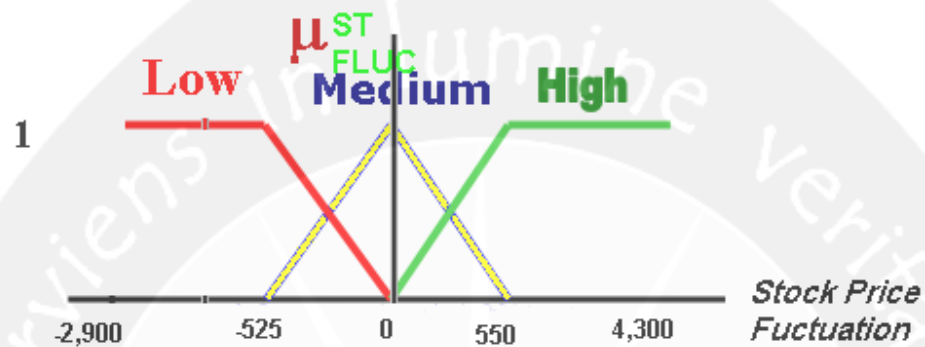
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 3. Fuzzy operator application: Match with the rules

[R3] If Closing Price is Low and Trade Volume is Low and DPS is High then

Stock Fluctuation= Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}], \mu [\text{DPS}])$$

$$= \min(1; 0.1961; 1) = 0.1961$$

$$\text{Low} = \frac{(0 - X)}{525}$$

$$0.1961 = \frac{(0 - X)}{525} \rightarrow X = -102.9525$$

[R6] If Closing Price is Low and Trade Volume is Medium and DPS is High then

Stock Fluctuation= Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}], \mu [\text{DPS}])$$

$$= \min(1; 0.8039; 1) = 0.8039$$

$$0.8039 = \frac{(0 - X)}{525} \rightarrow X = -422.0475$$

3. **Defuzzy: get the result**

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2}{\mu(k1) + \mu(k2)} = \frac{[0.1961 \times (-102.9525)] + [0.8039 \times (-422.0475)]}{0.1436 + 0.8564} =$$

**-359**



### ***Sampling no. 7***

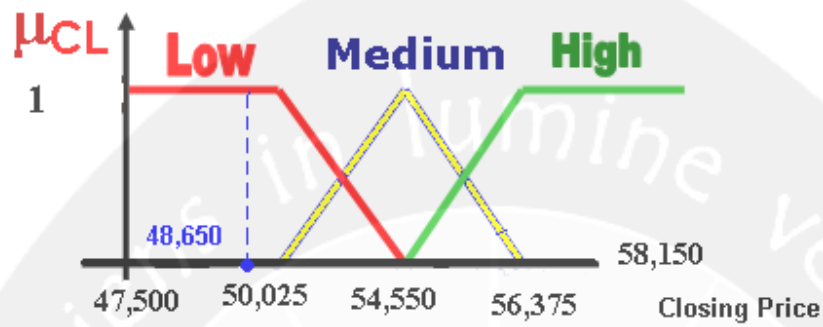
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

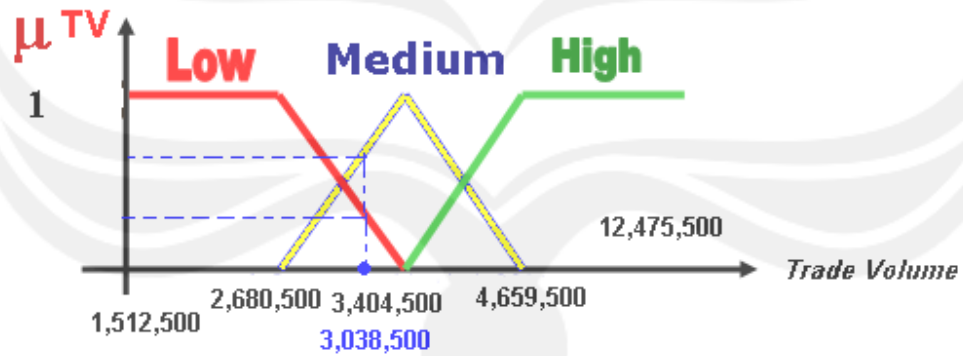
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 48,650               | 3,038,500           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



Closing Price Low:  $\mu = 1$

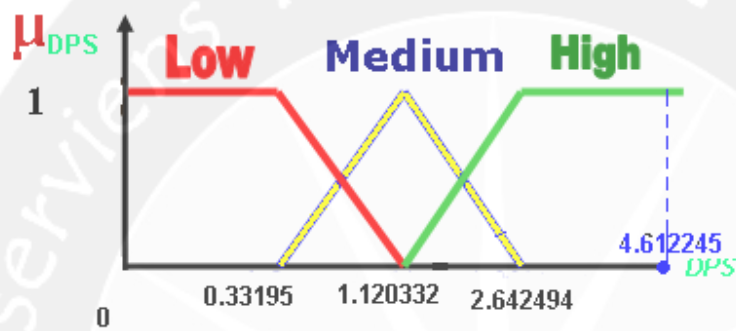
### B. Trade Volume Variable



$$\text{Trade Volume Low: } \frac{(D - X)}{(D - C)} = \frac{3,404,500 - 3,038,500}{3,404,500 - 2,680,500} = 0.5055$$

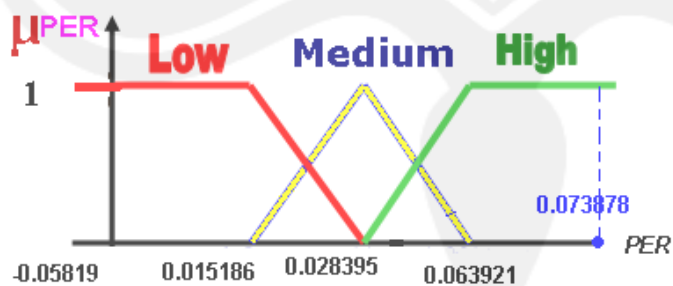
$$\text{Trade Volume Med: } \frac{(X - A)}{(B - A)} = \frac{3,038,500 - 2,680,500}{3,404,500 - 2,680,500} = 0.4945$$

### C. DPS Variable



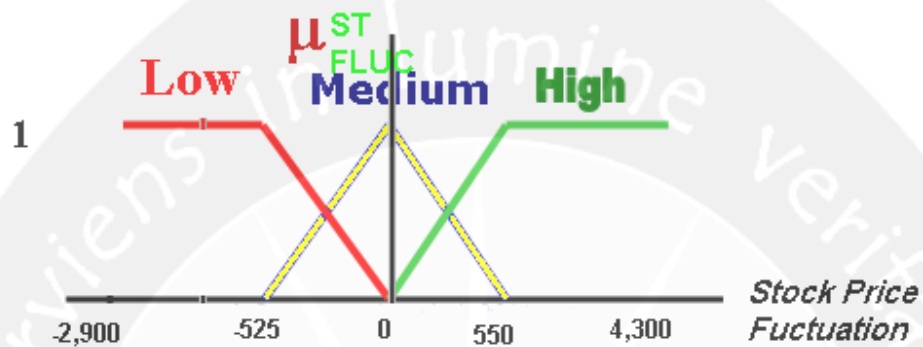
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

#### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

#### 2. Fuzzy operator application: Match with the rules

[R3] If Closing Price is Low and Trade Volume is Low and DPS is High then

Stock Fluctuation= Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}], \mu [\text{DPS}])$$

$$= \min(1; 0.5055; 1) = 0.5055$$

$$\text{Low} = \frac{(0 - X)}{525}$$

$$0.5055 = \frac{(0 - X)}{525} \rightarrow X = -265.3875$$

[R6] If Closing Price is Low and Trade Volume is Medium and DPS is High then  
Stock Fluctuation = Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}], \mu [\text{DPS}])$$

$$= \min(1; 0.4945; 1) = 0.4945$$

$$0.4945 = \frac{(0 - X)}{525} \rightarrow X = -259.6125$$

3. **Defuzzy: get the result**

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2}{\mu(k1) + \mu(k2)} = \frac{[0.5055 \times (-265.3875)] + [0.4945 \times (-259.6125)]}{0.5055 + 0.4945} =$$

**-262**



### ***Sampling no. 8***

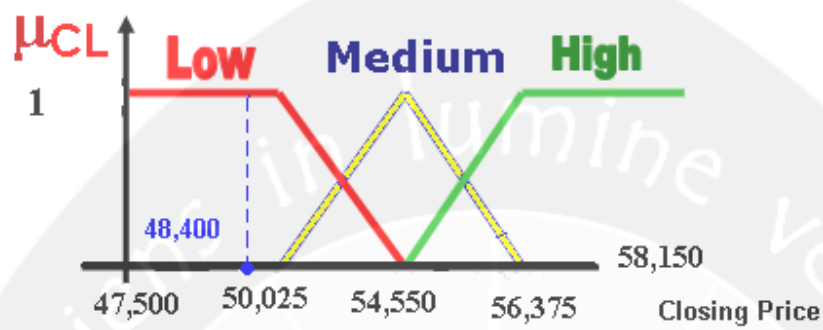
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

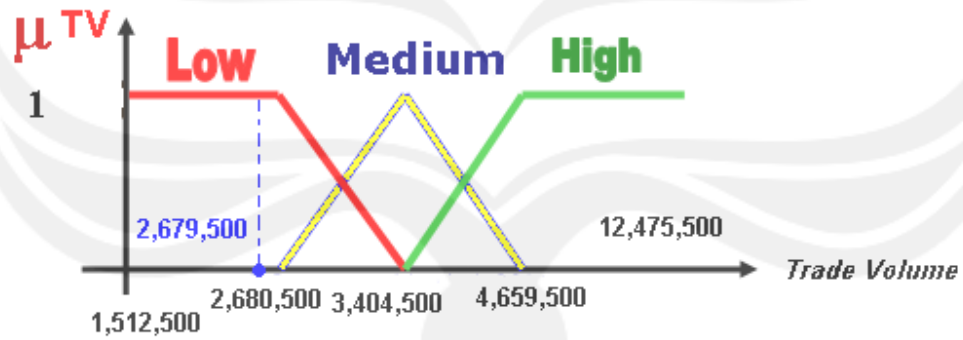
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 48,400               | 2,679,500           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



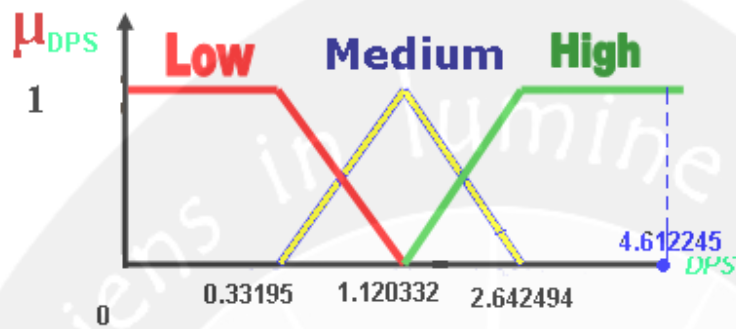
Closing Price Low:  $\mu = 1$

### B. Trade Volume Variable



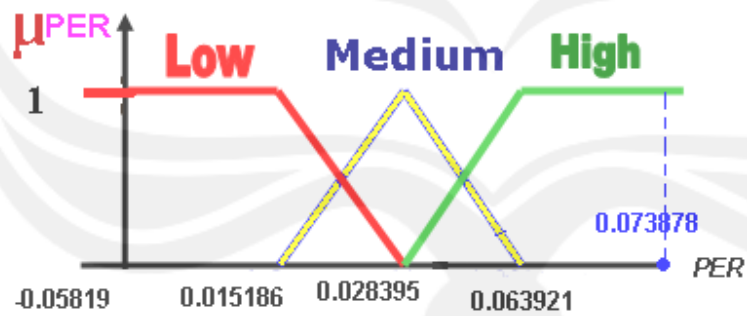
Trade Volume Low:  $\mu = 1$

### C. DPS Variable



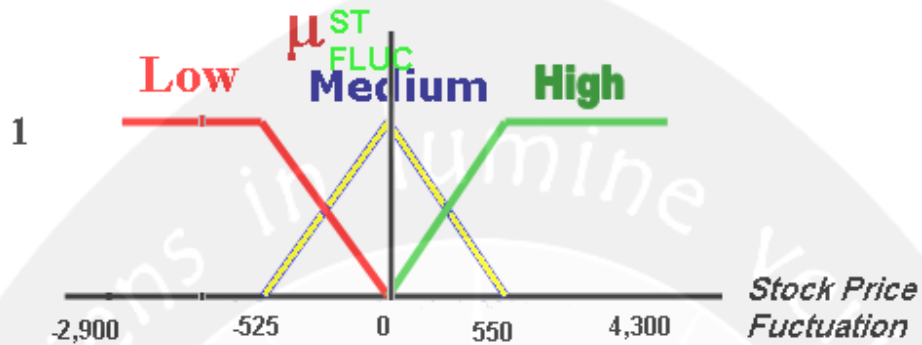
DPS High:  $\mu = 1$

### D. PER Variable



PER High:  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 3. Fuzzy operator application: Match with the rules

[R3] If Closing Price is Low and Trade Volume is Low and DPS is High then

Stock Fluctuation= Low

$$\text{Low} = \frac{(0 - X)}{525}$$

$$1 = \frac{(0 - X)}{525} \rightarrow X = -525$$

3. **Defuzzy: get the result**

$$Z = \frac{\mu(k1)xk1}{\mu(k1)} = \frac{1x(-525)}{1} = -525$$

### ***Sampling no. 9***

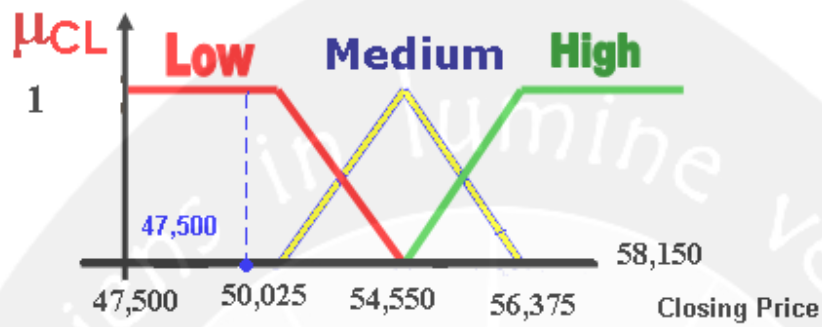
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

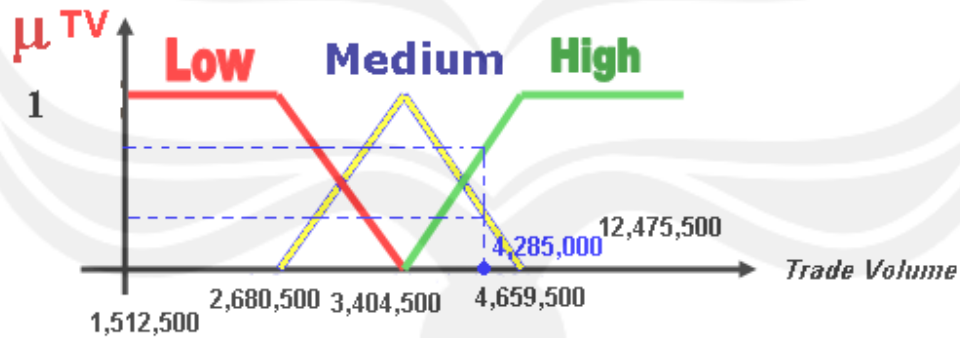
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 47,500               | 4,285,000           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



Closing Price Low:  $\mu = 1$

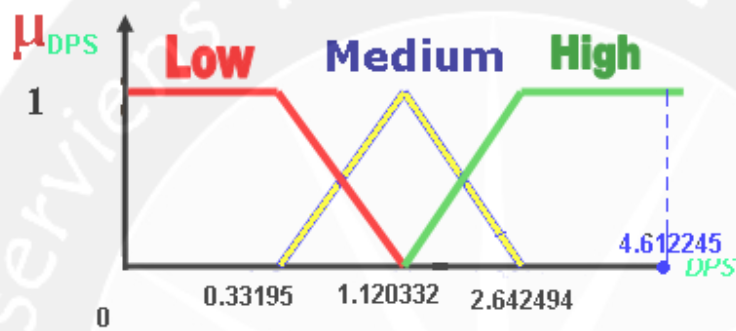
### B. Trade Volume Variable



Trade Volume Med: 
$$\frac{(C - X)}{(C - B)} = \frac{4,659,000 - 4,285,000}{4,659,000 - 3,404,500} = 0.2984$$

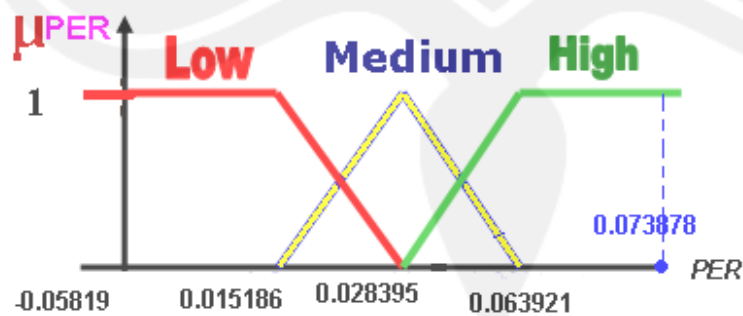
$$\text{Trade Volume High: } \frac{(X - A)}{(B - A)} = \frac{4,285,000 - 3,404,500}{4,659,000 - 3,404,500} = 0.7016$$

### C. DPS Variable



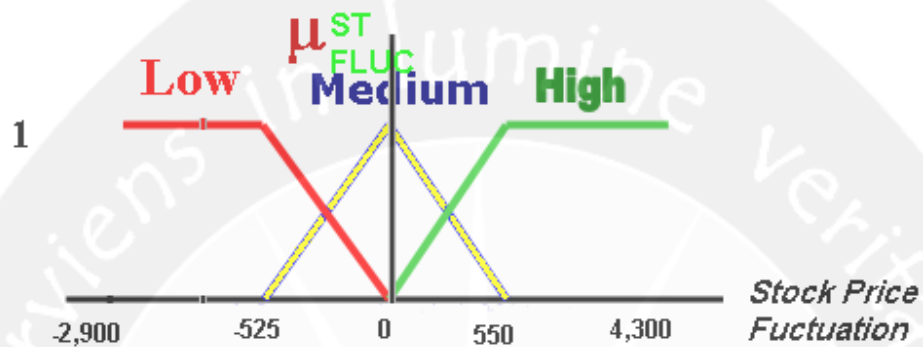
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 2. Fuzzy operator application: Match with the rules

[R2] If Trade Volume is Low and Trade Volume is High then Stock Fluctuation=

Medium

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}])$$

$$= \min(1; 0.7016) = 0.7016$$

$$X1 \rightarrow 0.7016 = \frac{(X + 525)}{525} \rightarrow X1 = -156.66$$

$$X2 \rightarrow 0.7016 = \frac{(550 + X)}{550} \rightarrow X2 = 164.12$$

[R6] If Closing Price is Low and Trade Volume is Medium and DPS is High then  
Stock Fluctuation= Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}], \mu [\text{DPS}])$$

$$= \min(1; 0.2984; 1) = 0.2984$$

$$0.2984 = \frac{(0 - X)}{525} \rightarrow X = -156.66$$

### 3. Defuzzy: get the result

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3}{\mu(k1) + \mu(k2) + \mu(k3)}$$
$$= \frac{[0.7016 \times (-156.66)] + [0.7016 \times 164.12] + [0.2984 \times (-156.66)]}{0.7016 + 0.7016 + 0.2984} = -24$$

### ***Sampling no. 10***

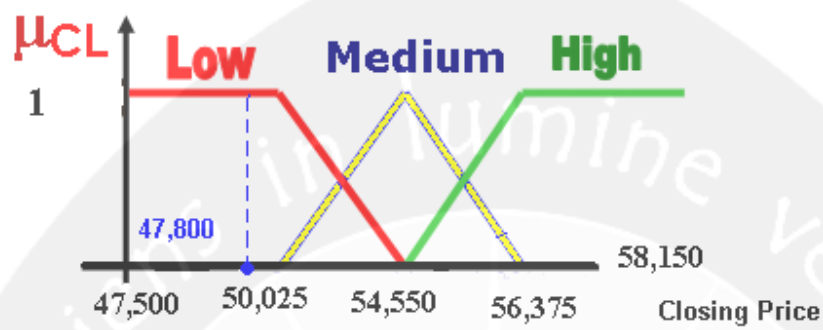
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

