



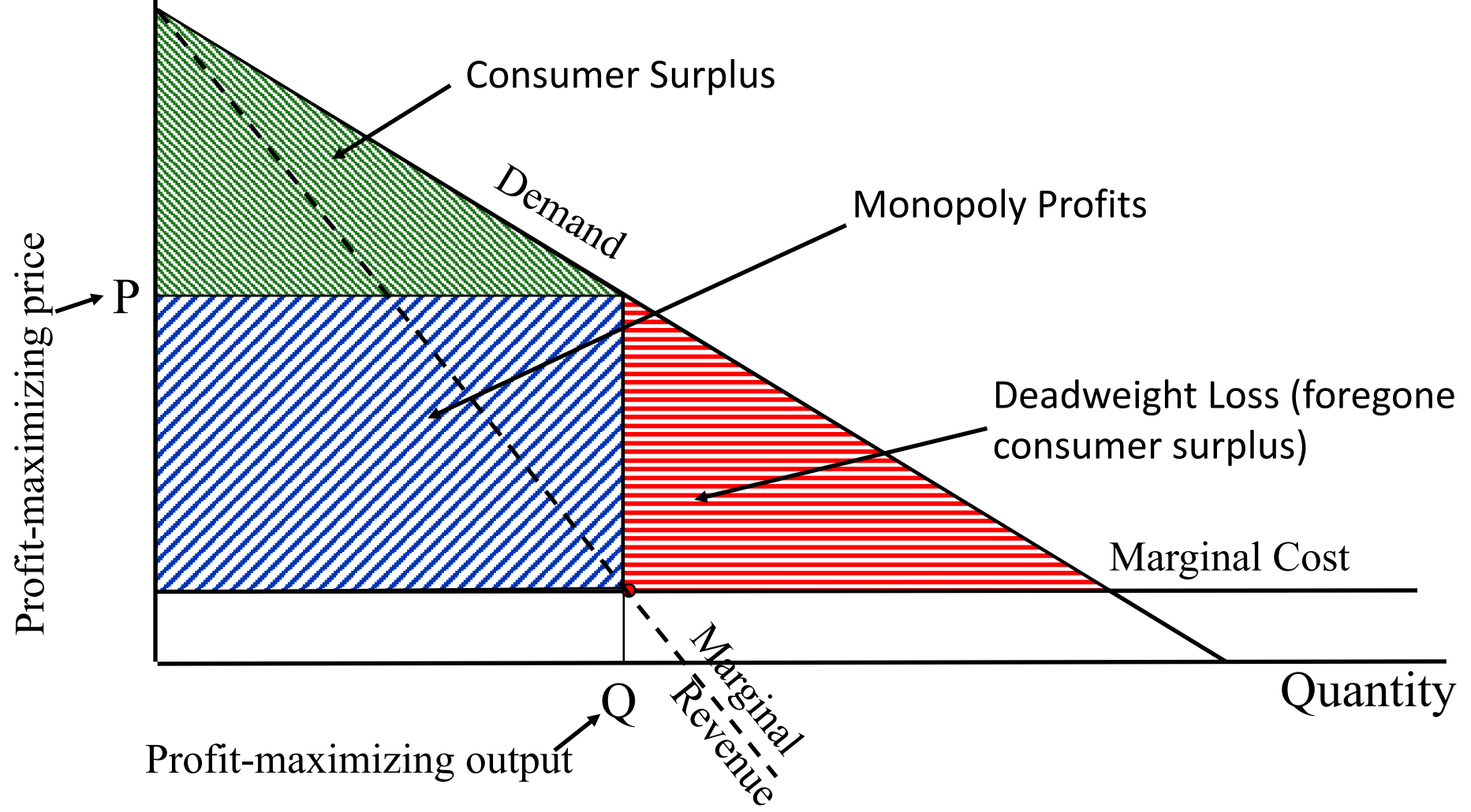
Bounded Rationality and IP

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The Incentive Theory of IP is founded upon the following conception of the impact of giving innovators exclusive rights, which in turn is founded on traditional assumptions of rational behavior





Refining the Approach

- Our aspiration should be to adjust patent doctrine that increase its socially beneficial effects and decrease its socially pernicious effects
- Our ability to do so will increase if our predictions of the impact of these various incentives is founded upon a more sophisticated model of human motivations



