

# Equity Funds: Management and Assessment

FN 451

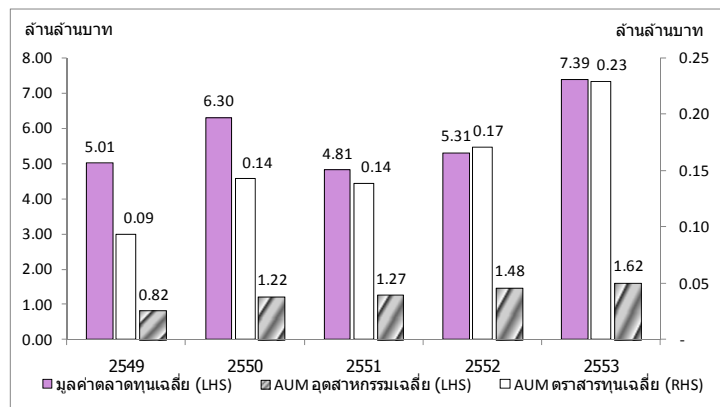


# Outline

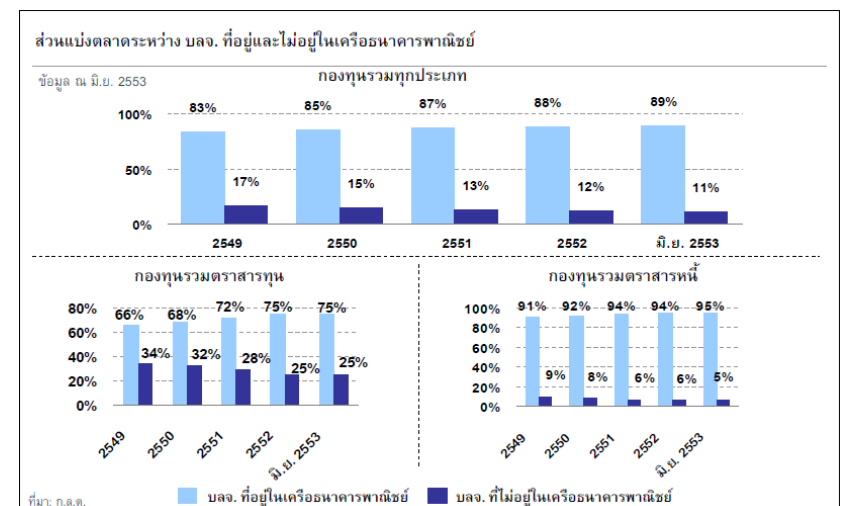
- Investment company/mutual funds in Thailand
- Portfolio management strategies
  - Passive vs Active management
  - Fundamental, technical, and anomalies & attributes
- Fund types
- Evaluation of portfolio performance
  - Performance with and without external cash flows
  - Composite portfolio performance measures
  - Performance attribution
  - Risk attribution: VaR, Volatility, Tracking error
- Computer exercise: Measuring tracking error



## การเติบโตของอุตสาหกรรมกองทุนรวมไทย



## ธนาคารพาณิชย์ถือครองตลาดส่วนใหญ่



## Mutual funds

- Pools funds belonging to many individuals in a single portfolio of securities. In exchange, the investment firm issues to each investor new shares representing share of ownership in fund.
- Fund value per share value is known as net asset value (NAV)
- Fund NAV =  $(\text{Total MV of fund} - \text{Fund expenses}) / \text{Total fund shares}$



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## NAV

- Ex. An investment firm with Bt 100 mn stock portfolio and 10 mn shares has NAV of Bt10.
- If during the holding period, the value of portfolio increases to Bt 112.5 mn while fund incurred Bt0.1 mn trading expenses and management fees. What is the new NAV?
- New NAV =  $112.5 - 0.1 / 10 = \text{Bt } 11.24$



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## Portfolio management strategies

- Passive management: A long term buy and hold strategy in which stocks are purchased so that portfolio returns will track those of an index over time.  
“Indexing”
- Active management: Management attempts to outperform on a risk adjusted basis the passive benchmark portfolio.



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## Index portfolio construction techniques

- Full replication
- Sampling
- Quadratic optimization



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## Active management strategies

- Fundamental analysis:
  - Top down (Tactical asset allocation, sector rotation)
  - Bottom up
- Technical analysis:
  - Contrarian
  - Momentum trading
- Anomalies and attributes:
  - Calender affects
  - Security characteristics: (size, P/E, P/B)
  - Investment style (value, growth)



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## Fundamental strategies

- Tactical asset allocation: Asset class mix in portfolio is adjusted frequently to account for changing market conditions.
- Sector rotation: Positioning the portfolio to take advantage of the market's next move.



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## Technical strategies

- Contrarian: Buying (selling) stocks near its lowest (highest) price.
- Momentum: Winners (losers) will continue to win (lose).



