

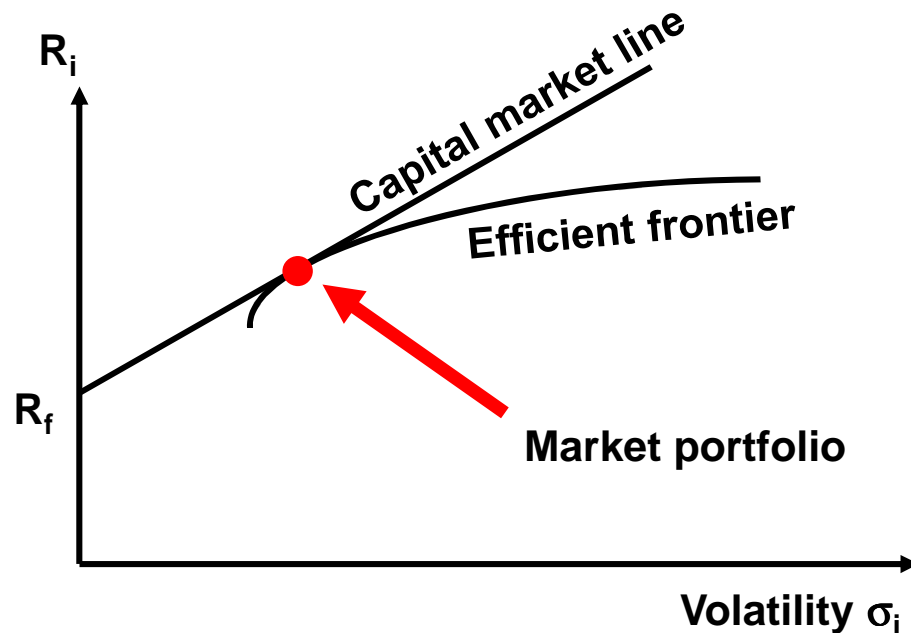
How much to invest into risk  
or  
Can we do the trade-off between risk and return?

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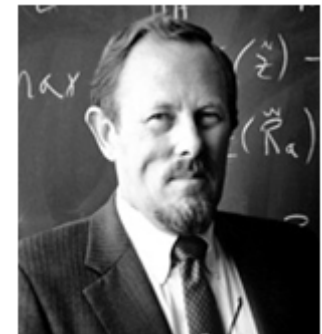
Martin Weber  
University of Mannheim

Lausanne, November 2013

# Portfolio theory and capital market line



Harry M.  
Markowitz



William F.  
Sharpe

Choose a diversified portfolio from the efficient ones in accordance with your preferences

Hold a combination of the risk-free asset and the market portfolio

H. Markowitz (1952), *Portfolio Selection*, Journal of Finance 7, 77-91.

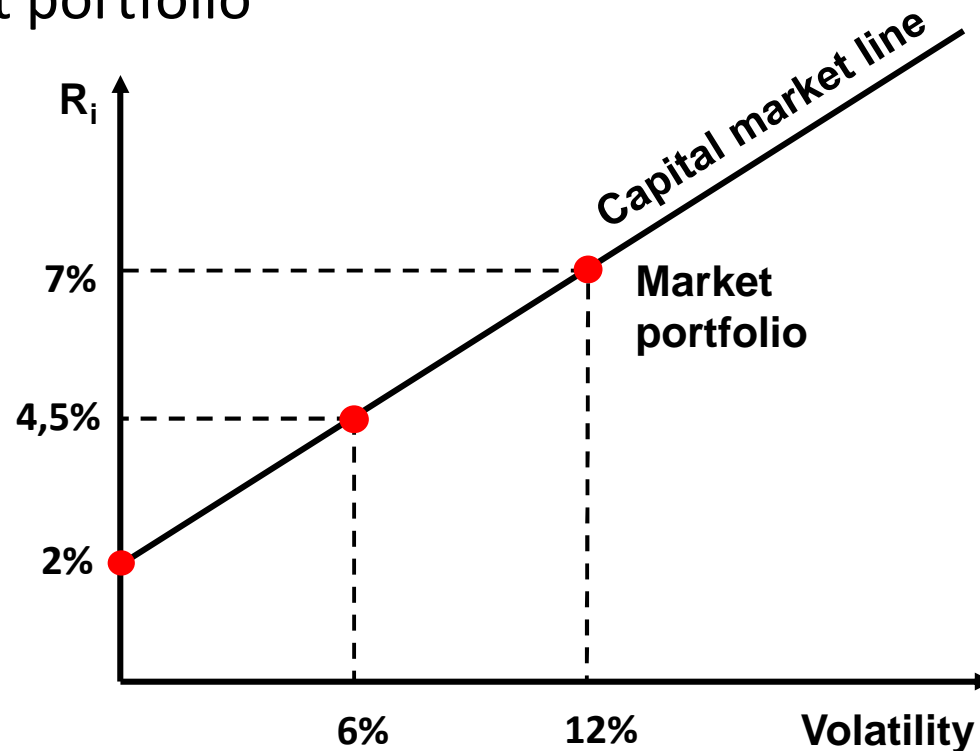
W. F. Sharpe (1964), *Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk*, Journal of Finance 19, 425-442.

# Portfolio theory and capital market line

## Optimal risk-return trade-off

- a. 100% market portfolio (e.g. Arero or well-diversified multi-asset-fund)
- b. 50% Cash – 50% market portfolio
- c. 100% Cash

Choose your portfolio on this line in accordance with your risk preferences



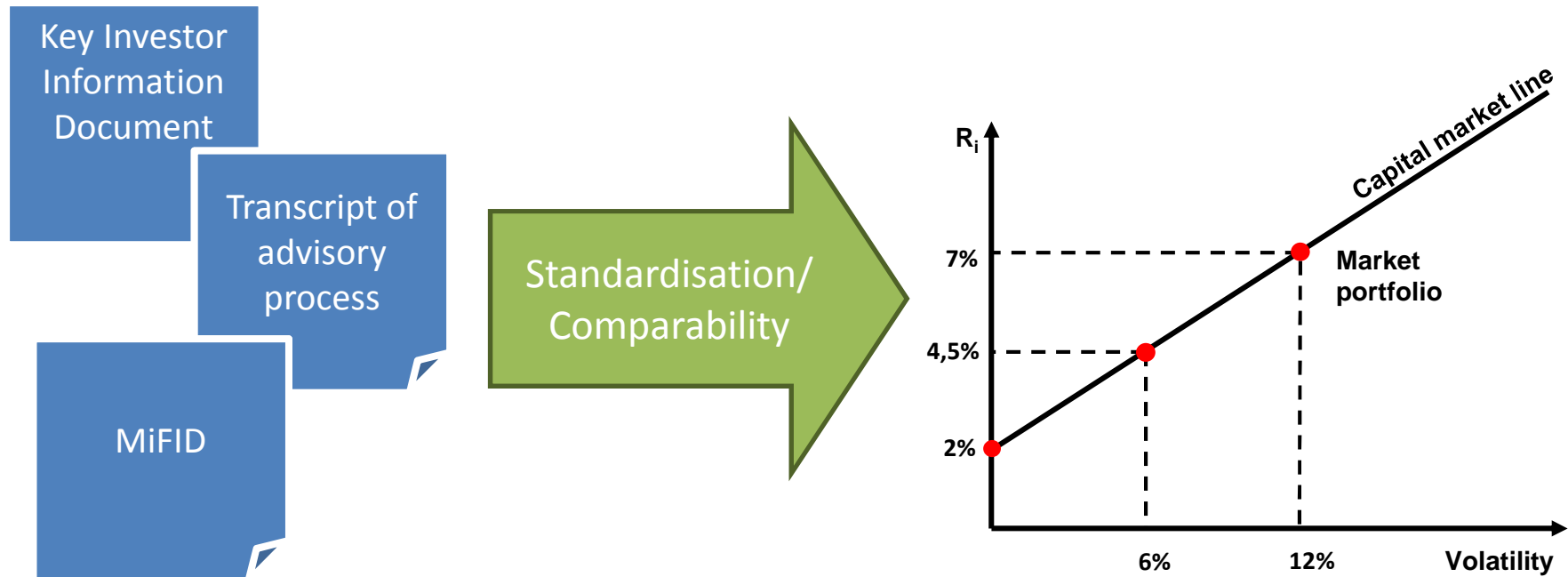
**Can we do the risk-return trade-off?**

