FEDERAL RESERVE BANK *of* NEW YORK

Inflation Expectations and Behavior: Do Survey Respondents Act on their Beliefs?

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Introduction

- Inflation expectations are at the center of modern Macro Theory
- Transmission effect : Beliefs about future inflation affect current behavior and therefore inflation
- Managing inflation expectations is first step in controlling inflation
- Recent research aims at better understanding and measuring inflation expectations.
- Two types of measures: market based and survey based

Introduction

- The NY Fed is developing a new inflation expectations survey of individual consumers

- Objectives:
  - Understand belief formation and belief updating
  - Obtain better point predictions
  - Measure probabilistic beliefs
  - Study link between beliefs and behavior

What we do

- We ask the same subjects to respond to a survey and participate in a financially incentivized experiment
- In survey, we elicit inflation expectations
- In experiment, subjects chose between investments whose final payoffs depend on future inflation
- The objective is to compare the survey responses with the behavior in experiment

Motivation 1 : Are survey responses Informative?

- Possible reasons why surveys may not be informative about the true inflation beliefs of individual consumers:
  - Respondents may not provide truthful responses
  - Respondents may not provide thoughtful responses
  - Survey questions may not be clear.

- What we do:
  - We test how informative the subjects survey responses are about their decisions in the experiment.

Motivation 2 : Do agents act on their inflation beliefs?

- Possible reasons why agents may not act on their inflation beliefs?
  - Lab evidence that agents do not systematically act on their beliefs
  - The impact of future inflation may not be sufficiently salient
  - Agents may not be forward looking

- What we do:
  - We examine whether actions in financially incentivized experiment are consistent with self reported beliefs in survey

The Survey

- Fielded to 745 respondents by RAND at the end of July 2010
- Consists of 6 parts, including inflation expectations elicitation, experiment, elicitation of risk attitude, numeracy and financial literacy
- Inflation Expectation Question
  - *Over the next 12 months, I expect the rate of inflation to be ___% OR the rate of deflation (the opposite of inflation) to be ___%.*

The experiment

- Consists of 10 questions
- In each question, a subject chooses between investment A or B
- Each investment generates a payoff 12 months from now
- Once survey completed, we draw randomly 2 subjects and 1 question
- 12 months later, each of the selected subjects is paid according to his/her choice for the selected question

The Experimental Questions

Earnings under investment A												
Rate of inflation	-1% or less (deflation)	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	10% or more
Earnings	$600	$550	$500	$450	$400	$350	$300	$250	$200	$150	$100	$50

Question 1: Which one of these two investments do you choose?

( ) Investment **A**: your earnings are determined by the table above.

( ) Investment **B,** your earnings are exactly **$100**.

Question 2: Which one of these two investments do you choose?

( ) Investment **A**: your earnings are determined by the table above.

( ) Investment **B,** your earnings are exactly **$150**.

....

....

Question 10: Which one of these two investments do you choose?

( ) Investment **A**: your earnings are determined by the table above.

( ) Investment **B,** your earnings are exactly **$550**.

The Experimental Questions

Earnings under investment A												
Rate of inflation	-1% or less (deflation)	0%	1%	2%	3%	**4%**	5%	6%	7%	8%	9%	10% or more
Earnings	$600	$550	$500	$450	$400	**$350**	$300	$250	$200	$150	$100	$50

Question 1: Which one of these two investments do you choose?

( ) Investment **A**: your earnings are determined by the table above.

( ) Investment **B,** your earnings are exactly **$100**.

....

Question 6: Which one of these two investments do you choose?

( ) Investment A: your earnings are determined by the table above.

( ) Investment B, your earnings are exactly $350?

