

# RISK COMMUNICATION WITHIN THE KIID

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# OVERVIEW

- Introduction
- Research Questions
- Review KIID
- Data Sample and Survey Design
- Results

# INTRODUCTION

- Regulation aims at changing people's behavior
- What can happen if the “regulator” has a wrong perception of people's behavior?
- Example: Rats in Hanoi<sup>1)</sup>



<sup>1)</sup> Michael G. Vann (2003): “Of Rats, Rice, and Race: The Great Hanoi Rat Massacre, an Episode in French Colonial History”, French Colonial History Society, May 2003.

# RESERACH QUESTIONS

- Which graphical illustration of the past performance is most suitable to communicate risk (within the KIID framework)?

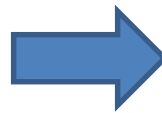
Accuracy:

Risk perception

Return expectation

Volatility expectation

Loss expectation



Comparability:

Variance of answers

- Does the Synthetic Risk and Reward Indicator (SRRI) help to better understand the risk?

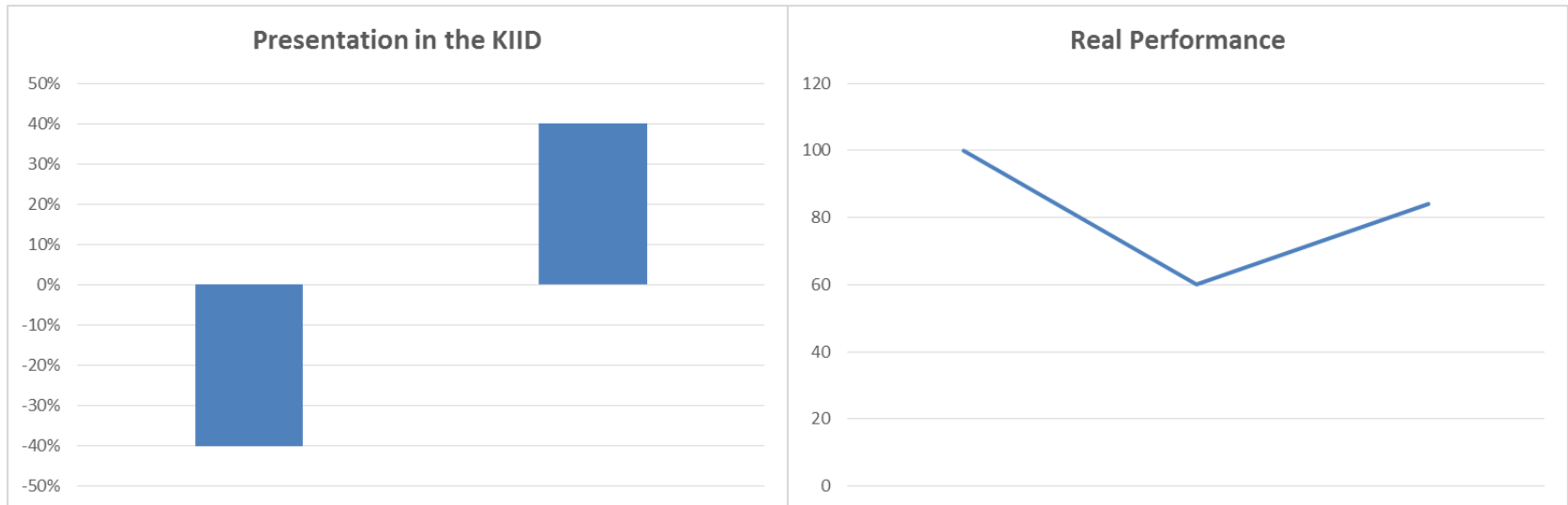
# RESERACH QUESTIONS

- Which criteria has the most influence on investment decisions?
- Is there a relationship between the accuracy of an investor's risk assessment and his:
  - Socioeconomic characteristics
  - Financial knowledge and Confidence

# KIID SECTIONS

1. Objectives & Investment Policy
2. **Risk & Reward Indicator (SRRI)**
3. Charges
4. **Past Performance**
5. Practical Information