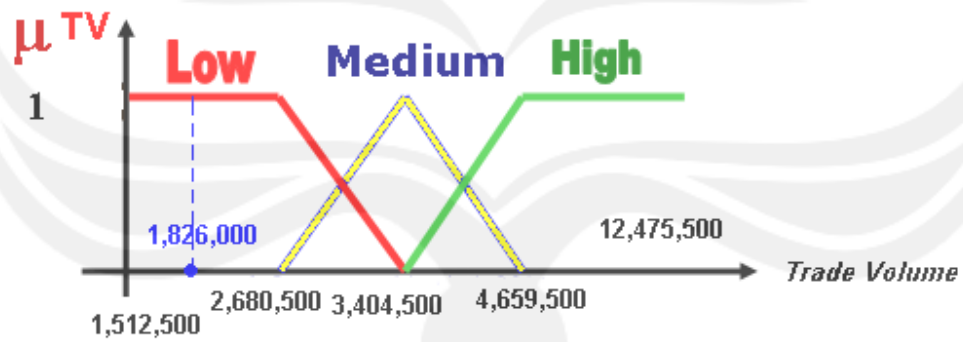
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 47,800               | 2,063,500           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



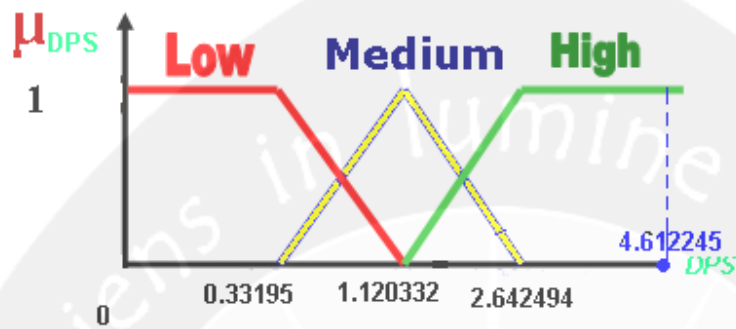
Closing Price Low:  $\mu = 1$

### B. Trade Volume Variable



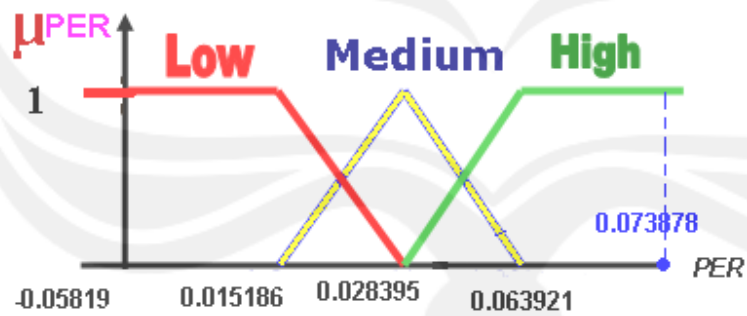
Trade Volume Low:  $\mu = 1$

### C. DPS Variable



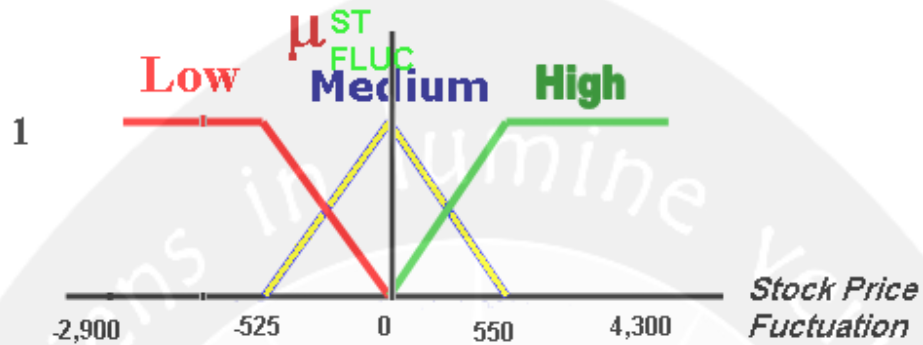
DPS High:  $\mu = 1$

### D. PER Variable



PER High:  $\mu = 1$

## E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

## 2. Fuzzy operator application: Match with the rules

[R3] If Closing Price is Low and Trade Volume is Low and DPS is High then

Stock Fluctuation= Low

$$\text{Low} = \frac{(0 - X)}{525}$$

$$1 = \frac{(0 - X)}{525} \rightarrow X = -525$$

3. **Defuzzy: get the result**

$$Z = \frac{\mu(k1)xk1}{\mu(k1)} = \frac{1x(-525)}{1} = -525$$

### ***Sampling no. 11***

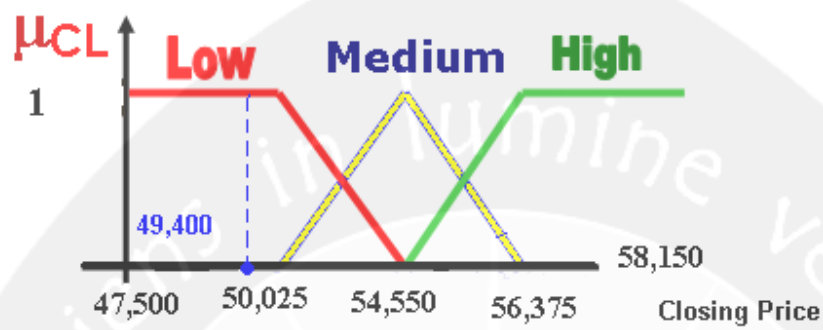
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

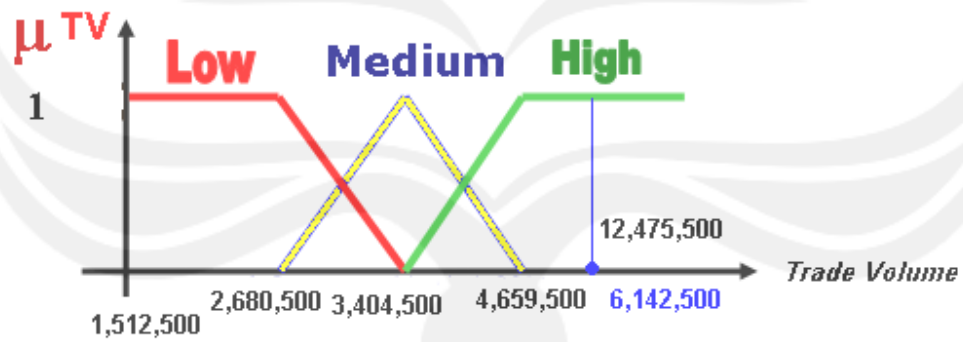
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 49,400               | 6,027,500           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



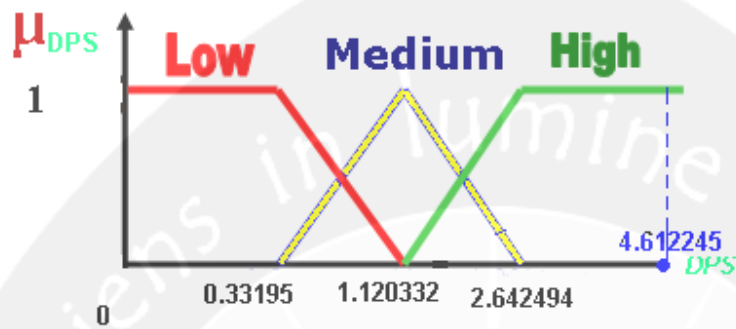
Closing Price Low:  $\mu = 1$

### B. Trade Volume Variable



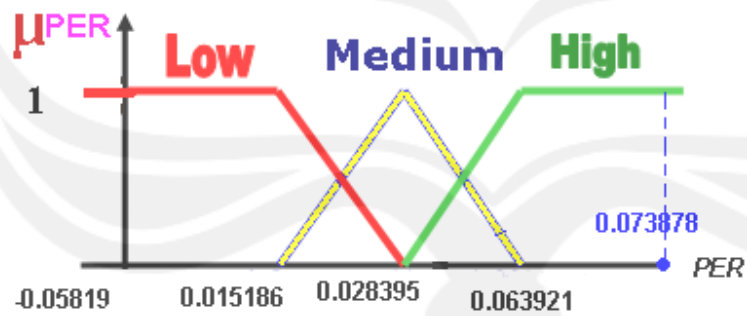
Trade Volume Low:  $\mu = 1$

### C. DPS Variable



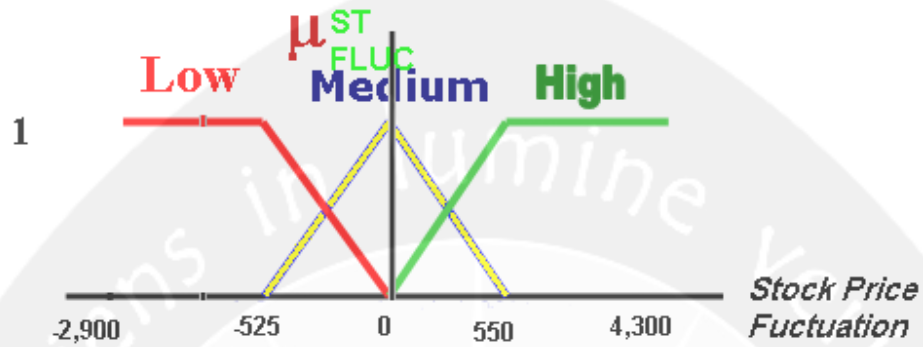
DPS High:  $\mu = 1$

### D. PER Variable



PER High:  $\mu = 1$

## E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

## 2. Fuzzy operator application: Match with the rules

[R2] If Trade Volume is Low and Trade Volume is High then Stock Fluctuation=

Medium

$$X1 = \frac{(X + 525)}{525} \rightarrow X1 = 0$$

$$X2 = \frac{(550 - X)}{550} \rightarrow X = 0$$

3. **Defuzzy: get the result**

$$Z = 0$$

### ***Sampling no. 12***

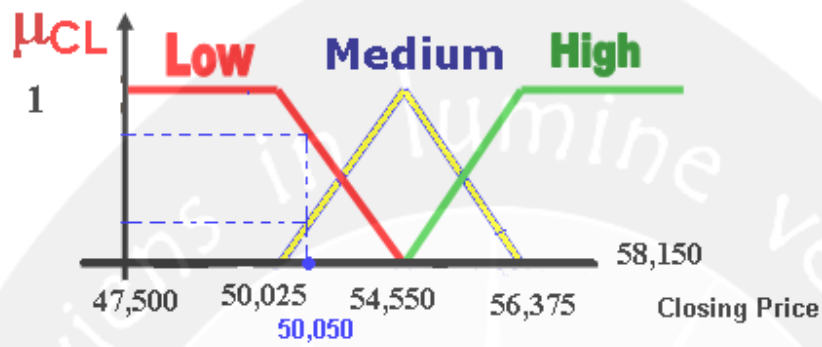
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 50,050               | 6,142,500           | 4.6122449  | 0.07387755 |

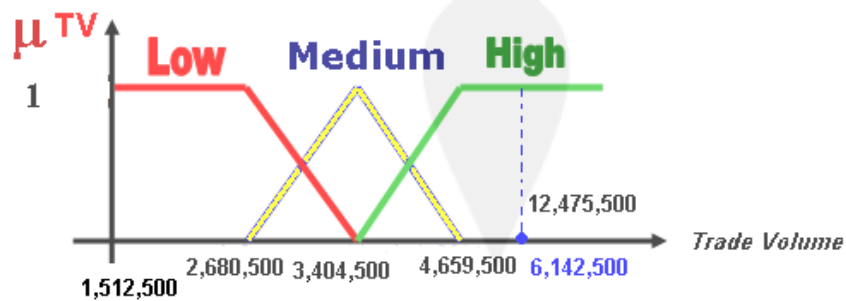
### A. Closing Price Variable



$$\text{Closing Price Low: } \frac{(D - X)}{(D - C)} = \frac{54,550 - 50,050}{54,550 - 50,025} = 0.9945$$

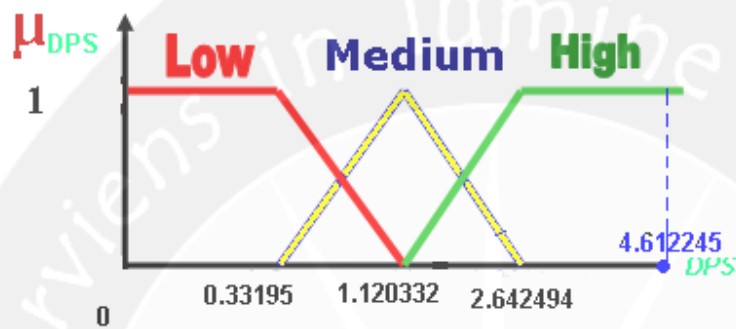
$$\text{Closing Price Med: } \frac{(X - A)}{(B - A)} = \frac{50,050 - 50,025}{54,550 - 50,025} = 0.0055$$

### B. Trade Volume Variable



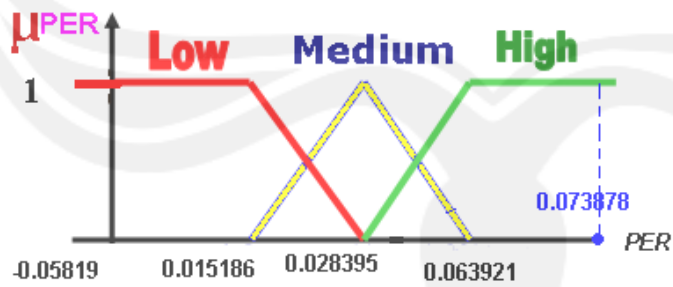
Trade Volume High:  $\mu = 1$

C. DPS Variable



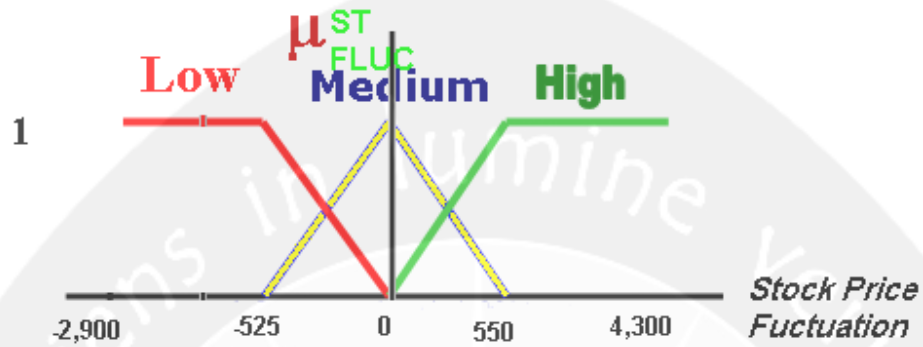
DPS High:  $\mu = 1$

D. PER Variable



PER High:  $\mu = 1$

## E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

## 2. Fuzzy operator application: Match with the rules

[R2] If Trade Volume is Low and Trade Volume is High then Stock Fluctuation=

Medium

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}])$$

$$= \min(1; 0.9945) = 0.9945$$

$$X1 \rightarrow 0.9945 = \frac{(X + 525)}{525} = X1 = -2.8875$$

$$X2 \rightarrow 0.9945 = \frac{(550 - X)}{550} = X2 = 3.025$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

$$X3 \rightarrow 0.0055 = \frac{(X + 525)}{525} = X1 = -522.1125$$

$$X4 \rightarrow 0.0055 = \frac{(550 - X)}{550} = X2 = 546.875$$

### 3. Defuzzy: get the result

$$\begin{aligned} Z &= \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3 + \mu(k4) \times k4}{\mu(k1) + \mu(k2) + \mu(k3) + \mu(k4)} \\ &= \\ &= \frac{[0.9945 \times (-2.8875)] + [0.9945 \times 3.025] + [0.0055 \times (-522.1125)] + [0.0055 \times (546.975)]}{0.9945 + 0.9945 + 0.0055 + 0.0055} \\ &= \mathbf{0.14} \end{aligned}$$

### ***Sampling no. 13***

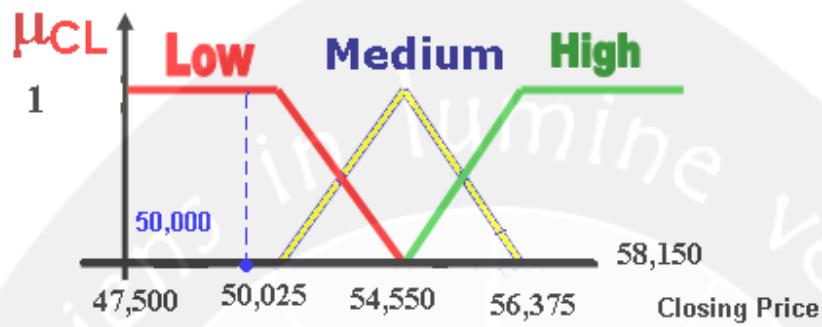
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

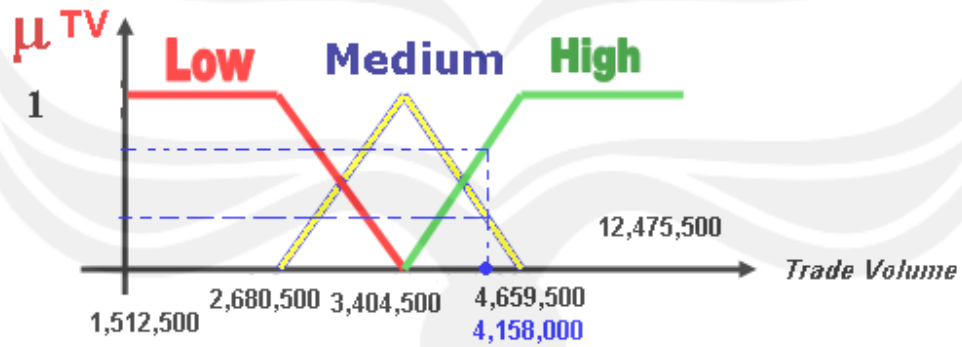
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 50,000               | 4,158,000           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



Closing Price Low:  $\mu = 1$

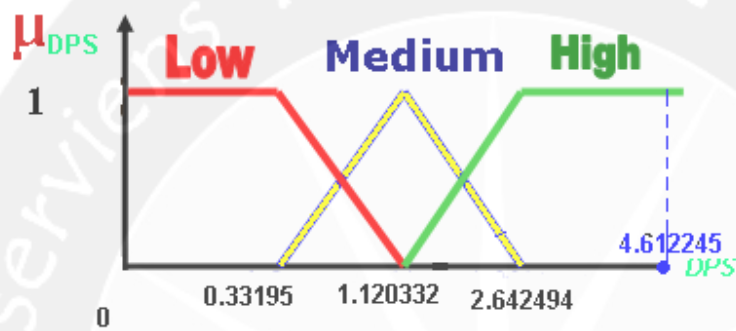
### B. Trade Volume Variable



$$\text{Trade Volume Medium: } \frac{(C - X)}{(C - B)} = \frac{4,659,500 - 4,158,000}{4,659,500 - 3,404,500} = 0.3996$$

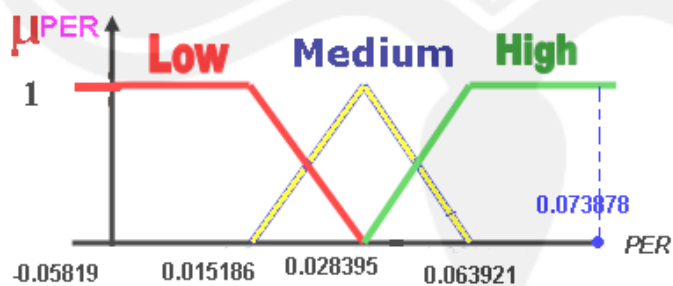
$$\text{Trade Volume High: } \frac{(X - A)}{(B - A)} = \frac{4,158,000 - 3,404,500}{4,659,500 - 3,404,500} = 0.6004$$

### C. DPS Variable



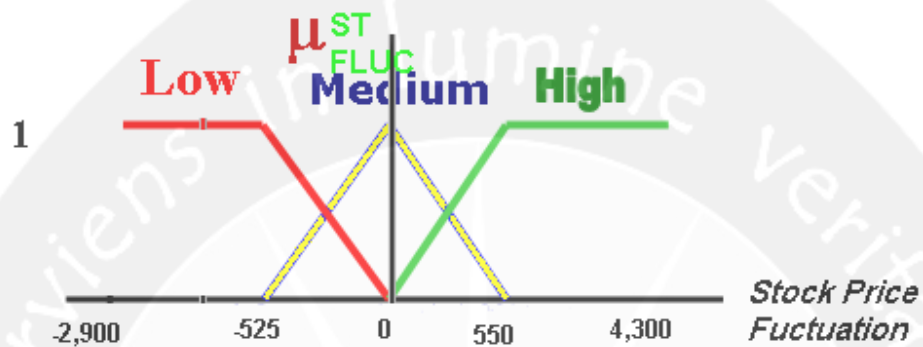
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 2. Fuzzy operator application: Match with the rules