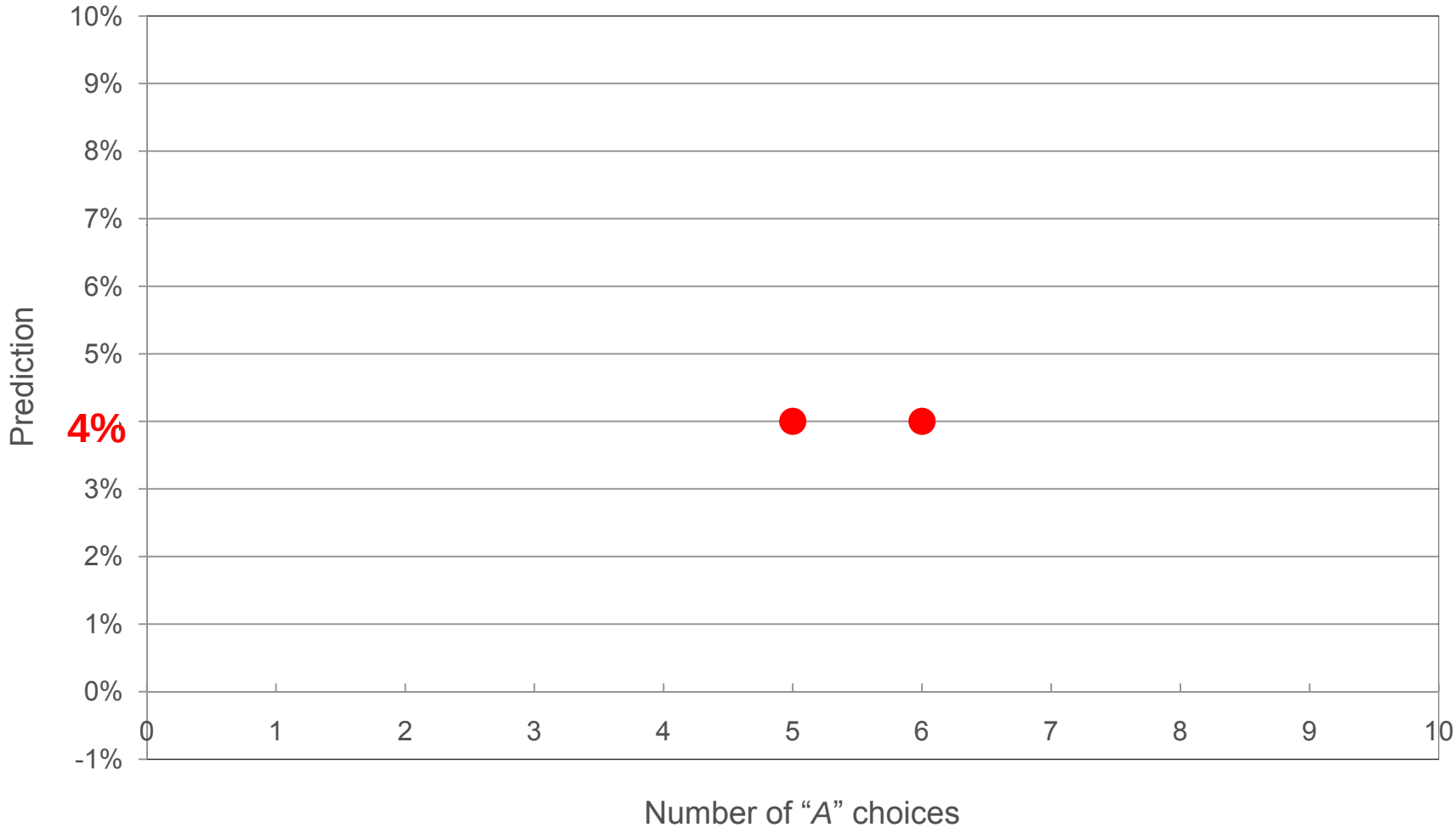
....

Question 10: Which one of these two investments do you choose?