Rationality

1) Expected Utility Theory

a) Concave utility functions

b) Decisionmaking on the basis of expected utility

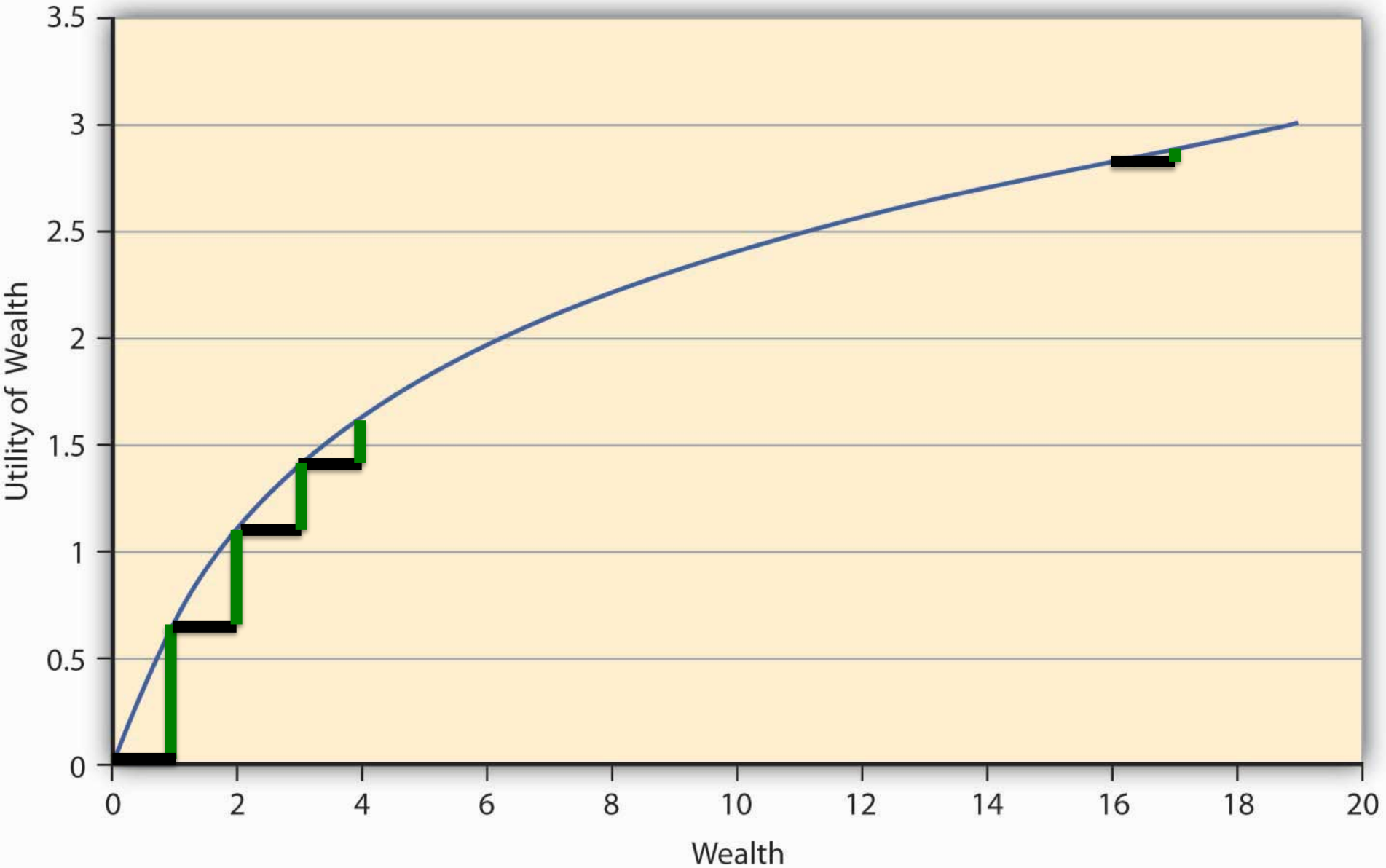
c) General phenomenon of risk aversion

2) Ubiquitous Forms of Bounded Rationality

3) Forms of Bounded Rationality specific to creators



Standard Utility Curve



Source: Prakash, Enterprise and Individual Risk Management



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Decision-making on the basis of expected utility

- Rational choice = selecting path B over path A iff the sum of the expected utilities of the various possible outcomes of path B exceed those of path A
- To illustrate:
 - path A leads to certain gain of 20 utiles (or units of pleasure)
 - path B leads to 25% chance of gaining 100 utiles and a 75% chance of gaining nothing
 - expected utility from pursuing path A is 20;
 - expected utility from pursuing path B is $.25(100) + .75(0) = 25$ utiles
 - Under these circumstances, a rational person will choose path B

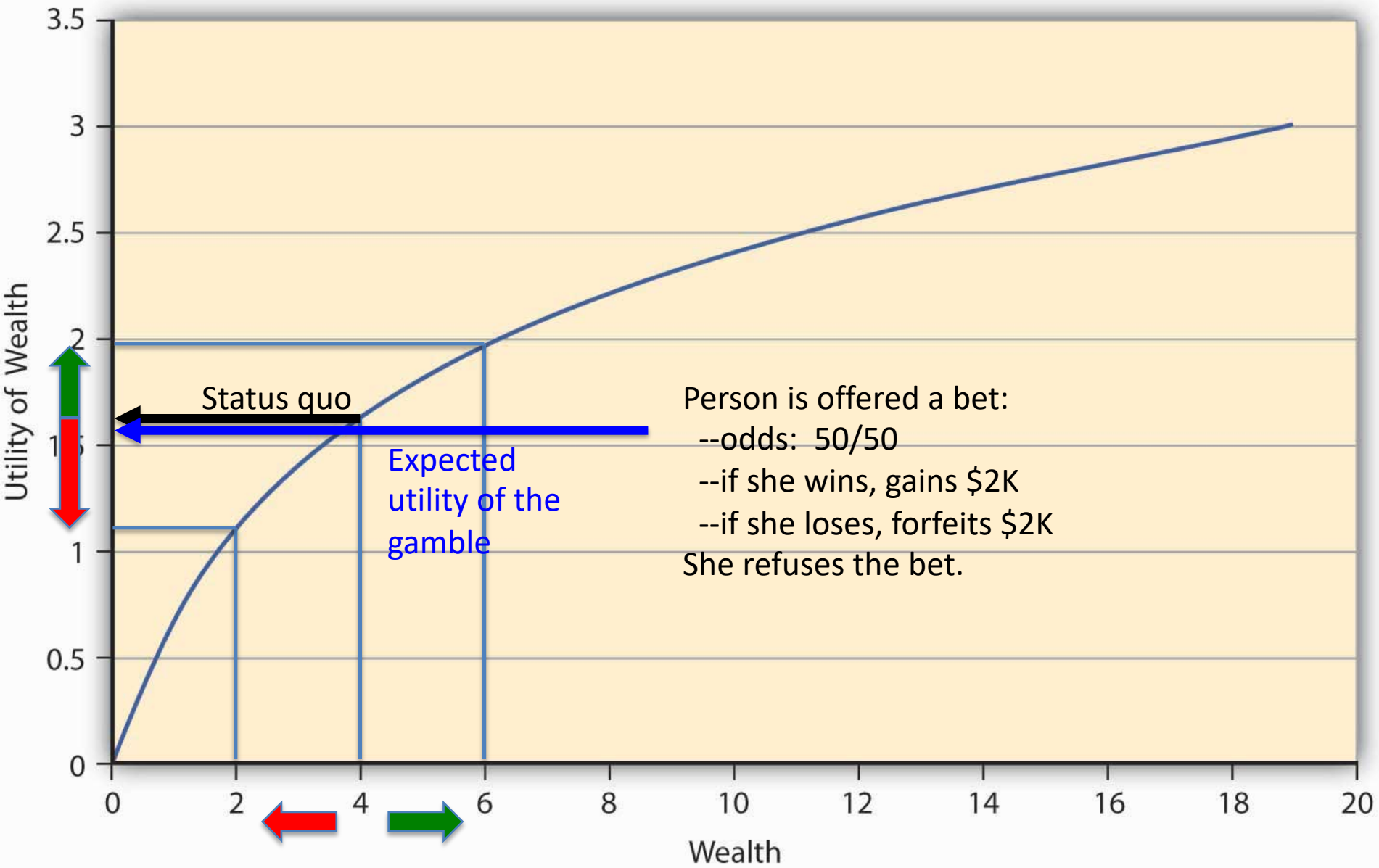


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Decision-making on the basis of expected utility

- Rational choice = selecting path B over path A iff the sum of the expected utilities of the various possible outcomes of path B exceed those of path A
- To illustrate:
 - path A (Harvard Law School) leads to certain lifetime total income of \$20M (discounted to present value)
 - path B (Berkeley Colley of Music) leads to 25% chance of lifetime income of \$100M and a 75% chance of \$1M
 - expected benefit from pursuing path A is \$20M
 - expected benefit from pursuing path B is $.25(100) + .75(1) = \$25.75M$
 - In the absence of risk aversion, a rational person will choose path B
 - But risk aversion is likely to cause the person to choose path A instead



Rationality

- 1) Expected Utility Theory
- 2) Ubiquitous Forms of Bounded Rationality
 - a) Prospect Theory
 - b) Endowment Effect
 - c) Presence Heuristic
 - d) Overoptimism
 - e) Lottery Effect
- 3) Forms of Bounded Rationality specific to creators



