

# The Pioneer Investments' Forum

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*Psychological and Economic Factors in Decumulation:  
Implications for Product Design*

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## Why is retirement saving now so important?

- A century ago, few needed to save for retirement, since people often
  - worked until they died
  - lived with their kids
- If born in 1900 and survived to age 20
  - 50% chance of living to age 70
- If born in 1960 and survived to age 20
  - 50% chance of living to age 81
- By this measure, the typical length of retirement grew from 5 years to 16 years.

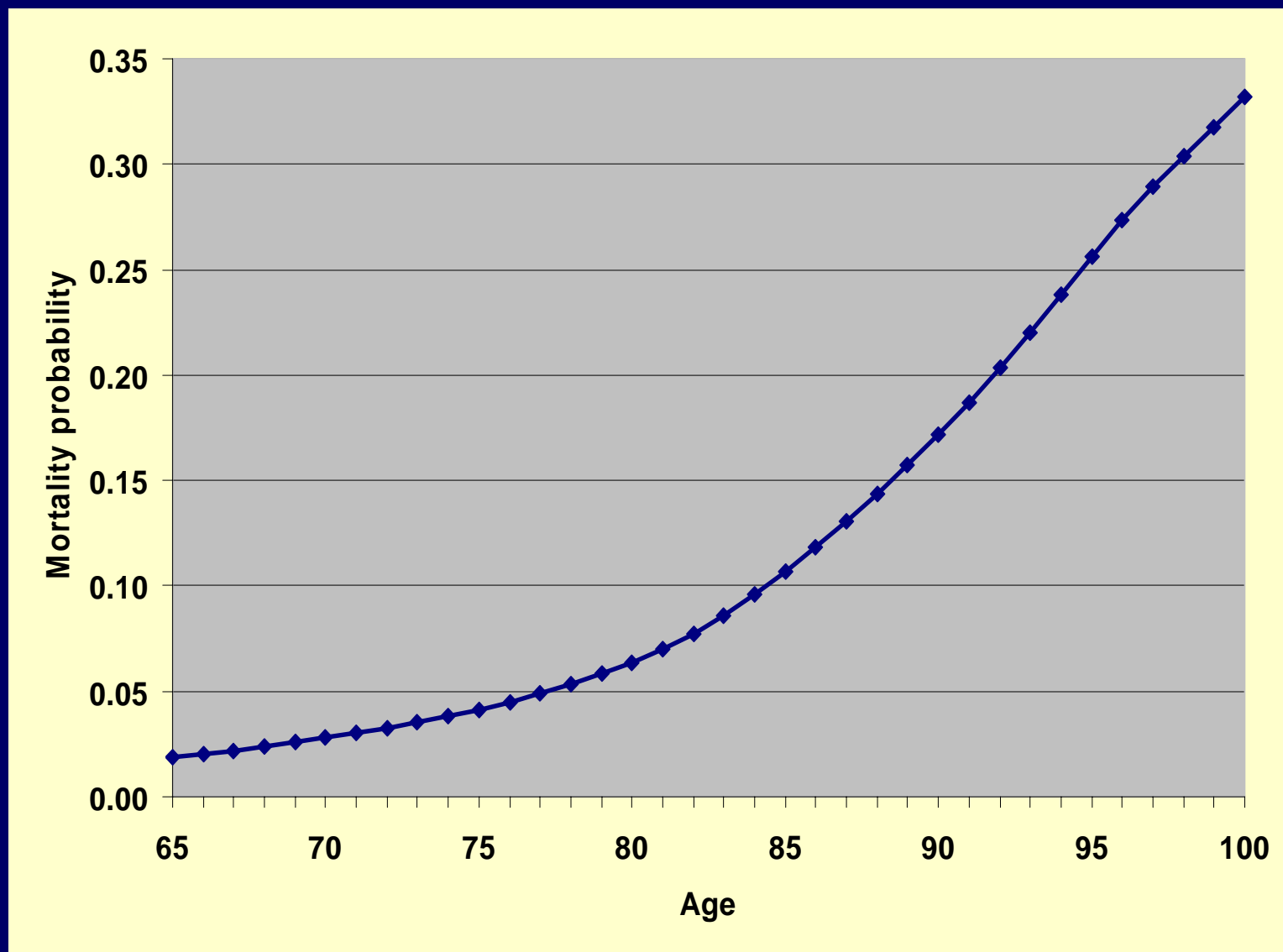
## Baby boomer cohort is just reaching retirement

- Need to decide on investment and withdrawal strategies for the post-retirement period
- How much should individuals spend out of wealth (level and slope)?
  - Fixed annual withdrawal?
  - Proportional annual withdrawal?
  - Life annuity?

