

# **Biases in Consumer Finance**

## **Lecture 12**



# Financial illiteracy and biases

Financial decision-making faces many obstacles:

- Lack of knowledge
- Psychological biases

The two can also mix: we have biases because of ignorance

# The ABCs of personal finance

In the class, we have seen it is essential to know about the following concepts:

- Interest compounding
- Inflation
- Risk diversification
- Insuring against negative shocks (loss of life, disability)
- Planning for the future

# **Interest Compounding and Exponential Growth Bias**



# Exponential growth bias

- Exponential growth bias is the tendency for individuals to partially neglect compounding of exponential growth.
- It is the inclination to underestimate the future value of a variable growing at a constant rate.
- Essentially, individuals tend to “linearize” the formula of interest compounding.
- When asked to guess the future value of an investment growing at a compound rate, a representative sample of Swedish adults was almost twice as likely to underestimate the correct amount than to overestimate it.

➤ Source: Almenberg, J. and Gerdes, C. “Exponential Growth Bias and Financial Literacy.” *Applied Economic Letters*, 2011.

# Comments

- The formula is complex and difficult to grasp if people do not have an understanding of math.

$$F = P(1 + r)^T$$

- Ignorance is consequential: Research shows that more biased households save less, borrow more, and are less likely to invest in stocks.

# Financial literacy and exponential growth bias

- Ignorance and biases are often correlated: Individuals who display larger exponential growth biases will also have lower financial literacy (Almenberg and Gerdes, 2011).
- The bias tells us that there is an asymmetry: people underestimate therefore they are more likely to save less rather than save more.

# What can be done?

## Possible solutions:

- Show visually how the interest compounding works.
- Simplify the formula of interest compounding via the rule of 72.
- Rule of 72: How long it takes for money to double? Take 72 and divide by the interest rate you hope to earn





# Money Illusion



# Money illusion

- It refers to the tendency of people to think of currency in nominal, rather than real, terms.
- The nominal value of money is mistaken for its purchasing power at a previous point in the past.
- People usually use nominal prices as a rule of thumb for determining value, and real prices are only calculated if they seem highly salient (e.g. in periods of hyperinflation or in long term contracts).

# Comments

- This bias is consequential because if people fail to take inflation into account in their planning, they will for example be unable to accumulate enough money for their retirement.
- If people fail to understand inflation, they do not grasp that the increase in prices over time will make them poorer and that cash carries a risk and delivers a negative return.

# What can be done?

## Possible solutions:

- Media should not reflect the confusion about real and nominal value.
- Individuals should be explained the effects of inflation in simple terms (an example is the video we saw in class).



# **Risk Diversification**



# Diversification heuristic

- People use simple diversification heuristics: when faced with “ $n$ ” options, people divide assets evenly across the options, the so called “ $1/n$ ” rule.
- This is a naïve diversification strategy, which only rarely works to truly diversify risk and breaks down when  $n$  is large.

# Empirical evidence for retirement savings

- In the world of retirement savings plans, Huberman and Jiang found a positive correlation between the fraction of equity funds offered to pension participants and the resulting allocation to equities for plans that offer up to ten investment choices.
  - Source: Huberman, G and Jiang, W. "Offering versus Choice in 401(k) Plans: Equity Exposure and Number of Funds." *Journal of Finance*, 2006.
- The correlation is no longer significant in plans with more than ten funds.

