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The Nobel Foundation



The Nobel Foundation – Asset Management

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

21 April 2016

Gustav Karner

Chief Investment Officer – The Nobel Foundation



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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**
- Head of Risk Management **Alecta**
- Head of Asset Management **Länsförsäkringar**
- Chief Investment Officer **Nobelstiftelsen**

Twitter @gustavkarner



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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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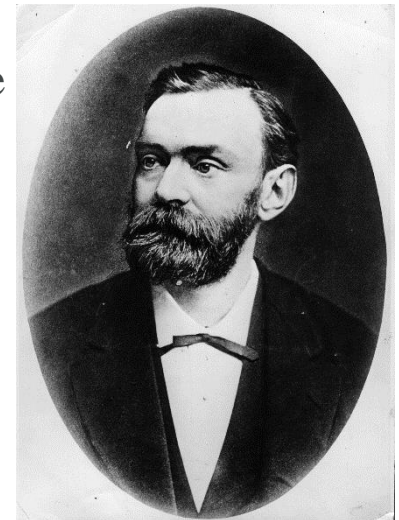
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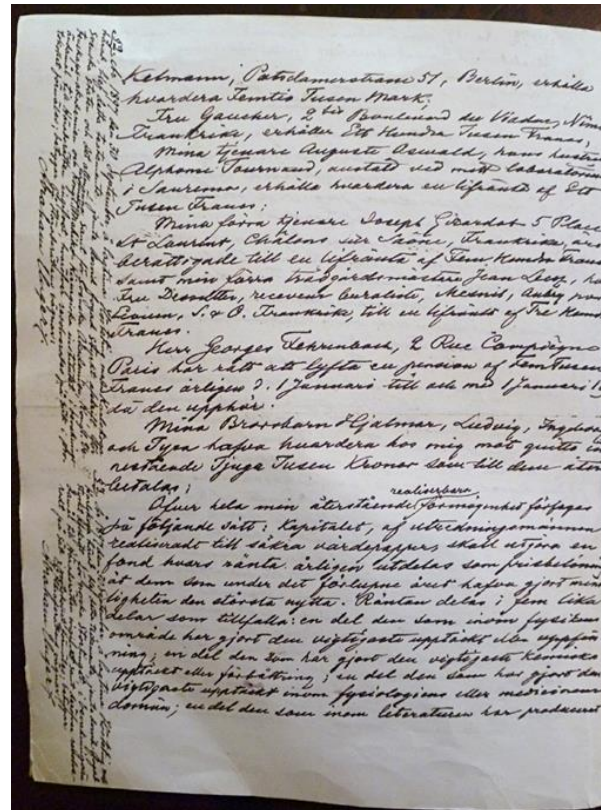
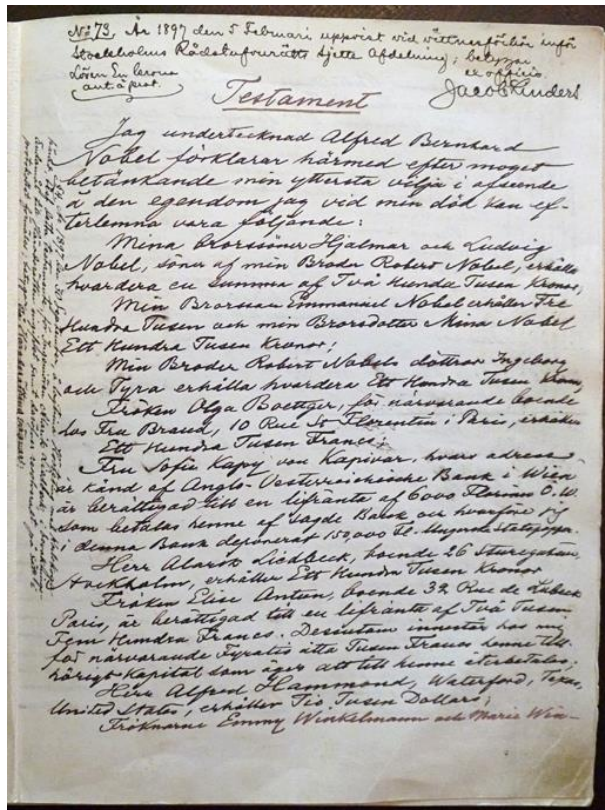
Who was Alfred Nobel?