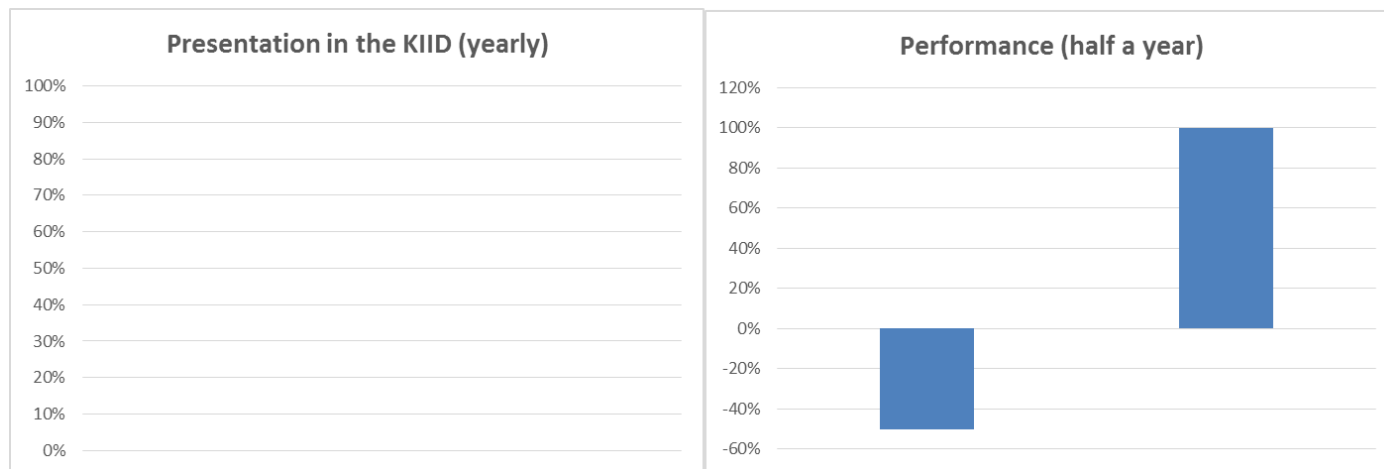
# KIID AND FRAMING



- > Hard to see the value of the fund
- > You can be influenced by framing (positive and negative)
- > Positive and negative area on the y-Axis

# KIID AND INFORMATION LOSS

○ 1.1.:100--> 31.6.:50--> 31.12.:100



- > Information loss regarding the volatility.
- > SRRI is calculated based on WEEKLY returns.
- > Less influence of the past stock performance path



# LITERATUR REVIEW

- Risk communication is faced by many research areas:
  - Actuarial: Duklan and Martin (2002)
  - Finance: Weber et al. (2005)
  - Medicine: Lipkus and Hollands (1999); Fagerlin et al. (2007); Lipkus (2007)
  - Psychology: Fischhoff et al. (1998)
- Importance of the context:
  - Duklan and Martin (2002); Visschers et al. (2009); Spiegelhalter et al. (2011)
- Risk perception:
  - Multidimensional: Veld et al. (2008); Vlaev et al. (2009)
  - Influence on investment decision: Veld et al. (2008); Weber et al. (2005)
- Most similar Papers:
  - Weber et al. (2005)
  - Diacon & Hasseldine (2007)

# DATA SAMPLE

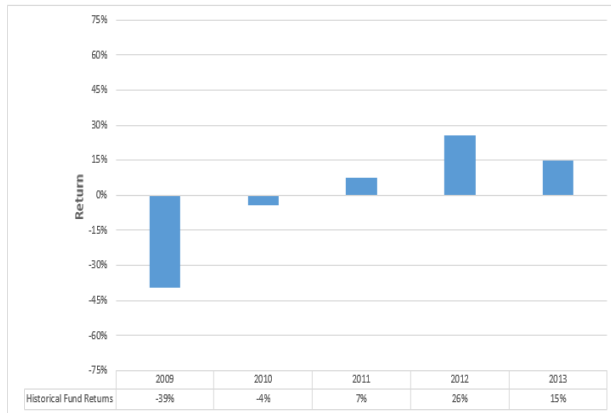
- Online survey conducted in October 2014
- Representative sample in UK (1000 people)
- Pollster firm «Research Now»

# SURVEY DESIGN

- 5 Treatments:
  - Return bar chart without SRRI
  - Return bar chart and SRRI (current KIID)
  - Price line chart (260 weekly returns)
  - Price line and range chart (260 weekly returns)
  - Return and price chart
- Within each treatment three graphs are shown, each with a different past performance path (same return distribution):
  - up-down, down-up, straight
- Asked Questions:
  - Risk perception
  - Return, Volatility and Loss expectation
  - Investment decision

