Skewness Expectations and Portfolio Choice

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How do skewness expectations affect portfolio choice?

- Many models of investor behavior propose a preference for skewness
  - Investors like positively skewed, lottery-like return distributions
  - Different channels (Brunnermeier et al., 2007; Mitton & Vorkink, 2007; Barberis & Huang, 2008)
  - Lottery choice experiments in the laboratory (Ebert & Wiesen, 2011)

- In the field distribution of future returns is unknown, investors form expectations

- Problem: Direct test of models requires knowing *expected* skewness

We directly measure expected skewness and relate it to portfolio choice.

- Previous literature: indirect approach
  - Proxy for expected skewness
    - Investors extrapolate from past returns (Kumar, 2009; Barberis et al. 2016)
    - Maximum return over certain period in the past (Bali et al., 2011; Lin & Liu, 2017)
    - Future returns, option market data (Mitton & Vorkink, 2007; Conrad et al., 2013)
  - Show that proxy is negatively related to future returns
  - ➢ What is a good proxy? Over which period should we calculate it?

- This paper: direct approach
  - Measure expected skewness at the individual level
  - Relate it to portfolio choice (cross-section and over time)

We extend the literature on stock market expecations.

- Higher order risk attitudes and financial decisions (Noussair et al., 2013)
  - ➢ Do not focus on expectations

- Literature on stock market expectations (Vissing-Jorgensen, 2003; Dominitz & Manski, 2004; Kézdi & Willis, 2011; Hurd et al., 2011; Hudomiet et al., 2011; Amromin & Sharpe, 2014; Ameriks et al., 2015; Drerup et al., 2016; Huck et al., 2017)
  - – Expectations well calibrated?
  - – Related to heterogeneity to socio-demographics?
  - – Expectations related to stock holdings?
  - ➢ All focus on point predictions or mean-variance, no evidence on expected skewness

Outline

1. Motivation
2. Design
3. Results
4. Conclusions

We use a representative sample of the Dutch poplulation.

- Representative panel of the Dutch population (LISS)
- Series of incentivized experiments embedded into monthly surveys
  - Beliefs about return distribution for two risky assets
  - Construct portfolio out of these assets and a risk-free asset.
- Rich set of background variables
- Exclude households with financial wealth < 1000 €

