Two Dogmas of the Consumption CAPM

Lu Zhang[1]

[1]Ohio State and NBER

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Theme

What must the world be like for asset pricing anomalies to be possible?

In the Arrow-Debreu theory, the consumption CAPM and the investment CAPM deliver identical expected returns:

$$R_{ft} + \beta_{it}^{M} \lambda_{Mt} = E_t[R_{it+1}] = \frac{E_t[\Pi_{it+1}]}{1 + a(I_{it}/A_{it})}$$

Empirically:

$$R_{ft} + \beta_{it}^{M} \lambda_{Mt} \neq E_t[R_{it+1}] = \frac{E_t[\Pi_{it+1}]}{1 + a(I_{it}/A_{it})}$$

\$1 billion question: Why?

Theme

What must the world be like for asset pricing anomalies to be possible?

The CAPM fails to explain asset pricing anomalies

The consumption CAPM performs often worse than the CAPM

Workhorse factor models formed on firm characteristics

The investment CAPM does a good job in explaining anomalies in micro finance

The consumption CAPM does a good job in explaining stock market behavior in macro finance

Theme

The fundamental structure of social reality

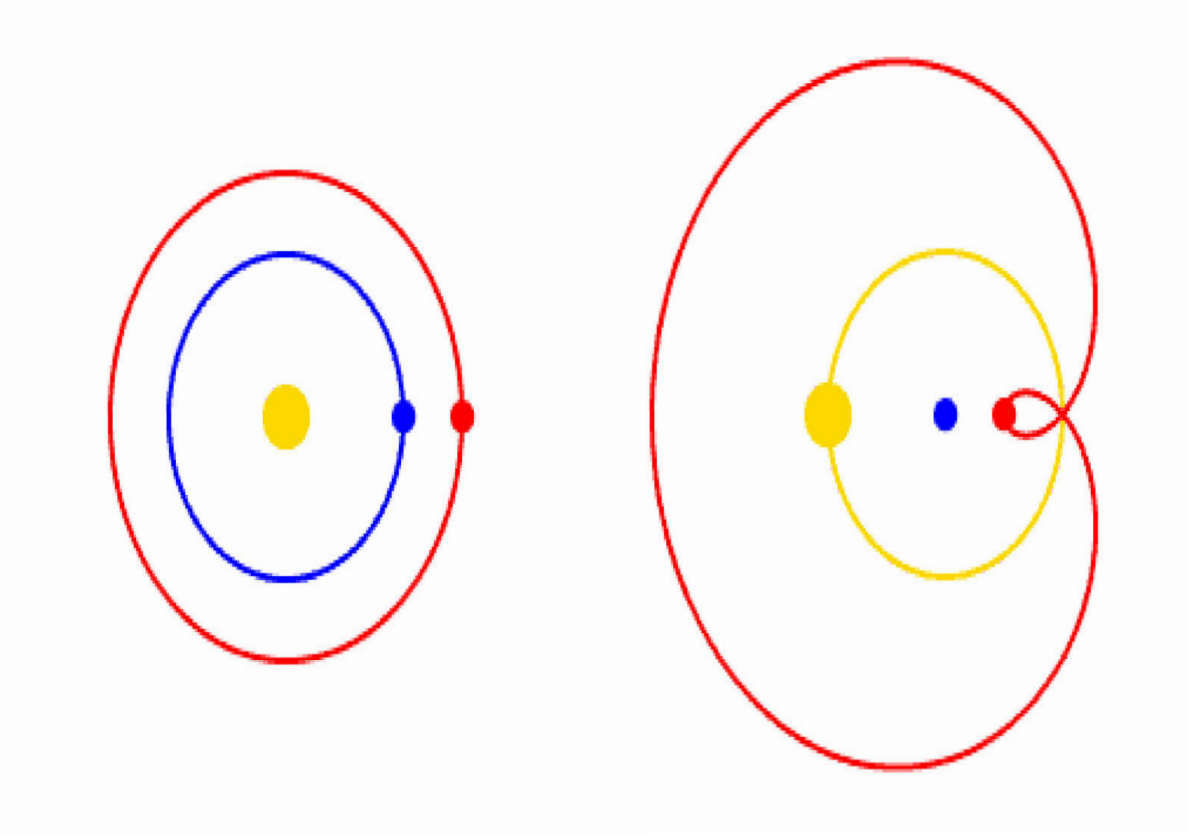
Firms, not investors, are the primary causal powers of asset prices of their own stocks (a Copernican revolution)

