

The 2013 Capital Market Research Scholarship for Graduate Students

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“Selection of Investment Strategies in Thai Stock Market”

By

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Research Objectives

- Compare the performance of the popular investment strategies in Thai Stock Market i.e., the size related strategy, the size and book-to-market related strategy.
- Find ways to improve the performance of the popular investment strategies in Thai Stock Market such as incorporating quality measures into the investment strategies.

Executive Summary

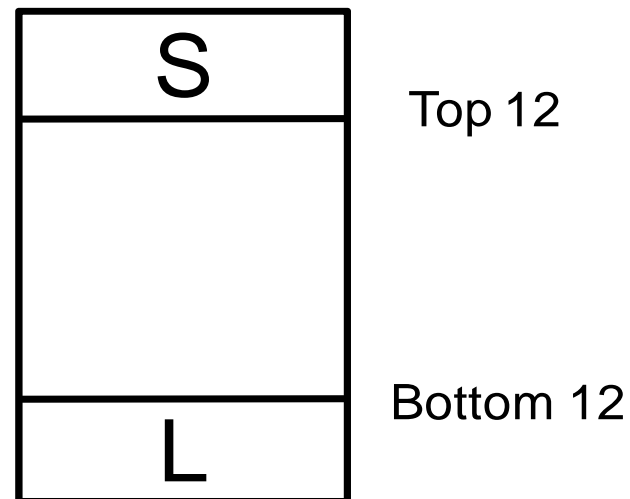
This paper examines the performance of the popular investment strategies such as value strategy, small-cap growth strategy, and so on for Thai Stock Market from March 2005 to May 2013. It was found that only the small-cap, value strategy can outperform Thai stock market. However, if I add a criterion about quality on top of the value and growth strategies like considering the profits of company, surprisingly, it was found that the quality criterion can improve the performance of most strategies enormously and make them outperform Thai stock market. I found that small-cap, joint value and quality strategy has highest Sharpe ratio of 0.84. Moreover, incorporating the quality reduces the drop of returns in the market downturn period.

Data

- Non-financial, liquid Stocks in the Stock Exchange of Thailand from March 2005 to May 2013.
- Liquidity: Average Daily Trading Value > 1 Million Baht
- Monthly Stock Prices (with adjustment for dividend and stock split) from Bloomberg Database.
- Company data from Capital IQ Database (e.g. Book-to-Market, Profit, Total Asset).

Methodology – Size Portfolio Formation

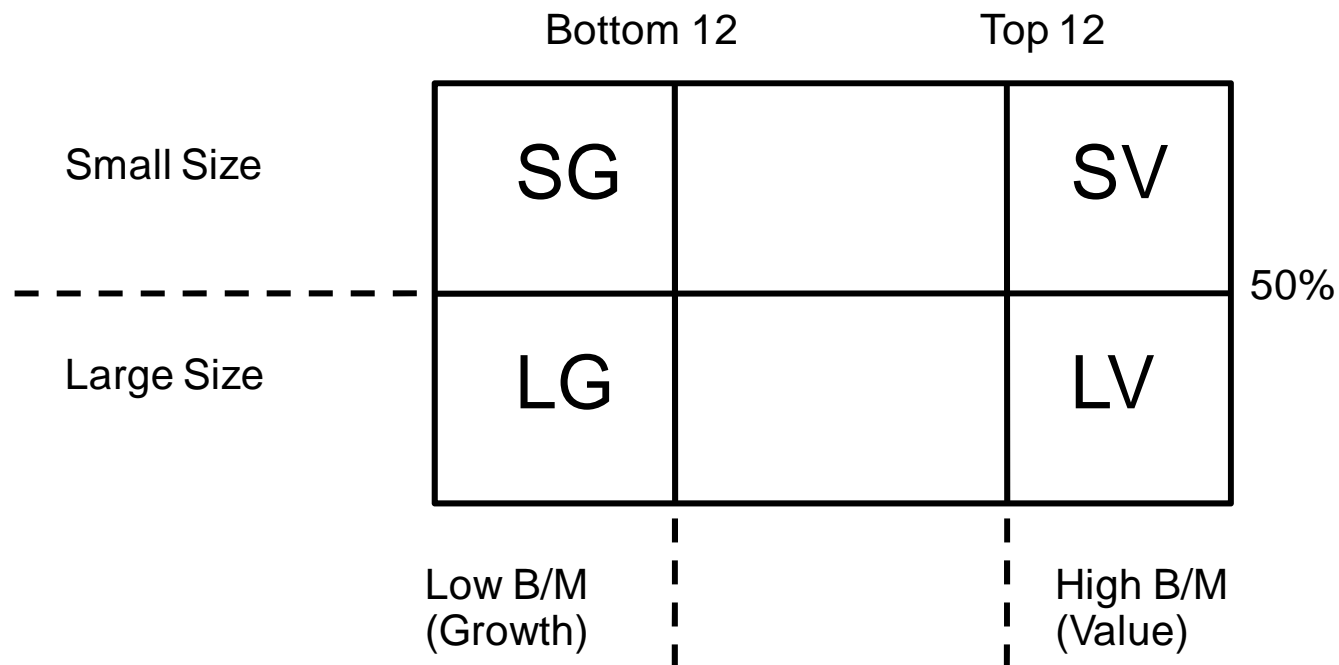
- Sort to construct value-weighted size related portfolio over time and rebalance the portfolio every the end of March of every year.



