Keeping Up with the Joneses Preferences: Asset Pricing Considerations

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- Economics and Finance have developed a series of models and theories.
- Many of them, especially in finance, are very recent.
- Based on these models, we try to understand how investors and markets behave:
  - The predictive power of the models is not very good.
  - Even worse: we do not seem to be able to explain many events *ex post*.
- For example:
  - Market efficiency.
  - CAPM

Efficient Markets

- Concept: All relevant information is immediately incorporated into prices.
  - Therefore, there is no gain to be attained by *picking* securities...
- Refinement: there are different levels of information and, therefore, market efficiency:
  1. Past prices:
     - If prices immediately incorporate this information, markets are *weakly* efficient.
  2. Public information, available to everybody:
     - *semi-strong* form.
  3. Public and private information:
     - *strong* form.
- Non-informational events should not matter:
  - For example, a big sale in the market.

Abnormal Returns Around Takeover Announcements

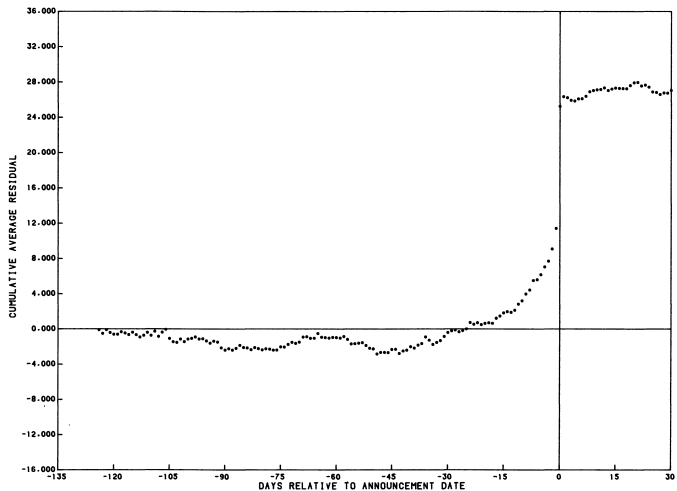
Figure: From Keown and Pinkerton, Journal of Finance 1981

- Similar failures.

Characteristics of Investors and Consumers

- Models assume some properties of investors that drive their economic decisions:
    - Monotonicity or non-satiation:
        - More is better.
        - *But:* What about charities, phylantropy, volunteer work...?
    - Risk-aversion:
        - The expected return of a risky decision is worth more than the risky decision.
        - *But:* What about gambles –either real gambles or through financial markets or similar?
- The objective of the investor is represented by a *utility function*, for example:

$$\max E\left[\frac{X^{1-\gamma}}{1-\gamma}\right]$$

X represents wealth and γ the coefficient of risk-aversion.

Other Problems with Standard Models of Investors

▶ Take utility function of an investor who cares about consumption over time (*intertemporal consumption*):

$$\max E \left[\sum_{t=0}^{T} \beta^t \frac{c(t)^{1-\gamma}}{1-\gamma} \right]$$

- $\beta < 1$ is a subjective discount coefficient ("earlier is better"), $c(t)$ is consumption at moment t and γ is as before;
- for a total of T *periods* (for example, years).

▶ Many questions:
1. At time t only consumption $c(t)$ matters?
2. Only a parameter, γ to decide choices?
3. Why is β constant?
4. Why is T fixed?
5. All the investors are identical?
6. . . .

Problems with Standard Preferences

- People preferences appear inconsistent with expected utility:
- One particular instance is Allais Paradox:
  - Offer people to choose one of the gambles from each experiment:

Experiment 1				Experiment 2			
Gamble 1A		Gamble 1B		Gamble 2A		Gamble 2B	
Prize	Chance	Prize	Chance	Prize	Chance	Prize	Chance
$1 M	100%	$1 M	89%	Nothing	89%	Nothing	90%
		Nothing	1%	$1 M	11%		
		$5 M	10%			$5 M	10%

  - The choices are often inconsistent with expected utility.