# Mechanics of Life Annuities

- Premium is paid to insurance company
- Ongoing payment stream is given to annuitant as long as the annuitant survives
- Payment stream can be linked to an index (CPI, equities)
- Because payments are only made when individual is alive, these payouts are much higher than those that are not life-contingent

## Mortality probabilities for a 65 year old in 2005



Data source: Social Security 2007 cohort life tables

# Life annuities provide a higher income stream than alternative strategies

## Setup:

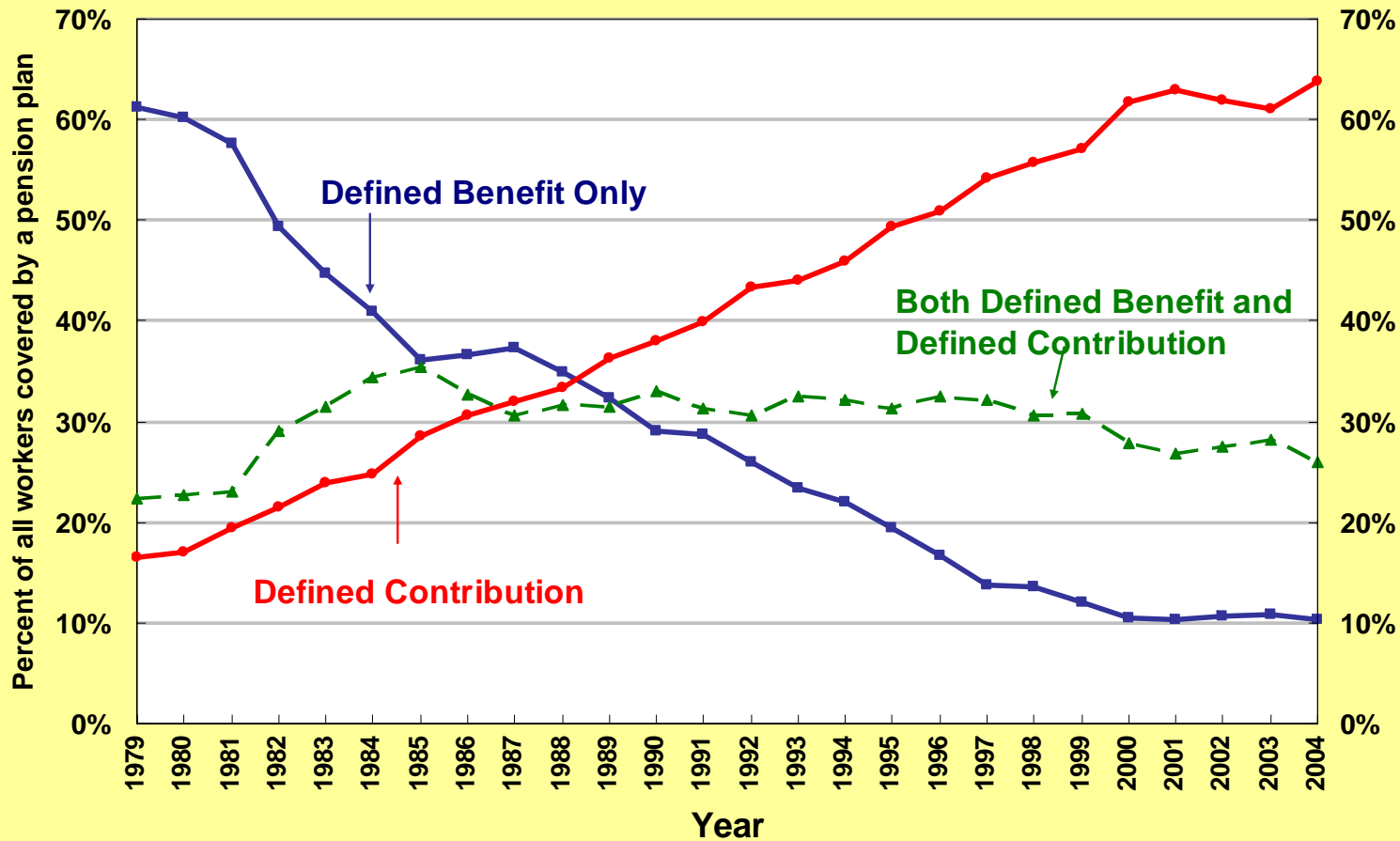
3% real interest rate  
65 year old annuitant  
real annuity