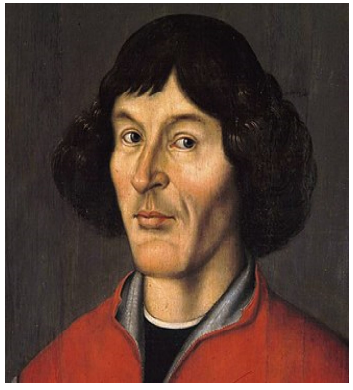
Two dogmas of the consumption CAPM (anthropocentrism and reductionism) likely responsible for its empirical failure

Emergentism resolves most debates (arising only from reductionism, i.e., imposing the causal structure of one stratum onto another)

Theme

Copernicus (1543, "On the Revolutions of the Heavenly Spheres")





Outline

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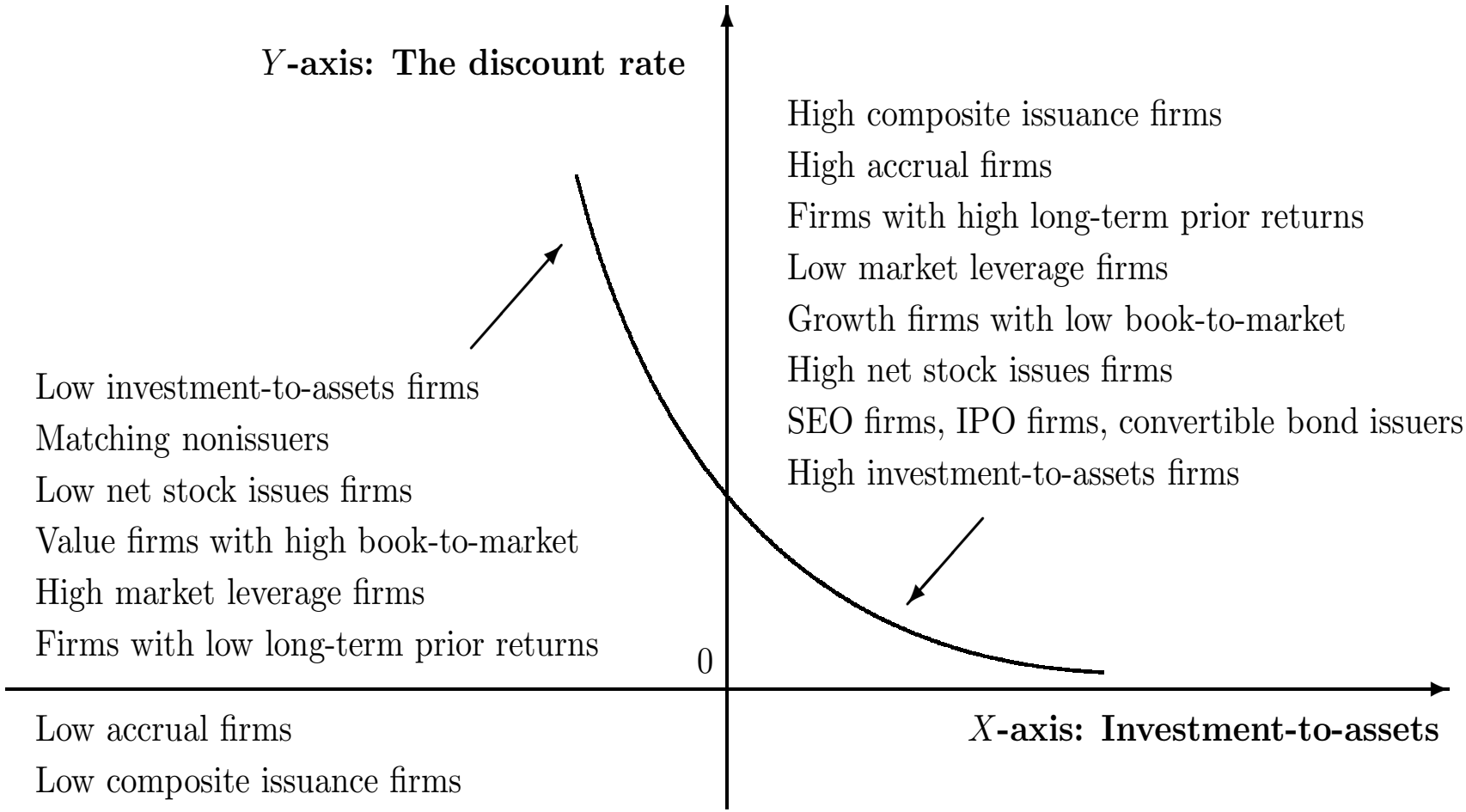
Corporate Causes

