The Nobel Foundation – Asset Management

How we use MATLAB to secure the Nobel Prizes for the future

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Bio - Gustav Karner

- Master of Science in Computer Science, Linköping University
- Bachelor of Science in Business Admin, Major in Economics, Uppsala University
- Programmer and quantitative analyst Handelsbanken Markets
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Agenda

• The Nobel Foundation

• Historical Results

• How We Manage the Assets

• How We Use MATLAB to Find the Best Strategic Assets Allocation

• Conclusions
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Who was Alfred Nobel?

- **Born in 1833** in Stockholm. Raised in Stockholm and St. Petersburg. Received a broad and deep education.
- Experimented with explosives. Received his first patent at age 30. Earned **355 patents** in all. Famous for **dynamite**, but everything from bicycles to artificial silk. Built a corporate empire based on his patents.
- **Industrialist/entrepreneur.** Constantly travelling. Wrote hundreds of letters in five languages. Spent his later life in Paris, Sanremo and Karlskoga.
- Active in many fields. Wrote dramatic works.
- **No family of his own.** Contacts and business transactions with brothers Ludwig and Robert. His mother Andriette a key influence. Melancholic. Died alone in Sanremo in 1896.
Nobel’s will

http://www.nobelprize.org/alfred_nobel/will/testamente.html
The Nobel Foundation's tasks

• The connecting link for the Nobel Price Awarding Institutions

• Coordinate the Nobel Prize Award Cermony and celebrations

• Manage the Assets

• But also other tasks as:
  – The Nobel Museum
  – Nobel Media
  – Nobel Week Dialogue
  – Conferences
  – Symposium
The Prize Awarding Institutions

Royal Swedish Academy of Sciences
Nobel Assembly at Karolinska Institutet
Swedish Academy
Norwegian Nobel Committee

Trustees of the Nobel Foundation

The Nobel Foundation
The Nobel Prize

- Nobel Prizes first awarded in 1901. Since then, 900 Prizes have gone to individual Laureates and 23 to organisations. The Nobel Prize is the “Gold Standard”.

- The Prize is:
  a) **Large** (SEK 8 million).
  b) **Universal**.
  c) **Long history** of **quality** (smoothly functioning selection process with few mistakes) and **independence** (from von Ossietzky to Xiaobo).
  d) **Breadth** (everything from physics to peace, mutually reinforcing).

- Great PR for science and research each year when the laureates are awarded.
The Nobel Prize Award Ceremony
The Nobel Banquet
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The Nobel Prize - amount

The graph shows the amount of the Nobel Prize over time from 1895 to 2020, with a significant increase around the 1980s and a peak in 2020.
The Assets
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The Investment Committee

- The Investment Committee was formed at the initiative of Lars Heikensten 2011

- The Investment Committee makes all asset management decisions

- The Investment Committee:
  - Tomas Nicolin, chairman, previously CEO Alecta and AP3
  - Magnus Dahlquist, prof. Stockholm School of Economics
  - Lars Heikensten, CEO The Nobel Foundation, previously The Riksbank
  - Carl-Henrik Heldin, chairman The Nobel Foundation
  - Kent Janér, founder and CIO Nektar
  - Gustav Karner, CIO Nobelstiftelsen
  - Sven Nyman, founder and CIO RAM ONE
The Investment Process

I – Strategy

Goal
- Risk Level
- Long-Term Assumptions
- Asset/Liability Management

Possible Total Risk
- Expected Returns
- Investment Policy
- Strategic Asset Allocation

Board Decision

II – Portfolio Constr

Economic Analysis
- Strategic Deviations
- Alpha + Δrisk
- Active Riskfactors

Risk Budget
- Strategic positions
- Passive Exposure
- Aktive risk
- Manager Selection

IC Decision

III – Implementation

Implementation of Active and Passive Risk
- Hedge unwanted risks

Due-diligence
- Custody
- Hedge-overlays

IV – Reporting

Follow up step I-III -> IC/Board

Ex Ante/Ex Post
- Risk-Return cmp to Normal Portfolio
- (benchmark)
- Peer-group
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Asset/Liability Management with MATLAB

• The desired risk-level derives from:
  – The Board’s risk preferences
  – Financial Strength
  – Costs (Nobel Prizes and other costs)
Asset/Liability Management - Assumptions

- Expected (Real) Returns
- Fees
- Covariance Matrix
- Expected costs (incl Nobel Prizes)
- Inflation and wage inflation
- Rebalancing strategy
Asset/Liability Management - MATLAB

- MATLAB is the "engine" for the calculations.

- Most of the calculations are done with matrix operations in MATLAB.

- MATLAB produces 1,000,000 different scenarios for every asset class every year.

- The model today simulates the next 30 years (but can be expanded to 100 years).

- The time to run the model is around 7 sec.
Asset/Liability Management Results

Simulated Median of the Assets

Year

Assets (kkr)

$5 \times 10^6$
Asset/Liability Management Results

Simulated Median Cost ratio

Cost ratio

Year
Asset/Liability Management Results

![Graph showing the Default Ratio over time.](image)
Asset/Liability Management Results

![Graph showing Risks and Opportunities over time]

- **X-axis**: Year
- **Y-axis**: Assets (kkr) x 10^7

The graph illustrates the evolution of assets over different years, highlighting both risks and opportunities.
The Final Results -
The Strategic Asset Allocation

Normal Portfolio
Equities incl Private Eq.  55 %  +/- 10 % (60 %)
Fixed Incomes  20 %  +/- 10 % (35 %)
Alternative Investments  25 %  +/- 10 % (5 %)
Long-term benchmark

Genomsnittlig årlig avkastning de senaste fem åren (2008 - 2012)

Genomsnittlig årlig avkastning de senaste fem åren (2010 - 2014)

Genomsnittlig årlig avkastning de senaste fem åren (2011 - 2015)

Genomsnittlig årlig avkastning de senaste fem åren (2009 - 2013)

Genomsnittlig årlig avkastning 2008 - 2012
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Conclusions

• The Nobel Foundation has a Long History and Strong Brand.

• Decent Returns are Required to Maintain the Size of the Nobel Prize Adjusted for Inflation.

• A Robust Simulation Process to Find the Right Strategic Assets Allocation and a Competent Investment Committee is the Key.