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ACCT340
Section 1
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Portfolio 123 Contest

Executive Summary

The ranking system behind our P123 Contest entry represents the synthesis of much of the research we have read in class this quarter. It includes variables in five broad categories: value, momentum, analyst coverage and estimates, short interest, and quality of earnings. This system produces a 21.18% annualized return (21.21% annualized alpha) over the entire Portfolio123 backtest period (i.e. 9 years) and a 16.45% over the past five years (17.85% annualized alpha).

Stock Ranking Criteria

Exhibit A shows the complete stock ranking system with all branches and formulas. In constructing it, we attempted to glean the strongest indicators from the majority of academic research which we read throughout the quarter. Our criteria are detailed below and are organized within five key categories: value, momentum, analyst coverage and estimates, short interest, and quality of earnings.

I. Value

There is much research which defends the power of value-based factors within stock selection criteria. According to Shiller (1984), although investor sentiment and arbitrage costs play a role in determining price, fundamental value is perhaps the most important determinant. In his book, *What Works on Wall Street*, James P. O'Shaughnessy also suggests that value-oriented factors, especially among larger stocks, have consistently bested their benchmark indices and offer better direction in picking stocks than many growth-oriented factors. He finds this to be true on a Price-to-Earnings basis, a Price-to-Book basis, a Price-to-Cash Flow basis, and particularly on a Price-to-Sales basis. Labonishok, Shleifer, and Vishny (1994) found that "value" stocks consistently outperform "glamour" stocks regardless of size or business cycle. They also found that B/M, C/P, and E/P were especially powerful measures of value.

Given the importance of value-based metrics in predicting subsequent performance, we weighted our value indicators the heaviest of all branches (at 55%). We used each of the four metrics listed above and added to these TEV/EBITDA based on its prevalence in multiples analysis today. Out of these five factors, we tested them individually and weighted them

between 15 and 25% (in increments of 2.5%) based on their individual predictive power. We use Book / Market rather than P / B due to ensure better continuity.

II. Momentum

Jagedeesh and Titman (1993) observed a pattern of price momentum whereby past winners tend to outperform past losers over the next three to twelve months. Chan, Jagedeesh, and Lakonishok (1999) subsequently demonstrated an underreaction to earnings news and a general price drift associated with a gradual incorporation of new information. Based on this evidence, we included as factors price return (as %) for both the past three months and the previous 3 months.

In 2000, Lee and Swaminathan first introduced the Momentum Life Cycle (MLC) hypothesis which suggested that trading volume serves as a bridge between value and momentum strategies. This paper demonstrated that high-volume stocks typically behave more like "glamour" stocks and low-volume stocks behave like value stocks. Because of this, we included a volume factor (average trading volume scaled by shares outstanding), giving a higher rank to lower-volume (value) stocks. The same research also illustrated that price momentum effects largely disappear after the first year, but since we use quarterly rebalancing in our simulation, this effect is still powerful.

III. Analyst Coverage and Estimates

An interesting tie-in to the MLC hypothesis, Gleason and Lee (2003) showed that price drift is higher for those firms with fewer analysts, suggesting that analysts do serve some informative role for investors. By and large, however, research analysts tend to favor momentum-driven, "glamour" stocks ("trend chasing") and thus, their absolute recommendation is not a great predictor of future performance. The change in consensus recommendation, on the other hand, is a much more powerful tool. A series of upgrades is usually indicative of stock shifting toward a favorable position on the MLC continuum and, given the investor response to analyst opinions, portends an increase in price. Therefore, we included the 3-month change in average analyst recommendation as a ranking criterion, giving a higher rank to more sizable upgrades.

Also important are increases in consensus EPS estimates (Chan, Jagedeesh, Labonishok '96 and Jagadeesh, Kim, Krische, Lee '04), which appear to be correlated to an increase in stock prices as well. According to the Momentum Life Cycle hypothesis, earnings surprises tend to foreshadow increases in EPS estimates and analyst upgrades. We therefore include the 3-month increase in EPS estimates as well as EPS surprises (as %) from the most recent 2 quarters in our ranking system, preferring larger increases in estimates and larger (positive) recent EPS surprises.