- Annuity income: € 8225
- Perpetuity income: € 3000
- Term annuity (age 112) income: € 3996
- Term annuity (age 100) income: € 4816

## Annuitization provided to individuals is declining

- DB pension coverage is declining
- Likely to be future cuts in Social Security benefits (real life annuity)

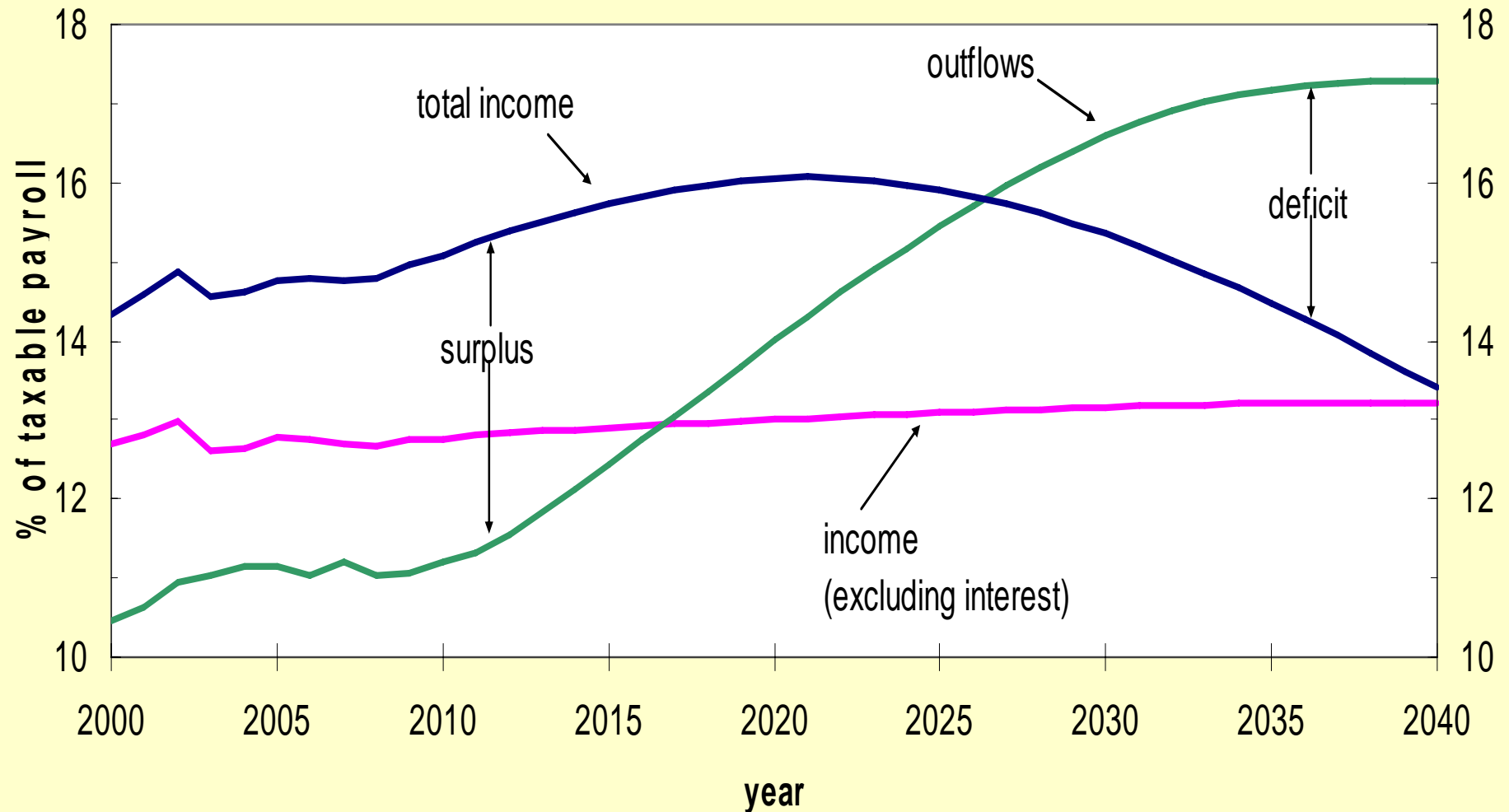
# Major decline in relative prevalence of DB plans for current private-sector workers