# Overview

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1. Introduction
2. Regulators and the industry
3. Description vs. Experience (simulation)
4. Challenge and solution (?)

# Regulation for investors



Does the current regulation support a good decision in the sense of portfolio theory and capital market line?

# Market in Financial Instruments Directive (MiFID)

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Advisor: Gather information about Customers' Risk Preferences

*("Information shall include ... his preferences regarding risk taking, his risk profile and..." § 19 (4) & § 35 (4))*



Perform Portfolio Optimization according to preferences

⇒ ***But: how to assess risk attitude? – No Regulation***

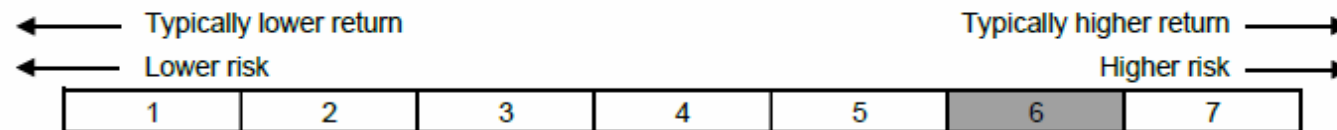
# EU-regulation (KIID): Communication of risk...

Key Investor Information Document (KIID): Risk indicator for funds as a number  
(Measure for volatility)

Risk Class	Volatility Intervals	
	equal or above	less than
1	0%	0.5%
2	0.5%	2%
3	2%	5%
4	5%	10%
5	10%	15%
6	15%	25%
7	25%	

volatility p.a.

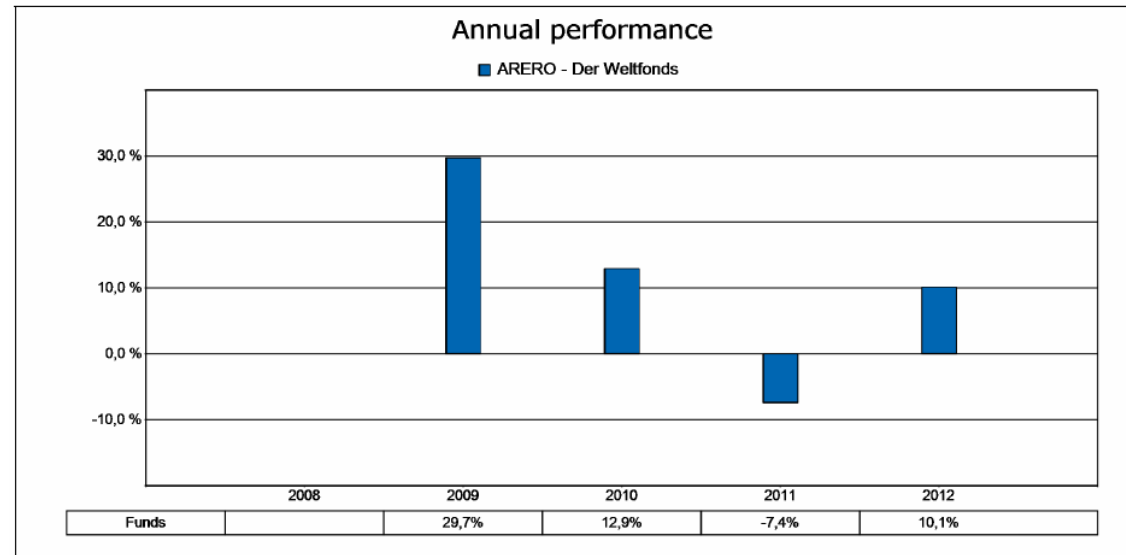
## Risk and reward profile



Ref. COMMITTEE OF EUROPEAN SECURITIES REGULATORS, CESR/10-673

# ... and communication of returns

## Past performance



Past performance is not a reliable indicator of future performance. All costs and fees that were withdrawn from ARERO - Der Weltfonds were deducted during the calculation. ARERO - Der Weltfonds was launched in 2008. The performance was calculated in EUR.

## Charges

The costs and fees borne by you are used for the management, administration and custody of the fund, as well as for its distribution and marketing. These costs restrict the potential growth of your investment.

One-off charges taken before or after you invest	
Entry charge	No initial sales charge
Exit charge	No redemption fee
Charges taken from the fund over a year	
Ongoing charge	0,50 %
Charges taken from the fund under certain specific conditions	
Performance fee	None
Fees from securities lending	0,01 %

The current costs specified here were incurred in the fiscal year of the fund, which ended on 31.12.2012. They may change from year to year. The current costs do not include the performance-based fee and the transaction costs. Additional information on costs can be found under "Costs" in the sales prospectus.



# KIID: the whole picture

## Key investor information

This document provides you with key investor information about this fund. It is not marketing material. The information is required by law to help you understand the nature and the risks of investing in this fund. You are advised to read it so you can make an informed decision about whether to invest.



## ARERO - Der Weltfonds

Security code: DWS0R4 ISIN: LU0360863863

Management Company: DWS Investment S.A., a member of the Deutsche Bank Group.

## Objectives and investment policy

The objective of the investment policy is to achieve sustainable capital growth. In order to achieve this, the fund uses the ARERO Weltstrategie to track the performance of the asset classes equities, bonds and commodities via representative indices. The weighting of the asset classes is adjusted on the fifth business day of February in each year to 80% equities, 25% government bonds and 15% commodities. In order to reflect the performance of the ARERO Weltstrategie, the fund invests predominantly in fixed and floating rate securities and in derivatives on the ARERO Weltstrategie. Because of its design, the fund is composed of two components: a bond portfolio and derivatives, in particular swaps. The bond portfolio accounts for the major portion of the portfolio. The selection of individual investments is at the discretion of the fund management. The fund is subject to various risks. A more detailed description of risks can be found under 'Risks' in the sales prospectus. The currency of ARERO - Der Weltfonds is EUR. Returns and gains are not distributed but are reinvested in the fund. You may request the redemption of shares on each valuation day. The redemption may only be suspended in exceptional cases taking into account your interests as an investor.

