

Fiduciaries and Financial Derivatives

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Fiduciaries and Financial Derivatives

- In your business, what do you seek from clients?
What do clients seek?
- Is finance more like a soccer game or a waltz?
That is, is finance more aligned with a
competition or a cooperation?
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An Illustration

- Municipality contemplates selling swaption
 - Where did they get that idea?
 - Who did the detail analysis?
- Swaption confirmation contains representations:
 - Non-reliance: each party acting independently
 - Assessment and understanding: merits of trade
 - Status: Neither party is acting as a fiduciary or advisor

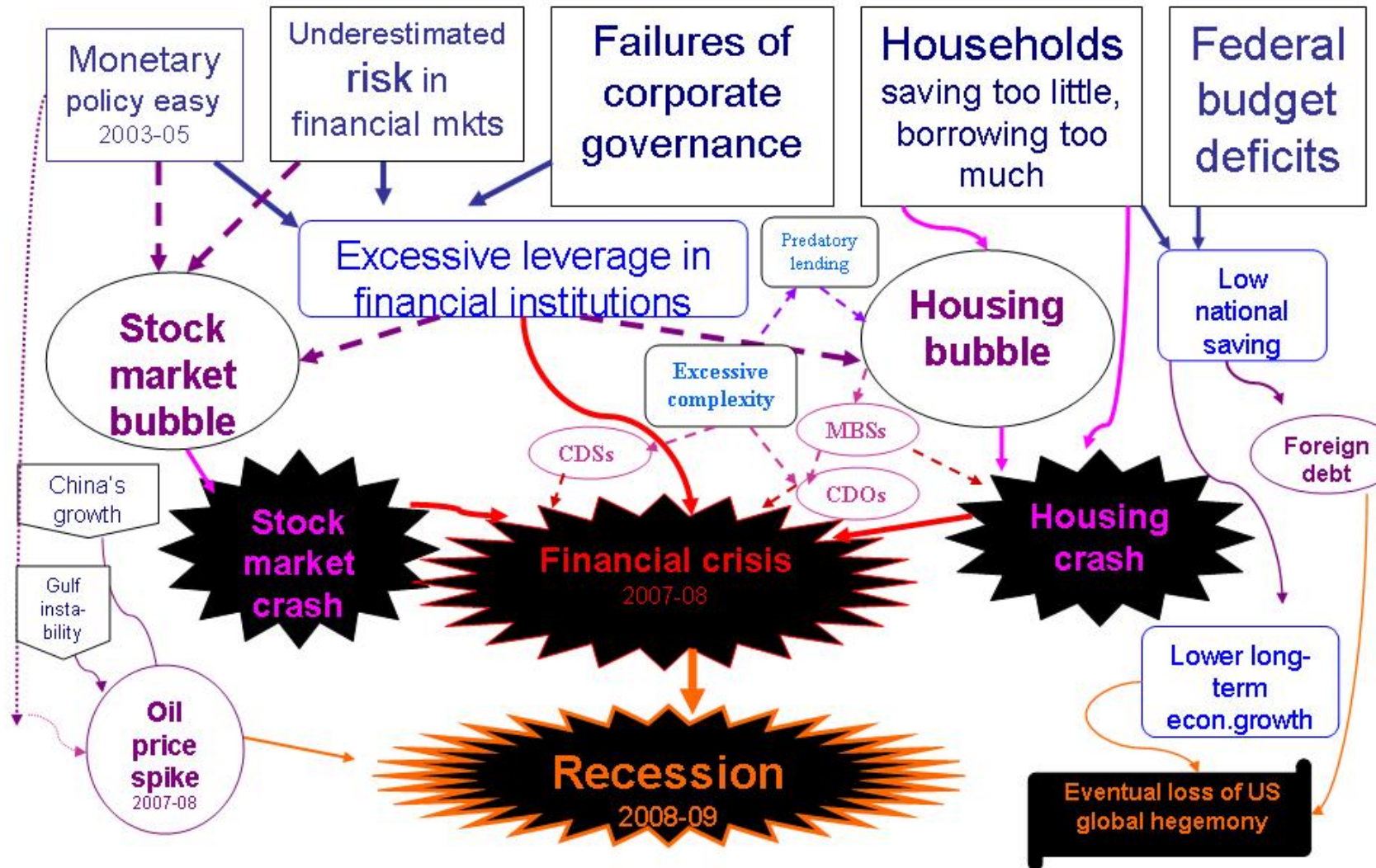
Selected Reasons for Financial Crisis

- Mark-to-market accounting
- Community reinvestment act
- Inappropriate incentives to purchase home
- Inappropriate risk-taking behavior of bankers
- Too much leverage in general
- High leverage of low quality assets
- Sleepy regulators

Selected Reasons for Financial Crisis

- Securitization
- Financial engineering
- Reckless financial innovations
- Financial complexity
- Fiscal policy (federal, state, local, families, ...)
- Monetary policy
- Corporate governance

Origins of the financial/economic crises



http://content.ksg.harvard.edu/blog/jeff_frankels_weblog/2008/12/05/origins-of-the-economic-crisis-in-one-chart/

Goals Today

- An alternative approach to “foundations of quantitative finance” (May 2009 meeting)
- Highlight importance of fiduciary duty
 - Fiduciary duty, first key to understanding crisis (and a successful career in finance)
 - Presuppositions to functioning financial markets
- Review history of financial derivatives
 - Performativity, second key to understanding crisis (and avoiding being blindsided by unpredictable risk)
 - Highlight selected predatory trading strategies
- Explore ways to preserve the fiduciary duty within financial derivatives markets

Fiduciary Duty

“A fiduciary duty is an obligation to act in the best interest of another party. ... A fiduciary obligation exists whenever the relationship with the client involves a special trust, confidence, and reliance on the fiduciary to exercise his discretion or expertise in acting for the client. ... When one person does agree to act for another in a fiduciary relationship, the law forbids the fiduciary from acting in any manner adverse or contrary to the interests of the client, or from acting for his own benefit in relation to the subject matter.”