- **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



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The Nobel Foundation's tasks

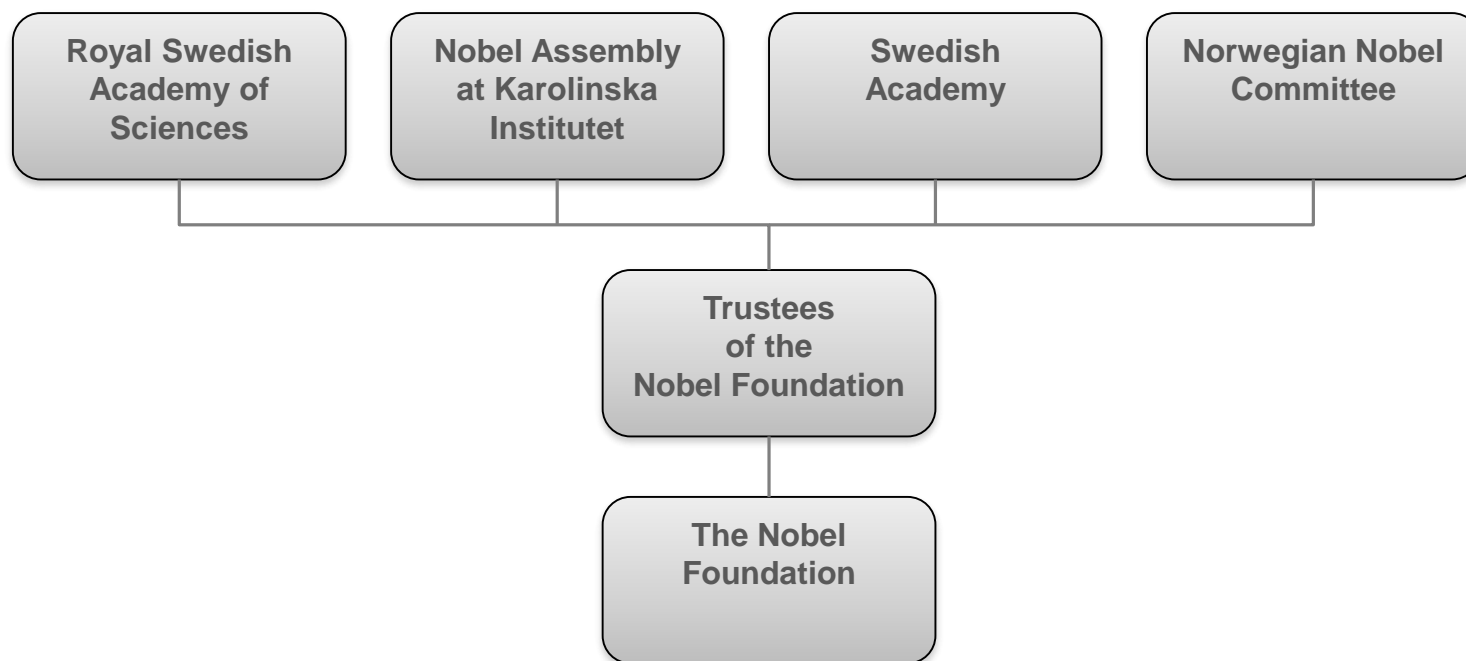
- The connecting link for the Nobel Price Awarding Institutions
- Coordinate the Nobel Prize Award Ceremony and celebrations
- **Manage the Assets**
- But also other tasks as:
 - The Nobel Museum
 - Nobel Media
 - Nobel Week Dialogue
 - Conferences
 - Symposium



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The Prize Awarding Institutions





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The Nobel Prize

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- 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.



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The Nobel Prize Award Ceremony