Source: Computations based on Department of Labor, Form 5500 reports  
line = # workers covered by indicated plan / all workers covered by any pension plan  
Coverage refers to plans offered by current employer only

# Social Security Income and Outflows

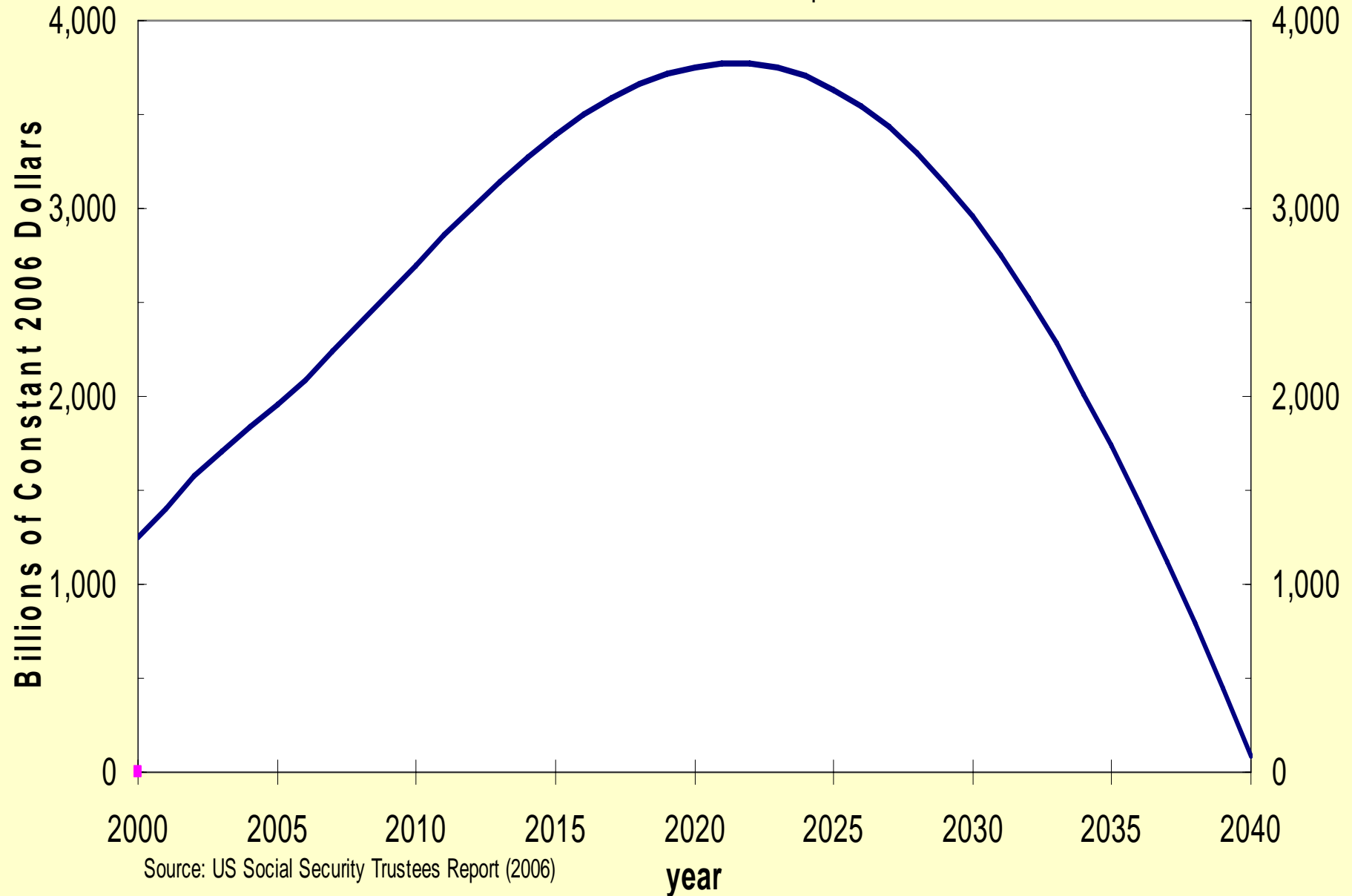
As percentage of Taxable Payroll  
Intermediate Cost Assumption