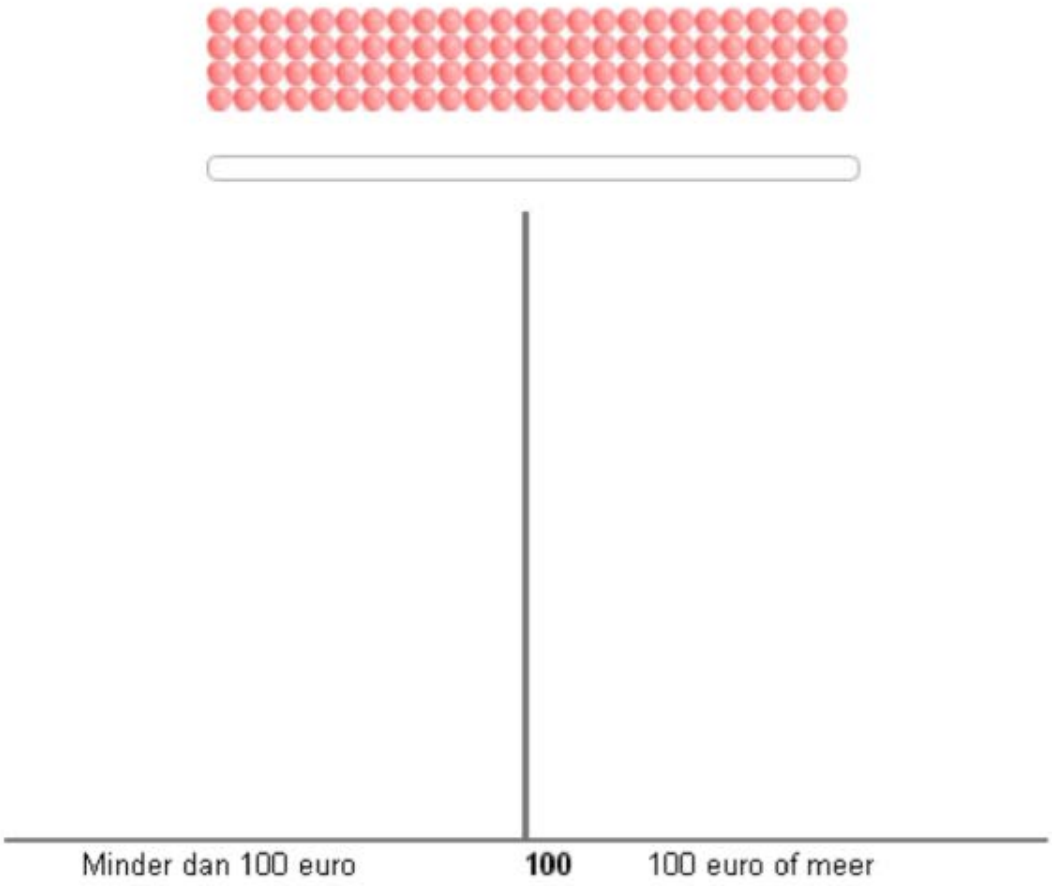
Timeline of experiments

Aug 2013

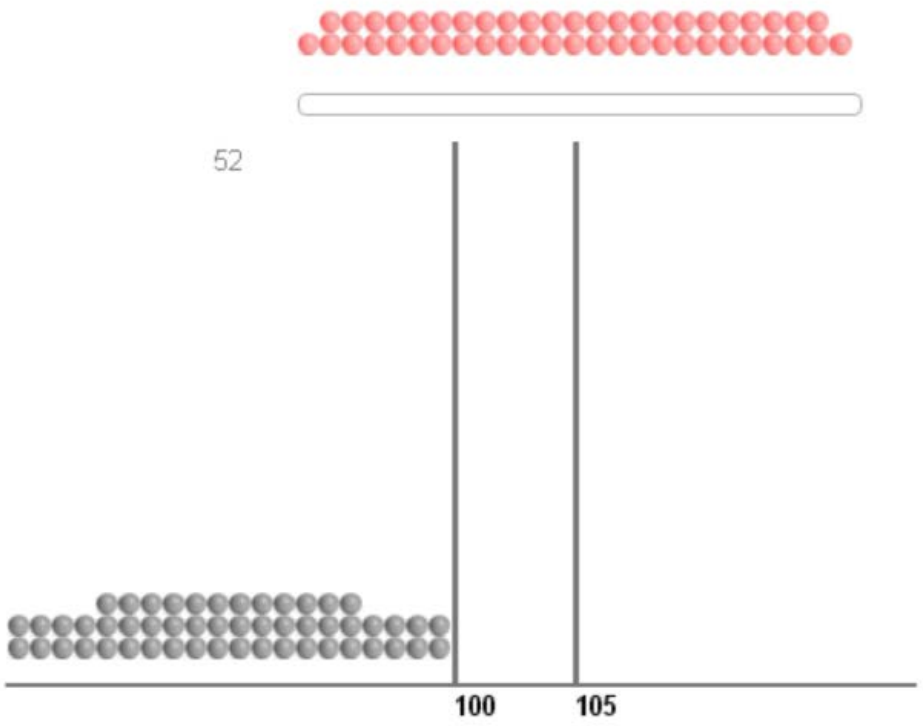
Beliefs for Aug '14:
AEX, Philips

Controls

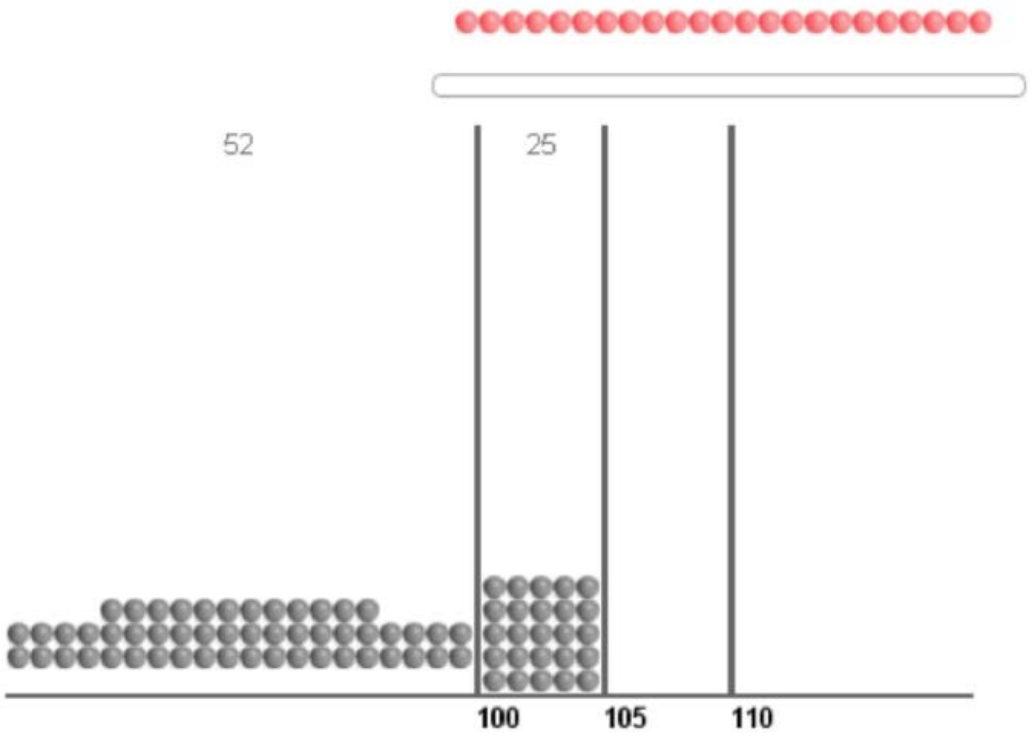