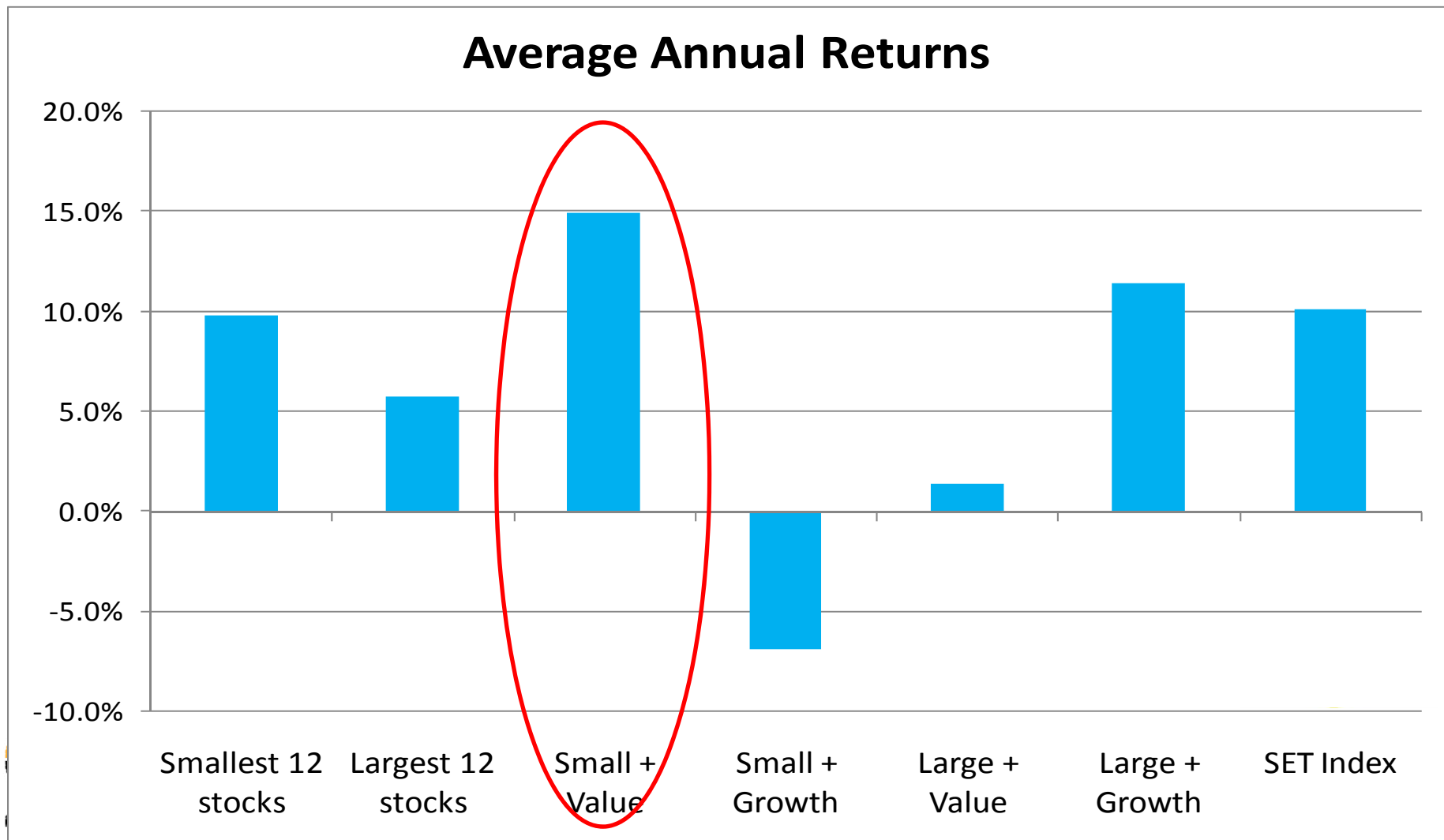
S = Small-Cap L = Large-Cap

Methodology – Size and B/M Portfolio Formation

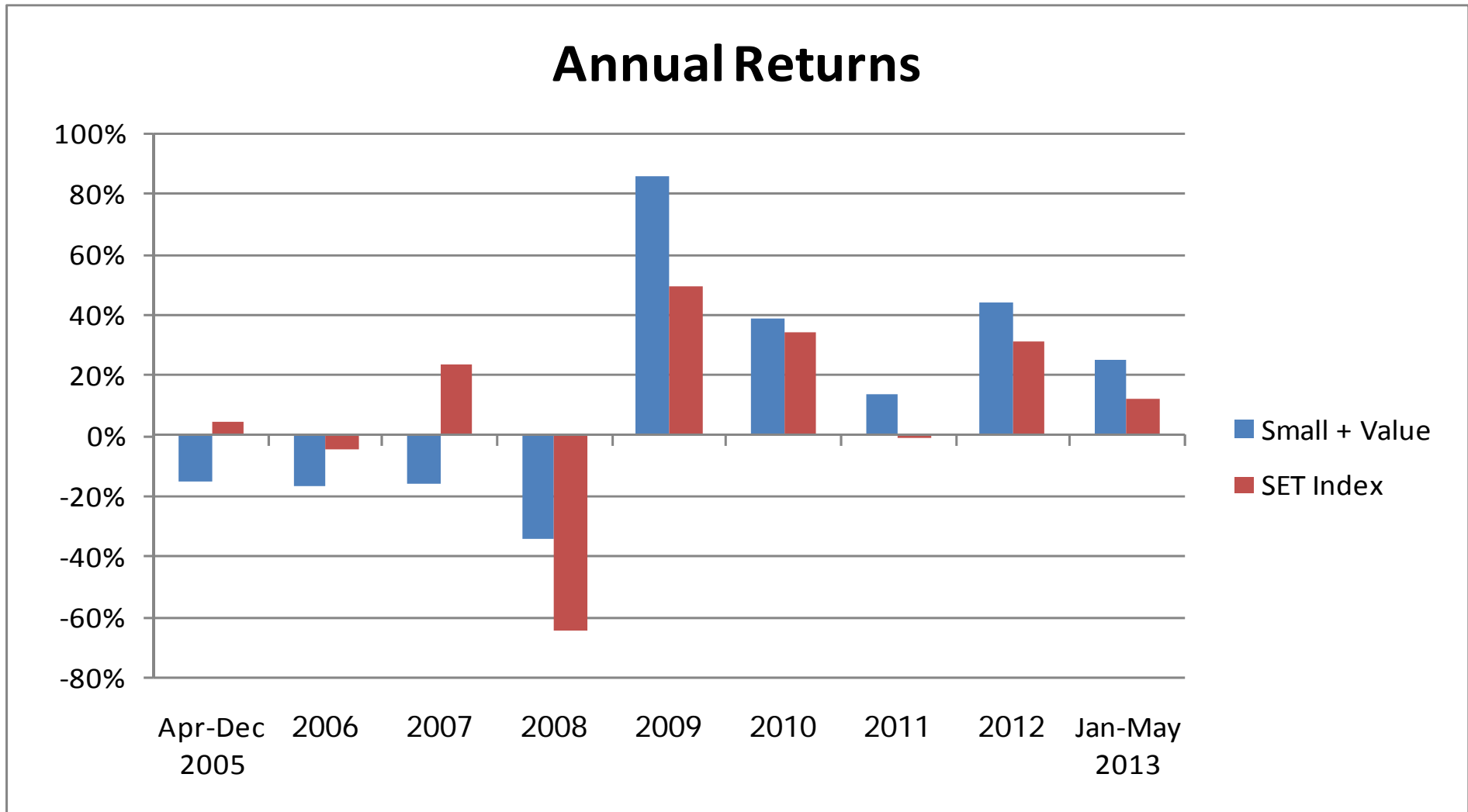
- Double Sort method to construct value-weighted portfolio of size and book-to-market over time and rebalance the portfolio every the end of March of every year.



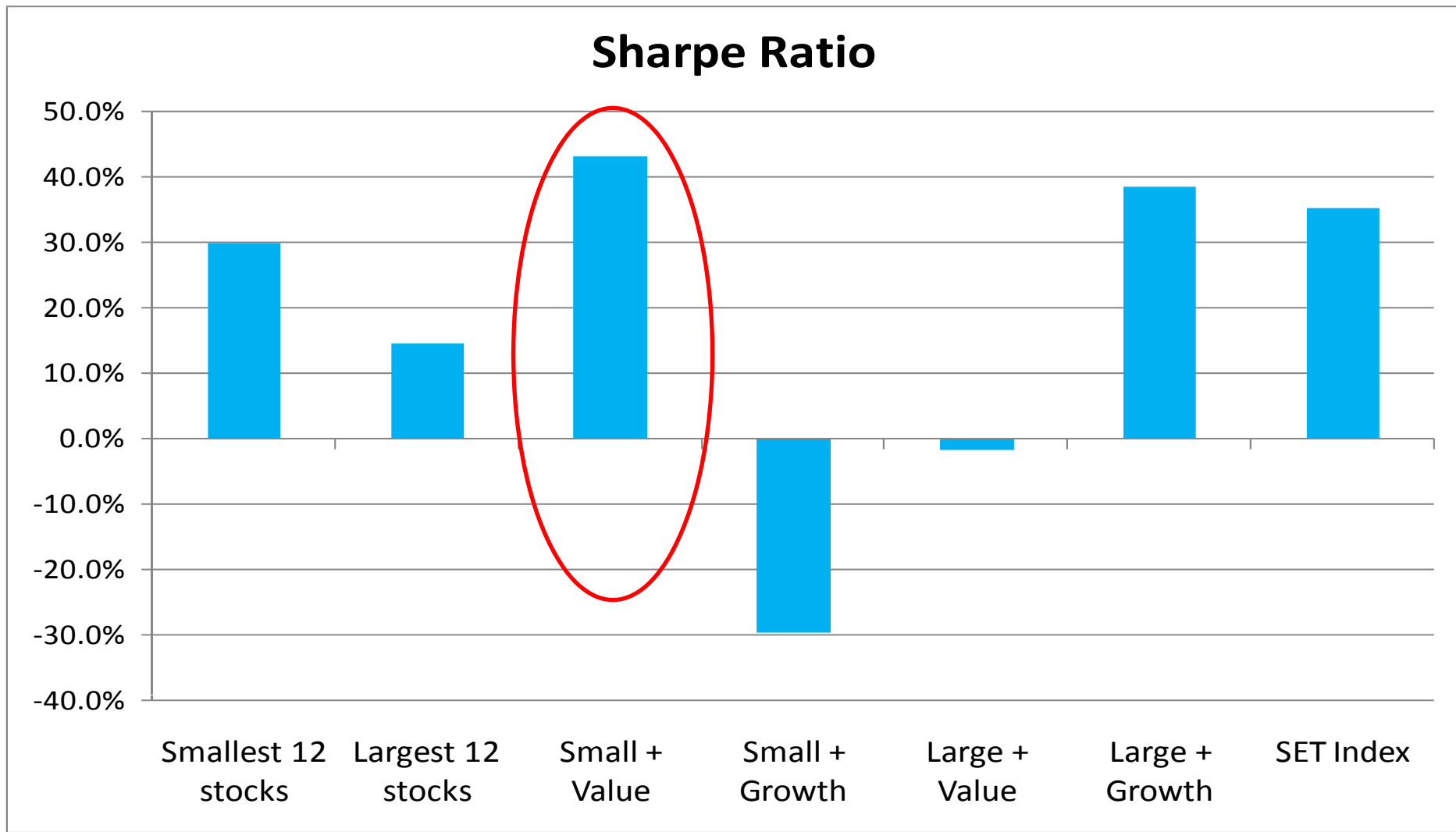
Small-Cap Value Strategy has higher average annual returns than market.