## Risk and reward profile



The calculation of the risk and reward profile is based on simulated data that cannot be used as a reliable indicator for the future risk profile. This risk indicator is subject to changes; the classification of the fund may change over time and cannot be guaranteed. Even a fund that is classified in the lowest category (category 1) does not represent a completely risk-free investment. The fund is classified in category 6 because its share price may fluctuate strongly and the likelihood of both losses and gains may therefore be high. The following are key risks for the fund and are not covered adequately by the risk and reward profile:

The fund invests a substantial portion in bonds, the value of which depends on whether the issuer is able to afford its payments. The risk of default is continuously present and can cause your investment to suffer a loss. The fund concludes derivative transactions with various contractual partners to a significant extent. If the contractual partner cannot afford any payments (e.g. due to insolvency), this can cause your investment to suffer a loss. The fund uses derivative transactions to a large extent to achieve higher appreciations. The increased opportunities are accompanied by increased risk of loss, therefore changes in value of the underlying instruments may negatively impact the value of the derivative. Due to its structure, a derivative may have a stronger impact on funds than is the case if an underlying instrument is acquired directly.

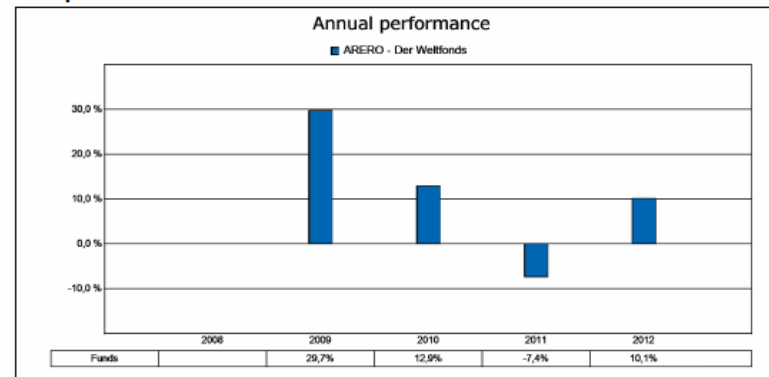
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## Past performance



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## Practical information

The custodian is State Street Bank Luxembourg S.A., Luxembourg. The sales prospectus, annual report and semiannual report are available in the language of this document or in German from DWS Investment S.A. and may be requested free of charge. The current share prices as well as additional information about the fund are available in the language of this document or in German in the 'Download' section of the fund on your local DWS Investments website or at [www.dws.com](http://www.dws.com). The fund is subject to Luxembourg tax law. This may affect how you are taxed on your income from the fund. DWS Investment S.A. may be held liable solely on the basis of any statement contained in this document that is misleading, inaccurate or inconsistent with the relevant parts of the sales prospectus. This fund is authorized in Luxembourg and is regulated by the Commission de Surveillance du Secteur Financier (CSSF).

This key investor information is accurate as at 12.02.2013.

# Risk in the industry

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- Investment risk
  - KIID
  - Sample portfolio
  - Distribution, price chart
  - Categories (high – average – low)

→ **Descriptive**
- Risk preferences

Bad: Do you do bungee jumping?



Better: How risky do you want to invest?



+ Good predictor on individual level

+ Differentiates between investors

- **Product level instead of portfolio level**

# Overview

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1. Introduction
2. Regulators and the industry
3. **Description vs. Experience (simulation)**
4. Challenge and solution (?)

# Description vs. Experience (simulation)

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Experienced returns influence risk-taking behavior

U. Malmendier, S. Nagel (2011), *Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?* The Quarterly Journal of Economics 126, 373-416.

Stock market participation decreases with experienced volatility

M. A. Appendino (2012), *Household Portfolio Choice: The Importance of Experienced Volatility*. Yale University Working Paper.

Crises with a high volatility lead to a flight from active funds to stocks

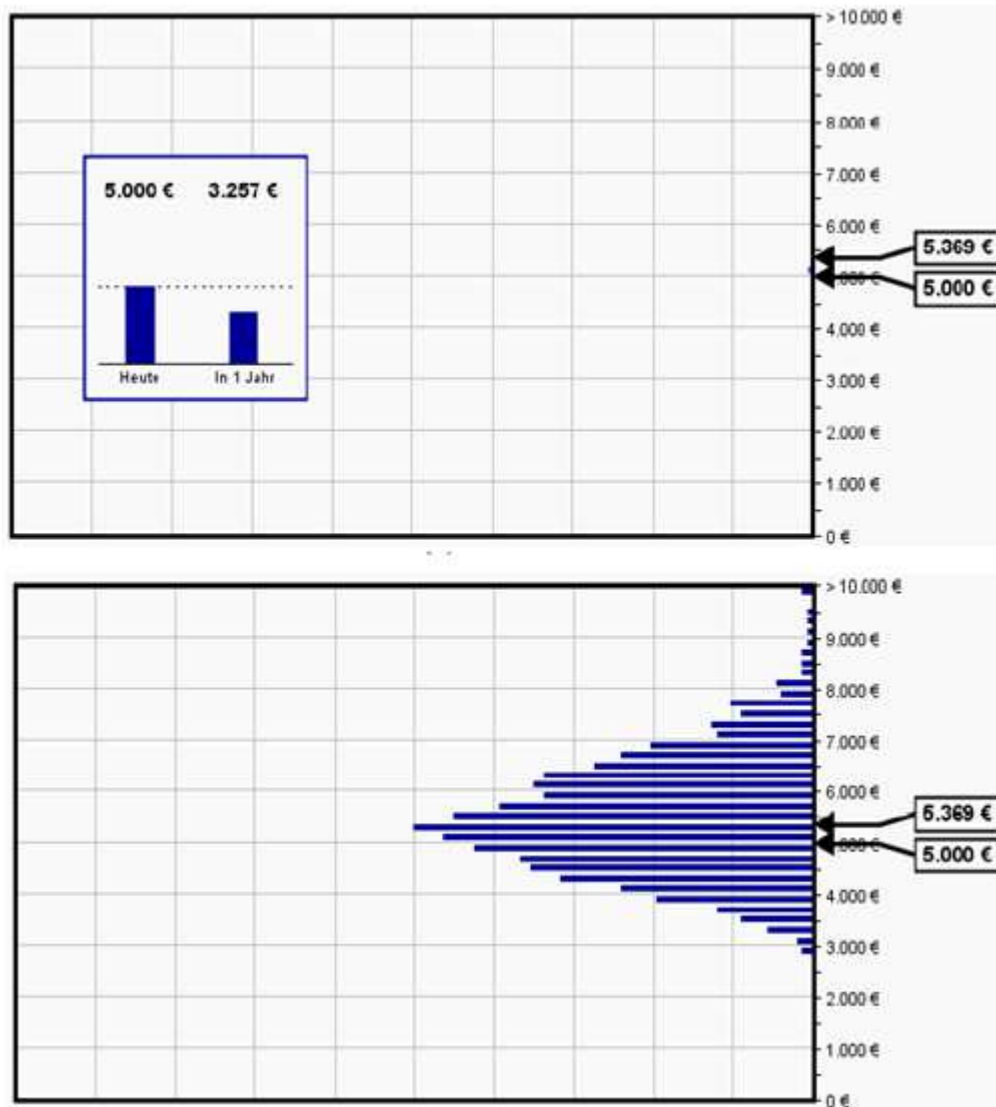
D. Dorn, M. Weber (2013), *Individual Investors' Trading in Times of Crisis: Going It Alone or Giving Up?* Working Paper.

