

Structured Products for Sustainable and Responsible Investment

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Overview

- Motivation
 - Research questions and goals
- Model
 - Quantification of preferences
 - Optimal responsible investment
- Results
 - Sustainability Index – an example
 - Structured Investment Products
- Conclusion
 - Summary and further research



Problem definition

- Sustainable and Responsible Investment (**SRI**)
 - SRI from the viewpoint of the **small retail investor**
 - Low participation in the market for SRI
 - Growing public awareness of sustainability and environmental issues
 - Often motivated by wish to align **personal values** with investment policies/practices
 - Research Questions
 - Can investors make informed investment decisions?
 - Are suitable means of investment available?
- *Do we even have a model?*



Research goals

- Define an integrated model for **Optimal Responsible Investment** considering the three characteristics

Portfolio { Risk
 Expected return
 Responsibility

- Investigate if **structured investment products** may help facilitate retail SRI

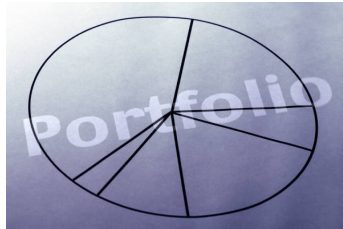


Literature

- Markowitz (1952)
 - *"Portfolio Selection"*
 - Gives a simplistic but sufficient setup for the starting point of the **optimal portfolio choice** problem
- Wisebrod (2007)
 - *"Social impact ratings: How to make RI appealing"*
 - Applies the typical risk-return evaluation of a portfolio followed by the choice of the **"socially dominant"** portfolio.
- Hallerbach et al (2002)
 - *"A framework for Managing a portfolio of SRI"*
 - Argue for a **"choose and re-evaluate"** interactive portfolio allocation, practically appealing



Model



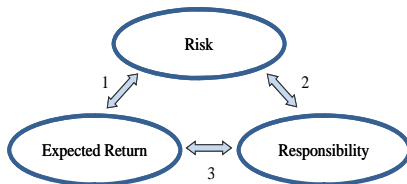
Preferences for Responsibility

- Investor **objectives**

$\left\{ \begin{array}{l} \text{Maximize Expected return} \\ \text{Maximize Responsibility} \\ \text{Minimize Risk} \end{array} \right.$

→ These goals may be **conflicting!**

- Integrated approach

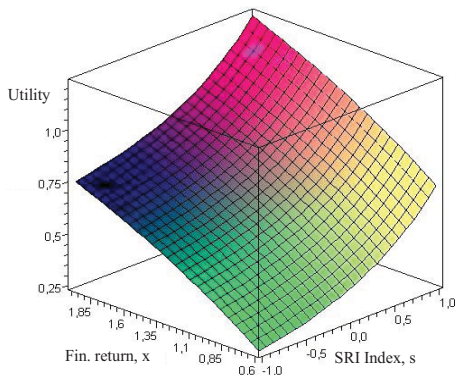


- Preferences for responsibility are seen as similar to preferences for certainty (risk aversion)



Utility function

- Evaluate an investment at maturity using a **utility function**, recognizing both preferences



Optimal Responsible Investment

- Utility function example

$$U(x, s) = u_1(x) + u_2(s)$$

where x is the **financial** outcome of an investment and s is the portfolio responsibility level, i.e. the **non-financial** outcome

- The **problem of the investor** then becomes

$$\max_{\mathbf{w}} E_0[U(x, s)]$$

where \mathbf{w} are the relative portfolio weights

→ In words: *Choose portfolio weights in order to maximize the expected utility at maturity*



Optimal Responsible Investment

Note

- Investors do not value responsibility equally, just like many investors choose to be neutral to non-financial values
- It is therefore important that investors quantify their
 - ▷ Level of interest in responsibility vs. risk or return
 - ▷ Particular interests (Environmental, Social, Governmental)

in order to obtain their **highest possible utility** of an investment



Example



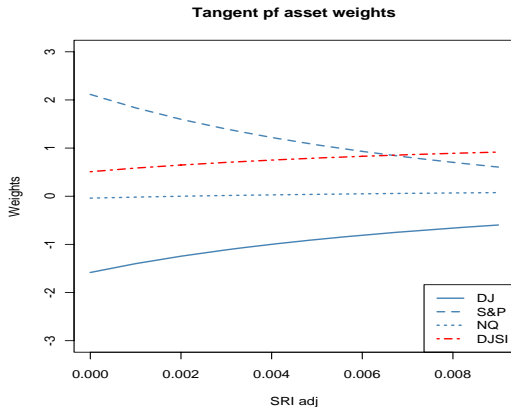
Optimal investment in DJSI

- Investment opportunities
 - Dow Jones Sustainability Index (DJSI) World
 - "The market" defined as
 - { S&P 500 (S&P)
 - { NASDAQ Composite (NQ)
 - { Dow Jones Industrial Average (DJ)
- Find the optimal portfolio weights when varying the preference for responsibility