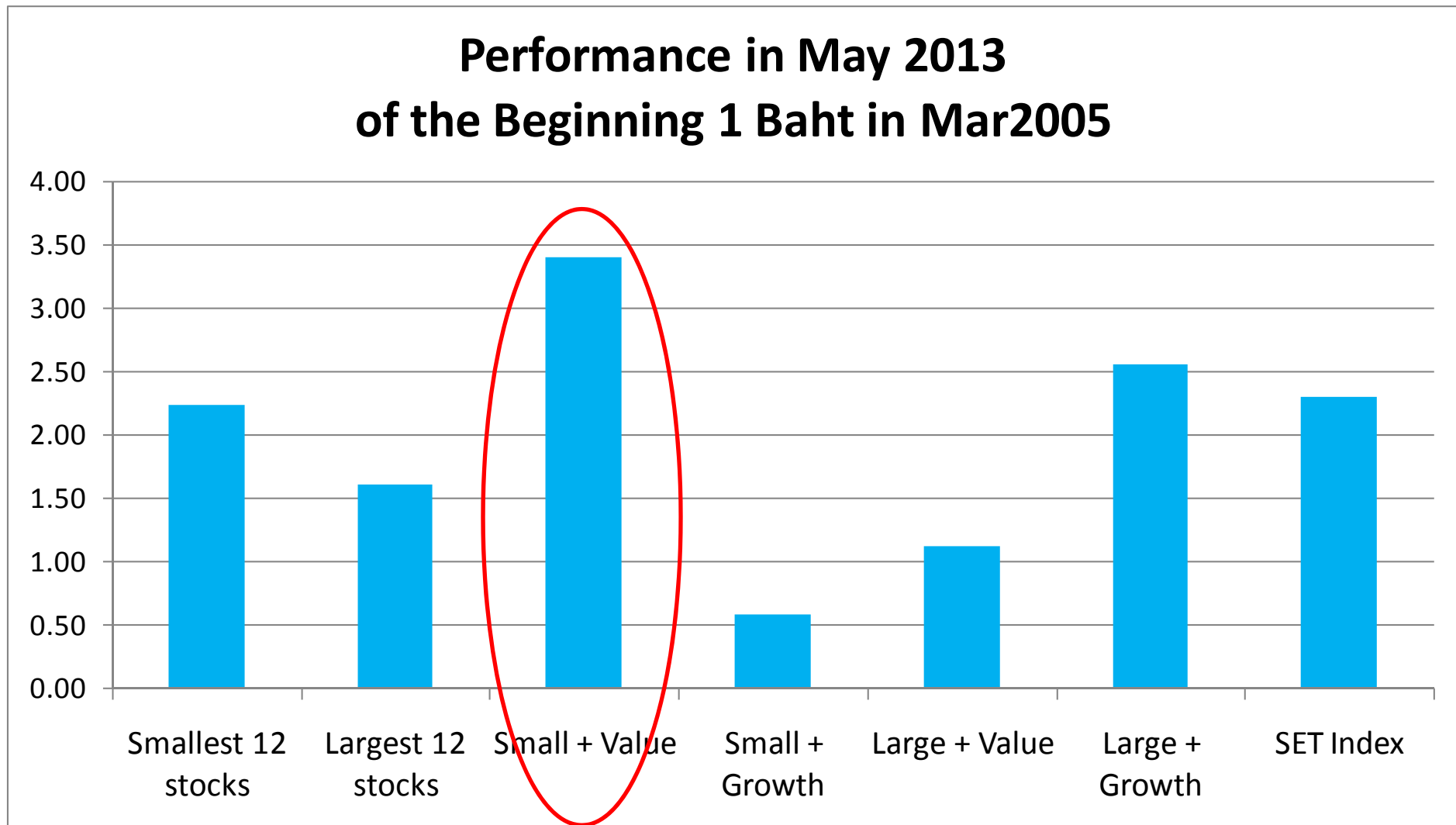
From 2008-2013, Small-Cap Value Strategy consistently beats market.



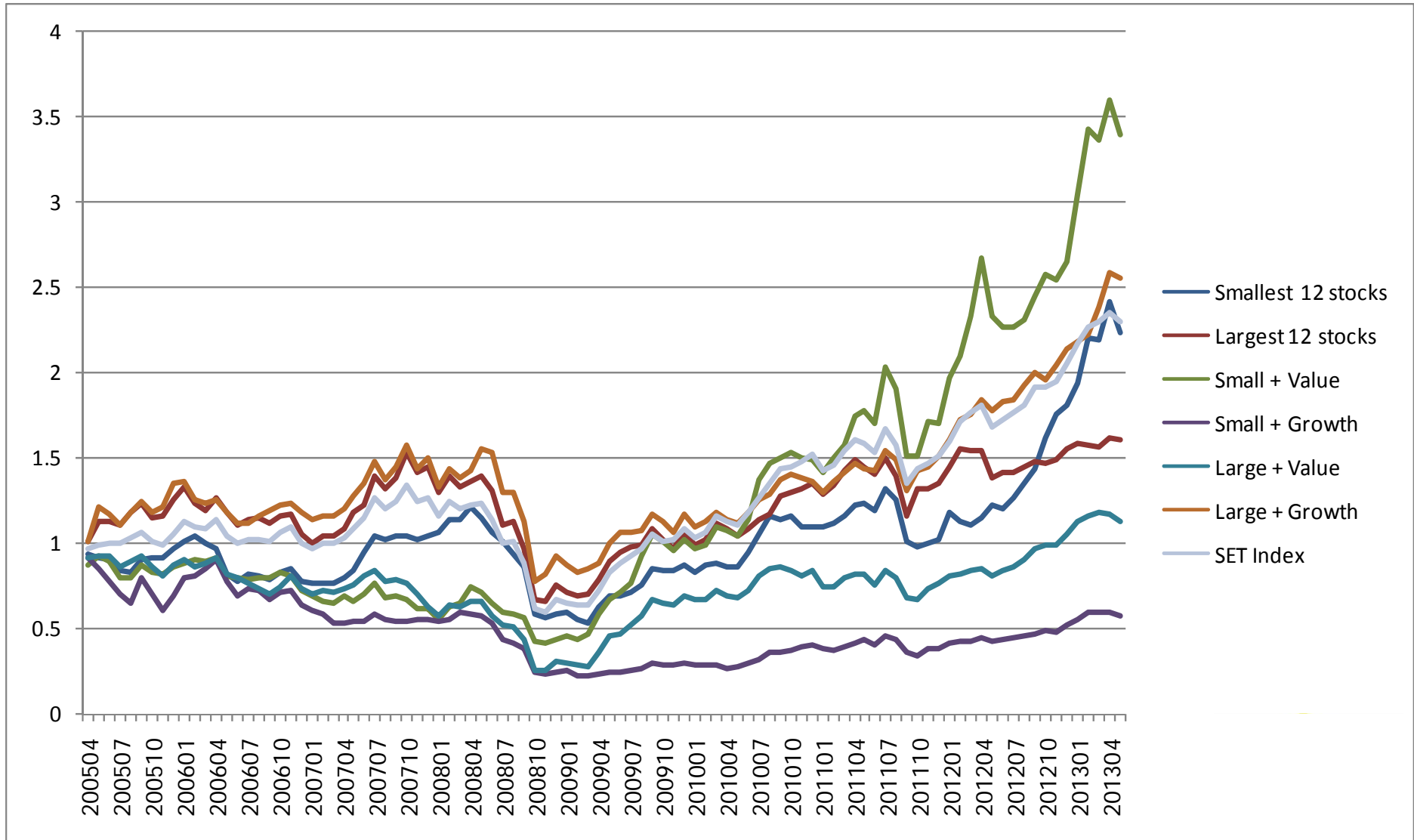
Small-Cap Value Strategy has higher Sharpe Ratio than market.