Source: US Social Security Trustees Report (2007)

# U.S. Social Security Trust Fund Assets

Intermediate Cost Assumptions



## Individuals generally prefer lump sums to annuities

- Social Security provides a real (inflation protected) life annuity
- 60% of survey respondents said they would trade half of their Social Security benefit stream for a single up-front lump sum payment of same present value (Brown, Casey and Mitchell, 2007)
- Caveat: political risk of Social Security

## Warner and Pleeter American Economic Review (2001)

- The US government offered retiring members of the armed services a choice between a term annuity and a lump sum
- Here's a typical example for officers:
  - Lump sum of \$46,219 (52%)
  - Annuity with NPV of \$82,908 (48%)
- Here's a typical example for enlisted soldiers:
  - Lump sum of \$22,283 (95%)
  - Annuity with NPV of \$39,972 ( 5%)
- Lump-sums have much lower NPV's but nevertheless are chosen more often

# Why don't individuals want life annuities?

- We'll describe both
  - economic reasons and
  - psychological reasons

## Economic barriers to annuity purchase

- Lack of liquidity
- Within-family longevity risk sharing
- Pre-existing annuitization (Social Security)
- Bequest motives
- Expense: Adverse selection / fees / risk premia
- Tax treatment (outside retirement accounts)
- Counterparty risk (bankruptcy of provider)
- Most annuities nominal
- Payout profile may not match preferences

# Psychological barriers to annuity purchase

- Illusion of control
- Over-optimism
- Impatience and myopia
- Financial illiteracy and complexity avoidance
- Annuities feel like a gamble instead of a hedge
- Loss/regret aversion
- Insurance mis-intuition

## Loss of Control

- People prefer to be in control of their environments (intuition: some people feel less nervous when they are a car driver rather than a passenger)
- Langer (1975) finds that experimental subjects will pay more for a lottery ticket if they pick the number themselves
- Annuities require that an investor give control to a third-party

## Over-optimism

- Investors believe that the stock market will return >15% per year on average (Vissing-Jorgensen 2003)
- Moreover, people generally believe that they will *outperform* their peers (Weinstein 1980, Camerer and Lovallo 1995)
- E.g. 70% of drivers believe that they are in the top 30% (ranked by skill or safety)
- Barber and Odean (2000) find that investors at a discount brokerage house trade actively and earn 200 basis points less than they would if they simply followed a buy and hold strategy

## Impatience and myopia

- As we saw yesterday, people want to enjoy themselves now and want to postpone sacrifice until “tomorrow”
- In addition, people tend to underweight or overlook delayed consequences