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The Nobel Banquet





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Agenda

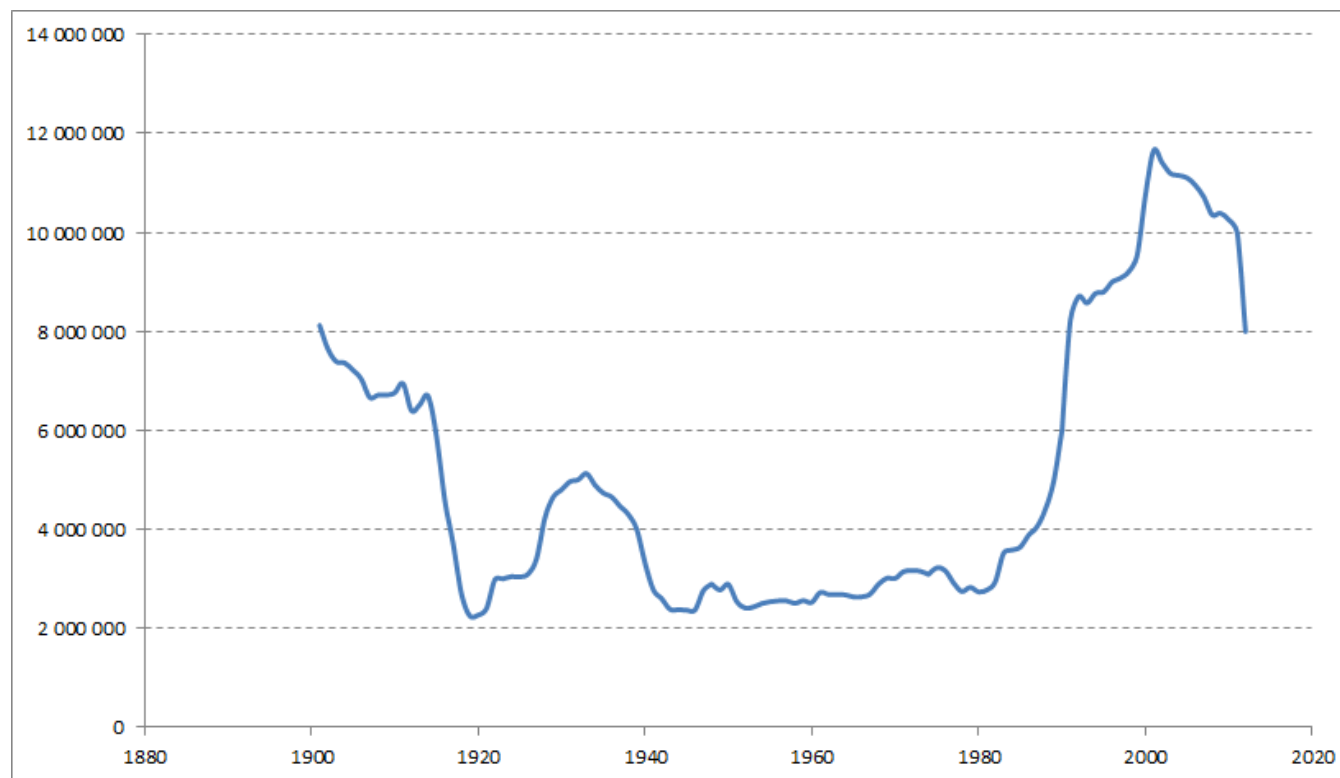
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The Nobel Prize - amount