Hou, Xue, and Zhang (2015) in the spirit of Fama and French (1993)

1/1967–12/2021	Average returns	6-factor alphas	q-factor alphas
The investment factor, $R_{I/A}$	0.35	0.07	
	(4.28)	(2.01)	
The Roe factor, R_{Roe}	0.53	0.25	
	(5.07)	(4.08)	
HML	0.27		0.01
	(1.96)		(0.11)
CMA	0.28		0.03
	(3.25)		(0.89)
RMW	0.30		0.03
	(3.03)		(0.38)
UMD	0.60		0.19
	(3.59)		(0.91)

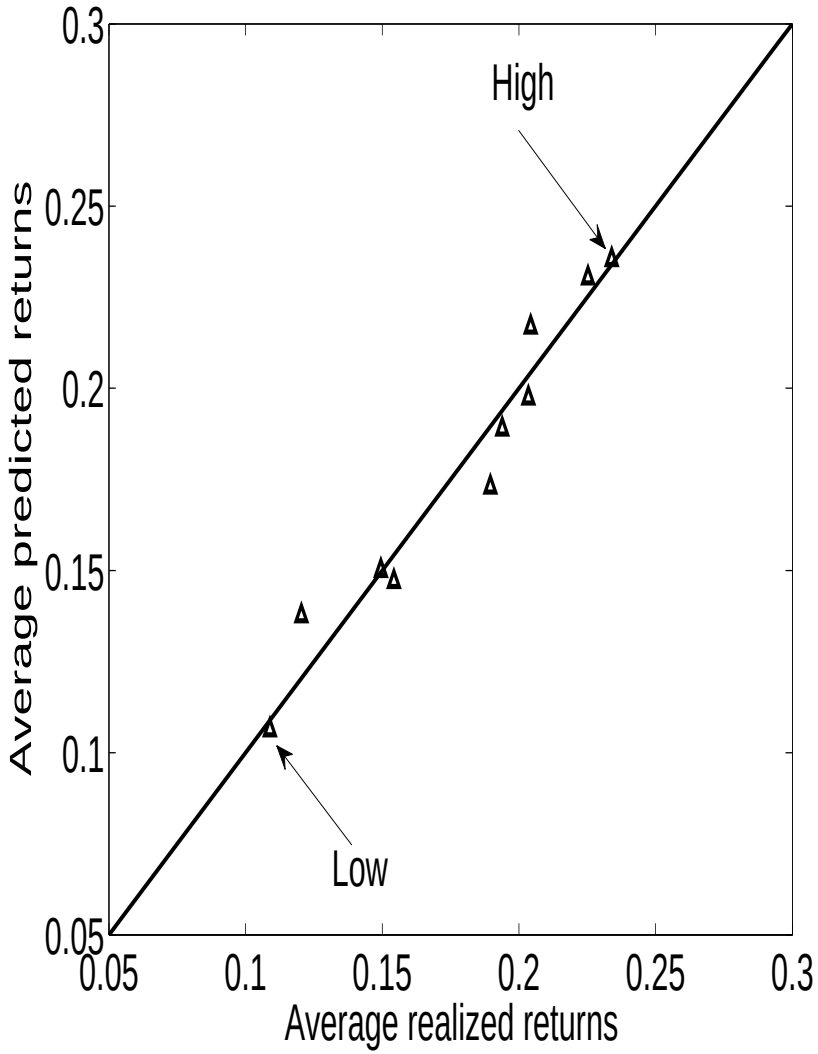
Corporate Causes

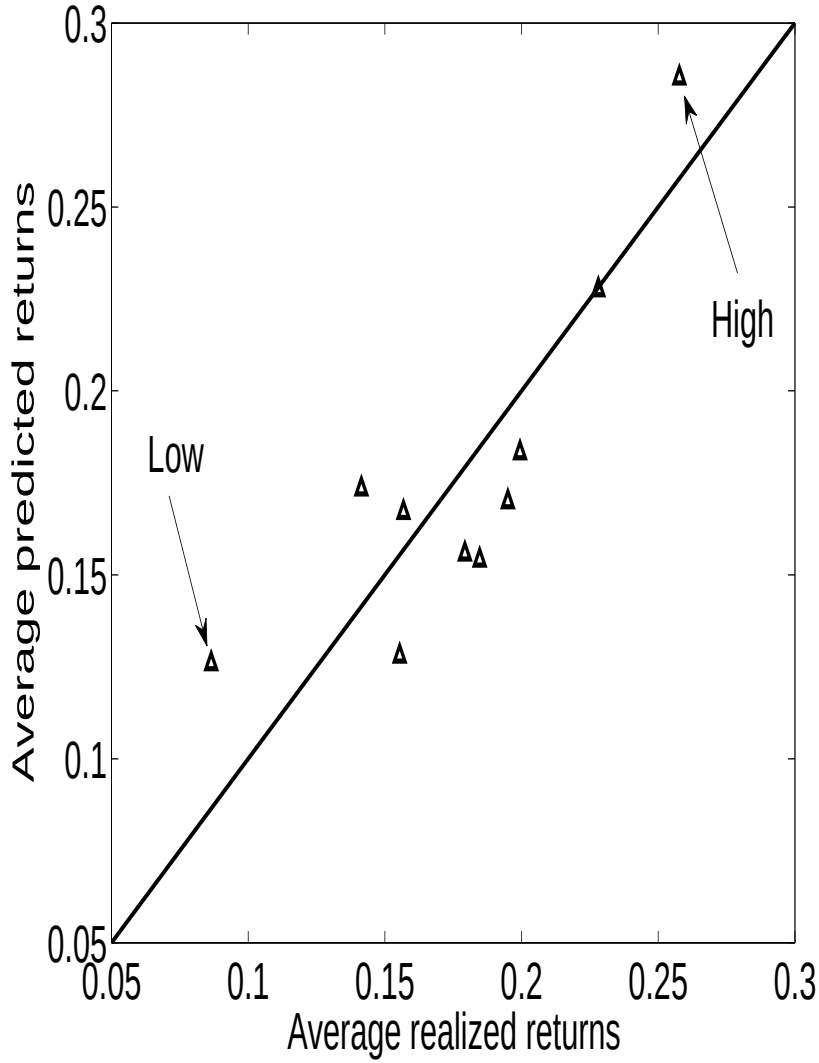
Hou, Xue, and Zhang (2015) in the spirit of Fama and French (1993)



