Ford Equity Research

A Mergent Company

Special Study

Improving Portfolio Returns with a Valuation Band Overlay
December 29, 2006

Introduction

The practice of investing, as compared to theoretical study, can yield some helpful insights into the effectiveness of strategies. In the implementation of a strategy, one can sometimes discover an investing relationship that merits further examination to determine whether it should be incorporated as a part of the strategy. This is the case with valuation bands. As we have used a number of strategies based on our successful Value/Momentum model, we have noted that some of the stocks that have not performed as well as we'd expected also were at or near the top of their valuation bands as represented in our Ford Custom Graphs application. Many of these stocks had what were considered good value and earnings momentum. The valuation bands in this study use our operating earnings yield (OEY) measure to determine its dispersion relative to its average level across a 36-month time frame for each stock. Also known as the standard deviation, this dispersion measure is applied to the current operating earnings per share to determine the likely range of price at which a stock should trade based on its historical valuations.

In this first of a series of studies examining valuation bands, we examine in which capitalization segments valuation bands based on OEY prove most effective. We also look at whether incorporating valuation bands into some strategies that have shown some success might lead to improvement of those strategies.

Valuation Band Performance Distributions

For the initial test of valuation bands we divided the Ford universe of stocks into 5 groups based on current price relative to its valuation band level for each month from December 1997 through December 2005. The groups, which are measured as standard deviations relative to the 36 month mean OEY, are: greater than 2 standard deviations below; greater than 1 up to 2 standard deviations below; plus or minus 1 standard deviation around the mean; greater than 1 up to 2 standard deviations above; and greater than 2 standard deviations above. The performance of each group was calculated monthly and the results were annualized. As can be seen in the performance table below, the companies which have current valuations more than 2 standard deviations below their average valuation level produced positive excess returns over the Ford universe in 5 of the 8 years measured. Likewise, those trading at more than 2 standard deviations above their average valuation level underperformed the universe in 5 of 8 years. This distribution of returns was indicative of a correlation between level of valuation and future returns.

Ford Universe total return (%)	> 2SD Below	>1 to 2 SD Below	1 SD Below/Above	>1 to 2 SD Above	> 2SD Above	Ford Universe
12/97-12/98	5.0	5.9	2.9	3.7	-7.9	0.4
12/98-12/99	14.7	4.1	17.7	25.5	28.4	21.4
12/99-12/00	30.4	11.3	14.8	10.2	-23.3	-0.1
12/00-12/01	53.5	28.5	19.9	2.5	30.6	22.0
12/01-12/02	-13.7	-10.2	-9.3	-12.4	-16.1	-15.2
12/02-12/03	61.2	57.6	61.8	66.1	90.5	70.3
12/03-12/04	32.4	20.0	21.7	18.7	9.9	20.6
12/04-12/05	12.6	11.1	5.6	-0.7	-14.3	4.3
Annualized	22.3	14.6	15.4	12.3	7.5	13.2
Ann. Std. Dev.	24.3	19.0	17.6	19.1	31.6	21.3
% Turnover	513	458	209	387	381	
Number of Companies						
12/97	54	228	999	666	318	2265
12/98	119	358	970	494	239	2180
12/99	404	564	1020	402	162	2552
12/00	180	435	1290	325	226	2456
12/01	43	204	1429	852	350	2878
12/02	170	462	1714	451	201	2998
12/03	20	242	2023	717	156	3158
12/04	46	512	2114	792	153	3617
12/05	111	658	2266	478	144	3657

After identifying that a relationship exists between valuation level based on the valuation bands for the entire Ford universe we were interested to determine if this held in both large and small capitalization groups. To look at this, we separated the Ford universe of stocks, excluding foreign companies, into two groups, the top 1000 companies by market cap and the next 2000 by market cap. Creating the valuation bands on each of these groups resulted in a lower number of constituents than 1000 and 2000, respectively, because not all of the companies had the available 36 months of data needed to create the standard deviation bands.