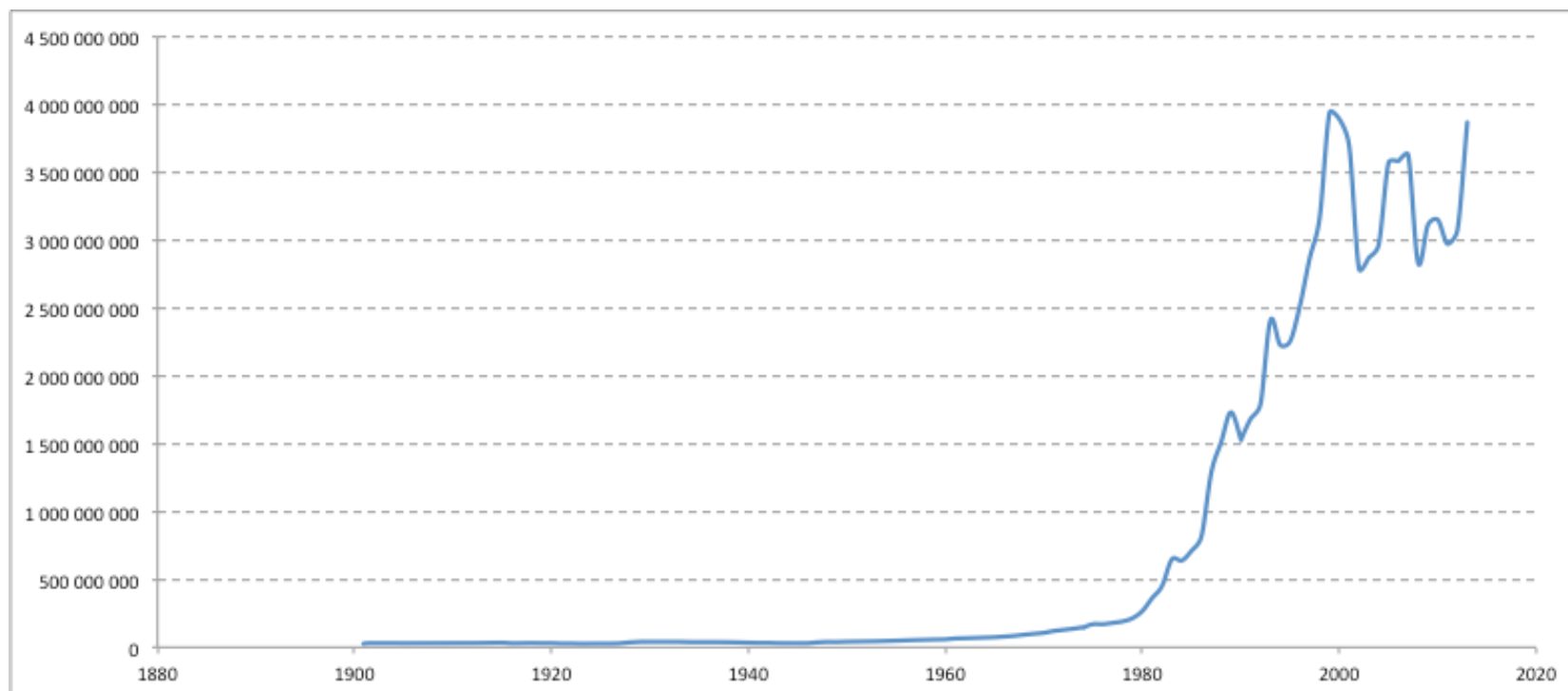


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The Assets





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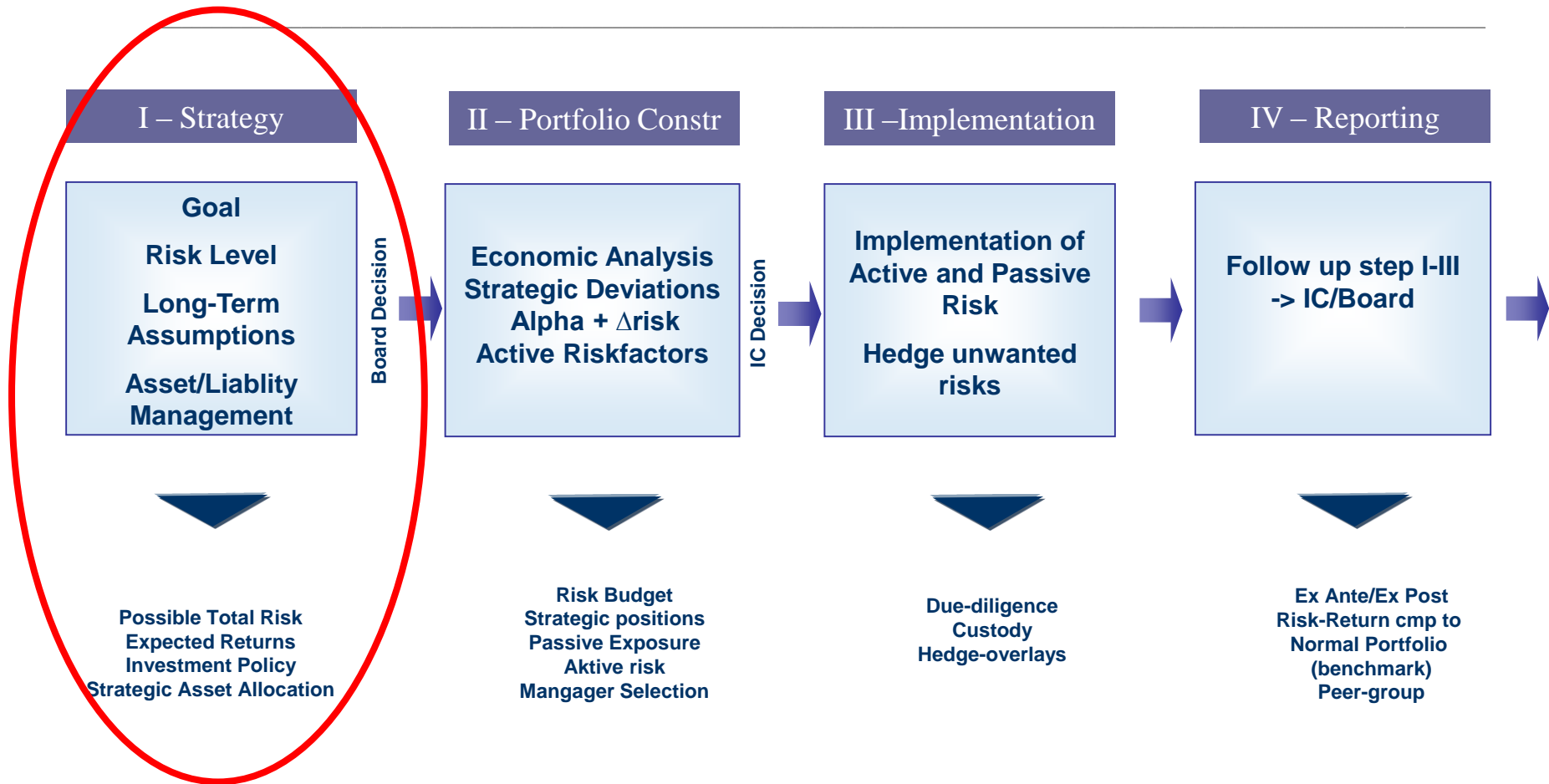