Given analysts' predisposition to favor growth stocks, which subsequently underperform value stocks, research supports the finding that stocks with the highest average long-term growth (LTG) rates in EPS tend to underperform. Lakonishok, Schleifer, and Vishny (1994) and La Porta (1996) both find that when analysts expect higher LTG rates, future returns disappoint growth and earnings expectations. Based on these findings, we include the average LTG rate, and rank higher those stocks with lower LTG estimates.

As mentioned above, Lee and Swaminathan (2000) and Gleason and Lee (2003) both show that stocks with less analyst coverage tend to show more prices drift and are better positioned on the MLC continuum for future returns. We therefore include a factor which ranks higher those stocks with few analysts covering them.

IV. Short Interest

In general, research shows that growth stocks are more heavily shorted than value stocks and that bears usually tend to be right. Asquith and Meulbroek (1995), Desai et al. (2001), and Dechow et al. (2001) provide evidence that more heavily shorted stocks tend to perform poorly. By extension, a reduction in short interest over recent months indicates less bearishness and potentially greater price appreciation going forward. Based on this research, we included variables for short interest (as % of float) and 3-month change in short interest, ranking higher those with low and declining short interest.

Drake et al. (2009) introduced a powerful addition to the short interest research. This paper not only suggested that short sellers incorporate most of the value and momentum signals already discussed, but that significant alpha could be generated in analyzing the interaction between short interest and analyst recommendations. Specifically, stocks with the best recommendations and highest short interest are the best short candidates and vice versa. Because of this, we include a variable that measures the product of [5 - Average Recommendation] (since P123 uses a recommendation of 1 to be a strong buy) and [Short Interest as % of Shares Outstanding], ranking highest those stocks with the lowest recommendations and lower short interest.

V. Quality of Earnings

Much of the quality-of-earnings research focuses on identifying those firms with more conservative accounting approaches and greater free cash flow relative to GAAP earnings. Sloan (1996) demonstrated that the market does not fully incorporate the difference between cash flows and net income and that "higher quality" earnings tend to persist going forward. This paper introduces the Total Accruals to Total Assets (TATA) measure which essentially takes the difference between pre-extraordinary net income and cash flows from operations (CFO) and divides it by total assets. Lower accruals (i.e. lower value of TATA) associated with "higher quality" earnings tend to produce better future returns. Beneish (1999) subsequently suggested that higher TATA firms are more likely to be earnings manipulators.

We included TATA in our ranking system and found it to be very predictive of future returns. In our many trials, we also sought to incorporate many of Beneish's other manipulation variables, but TATA alone seemed to trump the individual variables, presumably because it is a "catch all" for many aggressive accounting practices.

Richardson, Sloan, Soliman and Tuna (2005) sought to improve upon this accrual approach by broadening the definition of accruals to include non-current assets and liabilities. They developed the Total Operating Accrual (TACC) metric, which seeks to capture the growth in net operating assets. RSST (2005) found that companies with big increases in TACC tended to perform poorly. We included TACC as a variable in our ranking system, with lower TACC firms ranking higher, but noticed that it did not add a good deal of predictive power beyond TATA (hence its 5% weight).

Exhibit A. Stock Ranking System

Ranking System 340 Ranking System

[branches | reordering | f(x)] [copy system | text editor | raw editor (no ajax)]

