Statistic study of historical performance of Mutual funds

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“Compound Interest” is the Eighth Wonder of the World”
---- Albert Einstein
Outline

• Background

• How the power law works in the growth of wealth?

• Secret: cumulative compound interest

• Mutual funds and the performance of auto-investment plan (AIP)

• Summary
Background

- Short-term stock price is like Brownian motion, in which $\bar{W} = 0$;

- Long-term stock price is affected by the black swan events.

The market turns after a series of independent events!

How can personal investor benefit from it?
Life is like a snowball. The important thing is finding wet snow and a really long hill.

— Warren Buffett —
Age – log (wealth) function

Net worth of Warren Buffett

Age 26: $ 140,000

What is the secret?

• The magic of the compound interest!!

• Power law!

Cumulative return in 30 years:

Compound return equation:

\[\left[\left( (a + x) \cdot 1.0013 + x \right) \cdot 1.0013 + x \right] \ldots + x \right] \cdot 1.0013\]

“a” is the initial investment

“X” is the periodic contribution.

http://www.datedial.com/datEquivalent_Interest_Rate.asp

1561
The magic of the compound interest

Step 1: Initial Investment
- Amount of money that you have available to invest initially: $2,000

Step 2: Contribute
- Amount that you plan to add to the principal every month: $3,000
- Length of time, in years, that you plan to save: 30

Step 3: Interest Rate
- Your estimated annual interest rate: 7%
- Range of interest rates (above and below the rate set above) that you desire to see results for:

Step 4: Compound It
- Times per year that interest will be compounded: ANNUALLY

The Results Are In
In 30 years, you will have $3,415,812.82

https://www.investor.gov/additional-resources/free-financial-planning-tools/compound-interest-calculator
Compound interest growth for personal investor

• How can individual investor take the advantage of compound growth?

Suggestions:

• Minimize the impact of loss, broker fee and Tax!

• Accumulate the base (or “snow ball”), invest long enough

• Mutual funds!
What is mutual funds? Why?

- **A mutual fund** is an investment vehicle made up of a pool of moneys collected from many investors for the purpose of investing in securities such as stocks, bonds, money market instruments and other assets.

- The first modern-day mutual fund, **Massachusetts Investors Trust**, was created on March 21, 1924.

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Disadvantage</th>
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<tbody>
<tr>
<td>Passive investment</td>
<td>Positive return after a long while</td>
</tr>
<tr>
<td>Small initial amount</td>
<td>Less volatility</td>
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<tr>
<td>Extra money: like sands dribbling out of your grasp</td>
<td>Not so profitable and exciting as a stock</td>
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<tr>
<td>Less broker fee</td>
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Selection criteria and results

<table>
<thead>
<tr>
<th>Search Criteria Review</th>
<th>Manager Tenure</th>
<th>greater than or equal to</th>
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<tbody>
<tr>
<td></td>
<td>Minimum Initial Purchase</td>
<td>less than or equal to</td>
</tr>
<tr>
<td></td>
<td>No-load funds only</td>
<td>$ 500</td>
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<tr>
<td></td>
<td>Expense Ratio</td>
<td>less than or equal to</td>
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<tr>
<td></td>
<td>YTD Return</td>
<td>7%</td>
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<tr>
<td></td>
<td>1-year Return</td>
<td>7%</td>
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<td></td>
<td>3-year Return</td>
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<td>5-year Return</td>
<td>7%</td>
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<td></td>
<td>10-year Return</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>Turnover Ratio</td>
<td>25%</td>
</tr>
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U.S. equity

Oppenheimer global opportunities: OPGIX

http://screen.morningstar.com/fundselectoraol.html
Historical performance (01/01/2003 - current)

- S&P 500 Index:
  - Peak: 2,900
  - Without restoration!!

- Berkshire Hathaway Inc. Class A:
  - Peak: 340,000
  - 6 times

- Oppenheimer Global Opportunities Fund Class Y:
  - Peak: 80
  - 4 times

Without restoration!!!
Historical performance (01/01/2003 - current)

800% ➤

Oppenheimer Global Opportunities Fund Class Y

8 times !!

After restoration!!!
Summary and next plan

• Compound interest is the most important secret of wealth growth.

• Auto investment in mutual funds is a smart way to accumulate compound interest.

• Further investigations would be conducted on not only equity funds but also bond funds and etc.

• Optimize a portfolio of mutual funds which be more robust under severe market volatility.
Thanks !!!