[R2] If Trade Volume is Low and Trade Volume is High then Stock Fluctuation=

Medium

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}])$$

$$= \min(1; 0.6004) = 0.6004$$

$$X1 \rightarrow 0.6004 = \frac{(X + 525)}{525} = -209.79$$

$$X1 \rightarrow 0.6004 = \frac{(550 - X)}{550} = 219.78$$

[R6] If Closing Price is Low and Trade Volume is Medium and DPS is High then  
Stock Fluctuation= Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}])$$

$$= \min(1; 0.3996) = 0.3996$$

$$0.3996 = \frac{(0 - X)}{525} \rightarrow X3 = -209.79$$

### 3. Defuzzy: get the result

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3}{\mu(k1) + \mu(k2) + \mu(k3)}$$
$$= \frac{[0.6004 \times (-209.79)] + [0.6004 \times 219.78] + [0.3996 \times (-209.79)]}{0.6004 + 0.6004 + 0.3996} = \mathbf{1.6004}$$

### ***Sampling no. 14***

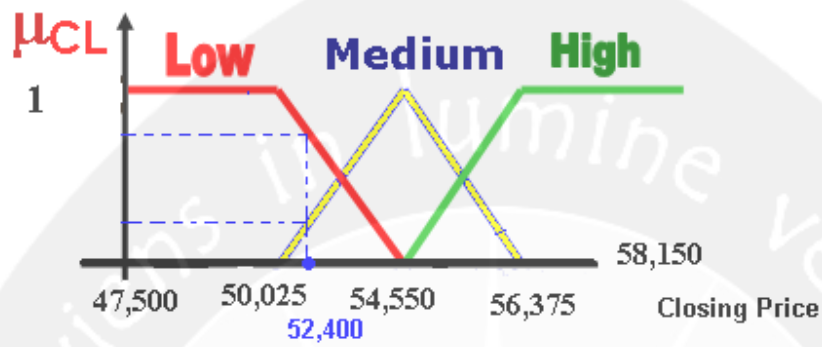
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 52,400               | 6,315,500           | 4.6122449  | 0.07387755 |

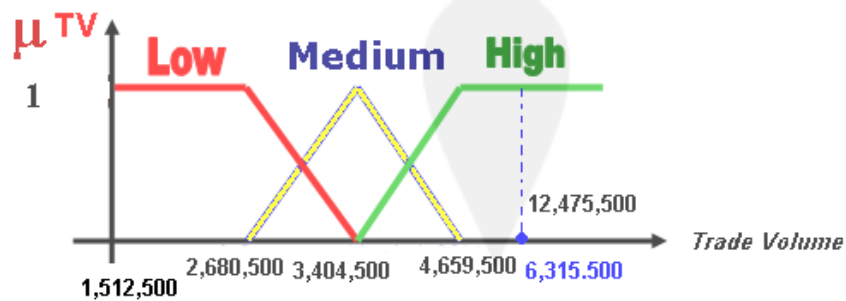
### A. Closing Price Variable



$$\text{Closing Price Low: } \frac{(D - X)}{(D - C)} = \frac{54,550 - 52,400}{54,550 - 50,025} = 0.9945$$

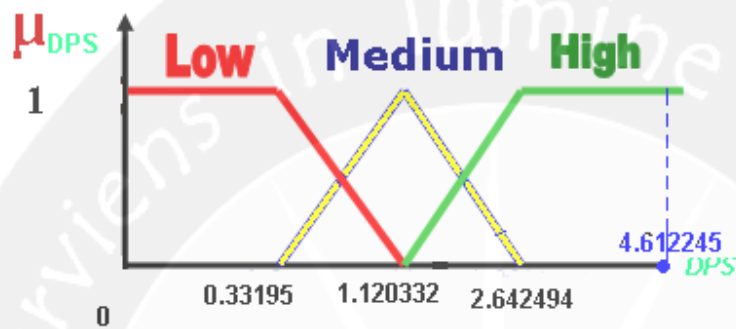
$$\text{Closing Price Med: } \frac{(X - A)}{(B - A)} = \frac{52,400 - 50,025}{54,550 - 50,025} = 0.0055$$

### B. Trade Volume Variable



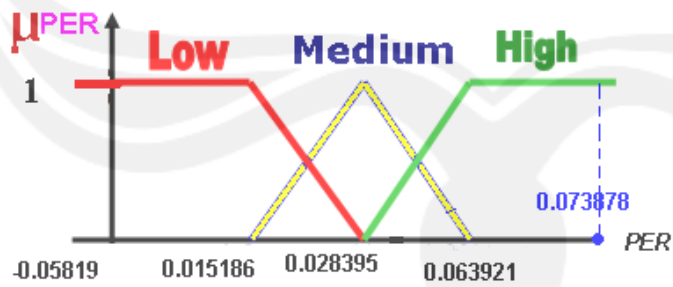
Trade Volume High:  $\mu = 1$

C. DPS Variable



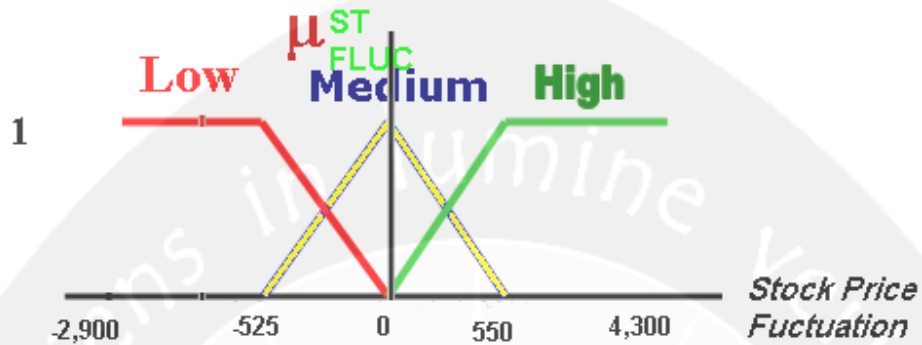
DPS High:  $\mu = 1$

D. PER Variable



PER High:  $\mu = 1$

## E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

## 2. Fuzzy operator application: Match with the rules

[R2] If Trade Volume is Low and Trade Volume is High then Stock Fluctuation=

Medium

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}])$$

$$= \min(0.4751; 1) = 0.4751$$

$$X1 \rightarrow 0.4751 = \frac{(X + 525)}{525} = X1 = -275.5725$$

$$X2 \rightarrow 0.4751 = \frac{(550 - X)}{550} = X2 = 288.695$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

$$X3 \rightarrow 0.5249 = \frac{(X + 525)}{525} = X1 = -249.4275$$

$$X4 \rightarrow 0.5249 = \frac{(550 - X)}{550} = X2 = 261.305$$

#### 4. Defuzzy: get the result

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3 + \mu(k4) \times k4}{\mu(k1) + \mu(k2) + \mu(k3) + \mu(k4)}$$

=

$$\frac{[0.4751X(-275.5725)] + [0.4751X 288.695] + [0.5249X(-249.4275)] + [0.5249X(261.305)]}{0.4751 + 0.4751 + 0.5249 + 0.5249}$$

$$= \mathbf{6.2345}$$

### ***Sampling no. 15***

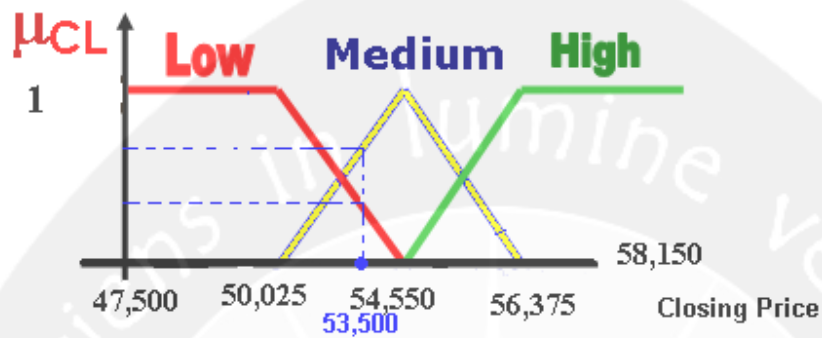
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 53,500               | 3,048,000           | 4.6122449  | 0.07387755 |

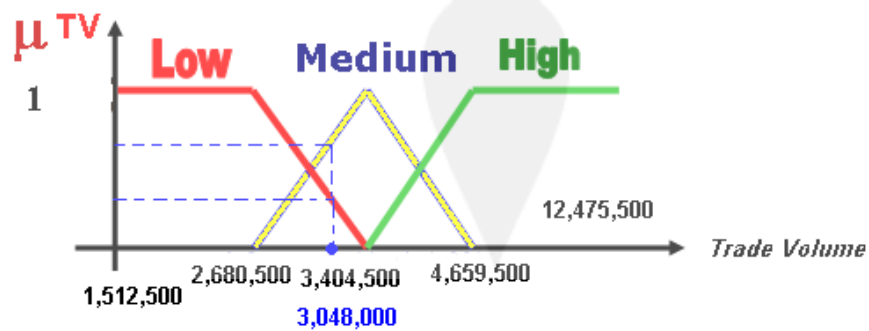
### A. Closing Price Variable



$$\text{Closing Price Low: } \frac{(D - X)}{(D - C)} = \frac{54,550 - 53,500}{54,550 - 50,025} = 0.232$$

$$\text{Closing Price Med: } \frac{(X - A)}{(B - A)} = \frac{53,500 - 50,025}{54,550 - 50,025} = 0.763$$

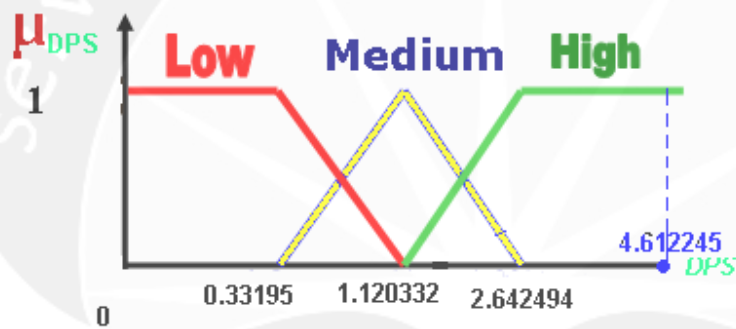
### B. Trade Volume Variable



$$\text{Trade Volume Low: } \frac{(D - X)}{(D - C)} = \frac{3,404,500 - 3,048,000}{3,404,500 - 2,680,500} = 0.4924$$

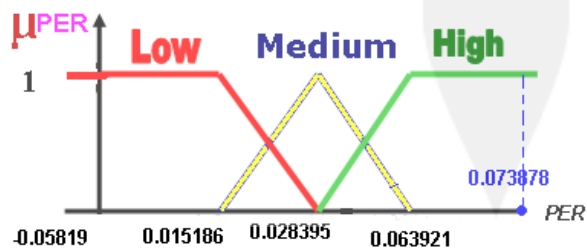
$$\text{Trade Volume Med: } \frac{(X - A)}{(B - A)} = \frac{3,048,000 - 2,680,500}{3,404,500 - 2,680,500} = 0.5076$$

### C. DPS Variable



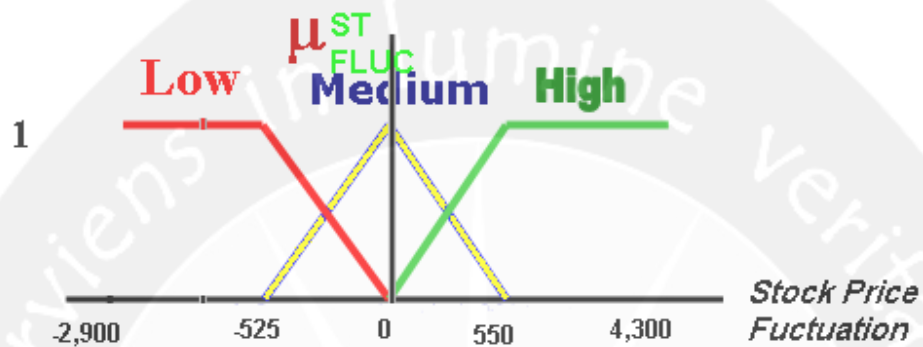
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

#### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

#### 2. Fuzzy operator application: Match with the rules

[R3] If Closing Price is Low and Trade Volume is Low and DPS is High then

Stock Fluctuation= Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}], \mu [\text{DPS}])$$

$$= \min(0,232;0.4924;1) = 0,232$$

$$X1 \rightarrow 0,232 = \frac{(0 - X)}{525} = -121.8$$

[R6] If Closing Price is Low and Trade Volume is Medium and DPS is High then  
Stock Fluctuation= Low

$$= \min(\mu [\text{ClosingPrice}], \mu [\text{TradeVolume}], \mu [\text{DPS}])$$

$$= \min(0,232;0.5076;1) = 0,232$$

$$X2 \rightarrow 0,232 = \frac{(0 - X)}{525} = -121.8$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

$$X3 \rightarrow 0.763 = \frac{(X + 525)}{525} = X3 = -124,425$$

$$X_4 \rightarrow 0.763 = \frac{(550 - X)}{550} = X_4 = 130,35$$

### 3. Defuzzy: get the result

$$\begin{aligned}
 Z &= \frac{\mu(k_1)x_{k1} + \mu(k_2)x_{k2} + \mu(k_3)x_{k3} + \mu(k_4)x_{k4}}{\mu(k_1) + \mu(k_2) + \mu(k_3) + \mu(k_4)} \\
 &= \frac{[0,2325X(-121.8)] + [0,232X(-121.8)] + [0.763X(-124,425)] + [0.763X(130,35)]}{0,232 + 0,232 + 0.763 + 0.763} \\
 &= \mathbf{-26,189}
 \end{aligned}$$

### ***Sampling no. 16***

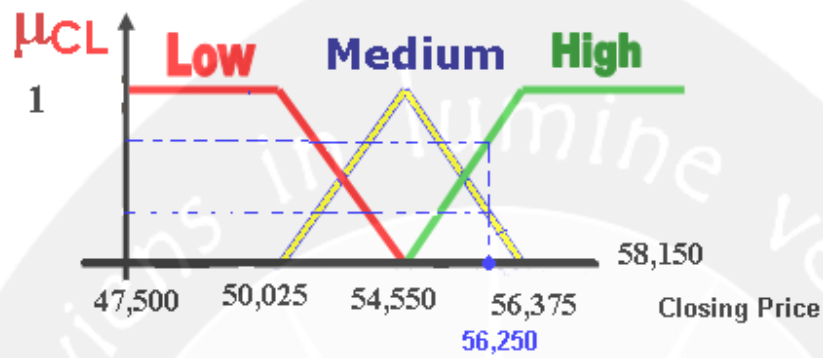
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 56,250               | 7,800,500           | 4.6122449  | 0.07387755 |

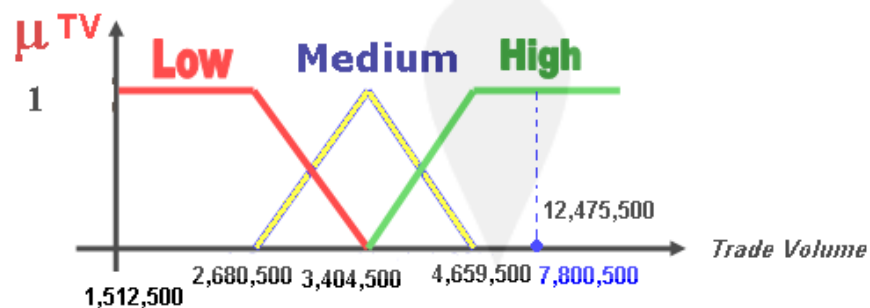
### A. Closing Price Variable



$$\text{Closing Price Med: } \frac{(C - X)}{(C - B)} = \frac{56,375 - 56,250}{56,375 - 54,550} = 0.0685$$

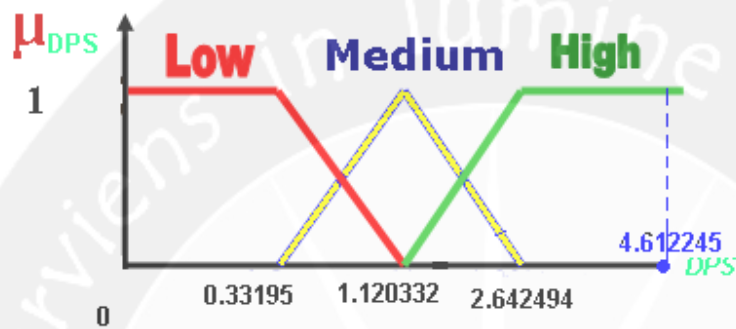
$$\text{Closing Price High: } \frac{(X - A)}{(B - A)} = \frac{56,250 - 54,550}{56,375 - 54,550} = 0.9315$$

### B. Trade Volume Variable



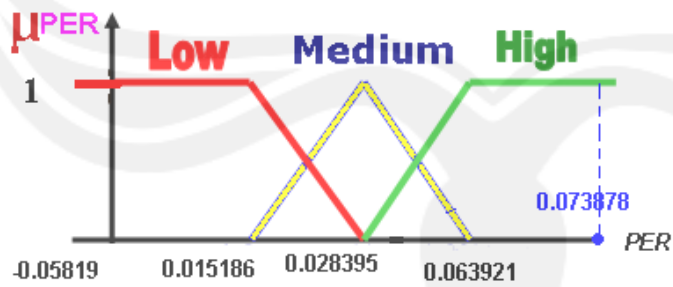
Trade Volume High:  $\mu = 1$

C. DPS Variable



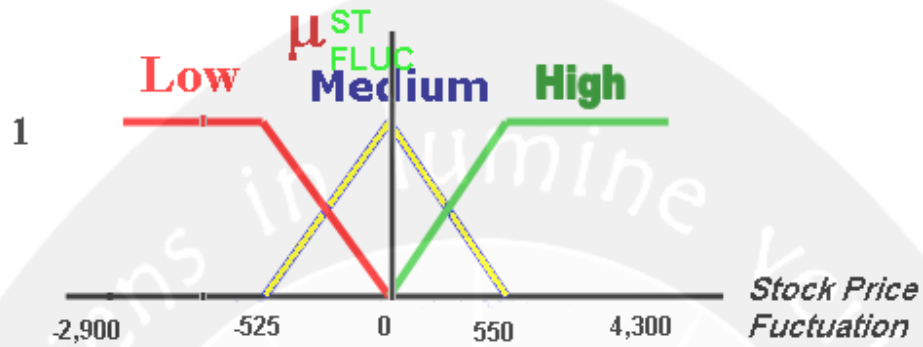
DPS High:  $\mu = 1$

D. PER Variable



PER High:  $\mu = 1$

## E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

## 2. Fuzzy operator application: Match with the rules

[R1] If Closing Price is High then Stock Fluctuation = Medium

$$X1 \rightarrow 0.9315 = \frac{(X - 0)}{550} = X1 = 512.325$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

$$X2 \rightarrow 0.0685 = \frac{(X + 525)}{525} = X2 = -489.0375$$

$$X3 \rightarrow 0.0685 = \frac{(550 - X)}{550} = X3 = 546.2325$$

**3. Defuzzy: get the result**

$$\begin{aligned} Z &= \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3}{\mu(k1) + \mu(k2) + \mu(k3)} \\ &= \frac{[0.9315X (512.325)] + [0.0685X - 489.0375] + [0.0685X 546.2325]}{0.9315 + 0.0685 + 0.0685} = \mathbf{450} \end{aligned}$$

***Sampling no. 17***

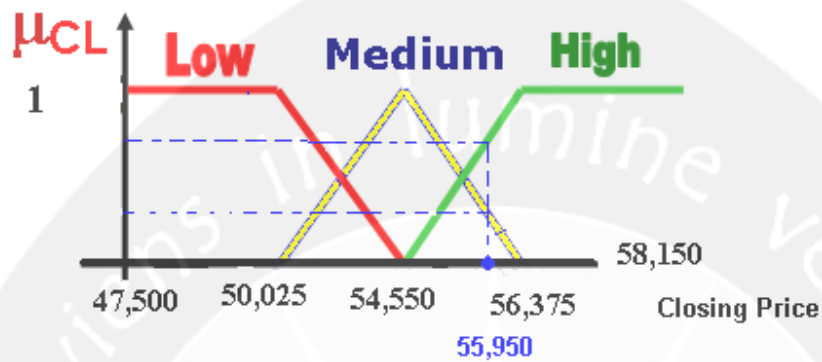
**1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 55,950               | 2,896,500           | 4.6122449  | 0.07387755 |