Top 1000 Market Cap.
total return (%)

	> 2SD Below	>1 to 2 SD Below	1 SD Below/Above	>1 to 2 SD Above	> 2SD Above	Top 1000 Universe
12/97-12/98	2.4	2.3	9.9	13.9	-0.7	9.7
12/98-12/99	-4.1	6.9	8.8	23.4	35.3	19.1
12/99-12/00	22.1	11.7	10.3	25.0	-5.3	5.2
12/00-12/01	18.2	12.1	-2.0	-10.6	-20.1	-6.4
12/01-12/02	-34.5	-26.7	-14.1	-18.0	-20.3	-18.6
12/02-12/03	44.8	38.4	38.0	41.5	38.7	38.8
12/03-12/04	25.6	9.9	19.4	15.3	14.3	17.5
12/04-12/05	11.4	8.3	10.3	8.3	-0.8	10.1
Annualized	8.2	6.5	9.2	10.8	3.1	8.2
Ann. Std. Dev.	26.9	18.5	15.7	17.3	24.9	17.4
% Turnover	510	512	245	373	484	

Number of Companies

	> 2SD Below	>1 to 2 SD Below	1 SD Below/Above	>1 to 2 SD Above	> 2SD Above	Top 1000 Universe
12/97	17	55	304	308	157	841
12/98	25	78	334	265	88	790
12/99	139	152	310	176	29	806
12/00	47	118	473	142	27	807
12/01	12	87	475	233	57	864
12/02	83	204	539	66	14	906
12/03	9	82	614	194	35	934
12/04	21	122	549	229	26	947
12/05	39	185	563	134	28	949

As the table above shows, the valuation band performance was less impressive on the largest capitalization stocks than was seen on the full universe. Despite positive excess returns over the top 1000 universe in 5 of the eight years, the companies with the lowest current price relative to their valuation band generated no excess return over the entire 8-year period. However, those companies with the highest prices relative to their valuation band showed weaker relative performance than the universe in 7 of the 8 years.

Next 2000 Market Cap.
total return (%)

	> 2SD Below	>1 to 2 SD Below	1 SD Below/Above	>1 to 2 SD Above	> 2SD Above	Next 2000 Universe
12/97-12/98	-0.5	-3.0	-0.3	-2.2	-4.2	-2.1
12/98-12/99	14.2	0.2	18.4	24.2	19.5	17.2
12/99-12/00	31.1	15.6	19.8	8.7	-7.9	3.7
12/00-12/01	73.5	31.7	34.4	9.0	23.4	23.7
12/01-12/02	4.0	-0.2	-11.7	-11.7	-15.7	-18.6
12/02-12/03	64.4	63.6	57.6	48.4	62.0	60.3
12/03-12/04	28.3	22.8	18.3	20.5	10.7	18.7
12/04-12/05	13.7	10.6	5.2	-2.4	-12.4	4.2
Annualized	26.2	16.0	16.1	10.5	7.0	11.4
Ann. Std. Dev.	25.6	21.2	19.6	19.8	31.0	22.1
% Turnover	549	474	243	423	437	

Number of Companies

	> 2SD Below	>1 to 2 SD Below	1 SD Below/Above	>1 to 2 SD Above	> 2SD Above	Next 2000 Universe
12/97	28	134	570	302	119	1153
12/98	62	185	424	151	81	903
12/99	207	293	454	132	47	1133
12/00	73	216	629	131	65	1114
12/01	14	63	624	420	135	1256
12/02	60	183	794	259	71	1367
12/03	6	98	924	384	77	1489
12/04	16	267	956	380	76	1695
12/05	47	321	1041	170	41	1620

When examining the next 2000 companies ranked by market capitalization, it is evident that the valuation bands are particularly effective is small caps. The companies with prices more than 2 standard deviations below their average OEY valuation outperformed the selected universe in 7 of the 8 years studied with an annualized excess return of 14.8%. Those with current prices more than 2 standard deviations above their average OEY valuation underperformed in 5 of the 8 years which annualized at 440 basis points over the period. This indicates that the level of price compared to the valuation band can identify the overvalued small cap companies that are likely to underperform relative to their peers.

Portfolio Application 1 (Ford Select Stocks)

The Ford Select Stock list, which has been created using the same method since 1997, uses our Value/Momentum model to select 20 stocks from a universe of high quality companies (quality rating of B or better, a growth persistence rating of A or B, and excluding foreign companies). The performance of the Select List portfolio has been good with excess returns over the quality universe in 5 of the last 8 years and an overall excess return of 3.5% annually.

total returns (%)

	Select List	Quality Universe	Portfolio Turnover (%)
12/97-12/98	22.9	-2.1	250
12/98-12/99	-5.2	17.2	255
12/99-12/00	5.5	3.7	301
12/00-12/01	14.0	23.7	205
12/01-12/02	0.2	-18.6	135
12/02-12/03	54.6	60.3	130
12/03-12/04	30.2	18.7	130
12/04-12/05	7.4	4.2	140
Annualized	14.9	11.4	197
Ann. Std. Dev.	17.0	22.1	

As a first test of overlaying the valuation bands on a strategy, we used the Select Stock List and limited initial selections to companies that met the Select List criteria and whose stock price was not more than 2 standard deviations above its average OEY. In this way we are avoiding the stocks that are at extreme high valuations relative to their historical level. The companies were held in the portfolio as long as they remained in the top 30% of VMO stocks and remained below the 2 standard deviation valuation band limit. As shown below, the addition of this rule had an improvement on the performance of the portfolio.