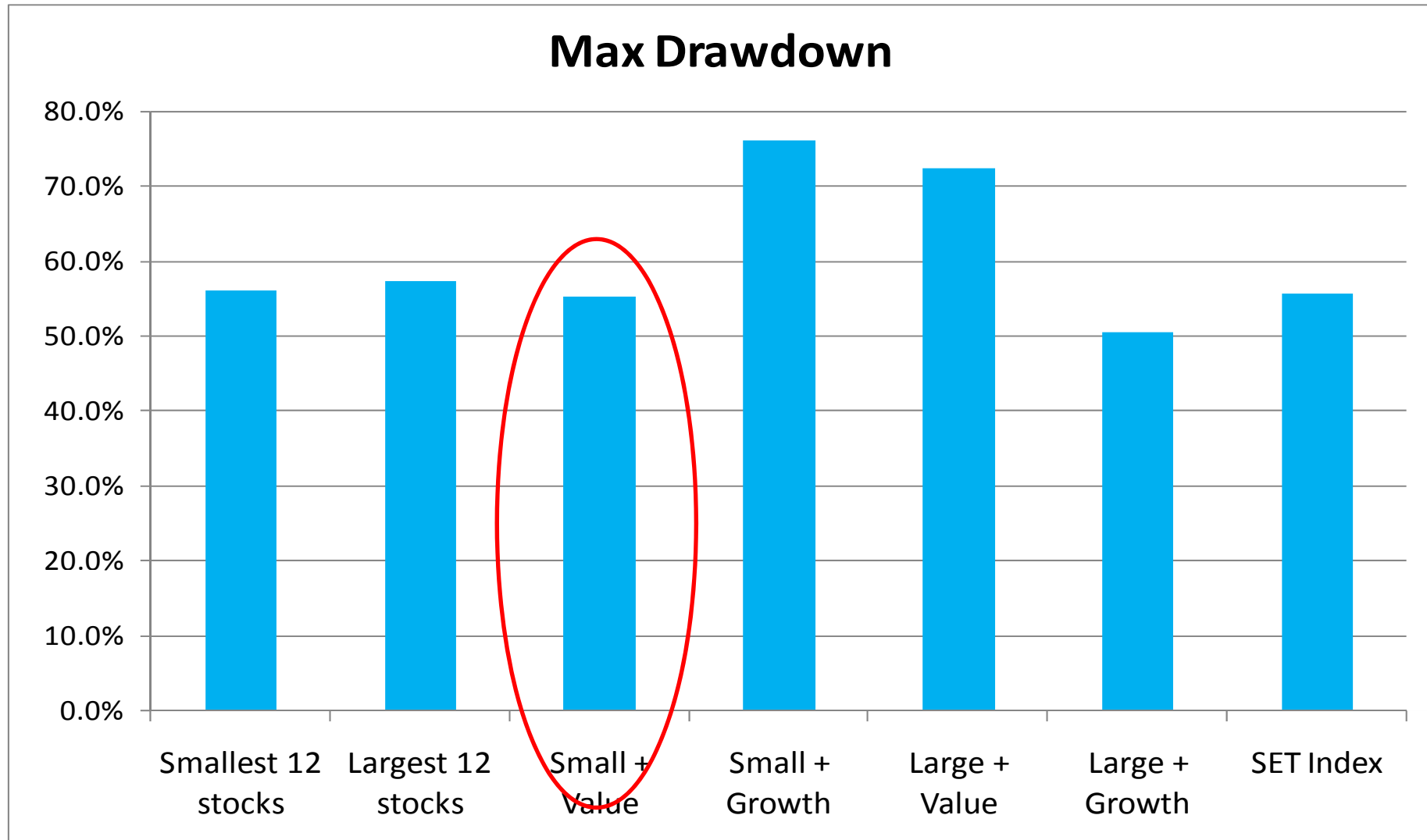
Small-Cap Value Portfolio is worth 3.4X in May 2013.



Performance of 1 Baht in Mar 2005



Small-Cap Value Strategy has about the same maximum drawdown as market.



Value Investing and Quality Measure

- The main principle of value investing is to buy the cheap stock, considering some measures like Price-to-Earning ratio (P/E) and Price-to-Book ratio (P/B). We will buy low P/E and P/B stocks.
- Recently, there are several papers arguing that value investing is not enough. If we also add some criteria about quality like considering the profits of company, we will gain more.
- In the pool of cheap stocks that we use P/E and P/B to determine, the quality measures will additionally enable us to distinguish the stock that is cheap for good reason (by its performance, this is the correct price) from the stock that is undervalued (this stock is very good, but for some reason at this moment of time it is underpriced by investors).
- So, if we use the joint value and quality strategy, we are expected to get higher returns than the value strategy alone.

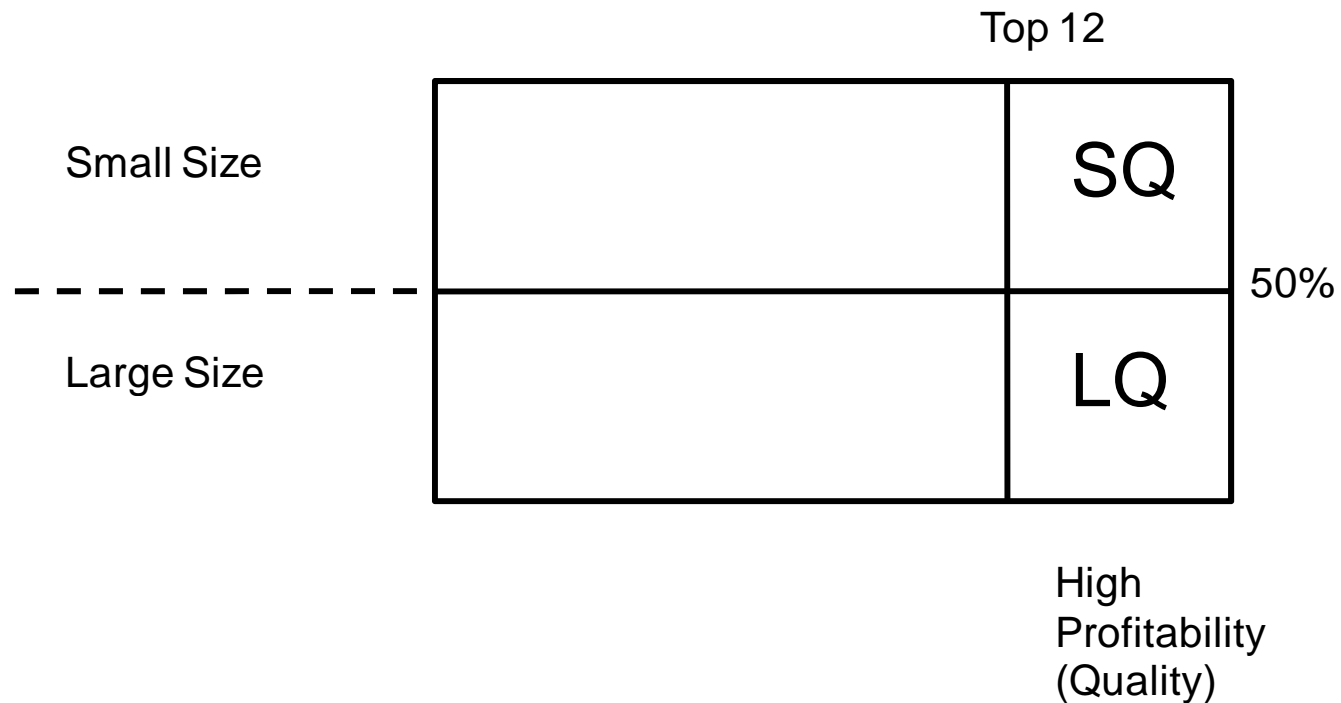
Selected Quality Measure

- We will use a number of Profitability Ratios as a proxy of Quality.
- Profitability Ratios:
 - Gross Profit/Asset
 - EBITDA/Asset
 - EBIT/Asset
 - Net Income/Asset

Methodology – Size and Quality

Portfolio Formation

- Double Sort method to construct value-weighted portfolio of size and profitability ratio over time and rebalance the portfolio every the end of March of every year.



GP/A is the best quality measure and helps improve portfolio performance of both small-cap and large-cap.

Investment Strategies	Annual Returns	Annual SD	Sharpe Ratio	Performance of 1 Baht	Max Drawdown
Smallest 12 stocks	9.8%	26.2%	0.30	2.23	56.0%
Largest 12 stocks	5.7%	25.8%	0.15	1.60	57.3%
Small + HighGP/A	14.3%	26.0%	0.47	3.22	55.7%
Large + HighGP/A	20.2%	25.2%	0.72	5.19	51.6%
Small +HighEBIT/A	8.5%	22.9%	0.28	2.00	54.7%
Large +HighEBIT/A	6.0%	23.1%	0.17	1.63	46.2%
Small + HighNI/A	7.0%	26.2%	0.19	1.77	58.4%
Large + HighNI/A	11.5%	25.9%	0.37	2.56	59.0%
Small+HighEBITDA/A	15.0%	21.0%	0.62	3.41	48.9%
Large+HighEBITDA/A	7.4%	22.1%	0.24	1.82	47.3%
SET Index	10.2%	23.2%	0.35	2.29	55.7%