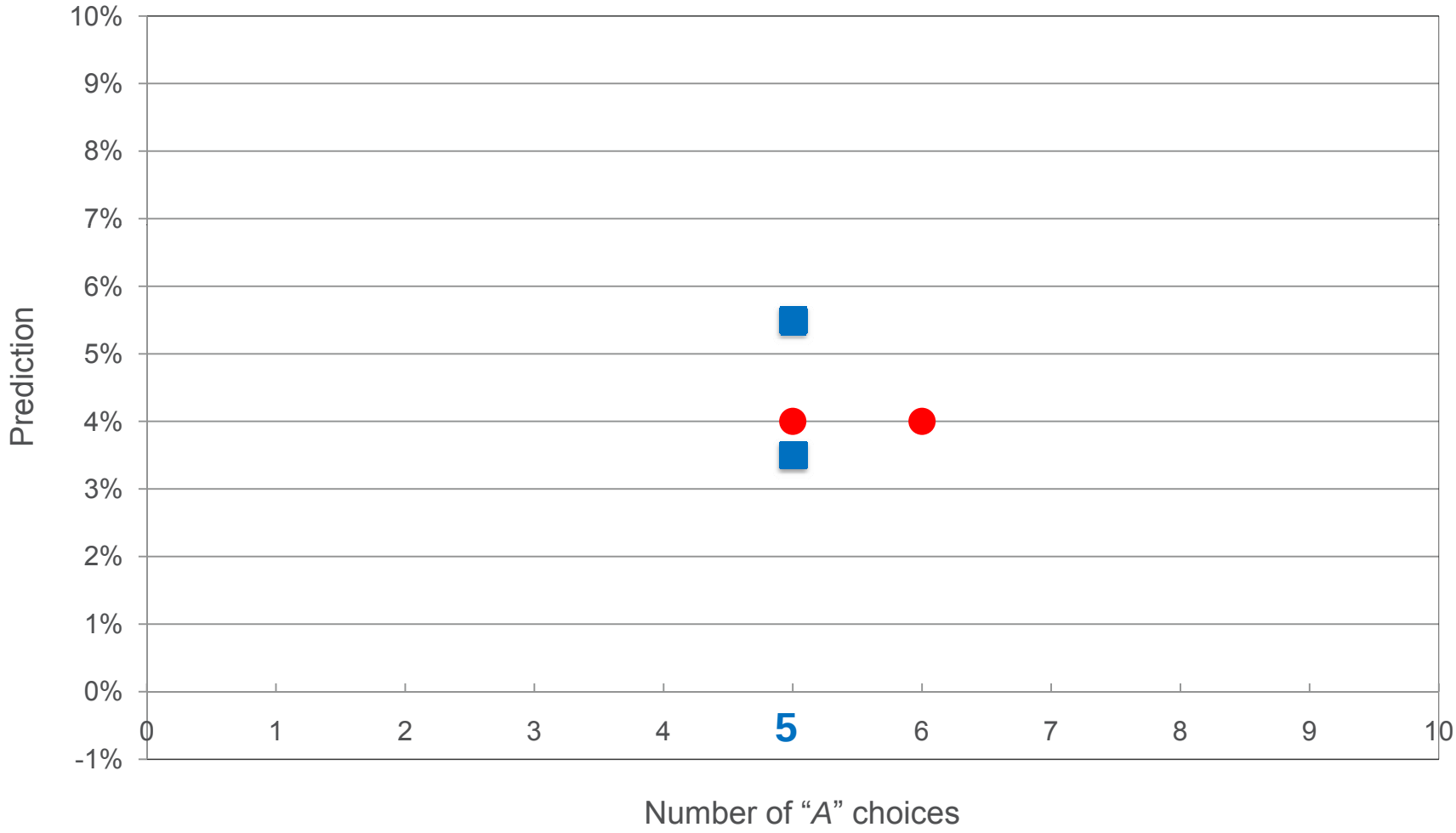
( ) Investment **A**: your earnings are determined by the table above.

( ) Investment **B,** your earnings are exactly **$550**?