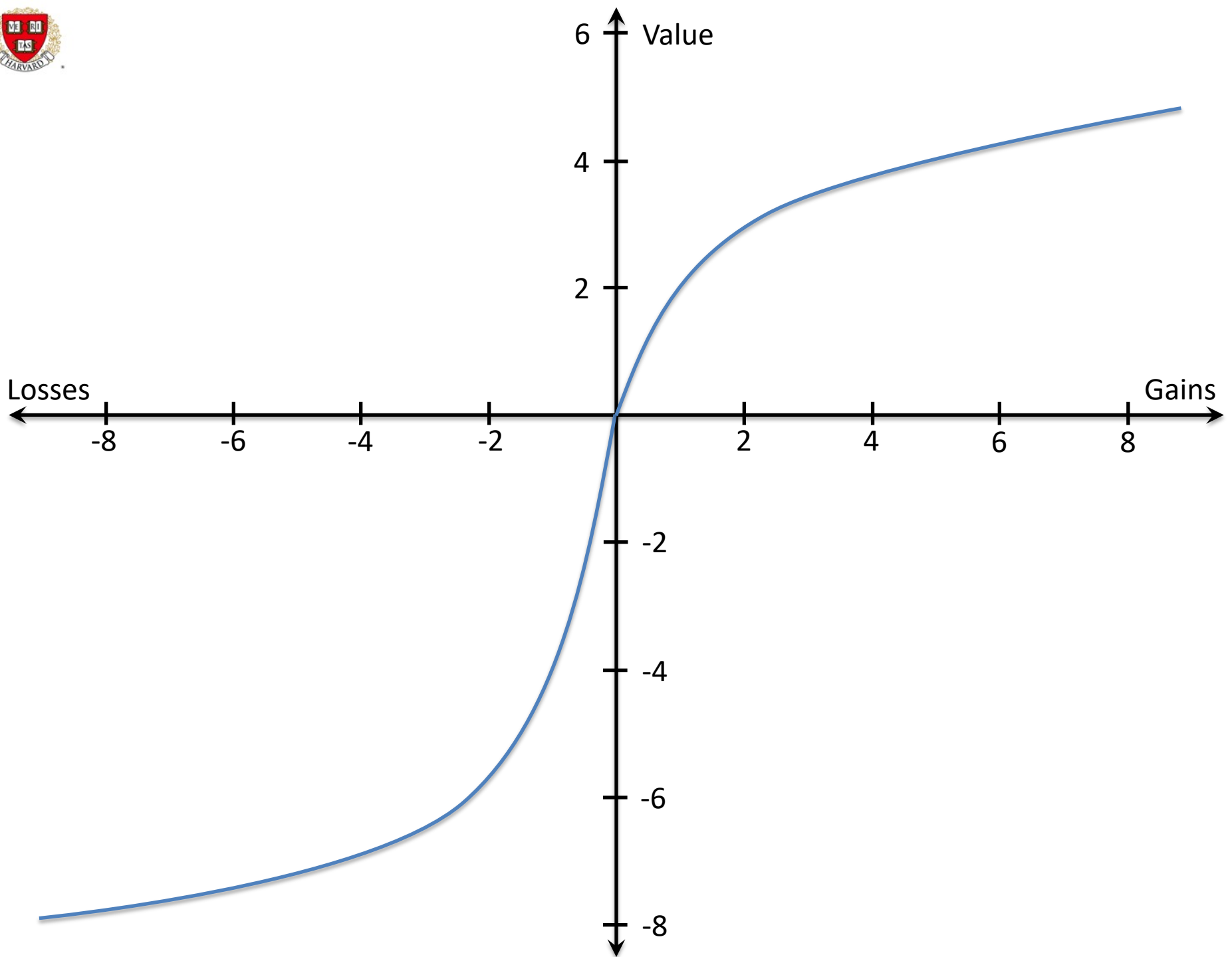
Prospect Theory

- In general, people underweight prospects that are merely probable in comparison to prospects that are certain
- Gains:
 - 100% chance of winning \$100 should be treated as equivalent of 10% chance of winning \$1000
 - but people behave as if the latter is 5%
 - gives rise to risk aversion for gains – but for a reason different from that offered by classical theory
- Losses:
 - 100% chance of losing \$100 should be treated as equivalent of 10% chance of losing \$1000
 - but people behave as if the latter is 5% -- i.e., expected utility is \$500 loss
 - gives rise to risk preference for losses



Endowment Effect

- The pain caused by a loss of X is typically greater than the pleasure reaped by a gain of X
 - Put differently, people place higher values on things to which they think they already have rights, than they do on identical things to which they think they don't (yet) have rights.
 - The result: people will demand a higher price to induce them to surrender an object or an entitlement than they will offer to acquire that object or entitlement.
- The reference point from which gains and losses are assessed is a psychological question, only indirectly a legal one





Endowment Effect

- Springsteen tickets:

https://www.npr.org/2017/11/09/563133762/bruce-springsteen-on-broadway-comes-with-an-economics-lesson?utm_medium=RSS&utm_campaign=business



Because they are less concerned with this than with this.