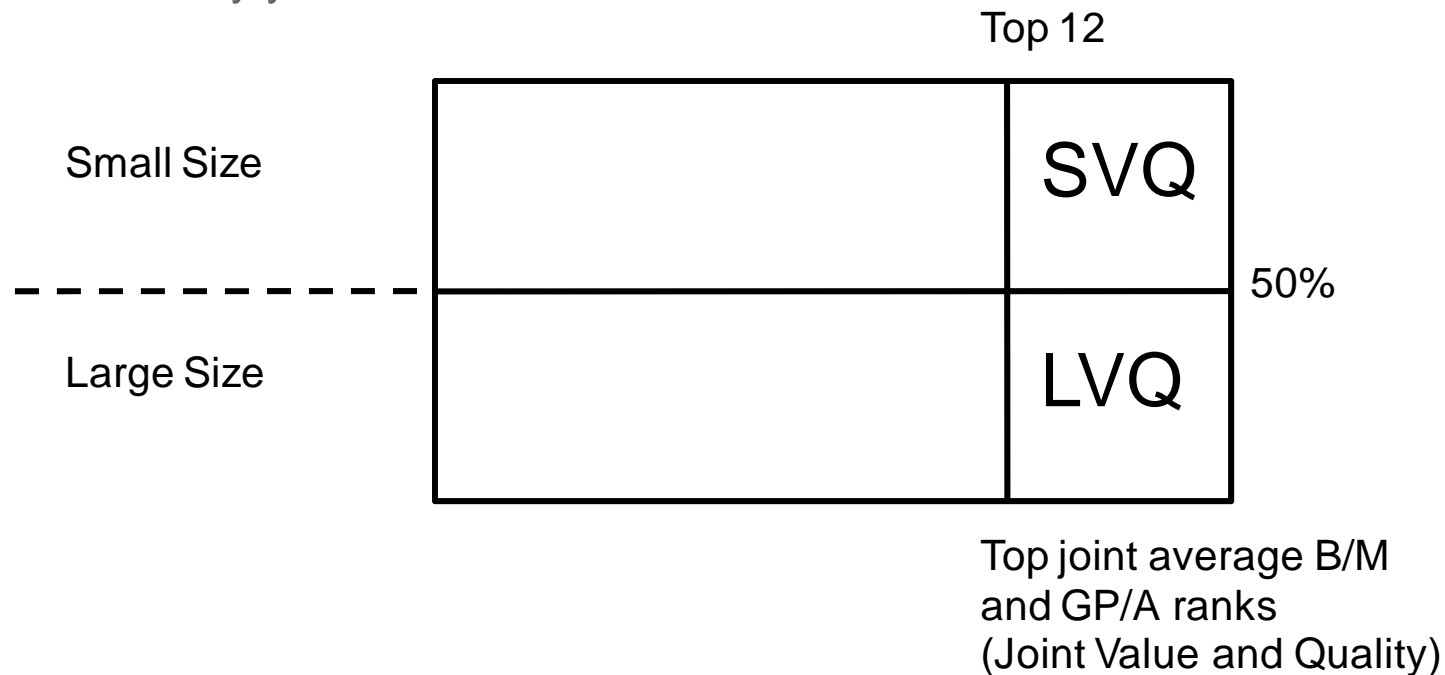
Gross Profit per Asset

- We will use Gross Profit per Asset as a proxy of Quality.
- Use Gross Profit per Asset instead of other profitability ratios since it is subject to less manipulative accounting adjustment.
- $GP/A = (GP / Sales) \times (Sales / A)$
- Gross Margin ($GP / Sales$) reflect the market power of firm.
- Asset turnover ($Sales / A$) is the dollar value of annual sales generated by each dollar of book assets). It measures the capital productivity.
- Combining Gross Margin and Asset turnover together make the GP/A a good quality measure.

Methodology – Size and Joint Value and Quality

Portfolio Formation

- Double Sort method to construct value-weighted portfolio of size and joint book-to-market and gross profit/asset over time and rebalance the portfolio every the end of March of every year.



Example of Average Joint Rank

Stock	B/M	GP/A	Rank of B/M	Rank of GP/A	Average Joint Rank
A	0.3	0.5	4	2	3
B	0.6	0.3	2	3	2.5
C	0.8	0.8	1	1	1
D	0.1	0.2	5	5	5
E	0.5	0.25	3	4	3.5