Allais Paradox Revisited

▶ Rewrite the previous menu of gambles as follows:

Experiment 1				Experiment 2			
Gamble 1A		Gamble 1B		Gamble 2A		Gamble 2B	
Prize	Chance	Prize	Chance	Prize	Chance	Prize	Chance
$1 M	89%	$1 M	89%	Nothing	89%	Nothing	89%
$1 M	11%	Nothing	1%	$1 M	11%	Nothing	1%
		$5 M	10%			$5 M	10%

   ▶ Independence axiom.
▶ Kahneman and Tversky developed the Prospect Theory to better capture these choices.
   ▶ It also has to do with *framing*.

Alternative Directions

- The finance literature has suggested a number of reasons why classic models do not work:
  1. Noise traders.
  2. Limits to arbitrage.
  3. Bounded rationality.
  4. Heuristics and biases.
  5. Preferences.
- In addition (not explicit in the behavioral finance literature):
  1. Heterogeneity of economic investors.
  2. Unusual incentives.

Non-Standard Preferences

- Prospect Theory is a first attempt to model consumers' behavior outside the classic paradigm.
- Other types of utility representations different from standard utilities have been developed.
- Here are some examples:
  - Recursive preferences.
  - Habit formation.
  - Keeping up with the Joneses.
  - Rank-dependent utilities.
    - Cumulative prospect theory is one case.
  - ...

Prospect Theory: Foundations

▶ Experiments conducted by Kahneman and Tversky in the 70's.
  ▶ Allais Paradox and others like the following.
▶ A group of people is asked *same group* both questions:
  (i) Choose between (percentage who chooses in parenthesis):
     A Sure gain of $240 (84%).
     B 25% chance to gain $1000, 75% chance to gain zero (16%).
  (ii) Choose between (percentage who chooses in parenthesis):
     C Sure loss of $750 (13%).
     D 75% chance to lose $1000, 25% chance to lose nothing (87%).
▶ The previous choices imply risk-aversion for gains, risk-love for losses.
▶ In fact, 73% chose A and D, only 3% B and C.
  ▶ However, B+C dominates A+D.

Value Function of Prospect Theory: Characteristics

- Decreasing sensitivities, both for gains and losses from the reference point:
  - The difference in value of possible gains of $100 and $200 is larger than the difference between $1100 and $1200.
  - The difference in value of possible losses of -$100 and -$200 is larger than the difference between -$1100 and -$1200.
- Characteristics of a value function for prospects:
  - (i) Defined on deviations from reference point.
  - (ii) Concave for gains, convex for losses.
  - (iii) Steeper for losses than for gains.
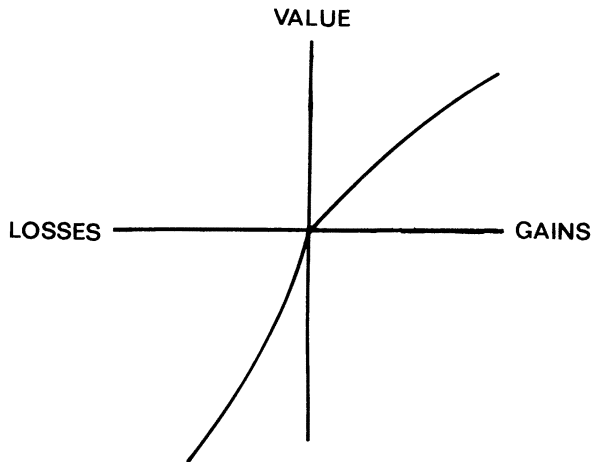
The Value Function

Figure: Value Function in Kahneman and Tversky (1979)

Rank-Dependent Utilities

- In the 90's, Kahneman and Tversky refined prospect theory.
  - Cumulative prospect theory.
  - Adjust original probabilities:
    - By assigning weights.
    - Different for probabilities of gains and probabilities of losses.
- This had a precedent in the work of Quiggin in the 80's:
  - Anticipated utility.
- Some work in mathematical finance.
  - For example, He, X. D. and X. Y. Zhou (2011), Portfolio Choice via Quantiles," Math. Finance 21, 203-231.

The Problem with Prospect Theory (and Similar Theories)

- They are *ad hoc* and not axiomatic.
- Need for axiomatic models.
- A good candidate: *Keeping Up with the Joneses* preferences.