„Good “ investment decision

- Risks and chances are known
- Framing has no influence
- Persistent decision

Presentation via a simulation

# Presentation of assets with a simulation tool

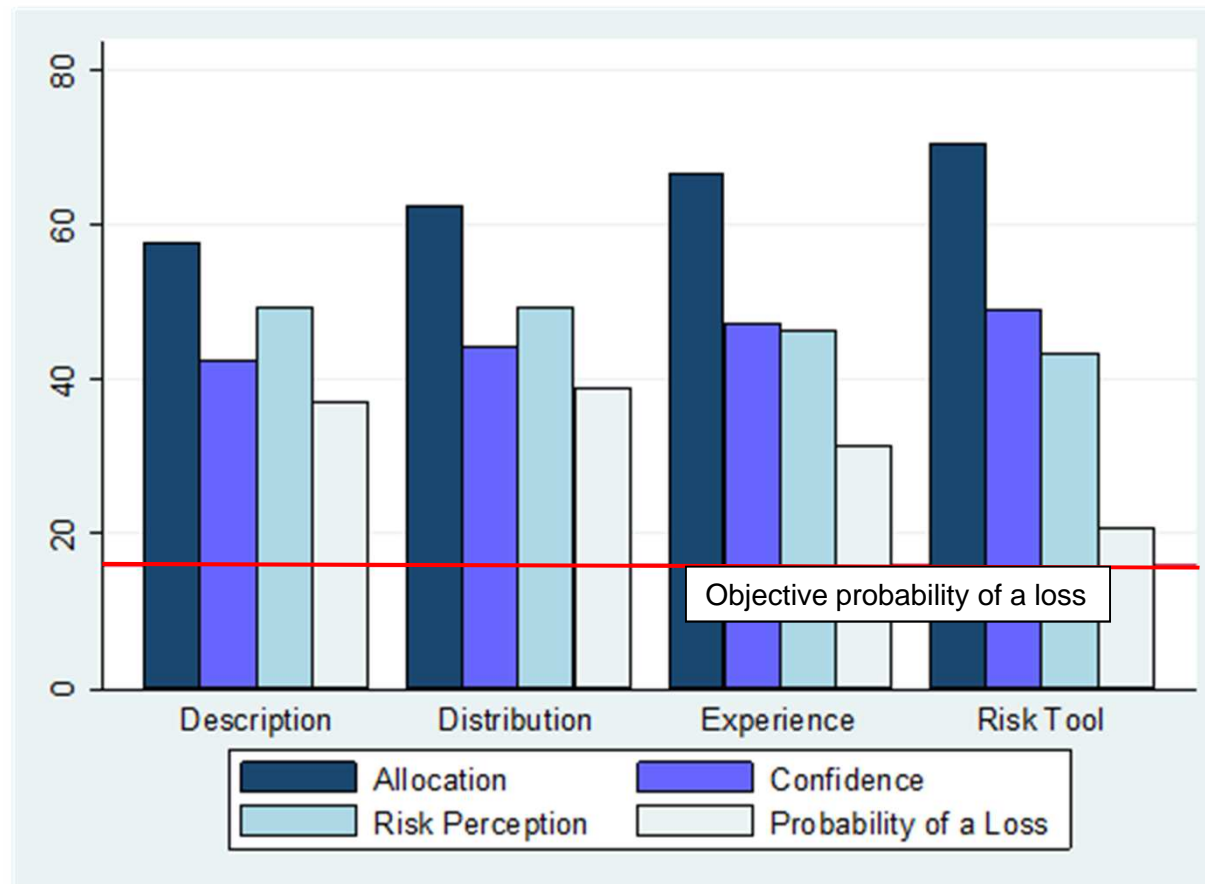


- The distribution can be „experienced“
- A multitude of possible returns is simulated based on historical returns

Available at:

<http://www.behavioral-finance.de/Risiko/>

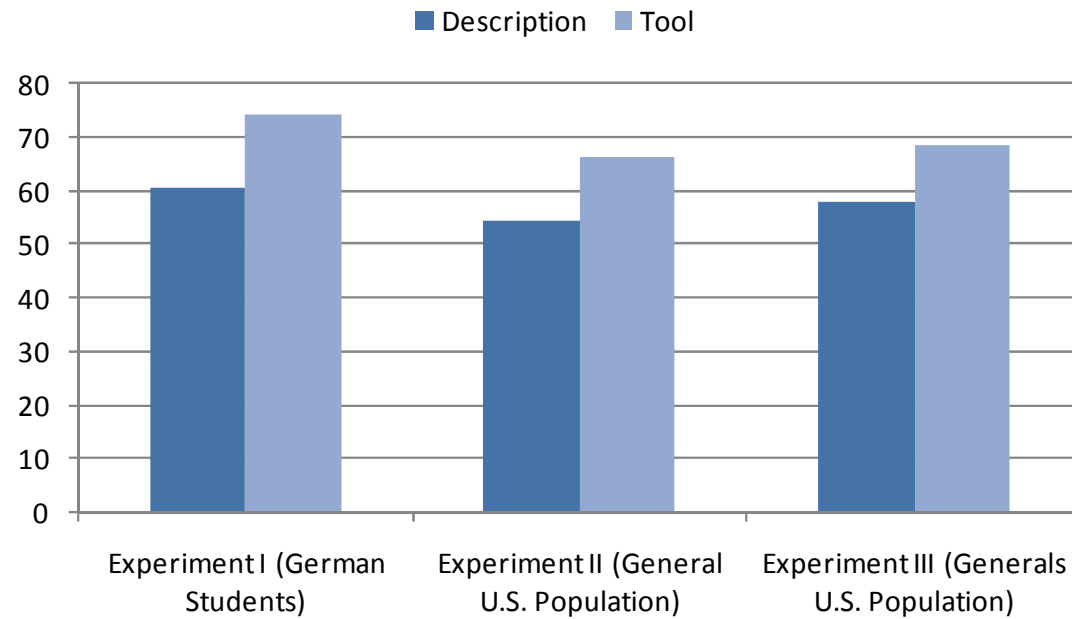
# Perception of the simulated asset



Kaufmann, C./Weber, M./Haisley, E. C. (2013): *The Role of Experience Sampling and Graphical Displays on One's Investment Risk Appetite and Comprehension*, Management Science 59, 323-340.