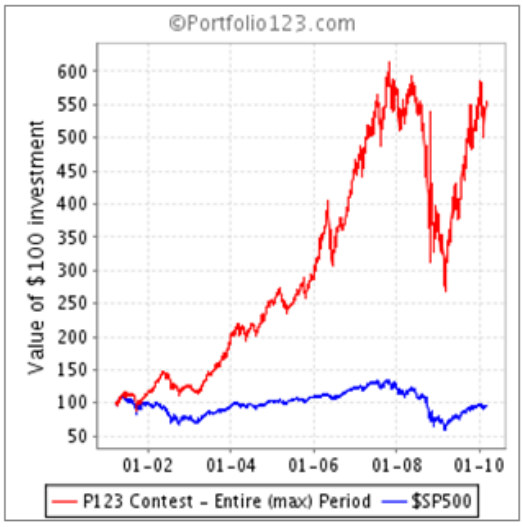
100% ⬆ Jan. 26 Ranking

- 55% ⬆ Value
  - 15% ⬇ PEExclXorTTM
  - 20% ⬇ Pr2FrCashFITTM
  - 25% ⬇ EV/EBITDATTM f(x)
    `(MktCap + DbtTotQ - (CashPSQ * ShsOutMR))/Eval(EBITDATTM>0,EBITDATTM,NA)`
  - 22.5% ⬇ EV/SalesTTM f(x)
    `(MktCap + DbtTotQ - (CashPSQ * ShsOutMR))/Eval(SALESTTM>0,SALESTTM,NA)`
  - 17.5% ⬆ BV / Price f(x)
    `BV$Q/ MktCap`
- 25% ⬆ Momentum
  - 33% ⬆ 3MoPctRet f(x)
    `Close(0)/Close(60)`
  - 33% ⬆ 3MoRet3MoAgo f(x)
    `Close(60)/Close(120)`
  - 34% ⬇ VolM%ShsOut
- 15% ⬆ Analysts
  - 20% ⬇ AnalystSentChg f(x)
    `(AvgRec13WkAgo- AvgRec)/ AvgRec`
  - 30% ⬇ AnalystEPSChg f(x)
    `( NextFYEPSMean- NextFYEst13WkAgo)/ NextFYEst13WkAgo`
  - 10% ⬆ Surprise%Q1
  - 5% ⬆ Surprise%Q2
  - 15% ⬇ #AnalystsCurFY
  - 20% ⬇ LTGrthRtMean
- 2.5% ⬆ Short Interest
  - 5% ⬇ SI%Float
  - 20% ⬆ 3 Mo SI Decrease f(x)
    `( SI%FloatPM3- SI%Float)/ SI%Float`
  - 75% ⬇ Recommendation | SI Interaction f(x)
    `(5 - AvgRec) * SI%ShsOut`
- 2.5% ⬆ Accounting | Quality of Earnings
  - 95% ⬇ TATA f(x)
    `(EBITTTM-FCFTTM)/(itemq(atot,3)+itemq(atot,0))*2`
  - 5% ⬇ TACC_TTM f(x)
    `Eval(ItemQ(ATOT,3) - ItemQ(SCSI,3) - ItemA(LTCL,3)>0, (ItemQ(ATOT,0)-ItemQ(SCSI,0)-ItemQ(LTCL,0))/(ItemQ(ATOT,3)-ItemQ(SCSI,3)-ItemA(LTCL,3)),NA)`

Exhibit B. Summary Simulation Performance (Entire Period and Last 5 Years)

Simulation P123 Contest - Entire (max) Period

Using this Simulation: [Re-run Simulation] [Create Portfolio] [Run Simulation] [Delete]



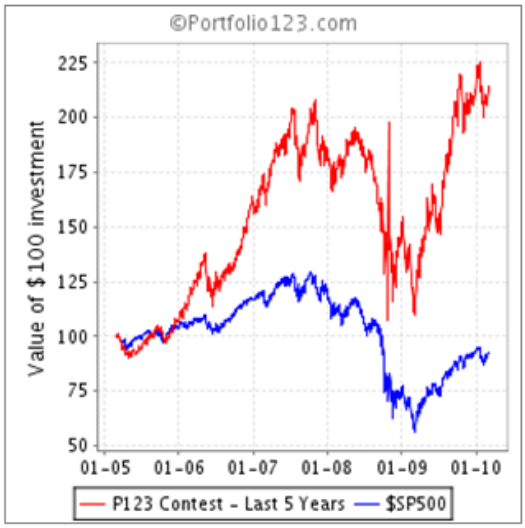
Interactive Graph

General Info	
Inception Date	03/31/01
Last Rebalance Date	12/19/09
Days Since Last Rebalance	74
Rebalance Frequency	Three Months
Ranking System	340 Ranking System