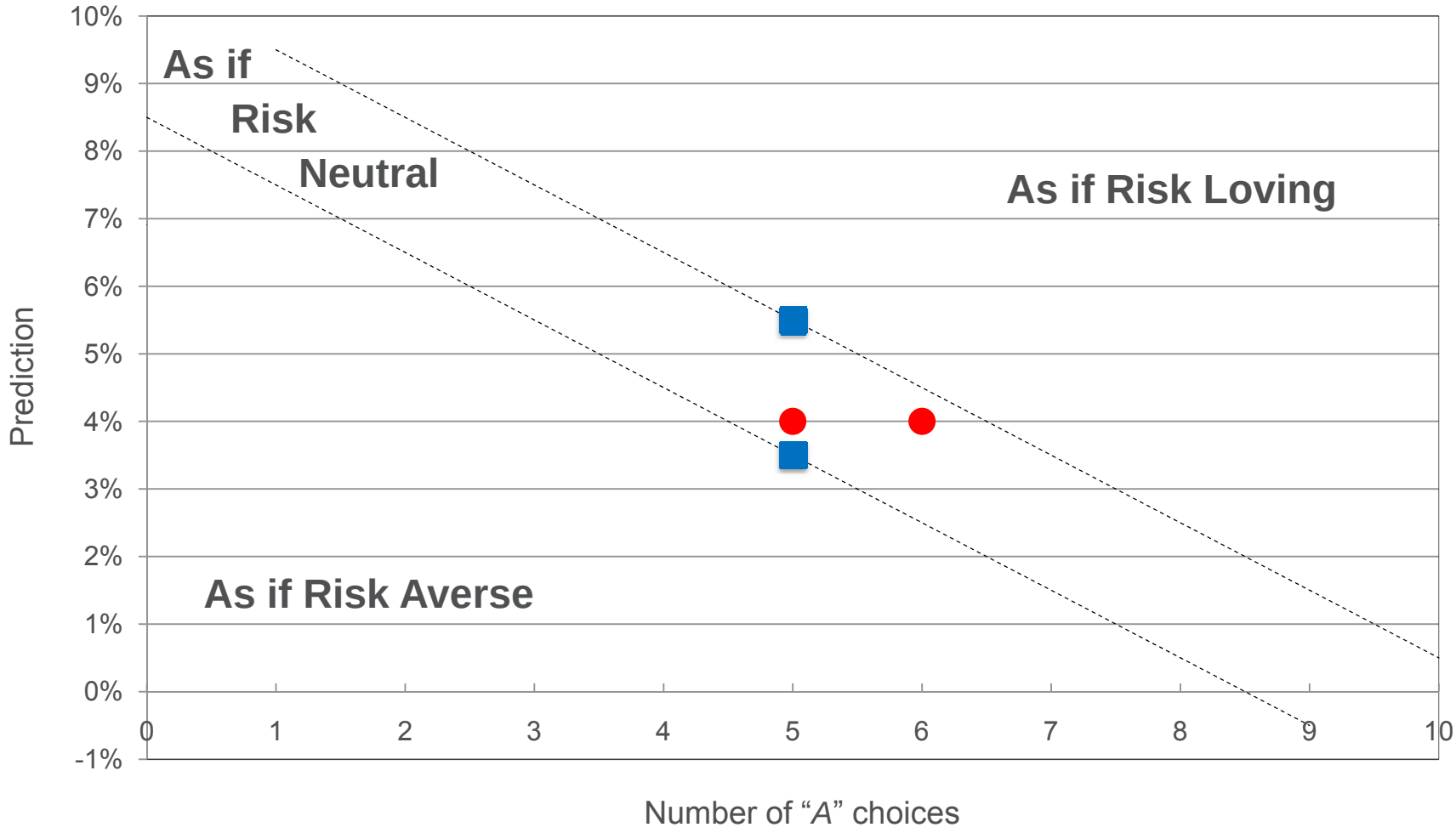
Choices and Predictions