Indeed the excess return for the Select List portfolio modified in this way (Select List 1) was 5.2%, substantially higher than the excess return of the original portfolio, with slightly lower standard deviation and comparable turnover.

total returns (%)

	Select List (1)	Quality Universe	Portfolio Turnover (%)
12/97-12/98	23.8	-2.1	240
12/98-12/99	-6.2	17.2	266
12/99-12/00	8.0	3.7	306
12/00-12/01	21.3	23.7	215
12/01-12/02	3.2	-18.6	155
12/02-12/03	53.2	60.3	120
12/03-12/04	31.9	18.7	145
12/04-12/05	7.6	4.2	145
Annualized	16.6	11.4	203
Ann. Std. Dev.	16.8	22.1	

In the next test we expand the overlay to limit initial selections to companies that met the Select List criteria and whose stock price is not more than 1 standard deviation above its 36-month average OEY (Select List 2). Again the hold criteria for the Select List portfolio was expanded to only hold companies that remained in the top 30% of VMO and remained below, in this case, 1 standard deviation above its 36-month average OEY. With this modification to the process, the improvement over the original Select List portfolio was even more pronounced. Excess return over the high quality universe was 7.9% annually while the standard deviation of returns was also reduced. However, the expanded hold criteria had the effect of increasing portfolio turnover to 281% (roughly 4 months) from about 200% (6 months).

total returns (%)

	Select List (2)	Quality Universe	Portfolio Turnover (%)
12/97-12/98	21.6	-2.1	390
12/98-12/99	-6.4	17.2	335
12/99-12/00	17.1	3.7	361
12/00-12/01	30.4	23.7	260
12/01-12/02	-0.5	-18.6	255
12/02-12/03	49.3	60.3	185
12/03-12/04	37.5	18.7	208
12/04-12/05	15.6	4.2	243
Annualized	19.3	11.4	281
Ann. Std. Dev.	15.6	22.1	

Portfolio Application 2 (top 40 VMO stocks)

We also tested valuation band limits on a straight VMO strategy applied to both the largest 1000 capitalization and next 2000 capitalization universes. In this strategy the top 40 companies are selected from the respective universe and are held until VMO drops below 50. With 5 of 8 years of positive excess returns versus the top 1000 cap universe, this strategy has shown excellent results. The overall annual excess return of 6.2% was achieved with a turnover of 83% which translates into an average holding period of over 14 months.

top 1000 cap, no valuation band limits
total returns (%)

	Top 40 VMO	Top 1000 Universe	Portfolio Turnover (%)
12/97-12/98	2.9	9.7	100
12/98-12/99	4.1	19.1	110
12/99-12/00	1.9	5.2	85
12/00-12/01	13.4	-6.4	110
12/01-12/02	-4.9	-18.6	96
12/02-12/03	57.3	38.8	40
12/03-12/04	32.1	17.5	65
12/04-12/05	20.1	10.1	51
Annualized	14.4	8.2	83
Ann. Std. Dev.	21.1	17.4	

As in the application to the Select Stock list method, we add limits to the original strategy to exclude companies whose prices are more than 2 standard deviations above its 36-month mean valuation from initial buys and sold them if they subsequently reached that level.

Excluding the companies above the upper limit of the 2 standard deviation valuation band did not have much of a positive effect on the large cap companies. This is despite showing a fairly good result (that is negative average excess returns for ">2SD above" stocks) in the overall performance distribution. As can be seen the performance compared to the portfolio without valuation band limits is only 10 basis points higher with slightly lower annual standard deviation and comparable turnover.

top 1000 cap, excluding over 2 SD above mean
total returns (%)

	Top 40 VMO	Top 1000 Universe	Portfolio Turnover (%)
12/97-12/98	1.9	9.7	105
12/98-12/99	-3.0	19.1	100
12/99-12/00	8.6	5.2	85
12/00-12/01	18.2	-6.4	110
12/01-12/02	-7.0	-18.6	98
12/02-12/03	56.1	38.8	45
12/03-12/04	32.2	17.5	63
12/04-12/05	21.5	10.1	58
Annualized	14.5	8.2	84
Ann. Std. Dev.	20.0	17.4	