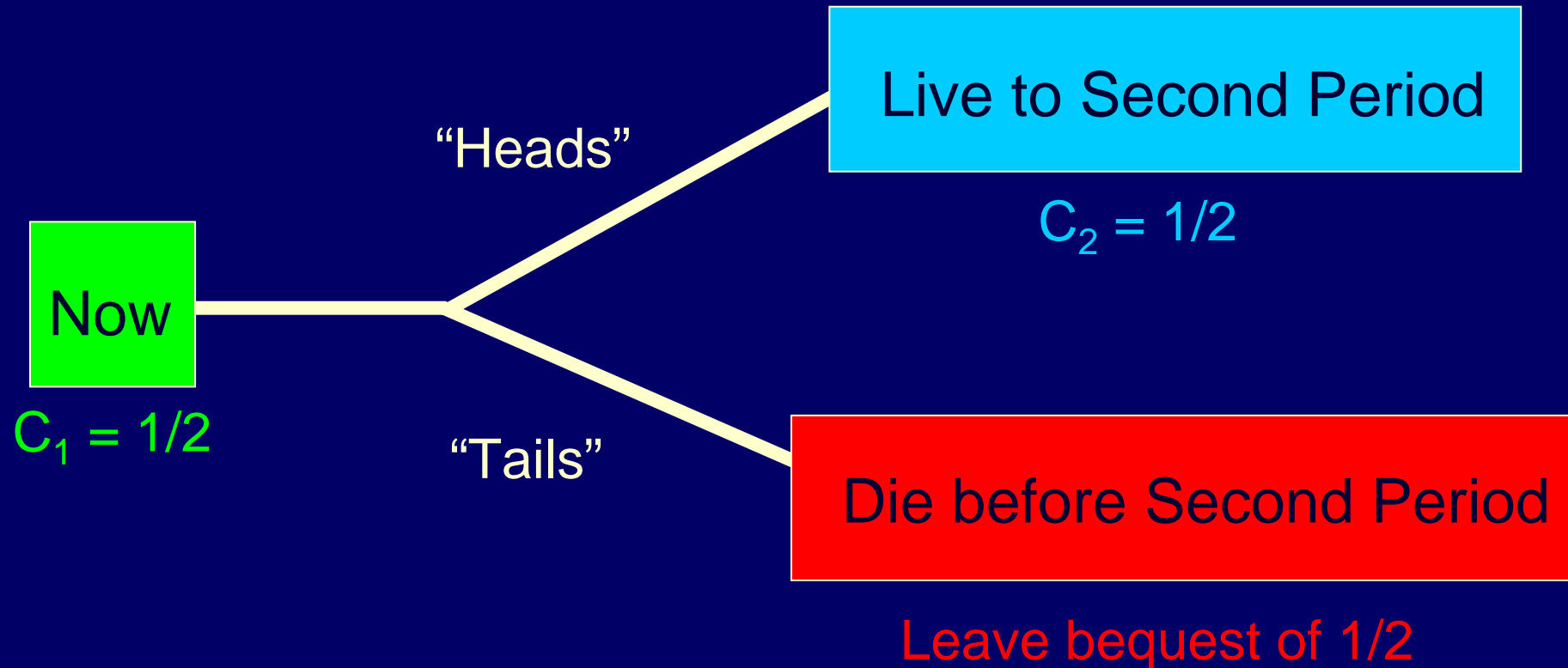
## Financial illiteracy and complexity avoidance

- People avoid complexity
- For instance, each additional 10 funds in the 401(k) menu produces a 1.5 to 2.0 percentage point decline in participation (Iyengar, Huberman and Jiang 2004)
- Likewise, more fund options causes 401(k) investors to increase the likelihood of choosing a money market instead of stock or bond fund (Iyengar and Kamenica 2007).

## Illustration of remaining concepts

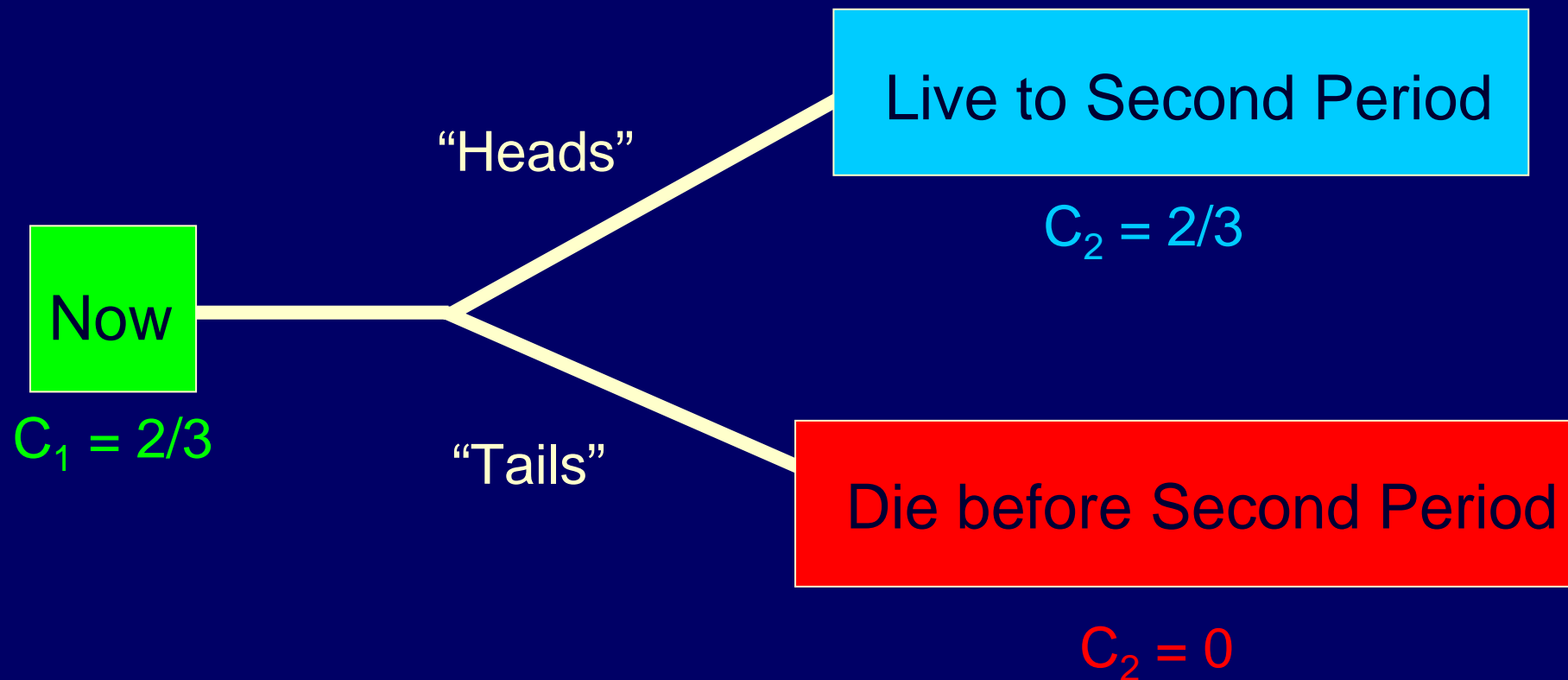
- Simple example (without interest)
- 2 periods: today and “tomorrow”
- Assume 50% chance of dying between today and tomorrow.
  - Heads live
  - Tails die