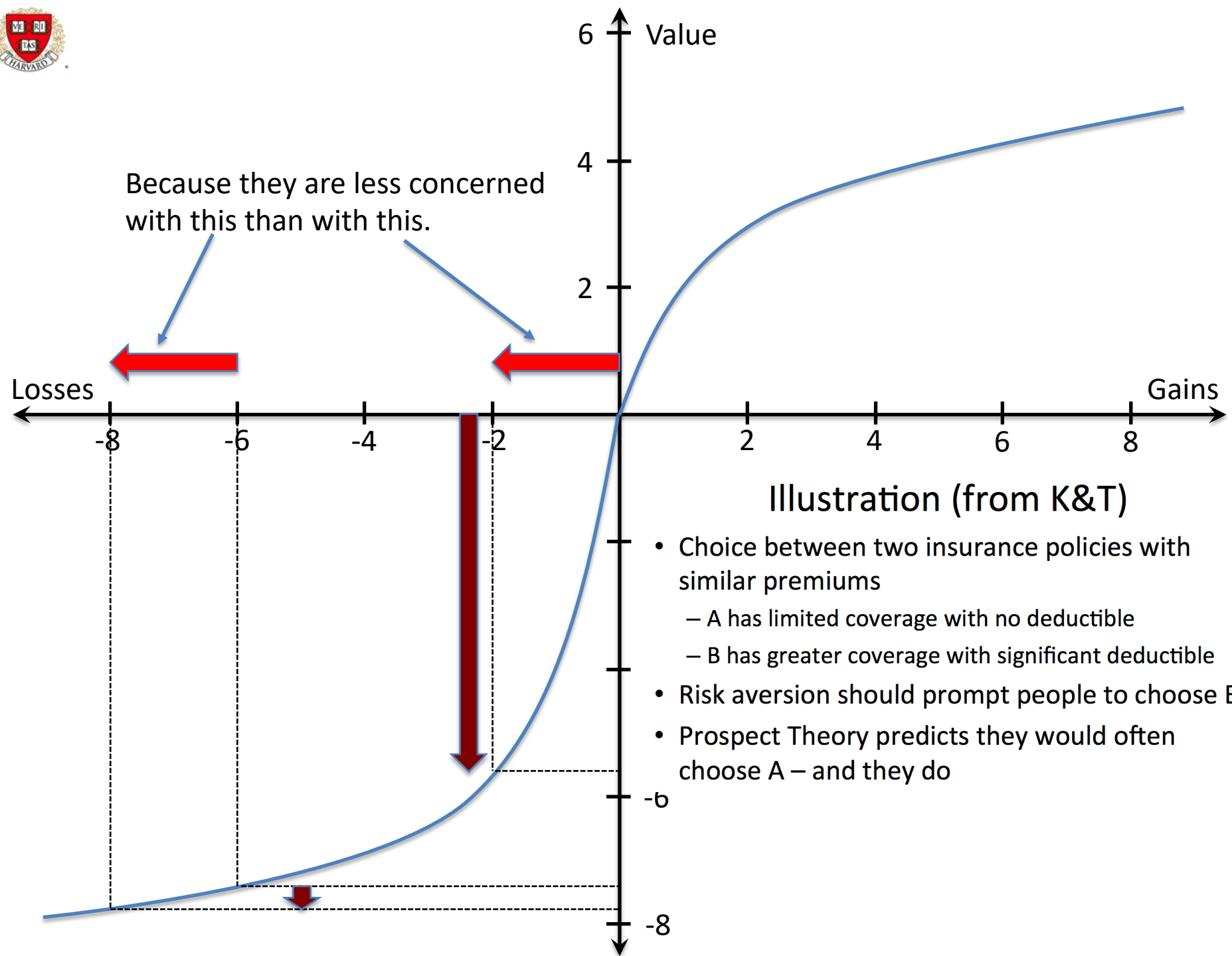


Illustration (from K&T)

- Choice between two insurance policies with similar premiums
 - A has limited coverage with no deductible
 - B has greater coverage with significant deductible
- Risk aversion should prompt people to choose B
- Prospect Theory predicts they would often choose A – and they do



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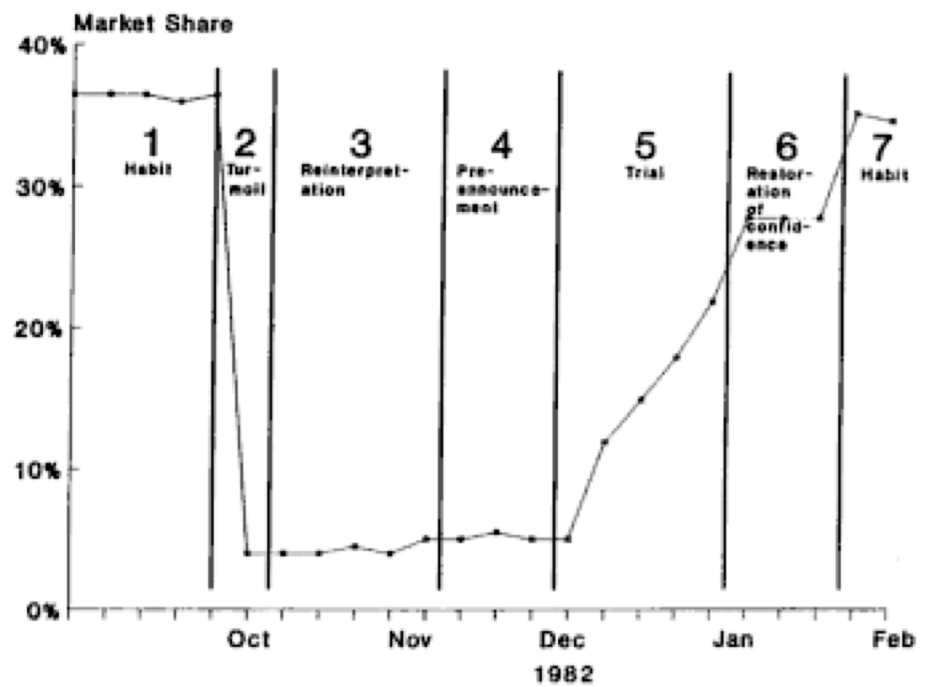


FIG. 13.2. Evolution of consumer attitudes.

Wisniewski, 1982; Deighton, 1983; Greyser, 1982; Mitroff & Kilmann, 1984.)



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Levallow & Kahneman, “Delusions of Success: How Optimism Undermines Executives’ Decisions” (2003)

“Research into human cognition has traced this overoptimism to many sources. One of the most powerful is the tendency of individuals to exaggerate their own talents—to believe they are above average in their endowment of positive traits and abilities. Consider a survey of 1 million students conducted by the College Board in the 1970s. When asked to rate themselves in comparison to their peers,

- 70% of the students said they were above average in leadership ability, while only 2% rated themselves below average.
- For athletic prowess, 60% saw themselves above the median, 6% below.
- When assessing their ability to get along with others, 60% of the students judged themselves to be in the top decile, and fully 25% considered themselves to be in the top 1%.”