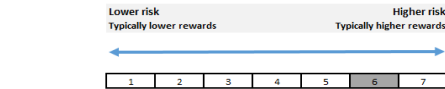
# SURVEY DESIGN

## Past Performance



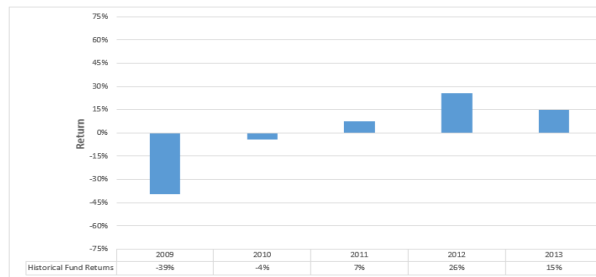
Past performance is not a guide to future performance. The value of your investment and income from it may go down as well as up and you may not get back the amount you invested.

## Risk & Reward Profile



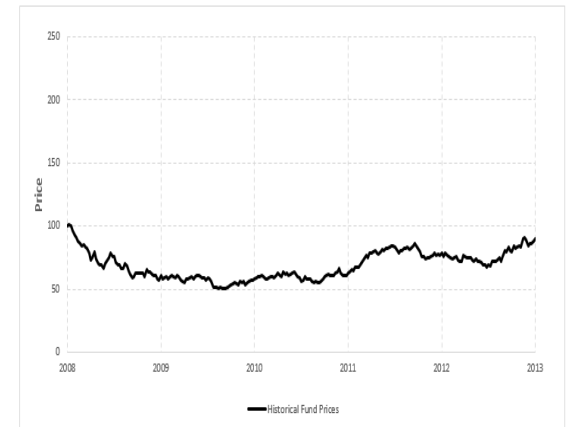
The indicator scores the investment on a risk and reward profile, 1 to 7 based on the volatility characteristics of the investment. The present investment has a score of 6, because its price can highly fluctuate and therefore the loss as well as the gain chances can be high.

## Past Performance



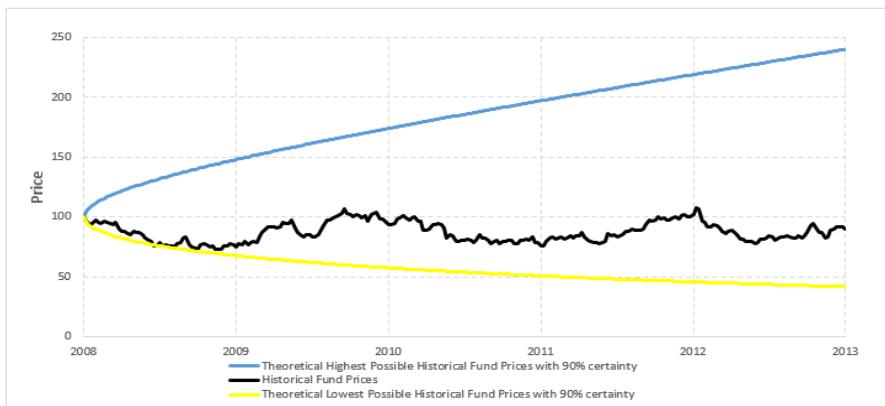
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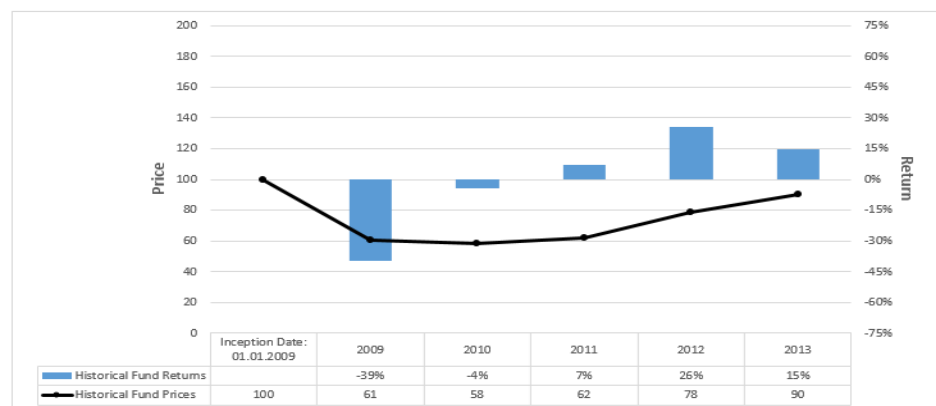
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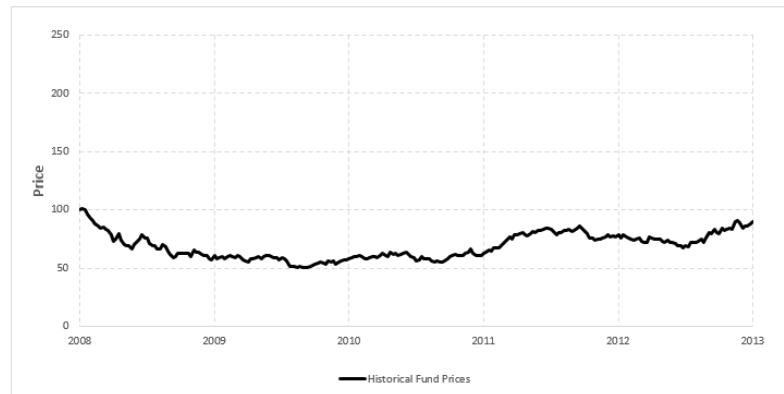
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# RESULTS (ACCURACY ANALYSIS)