See <http://definitions.uslegal.com/b/breach-of-fiduciary-duty>. For an interesting article related to this topic, see John C. Bogle, “The Fiduciary Principle: No Man Can Serve Two Masters,” *The Journal of Portfolio Management*, Fall 2009, 15-25.

Fiduciary Duty

“The client is entitled to the best efforts of the fiduciary on his behalf and the fiduciary must exercise all of the skill, care and diligence at his disposal when acting on behalf of the client. A person acting in a fiduciary capacity is held to a high standard of honesty and full disclosure in regard to the client and must not obtain a personal benefit at the expense of the client.” See <http://definitions.uslegal.com/b/breach-of-fiduciary-duty>.

“... fiduciary duty is the highest duty known to law.”

(Bogle, p. 16)

“What we need is congressional action to establish a federal principle of fiduciary duty – encapsulated by the phrase ‘no man can serve two masters’.”

(Bogle in Wall Street Journal, January 18, 2010.)

Standards of Professional Conduct

III. DUTIES TO CLIENTS

- A. **Loyalty, Prudence, and Care.** Members and Candidates have a duty of loyalty to their clients and must act with reasonable care and exercise prudent judgment. Members and Candidates must act for the benefit of their clients and place their clients' interests before their employer's or their own interests.

Standards of Practice Handbook, CFA Institute, 2010, page 6.

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Standards of Practice Handbook, CFA Institute, 2005, page 2.

Standards of Professional Conduct

Standard IV (B.1)–Fiduciary Duties

In relationships with clients, members shall use particular care in determining applicable fiduciary duty and shall comply with such duty as to those persons and interests to whom the duty is owed. Members must act for the benefit of their clients and place their clients' interests before their own.

Standards of Practice Handbook, CFA Institute, 1999 and 1996 (IV. B.1).

C. Fiduciary Duties

The financial analyst, in relationships with clients, shall use particular care in determining applicable fiduciary duty and shall comply with such duty as to those persons and interests to whom it is owed.

Standards of Practice Handbook, CFA Institute, 1992, 1990, 1988, 1986 (VII. C.).