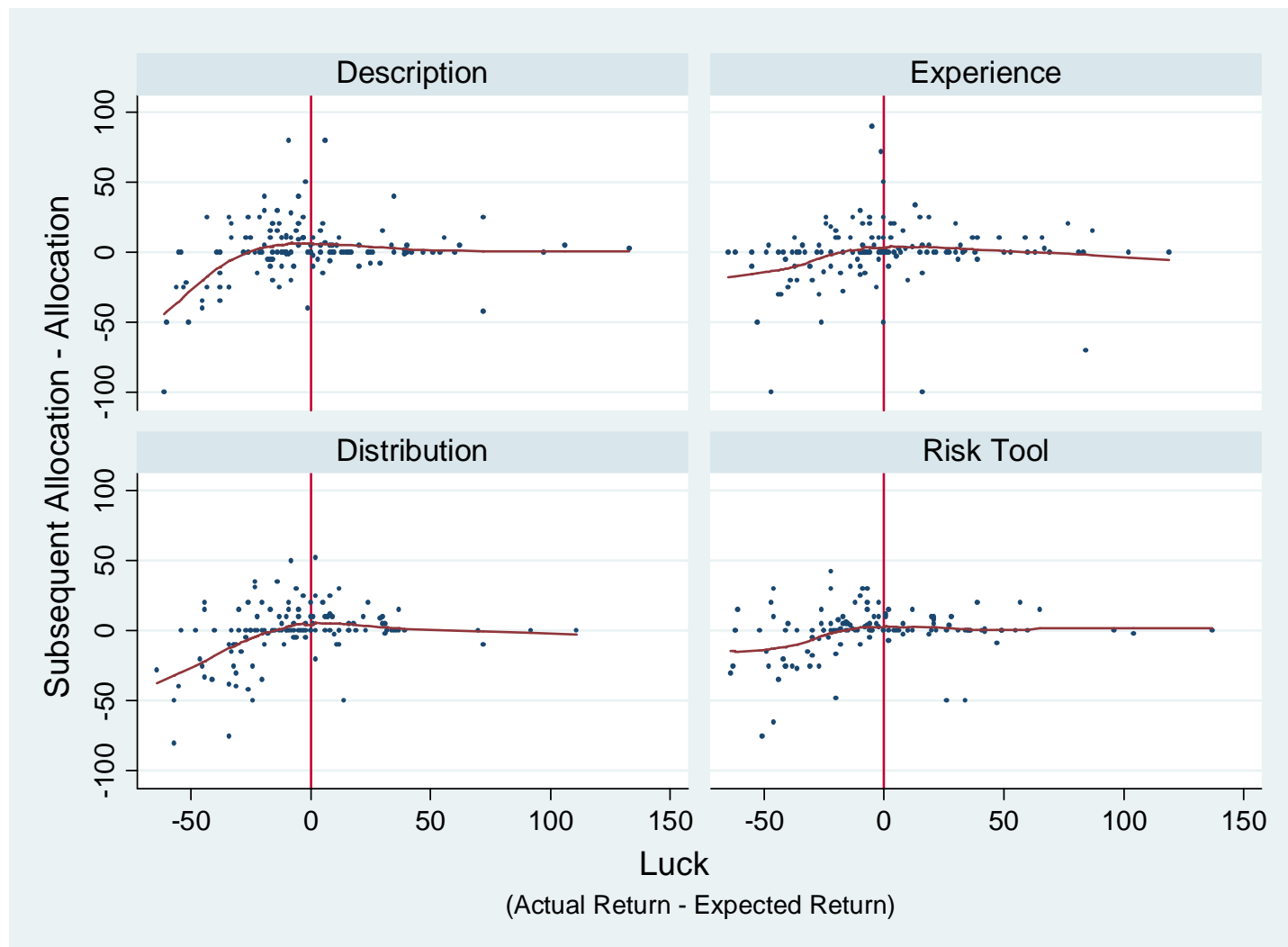
# Allocation to the risky asset (descriptives)

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Kaufmann, C./Weber, M./Haisley, E. C. (2013)

# Persistent decisions with the risk tool



Kaufmann, C./Weber, M./Haisley, E. C. (2013)