Limiting the original portfolio selection criteria to exclude those companies that are trading more than 1 standard deviation above the mean valuation indicated by its OEY produced slightly better results. However, there was a notable increase in turnover associated with employing these tighter valuation band constraints.

top 1000 cap, excluding over 1 SD above mean
total returns (%)

	Top 40 VMO	Top 1000 Universe	Portfolio Turnover (%)
12/97-12/98	6.4	9.7	155
12/98-12/99	-1.0	19.1	135
12/99-12/00	10.3	5.2	83
12/00-12/01	17.3	-6.4	133
12/01-12/02	-9.6	-18.6	146
12/02-12/03	56.3	38.8	78
12/03-12/04	29.7	17.5	94
12/04-12/05	22.7	10.1	90
Annualized	15.0	8.2	113
Ann. Std. Dev.	20.1	17.4	

The next 2000 companies by market cap were more fruitful for investors over the time period studied. This is also true for the strategy that picked the top 40 stocks from this universe which had annualized excess returns of 16.7%, a lower standard deviation of returns than the universe, and low portfolio turnover.

next 2000 cap, no valuation band limits
total returns (%)

	Top 40 VMO	Next 2000 Universe	Portfolio Turnover (%)
12/97-12/98	11.8	-2.1	88
12/98-12/99	13.6	17.2	134
12/99-12/00	19.6	3.7	72
12/00-12/01	39.0	23.7	70
12/01-12/02	18.5	-18.6	58
12/02-12/03	75.3	60.3	48
12/03-12/04	49.6	18.7	48
12/04-12/05	10.6	4.2	55
Annualized	28.1	11.4	74
Ann. Std. Dev.	20.1	22.1	

In limiting the portfolio selection and hold criteria to those that are below the 2 standard deviation band, performance increased by 130 basis points annually with only a minor increase in return volatility.

next 2000 cap, excluding over 2 SD above mean
total returns (%)

	Top 40 VMO	Next 2000 Universe	Portfolio Turnover (%)
12/97-12/98	12.6	-2.1	99
12/98-12/99	10.9	17.2	128
12/99-12/00	25.3	3.7	80
12/00-12/01	39.9	23.7	82
12/01-12/02	10.2	-18.6	97
12/02-12/03	86.5	60.3	53
12/03-12/04	56.9	18.7	70
12/04-12/05	11.4	4.2	76
Annualized	29.4	11.4	88
Ann. Std. Dev.	20.4	22.1	

By limiting the portfolio selection to those companies whose price is below 1 standard deviation above its 36-month mean OEY, performance was improved more dramatically. The annualized return was 500 basis points higher than the portfolio without the valuation band limits. The portfolio turnover and return volatility were higher, but the higher returns make up for these attributes.

**next 2000 cap, excluding over 1 SD above mean
total returns (%)**

	Top 40 VMO	Next 2000 Universe	Portfolio Turnover (%)
12/97-12/98	18.9	-2.1	120
12/98-12/99	12.3	17.2	149
12/99-12/00	36.8	3.7	93
12/00-12/01	44.7	23.7	108
12/01-12/02	10.0	-18.6	133
12/02-12/03	97.1	60.3	83
12/03-12/04	43.6	18.7	120
12/04-12/05	19.8	4.2	90
Annualized	33.1	11.4	111
Ann. Std. Dev.	21.0	22.1	

Conclusion

Using a 36-month valuation band based on Ford's operating earnings yield can be a useful tool in identifying an extreme in historical relative value for an individual stock. On average, those companies trading at prices that are more than 2 standard deviations above their average level based on this measure underperform their peers. In the 8-year period ended December 2005, this has been true of the overall Ford Universe of stocks and within market capitalization groupings of the largest 1000 companies and next 2000 companies. In addition, companies whose prices are more than 1 standard deviation above the mean underperformed in both the overall Ford Universe and in the next 2000 companies by market capitalization. In some cases this relationship can be applied to individual portfolio strategies to improve returns without substantial impact on portfolio volatility or turnover. Better results are seen when using 1 standard deviation bands as the limit. However, higher turnover and return volatility can also result. Additionally, initial tests indicate that the use of the valuation bands is more effective in smaller capitalization companies.