	Descriptive data			p-value (Wilcoxon rank-sum test. HA: less than)				
	Number of subjects	Mean	Median	Return bar chart	Return bar chart and SRRI (KIID)	Price line chart	Price line and range chart	Return and price chart
<b>Return expectation bias</b>								
Treatment 1: Return bar chart	126	8.47	6.27		0.1673	0.9700	0.0000	0.9666
Treatment 2: Return bar chart and SRRI (KIID)	122	11.2	7.27	0.8332		0.9953	0.0005	0.9983
Treatment 3: Price line chart	139	2.85	4.89	0.0302	0.0047		0.0000	0.2900
Treatment 4: Price line and range chart	136	12.06	15.43	1.0000	0.9995	1.0000		1.0000
Treatment 5. Return and price chart	114	11.11	4.45	0.0335	0.0017	0.7106	0.0000	
<b>Volatility expectation bias</b>								
Treatment 1: Return bar chart	126	-5.62	-6.49		0.1500	0.0949	0.0000	0.0131
Treatment 2: Return bar chart and SRRI (KIID)	122	-7.41	-8.66	0.1500		0.0007	0.0000	0.3001
Treatment 3: Price line chart	139	-3.83	-5.12	0.0949	0.0007		0.0000	0.0000
Treatment 4: Price line and range chart	136	15.82	3.82	0.0000	0.0000	0.0000		0.0000
Treatment 5. Return and price chart	114	-8.7	-9.61	0.0131	0.3001	0.0000	0.0000	

# RESULTS (ACCURACY ANALYSIS)

	Descriptive data			p-value (Wilcoxon rank-sum test. HA: less than)				
	Number of subjects	Mean	Median	Return bar chart	Return bar chart and SRRI (KIID)	Price line chart	Price line and range chart	Return and price chart
<b>Perceived (past) risk</b>								
Treatment 1: Return bar chart	126	4.24	4.33		1.0000	0.0000	0.0007	0.2613
Treatment 2: Return bar chart and SRRI (KIID)	122	4.8	4.67	0.0000		0.0000	0.0000	0.0000
Treatment 3: Price line chart	139	3.48	3.67	1.0000	1.0000		0.9971	1.0000
Treatment 4: Price line and range chart	136	3.82	4	0.9993	1.0000	0.0029		0.9948
Treatment 5. Return and price chart	114	4.17	4.17	0.7393	1.0000	0.0000	0.0052	
<b>Perceived (future) risk</b>								
Treatment 1: Return bar chart	126	4.29	4.33		0.9973	0.0000	0.0001	0.0469
Treatment 2: Return bar chart and SRRI (KIID)	122	4.64	4.67	0.0027		0.0000	0.0000	0.0000
Treatment 3: Price line chart	139	3.54	3.67	1.0000	1.0000		0.9955	1.0000
Treatment 4: Price line and range chart	136	3.84	4	0.9999	1.0000	0.0046		0.9830
Treatment 5. Return and price chart	114	4.13	4	0.9533	1.0000	0.0000	0.0171	