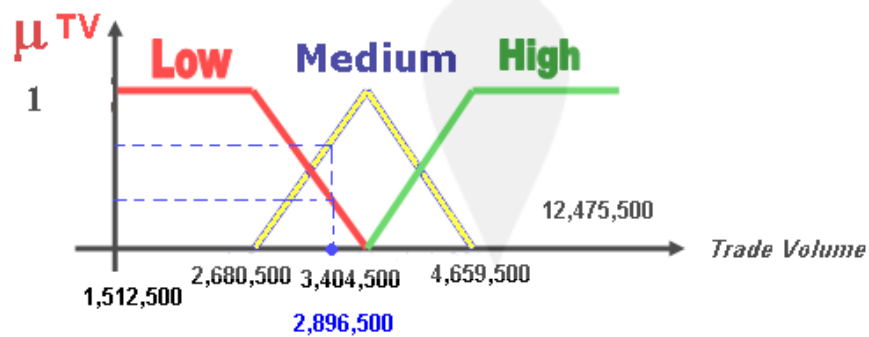
### A. Closing Price Variable



$$\text{Closing Price Med: } \frac{(C - X)}{(C - B)} = \frac{56,375 - 55,950}{56,375 - 54,550} = 0.2329$$

$$\text{Closing Price High: } \frac{(X - A)}{(B - A)} = \frac{55,950 - 54,550}{56,375 - 54,550} = 0.7671$$

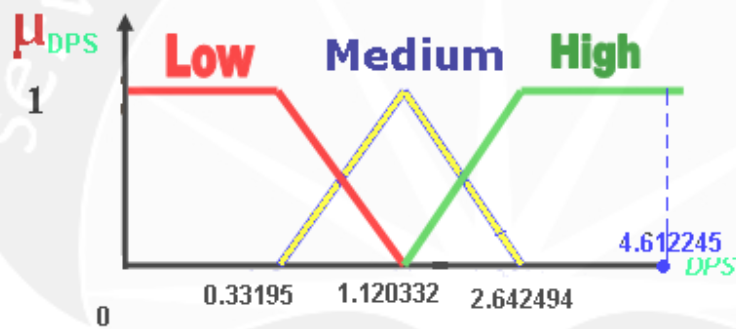
### B. Trade Volume Variable



$$\text{Trade Volume Low: } \frac{(D - X)}{(D - C)} = \frac{3,404,500 - 2,896,500}{3,404,500 - 2,680,500} = 0.7017$$

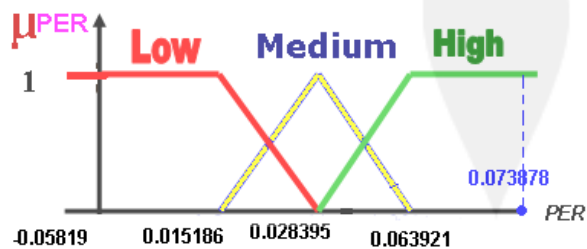
$$\text{Trade Volume Med: } \frac{(X - A)}{(B - A)} = \frac{2,896,500 - 2,680,500}{3,404,500 - 2,680,500} = 0.2983$$

### C. DPS Variable



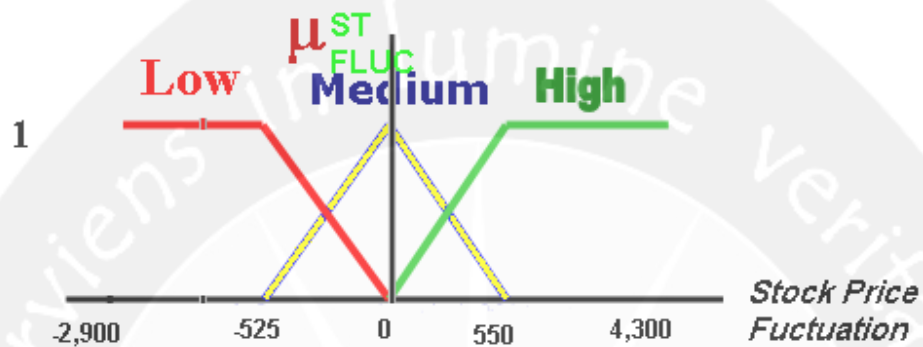
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 3. Fuzzy operator application: Match with the rules

[R1] If Closing Price is High then Stock Fluctuation = Medium

$$X1 \rightarrow 0,7671 = \frac{(X - 0)}{550} = 421.905$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

$$X2 \rightarrow 0.2329 = \frac{(X + 525)}{525} = X2 = -402,7275$$

$$X3 \rightarrow 0.2329 = \frac{(550 - X)}{550} = X3 = 421,905$$

#### 4. Defuzzy: get the result

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3}{\mu(k1) + \mu(k2) + \mu(k3)}$$

$$= \frac{[0,7671 \times (421.905)] + [0.2329 \times -402,7275] + [0.2329 \times 421,905]}{0,7671 + 0.2329 + 0.2329} = \mathbf{266,1285}$$

### ***Sampling no. 18***

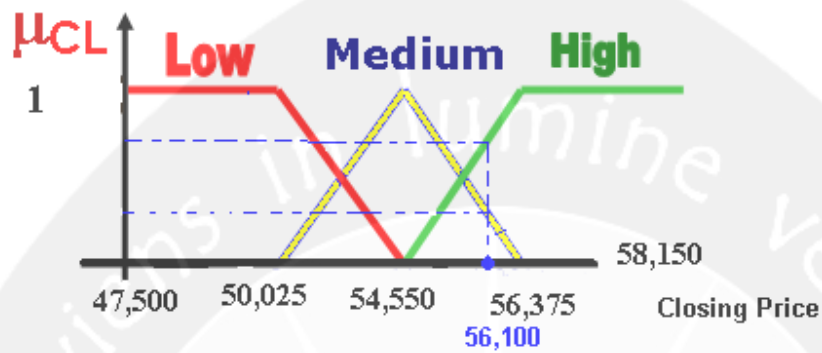
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 56,100               | 3,365,500           | 4.6122449  | 0.07387755 |

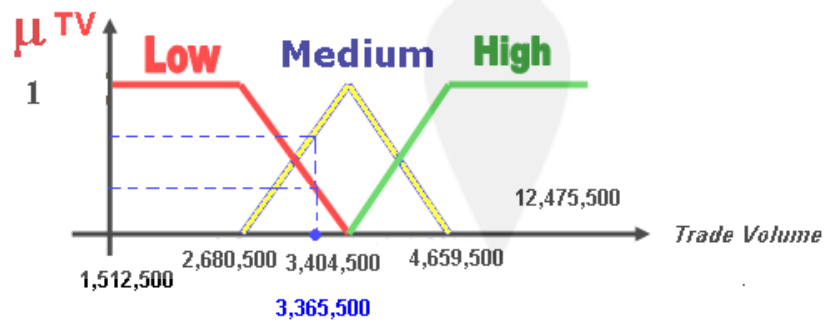
### A. Closing Price Variable



$$\text{Closing Price Med: } \frac{(C - X)}{(C - B)} = \frac{56,375 - 56,100}{56,375 - 54,550} = 0.1507$$

$$\text{Closing Price High: } \frac{(X - A)}{(B - A)} = \frac{56,100 - 54,550}{56,375 - 54,550} = 0.8493$$

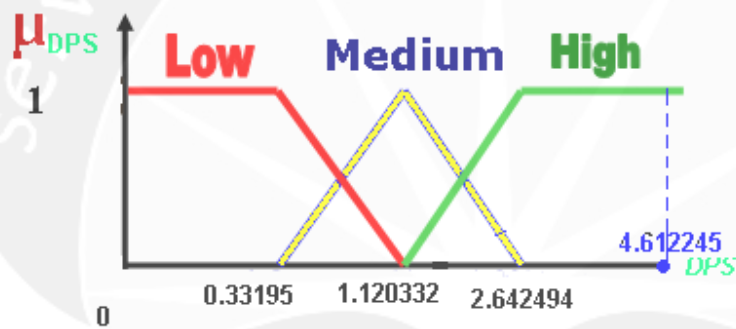
### B. Trade Volume Variable



$$\text{Trade Volume Low: } \frac{(D - X)}{(D - C)} = \frac{3,404,500 - 3,365,500}{3,404,500 - 2,680,500} = 0.0539$$

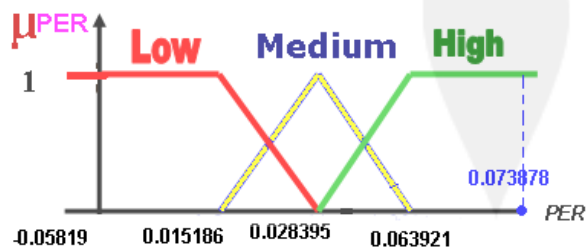
$$\text{Trade Volume Med: } \frac{(X - A)}{(B - A)} = \frac{3,365,500 - 2,680,500}{3,404,500 - 2,680,500} = 0.9461$$

### C. DPS Variable



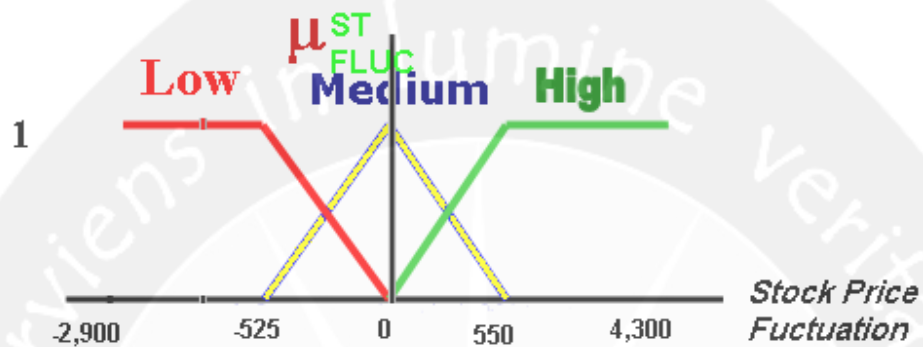
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

#### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

#### 4. Fuzzy operator application: Match with the rules

[R1] If Closing Price is High then Stock Fluctuation = Medium

$$X1 \rightarrow 0.8493 = \frac{(X - 0)}{550} = 467.115$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

Operator used is AND function, therefore:

$$X2 \rightarrow 0.1507 = \frac{(X + 525)}{525} = X2 = -445,8825$$

$$X3 \rightarrow 0.1507 = \frac{(550 - X)}{550} = X3 = 467,115$$

##### 5. Defuzzy: get the result

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3}{\mu(k1) + \mu(k2) + \mu(k3)}$$

$$= \frac{[0.8493 \times 467.115] + [0.1507 \times -445,8825] + [0.1507 \times 467.115]}{0.8493 + 0.1507 + 0.1507} = 389,1944$$

***Sampling no. 19***

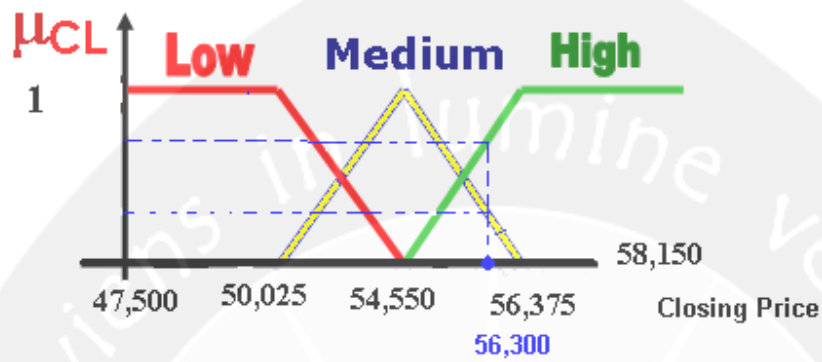
**1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| Closing Price | Trade Volume | DPS       | PER        |
|---------------|--------------|-----------|------------|
| 56,300        | 2,491,000    | 4.6122449 | 0.07387755 |

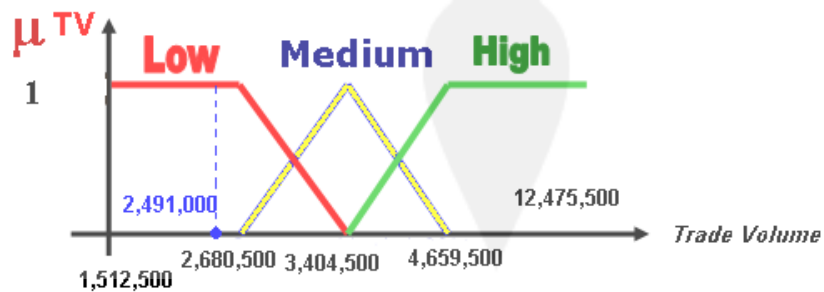
### A. Closing Price Variable



$$\text{Closing Price Med: } \frac{(C - X)}{(C - B)} = \frac{56,375 - 56,300}{56,375 - 54,550} = 0.0411$$

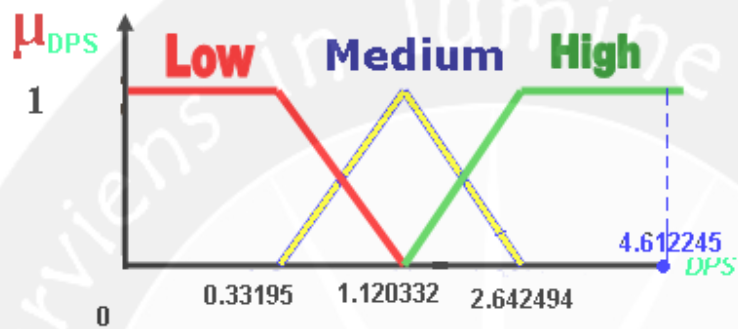
$$\text{Closing Price High: } \frac{(X - A)}{(B - A)} = \frac{56,300 - 54,550}{56,375 - 54,550} = 0.9589$$

### B. Trade Volume Variable



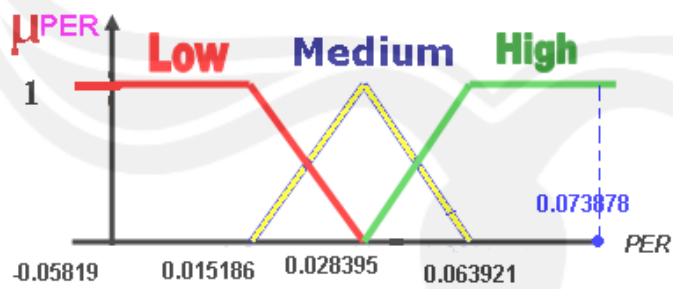
Trade Volume Low:  $\mu = 1$

C. DPS Variable



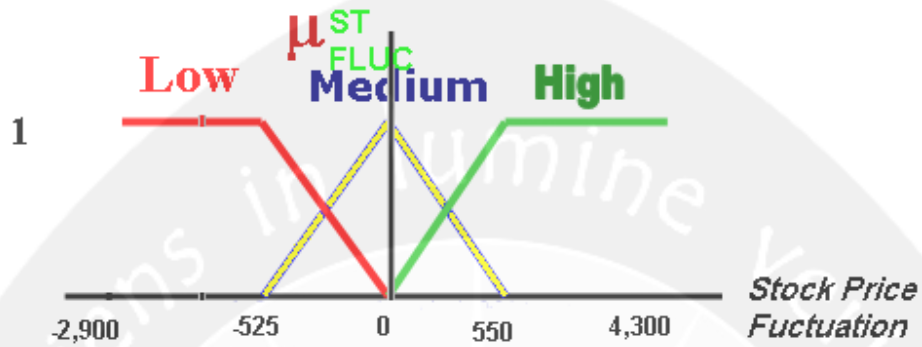
DPS High:  $\mu = 1$

D. PER Variable



PER High:  $\mu = 1$

## E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

## 2. Fuzzy operator application: Match with the rules

[R1] If Closing Price is High then Stock Fluctuation = Medium

$$X1 \rightarrow 0.9589 = \frac{(X - 0)}{550} = X1 = 527,395$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

$$X2 \rightarrow 0.0411 = \frac{(X + 525)}{525} = X2 = -503,4225$$

$$X3 \rightarrow 0.0411 = \frac{(550 - X)}{550} = X3 = 527,395$$

**3. Defuzzy: get the result**

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3}{\mu(k1) + \mu(k2) + \mu(k3)}$$

$$= \frac{[0.9589 \times (527,395)] + [0.0411 \times -503,4225] + [0.0411 \times 527,395]}{0.9589 + 0.0411 + 0.0411} = \mathbf{486,7404}$$

***Sampling no. 20***

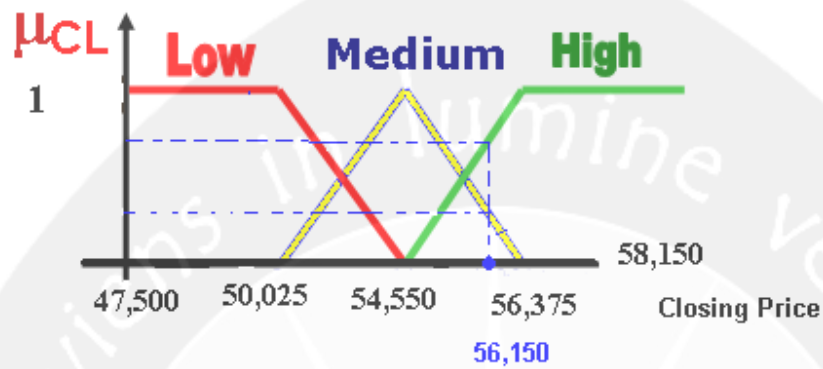
**1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| Closing Price | Trade Volume | DPS       | PER        |
|---------------|--------------|-----------|------------|
| 56,150        | 3,192,500    | 4.6122449 | 0.07387755 |

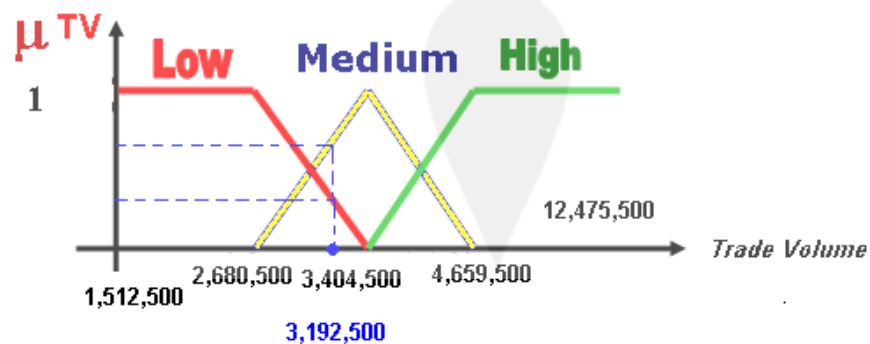
### A. Closing Price Variable



$$\text{Closing Price Med: } \frac{(C - X)}{(C - B)} = \frac{56,375 - 56,150}{56,375 - 54,550} = 0.1233$$

$$\text{Closing Price High: } \frac{(X - A)}{(B - A)} = \frac{56,150 - 54,550}{56,375 - 54,550} = 0.8767$$

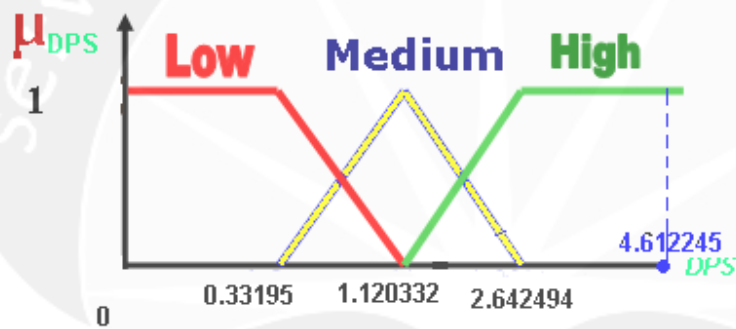
### B. Trade Volume Variable



$$\text{Trade Volume Low: } \frac{(D - X)}{(D - C)} = \frac{3,404,500 - 3,192,500}{3,404,500 - 2,680,500} = 0.2928$$

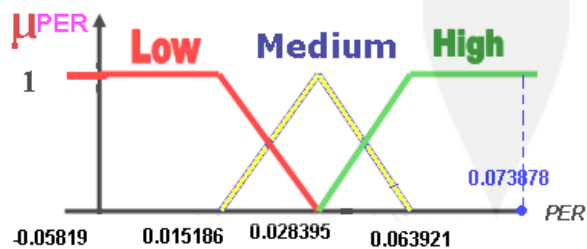
$$\text{Trade Volume Med: } \frac{(X - A)}{(B - A)} = \frac{3,192,500 - 2,680,500}{3,404,500 - 2,680,500} = 0.7072$$