Elicitation of expectations



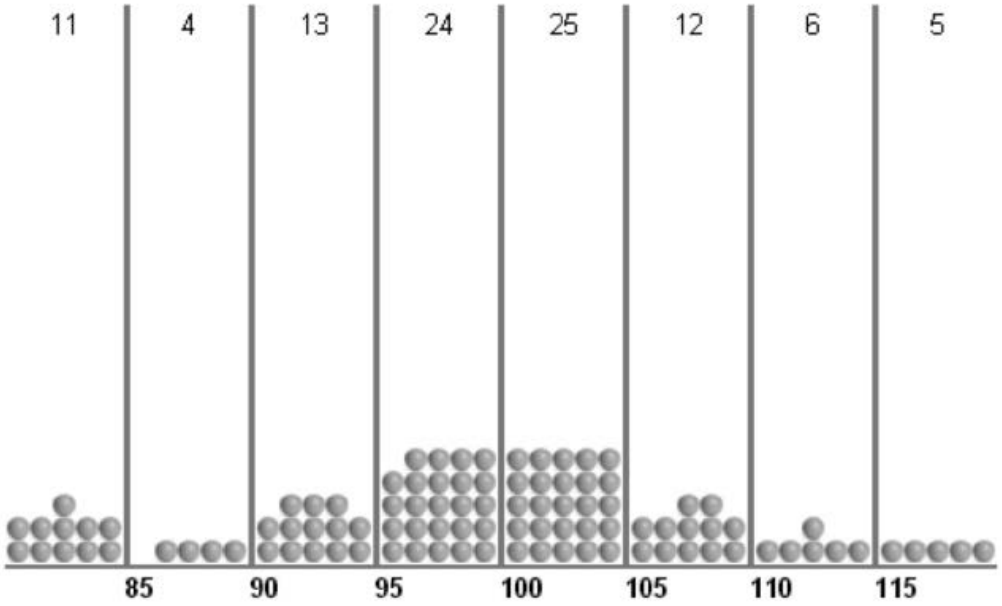
Elicitation of expectations



Elicitation of expectations

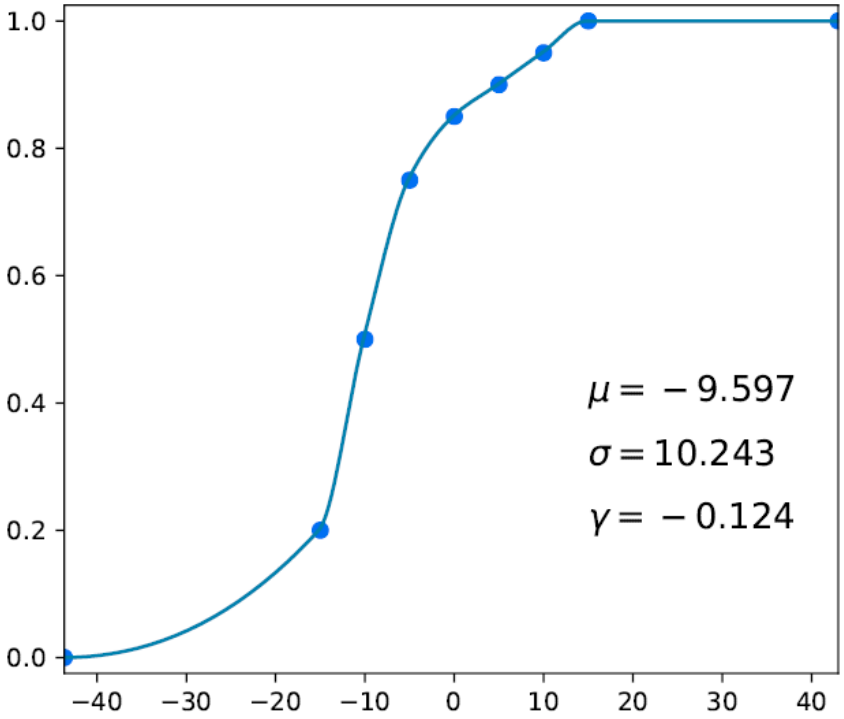


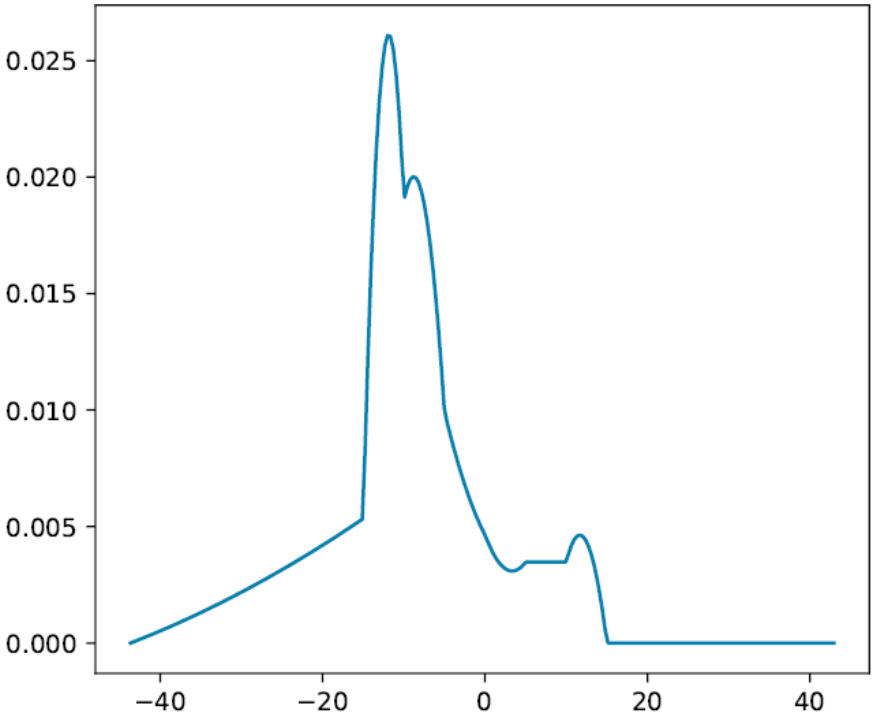
Elicitation of expectations



- Intuitive method
  (Delavande & Rohwedder, 2008)
- Avoids monotonicity violations common in probabilistic questions
- Use Bellemare et al. (2012) to estimate moments of belief distribution