Sort joint ranks

Stock	Average Joint Rank
C	1
B	2.5
A	3
E	3.5
D	5



Top joint ranks

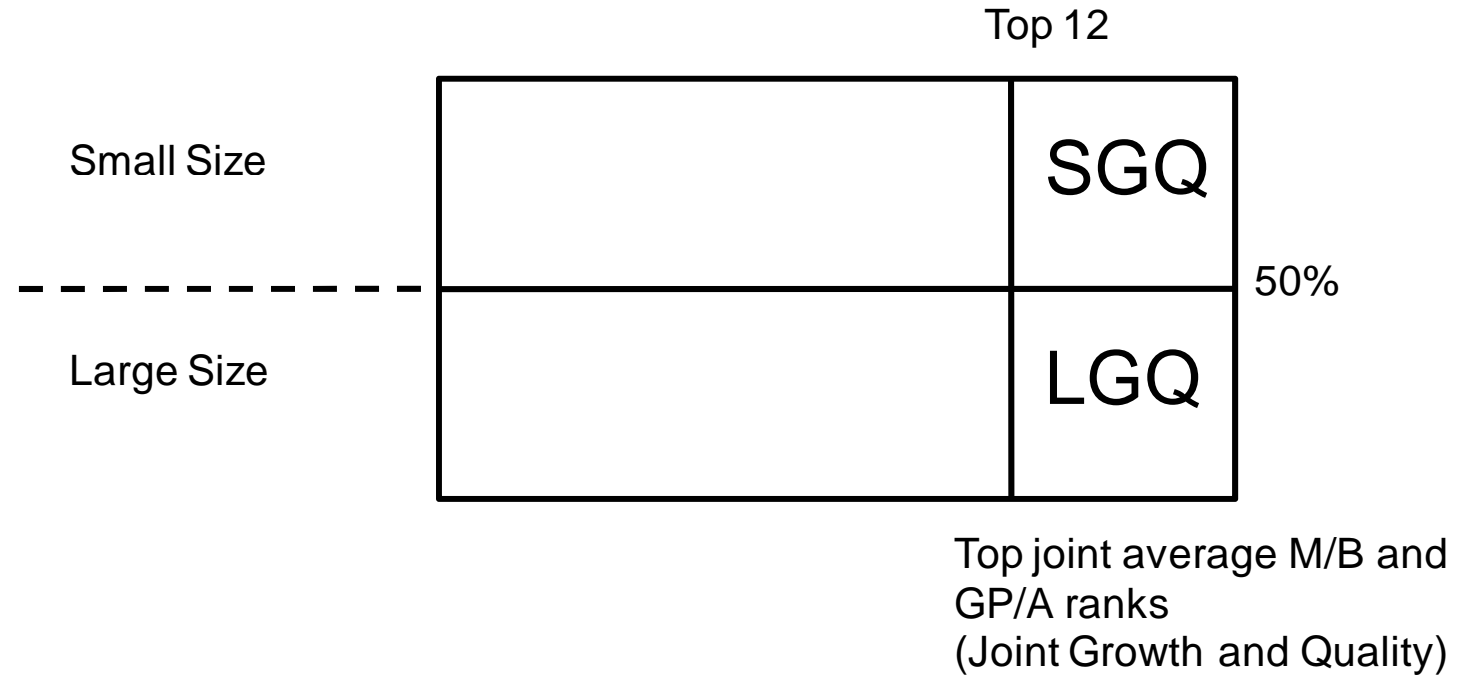


Bottom joint ranks

Methodology – Size and Joint Growth and Quality

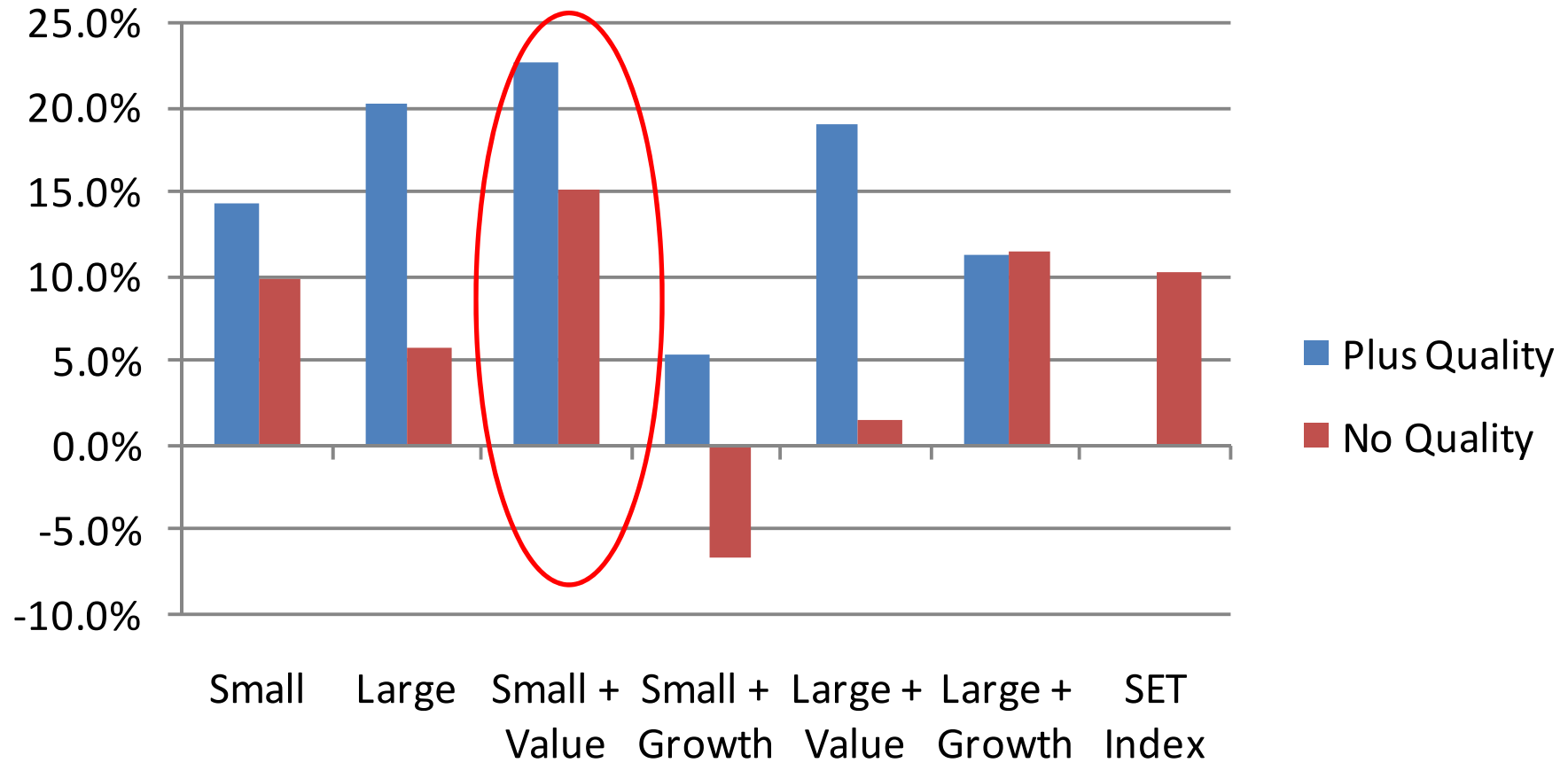
Portfolio Formation

- Double Sort method to construct value-weighted portfolio of size and joint market-to-book and gross profit/asset over time and rebalance the portfolio every the end of March of every year.

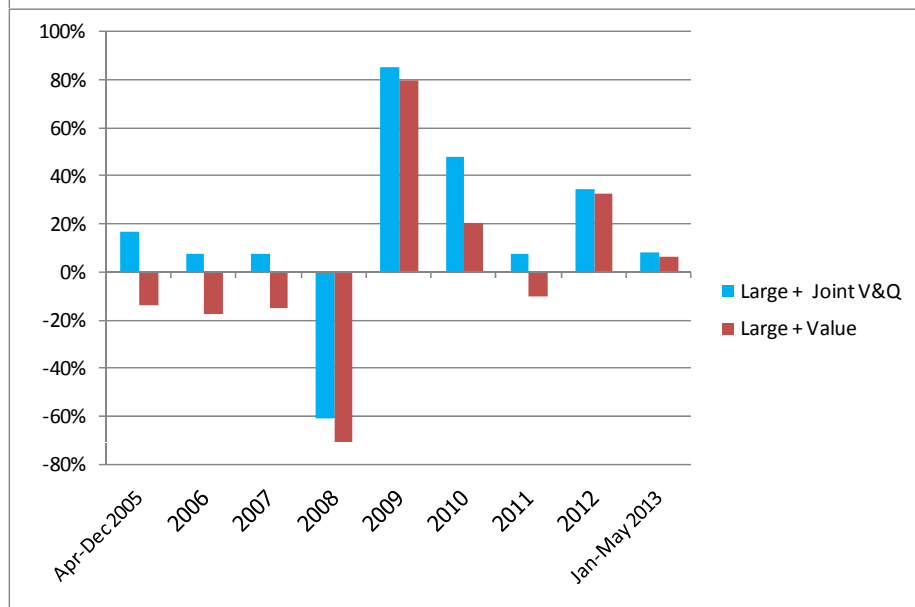
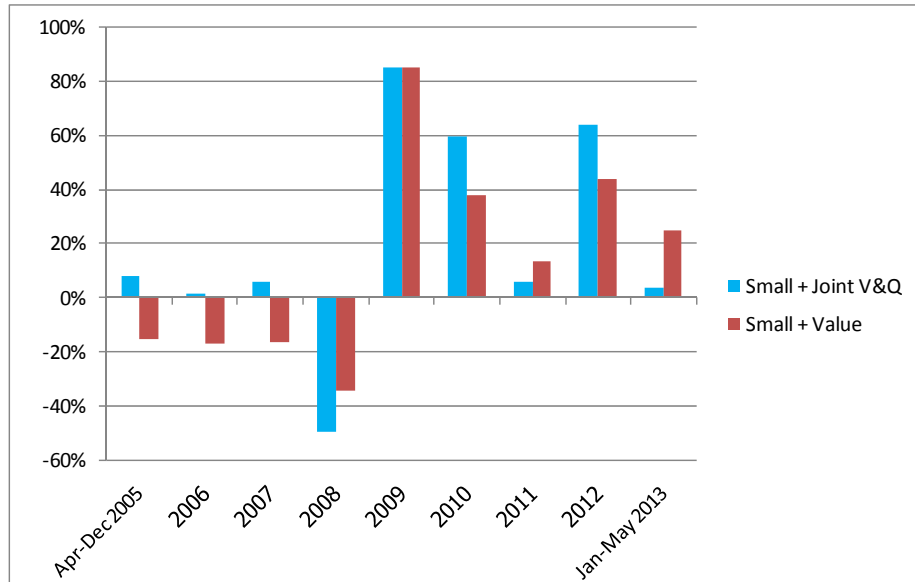


Excess Returns from Incorporating Quality

Average Annual Returns

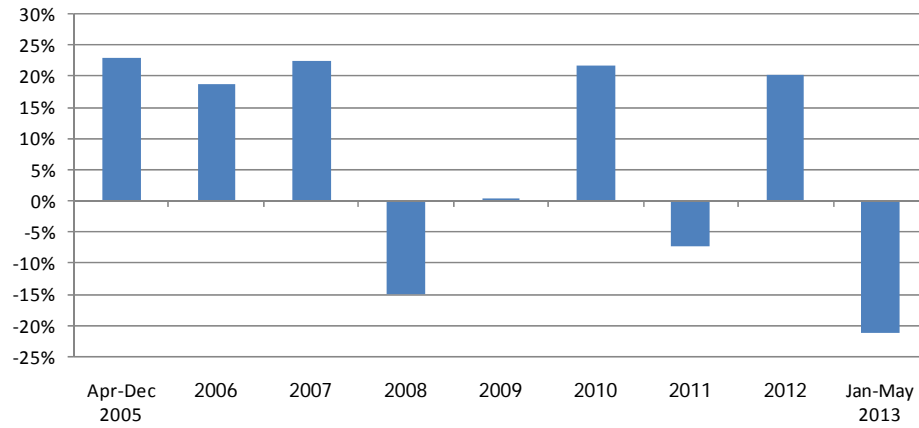


Excess Returns from Incorporating Quality

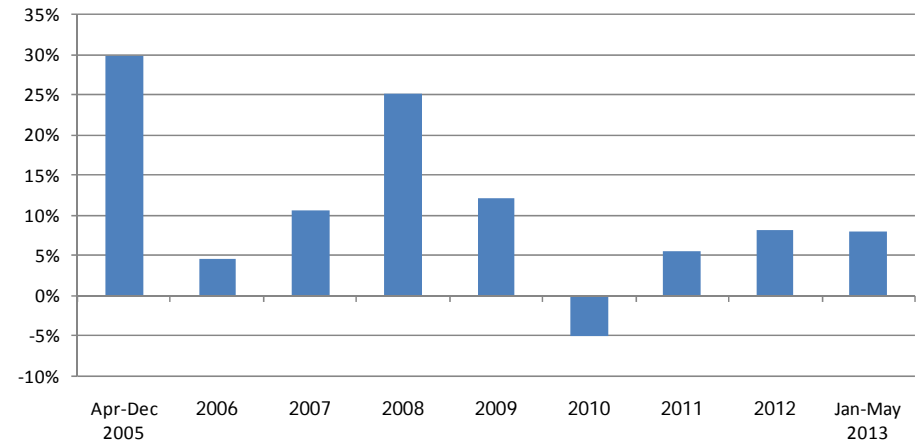


Excess Returns from Incorporating Quality

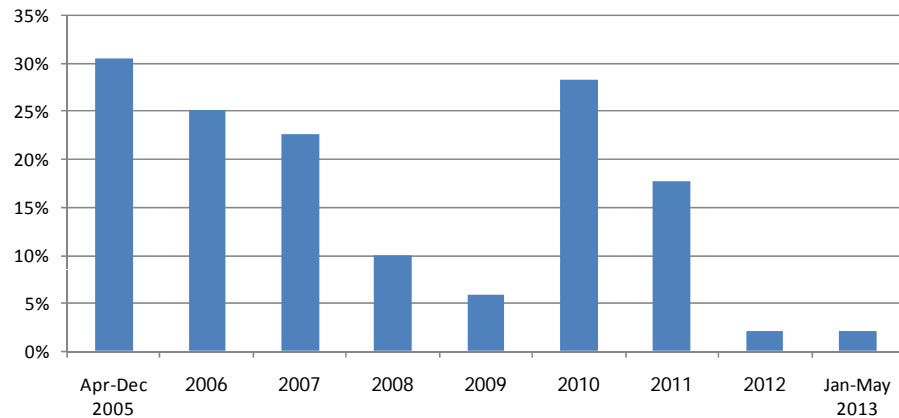
Small Value Quality - Small Value Excess Returns