### C. DPS Variable



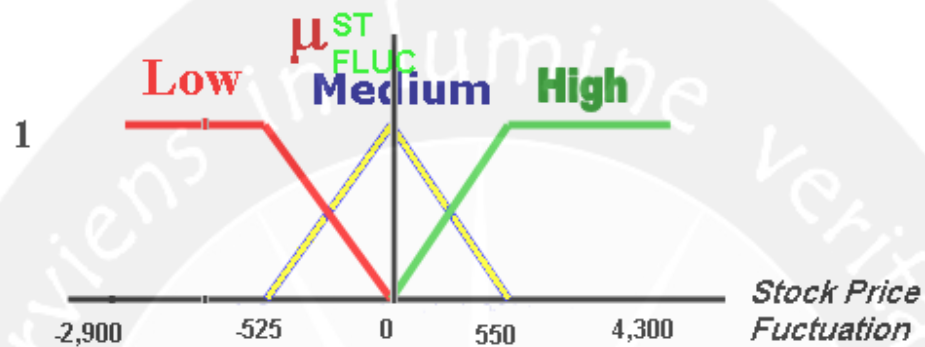
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 2. Fuzzy operator application: Match with the rules

[R1] If Closing Price is High then Stock Fluctuation = Medium

$$X1 \rightarrow 0.8767 = \frac{(X - 0)}{550} = 482,185$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

$$X2 \rightarrow 0.1233 = \frac{(X + 525)}{525} = X2 = -460,2675$$

$$X3 \rightarrow 0.1233 = \frac{(550 - X)}{550} = X3 = 482,185$$

### 3. Defuzzy: get the result

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3}{\mu(k1) + \mu(k2) + \mu(k3)}$$

$$= \frac{[0.8767 X (421.905)] + [0.1233 X -402,7275] + [0.1233 X 421,905]}{0.8767 + 0.1233 + 0.1233} = \mathbf{361,0432}$$

### ***Sampling no. 21***

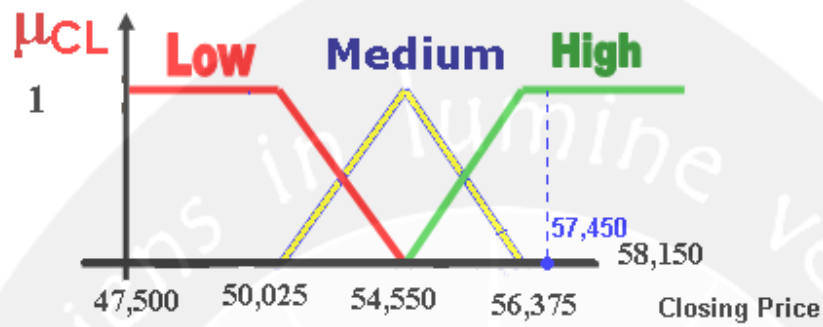
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

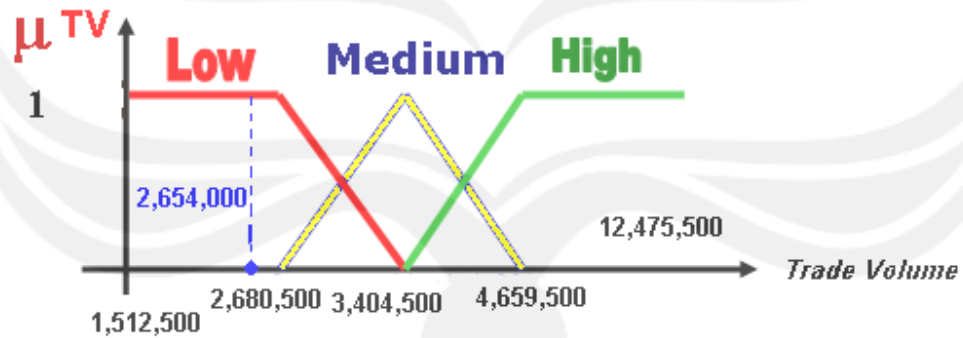
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 57,450               | 2,654,000           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



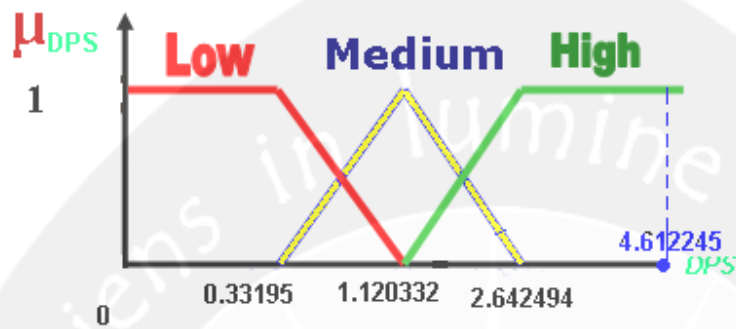
High:  $\mu = 1$

### B. Trade Volume Variable



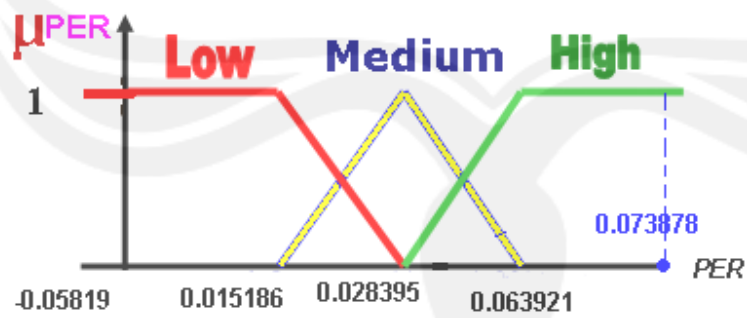
Trade Volume Low:  $\mu = 1$

### C. DPS Variable



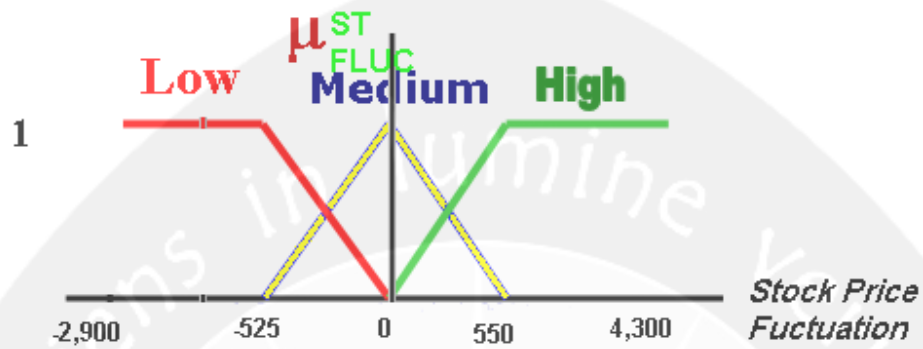
DPS High:  $\mu = 1$

### D. PER Variable



PER High:  $\mu = 1$

## E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

## 2. Fuzzy operator application: Match with the rules

[R1] If Closing Price is High then Stock Fluctuation = Medium

$$1 = \frac{(X - 0)}{550} \rightarrow X = 550$$

**3. Defuzzy: get the result**

$$Z = \frac{\mu(k1) \times k1}{\mu(k1)} = \frac{1 \times (550)}{1} = 550$$



## ***Sampling no. 22***

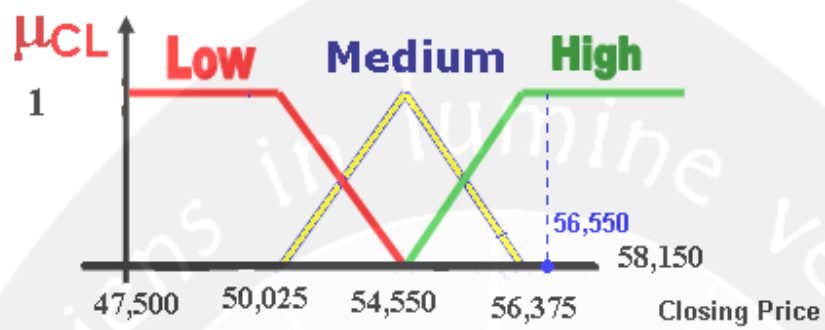
### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

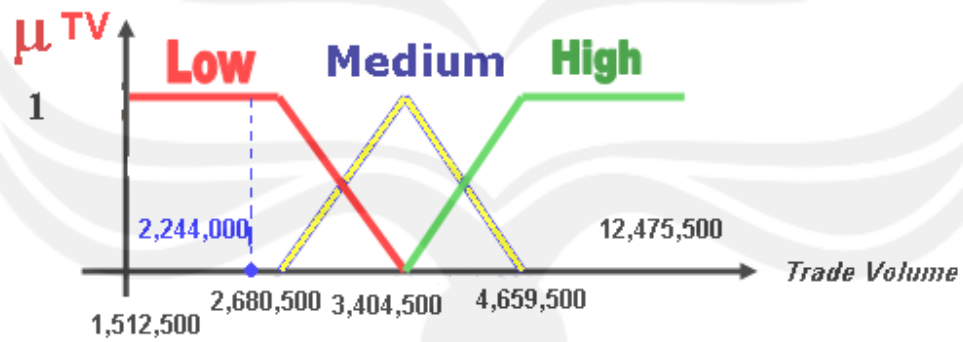
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 56,550               | 2,244,000           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



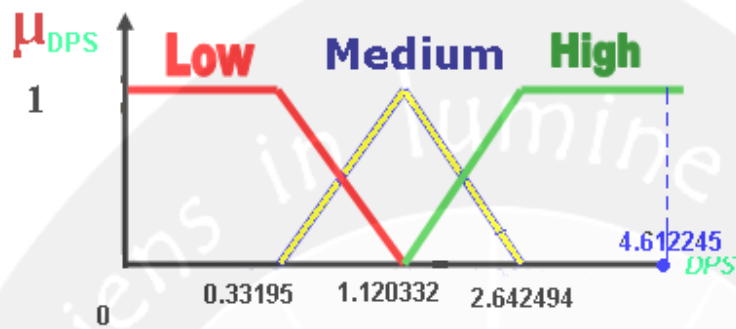
High:  $\mu = 1$

### B. Trade Volume Variable



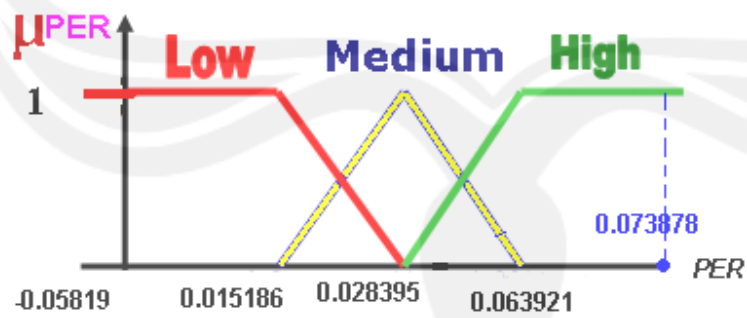
Trade Volume Low:  $\mu = 1$

### C. DPS Variable



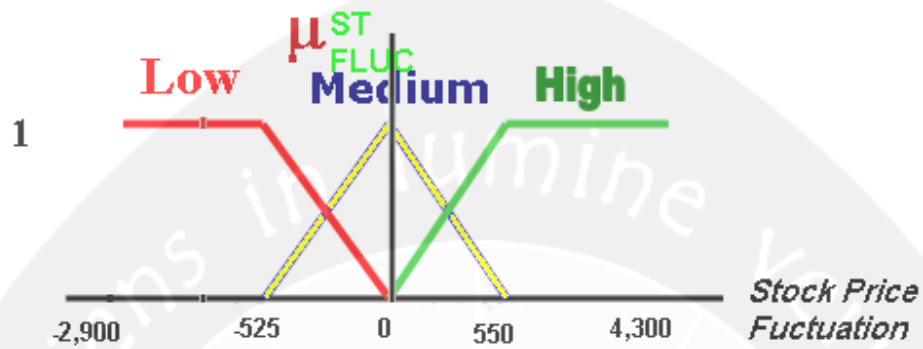
DPS High:  $\mu = 1$

### D. PER Variable



PER High:  $\mu = 1$

## E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

## 2. Fuzzy operator application: Match with the rules

[R1] If Closing Price is High then Stock Fluctuation = Medium

$$1 = \frac{(X - 0)}{550} \rightarrow X = 550$$

3. **Defuzzy: get the result**

$$Z = \frac{\mu(k1) \times k1}{\mu(k1)} = \frac{1 \times (550)}{1} = 550$$



### ***Sampling no. 23***

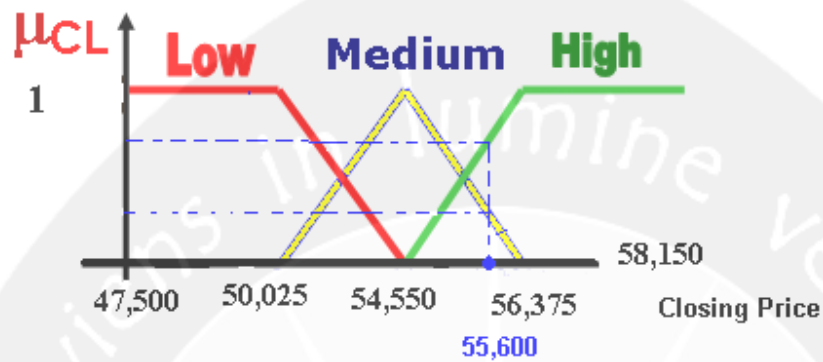
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 55,600               | 5,503,000           | 4.6122449  | 0.07387755 |

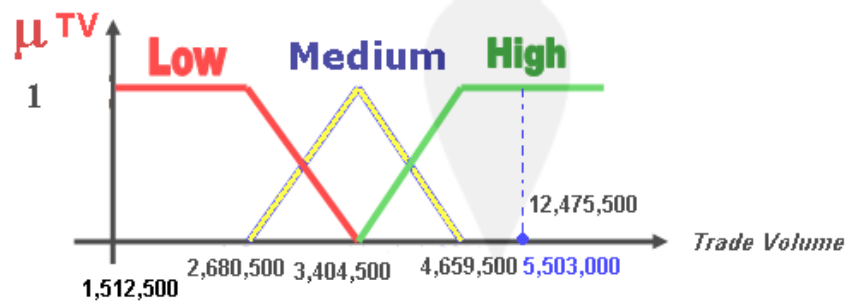
### A. Closing Price Variable



$$\text{Closing Price Med: } \frac{(C - X)}{(C - B)} = \frac{56,375 - 55,600}{56,375 - 54,550} = 0.4247$$

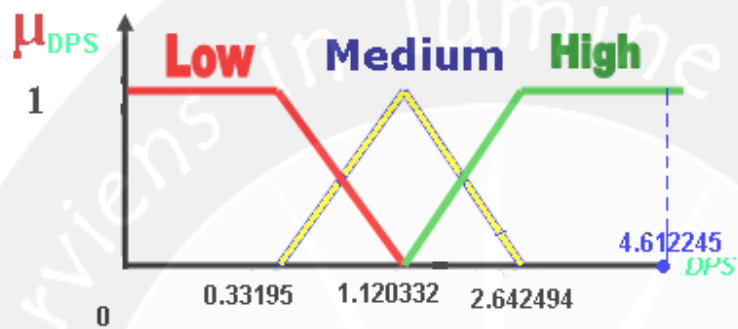
$$\text{Closing Price High: } \frac{(X - A)}{(B - A)} = \frac{55,600 - 54,550}{56,375 - 54,550} = 0.5753$$

### B. Trade Volume Variable



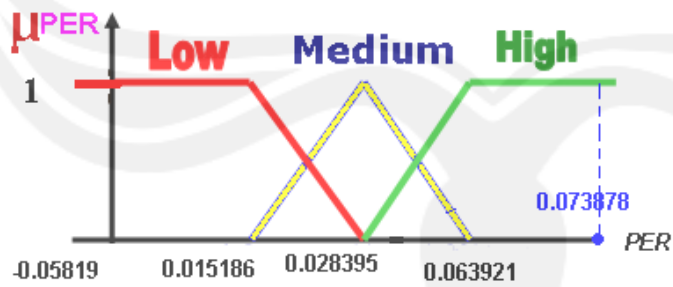
Trade Volume High:  $\mu = 1$

C. DPS Variable



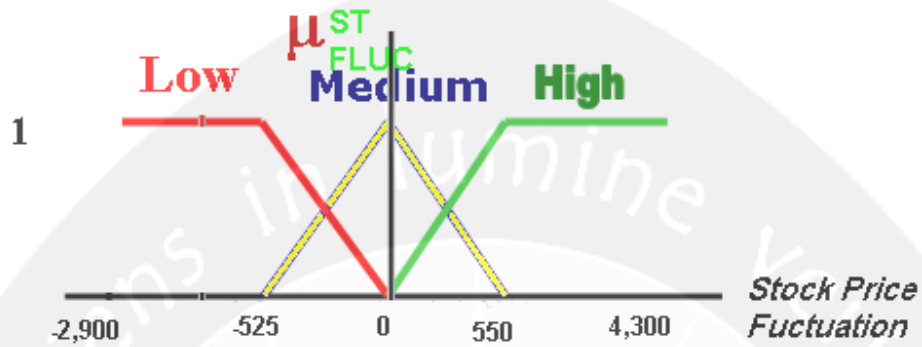
DPS High:  $\mu = 1$

D. PER Variable



PER High:  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 2. Fuzzy operator application: Match with the rules

[R1] If Closing Price is High then Stock Fluctuation = Medium

$$X1 \rightarrow 0.5753 = \frac{(X - 0)}{550} = X1 = 316.415$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

$$X2 \rightarrow 0.4247 = \frac{(X + 525)}{525} = X2 = -302,0325$$

$$X3 \rightarrow 0.4247 = \frac{(550 - X)}{550} = X3 = 316,415$$

**3. Defuzzy: get the result**

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3}{\mu(k1) + \mu(k2) + \mu(k3)}$$

$$= \frac{[0.5753 \times (316.415)] + [0.4247 \times -302,0325] + [0.4247 \times 316,415]}{0.5753 + 0.4247 + 0.4247} = \mathbf{132,0571}$$

### ***Sampling no. 24***

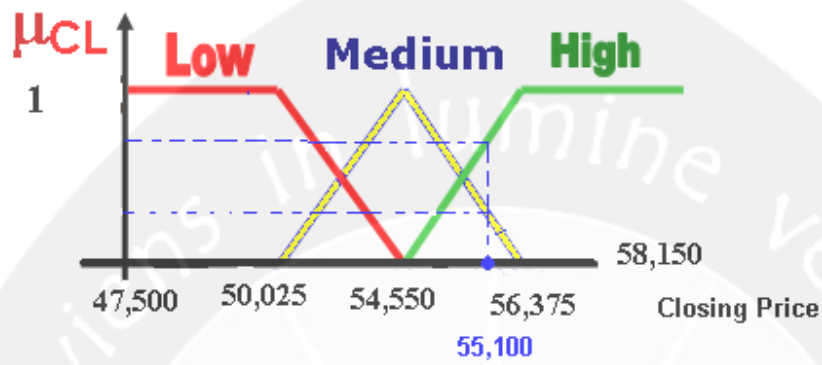
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 55,100               | 5,760,500           | 4.6122449  | 0.07387755 |

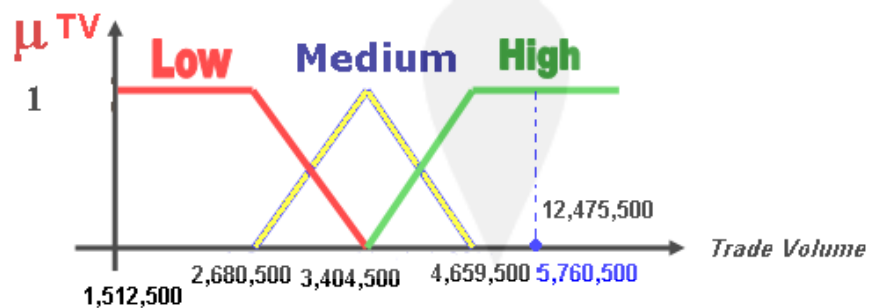
### A. Closing Price Variable



$$\text{Closing Price Med: } \frac{(C - X)}{(C - B)} = \frac{56,375 - 55,100}{56,375 - 54,550} = 0.6986$$

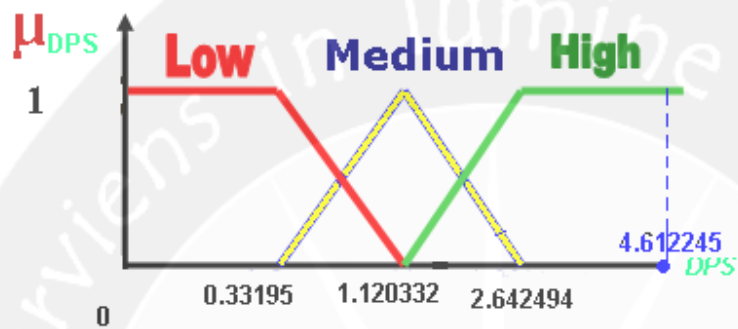
$$\text{Closing Price High: } \frac{(X - A)}{(B - A)} = \frac{55,100 - 54,550}{56,375 - 54,550} = 0.3014$$