Quick Stats -- as of 03/02/10	
Total Market Value (inc. Cash)	$ 2,779,721.75
Cash	$ 0.81
Number of Positions	23
Total Return	455.95%
Benchmark Return	-2.41%
Active Return	458.35%
Annualized Return	21.21%
Annual Turnover	56.35%
Max Drawdown	-56.23%
Overall Winners	(82/131) 62.60%
Sharpe Ratio	0.53
Correlation with S&P 500	0.71

Simulation P123 Contest - Last 5 Years

Using this Simulation: [Re-run Simulation] [Create Portfolio] [Run Simulation] [Delete]



Interactive Graph

General Info	
Inception Date	03/02/05
Last Rebalance Date	02/20/10
Days Since Last Rebalance	11
Rebalance Frequency	Three Months
Ranking System	340 Ranking System

Quick Stats -- as of 03/02/10	
Total Market Value (inc. Cash)	$ 1,070,682.38
Cash	$ 3.72
Number of Positions	24
Total Return	114.13%
Benchmark Return	-7.58%
Active Return	121.72%
Annualized Return	16.45%
Annual Turnover	57.61%
Max Drawdown	-48.34%
Overall Winners	(49/80) 61.25%
Sharpe Ratio	0.31
Correlation with S&P 500	0.69

Exhibit C. Trading System Settings

1.1 General Parameters [edit]	
Portfolio Name	P123 Contest - Entire (max) Period
Starting Capital	500000.0
Benchmark	SP500 Index
Commission	8 (Flat Fee)
Slippage	0.2% of Total Amount
Rebalance Frequency	Three Months
Price for Transactions	Next Open
Allow sold stocks to be re-bought at current rebalance	No
Category	Unclassified
Save Transactions	Yes
Visibility	Private
1.2 Position Sizing [edit]	
Type	'% of Market Value'
Ideal Weight New Pos	5%
Aprox. Number of Positions	20.0
Max Weight Deviation	30%

2. Data Source and Ranking System [edit]	
Universe	All Stocks
NA's from Pre-Annoucement	From previous Quarter
Ranking System	340 Ranking System

3. Buy Rules (Implicit AND) [edit]	
X IndWeight	IndWeight < 30
X Liquidity	PctAvgDailyTot(20) < 5
Size	Mktcap > 200
Price	close(0) > 3
Volume	avgdailytot(20)>200000

4. Sell Rules (Implicit OR) [edit]	
Rank	Rank < 88
X Rebalance	Eval(Weight>12,0.333,0)
Price	close(0)<2
X Stop-Loss	PctFromHi <= -40
RelativeStopLoss	(GainPct-BenchPct)<=-30

5. Simulation Period and Restrictions [edit]	
Start Date	03/31/2001
End Date	03/02/2010
Exposure List	None
Restrict Buy List	
Restrict Sell List	
Load Global Restrictions	Yes

Exhibit D. Risk Statistics (Entire Period and Last 5 Years)

Simulation P123 Contest - Entire (max) Period

Using this Simulation: [Re-run Simulation] [Create Portfolio] [Run Simulation] [Delete]

Risk Measurements - Since Inception: 03/31/01		
	Model	S&P 500
Standard Deviation	36.30 %	26.60 %
Sharpe Ratio	0.53	-0.09
Sortino Ratio	0.76	-0.12
Correlation with S&P 500	0.71	-
R-Squared	0.50	-
Beta	0.97	-
Alpha (annualized)	21.18 %	-

Risk Measurements - Trailing 3 Year		
	Model	S&P 500
Standard Deviation	54.63 %	36.21 %
Sharpe Ratio	0.10	-0.23
Sortino Ratio	0.16	-0.30
Correlation with S&P 500	0.74	-
R-Squared	0.54	-
Beta	1.11	-
Alpha (annualized)	14.75 %	-