Elicitation of expectations





Timeline of experiments

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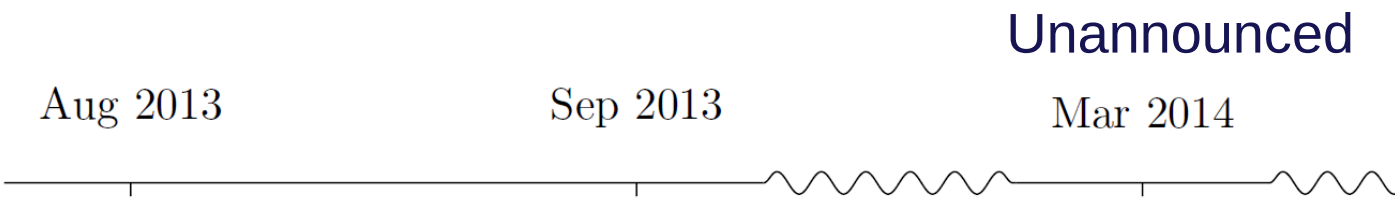

Aug 2013	Sep 2013	Mar 2014
Beliefs for Aug '14: AEX, Philips	Beliefs for Aug '14: Return of savings account	Beliefs for Aug '14: AEX, Philips
	Portf. construction: 100 € in AEX, Philips, savings account	Portf. rebalancing
Controls	Controls	Controls

Timeline of experiments

N = 1857

Aug 2013	Sep 2013	Mar 2014	Oct / Nov 2014
Beliefs for Aug '14: AEX, Philips	Beliefs for Aug '14: Return of savings account	Beliefs for Aug '14: AEX, Philips	Payout: Random / by accuracy
	Portf. construction: 100 € in AEX, Philips, savings account	Portf. rebalancing	Payout: Random / portf. value
Controls	Controls	Controls	Controls

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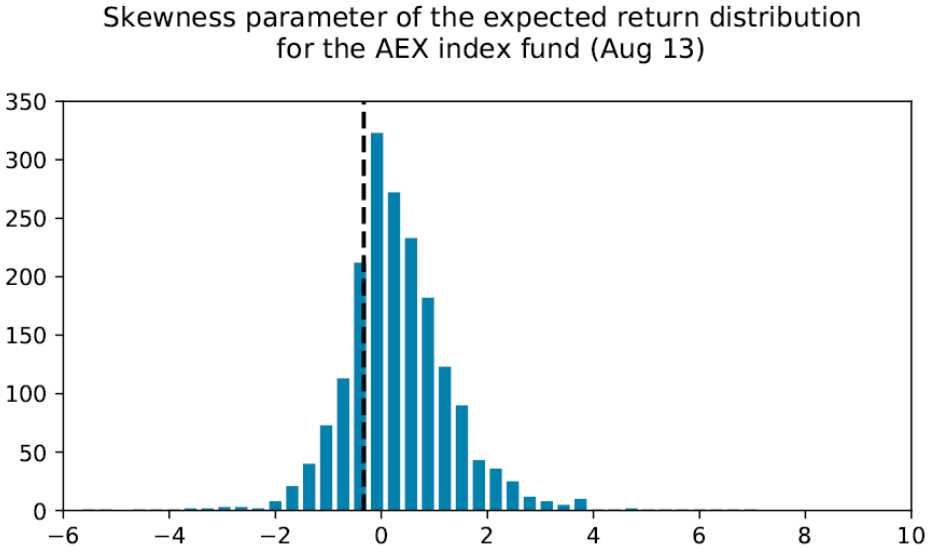
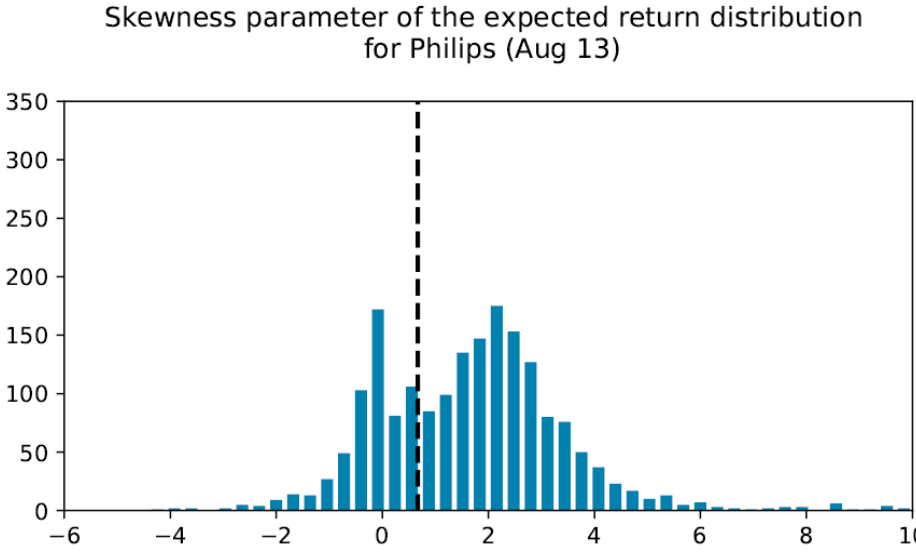
Skewness expecations are very heterogeneous, and not well calibrated to historical levels.