# What can be done?

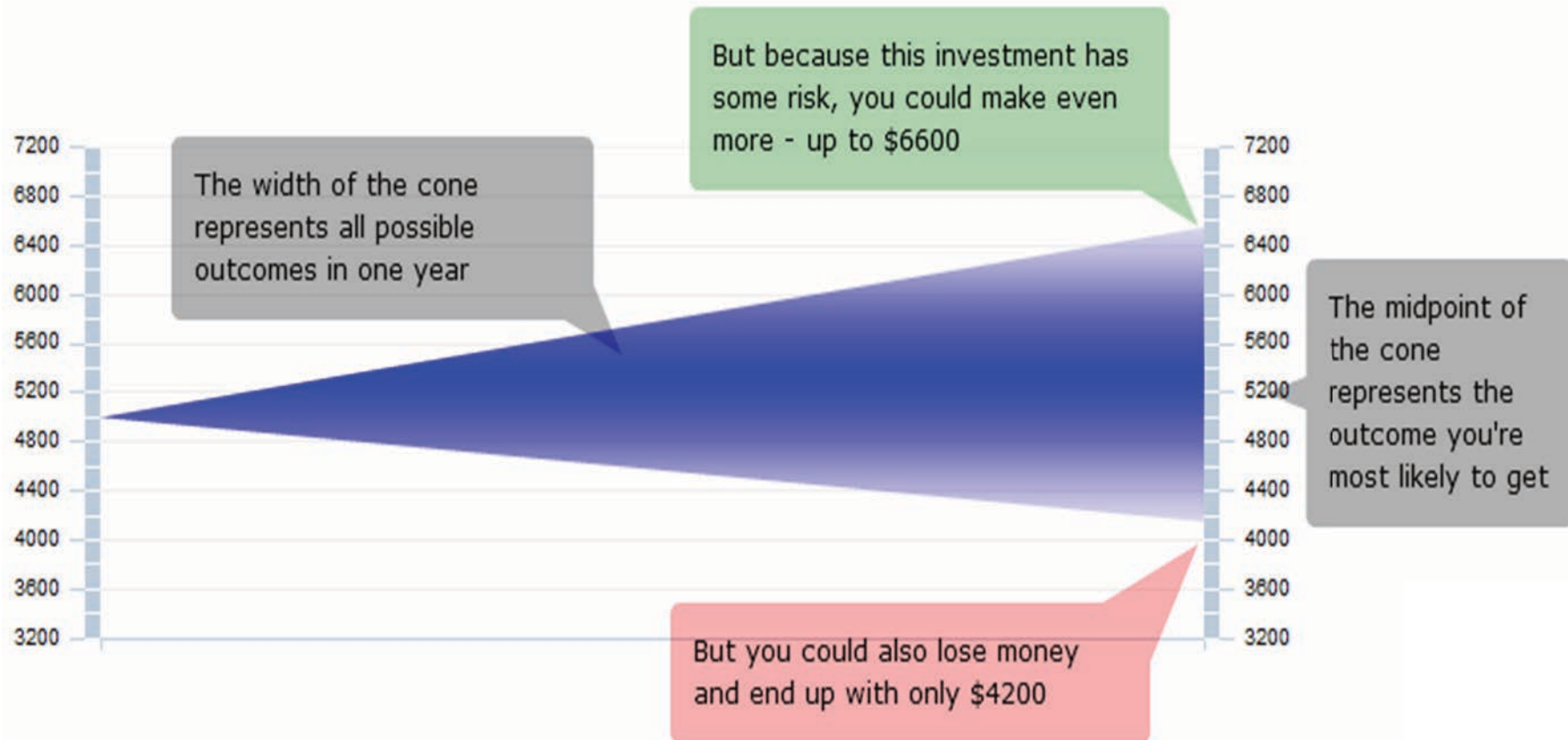
## Possible solutions:

- Use visual tools to show how risk diversification works.
- Teach the concept of risk diversification in simple ways.



# FinVis

Don't put all your savings in one basket



Source: Lusardi, A. et al. “

[Visual Tools and Narratives: New Ways to Improve Financial Literacy.](#)” *National Bureau of Economic Research*, 2014.