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## Anomalies and attributes

- Day of the week effect
- January effect
- Small firm premium
- Low P/E, P/BV portfolios tend to perform well



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## Value vs Growth

- Value focus
  - The price must be cheap
  - Less emphasis on current earnings and drivers of earnings growth
  - Low P/E, P/BV, high dividend yield
- Growth focus
  - Focus on EPS and economic prospects
  - Target firms with rapid earnings growth
  - High EPS growth, high profits, higher valuations, small firms



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## Fund types

- Open-end: Continues to sell and repurchase shares after IPO.
- Additional shares can be bought or sold at NAV.
- Closed-end: Offers no further shares and does not repurchase shares on demand.
- Close-end fund market price usually at discount NAV.
- Hedge funds: A fund, usually used by wealthy individuals and institutions, which is allowed to use aggressive strategies that are unavailable to mutual funds, including selling short, leverage, program trading, swaps, arbitrage, and derivatives.



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## Fund types in Thailand

ตารางที่ 1: เกณฑ์ในการจัดประเภทกองทุนรวม แบ่งตามนโยบายการลงทุน

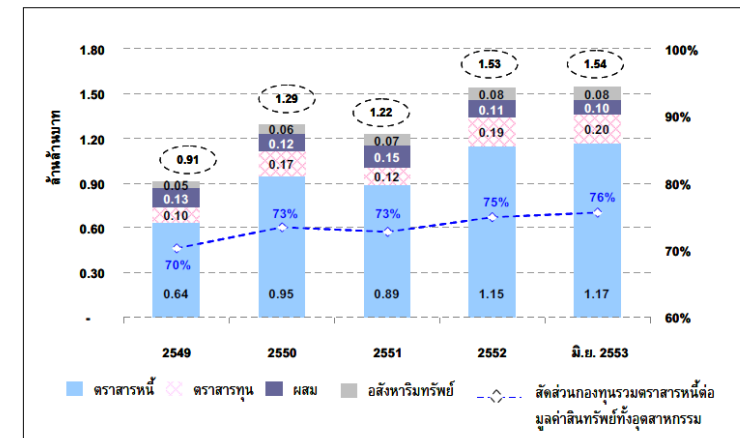
ประเภทกองทุนรวม	เกณฑ์ในการจัดประเภทกองทุนรวม
กองทุนรวมตราสารหนี้ (รวมกองทุนรวมตลาดเงิน)	ตามเกณฑ์ ก.ล.ด. และกองทุนรวมที่มีลักษณะคล้ายเงินฝาก
กองทุนรวมตราสารทุน	ตามเกณฑ์ ก.ล.ด.
กองทุนรวมผสม	ตามเกณฑ์ ก.ล.ด.
กองทุนรวมอสังหาริมทรัพย์	ตามเกณฑ์ ก.ล.ด.

ที่มา: ก.ล.ด.



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ภาพที่ 2: AUM แยกตามประเภทกองทุนรวม และสัดส่วน AUM ของกองทุนรวมตราสารหนี้ต่อ AUM ของอุตสาหกรรม



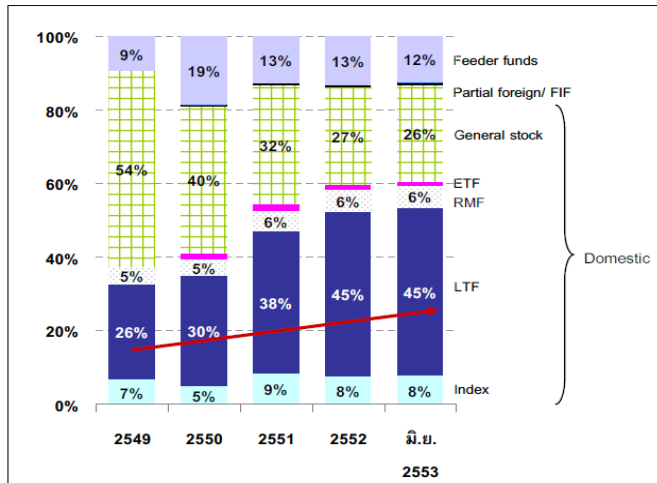
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ภาพที่ 5: สัดส่วนกองทุนรวมตราสารทุน แยกตามผลิตภัณฑ์



ที่มา: ก.ล.ด.

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## Performance without intraperiod external cash flows

- An asset management firm manages a family account initially valued at USD 1 mn. One month later it was worth USD 1.08 mn. Assuming no external CF, what is the return on this account.

$$r_t = \frac{MV_1 - MV_0}{MV_0} = \frac{1.08 - 1.00}{1.00} = 8\%$$



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## Performance when external CF occur at beginning or end of eval. period

- Return to previous example, suppose the account received USD 50,000 contribution at beginning of month. What is rate of return for the month?

$$r_t = \frac{MV_1 - (MV_0 + CF)}{MV_0 + CF} = \frac{1.08 - (1.00 + 0.05)}{1.05} = 2.86\%$$

- If contribution had occurred at month-end. The return will be.

$$r_t = \frac{(MV_1 - CF) - MV_0}{MV_0} = \frac{(1.08 - 0.05) - 1.00}{1.00} = 3.00\%$$

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## Composite portfolio performance measures

- Treynor performance measure:

$$T = \frac{\bar{R}_i - RFR_i}{\beta_i}$$

- Treynor ratio measures excess return per unit of systematic risk



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## Treynor measures

- Assume during the past 10 year period the average RF = 8% and average market return is 14%. Rank the following fund managers in terms of Treynor risk-adjusted performance.