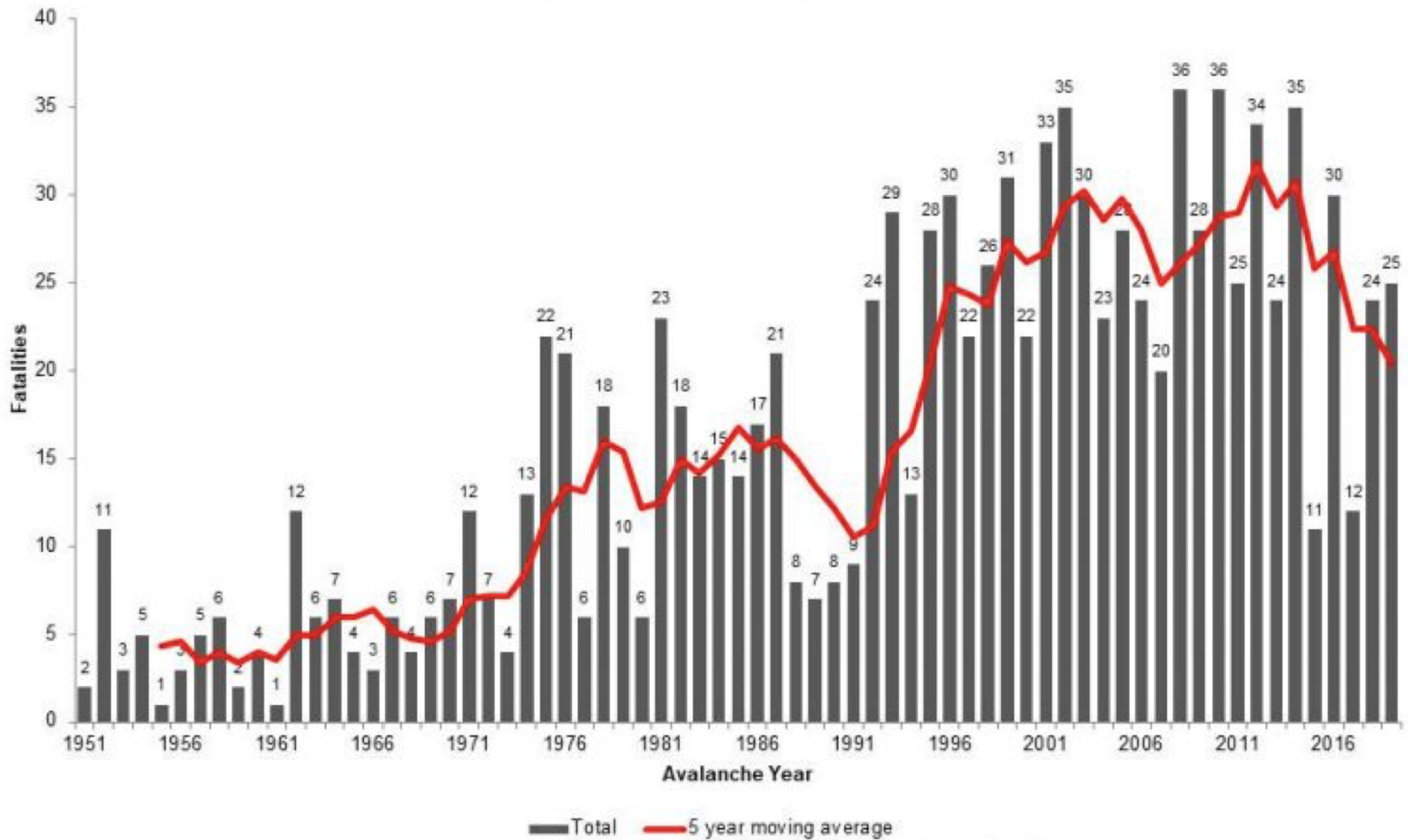


Levallow & Kahneman, “Delusions of Success: How Optimism Undermines Executives’ Decisions” (2003)

“The inclination to exaggerate our talents is amplified by our tendency to misperceive the causes of certain events. The typical pattern of such attribution errors, as psychologists call them, is for people to take credit for positive outcomes and to attribute negative outcomes to external factors, no matter what their true cause.

One study of letters to shareholders in annual reports, for example, found that executives tend to attribute favorable outcomes to factors under their control, such as their corporate strategy or their R&D programs. Unfavorable outcomes, by contrast, were more likely to be attributed to uncontrollable external factors such as weather or inflation. Similar self-serving attributions have been found in other studies of annual reports and executive speeches.”

US Avalanche Fatalities by Avalanche Year 1950-51 to 2018-19



CAIC
Colorado Avalanche
Information Center



Andrea Leiter, “The sense of snow : Individuals’ perception of fatal avalanche events,” Journal of Environmental Psychology (2011)

“All of the significant district dummies indicate a tendency of minimizing one’s personal risks. This is even true for respondents living in areas which were been severely affected by avalanches in the past (e.g., Landeck). These empirical estimates imply that the salient presence of avalanches accustoms individuals living in regions with frequent avalanche events are more likely to assess their personal avalanche risk as below average.

Another explanation for this outcome can be inferred from the ‘unrealistic optimism’ hypothesis: As argued above, due to the topographical characteristics of Tyrol all residents face a basic avalanche risk that could be reduced only at rather high costs (e.g., massive constructions, migration). Under such circumstances, people tend to ignore their exposure to risks.”



Ian McCammon, “The Role of Training in Avalanche Accidents in the United States” (2004)

- “Victims with basic formal training exposed themselves to more hazard than any other group, including those with no awareness of avalanches”



Carden, “Behavioral economics show that women tend to make better investments than men” (2013)

“Terry Odean, a University of California professor, has studied stock picking by gender for more than two decades. A seven-year study found single female investors outperformed single men by 2.3 percent, female investment groups outperformed male counterparts by 4.6 percent and women overall outperformed by 1.4 percent. Why? The short answer is overconfidence. Men trade more, and the more you trade, typically the more you lose — not to mention running up transaction costs....

Additionally, men hold onto their losers a lot longer than women. They’re sure the stock will come roaring back — even as it sinks. Academics call it confirmation bias; investment advisers call it boneheaded.”



Goodman-Delahunty et al., “Insightful or Wishful: Lawyers’ Ability to Predict Case Outcomes” (2010)

“The findings extend previous research on overconfidence in defense lawyers (Loftus & Wagenaar, 1988; Malsch, 1990), by establishing that similar biases arise in predictions by criminal prosecutors and by counsel for both plaintiffs and defendants in civil cases. Lawyers frequently made substantial judgmental errors, showing a proclivity to overoptimism. The most biased estimates were expressed with very high initial confidence: In these instances, lawyers were extremely overconfident. These findings are consistent with a large body of literature documenting overconfidence in a range of judgments (theoretical explanations of miscalibration of confidence are discussed in Gigerenzer, Hoffrage, & Kleinbolting, 1991; Kahneman, Slovic, & Tversky, 1982; Moore & Healy, 2008).”



Goodman-Delahunty et al., “Insightful or Wishful: Lawyers’ Ability to Predict Case Outcomes” (2010)

“With respect to the correlates of the overconfidence bias, certain results were somewhat counterintuitive, such as the finding that lawyers with more experience were not better calibrated than less experienced lawyers....

“With regard to gender, we replicated results obtained by Malsch (1990) that female lawyers were better calibrated than their male colleagues. Male practitioners were more overconfident than female practitioners. These findings are in line with gender differences observed in research on metacognition (Pallier, 2003).”



“Lottery Effect”

- (Some) people overweight small probabilities of reaping very large gains
 - A partial exception to prospect theory
- Manifestations
 - Playing lotteries (Scherer; Crouch)
 - People play lotteries, despite “house rake” of ~50%
 - A change in the amount of the payout will affect their willingness to participate much more than a change in probability of the payout
 - Amateur investors (Stout 1995)
 - Entrepreneurialism (Hopenhyn 2003; Astebro 2003)



Scherer, "Innovation Lottery"