Standards of Professional Conduct

The financial analyst/Chartered Financial Analyst, in relationships with clients, shall use particular care in determining applicable fiduciary duty and shall comply with such duty as to those persons and interests to whom it is owed.

II. Purpose of the Standard

The purpose of the standard is to state the responsibility of the members of The Financial Analysts Federation and The Institute of Chartered Financial Analysts (and holders of the designation Chartered Financial Analyst) to understand the nature of the fiduciary responsibility they assume with each client relationship and to apply that understanding appropriately to their professional conduct. The FAF and ICFA believe that members need such knowledge in order to place the fiduciary obligation first in all dealings, thus avoiding potential conflicts of interest with that obligation and other inappropriate conduct. The duty required in fiduciary relationships exceeds that which is acceptable in many other business relationships.

Standards of Practice Handbook, CFA Institute, Supplement 1985, (VII. C.). No reference in 1984 and 1982 versions.

Summary of Fiduciary Duty

- Loyalty
 - “Investment actions must be carried out for the sole benefit of the client and in a manner the member or candidate believes, given the known facts and circumstances, to be in the best interest of the client.”
- Prudence
 - “... requires caution and discretion ... requires following the investment parameters set forth by the client and balancing risk and return.”
- Care
 - “requires ... avoiding harm to clients.”
(SOPH, 10e, p. 69)

Practical Implications of Fiduciary Duty

- Trust is the most valuable asset in finance
- Levels of trust
 - Behavior (What you do)
 - Essence (Who you are)
- How to improve one's trustworthiness?
 - Knowledge
 - Understanding
 - Transformation

Presuppositions for Markets

- Presupposition – “to suppose beforehand, to require as an antecedent in logic or fact” (Mirriam-Webster online)
- Ideas have both antecedents and consequences
 - Invisible hand of Adam Smith
 - Capital markets are information efficient
 - Financial institutions serve as fiduciaries

Presuppositions for Markets

- Well-defined property rights
 - “Rights to control, use, or transfer things (broadly conceived), including rights in intangibles such as intellectual property.” Case, 2003, p. 1.
 - Common stock and naked short selling
- Rule of law
 - “(T)he degree to which the society is bound by law, is committed to processes that allow property rights to be secure under legal rules that will be applied predictably and not subject to the whims of particular individuals, matters.” Case, 2003, p. 2.
 - Financial instruments and insider trading

Presuppositions for Markets

- Culture of trust
 - Features of trust
 - Rely on someone with something valuable
 - Make oneself vulnerable in confidence
 - Trusted will not exploit and will care
 - Means of making business simpler and safer
 - Makes cooperative activities possible
 - Plato's, *The Republic* (YEAR), only fear of detection and punishment restrains person from self-interest

Culture of Trust

- Machiavelli, *The Prince* (1515), people are not trustworthy, thus one must be the preemptor (mutual distrust, cunning, and brutality)
- Thomas Hobbes, *Leviathan* (1651), considering life without a state, there would be “war...of every man against every man,” life would be “solitary, poor, nasty, brutish, and short.” (Bailey, p. 3.)
- David Hume, *A Treatise of Human Nature* (1739), love and sympathy facilitates more trust, education makes us more trustworthy (?)

Practical Implications-Presuppositions

- Financial theories are based on stated assumptions and unstated presuppositions
- When presuppositions fail, stated assumptions are false, and financial theories are irrelevant
- Are capital markets information efficient?
 - With culture of trust?
 - Without culture of trust?
 - When culture of trust is in transition?