- Similar heterogeneity and miscalibration for mean and standard deviation (in line with previous work).

Expected skewness is not correlated with sociodemographics.

- Is expected skewness related to sociodemographics?
  - Might explain why certain groups are more likely to gamble on the stock market. (Kumar, 2009)

➢ We do not find any significant and consistent correlations between sociodemographics and expected skewness.

Expected skewness is correlated with portfolio choice.

	Portfolio Share	
	AEX	
	(1)	(2)
Constant	26.61***	28.67***
	(3.33)	(3.42)
μ_{aex}	0.68***	0.86***
	(0.11)	(0.11)
σ_{aex}	0.04	0.27
	(0.19)	(0.22)
γ_{aex}	1.07*	1.20**
	(0.56)	(0.56)
$\mu_{philips}$		-0.24***
		(0.09)
$\sigma_{philips}$		-0.19
		(0.14)
$\gamma_{philips}$		0.17
		(0.33)
Exp. return for savings account		-0.16
		(0.10)
Controls	X	X
Observations	1,857	1,857
Adj. R^2 (%)	10.3	11.5

- Increase in expected skewness for AEX by 1 st.d. increases share invested into AEX by 1.3%.
- 1/5 of the effect for comparable increase in expected mean
- Including expected skewness leads to moderate increase in Adj. R^2

Change in expectations is correlated with changes in portfolio choice for the stock.

	Change in Portfolio Share			
	AEX		Philips	
	(1)	(2)	(3)	(4)
Constant	4.78***	4.29***	-1.63	-1.79
	(1.52)	(1.43)	(1.45)	(1.44)
$\Delta\mu_{\text{aex}}$	0.46**	0.58***		0.26*
	(0.23)	(0.24)		(0.16)
$\Delta\sigma_{\text{aex}}$	-0.48*	-0.18		-0.43
	(0.27)	(0.31)		(0.29)
$\Delta\gamma_{\text{aex}}$	-0.38	0.06		0.37
	(0.72)	(0.74)		(0.74)
$\Delta\mu_{\text{philips}}$		-0.38***	0.31**	0.26*
		(0.10)	(0.14)	(0.14)
$\Delta\sigma_{\text{philips}}$		0.03	0.25	0.39
		(0.18)	(0.22)	(0.24)
$\Delta\gamma_{\text{philips}}$		-1.03***	1.06***	0.99***
		(0.37)	(0.36)	(0.36)
Controls	X	X	X	X
Observations	1,857	1,857	1,857	1,857
Adj. R^2 (%)	1.9	4.7	3.9	4.3

- Changes in expected skewness only correlated with changes in portfolio share of Phillips
- Possibly due to lack of temporal variation for expected skewness in AEX

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Conclusions

- Skewness expectations are very heterogenous and not related to sociodemographics.

- Suggestive evidence that respondents prefer skewed return distributions.

Thank you for your attention!

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