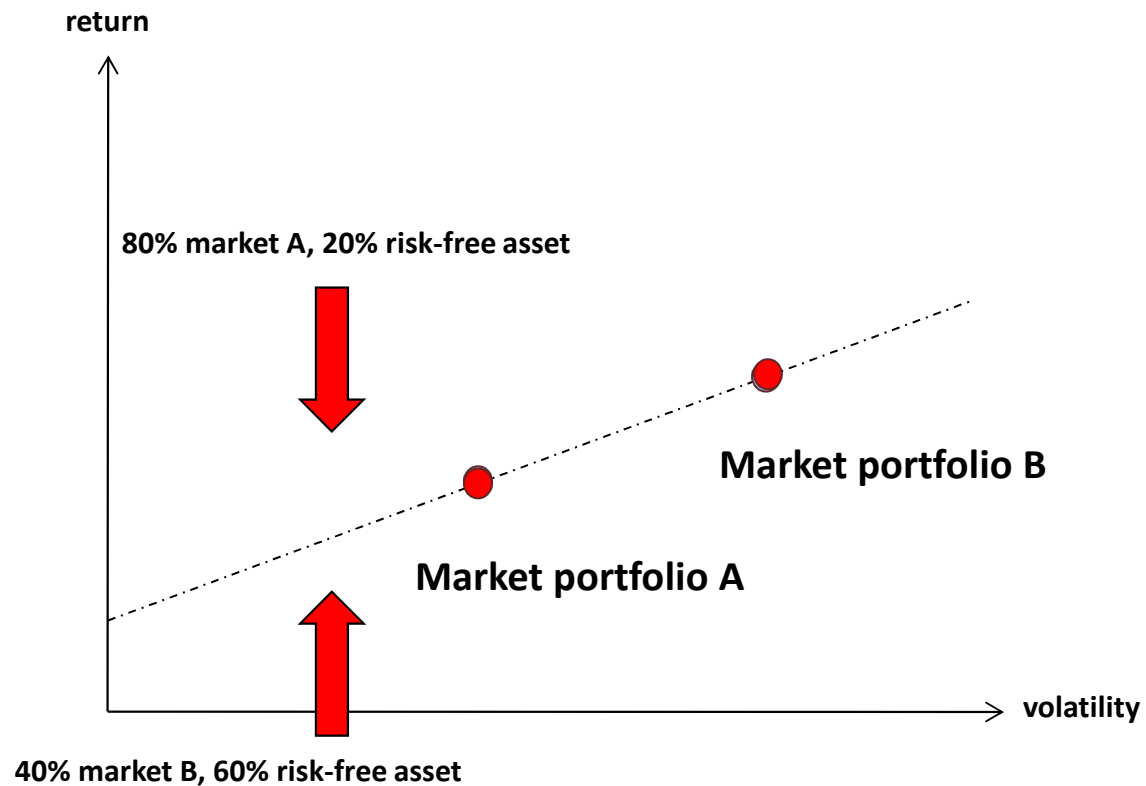


# Overview

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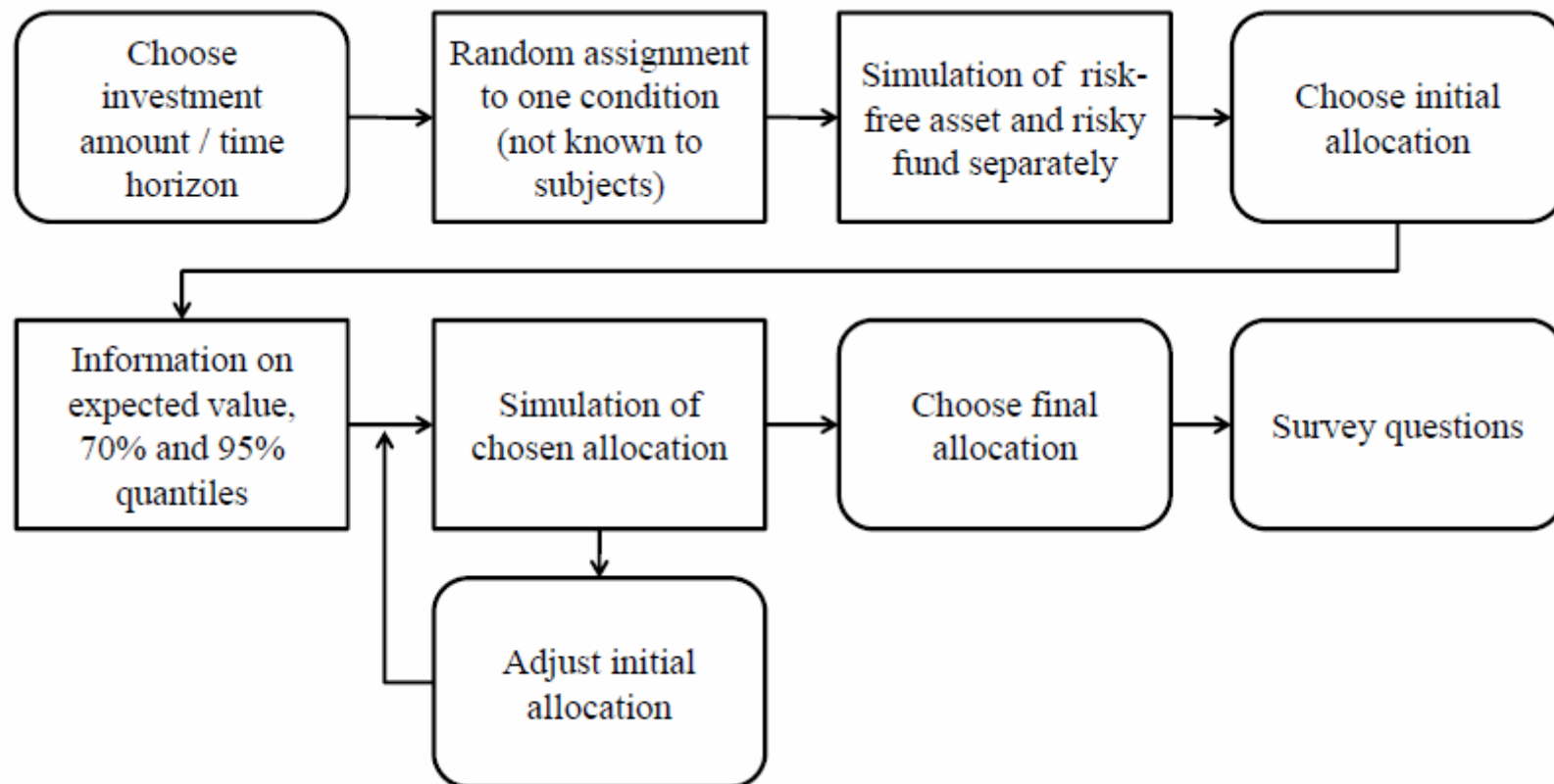
1. Introduction
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# What about different assets or market portfolios?



# Experimental setting

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Ehm, C./Kaufmann, C./Weber, M. (2013a): *Volatility inadaptability: Investors care about risk, but can't cope with volatility*, Review of Finance, to appear.

# Subjects

- Common press release with Consumer Protection Agency
- Media coverage in daily papers and on radio stations



Income	N	German average
less than € 12,000	179	€ 33,700
€ 12,000 to € 30,000	410	
€ 30,000 to € 50,000	648	
€ 50,000 to € 100,000	402	
more than € 100,000	125	
no answer	194	
N	1958	

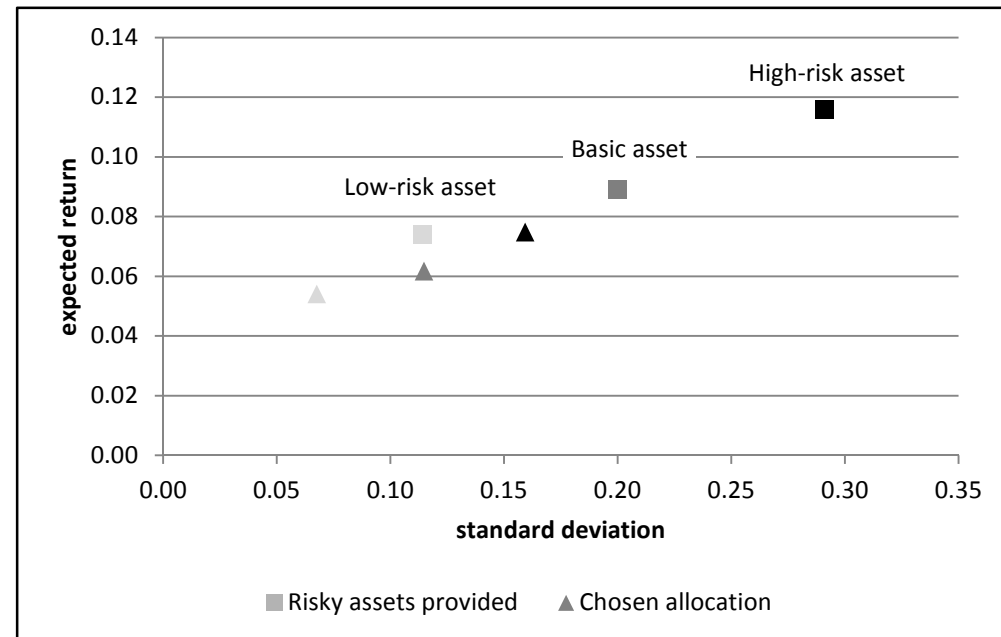
Education	N	Percentage sample	Percentage Germany
Still in school	19	0.97%	3.25%
Hauptschule	107	5.46%	38.43%
Realschule	398	20.33%	21.42%
Gymnasium	424	21.65%	11.69%
University	864	44.13%	12.50%
Ph.D.	146	7.46%	1.07%
No response/Other	0	0.00%	11.64%
N	1958	100.00%	100.00%

Variable	Mean	St.D.	Min.	Max.	German average
Risk attitude	4.23	1.37	1	7	2.24
Financial literacy	8.19	1.16	0	9	-
Age	42.17	16.99	11	109	55.44
Male gender	0.87	0.33	0	1	0.49
Stock market participation	0.81	0.39	0	1	0.25
Financial professional	0.31	0.46	0	1	-
N	1,958				

Ehm, C./Kaufmann, C./  
Weber, M. (2013a)

# Different risky assets

- Investors do not sufficiently adjust their allocation
- Same percentage allocation independent of the risky asset even with simulation