Derivatives Ancient History

- 1700 BC: Jacob entered into a seven year forward contract for Rachael. Laban executed a switch option, whereby Jacob entered another seven year forward contract with advanced delivery (Bible, Genesis 29:16-30)
- 46 BC – 476 AD: Phoenicians and Romans starting with Julius Ceasar “... traded contracts, with terms similar to those that make up an option, on the delivery of goods they transported on their ships.” (Chance, Chronology of Derivatives, p. 2)

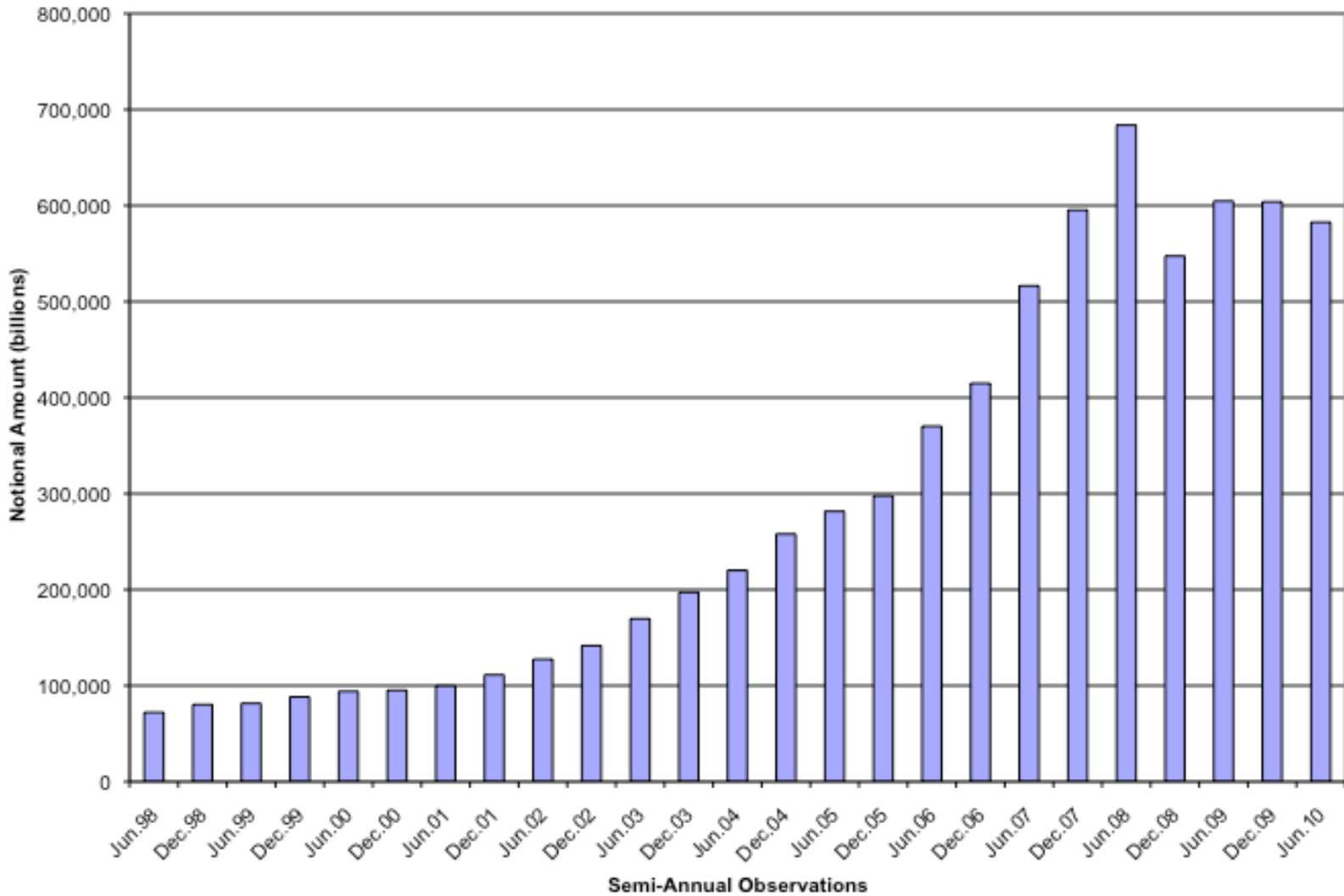
Some Ancient History

- 1637: Dutch tulip bulb mania; defaults on tulip bulb contingent forward contracts. After wild speculation, took decades for Dutch economy to recover
- 1650: “Rice tickets” begin trading at Yodoya Rice Market in Osaka, Japan
- 1690: Option begin trading in London, Barnard’s Act declares them illegal in 1733
- 1790: Options begin trading on securities in U. S.