Corporate Causes

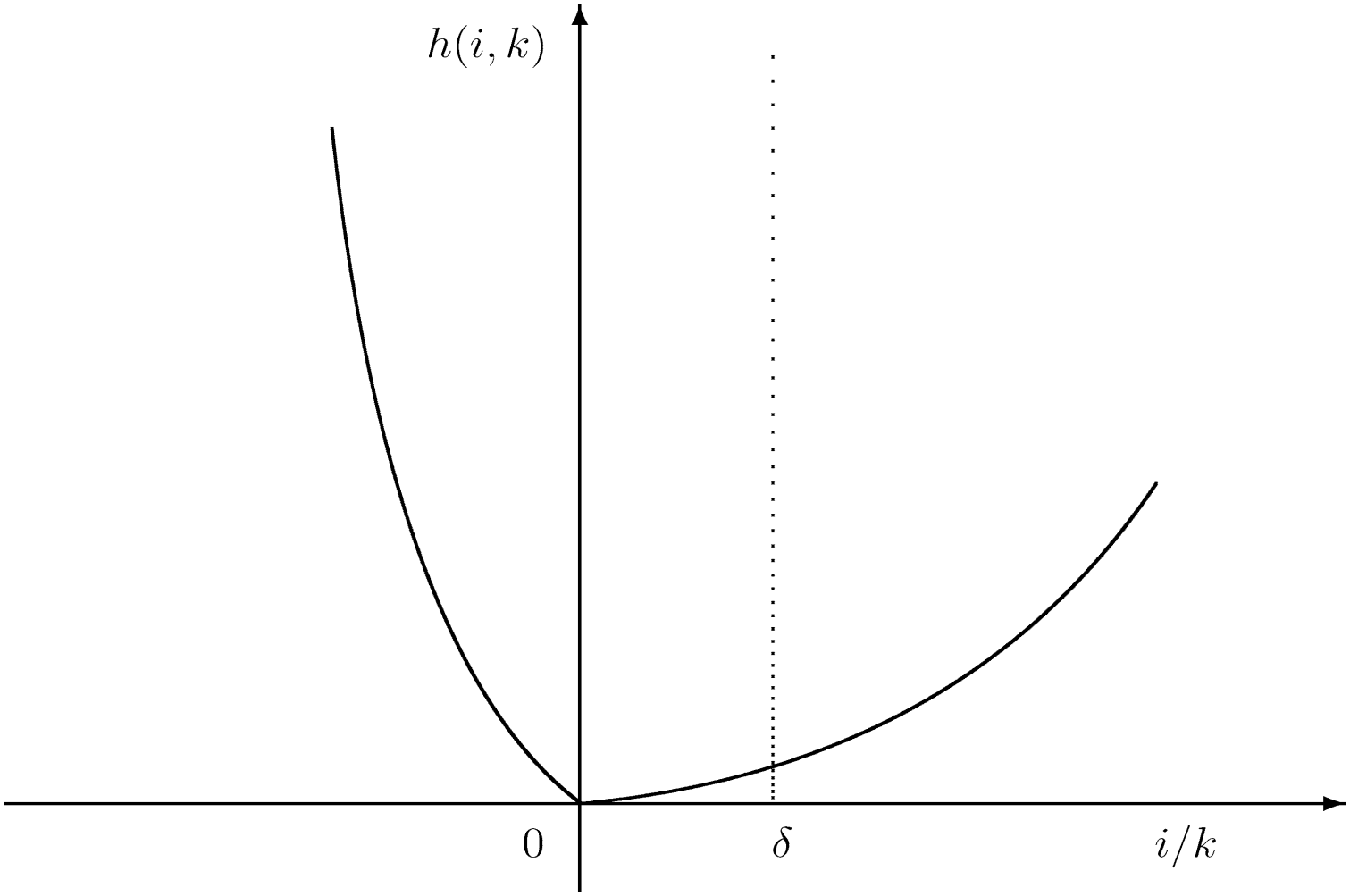
Liu, Whited, and Zhang (2009) in the spirit of Hansen and Singleton (1982)