**Are we able to do the risk-return trade-off?**

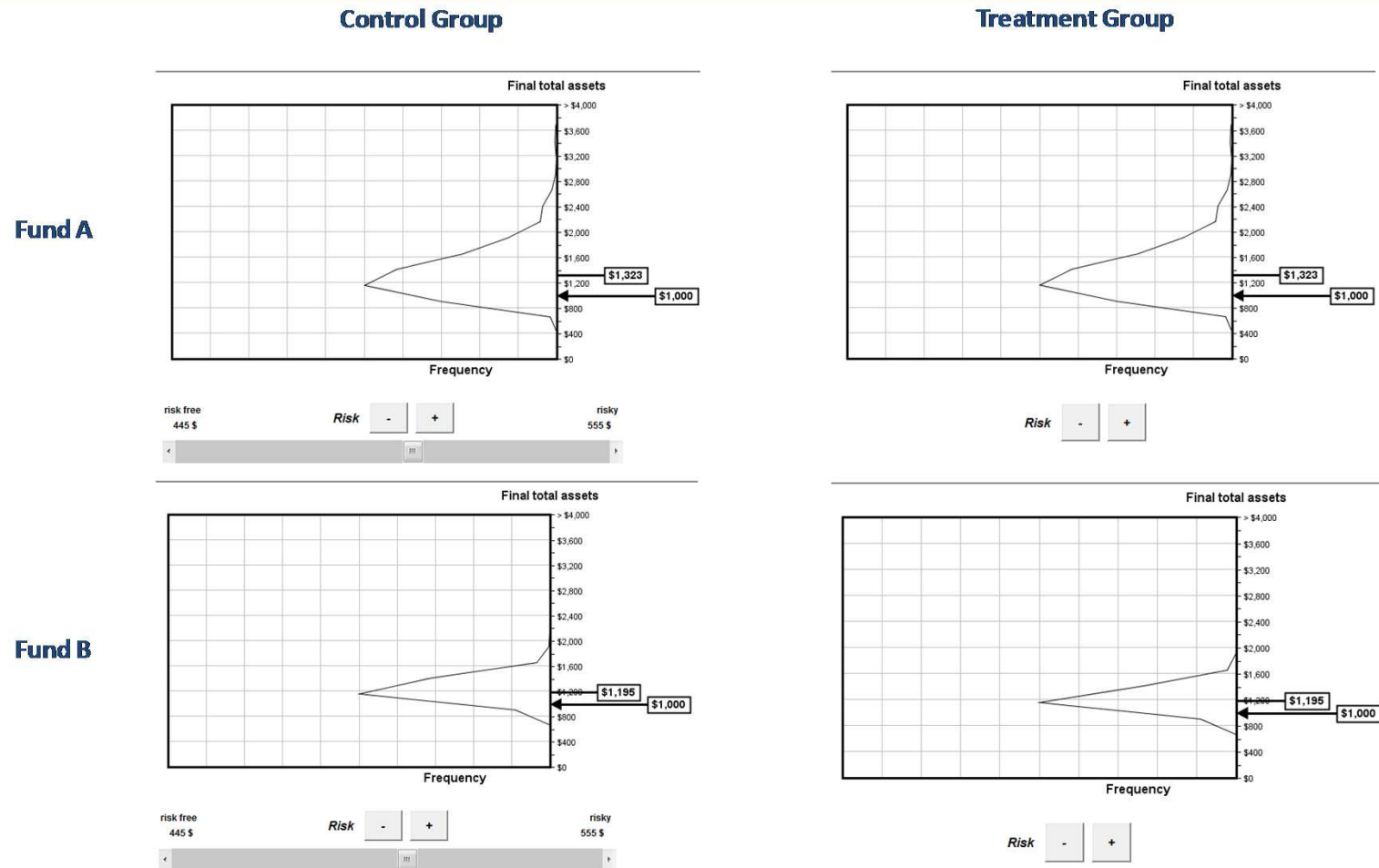
Ehm, C./Kaufmann, C./Weber, M. (2013a)

# Multivariate results

	(1) allocation	(2) volatility
Low-risk asset	0.013 (0.018)	-0.048*** (0.004)
High-risk asset	-0.020 (0.018)	0.046*** (0.004)
Risk attitude	0.069*** (0.006)	0.014*** (0.001)
Perc. risk (asset provided)	-0.034*** (0.006)	-0.007*** (0.001)
Investment horizon	0.005** (0.002)	0.001** (0.001)
log(Investment amount)	-0.008 (0.006)	-0.003* (0.001)
Stock market participation	0.001 (0.020)	-0.000 (0.004)
Male gender	0.030 (0.022)	0.009* (0.005)
Age	-0.000 (0.000)	-0.000 (0.000)
Education	0.002 (0.006)	-0.001 (0.001)
Constant	0.475*** (0.075)	0.106*** (0.016)
Observations	966	966
Adjusted $R^2$	0.222	0.451

Ehm, C./Kaufmann, C./Weber, M. (2013a)

# Solution: Portfolio choice without anchor (percentages)

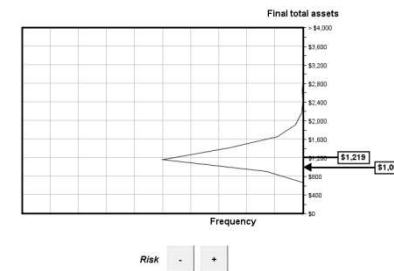
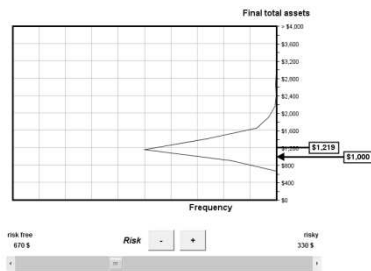


If the treatment group behaves differently from the control group, the percentages should be the reason.

Ehm, C./Kaufmann, C./Weber, M. (2013b): *De-biasing investors' volatility inadaptability*. Working paper.

# Study design

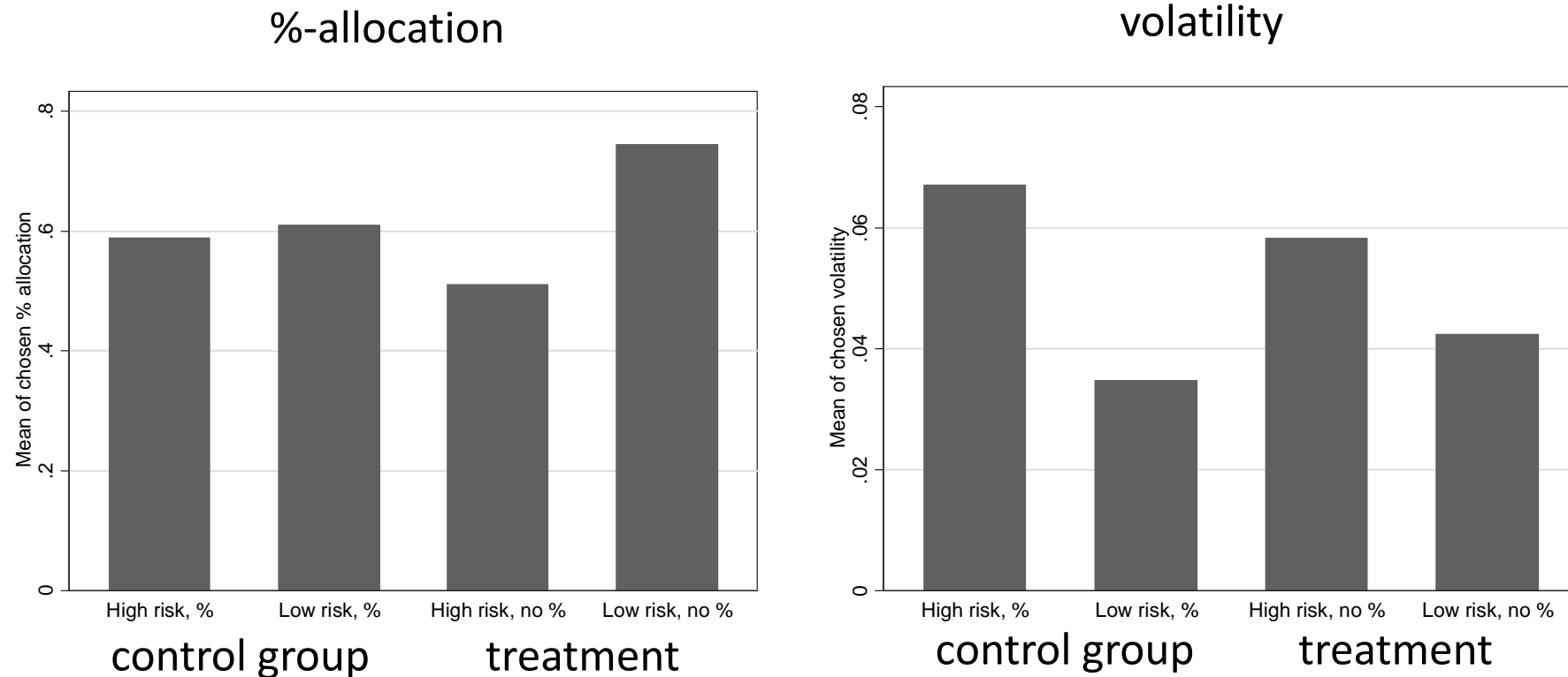
- 1 Subjects in both groups randomly face one of two assets: a high risk asset (volatility= 11.39%) or a low risk asset (5.70%)