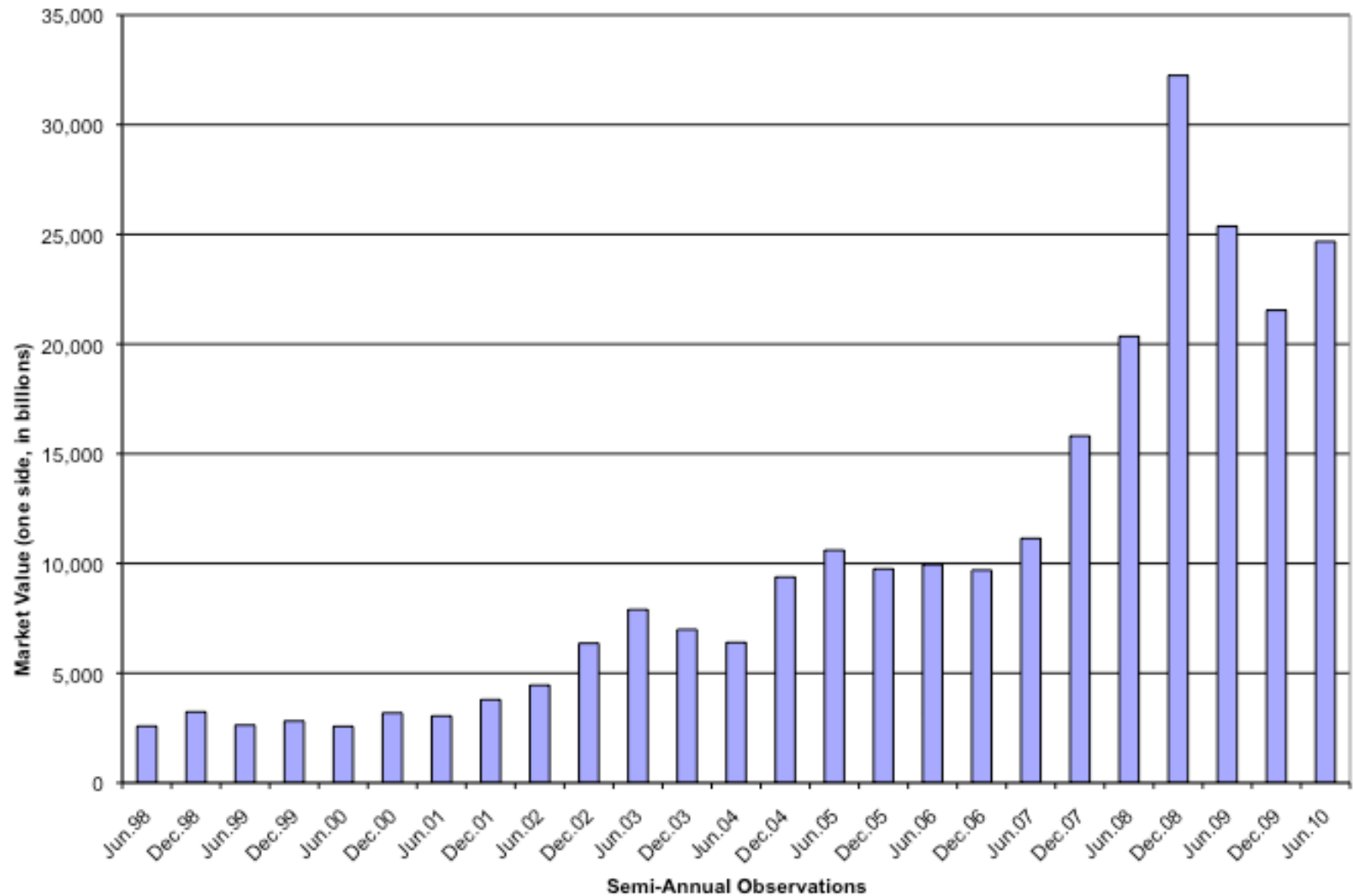
Some Ancient History

- 1835: Scottish physicist Robert Brown observes movement of particles suspended in water, now known as Brownian motion
- 1848: Chicago Board of Trade formed
- 1900: Louis Bachelier writes doctoral dissertation at Sorbone (Academy of Paris, 3/29/1900) modeling commodity prices as arithmetic Brownian motion, first known OPM
- 1973: Chicago Board Options Exchange opens, Black and Scholes as well as Merton publish new option pricing model (parsimonious)