The Investment Committee

- 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





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Asset/Liability Management with MATLAB



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- The desired risk-level derives from:
 - The Board's risk preferences
 - Financial Strength
 - Costs (Nobel Prizes and other costs)



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Asset/Liability Management - Assumptions

- Expected (Real) Returns
- Fees
- Covariance Matrix
- Expected costs (inlc Nobel Prizes)
- Inflation and wage inflation
- Rebalancing strategy

Asset/Liability Management - MATLAB



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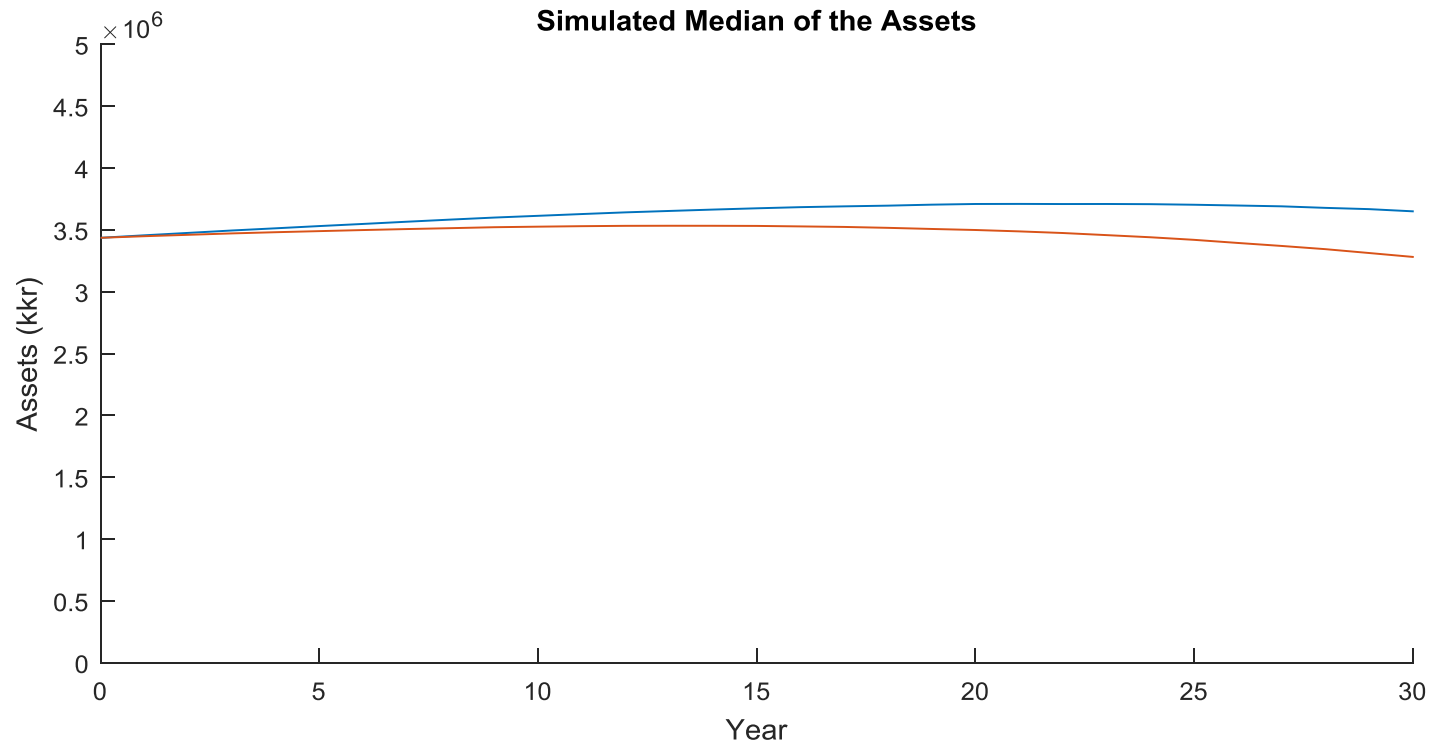
- MATLAB is the "engine" for the calculations.
- Most of the calculations are done with matrix operations in MATLAB.
- MATLAB produces 1 000 000 different scenarios for every asset class every year.
- The model today simulates the next 30 years (but can be expanded to 100 years).
- The time to run the model is around 7 sec.