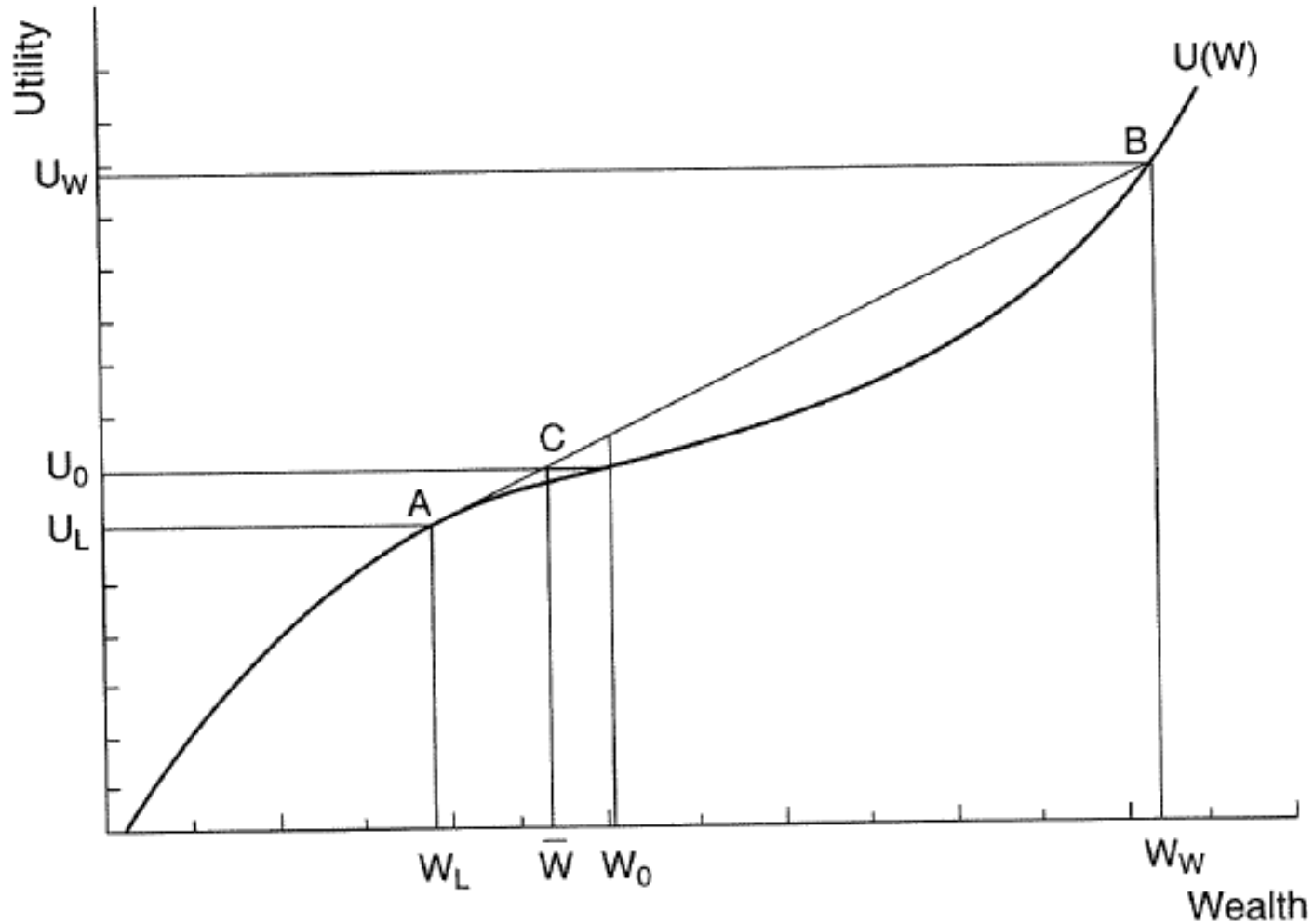
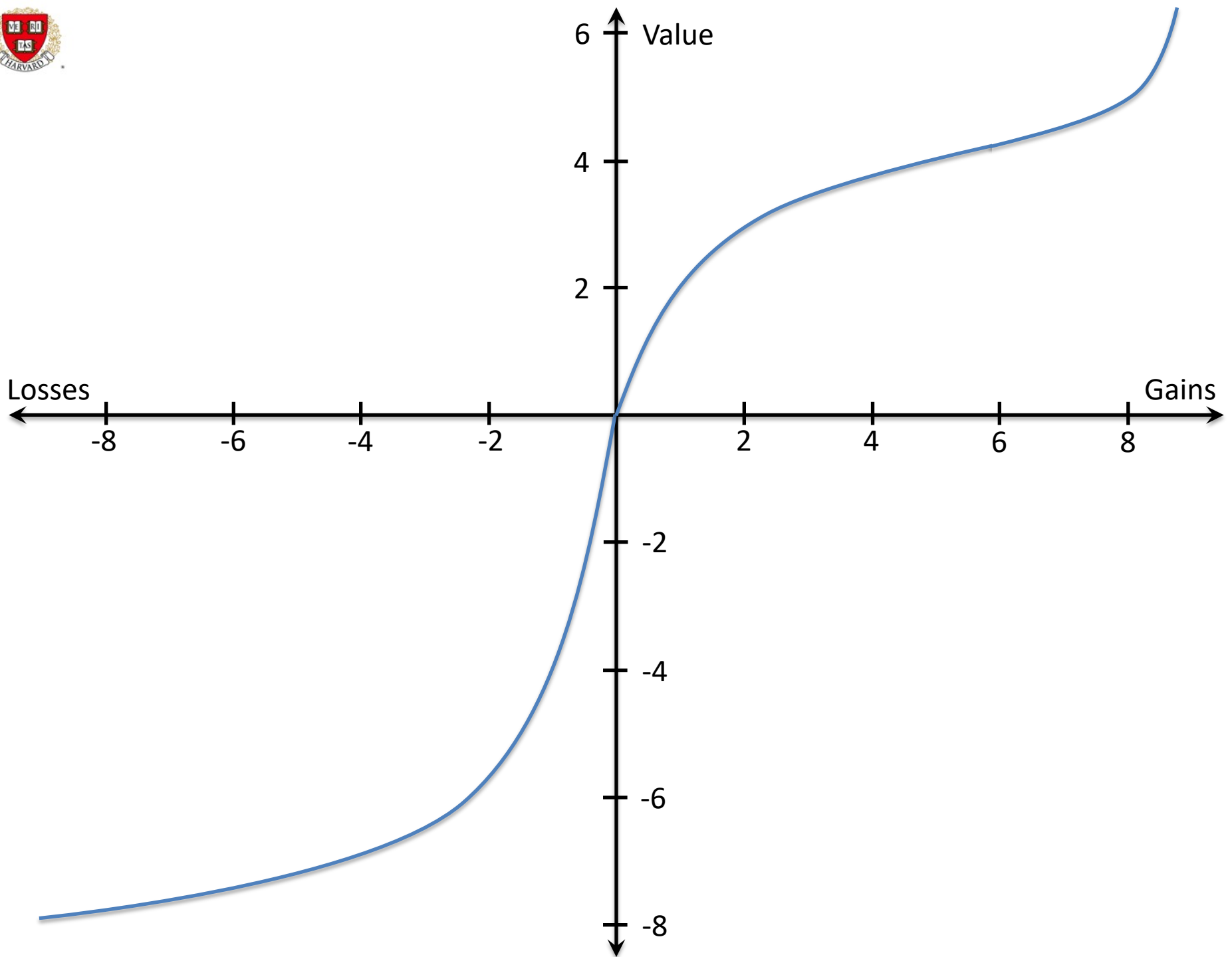