OTC Derivatives Notional Amounts

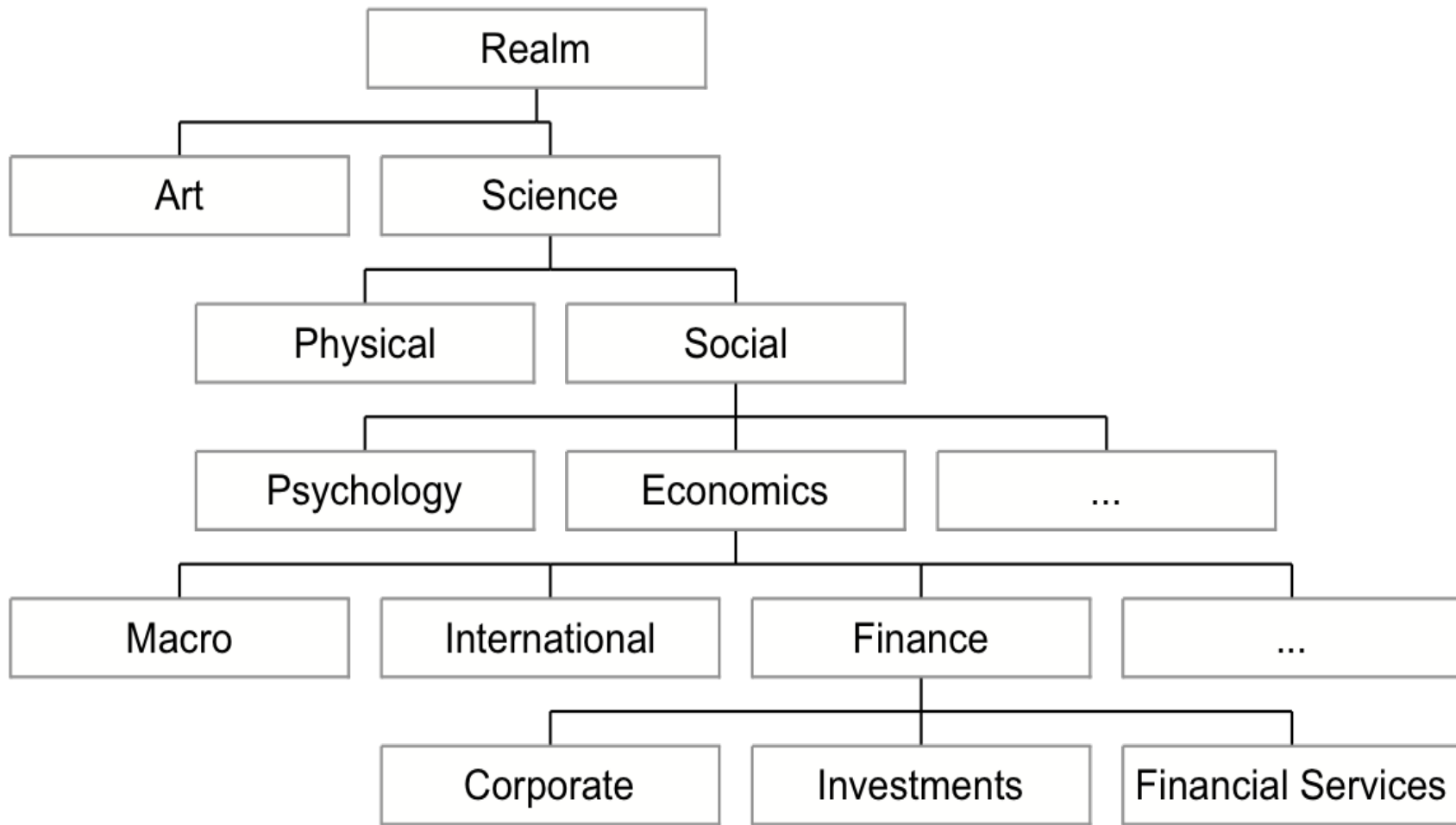


OTC Derivatives Gross Value



Finance's Place in the Academic World

Taxonomy: Fields of Study



Physical vs. Social Science

- Physical science
 - Replication
 - Beliefs do not influence time series data (much)
- Social science
 - No replication
 - Beliefs do influence time series data (very much)
- Finance is a social science and not a physical science