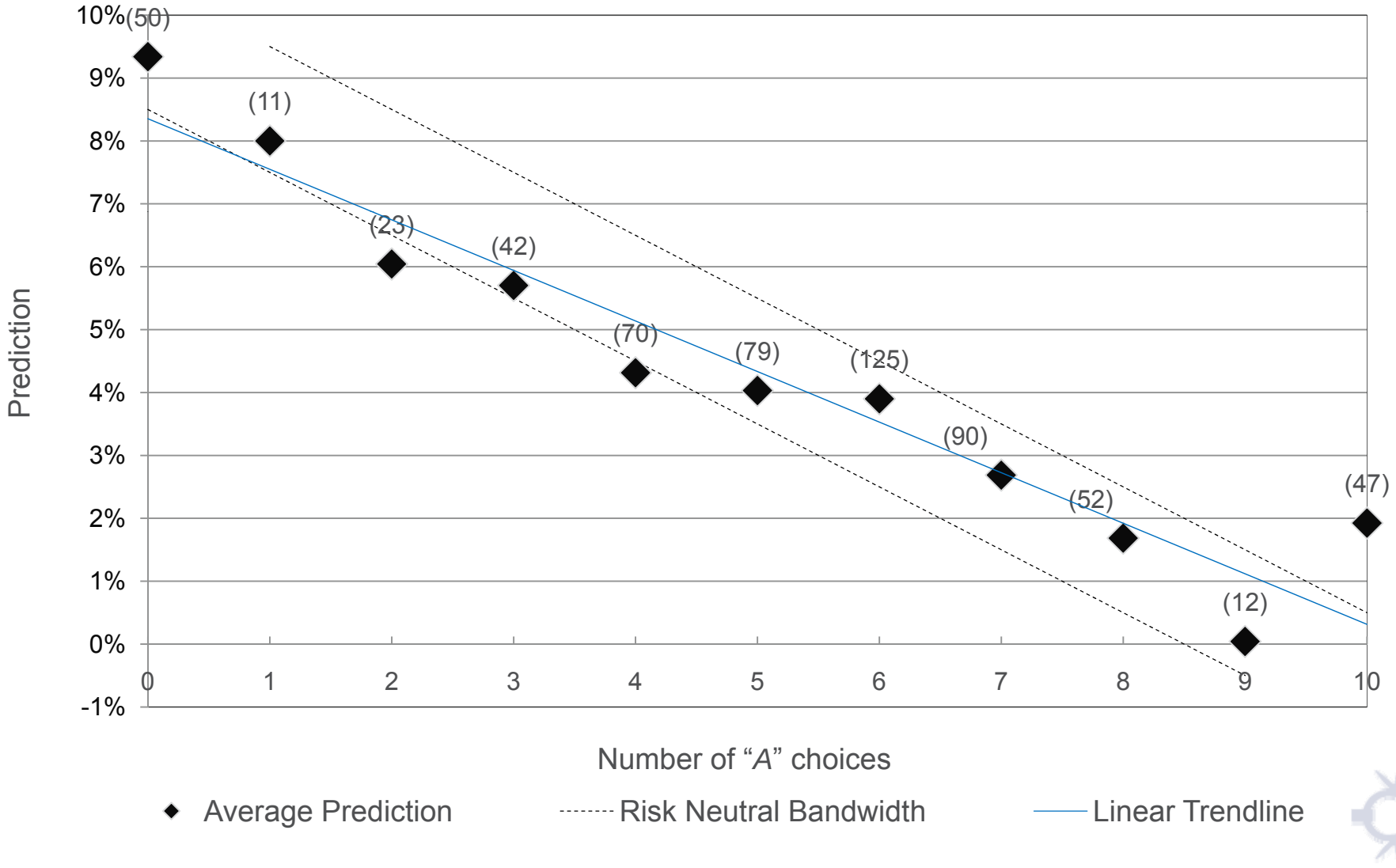
Choices and Predictions



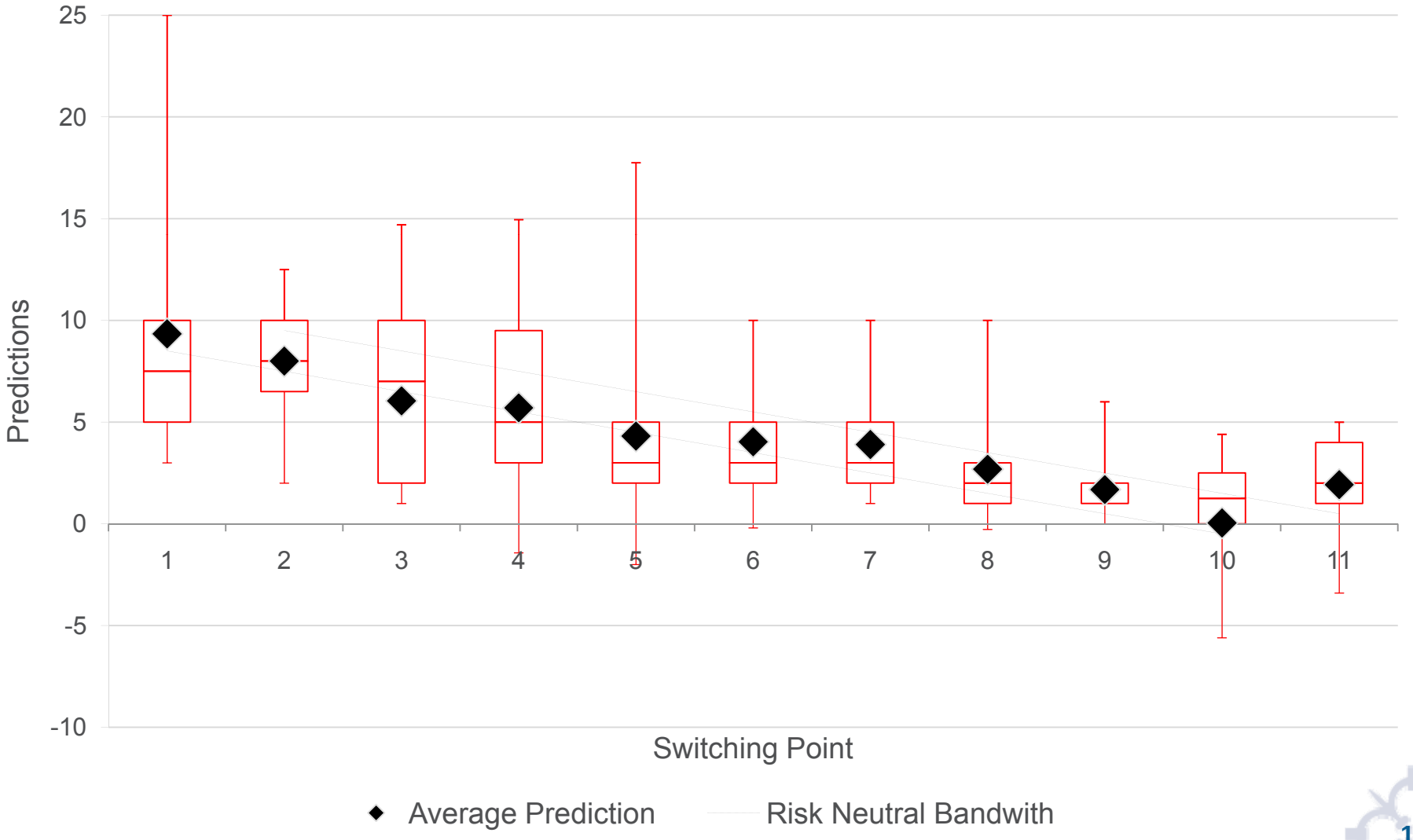
Choices and Predictions



Choices and Predictions
(all Data, N=601)