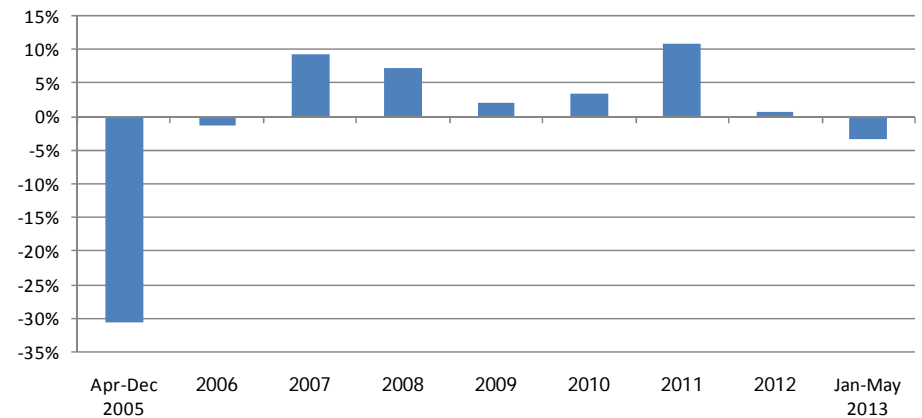
Small Growth Quality - Small Growth Excess Returns



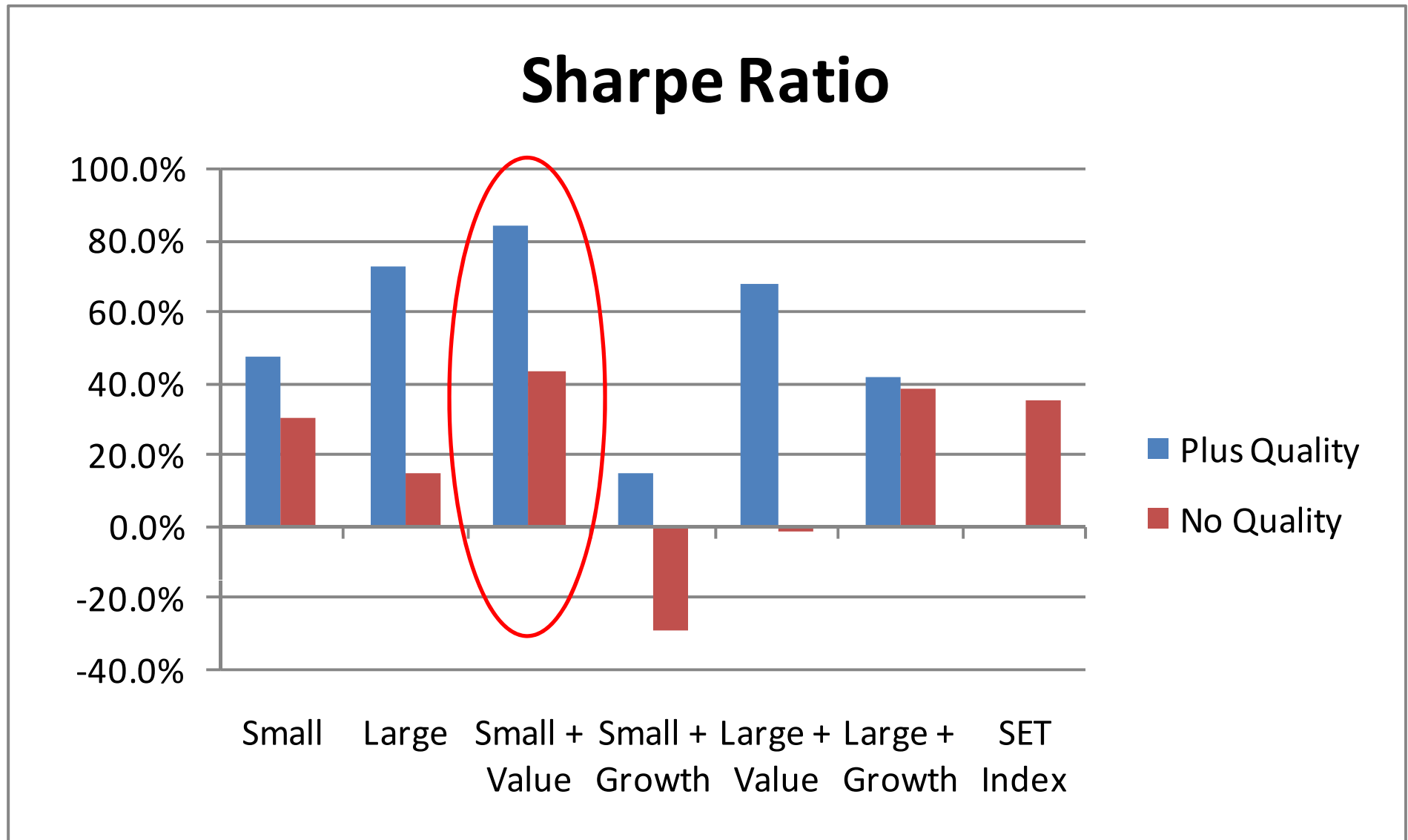
Large Value Quality - Large Value Excess Returns