Optimal investment in DJSI

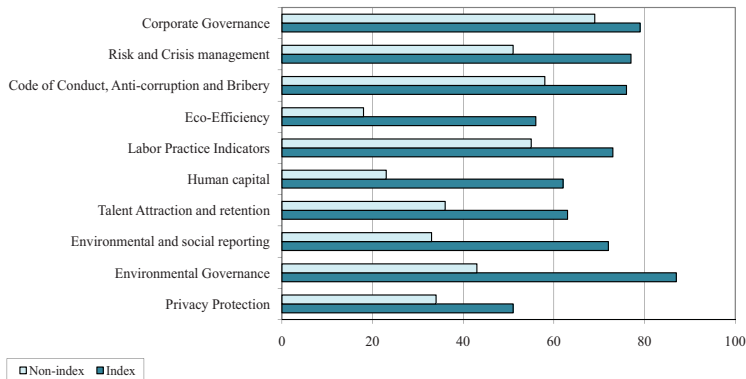
- Optimal investment in DJSI + "the market" depends on the match of preferences and the implied utility premium



Sustainable Index Ratings

- DJSI ratings compared to non-index average

Average Sustainability Scores 2008 for selected criteria

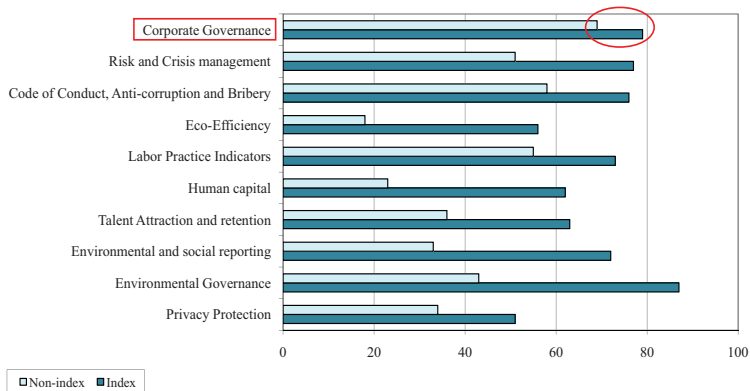


Source: SAM annual review, Sep 4, 2008, available from www.sustainability-index.com

Sustainable Index Ratings

- DJSI ratings compared to non-index average

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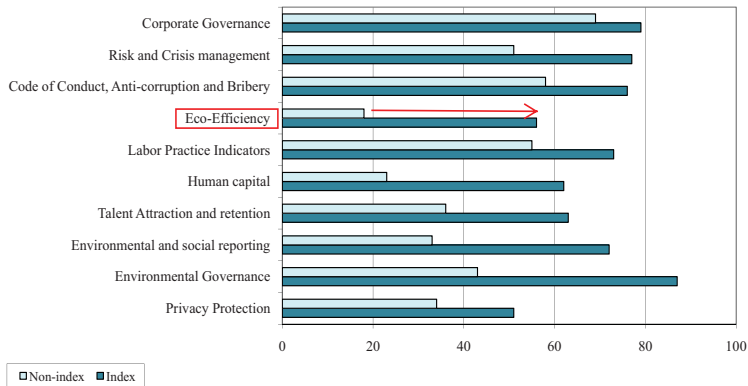


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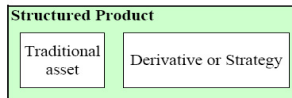
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- ▶ *How can the small retail investor **access** the best possible responsible investment?*

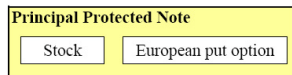


Structured Investment Products

- Structured Investments, key properties
 - **Tailor risk** profile, eg. capital protection
 - Create **access** to "exotic" investment projects, e.g. sustainable venture capital with potentially a very high non-financial utility premium



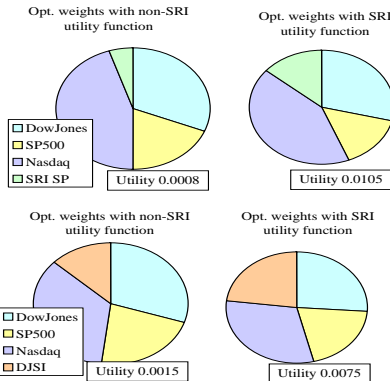
- Simple ex. *Principal Protected Note*



Results

• Preliminary results

- Invest in "the market" + SRI structured product (SP)
- Invest in "the market" + the sustainable index (DJSI)



Summary

▷ Quick summary

- Optimal Responsible Investment problem
 - Additional dimension to the traditional portfolio choice
 - Quantification of preferences
 - Index example
- Structured products
 - Preliminary suggestion
 - Subjectively better investment?



Conclusion

▷ Conclusion

- Encourage **informed, value based** investment decisions
 - In particular for the retail segment
 - Potential mutual benefits: Personal gain and social/environmental benefits
- Further studies
 - Responsible **investor behavior** and preferences – institutional and retail
 - Merging **responsibility** criteria into conventional finance theory – long term risk management



Literature

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