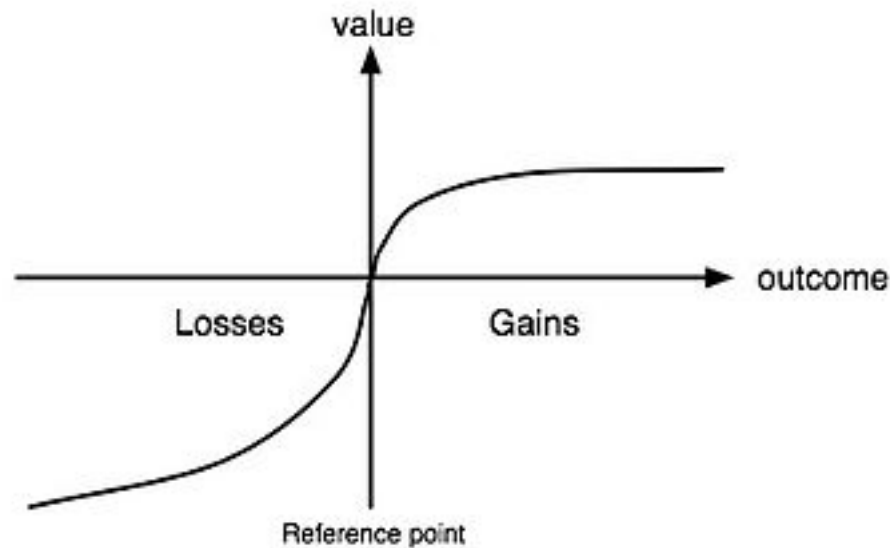
# **Loss rather than risk aversion**



# Loss aversion

- Loss aversion or “prospect theory” is related to individual’s stronger desire to avoid losses than experience comparable gains.
- Losses are emotionally felt twice as strongly by people compared to comparable gains.
  - Source: Tversky, A. and Kahneman, D. “Prospect Theory: An Analysis of Decision under Risk.” *Econometrica*, 1979.

# A loss aversion value function



- Value is defined as deviations from a reference point that allows for different functions for gains and losses.
- The value function for losses is much steeper (and convex) than the value function for gains (and concave).

# Comments

- This is consequential for financial decision-making. Research shows that people who suffer from loss aversion are less likely to invest in stocks, which can slow wealth accumulation.

# What can be done?

## Possible solution:

- Teach people how to make decisions based on the final outcome rather than on potential losses and gains.

# **Wishful thinking**



# Wishful thinking

- This happens when people are too optimistic relative to specific events. Thus, they do not consider the objective probabilities.
- Individuals often engage in too much positive thinking, selectively focusing on one win among hundreds of losses, when they think back on their overall experience.
- Wanting to see things in a positive light can distort perception and objective thinking.
- It causes people to believe that they are less at risk of experiencing a negative event compared to others.
- People look for ways to reduce, if not cancel, the pain associated with the negative events.



# Comments

- Wishful thinking can lead to poor financial behavior.
- People who suffer from wishful thinking can take too much risk, for example by becoming an entrepreneur, and they can also fail to insure, for example buy life or disability insurance.

# What can be done?

## Possible solutions:

- Help people not to distort their memory of the past.
- Help them adopt objective thinking.



# **Sunk cost fallacy**



# Sunk cost fallacy

- It is the tendency of people to irrationally follow through on an activity that is not meeting their expectations because of the time and/or money they have already spent on it.
- People hang on to a losing position, hoping that it will eventually return to the price they paid for it.
- People are reluctant to admit, even to themselves, that they have wasted resources on a past decision.
- Changing direction is viewed as admitting failure.

# Comments

- Investors fall victim to the sunk cost fallacy when they allow the purchase price of a stock to dictate when they will sell.
- People tend to stay the course or even invest additional resources in a bad decision in a futile attempt to make their initial decision seem worthwhile.

# Examples of sunk cost fallacy

- People fix something old, like a car, because they have high sunk costs that would go to waste if they bought a newer car. In fact, only future costs should matter.
- When they have a lot of chips in the pot, inexperienced poker players continue to call raises even if they have little chance of winning the hand. The only factors that should matter are the cost of the bet, the odds of winning, and the size of the pot. It doesn't matter whether the money in the pot is the bettor's own money or from the bets of other players.



# What can be done?

## Possible solutions:

- Financial consulting can help people cut their losses and prevent sunk costs from affecting their personal finances.
- People should know that they have to make the decision that would give them the best outcome going forward.



# **Too much choice**





# Too much choice

- Most people would favor having more options in most contexts.
- However, more options also mean more information to process, greater demand for cognitive resources, and higher potential for cognitive overload.
- Having too much information and too many choices can lead to suboptimal choices, where people do “nothing” rather than making choices.