Models and Theories

- “Models are analogies, and always describe something *relative* to something else. Theories, in contrast, are the real thing. They don’t compare, they describe the essence, without reference. Every fact ... is a theory.”
- “Theories tell you what something *is*.”
- “Models tell you only what something is *more or less* like.” (See Derman, 2010.)

Financial Models

- “There are no genuine theories in finance ... (b)ecause finance is concerned with value, an even more subjective concept”
- “Human being and societies learn; physical systems by and large don’t.”
- “Models inevitably mask as well as expose risk.”
- “In physics there may one day be a Theory of Everything; in finance and the social sciences, you have to work hard to have a usable Theory of Anything.” (Derman, 2010)

Is *Good to Great* great?

- “It is important to understand that we developed all of the concepts in this book by making empirical deductions directly from the data. We did not begin this project with a theory to test or prove. We sought to build a theory from the ground up, derived directly from the evidence.”
J. Collins, 2001.
- Does “data rule” or does “data fool”?
 - Interstate driving using only the rearview mirror
- Are there things we know, absent empirical data?

Mathematics / Knowledge Uncertainty

- Financial mathematics is precise
- Risk becoming Pythagoreans (500 BC, pre-Socratic, heavy focus on mathematics)
- Assuming the “standard finance conditions,” then (spread option pricing model)

$$CSO_{1,0}(I_1, I_2) = I_1 e^{-\delta_1 T} \int_{-\infty}^{\infty} N(d_{1,1}(z)) n(z) dz + \frac{\alpha_2 I_2}{\alpha_1} e^{-\delta_2 T} \int_{-\infty}^{\infty} N(d_{1,2}(z)) n(z) dz - \frac{X}{\alpha_1} e^{-rT} \int_{-\infty}^{\infty} N(d_2(z)) n(z) dz$$

- Looks precise, reality is not so elegant

Financial Mathematics

- Reality does not follow the “standard finance conditions,” thus actual market prices depend on
 - Market participants’ fears
 - Market participants’ perceptions
 - Market participants’ digestion
 - Sugar lowers the implied discount rate assigned to future risky outcomes
- Therefore, need to fully understand model risk

Performativity

- “Practical use of an aspect of economics makes economic processes more like their depiction by economics.” MacKenzie, p. 17.
- Option market making via BSMOPM – pre-1973 option prices behave as if BSMOPM is not reliable
- 1976 to October 1987 option prices behave as if BSMOPM is reliable
- Post-October 1987 option prices behave as if BSMOPM is not reliable

Counterperformativity

- “Practical use of an aspect of economics makes economic processes less like their depiction by economics.” MacKenzie, p. 17.
- Dynamic portfolio insurance, 1983-October 1987, based on BSMOPM paradigm, payoffs from buying put options on existing portfolio can be produced by a trading strategy that is roughly equivalent to a graduated stop loss strategy

Practical Implications

- Financial analysis, based solely on historical observation, is severely flawed
 - “Risk means more things can happen than will happen.” Elroy Dimson
 - “My perspective of not viewing the past as a necessary predictor of the future is something I believe in like deep religion and it has influenced every decision I have made.” Bernstein, JBF, 2005
- Financial risk management needs to incorporate potential counterperformativity risk

Risk Management

- “Risk managers need to be perceived like good goalkeepers: always in the game and occasionally absolutely at the heart of it, like in a penalty shoot-out.” Confessions, 2008.
- Risk managers job “... has the risk profile of a short options position with unlimited downside and limited upside. This is the one position that every good risk manager knows he must avoid at all cost.” Confessions, 2008.