### B. Trade Volume Variable



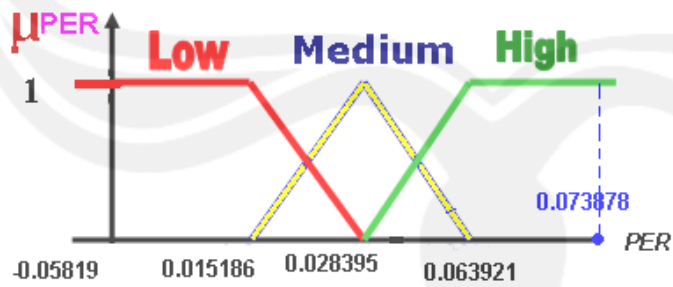
Trade Volume High:  $\mu = 1$

C. DPS Variable



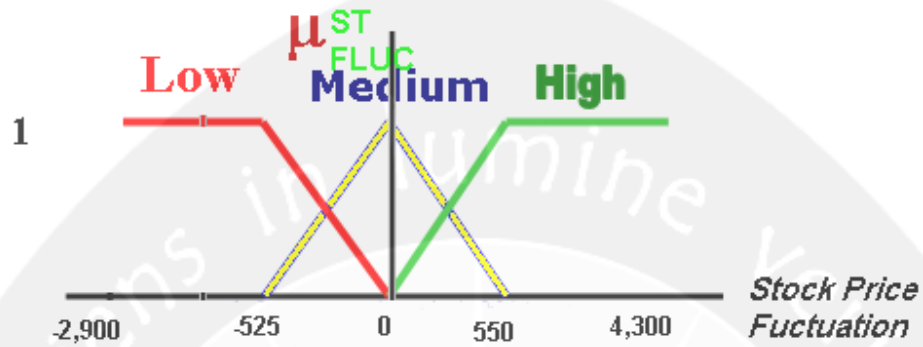
DPS High:  $\mu = 1$

D. PER Variable



PER High:  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 3. Fuzzy operator application: Match with the rules

[R1] If Closing Price is High then Stock Fluctuation = Medium

$$X1 \rightarrow 0.3014 = \frac{(X - 0)}{550} = X1 = 165.72$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

$$X2 \rightarrow 0.6986 = \frac{(X + 525)}{525} = X2 = -158.235$$

$$X3 \rightarrow 0.6986 = \frac{(550 - X)}{550} = X3 = 165.77$$

**4. Defuzzy: get the result**

$$\begin{aligned} Z &= \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3}{\mu(k1) + \mu(k2) + \mu(k3)} \\ &= \frac{[0.3014 \times (165.72)] + [0.6986 \times -158.235] + [0.6986 \times 165.77]}{0.5753 + 0.6986 + 0.6986} = \mathbf{33} \end{aligned}$$

### ***Sampling no. 25***

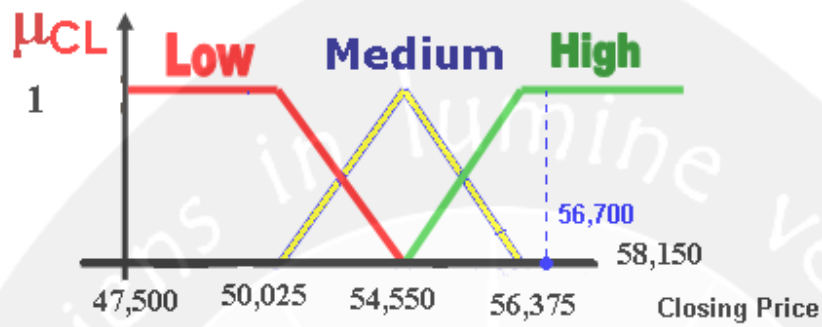
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

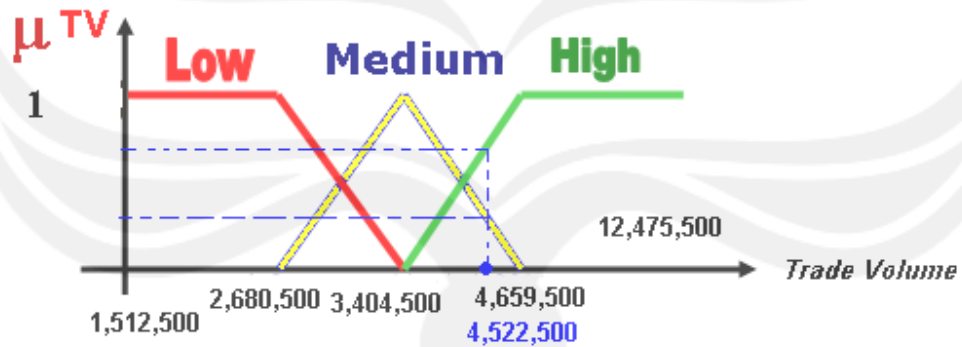
| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 56,700               | 4,522,500           | 4.6122449  | 0.07387755 |

### A. Closing Price Variable



High:  $\mu = 1$

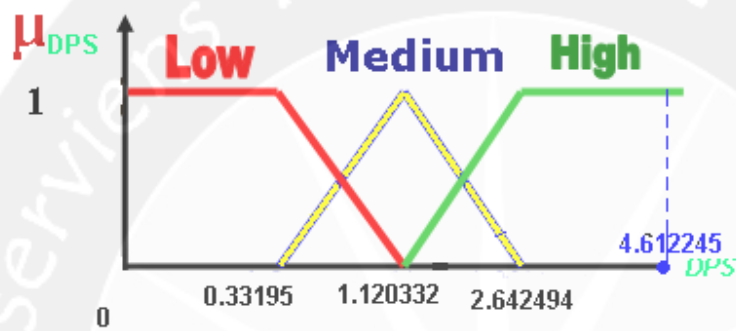
### B. Trade Volume Variable



$$\text{Trade Volume Med: } \frac{(C - X)}{(C - B)} = \frac{4,659,500 - 4,522,500}{4,659,500 - 3,404,500} = 0.1092$$

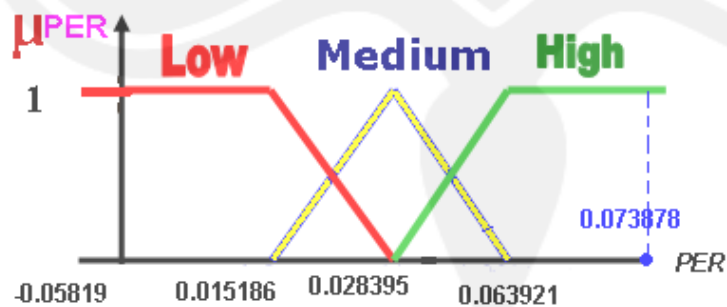
$$\text{Trade Volume High: } \frac{(X - A)}{(B - A)} = \frac{4,522,500 - 3,404,500}{4,659,500 - 3,404,500} = 0.8908$$

### C. DPS Variable



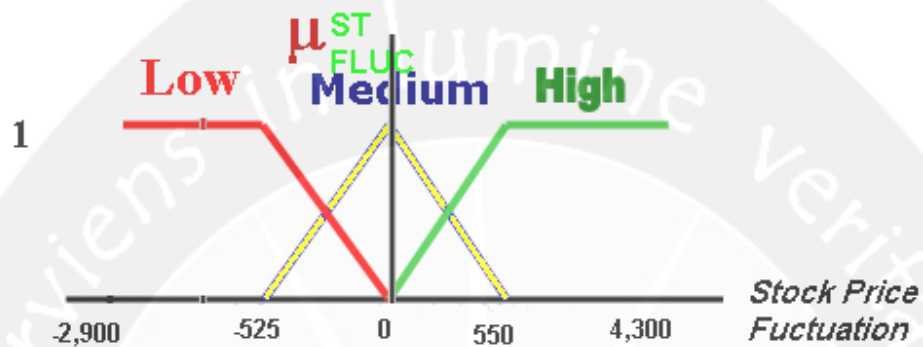
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 3. Fuzzy operator application: Match with the rules

[R1] If Closing Price is High then Stock Fluctuation = Medium

$$1 = \frac{(X - 0)}{550} \rightarrow X = 550$$

### ***Sampling no. 26***

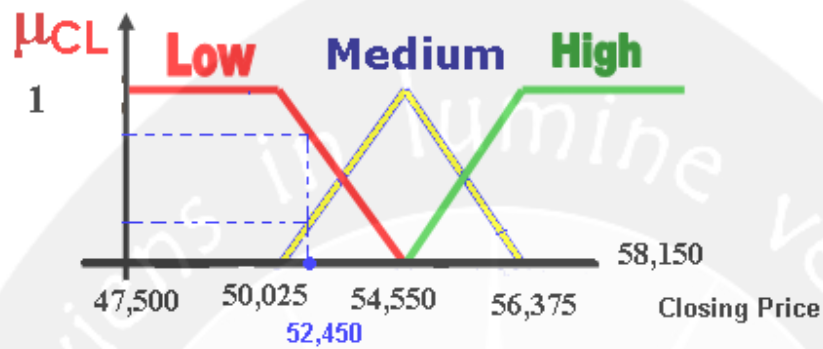
#### **1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 52,450               | 4,301,500           | 4.6122449  | 0.07387755 |

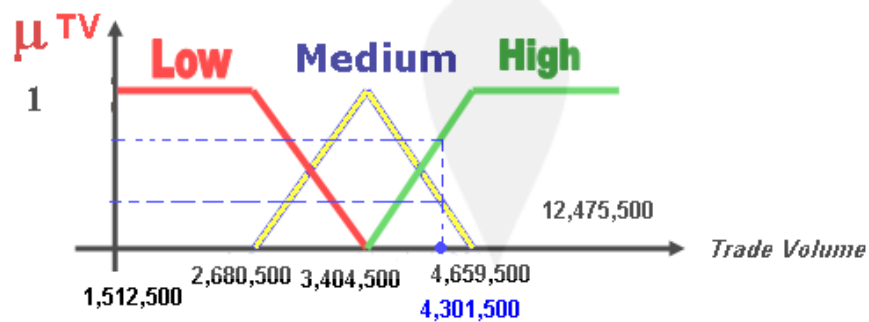
### A. Closing Price Variable



$$\text{Closing Price Low: } \frac{(D - X)}{(D - C)} = \frac{54,550 - 52,450}{54,550 - 50,025} = 0.4641$$

$$\text{Closing Price Med: } \frac{(X - A)}{(B - A)} = \frac{52,450 - 50,025}{54,550 - 50,025} = 0.5359$$

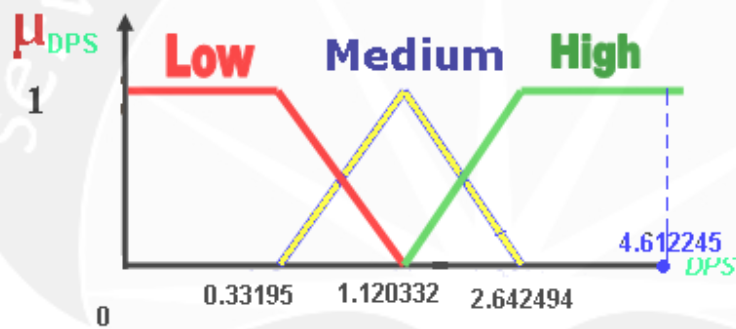
### B. Trade Volume Variable



$$\text{Trade Volume Med: } \frac{(C - X)}{(C - B)} = \frac{4,659,500 - 4,301,500}{4,659,500 - 3,404,500} = 0.2853$$

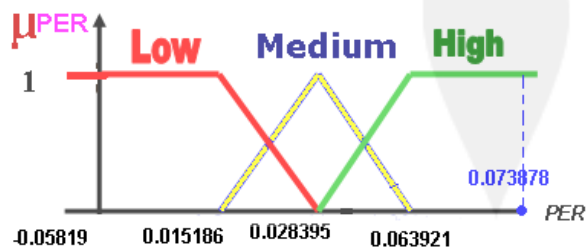
$$\text{Trade Volume High: } \frac{(X - A)}{(B - A)} = \frac{4,301,500 - 4,659,500}{4,659,500 - 3,404,500} = 0.7147$$

### C. DPS Variable



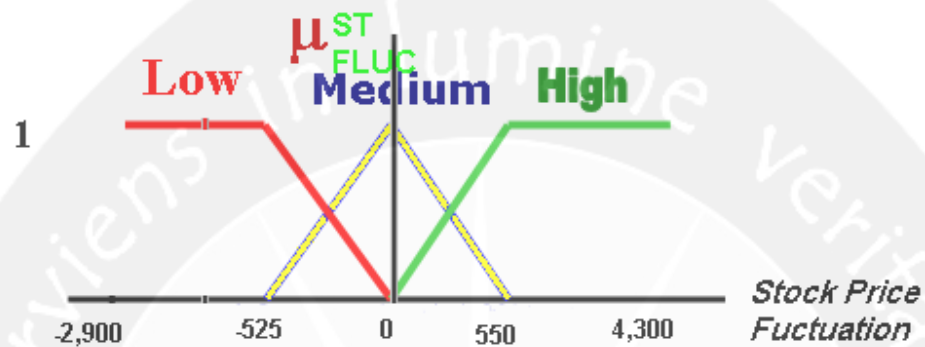
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

#### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

#### 5. Fuzzy operator application: Match with the rules

[R2] If Closing Price is Low and Trade Volume is High then Stock Fluctuation=  
Medium

Operator used is AND function, therefore:

$$= \min(\mu [\text{Closing Price}], \mu [\text{TradeVolume}])$$

$$= \min(0.4641; 0.7147) = 0.4641$$

$$X1 \rightarrow 0.4641 = \frac{(X + 525)}{525} = X1 = -281.3475$$

$$X2 \rightarrow 0.4641 = \frac{(550 - X)}{550} = X2 = 294.745$$

[R6] If Closing Price is Low and Trade Volume is Medium and DPS is High then  
Stock Fluctuation= Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{Closing Price}], \mu [\text{TradeVolume}])$$

$$= \min(0.4641; 0.2853) = 0.4641$$

$$X3 \rightarrow 0.2853 = \frac{(0 - X)}{525} = X3 = -149.7825$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

Operator used is AND function, therefore:

$$= \min(\mu [\text{Closing Price}], \mu [\text{TradeVolume}])$$

$$= \min(0.5359; 0.7147) = 0.4641$$

$$X4 \rightarrow 0.5359 = \frac{(X + 525)}{525} = X4 = -243.6525$$

$$X5 \rightarrow 0.5359 = \frac{(550 - X)}{550} = X5 = 255.255$$

### 3. Defuzzy: get the result

$$Z = \frac{\mu(k1)xk1 + \mu(k2)xk2 + \mu(k3)xk3 + \mu(k4)xk4 + \mu(k5)xk5}{\mu(k1) + \mu(k2) + \mu(k3) + \mu(k4) + \mu(k5)}$$

$$\frac{[0.4641X(-281.3475)] + [0.4641X 294.745] + [0.2853X -149.7825] + [0.5359X - 243.6525] + [0.5359X 255.255]}{0.4641 + 0.2329 + 0.2853 + 0.5359 + 0.5359}$$

$$= \textbf{-13,2595}$$

***Sampling no. 27***

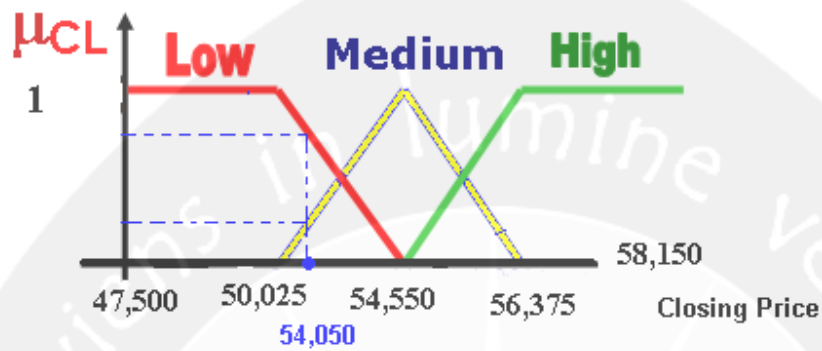
**1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| Closing Price | Trade Volume | DPS       | PER        |
|---------------|--------------|-----------|------------|
| 54,050        | 4,618,500    | 4.6122449 | 0.07387755 |

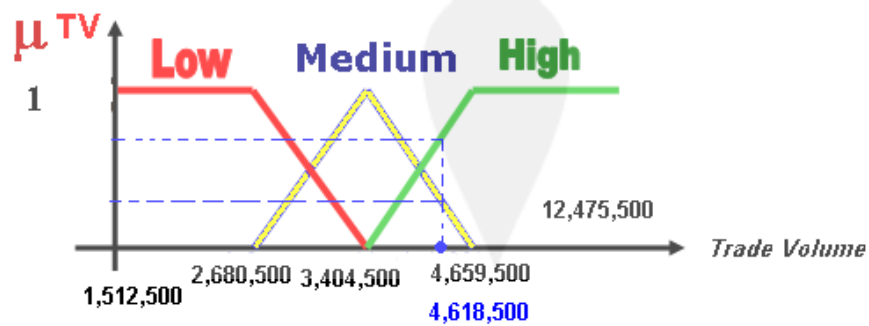
### A. Closing Price Variable



$$\text{Closing Price Low: } \frac{(D - X)}{(D - C)} = \frac{54,550 - 54,050}{54,550 - 50,025} = 0.1105$$

$$\text{Closing Price Med: } \frac{(X - A)}{(B - A)} = \frac{54,050 - 50,025}{54,550 - 50,025} = 0.8895$$

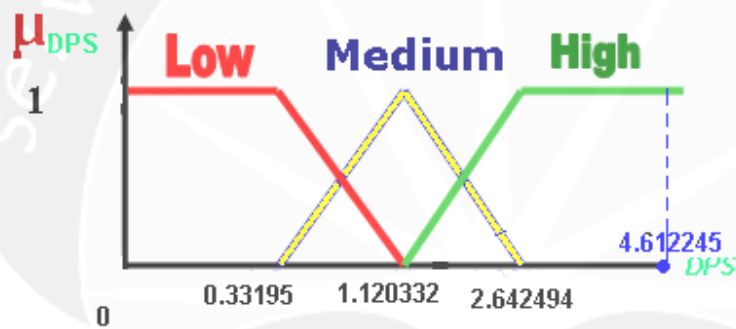
### B. Trade Volume Variable



$$\text{Trade Volume Med: } \frac{(C - X)}{(C - B)} = \frac{4,659,500 - 4,618,500}{4,659,500 - 3,404,500} = 0.0327$$

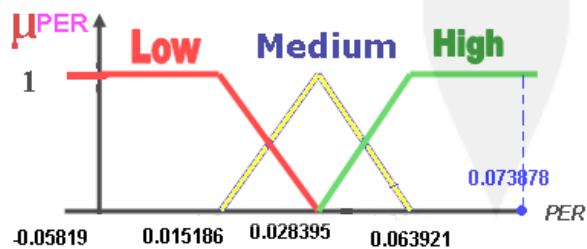
$$\text{Trade Volume High: } \frac{(X - A)}{(B - A)} = \frac{4,618,500 - 4,659,500}{4,659,500 - 3,404,500} = 0.9673$$

### C. DPS Variable



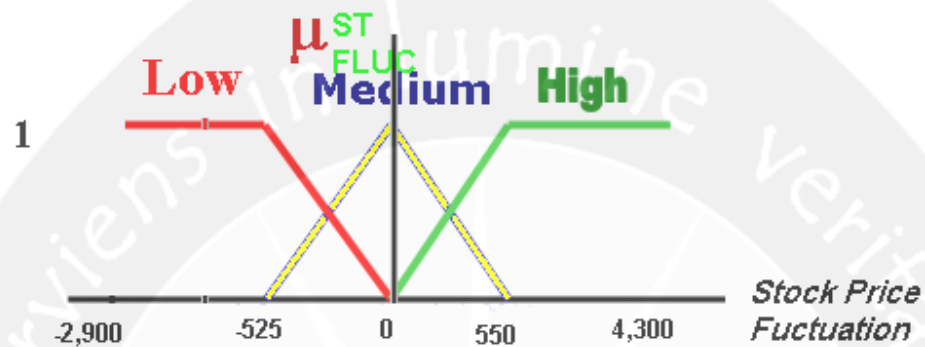
DPS High:  $\mu = 1$

### D. PER Variable



**PER High:**  $\mu = 1$

### E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

### 2. Fuzzy operator application: Match with the rules

[R2] If Closing Price is Low and Trade Volume is High then Stock Fluctuation=

Medium

Operator used is AND function, therefore:

$$= \min(\mu [\text{Closing Price}], \mu [\text{TradeVolume}])$$

$$= \min(0.1105; 0.9673) = 0.1105$$

$$X1 \rightarrow 0.1105 = \frac{(X + 525)}{525} = X1 = -466.9875$$

$$X2 \rightarrow 0.1105 = \frac{(550 - X)}{550} = X2 = 489.225$$

[R6] If Closing Price is Low and Trade Volume is Medium and DPS is High then  
Stock Fluctuation= Low