Performance disclosure

The returns shown in this study are estimated total returns of hypothetical portfolios. Estimated total returns are computed using month end price changes plus 1/12 of dividend yield based on indicated annual dividend rates. The returns presented exclude transaction costs. And, of course, there is no guarantee that future results will equal past results.
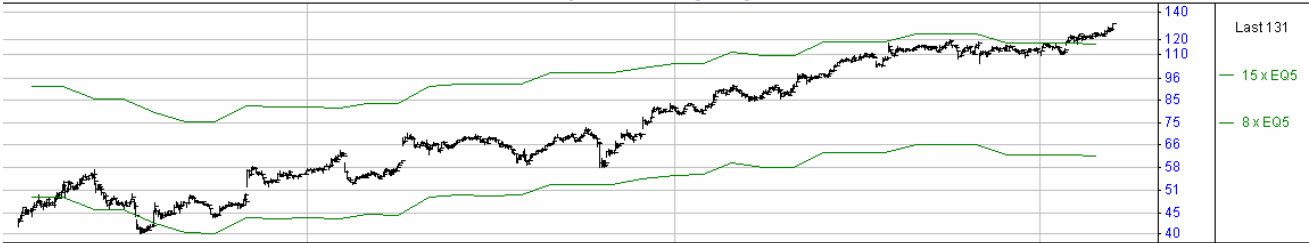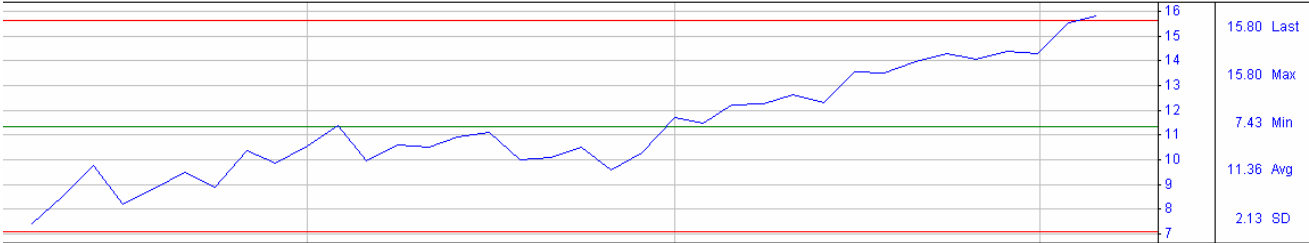
Appendix:

