

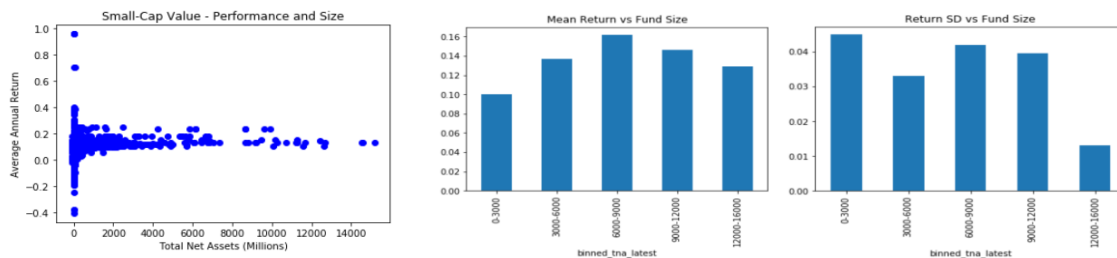
Asset Management HW2

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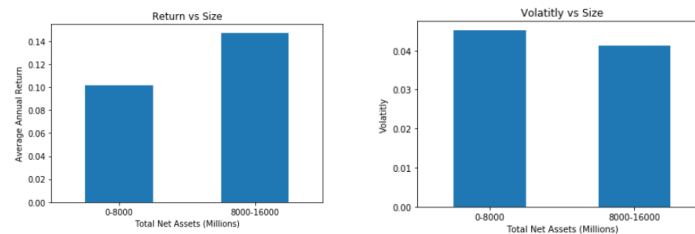
Data Acquisition: we pulled all the mutual funds performance in the CRSP database and matched with Small Cap Value funds (SCVF) to extract the returns.

Data Processing: We merge fund return dataset with SCVF on the “fundno” column and remove null values. Outlier with fund number 22169 and inputs with erroneous data types are removed. Returns are then annualized and compared with SCVF’s total net asset value.

Analysis: For funds with size smaller than \$1B, returns are highly varied. There are funds with exceptionally high returns and funds that keep losing money. From exploratory analysis through scatter plot and bar plots, we see that as fund size grows, return variance gets smaller. After binning data with regard to fund size (TNA) sequentially into five regions (3000, 6000, 9000, 12000, 16000 as delimiters) Funds within 6000-9000 million earn the highest return, which then decreases towards two ends. Return volatility tend to decrease as the fund size grows and see a sharp dip for funds in the largest size range.



To further explore the relationship between fund size and returns, we separate the data into binary form: smaller than and larger than 8000 million. We then compared the annualized return and volatility of categorized funds. We found that funds in the 8000-16000 range had higher annualized return and lower volatility, which is an absolute advantage in terms of risk-return.



Our analysis showed that within small-cap value funds, return of funds with less than \$8 billion AUM is highly varied and on average less than the return of funds with AUM greater than \$8 billion. We verified that this difference is significant by performing a paired t-test, which gave us a p-value under $\alpha=0.05$ of 2.22×10^{-5} . In addition, the volatility of funds with less than \$8 billion AUM is higher than funds with more than \$8 billion AUM. However, this difference is not statistically significant under $\alpha=0.05$ as F-test gave a p-value of 0.75. Therefore, we conclude that within small-cap value mutual funds, having more total net assets under management, the funds tend to generate high returns, but a yet-to-prove low volatility. We hypothesize that this observation could be attributed to better talent at more prestigious and well funded mutual funds.