Motivation

- ▶ Consider the following two worlds (Frank, JPubE, 2008):
    - A You earn $110,000 per year, all others earn $200,000.
    - B You earn $100,000 per year, all others earn $85,000.
- ▶ Which one would you prefer.
- ▶ Frequent choice is incompatible with standard utility theory.
- ▶ Happiness and growth:
    - ▶ Relative income is a better predictor of happiness than absolute income.
    - ▶ First pointed out by Easterlin in 1974.
    - ▶ Several studies are consistent with this observation.
- ▶ Evidence that *income matters* for happiness.
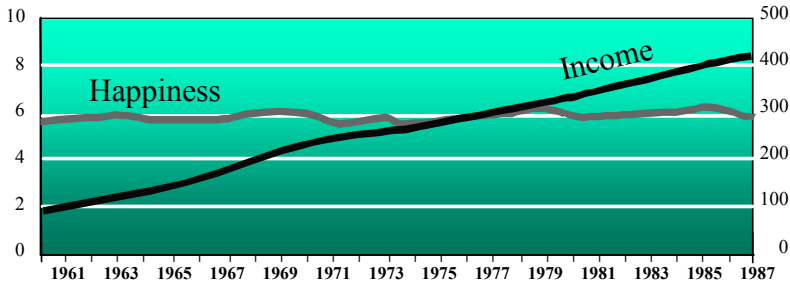
Growth and Happiness in Japan

Figure: From R. Veenhoven, "Happiness in Nations," IMF, 1993
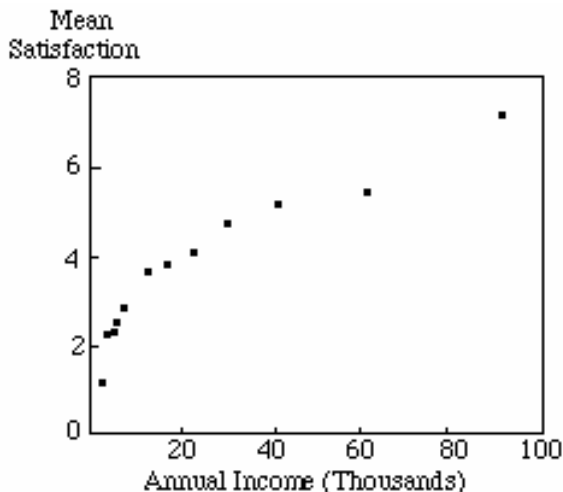
Income and Happiness (US in the 80s)

Figure: From Diener, Sandvik, Seidlitz, and Diener, SIR, 1993

Basic Idea

- ▶ People care about their consumption/wealth relative to other people's consumption/wealth.
  - ▶ "Keeping up with the Joneses."
- ▶ Some closely related issues:
  - ▶ Consumption in *positional* goods.
    - ▶ Also called *conspicuous* consumption.
  - ▶ Search for status.
- ▶ Differs from standard expected utility theory.
- ▶ A very large number of economic and financial implications.
  - ▶ In the choice of consumption.
  - ▶ In the choice of portfolios.
    - ▶ Through this, on security prices.

Precedents

- Mentioned by Adam Smith (The Wealth of the Nations):

  > "A creditable day-labourer would be ashamed to appear in
  > public without a linen shirt, the want of which would be
  > supposed to denote that disgraceful degree of poverty which, it
  > is presumed, nobody can well fall into without extreme bad
  > conduct."

- Veblen (The Theory of the Leisure Class, 1899).
  - Introduces the expression *conspicuous consumption*.
- Duesenberry (Income, Saving, and the Theory of Consumer
  Behavior, 1949).
  - Introduces the *demonstration effect*.
- Robert Frank (Choosing the Right Pond, 1985)
  - Several books and research articles on the topic and its
    economic implications.

Utility Function with Relative Wealth Concerns

- The investor chooses investments to achieve:

$$\max E \frac{c^{1-\gamma}}{1-\gamma} C^{\alpha}$$

  - c is the consumption of the investor.
  - C is the consumption of the *peers*.
  - γ is the risk-aversion, as in the standard case.
  - α is a positive coefficient that measures the *strength* of the relative concerns:
    - The higher is α the more the consumer cares about the level of consumption of the peers.
- Who are the peers?
  - Neighbors? Family? Coworkers?