Choices and Dispersion of Predictions



Results

- Average behavior is consistent with expected payoff maximization
- Substantial heterogeneity in choices

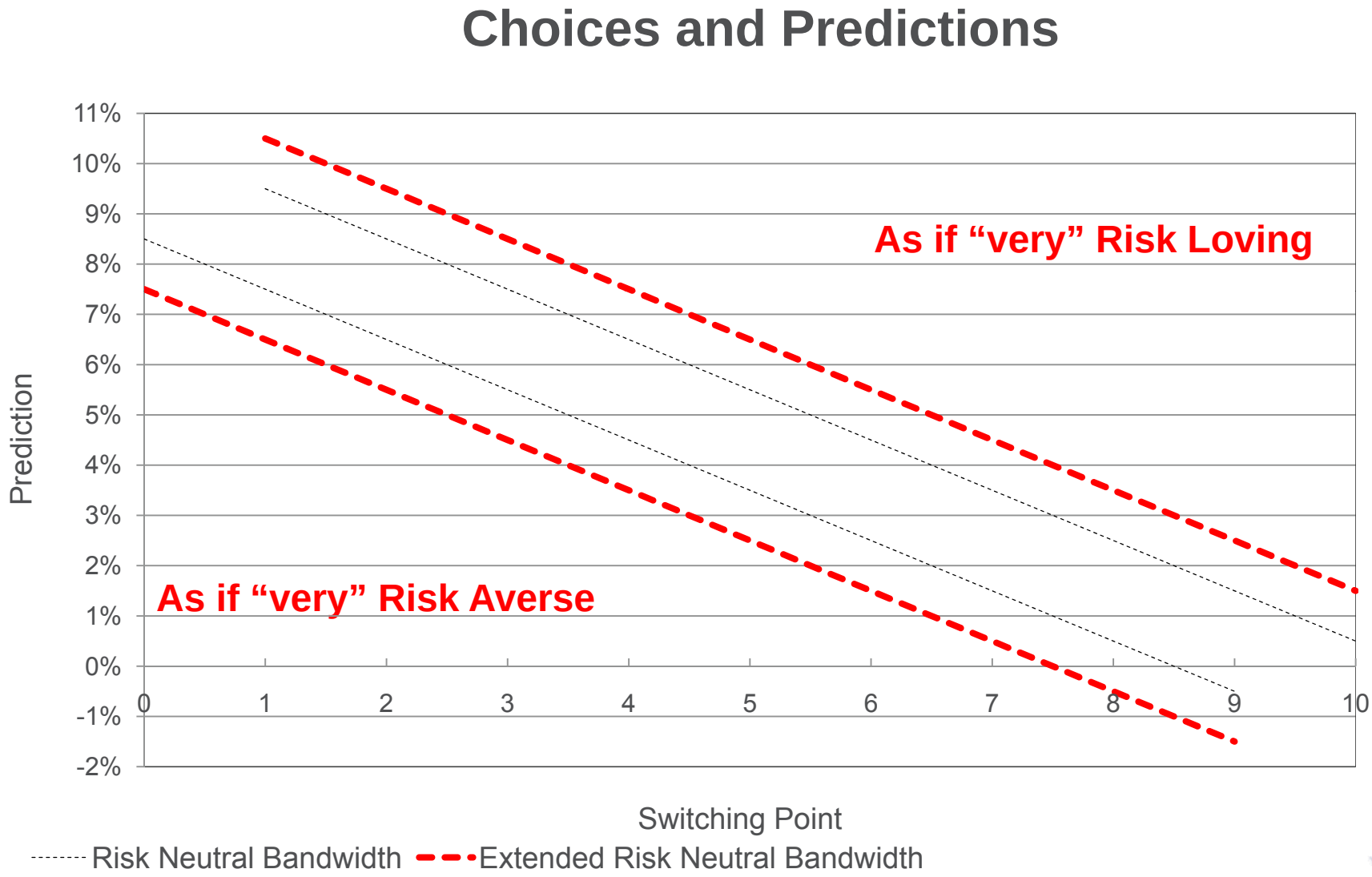
Distribution of Subjects According to Observed Behavior		
As if Risk Averse	As if Risk Neutral	As if Risk Loving
41%	21%	28%

Can Behavior be Fully Rationalized under EU?