# RESULTS (ACCURACY ANALYSIS)

**Level of the bias is very high**

	Descriptive data			p-value (Wilcoxon rank-sum test. HA: less than)				
	Number of subjects	Mean	Median	Return bar chart	Return bar chart and SRRI (KIID)	Price line chart	Price line and range chart	Return and price chart
<b>Loss expectation bias</b>								
Treatment 1: Return bar chart	126	35.94	34.18		0.0244	0.9951	1.0000	0.0113
Treatment 2: Return bar chart and SRRI (KIID)	122	41.09	38.67	0.9757		1.0000	1.0000	0.3627
Treatment 3: Price line chart	139	28.14	30.67	0.0049	0.0000		0.9998	0.0000
Treatment 4: Price line and range chart	136	16.12	21.58	0.0000	0.0000	0.0002		0.0000
Treatment 5: Return and price chart	114	43.14	38.83	0.9887	0.6380	1.0000	1.0000	



# RESULTS (COMPARABILITY ANALYSIS)

Not always significantly better but each time at 2nd place

	Descriptive data			p-value (Wilcoxon rank-sum test. HA: less than)				
	Number of subjects	Mean	Median	Return bar chart	Return bar chart and SRRI (KIID)	Price line chart	Price line and range chart	Return and price chart
<b>Return expectation bias (<math>\sigma</math>)</b>								
Treatment 1: Return bar chart	126	12.13	9.55		0.8617	0.0679	0.0877	0.9960
Treatment 2: Return bar chart and SRRI (KIID)	122	10.21	7.21	0.1387		0.0018	0.0043	0.9561
Treatment 3: Price line chart	139	12.82	11.77	0.9323	0.9982		0.4619	1.0000
Treatment 4: Price line and range chart	136	15.49	10.78	0.9126	0.9957	0.5387		1.0000
Treatment 5: Return and price chart	114	9.33	6.42	0.0041	0.0441	0.0000	0.0000	
<b>Volatility expectation bias (<math>\sigma</math>)</b>								
Treatment 1: Return bar chart	126	6.47	5.31		0.7776	0.5368	0.0215	0.9966
Treatment 2: Return bar chart and SRRI (KIID)	122	6.17	4.62	0.2229		0.2202	0.0040	0.9789
Treatment 3: Price line chart	139	6.04	5.06	0.4639	0.7803		0.0127	0.9986
Treatment 4: Price line and range chart	136	10.18	7.27	0.9786	0.9961	0.9873		1.0000
Treatment 5: Return and price chart	114	4.95	3.13	0.0035	0.0212	0.0014	0.0000	

# RESULTS (COMPARABILITY ANALYSIS)

	Descriptive data			p-value (Wilcoxon rank-sum test. HA: less than)				
	Number of subjects	Mean	Median	Return bar chart	Return bar chart and SRRI (KIID)	Price line chart	Price line and range chart	Return and price chart
<b>Loss expectation bias (<math>\sigma</math>)</b>								
Treatment 1: Return bar chart	126	12	10		0.8080	0.0103	0.5247	0.9913
Treatment 2: Return bar chart and SRRI (KIID)	122	11.62	8.66	0.1924		0.0009	0.2112	0.9241
Treatment 3: Price line chart	139	14.14	13.06	0.9897	0.9991		0.9744	1.0000
Treatment 4: Price line and range chart	136	13.92	8.84	0.4759	0.7893	0.0257		0.9777
Treatment 5. Return and price chart	114	9.95	7.64	0.0087	0.0762	0.0000	0.0224	
<b>Perceived (past) risk (<math>\sigma</math>)</b>								
Treatment 1: Return bar chart	126	1.14	1		0.9981	0.7848	0.5738	0.2366
Treatment 2: Return bar chart and SRRI (KIID)	122	0.91	1	0.0020		0.0251	0.0066	0.0003
Treatment 3: Price line chart	139	1.11	1	0.2157	0.9749		0.3636	0.0962
Treatment 4: Price line and range chart	136	1.11	1.15	0.4268	0.9934	0.6370		0.2405
Treatment 5. Return and price chart	114	1.18	1.15	0.7640	0.9997	0.9040	0.7601	