Operator used is AND function, therefore:

$$= \min(\mu [\text{Closing Price}], \mu [\text{TradeVolume}])$$

$$= \min(0.1105; 0.0327) = 0.0327$$

$$X3 \rightarrow 0.0327 = \frac{(0 - X)}{525} = X3 = -17.1675$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

Operator used is AND function, therefore:

$$= \min(\mu [\text{Closing Price}], \mu [\text{TradeVolume}])$$

$$= \min(0.8895; 0.9673) = 0.8895$$

$$X4 \rightarrow 0.8895 = \frac{(X + 525)}{525} = X4 = -58.0125$$

$$X5 \rightarrow 0.8895 = \frac{(550 - X)}{550} = X5 = 60.775$$

#### 4. Defuzzy: get the result

$$Z = \frac{\mu(k1)xk1 + \mu(k2)xk2 + \mu(k3)xk3 + \mu(k4)xk4 + \mu(k5)xk5}{\mu(k1) + \mu(k2) + \mu(k3) + \mu(k4) + \mu(k5)}$$

$$\frac{[0.1105X(-281.3475)] + [0.1105X 294.745] + [0.0327X -17.1675] + [0.8895X -58.0125] + [0.8895X 60.775]}{0.1105 + 0.1105 + 0.0327 + 0.8895 + 0.8895}$$

$$= \mathbf{2,1415}$$

***Sampling no. 28***

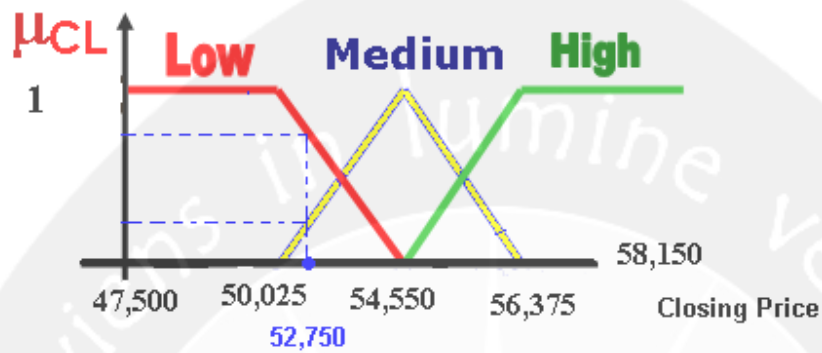
**1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| Closing Price | Trade Volume | DPS       | PER        |
|---------------|--------------|-----------|------------|
| 52,750        | 5,952,000    | 4.6122449 | 0.07387755 |

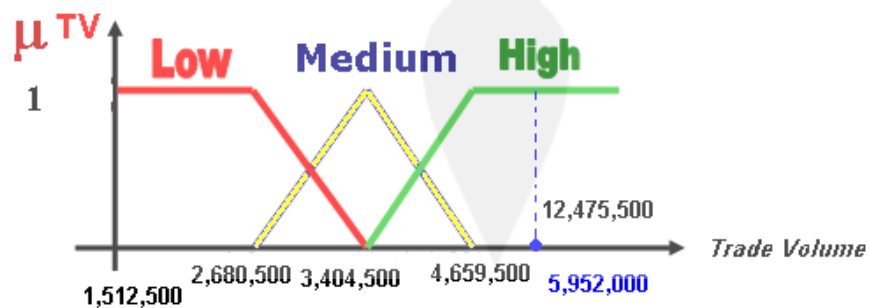
### A. Closing Price Variable



$$\text{Closing Price Low: } \frac{(C - X)}{(C - B)} = \frac{54,550 - 52,750}{54,550 - 50,025} = 0.3978$$

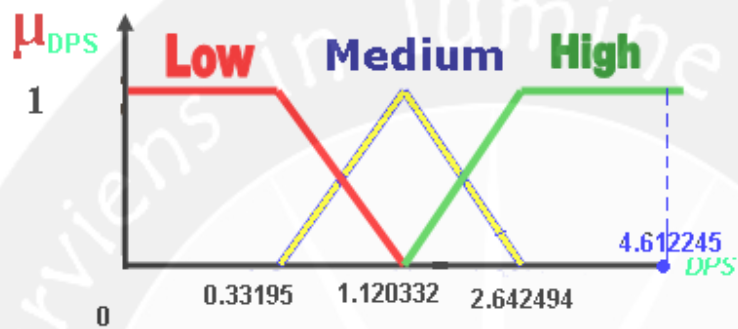
$$\text{Closing Price Med: } \frac{(X - A)}{(B - A)} = \frac{52,50900 - 50,025}{54,550 - 50,025} = 0.6022$$

### B. Trade Volume Variable



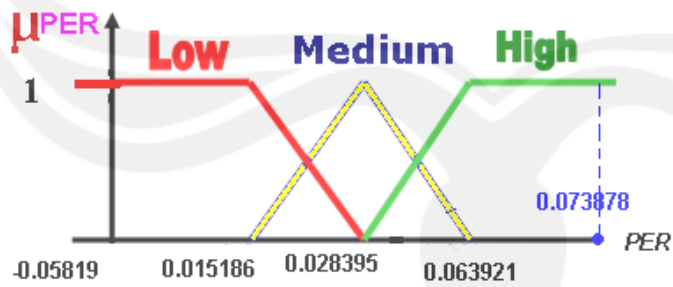
Trade Volume High:  $\mu = 1$

C. DPS Variable



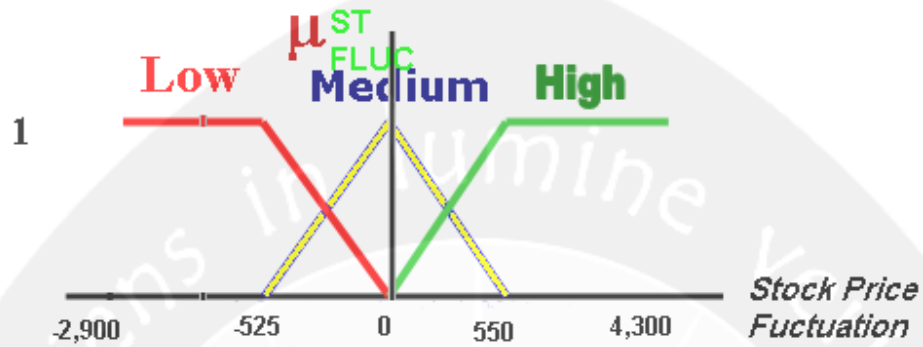
DPS High:  $\mu = 1$

D. PER Variable



PER High:  $\mu = 1$

## E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

## 2. Fuzzy operator application: Match with the rules

[R2] Closing Price is Low and Trade Volume is High then Stock Fluctuation=

Medium

$$X1 \rightarrow 0.3978 = \frac{(X + 525)}{550} = X1 = -316.155$$

$$X2 \rightarrow 0.3978 = \frac{(550 - X)}{550} = X2 = 331.21$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

$$X3 \rightarrow 0.6022 = \frac{(X + 525)}{525} = X3 = -208.845$$

$$X4 \rightarrow 0.6022 = \frac{(550 - X)}{550} = X4 = 218.79$$

### 3. Defuzzy: get the result

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3 + \mu(k4) \times k4}{\mu(k1) + \mu(k2) + \mu(k3) + \mu(k4)}$$

=

$$\frac{[0.3978 \times (-316.155)] + [0.3978 \times 331.21] + [0.6022 \times 218.79] + [0.6022 \times -208.845]}{0.3978 + 0.3978 + 0.6022 + 0.6022}$$

= **6**

***Sampling no. 29***

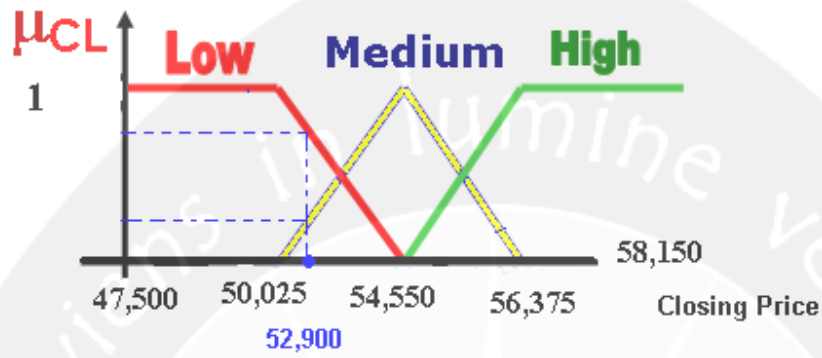
**1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

| <b>Closing Price</b> | <b>Trade Volume</b> | <b>DPS</b> | <b>PER</b> |
|----------------------|---------------------|------------|------------|
| 52,900               | 4,700,500           | 4.6122449  | 0.07387755 |

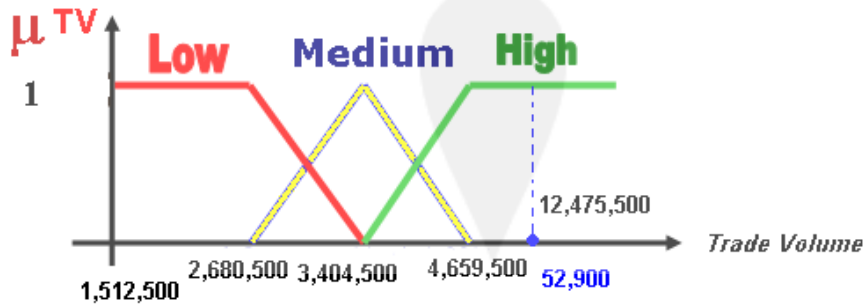
### A. Closing Price Variable



$$\text{Closing Price Low: } \frac{(D - X)}{(D - C)} = \frac{54,550 - 52,900}{54,550 - 50,025} = 0.3978$$

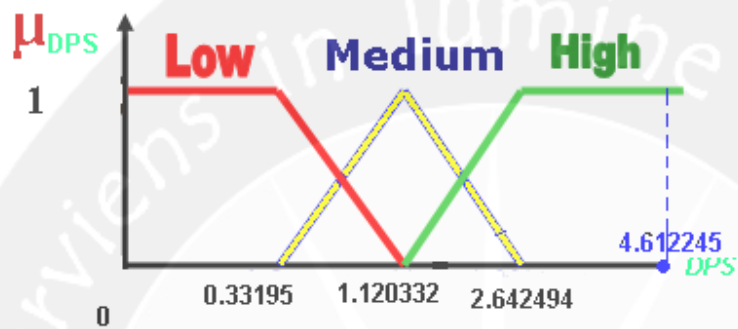
$$\text{Closing Price Med: } \frac{(X - A)}{(B - A)} = \frac{52,900 - 50,025}{54,550 - 50,025} = 0.6022$$

### B. Trade Volume Variable



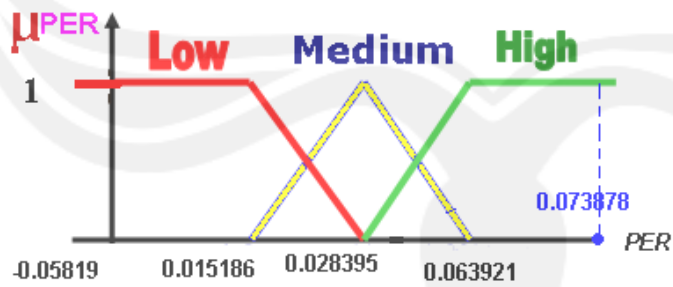
Trade Volume High:  $\mu = 1$

C. DPS Variable



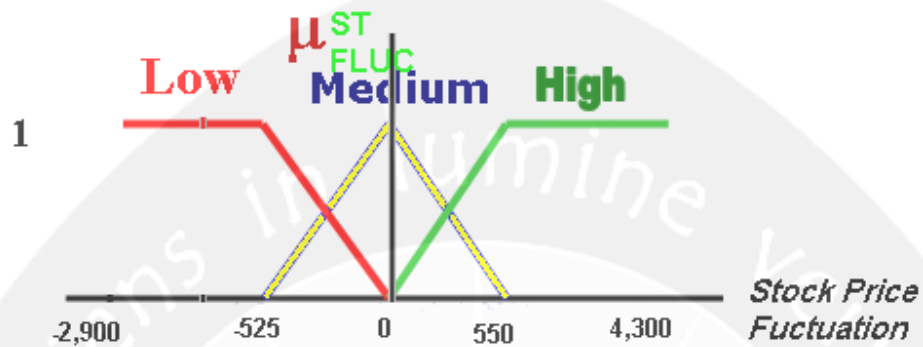
DPS High:  $\mu = 1$

D. PER Variable



PER High:  $\mu = 1$

## E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

## 2. Fuzzy operator application: Match with the rules

[R2] Closing Price is Low and Trade Volume is High then Stock Fluctuation=

Medium

$$X1 \rightarrow 0.3646 = \frac{(X + 525)}{550} = X1 = -333.585$$

$$X2 \rightarrow 0.3646 = \frac{(550 - X)}{550} = X2 = 349.47$$

[R9] If Closing Price is Medium then Stock Fluctuation= Medium

$$X3 \rightarrow 0.6354 = \frac{(X + 525)}{525} = X3 = -191.415$$

$$X4 \rightarrow 0.6354 = \frac{(550 - X)}{550} = X4 = 200.53$$

#### 4. Defuzzy: get the result

$$Z = \frac{\mu(k1) \times k1 + \mu(k2) \times k2 + \mu(k3) \times k3 + \mu(k4) \times k4}{\mu(k1) + \mu(k2) + \mu(k3) + \mu(k4)}$$

=

$$\frac{[0.3646X(-333.585)] + [0.3646X349.47] + [0.6354X-191.415] + [0.6354X200.53]}{0.3646 + 0.3978 + 0.6354 + 0.6354}$$

= **6**

***Sampling no. 30***

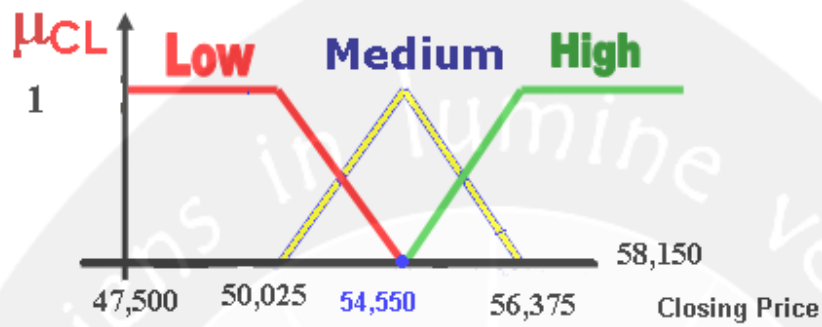
**1. Make Membership Function and Fuzzy Input**

There are Five Fuzzy Variables model:

1. Closing Price, consist of 3 Fuzzy membership: High, Medium and Low
2. Trade Volume, consist of 3 Fuzzy membership: High, Medium and Low
3. Dividend per Share (DPS), consist of 3 Fuzzy membership: High, Medium and Low
4. Price to Equity Ratio (PER), consist of 3 Fuzzy membership: High, Medium and Low
5. Stock Price Fluctuation, consist of 3 Fuzzy membership: High, Medium and Low

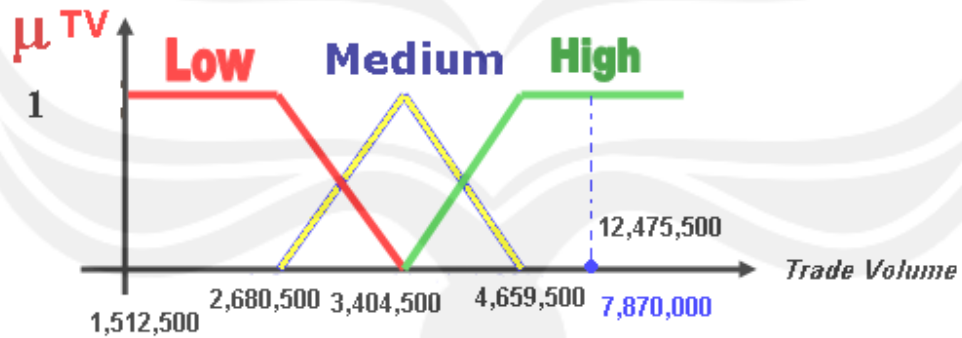
| Closing Price | Trade Volume | DPS       | PER        |
|---------------|--------------|-----------|------------|
| 54,550        | 7,870,000    | 4.6122449 | 0.07387755 |

### A. Closing Price Variable



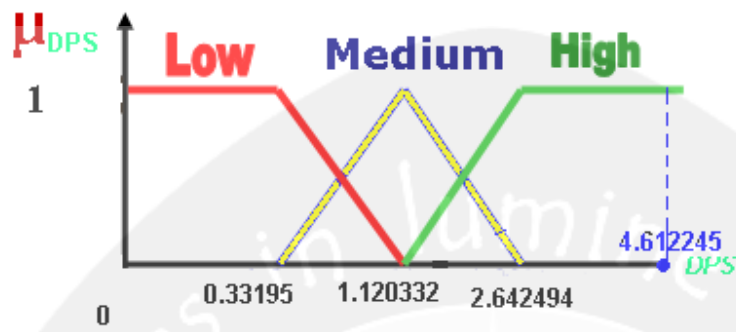
Closing Price Medium:  $\mu = 1$

### B. Trade Volume Variable



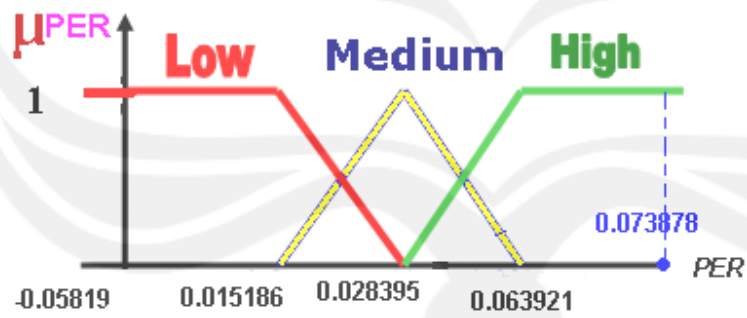
Trade Volume High:  $\mu = 1$

### C. DPS Variable



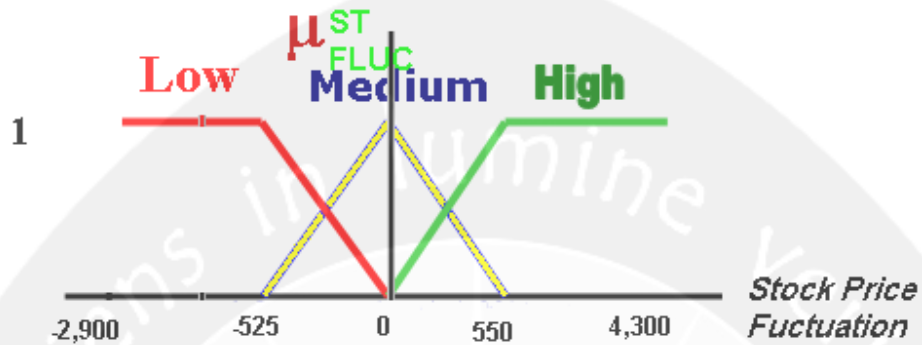
DPS High:  $\mu = 1$

D. PER Variable



PER High:  $\mu = 1$

## E. Stock Price Fluctuation Variable



$$\text{Fluctuation: Low} = \frac{(0 - X)}{525}$$

$$\text{Medium} = \frac{X + 525}{525} \text{ and } \frac{550 - X}{550}$$

$$\text{High} = \frac{(X - 0)}{550}$$

## 2. Fuzzy operator application: Match with the rules

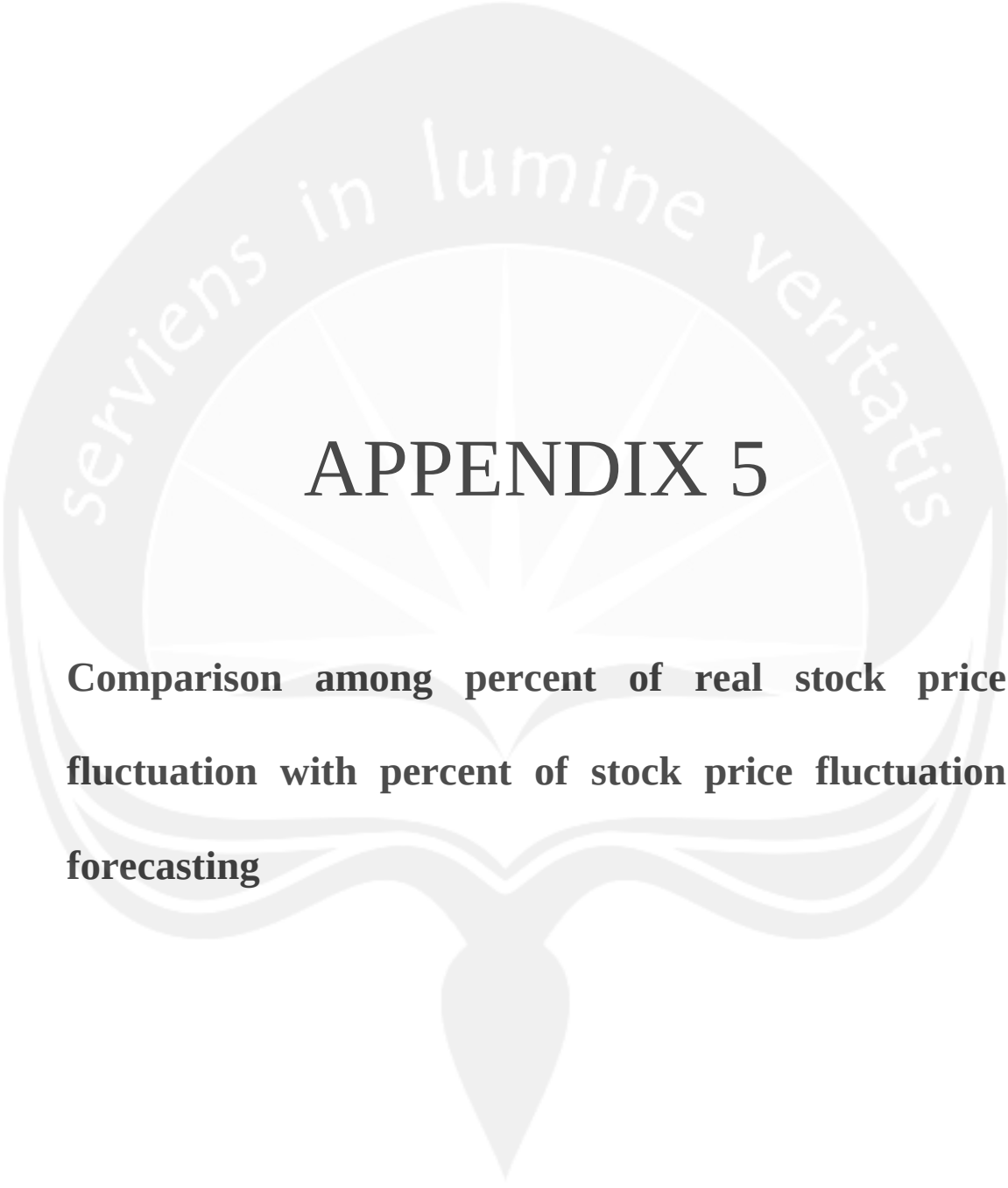
[R9] If Closing Price is Medium and Trade Volume is High and DPS is High  
then Stock Fluctuation= Medium