FIG. 1.8: Utility function consistent with buying insurance and betting in lotteries





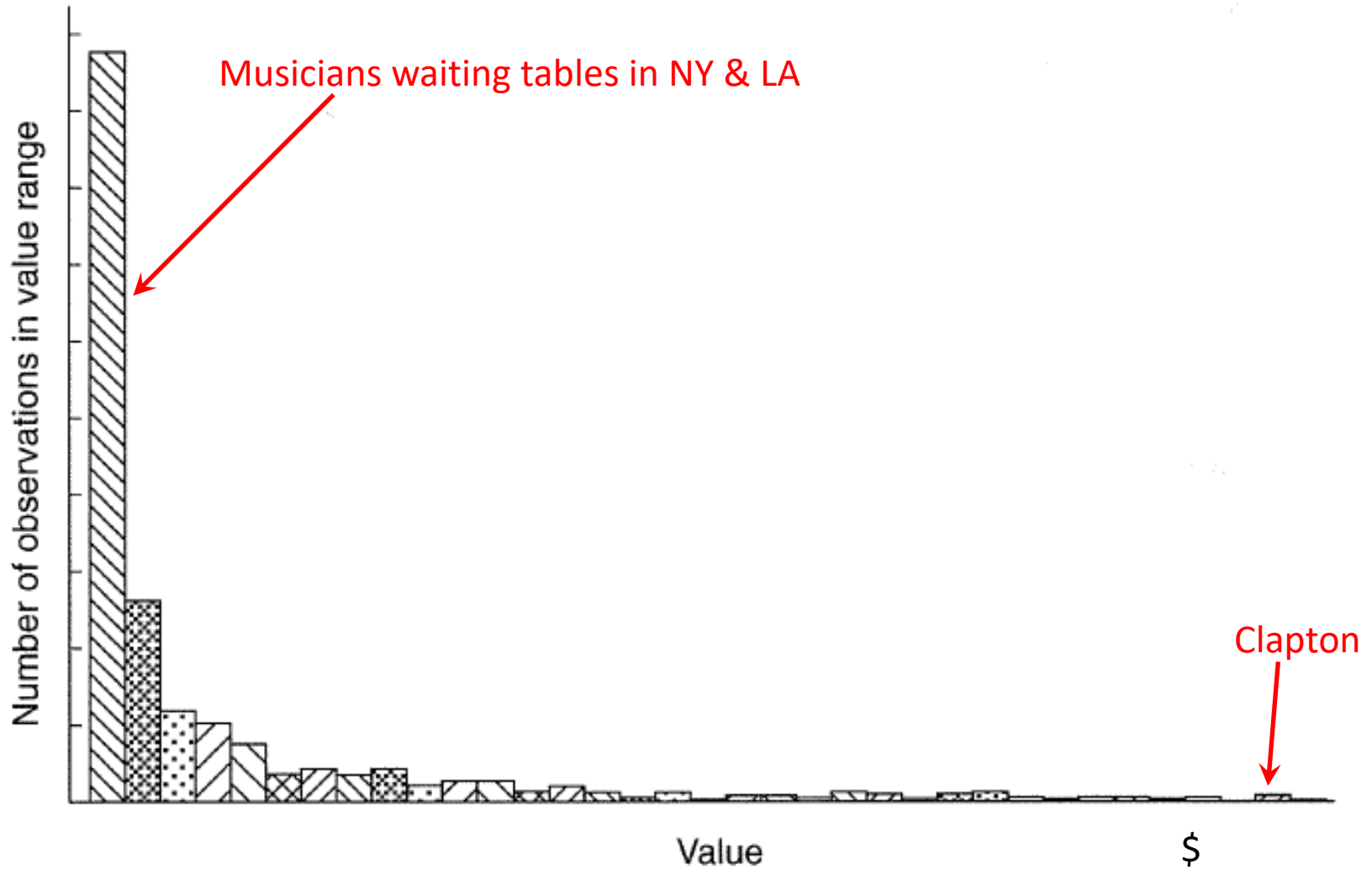
Rationality

- 1) Expected Utility Theory
- 2) Ubiquitous Forms of Bounded Rationality
- 3) Forms of Bounded Rationality specific to creators
 - a) Unusually strong version of “overoptimism”?
 - b) Are artists “skewness lovers”?
 - c) The intuitions underlying personality theory and labor theory may help to define artists’ reference points



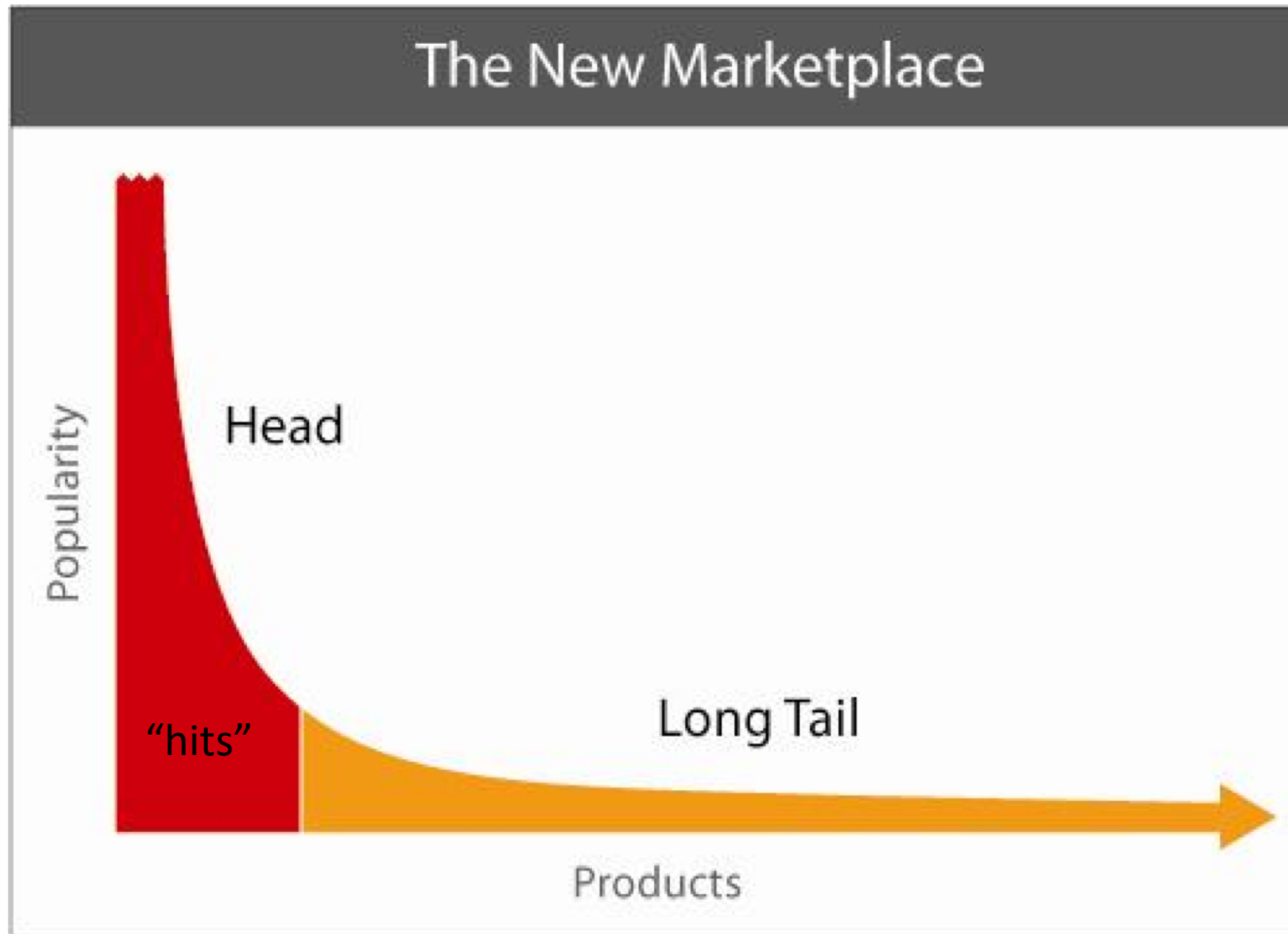
Scherer, "Innovation Lottery"