# RESULTS – IMPORTANCE FACTORS

Independent variables	Sign	Average adjusted R-squared	Significance level
Return expectation	+	2.8% [-0.9%-11.6%]	-
Volatility expectation	-	0.7% [-0.8%-7.4%]	-
Loss expectation	+	1.6% [-0.9%-7.3%]	-
Perceived (past) risk	-	5.3% [-0.9%-13.3%]	**
Perceived (future) risk	-	7.6% [0.7%-23.5%]	**

**Most important factor for decision making: Perceived Risk**

# RESULTS – IMPORTANCE FACTORS

	<b>Treatment 1:</b> Return bar chart	<b>Treatment 2:</b> Return bar chart and SRRI (KIID)	<b>Treatment 3:</b> Price line chart	<b>Treatment 4:</b> Price line and range chart	<b>Treatment 5:</b> Return and price chart	<b>Average Ranking</b> <b>(1=lowest; 9=highest):</b>
Return expectation	6	6	6	7	7	6.4
Volatility expectation	2	1	1	2	2	1.6
Loss expectation	1	4	1	4	3	2.6
Perceived (past) risk	7	7	7	5	5	6.2
Perceived (future) risk	8	9	8	9	8	8.4
Past performance	5	8	5	8	6	6.4
Risk & Reward		5				5
Theoretical highest/lowest possible historical fund returns				3		3
End value of the fund	3	2	3	6	4	3.6
Past experience with funds	4	3	4	1	1	2.6

# RESULTS – SOCIOECONOMIC

Independent variables	Return expectation bias	Volatility expectation bias	Loss expectation bias	Perceived (past) risk	Perceived (future) risk
Return bar chart and SRRI (KIID)	2.3016 (3.5267)	-1.0982 (2.0561)	3.9782 (3.4315)	0.53097*** (0.12751)	0.33986** (0.12329)
Price line chart	-5.9787 (3.4381)	2.8809 (2.0044)	-9.3895** (3.3453)	-0.78599*** (0.12431)	-0.7755*** (0.12019)
Price line chart and range chart	3.2685 (3.4371)	22.2177*** (2.0038)	-21.0017*** (3.3443)	-0.44129*** (0.12427)	-0.45644*** (0.12016)
Return and price chart	2.2535 (3.6001)	-2.8293 (2.0989)	6.5709 (3.5029)	-0.0926 (0.13016)	-0.1716 (0.12586)
25-34	-4.0028 (4.2996)	-6.2118* (2.5067)	3.1754 (4.1836)	0.1119 (0.15546)	0.1123 (0.15031)
35-44	-1.9717 (4.2346)	-9.8984*** (2.4688)	9.8814* (4.1203)	0.0496 (0.1531)	0.0652 (0.14804)
45-54	-2.4520 (4.0565)	-9.8973*** (2.3650)	8.8061* (3.947)	0.1640 (0.14666)	0.1931 (0.14181)
55-64	-0.6856 (4.1806)	-9.0403*** (2.4373)	9.7135* (4.0678)	0.1369 (0.15115)	0.1680 (0.14615)
> 65	-4.7812 (3.9811)	-11.2517*** (2.3210)	8.5593* (3.8737)	0.1849 (0.14394)	0.1951 (0.13918)
Female	-0.2436 (2.209)	3.3261* (1.2878)	-4.8835* (2.1494)	0.0672 (0.07987)	0.0820 (0.07722)
Bachelor	-0.5936 (2.6442)	3.7591* (1.5416)	-4.5727 (2.5729)	-0.1399 (0.0956)	-0.0509 (0.09244)
Master	-8.4230* (3.7765)	1.9998 (2.2018)	-10.3082** (3.6747)	-0.2272 (0.13654)	-0.1399 (0.13203)
PhD	8.1455 (6.6487)	0.8209 (3.8763)	8.0057 (6.4693)	0.0560 (0.24039)	-0.0229 (0.23244)
Another education	0.3654 (3.4561)	3.8625 (2.0150)	-5.5507 (3.3629)	0.0604 (0.12496)	-0.0267 (0.12082)
No education	-2.1428 (16.2016)	-1.5751 (9.4457)	-0.1693 (15.7645)	0.1572 (0.58578)	0.1513 (0.5664)
Constant	12.2201** (4.1201)	-1.4589 (2.402)	35.1621*** (4.0089)	4.16407*** (0.14896)	4.15915*** (0.14404)
Adjusted R squared	0.0080	0.2696	0.1360	0.1580	0.1241