All Subjects

		Self Reported Risk Attitude			
		Lowest (Risk Averse)	Medium	Highest (Risk Loving)	Total
Numeracy and Education	Lowest				160
					26.6%
	Medium				306
					50.9%
	Highest				135
					22.5%
	Total	161	264	176	601
		26.8%	43.9%	29.3%	100.0%

Can Behavior be Fully Rationalized under EU?



Can Behavior be Fully Rationalized under EU?

All Subjects

		Self Reported Risk Attitude			
		Lowest (Risk Averse)	Medium	Highest (Risk Loving)	Total
Numeracy and Education	Lowest				160 / 26.6%
	Medium				306 / 50.9%
	Highest				135 / 22.5%
	Total	161 / 26.8%	264 / 43.9%	176 / 29.3%	601 / 100.0%

As if "very" Risk Loving

		Self Reported Risk Attitude			
		Lowest (Risk Averse)	Medium	Highest (Risk Loving)	Total
Numeracy and Education	Lowest				46 / 38.3%
	Medium				60 / 50.0%
	Highest				14 / 11.7%
	Total	9 / 7.5%	47 / 39.2%	64 / 53.3%	120 / 100.0%

Can Behavior be Fully Rationalized under EU?

All Subjects

		Self Reported Risk Attitude: Lowest (Risk Averse)	Medium	Highest (Risk Loving)	Total
Numeracy and Education	Lowest	49 / 30.4%			160 / 26.6%
	Medium	78 / 48.4%			306 / 50.9%
	Highest	34 / 21.1%			135 / 22.5%
	Total	161 / 26.8%	264 / 43.9%	176 / 29.3%	601 / 100.0%

As if "very" Risk Loving

		Self Reported Risk Attitude: Lowest (Risk Averse)	Medium	Highest (Risk Loving)	Total
Numeracy and Education	Lowest	8 / 88.9%			46 / 38.3%
	Medium	1 / 11.1%			60 / 50.0%
	Highest	0 / 0.0%			14 / 11.7%
	Total	9 / 7.5%	47 / 39.2%	64 / 53.3%	120 / 100.0%

Can Behavior be Fully Rationalized under EU?

All Subjects

		Self Reported Risk Attitude			
		Lowest (Risk Averse)	Medium	Highest (Risk Loving)	Total
Numeracy and Education	Lowest			44 25.0%	160 26.6%
	Medium			89 50.6%	306 50.9%
	Highest			43 24.4%	135 22.5%
	Total	161 26.8%	264 43.9%	176 29.3%	601 100.0%

As if "very" Risk Averse

		Self Reported Risk Attitude			
		Lowest (Risk Averse)	Medium	Highest (Risk Loving)	Total
Numeracy and Education	Lowest			19 73.1%	54 34.0%
	Medium			7 26.9%	72 45.3%
	Highest			0 0.0%	33 20.8%
	Total	69 43.4%	64 % 40.3%	26 16.4%	159 100.0%

Conclusion

- On average, subjects do seem to act on their self reported belief about future inflation, but there is substantial heterogeneity
- We find evidence that the behavior of a subject can often be rationalized under Expected Utility
- Subjects who are inconsistent with Expected Utility tend to have lower education and lower numeracy and financial literacy

What is next?

- We will repeat the survey and experiment two more times at 3 months interval with the same subjects
- We will introduce a different question to elicit risk aversion
- We are trying to devise questions to elicit self reported and hypothetical behavior that may be influenced by expected inflation