Simulation P123 Contest - Last 5 Years

Using this Simulation: [Re-run Simulation] [Create Portfolio] [Run Simulation] [Delete]

Risk Measurements - Since Inception: 03/02/05		
	Model	S&P 500
Standard Deviation	45.09 %	29.11 %
Sharpe Ratio	0.31	-0.14
Sortino Ratio	0.45	-0.17
Correlation with S&P 500	0.69	-
R-Squared	0.48	-
Beta	1.07	-
Alpha (annualized)	17.85 %	-

Risk Measurements - Trailing 3 Year		
	Model	S&P 500
Standard Deviation	55.97 %	36.21 %
Sharpe Ratio	0.14	-0.23
Sortino Ratio	0.22	-0.30
Correlation with S&P 500	0.69	-
R-Squared	0.47	-
Beta	1.06	-
Alpha (annualized)	16.31 %	-

Exhibit E1. Performance Statistics (Entire Period)

Simulation P123 Contest - Entire (max) Period

Using this Simulation: [Re-run Simulation] [Create Portfolio] [Run Simulation] [Delete]

Performance		
Return	Model	S&P 500
Total	455.95 %	-2.41 %
Annualized	21.21 %	-0.27 %
Year To Date	1.16 %	0.29 %
4 Week	1.83 %	1.36 %
13 Week	6.33 %	0.85 %
1 Year	99.54 %	59.57 %
3 Year	22.85 %	-18.62 %

Annualized Performance by Calendar Year										
	2001*	2002	2003	2004	2005	2006	2007	2008	2009	2010**
Model	21.17 %	7.53 %	56.91 %	31.09 %	11.91 %	60.61 %	24.16 %	-34.68 %	47.26 %	- %
S&P 500	-1.38 %	-23.37 %	26.38 %	8.99 %	3.00 %	13.62 %	3.53 %	-38.49 %	23.45 %	- %
Excess Return	**22.56 %**	**30.90 %**	**30.53 %**	**22.10 %**	**8.91 %**	**46.99 %**	**20.63 %**	**3.81 %**	**23.81 %**	**- %**

33% of annual data is required to calculate annualized return.
(*) Inception Date: 03/31/01
(**) End Date: 03/02/10