Financial Predatory Trading

- Financial predatory trading (FPT) is trading in financial instruments that induces other investors to change their positions and/or exploits other investors' need to change their positions
- Long history
- Anthropology more helpful than physics in understanding FPT

FPT 1.0: Banking / Securities Markets

- Lending to uneducated (loan sharks)
- Bear raids in securities markets (dates back at least to pre-1933)
- Insider trading in securities markets
 - "I'm very aware that some of the things I may be privy to are sensitive," said Mark A. Smith, a professor of pathology at Case Western Reserve University in Cleveland. "I will only discuss things that are public ... " WSJ, 12/6/2010 (Expert Services)

FPT 2.0: Exchange-Traded Derivatives

- Cornering via futures trading
- Insider trading via options
 - John Marshall and Alan Tucker, Eurex merger with ISE
 - Marshall breached fiduciary duty to ISE and its shareholders
 - Tucker bought 700 ISE out-of-the-money call options (\$6-\$14 above stock), comprised 100% of volume in those option series

FPT 3.0: OTC Derivatives

- Swap trading with uninformed municipality
- Faulty hedging strategies using derivatives
 - View driven
 - Should wheat farmer hedge price risk by selling wheat futures?
 - Futures trading firm that is promoting this strategy would never do it themselves
 - Many interest rate risk management strategies promoted by dealers would never be done at dealer's own firm

FPT 4.0: Information Asymmetry Light

- Credit default swaps and bank lending
 - Bank lends corporation more money than appropriate
 - Bank purchases credit protection 3 times exposure
- Naked short selling
 - Short sell stock without subsequently borrowing the shares
 - Net result is more shares outstanding than company issued (property rights violated)

FPT 5.0: Information Asymmetry Heavy

- Mark-to-market (M2M) and commercial banks
 - Price setting structured products trading firms post low bids on selected products
 - Forces M2M losses at commercial bank
 - Losses result in profits from purchases of CDSs and naked short selling

FPT 6.0: Modern Bear Raid

- Investment bank (IB) funds long term investments (structured products) with short term funding (repo market)
- Repo predator terminates short term funding
- Forces selling of longer term investments
- Creates losses for IB
- Creates profits for short sellers of IB stock
- M2M further deepens the problem

Practical Implications of FPT

- Culture of trust within industry is essential
 - Self regulation is very efficient (e.g., impaired driving)
 - Trust increases many financial instrument's value
 - Improves efficiency in contracting
- Avoid industry hubris
 - “In today’s regulatory environment, it’s virtually impossible to violate rules.” Bernie Madoff, 2007
- Understand finance cultural anthropology

What You Can Do

- Cherish your own personal fiduciary responsibilities
- Preserve fiduciary duty within financial derivatives markets
- Market participants (not regulators) should demand financial institutions to behave as fiduciaries (or take business elsewhere)
- View fiduciary duty as vital to long run profitability

What You Can Do

- Actively seek to minimize conflicts of interest
- Fiduciary duty is better caught than taught, or imposed by regulation
- Financial derivatives are like fire, electricity, and at times, nuclear power
 - Used properly, tremendously beneficial
 - Used improperly, tremendously dangerous

Summary

- In your business, what do you seek from clients? What do clients seek?
 - Clients are desperately seeking fiduciaries who understand loyalty, prudence, and care
- Markets require rule of law, property rights and a culture of trust
- Finance is a social science (performativity)
- Financial predatory trading will continue to exist, industry self-regulation will minimize it

References

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Madoff, Bernie, "The Top 10 Worst Predictions of the Financial Crisis," The Motley Fool,

www.fool.com.

"The real trouble with this world of ours is not that it is an unreasonable world, nor even that it is a reasonable one. The commonest kind of trouble is that it is nearly reasonable, but not quite. Life is not an illogicality; yet it is a trap for logicians. It looks just a little more mathematical and regular than it is; its exactitude is obvious, but its inexactitude is hidden; its wildness lies in wait." G. K. Chesterton, *Orthodoxy*, 1908.