The following examples taken from Ford Custom Graphs illustrate the relationship between extreme high levels of price relative to valuation band and subsequent stock price performance.
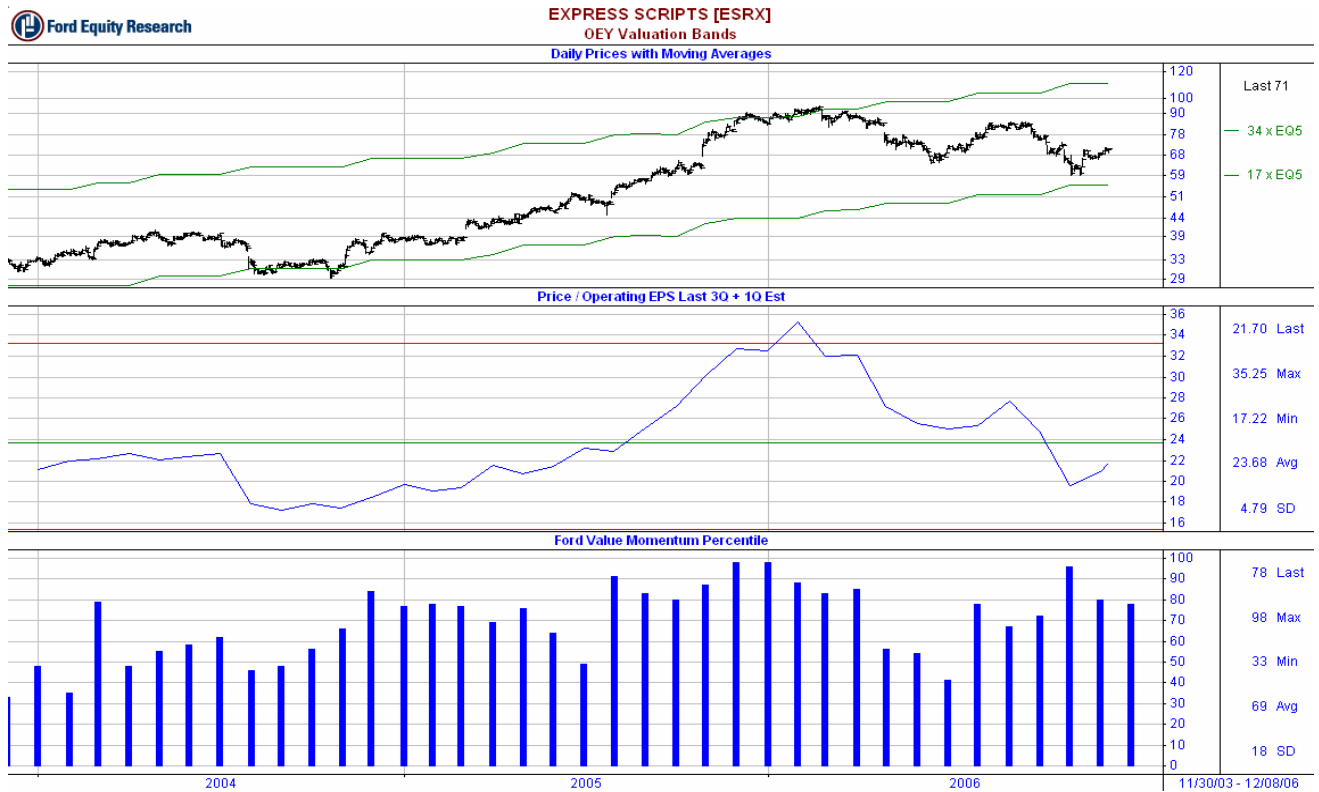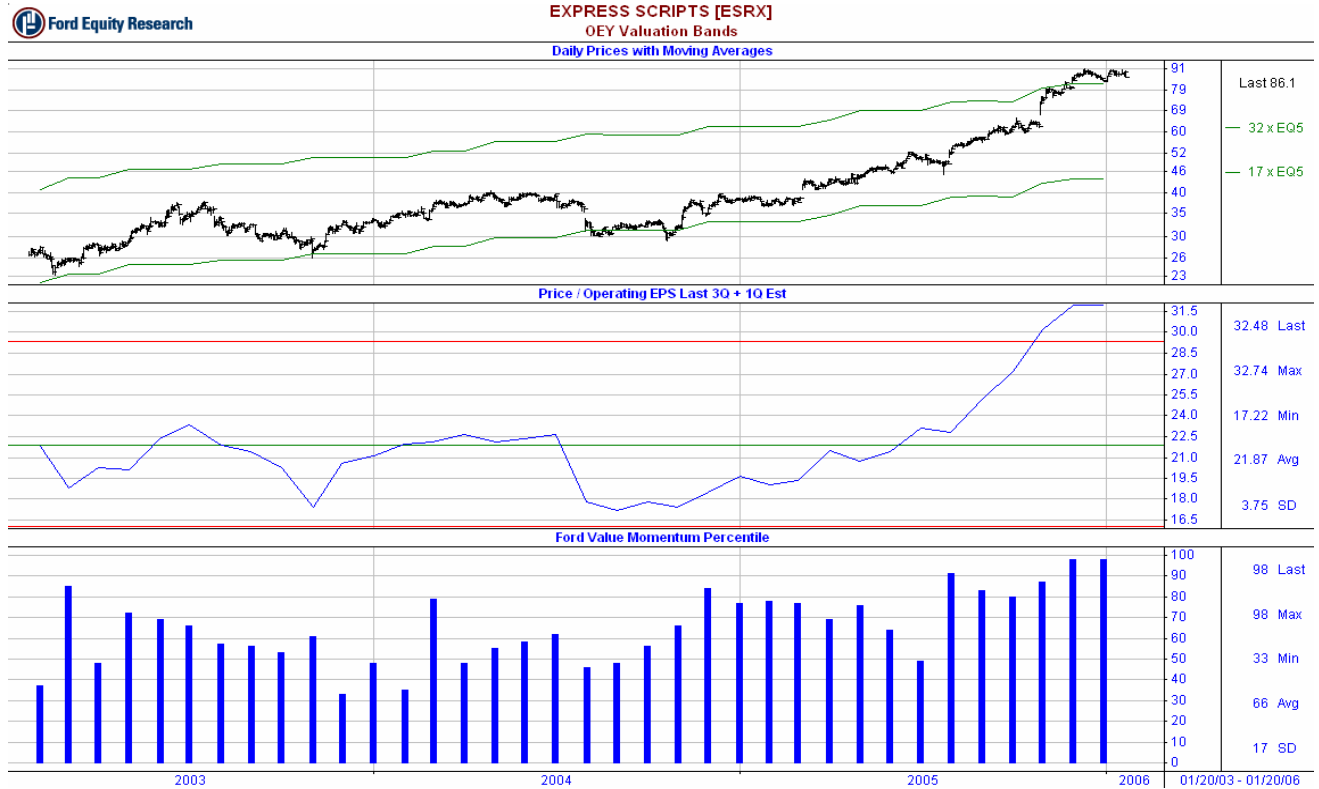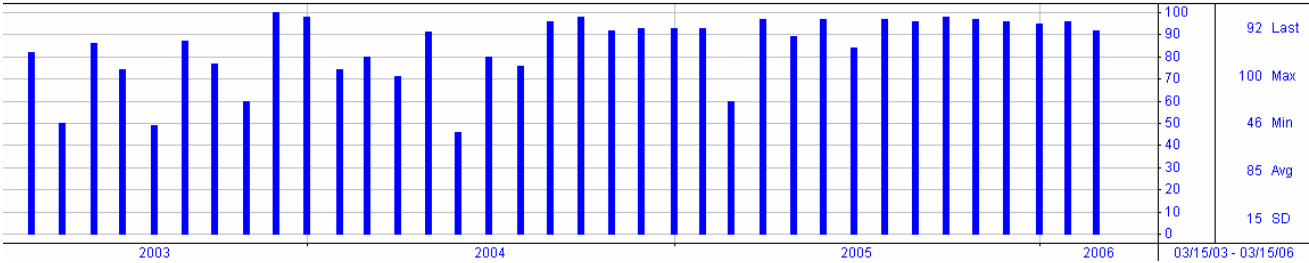
CIGNA [CI]
OEY Valuation Bands
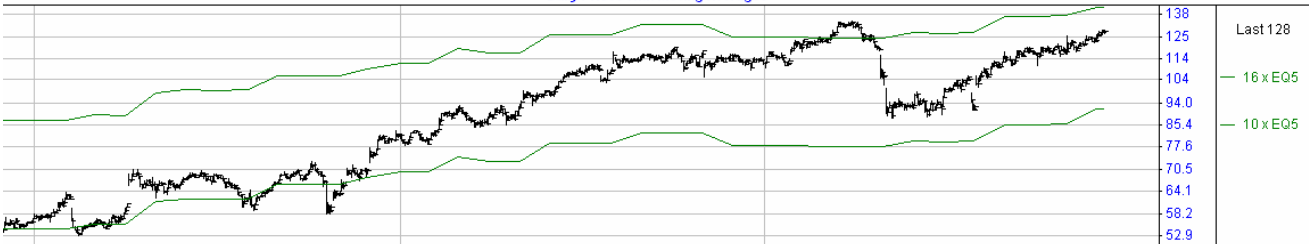
Daily Prices with Moving Averages