○ Weekly ◉ Monthly ○ Yearly

download

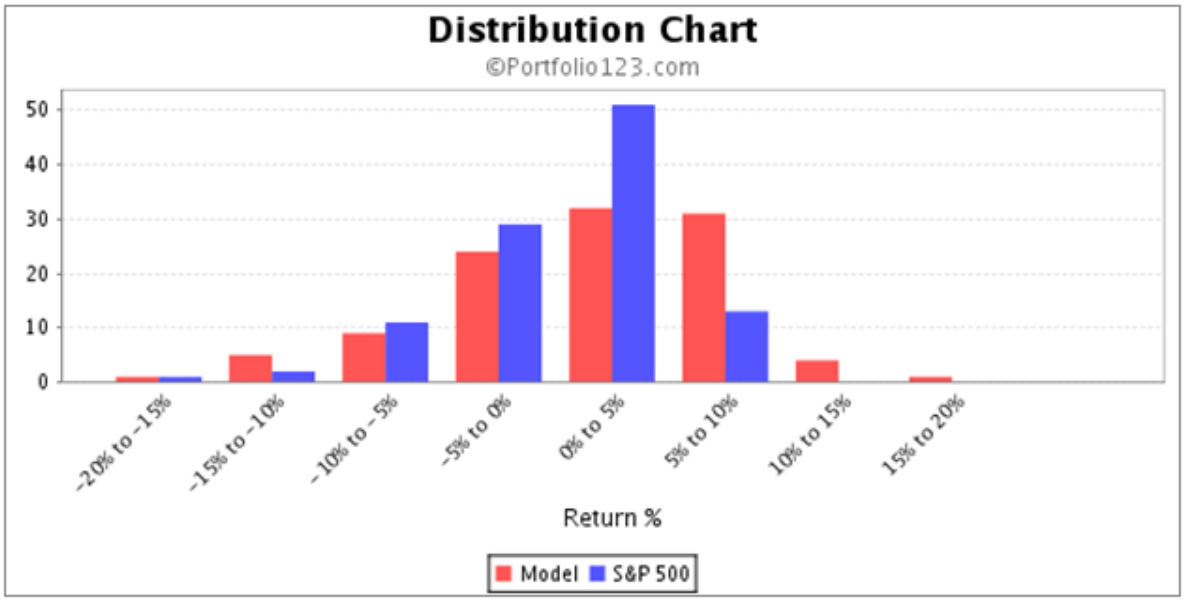


Exhibit E2. Performance Statistics (Last 5 Years)

Simulation P123 Contest - Last 5 Years

Using this Simulation: [Re-run Simulation] [Create Portfolio] [Run Simulation] [Delete]

Performance		
Return	Model	S&P 500
Total	114.13 %	-7.58 %
Annualized	16.45 %	-1.57 %
Year To Date	1.69 %	0.29 %
4 Week	-0.19 %	1.36 %
13 Week	3.29 %	0.85 %
1 Year	91.79 %	59.57 %
3 Year	30.76 %	-18.62 %

Annualized Performance by Calendar Year						
	2005*	2006	2007	2008	2009	2010**
Model	8.37 %	51.52 %	14.30 %	-19.45 %	41.07 %	- %
S&P 500	3.77 %	13.62 %	3.53 %	-38.49 %	23.45 %	- %
Excess Return	**4.61 %**	**37.90 %**	**10.77 %**	**19.04 %**	**17.62 %**	**- %**

33% of annual data is required to calculate annualized return.
(*) Inception Date: 03/02/05
(**) End Date: 03/02/10

○ Weekly ◉ Monthly ○ Yearly

download

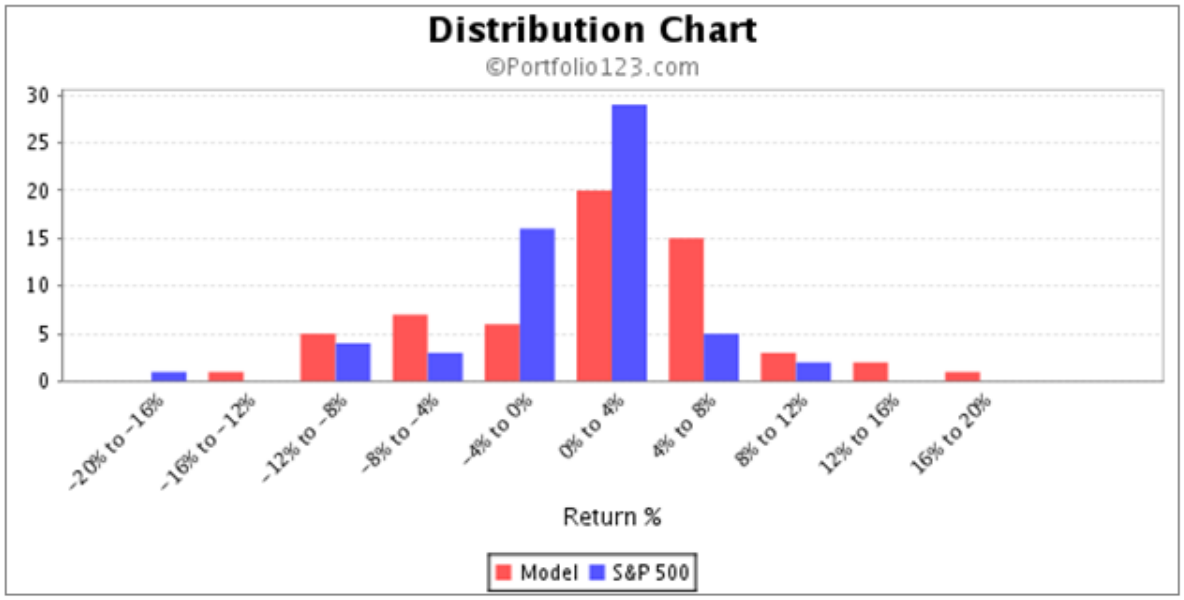


Exhibit F1. Allocation of Holdings (Entire Period)