Asset/Liability Management Results



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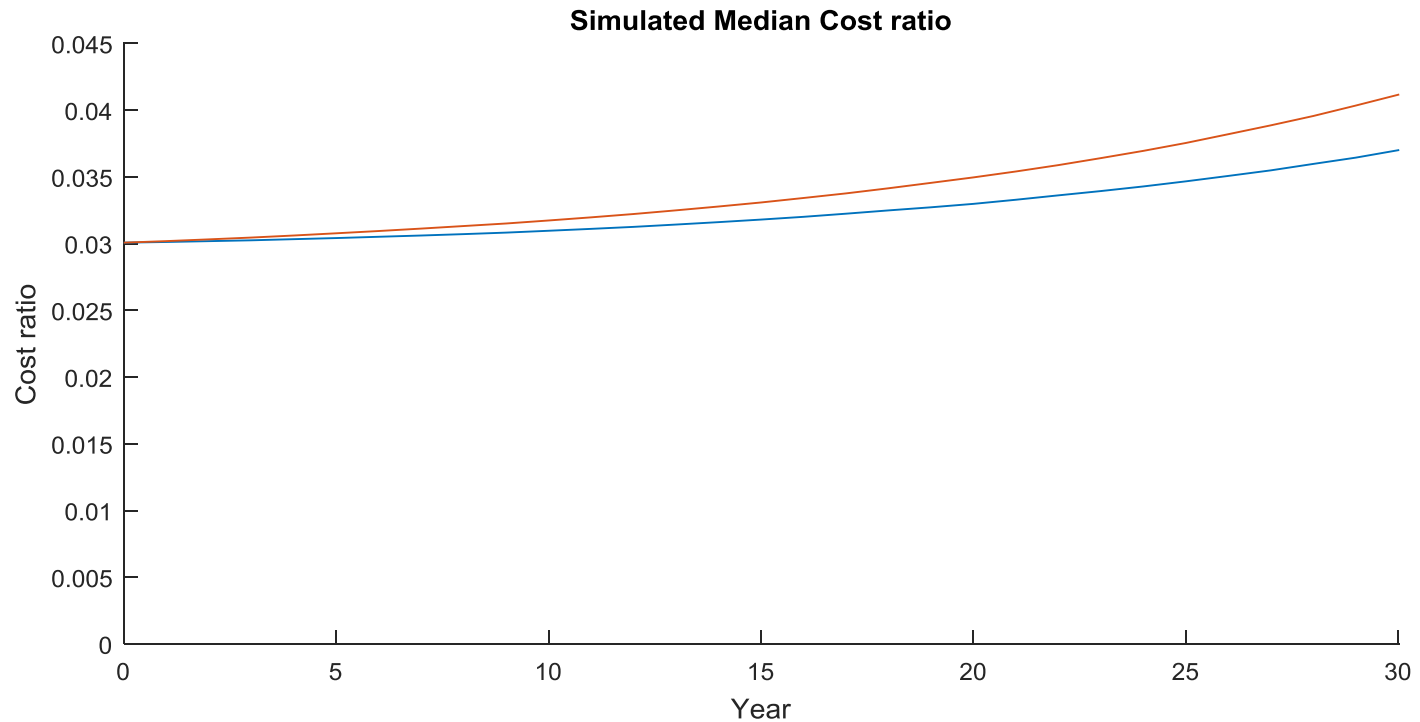