Economic Effects

- Wealth increase of one agent affects utility of other agents.
    - Negative (or positive?) externality on others.
    - Increases marginal utility.
- Relative wealth concerns lead to status seeking.
- Status seeking leads to purchase of *positional goods*.
- Positional goods displace other consumption.
    - Possible barrier to growth?
- *Economic cascades* (Robert Frank):
    - If someone spends on a positional good, it forces others to do so.
    - For example, median size of a newly constructed house.
        - 1600 feet in 1980.
        - 2100 feet in 2000.
    - Like an arms' race?

Effects of Economic Cascades?

- ▶ Also suggested by Robert Frank.
- ▶ People are working longer hours.
- ▶ Longer commuting distances.
- ▶ Higher bankruptcy rates.
    - ▶ In Frank, Levine,and Dijk (2010, wp).
    - ▶ They study changes between 1990 and 2000 in bankruptcies filings across counties.
    - ▶ They find positive correlation between filings and growth of income dispersion.
- ▶ Savings:
    - ▶ According to standard theory, the savings rate should be independent of income.
    - ▶ However, it has been dropping consistently in the US.
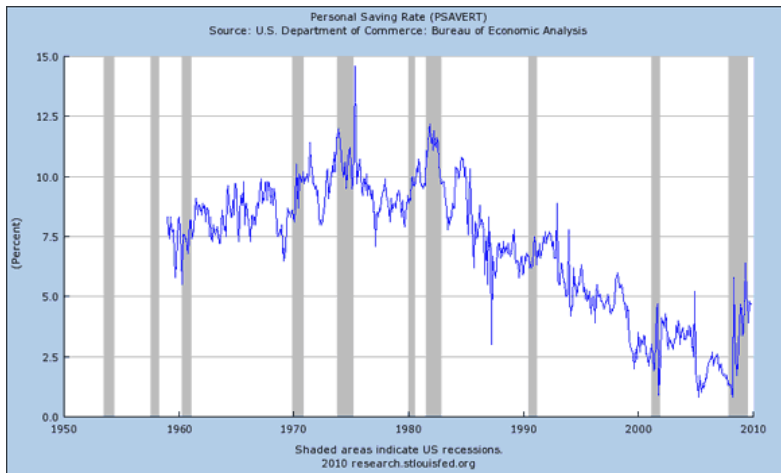
US Savings Rate

Figure: From BEA

Financial Effects

- Consider a setting in which agents care about each other's wealth.
- Suppose that the wealth of at least some of them is correlated with security prices.
    - For example, software engineers who receive bonuses depending on the performance of the company.
    - Their income will be highly correlated with the price of the stock of their company.
    - In general, with prices of high-tech companies.
- Buying stock correlated with wealth/income of reference group will be optimal strategy.
- In such a setting, investors will be willing to overpay for stock that helps them "keep up with their peers."

Financial Effects: Equilibrium

▶ Consider a CAPM type of equation,

$$\bar{r}_i = r_f + \beta_i(\bar{r}_M - r_f)$$

▶ Re-write,

$$\bar{r}_i = a + \beta_i \bar{r}_M$$

▶ With relative wealth concerns we get,

$$\bar{r}_i = a + \beta_i^M \bar{r}_M + \beta_i^I f^I$$

  ▶ where β^M is as before,
  ▶ β^I is the correlation with the income of the peers,
  ▶ f^I measures the "premium" associated with the correlation with income.
    ▶ Is *negative*.

▶ If there are "different groups of peers,"

$$\bar{r}_i = a + \beta_i^M \bar{r}_M + \beta_i^1 f^1 + \beta_i^2 f^2 + ...$$

- Explains relation between stock returns and labor income.
- Risk premia are stronger (in absolute value) in areas of *lower* population density.
- Is the effect stronger in areas of lower population density?
- There is evidence that this is the case.
    - Luxury car purchases are strongly influenced by luxury car purchases of neighbors in areas of lower population density.
- In areas of low population density is easy to identify peers.
- Stronger peer pressure.

The Future

- Many questions on the economic front:
  - *Keeping Up* or *Catching Up*?
  - Who is the reference group?
  - ...
- On the mathematical front:
  - Very little work.
  - Exceptions:
    - Chan and Kogan (JPE 2002), a dynamic version of Campbell and Cochrane (JPE 1999).
    - Benchmarking models (for example, work of Basak and coauthors).