# A study on jam choice by Iyengar and Lepper

- People are more likely to purchase jams when offered a limited array of 6 choices rather than a more extensive array of 24 choices.



# Comments

- This has consequences in particular in the area of retirement savings: When employees enroll in retirement savings programs, they are often deluged with hundreds of funds to choose from.
- Lacking knowledge about which funds they should choose, some employees prefer not to make any decision and do not enroll.



# What can be done

## Possible solutions:

- Organizing options can alleviate the sense of confusion and overcome the intimidation that it causes.
- Providing a default option allows consumers to avoid feeling the need to research dozens of funds and choose among them.
- Simplify decision-making as much as possible and do not offer a “choice frame” which is very complex.

# Thinking about the future



# Intertemporal trade-offs

## Hyperbolic discounting

- Individuals show systematic cognitive and perceptual distortions of the present and future.
- Benefits loom larger than costs in the future, but the reverse occurs in the present.
- For individuals deciding whether to save, the consumption they must forgo in the present is more salient than the additional consumption they can enjoy in the future.

# Comments

- This is consequential as people who discount the future heavily will consume a lot today and may borrow a lot more.
- People act “as if” they are myopic, but the future will eventually come.

# A famous study of Stanford University

- People allocate more resources to the future if they see themselves senior.





# What can be done?

## Possible solutions:

- A concrete budget can translate abstract goals to concrete retirement goals.
- It can connect goals to expected costs and estimate what the user would need to put into savings now to afford those costs.
- This should encourage individuals to be more forward-looking about financial planning.
- Inducing people to visualize more concretely future states has been shown to lead them to place greater weight on future considerations that are otherwise neglected.

# **Self-control problems**



# Self-control problems

- Planning about the future also implies that people can control their spending today.
- However, people often display self-control problems, failing for example the urges to spend and to get an immediate gratification.
- Overwhelming power of visceral factors felt at the time of decision plays an important role.
- A lot of marketing is about how to make people spend and there is not much push in the other direction (make people save).

# A famous example: Ulysses tied to the mast



# Comments

- This is also consequential. Research shows that people who have self-control biases not only save less for retirement but they are also less likely to invest in education and have successful careers.

# Stanford marshmallow experiment

- Children were offered a choice between one small reward provided immediately or two small rewards if they waited for a short period.
- In follow-up studies, the researchers found that children who were able to wait longer for the preferred rewards tended to have better life outcomes.



# What can be done?

## Possible solutions:

- Giving consumers the option to pre-commit to a choice or behavior can attenuate the self-control problems.
- For example, having employees pre-commit to saving their salary increased actual savings rates.
  - Thaler, R. and Benartzi, S. “Save More Tomorrow: Using Behavioral Economics to Increase Employee Saving.” *Journal of Political Economy*, 2004.
- Give people locked box where they can put their savings (which cannot be withdrawn).

# Inertia





# Cognitive inertia

- It refers to the tendency for sets of beliefs to endure once they have been formed.
- Once some assumptions are formed, people are reluctant or unable to revise them, even when the evidence supporting the assumptions no longer exists or when other evidence would question the accuracy of the assumption.

# Cognitive inertia

- People fail to update and revise their understanding of a situation when that situation changes.
- Inertia is often a behavioral challenge or an obstacle that prevents employees from saving for their future.



# What can be done

## Possible solutions:

- Changing the default option is a way to make good use of the inertia.
- In a retirement saving plan, employees could be automatically enrolled in the plan, unless they actively opt-out (rather than opting in).
- With automatic enrollment, taking no action results in people saving for retirement.

# Today we learned...

- ✓ Biases in consumer finance
  - ✓ Compounding and exponential growth bias
  - ✓ Money illusion
  - ✓ Diversification heuristic
  - ✓ Loss rather than risk aversion
  - ✓ Wishful thinking
  - ✓ Choice overload
  - ✓ Perceptual distortions in thinking about the future
  - ✓ Self-control problems
  - ✓ Cognitive inertia