Asset/Liability Management Results



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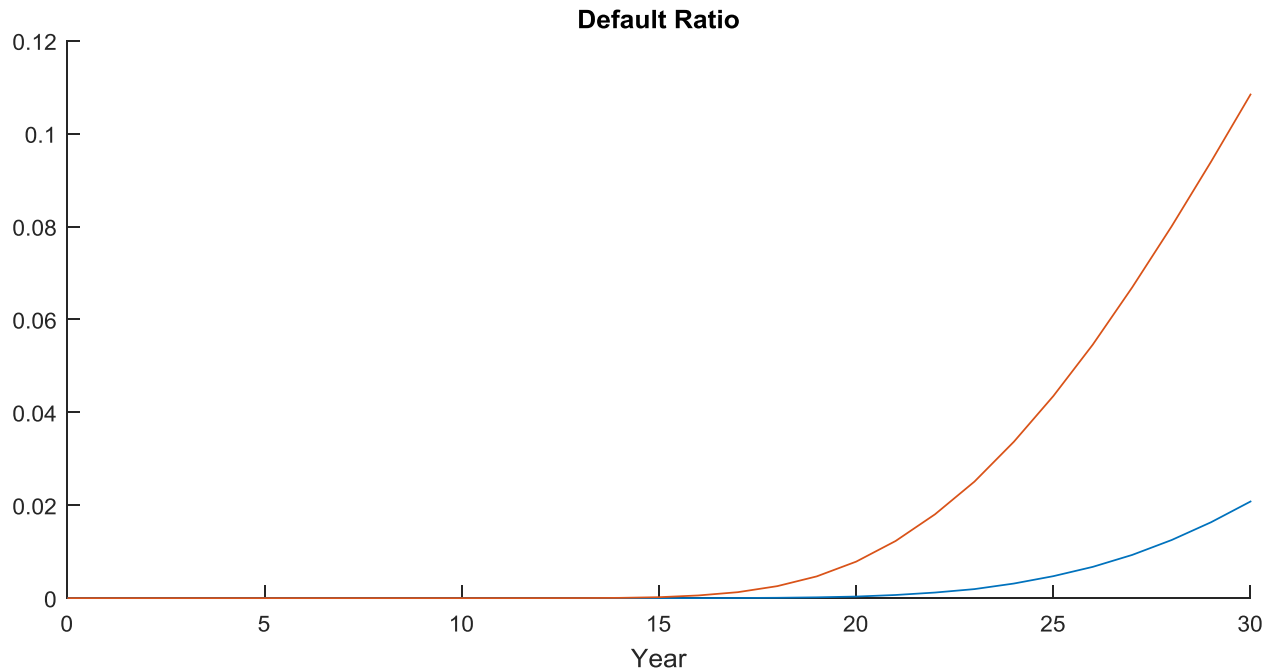


Asset/Liability Management Results



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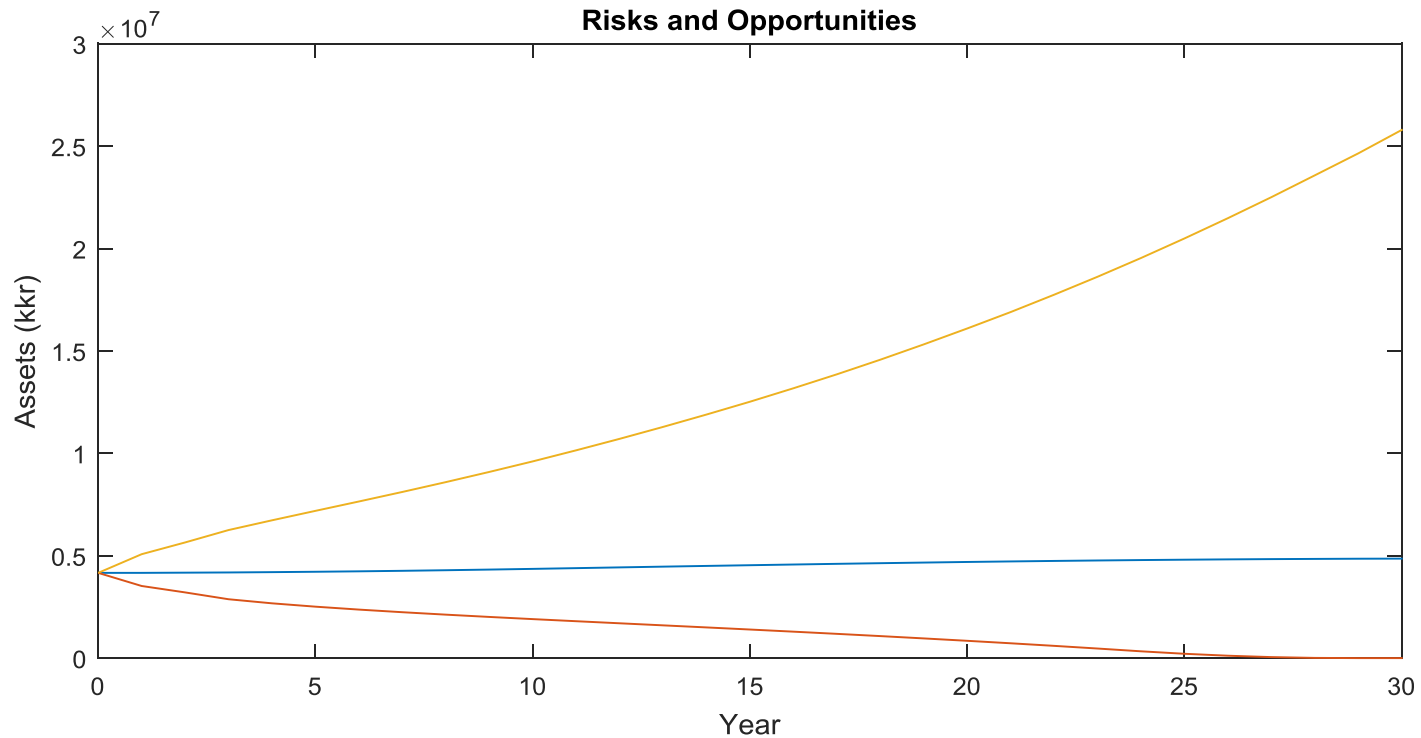