- 2 Difference of **chosen** volatility within control group
- 3 Difference of **chosen** volatility within treatment group
- 4 If the percentages are the reason for the choice of different volatilities, then the difference should be smaller in the treatment group

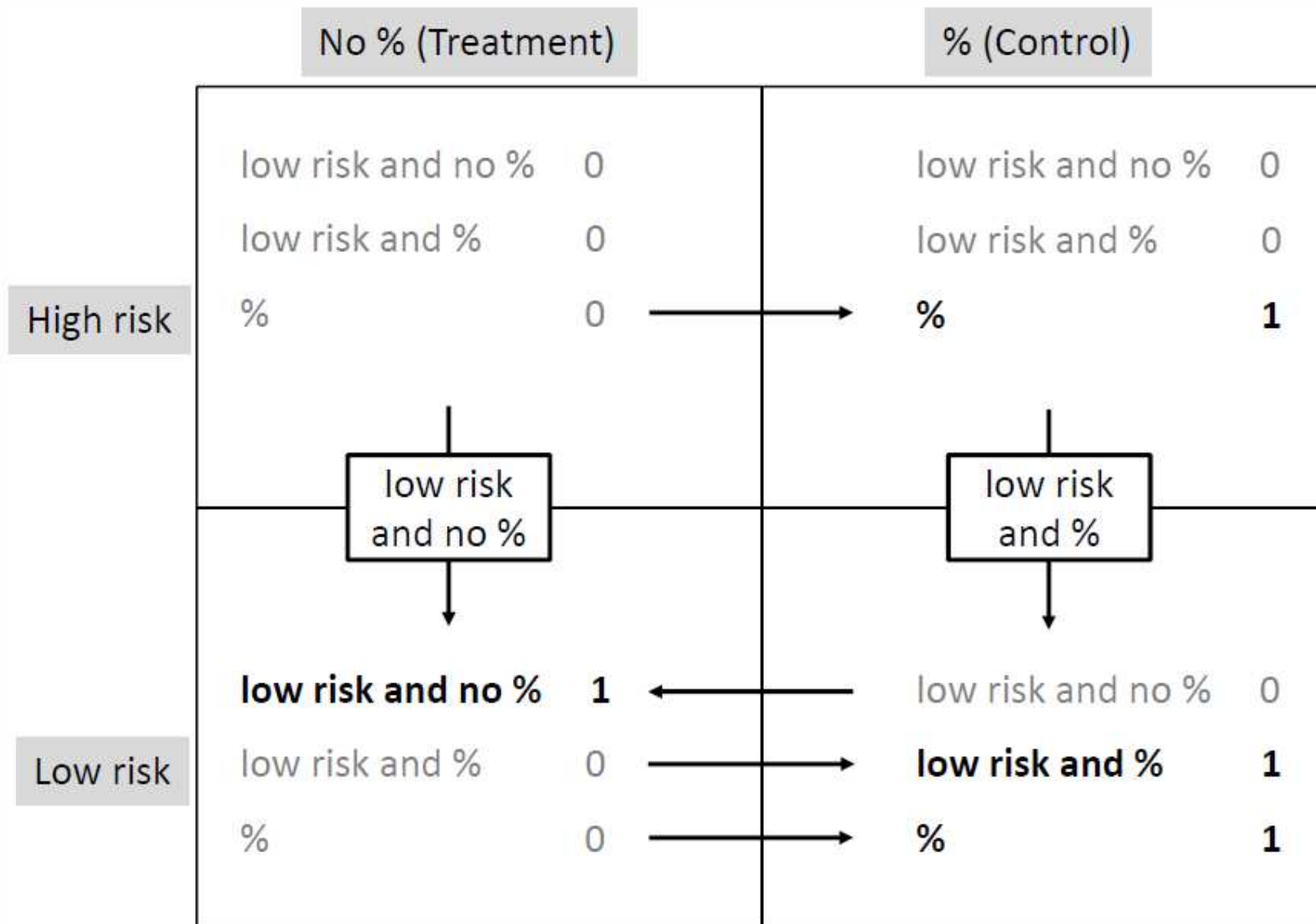


# Results: With and without percentages



- Control group: same allocation, different volatilities
- Treatment group: More similar volatilities

# Dummies used for multivariate analysis



# Multivariate results

	(1) Allocation	(2) Allocation	(3) Volatility	(4) Volatility
Dummy: low risk and no %	0.239*** (0.062)	0.241*** (0.065)	-0.019*** (0.005)	-0.020*** (0.005)
Dummy: low risk and %	0.034 (0.055)	0.022 (0.057)	-0.032*** (0.005)	-0.033*** (0.005)
Dummy: %	0.070 (0.056)	0.073 (0.060)	0.008* (0.005)	0.008* (0.005)
Risk attitude	0.078*** (0.014)	0.065*** (0.017)	0.006*** (0.001)	0.005*** (0.001)
Male gender		0.098** (0.044)		0.009** (0.004)
Age		-0.001 (0.002)		-0.000 (0.000)
Investement in stocks		0.074 (0.054)		0.004 (0.004)
College attended		0.012 (0.045)		0.003 (0.004)
Financial literacy		-0.015 (0.013)		-0.001 (0.001)
income: 12k to 30k		-0.045 (0.064)		-0.004 (0.005)
income: 30k to 50k		-0.030 (0.062)		-0.000 (0.005)
income: 50k to 100k		0.046 (0.069)		0.002 (0.006)
income: more than 100k		0.013 (0.099)		-0.003 (0.008)
Constant	0.214*** (0.070)	0.344*** (0.107)	0.034*** (0.006)	0.042*** (0.009)
Observations	146	139	146	139

# Summary

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- Descriptions do not lead to a consistent investment decision
- Simulations can lead to a more consistent decision
  - Investors are enabled to experience assets
  - Comprehension, satisfaction, and persistence are improved
- Anchoring effects from percentages can be reduced in a simulation setting