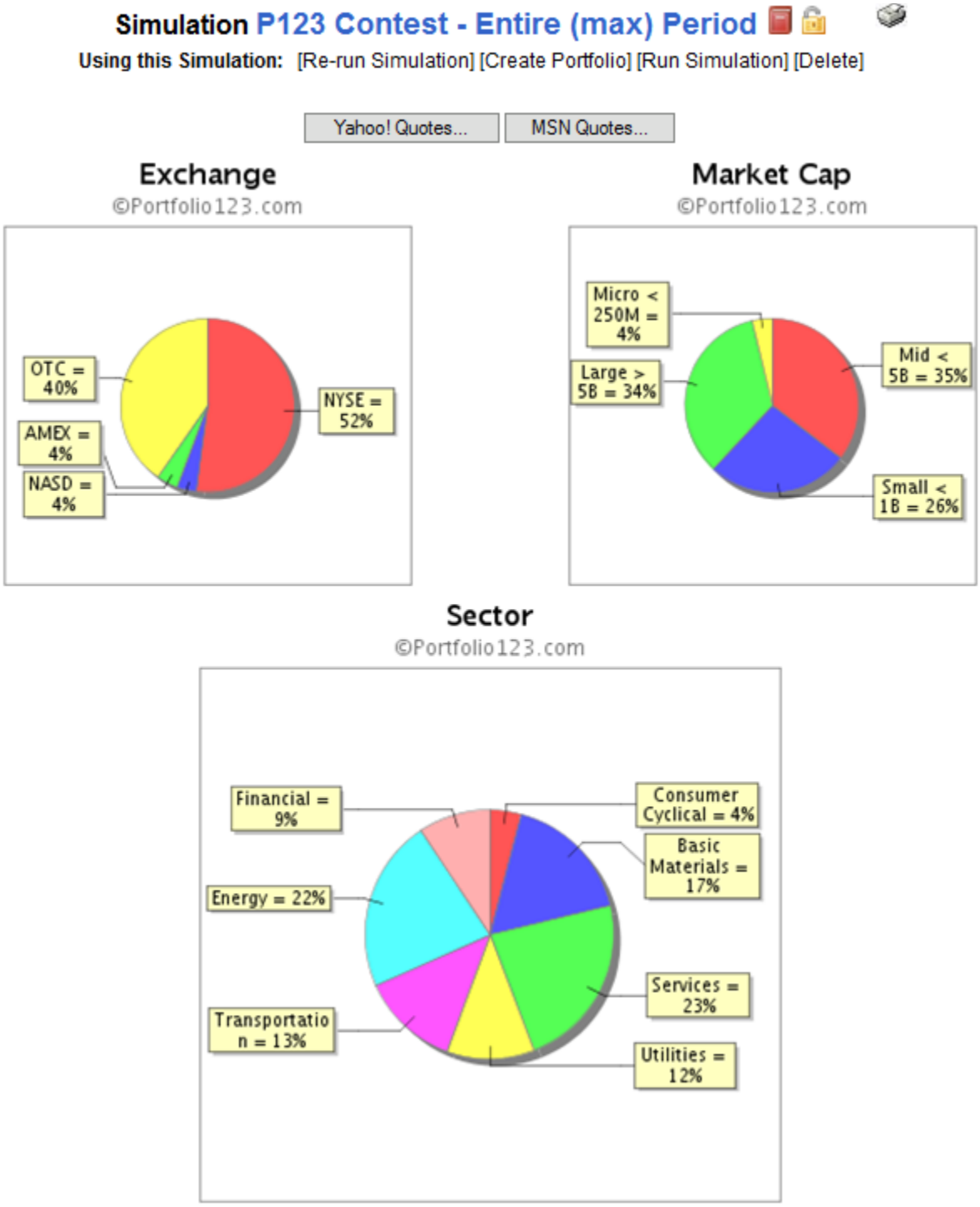
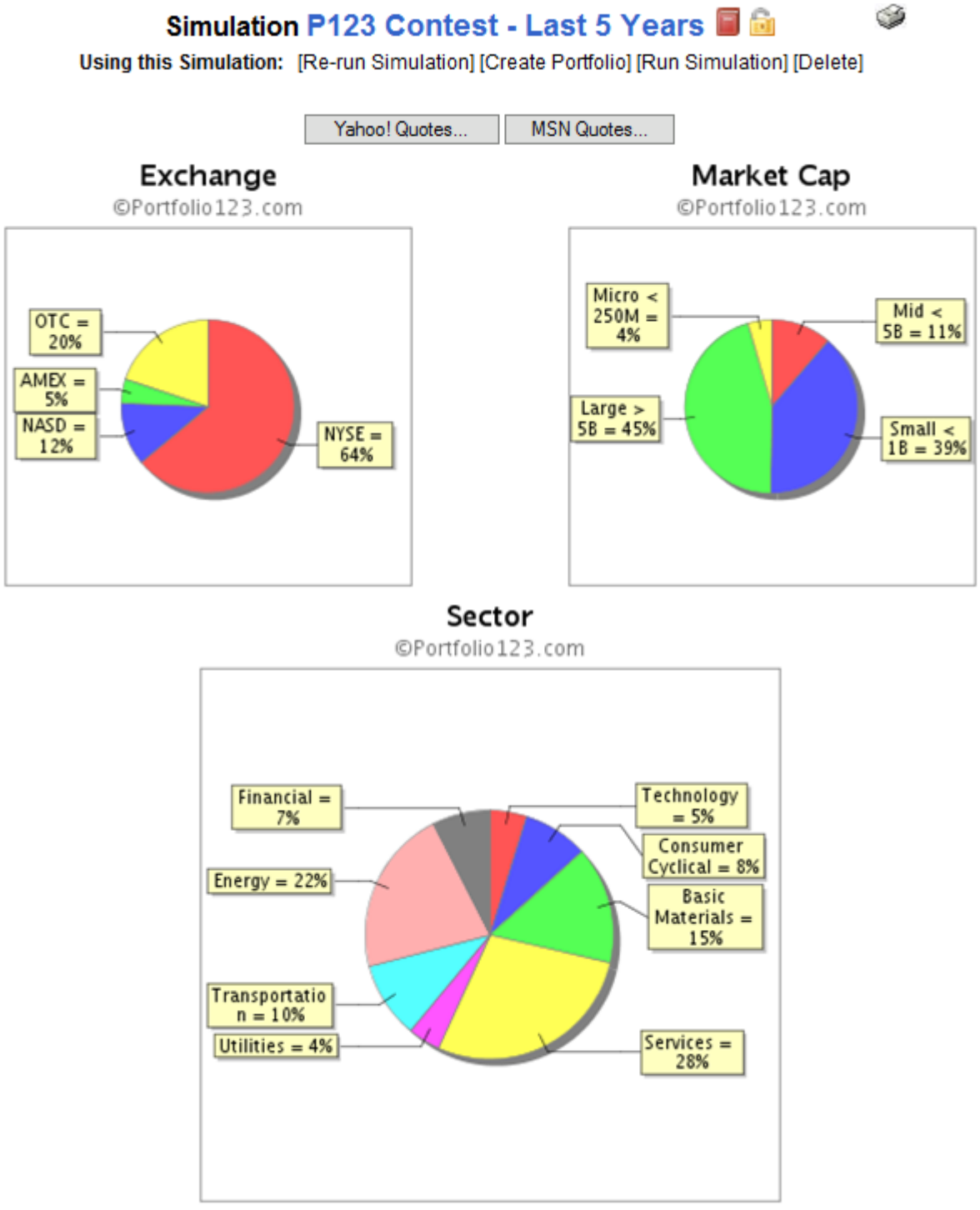


Exhibit F2. Allocation of Holdings (Last 5 Years)



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