Large Growth Quality - Large Growth Excess Returns

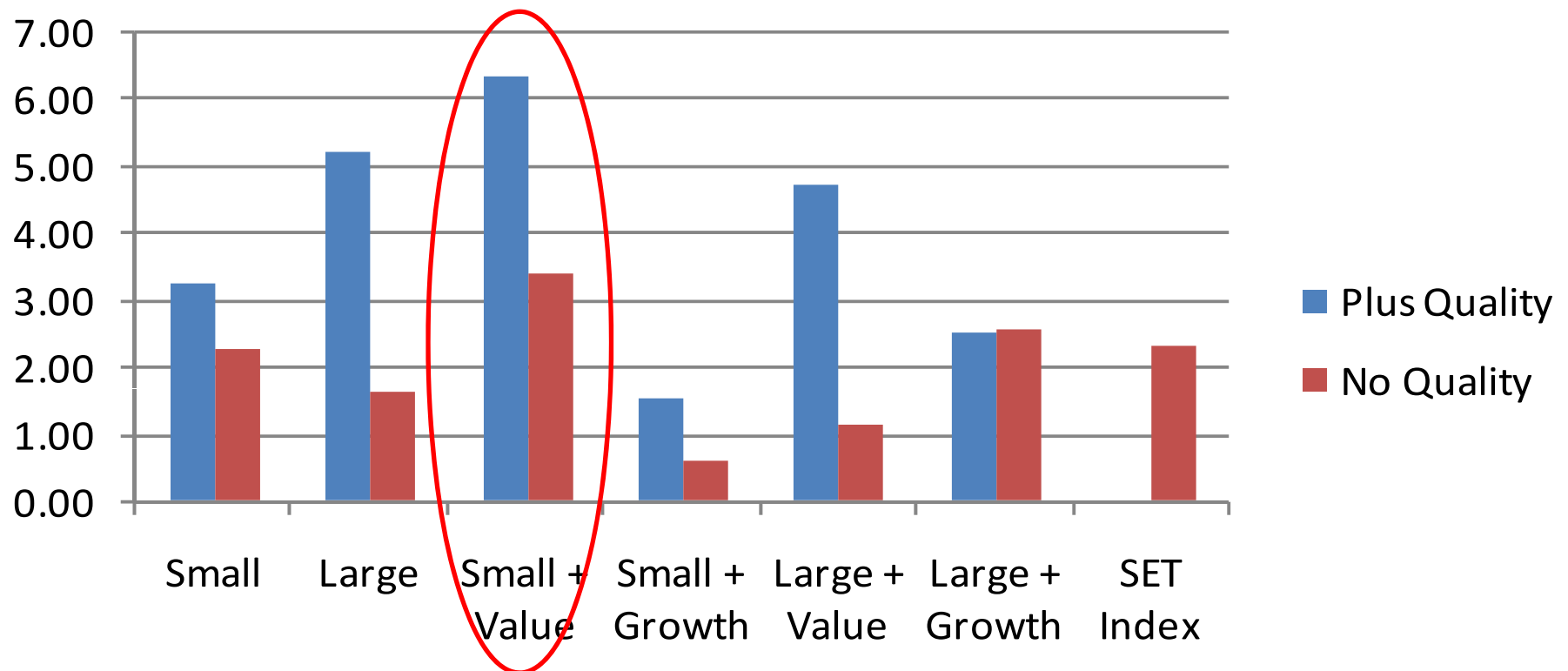


Extra Sharpe Ratio from Incorporating Quality

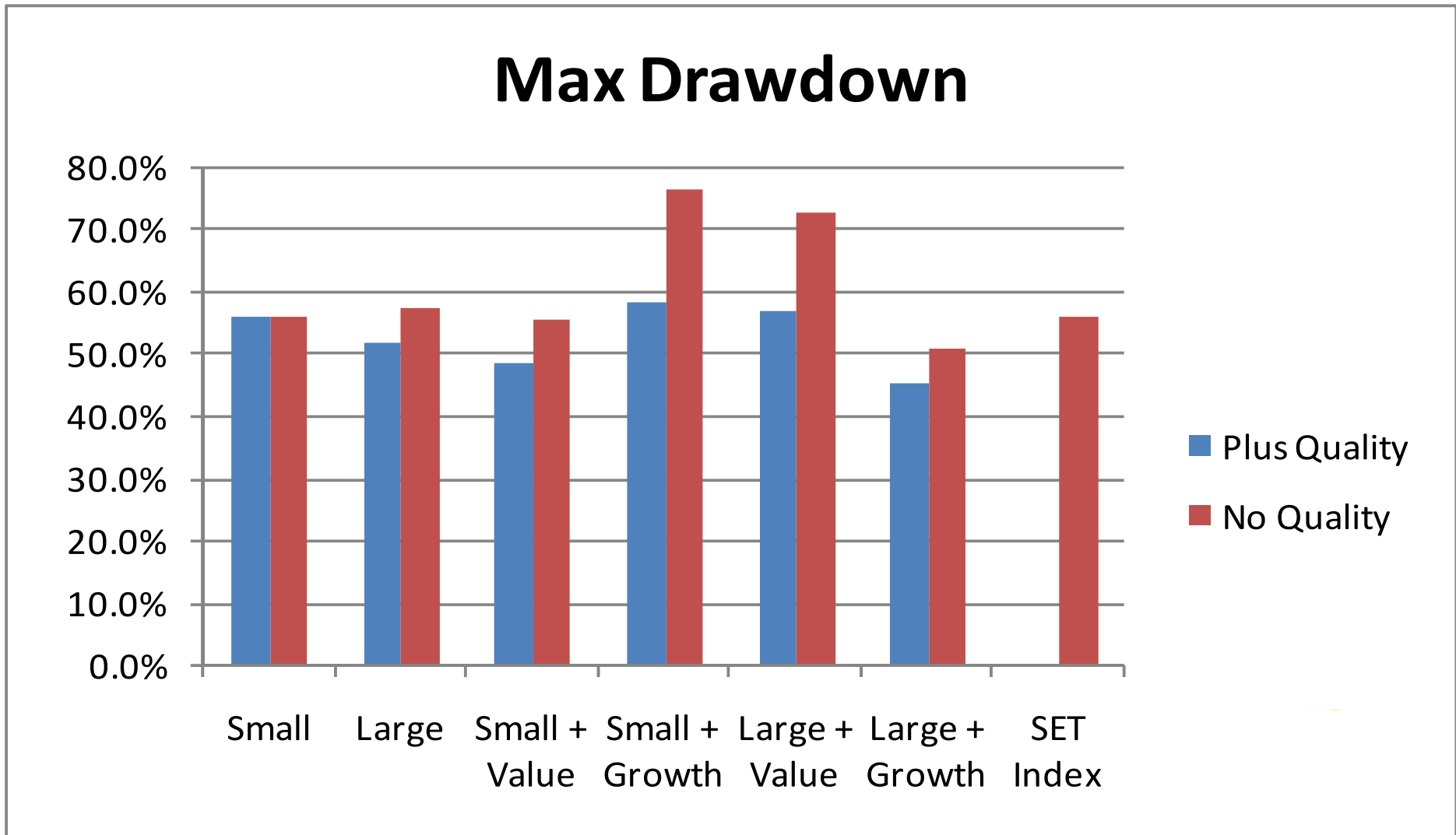


Small-Cap Value Quality Portfolio is worth 6.3X in May 2013.

Performance in May 2013 of the Beginning 1 Baht in Mar 2005



Incorporating Quality can reduce maximum drawdown.



Jensen's Alpha (Abnormal Returns)

$$R_{\text{investment strategy},t} - R_{f,t} = \alpha + \beta (R_{\text{market},t} - R_{f,t})$$

$$\alpha = (R_{\text{investment strategy},t} - R_{f,t}) - \beta (R_{\text{market},t} - R_{f,t})$$

Coefficients	Small+HighGP/A	Large+HighGP/A	Small Joint V&Q	Small Joint G&Q	Large Joint V&Q	Large Joint G&Q
Intercept	0.4%	0.9%	1.2%	-0.2%	0.8%	0.2%
p-value	0.3610	0.0170	0.0119	0.5499	0.0397	0.5197
Mkt Risk Premium	0.91	0.95	0.82	0.73	0.94	0.82
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R-squared	66.4%	76.8%	60.8%	63.0%	74.9%	76.8%

- The small-cap, joint value and quality strategy, the large-cap, quality strategy, and the large-cap, joint value and quality strategy have the significantly positive alpha of 1.2%, 0.9%, 0.8% per month respectively.

Investment Strategies with Quality in the Market Downturn Period

$$R_{\text{with Quality},t} - R_{\text{without Quality},t} = \beta_0 + \beta_1 D_t + \varepsilon_t$$

where

$D_t = 1$ if the Market return < 0
 $= 0$, otherwise

Coefficients	Small	Large	Small + Value	Small + Growth	Large + Value	Large + Growth
Intercept	0.1%	0.6%	-0.1%	0.2%	0.6%	-0.2%
p-value	0.8177	0.2340	0.8163	0.6713	0.2560	0.5564
Dummy for Negative Mkt Returns	0.7%	1.6%	2.1%	2.1%	2.5%	0.5%
p-value	0.4964	0.0661	0.0255	0.0241	0.0049	0.3885

- If we incorporate the quality measure, there are additional 2% monthly returns when the market has negative returns (e.g. market downturn).

Performance of Investment Strategies

Investment Strategies	Annual Returns	Annual SD	Sharpe Ratio	Performance of 1 Baht	Max Drawdown
Smallest 12 stocks	9.8%	26.2%	29.8%	2.23	56.0%
Largest 12 stocks	5.7%	25.8%	14.5%	1.60	57.3%
Small + Value	15.0%	30.1%	43.0%	3.40	55.2%
Small + Growth	-6.8%	29.7%	-29.7%	0.57	76.1%
Large + Value	1.4%	31.9%	-1.9%	1.12	72.4%
Large + Growth	11.4%	24.6%	38.5%	2.55	50.5%
Small + Value + Quality	11.9%	29.0%	34.1%	2.63	68.2%
Small + Growth + Quality	2.7%	21.9%	3.3%	1.25	60.2%
Large + Value + Quality	13.2%	24.3%	46.1%	2.94	52.4%
Large + Growth + Quality	10.8%	25.2%	35.1%	2.42	50.8%
Small + Joint V&Q	22.5%	24.4%	84.1%	6.30	48.1%
Small + Joint G&Q	5.2%	21.4%	14.9%	1.53	58.0%
Large + Joint V&Q	19.0%	25.2%	67.3%	4.71	56.8%
Large + Joint G&Q	11.1%	21.9%	41.8%	2.48	45.2%
Small + Quality	14.3%	26.0%	47.4%	3.22	55.7%
Large + Quality	20.2%	25.2%	72.2%	5.19	51.6%
Small +HighEBIT/A	8.5%	22.9%	28.3%	2.00	54.7%
Large +HighEBIT/A	6.0%	23.1%	17.2%	1.63	46.2%
Small+Greenblatt	7.1%	25.2%	20.1%	1.78	56.0%
Large+Greenblatt	11.3%	26.7%	34.7%	2.51	57.5%
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