$$1 = \frac{X + 525}{525} \rightarrow X = -525$$

$$1 = \frac{550 - X}{550} = 550$$

**3. Defuzzy: get the result**

$$Z = \frac{\mu(k1)xk1 + \mu(k2)xk2}{\mu(k1) + \mu(k2)} = \frac{[1x(-525)] + [1x550]}{1 + 1} = \mathbf{12.5}$$



# APPENDIX 5

**Comparison among percent of real stock price fluctuation with percent of stock price fluctuation forecasting**

Fuzzy Inference System model implemented in the Astra International Tbk. Company  
and has its result:

| Forecasted Stock Price Fluctuation | Percent of Stock Price Fluctuation<br>Forecasting (%) |
|------------------------------------|-------------------------------------------------------|
| -525                               | -1,086956522                                          |
| -396                               | -0,819875776                                          |
| 0                                  | 0                                                     |
| -525                               | -1,075819672                                          |
| -475                               | -0,954773869                                          |
| -359                               | -0,732653061                                          |
| -262                               | -0,538540596                                          |
| -525                               | -1,084710744                                          |
| -24                                | -0,050526316                                          |
| -525                               | -1,09832636                                           |
| 0                                  | 0                                                     |
| 0.14                               | 0,00027972                                            |
| 1.6                                | 0,0032008                                             |
| 6,23                               | 0,011889313                                           |
| -26.19                             | -0,048951402                                          |
| 450                                | 0,8                                                   |
| 266.1285                           | 0,475654155                                           |
| 319                                | 0,693404635                                           |
| 487                                | 0,865008881                                           |
| 361                                | 0,642920748                                           |

|      |             |
|------|-------------|
| 550  | 0,957354221 |
| 550  | 0,972590628 |
| 132  | 0,23751277  |
| 33   | 0,059891107 |
| 550  | 0,970017637 |
| -13  | -0,02478551 |
| 2.45 | 0,00453284  |
| 6    | 0,011374408 |
| 6    | 0,011342155 |
| 12.5 | 0,022914757 |

**Compare with the real fluctuation:**

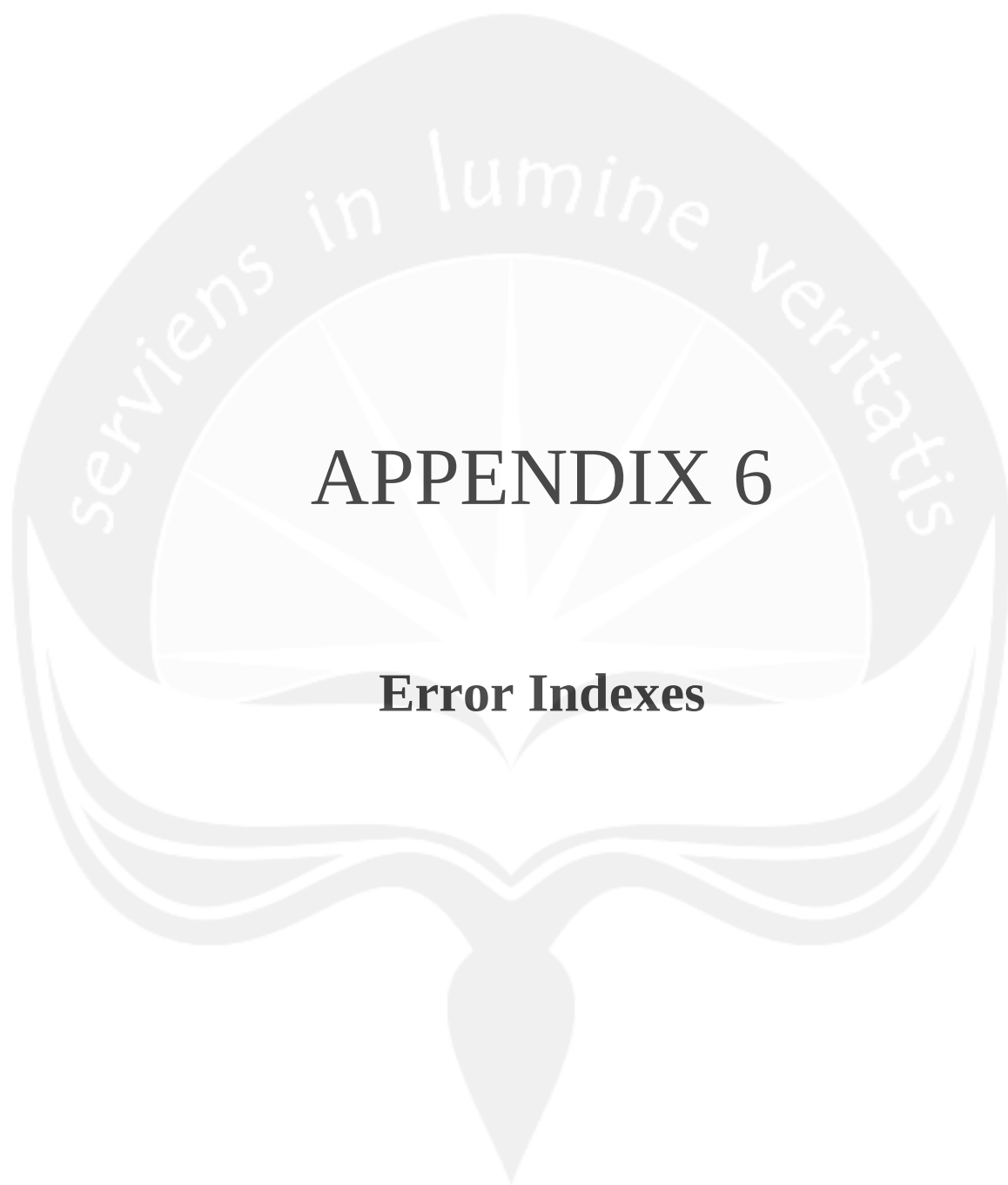
| Real Stock Price Fluctuation | Percent of Real Stock Price Fluctuation(%) |
|------------------------------|--------------------------------------------|
| 0                            | -1,086956522                               |
| 500                          | -0,819875776                               |
| 0                            | 0                                          |
| 950                          | -1,075819672                               |
| -750                         | -0,954773869                               |
| -350                         | -0,732653061                               |
| -250                         | -0,538540596                               |
| -900                         | -1,084710744                               |
| 300                          | -0,050526316                               |
| -200                         | -1,09832636                                |

|       |              |
|-------|--------------|
| 650   | 0            |
| -50   | 0,00027972   |
| 2400  | 0,0032008    |
| 1100  | 0,011889313  |
| 4300  | -0,048951402 |
| -300  | 0,8          |
| 150   | 0,475654155  |
| 200   | 0,693404635  |
| -150  | 0,865008881  |
| 0     | 0,642920748  |
| -900  | 0,957354221  |
| -950  | 0,972590628  |
| -500  | 0,23751277   |
| 1600  | 0,059891107  |
| 700   | 0,970017637  |
| 1600  | -0,02478551  |
| -1300 | 0,00453284   |
| 150   | 0,011374408  |
| 1650  | 0,011342155  |
| 0     | 0,022914757  |

**Checking Error:** (Real Stock Price Fluctuation - Forecasting Stock Price Fluctuation).

| Date       | Percent of Real Fluctuation | Percent of Stock Price Fluctuation Forecasting | Checking Errors |
|------------|-----------------------------|------------------------------------------------|-----------------|
| 16/08/2010 | 0                           | -1,086956522                                   | 1,0870          |
| 18/08/2010 | 1,035196687                 | -0,819875776                                   | 1,8551          |
| 19/08/2010 | 0                           | 0                                              | 0,0000          |
| 20/08/2010 | 0,19466894                  | -1,075819672                                   | 1,2705          |
| 23/08/2010 | -1,507537688                | -0,954773869                                   | -0,5528         |
| 24/08/2010 | -0,714285714                | -0,732653061                                   | 0,0184          |
| 25/08/2010 | -0,513874615                | -0,538540596                                   | 0,0247          |
| 26/08/2010 | -1,859504132                | -1,084710744                                   | -0,7748         |
| 27/08/2010 | 0,631578947                 | -0,050526316                                   | 0,6821          |
| 30/08/2010 | -0,418410042                | -1,09832636                                    | 0,6799          |
| 01/09/2010 | 1,315789474                 | 0                                              | 1,3158          |
| 02/09/2010 | -0,0999001                  | 0,00027972                                     | -0,1002         |
| 03/09/2010 | 4,8                         | -0,098                                         | 4,7968          |
| 06/09/2010 | 2,099236641                 | 0,011889313                                    | 2,0873          |
| 07/09/2010 | 8,037383178                 | -0,033383178                                   | 8,0863          |
| 15/10/2010 | -0,533333333                | 0,8                                            | -1,3333         |
| 18/10/2010 | 0,268096515                 | 0,350312779                                    | -0,2076         |
| 19/10/2010 | 0,356506239                 | 0,568627451                                    | -0,3369         |

|            |              |              |         |
|------------|--------------|--------------|---------|
| 20/10/2010 | -0,26642984  | 0,865008881  | -1,1314 |
| 21/10/2010 | 0            | 0,557435441  | -0,6429 |
| 01/11/2010 | -1,566579634 | 0,957354221  | -2,5239 |
| 02/11/2010 | -1,679929266 | 0,972590628  | -2,6525 |
| 03/11/2010 | -0,899280576 | 0,237410072  | -1,1368 |
| 04/11/2010 | 2,903811252  | 0,059891107  | 2,8439  |
| 05/11/2010 | 1,234567901  | 0,970017637  | 0,2646  |
| 01/12/2010 | 3,050524309  | -0,011439466 | 3,0753  |
| 02/12/2010 | -2,405180389 | 0,00453284   | -2,4097 |
| 03/12/2010 | 0,28436019   | 0,011374408  | 0,2730  |
| 06/12/2010 | 3,119092628  | 0,011342155  | 3,1078  |
| 08/12/2010 | 0            | 0,022914757  | -0,0229 |



# APPENDIX 6

## **Error Indexes**

Error indexes uses in this research are:

### 1. Mean Absolute Deviation

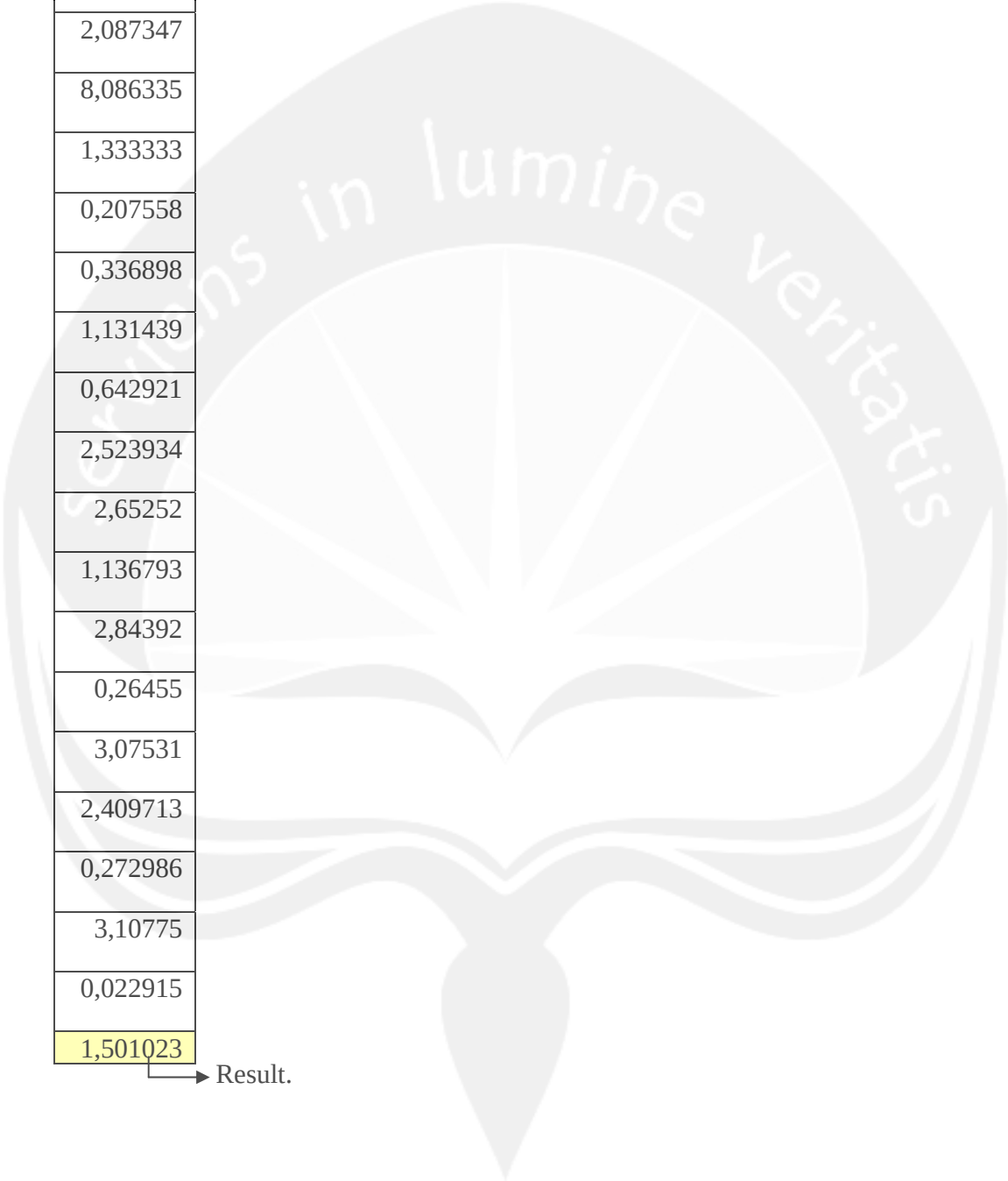
$$MAD = \frac{1}{n} \sum |Y_t - \hat{Y}_t| \dots\dots\dots (9)$$

Where: n= Number of time period

$Y_t$ = an observed value of y

$\hat{Y}_t$  = the value of y that is predicted using the estimation quotation

| MAD      |
|----------|
| 1,086957 |
| 1,855072 |
| 0        |
| 1,270489 |
| 0,552764 |
| 0,018367 |
| 0,024666 |
| 0,774793 |
| 0,682105 |
| 0,679916 |
| 1,315789 |
| 0,10018  |



|          |
|----------|
| 4,796799 |
| 2,087347 |
| 8,086335 |
| 1,333333 |
| 0,207558 |
| 0,336898 |
| 1,131439 |
| 0,642921 |
| 2,523934 |
| 2,65252  |
| 1,136793 |
| 2,84392  |
| 0,26455  |
| 3,07531  |
| 2,409713 |
| 0,272986 |
| 3,10775  |
| 0,022915 |
| 1,501023 |

Result.

## 2. Mean Square Error

$$\text{MSE} = \frac{\sum (Y_t - \hat{Y}_t)^2}{n} \dots\dots\dots(10)$$

Where: n= Number of time period

$Y_t$ = the value of y that is predicted using the estimation quotation

$\hat{Y}_t$  = an observed value of y

| MSE     |
|---------|
| 1,1815  |
| 3,4413  |
| 0,0000  |
| 1,6141  |
| 0,3055  |
| 0,0003  |
| 0,0006  |
| 0,6003  |
| 0,4653  |
| 0,4623  |
| 1,7313  |
| 0,0100  |
| 23,0093 |
| 4,3570  |
| 65,3888 |

|        |
|--------|
| 1,7778 |
| 0,0431 |
| 0,1135 |
| 1,2802 |
| 0,4133 |
| 6,3702 |
| 7,0359 |
| 1,2923 |
| 8,0879 |
| 0,0700 |
| 9,4575 |
| 5,8067 |
| 0,0745 |
| 9,6581 |
| 0,0005 |
| 5,1350 |

→ Result.

### 3. Mean Absolute Percentage Error

$$M = \frac{1}{n} \sum_{t=1}^n \left| \frac{A_t - F_t}{A_t} \right| \dots\dots\dots(11)$$

Where: n= Number of time period

$A_t$  is the actual value

$F_t$  is the forecast value.

| MAPE     |
|----------|
| 0        |
| 1,792    |
| 0        |
| 6,526406 |
| 0,366667 |
| 0,025714 |
| 0,048    |
| 0,416667 |
| 1,08     |
| 1,625    |
| 1        |
| 1,0028   |
| 0,999333 |
| 0,994336 |
| 1,00609  |
| 2,5      |
| 0,77419  |
| 0,945    |
| 4,246667 |
| 0        |

|          |
|----------|
| 1,611111 |
| 1,578947 |
| 1,264114 |
| 0,979375 |
| 0,214286 |
| 1,008125 |
| 1,001885 |
| 0,96     |
| 0,996364 |
| 0        |
| 1,344734 |

#### 4. Mean Percentage Error

$$MPE = \frac{1}{n} \sum_{t=1}^n \frac{f_t - a_t}{a_t} \dots\dots\dots(12)$$

Where: n= Number of time period

$A_t$  is the actual value

$F_t$  is the forecast value.

|        |
|--------|
| MPE    |
| 0      |
| -1,792 |

|          |
|----------|
| 0        |
| -6,52641 |
| -0,36667 |
| 0,025714 |
| 0,048    |
| -0,41667 |
| -1,08    |
| 1,625    |
| -1       |
| -1,0028  |
| -0,99933 |
| -0,99434 |
| -1,00609 |
| -2,5     |
| 0,77419  |
| 0,945    |
| -4,24667 |
| 0        |
| -1,61111 |
| -1,57895 |
| -1,26411 |
| -0,97938 |
| -0,21429 |
| -1,00813 |

|          |
|----------|
| -1,00188 |
| -0,96    |
| -0,99636 |
| 0        |
| -1,08182 |

| Errors Indexes                 | Error    |
|--------------------------------|----------|
| Mean Absolute Deviation        | 1,509804 |
| Mean Square Error              | 5,134975 |
| Mean Absolute Percentage Error | 1,344734 |
| Mean Percentage Error          | -1,08182 |