Asset/Liability Management Results



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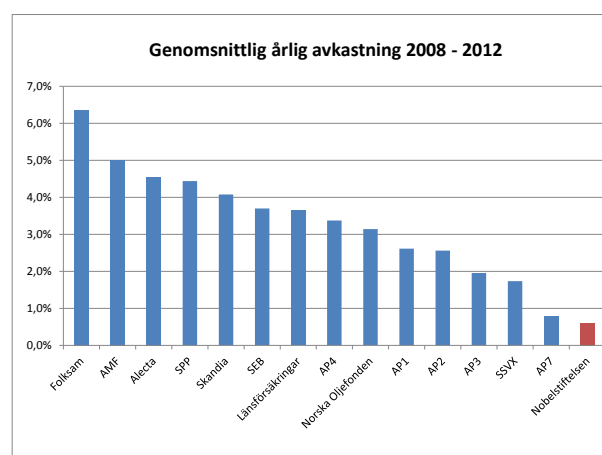
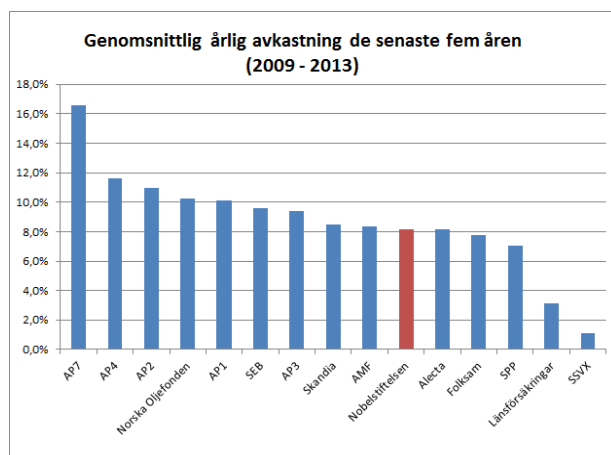
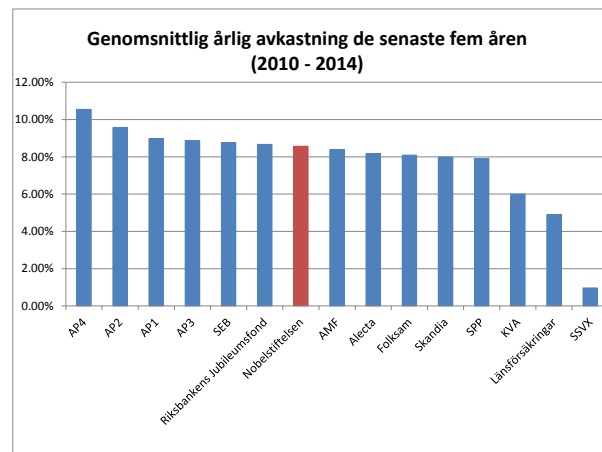
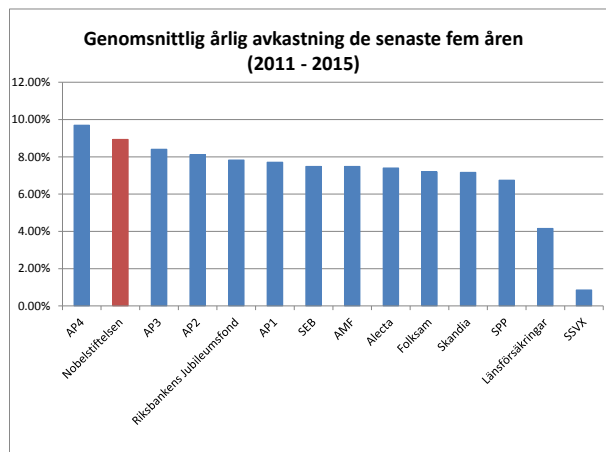
The Final Results - The Strategic Asset Allocation

Normal Portfolio

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



Long-term benchmark





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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.