Manager	Avg return	Beta
W	0.12	0.9
X	0.16	1.05
Y	0.18	1.2
Z	0.07	0.5
G	0.1	-0.2



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## Treynor measures

- How would you rank these funds?
- How would they plot on the SML?

$$T_M = \frac{0.14 - 0.08}{1.0} = 0.06$$

$$T_W = \frac{0.12 - 0.08}{0.9} = 0.044$$

$$T_X = 0.076$$

$$T_Y = 0.083$$

$$T_Z = \frac{0.07 - 0.08}{0.50} = -0.02$$

$$T_G = \frac{0.10 - 0.08}{-0.20} = -0.10$$



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## Sharpe ratio

- Measures excess return to total risk

$$T = \frac{\bar{R}_i - RFR_i}{\sigma_i}$$



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## Sharpe ratio

- Using previous information plus STD of market is 20%, rank the following funds.

$$S_M = \frac{0.14 - 0.08}{0.20} = 0.30$$

$$S_D = \frac{0.13 - 0.08}{0.18} = 0.278$$

$$S_E = 0.409$$

$$S_F = 0.348$$

Manager	Avg return	Std
D	0.13	0.18
E	0.17	0.22
F	0.16	0.23



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## Treynor vs Sharpe ratio

- Should the two be equivalent?
- Which is more appropriate for a poorly diversified portfolio?



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## Jensen's alpha

- The alpha,  $\alpha$  is computed from the regression,

$$R_{it} - RF_t = \alpha_i + \beta_i(R_{mt} - RF_t) + e_{it}$$

- A superior portfolio manager has significant positive alpha.



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## Information ratio

- Also known as appraisal ratio, measures a portfolio average return relative to benchmark portfolio.

$$IR_i = \frac{E(R_i - R_b)}{\sigma_{ER}} = \frac{\bar{ER}}{\sigma_{ER}}$$



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## Value at Risk (VAR)

- The value at risk (VAR) of a portfolio is the loss in value in the portfolio that can be expected over a given period of time (e.g., 1-Day) with a probability not exceeding a given number (e.g., 5%).
- Probability (Portfolio Loss < - VAR) = K
- K = Given Probability

If the Value at Risk at the 5% level for the next week equals \$20 million, then

- Prob(change in portfolio value < -\$20 million) = 0.05
- In words, there is 5% chance that the portfolio will lose more \$20 million over the next week

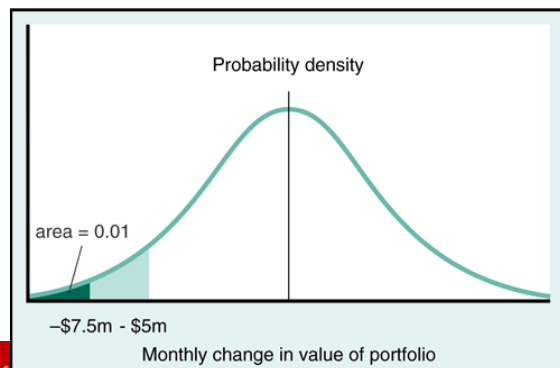


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## Value at Risk

– Example:

- Assume VAR at the 5% level = \$5 million
- And VAR at the 1% level = \$7 million



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## Important Properties of the Normal Distribution

- Often analysts use the following properties of the normal distribution to calculate VAR:

– Assume  $X$  is normally distributed with mean  $\mu$  and standard deviation  $\sigma$ . Then

- $\text{Prob}(X > \mu - 2.33\sigma) = 0.01$
- $\text{Prob}(X > \mu - 1.645\sigma) = 0.05$

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## Computing the VaR metric

- Compute the maximum expected loss at 5% and 1% degrees of confidence of a portfolio with mean expected profit of Bt 5.0 mn and standard deviation of Bt 3.50 mn.
- At 1% confidence level, max expected loss is,
- $5.00 - 3.50 \times 2.33 = 5.00 - 8.16 = - 3.16$
- At 5% confidence level, max expected loss is,
- $5.00 - 3.50 \times 1.645 = 5.00 - 5.75 = - 0.75$  mn

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## VaR is a simple concept, but...

- Estimation is difficult.
- Requires prediction of portfolio returns and this requires rigorous maths, stats, and computing power.

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## Risk attribution

- Volatility: Volatility of return or volatility of excess return relative to risk free or benchmark.



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## Risk attribution

- Tracking error is computed from,
- The variance of tracking error is,
- Annualized tracking error is,  
Where  $P = 12$  for monthly returns and  $P = 250$  for daily returns

$$\Delta_t = R_{pt} - R_{bt}$$

$$\sigma_{\Delta}^2 = \frac{\sum_{t=1}^T (\Delta_t - \bar{\Delta})^2}{T-1}$$

$$TE_{annual} = \sigma_{\Delta} \sqrt{P}$$



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## Break-out sessions

- In-class problems



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