# A € Investment Problem (No Annuity)



Investment pays out 1€ whether you live or die.

# A €1 Annuity Problem



Investment pays out  $4/3$  if you live or  $2/3$  if you die.

# Summary of Example

	Year 1 Payout	Mortality?	Year 2 Payout	Total Payout
Investment	<b>1/2</b>	<b>Live</b>	<b>1/2</b>	<b>1</b>
	<b>1/2</b>	<b>Die</b>	<b>1/2</b>	<b>1</b>

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Annuity	<b>2/3</b>	<b>Live</b>	<b>2/3</b>	<b>4/3</b>
	<b>2/3</b>	<b>Die</b>	<b>0</b>	<b>2/3</b>

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	2/3	Die	0	2/3

Is the investment *or* the annuity more risky?

## Annuities may feel like a gamble not a hedge

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	1/2	Die	1/2	1
Annuity	2/3	Live	2/3	4/3
	2/3	Die	0	2/3

Is the investment or the annuity more risky?

## Loss Aversion

Kahneman and Tversky (1979)

- People weigh losses twice as heavily as gains
- Nobel Prize was awarded for this work: “Prospect Theory”
- Annuities create the possibility of loss (what happens to my premium if I die?)

## Translated into Gain/Loss Frame

	Year 1 Payout	Mortality?	Year 2 Payout	Total Gain/Loss
Investment	1/2	Live	1/2	0
	1/2	Die	1/2	0
Annuity	2/3	Live	2/3	+1/3
	2/3	Die	0	-1/3

Does the investment *or* the annuity generate a risk of a loss?

# Intuition about insurance

When something bad happens...

- House burns down
- Vacation cancelled
- Primary earner dies early
- iPod breaks

...I get an insurance payment.

## Is this insurance?

	Year 1 Payout	Mortality?	Year 2 Payout	Total Gain/Loss
Investment	1/2	Live	1/2	0
	1/2	Die	1/2	0
Annuity	2/3	Live	2/3	+1/3
	2/3	Die	0	-1/3

Does the investment or the annuity violate our insurance intuitions?

# Psychological barriers to annuity purchase

- Illusion of control
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# Implications for product design

- Goal: A product that is good for people and that they would actually want to buy
- Economic Principles
- Psychological Principles

# Economic Principles

1. Provide longevity insurance
2. Provide some liquidity
3. Keep fees modest
4. Provide some exposure to equities
5. Provide a bequest mechanism
6. Customize for background factors and investor preferences

## Psychological Principles

1. Guarantee that the annuitant will at least recover her nominal premium
2. Allow the annuitant to withdraw a portion of her funds with no penalty
3. Allow the annuitant to have some control over asset allocation
4. Reduce fine print
5. Frame the annuity as insurance against outliving one's assets (annuities reduce risk)

Q & A



# Pioneer Investments' Forum Vienna 2007