Last 131

— 15 x EQ5

— 8 x EQ5

Price / Operating EPS Last 3Q + 1Q Est

15.80 Last

15.80 Max

7.43 Min

11.36 Avg

2.13 SD

Ford Value Momentum Percentile

92 Last

100 Max

46 Min

85 Avg

15 SD

2003   2004   2005   2006   03/15/03 - 03/15/06

CIGNA [CI]
OEY Valuation Bands

Daily Prices with Moving Averages

Last 128

— 16 x EQ5

— 10 x EQ5

Price / Operating EPS Last 3Q + 1Q Est

13.96 Last

16.81 Max

9.59 Min

12.48 Avg

1.83 SD

Ford Value Momentum Percentile

73 Last

100 Max

46 Min

89 Avg

12 SD
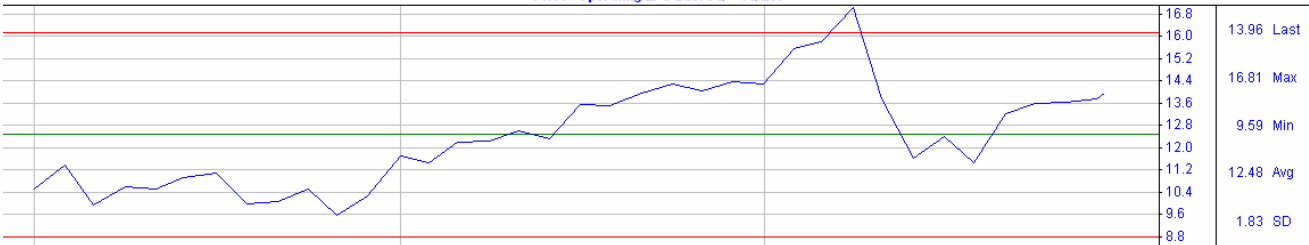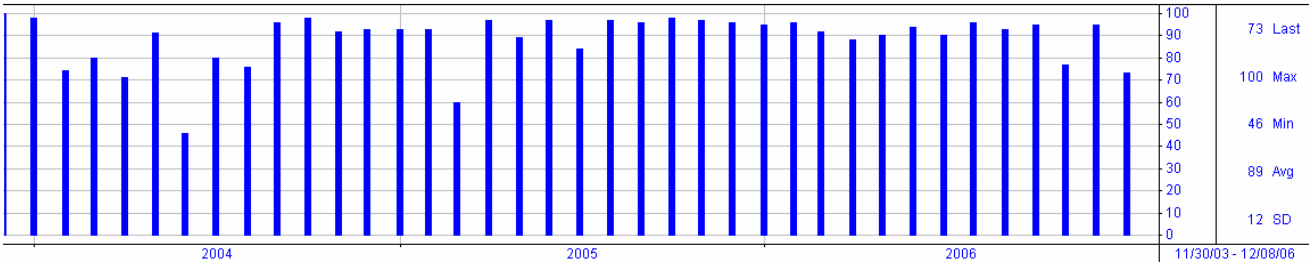
2004   2005   2006   11/30/03 - 12/08/06

KB HOME [KBH]
OEY Valuation Bands

Daily Prices with Moving Averages

Last 82.3

— 10 x EQ5

— 6 x EQ5

Price / Operating EPS Last 3Q + 1Q Est

9.46 Last

10.23 Max

5.87 Min

7.49 Avg

1.05 SD

Ford Value Momentum Percentile

100 Last

100 Max

57 Min

93 Avg

9 SD
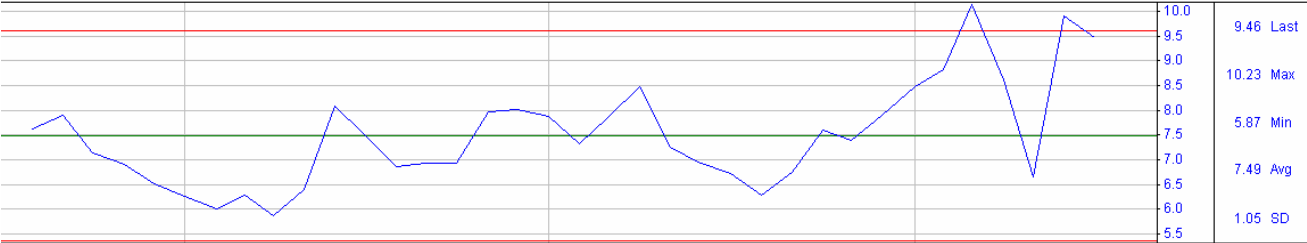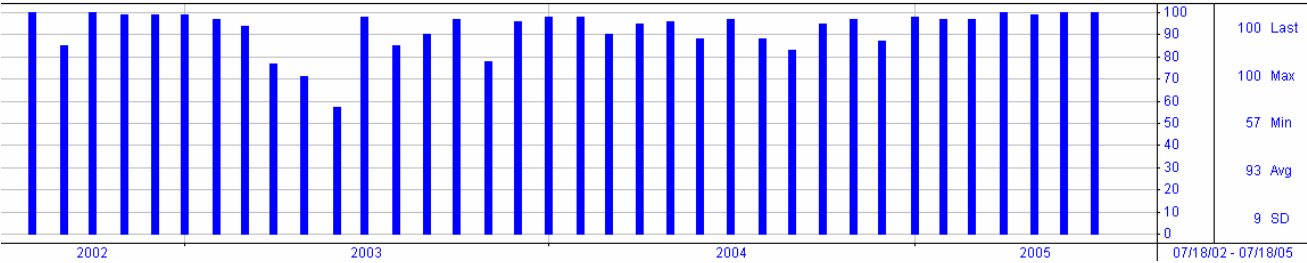
2002   2003   2004   2005   07/18/02 - 07/18/05

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OEY Valuation Bands

Daily Prices with Moving Averages

Last 52

— 10 x EQ5

— 4 x EQ5

Price / Operating EPS Last 3Q + 1Q Est

5.22 Last

10.23 Max

4.12 Min

7.10 Avg

1.70 SD

Ford Value Momentum Percentile

38 Last

100 Max

37 Min

84 Avg

19 SD

2004   2005   2006   11/30/03 - 12/08/06