# IMPROVEMENT IDEAS

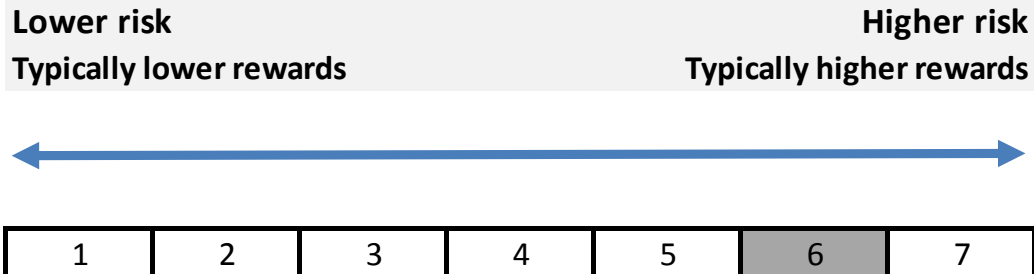
**Add to KIID!**

**Loss & Gain Range**

By investing in the present investment you have a 1 in 100 chance (1%) to realize a return lower than -35% or higher than +35% per annum. This mean that you have a 98 in 100 chance (98%) to realize a return between -35% and +35% per annum.

**Change from volatility to loss measure?**

**Risk & Reward Profile**



The indicator scores the investment on a risk and reward profile, 1 to 7 based on the volatility characteristics of the investment. The present investment has a score of 6, because its price can highly fluctuate and therefore the loss as well as the gain chances can be high.

# CONCLUSION

- None of the 5 graphical illustrations is superior
- **Return bar** charts leads to highest/most accurate risk perception
- **Price line** charts leads to most accurate return/volatility expectations
- **Potential for losses is extremely underestimated**
- The **SRRI** helps to easily compare the risk of different funds.
- **Perceived risk** is the most important factor for decision making
- **One common KIID** can be used for all demographics
- **Add a loss & gain range to the KIID**

# LITERATUR

- Diacon, Stephen, and John Hasseldine. "Framing effects and risk perception: The effect of prior performance presentation format on investment fund choice." *Journal of Economic Psychology* 28.1 (2007): 31-52.
- Duklan, Karolina, and Michael A. Martin. *Communicating effectively with words, numbers and pictures: Drawing on experience*. School of Finance and Applied Statistics, Australian National University, 2002.
- Fagerlin, Angela, et al. "Making numbers matter: Present and future research in risk communication." *American Journal of Health Behavior* 31.Supplement 1 (2007): S47-S56.
- Fischhoff, Baruch, et al. "What information belongs in a warning?." *Psychology & Marketing* 15.7 (1998): 663-686.
- Lipkus, Isaac M. "ONLINE COLOR\_Numeric, Verbal, and Visual Formats of Conveying Health Risks: Suggested Best Practices and Future Recommendations." *Medical Decision Making* (2007).
- Lipkus, Isaac M., and J. G. Hollands. "The visual communication of risk." *JNCI monographs* 1999.25 (1999): 149-163.
- Spiegelhalter, David, Mike Pearson, and Ian Short. "Visualizing uncertainty about the future." *Science* 333.6048 (2011): 1393-1400.
- Veld, Chris, and Yulia V. Veld-Merkoulova. "The risk perceptions of individual investors." *Journal of Economic Psychology* 29.2 (2008): 226-252.
- Visschers, Vivianne HM, et al. "Probability information in risk communication: a review of the research literature." *Risk Analysis* 29.2 (2009): 267-287.
- Vlaev, Ivo, Nick Chater 1, and Neil Stewart. "Dimensionality of risk perception: Factors affecting consumer understanding and evaluation of financial risk." *The Journal of Behavioral Finance* 10.3 (2009): 158-181.
- Weber, Elke U., Niklas Siebenmorgen, and Martin Weber. "Communicating asset risk: how name recognition and the format of historic volatility information affect risk perception and investment decisions." *Risk Analysis* 25.3 (2005): 597-609.