(b) Log normal distribution





Chris Anderson, “The Long Tail”



Source: <http://www.thelongtail.com/about.html>



Chris Anderson, "The Long Tail"

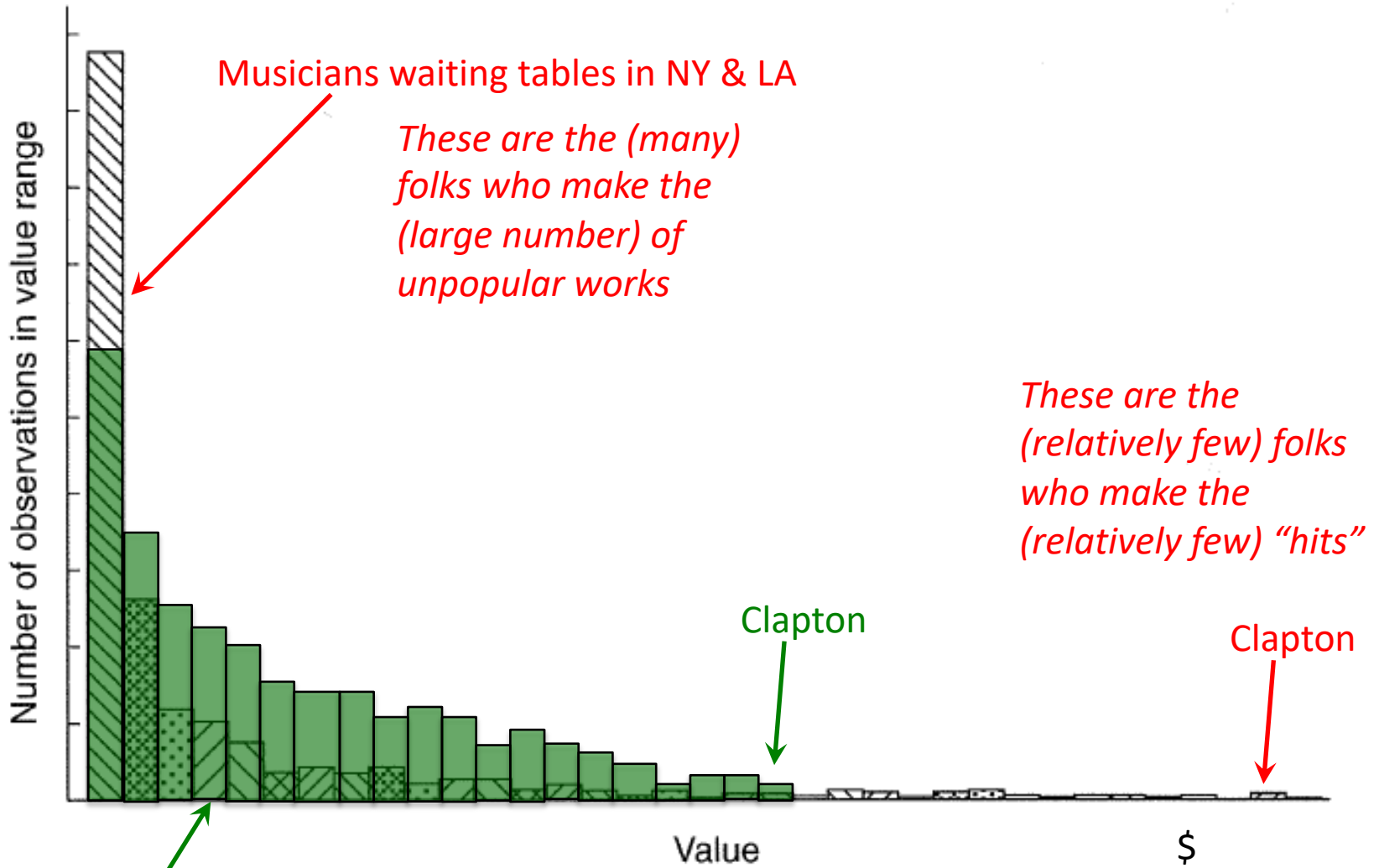
"The theory of the Long Tail is that our culture and economy is increasingly shifting away from a focus on a relatively small number of "hits" (mainstream products and markets) at the head of the demand curve and toward a huge number of niches in the tail. As the costs of production and distribution fall, especially online, there is now less need to lump products and consumers into one-size-fits-all containers. In an era without the constraints of physical shelf space and other bottlenecks of distribution, narrowly-targeted goods and services can be as economically attractive as mainstream fare."

Source: <http://www.thelongtail.com/about.html>



Scherer, "Innovation Lottery"

(b) Log normal distribution



If Anderson is correct, we should see a shift toward a pattern like this.



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Possible Implications for IP Law

- 1) Hyper-optimism of creators may be socially beneficial
 - argument against “debiasing” (Crouch) ← Ethical?
- 2) If creators are “skewness lovers,” we should hesitate to alter the current distribution pattern (Scherer)
- 3) Other things equal, we should adjust doctrines to increase payouts but reduce probability (Crouch)
 - e.g. *KSR*’s increase in non-obviousness standard makes economic sense
- 4) Limits on work-for-hire doctrine and pre-employment patent assignment agreements may be socially beneficial (Scherer)
- 5) Legal doctrine has (partial) control over the location of reference points – and thus how innovators and users value their entitlements
 - e.g., rhetoric of “intellectual property”
 - complication: reference points may not be fully complementary (e.g., with respect to file-sharing)
- 6) Uncertainty may not be so bad (Horowitz)