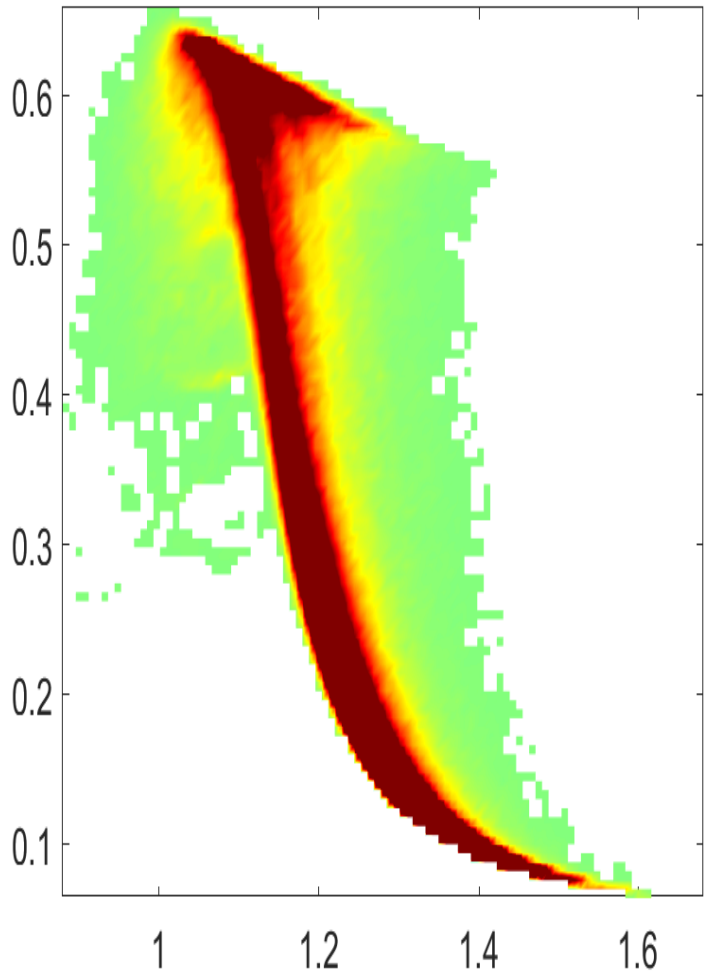
Corporate Causes

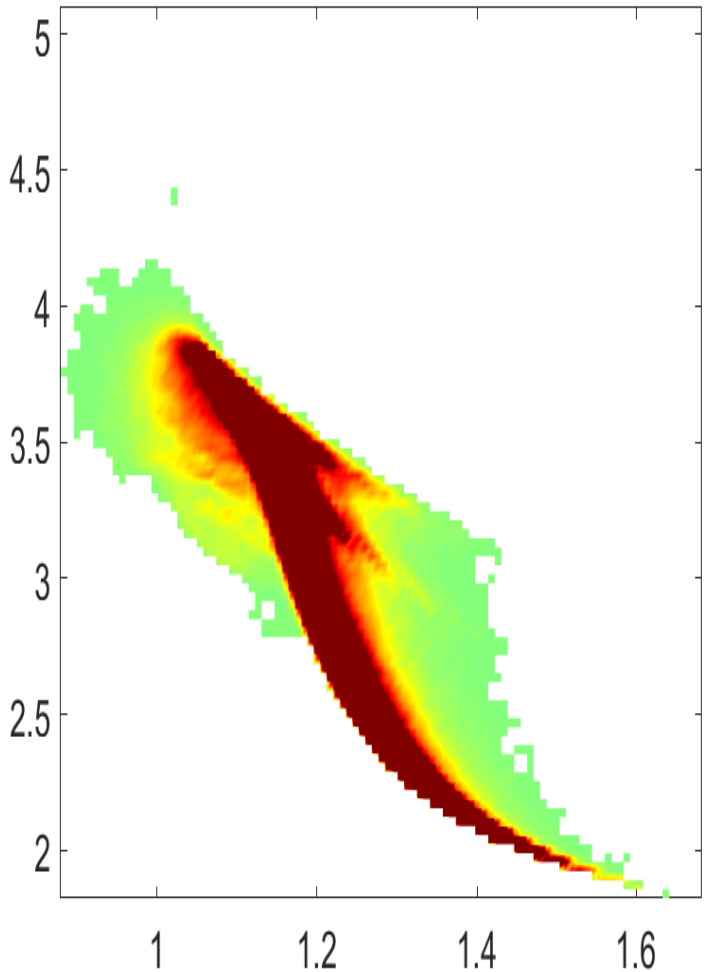
Zhang (2005) in the spirit of Kydland and Prescott (1982)



Corporate Causes

Bai and Zhang (2022): The equity premium and stock market volatility





Firms as causal powers of the market value: Well established in corporate finance, microeconomics, sociology (Coleman 1990), and social ontology (List and Pettit 2011, Lawson 2012)

Firms have better information about their operating performance than investors (Myers and Majluf 1984, Healy and Palepu 2001)

Identical causal structure for the market value as expected return: The pricing kernel gone via constant returns (Hayashi 1982)

Firms as the primary causal powers of their own asset prices

"Primary" does not mean "only" (GameStop)

Open-system: Dropping a $100 bill from the top of Hyatt Regency

Firms as gravity for the $100 bill, investors fluid dynamics

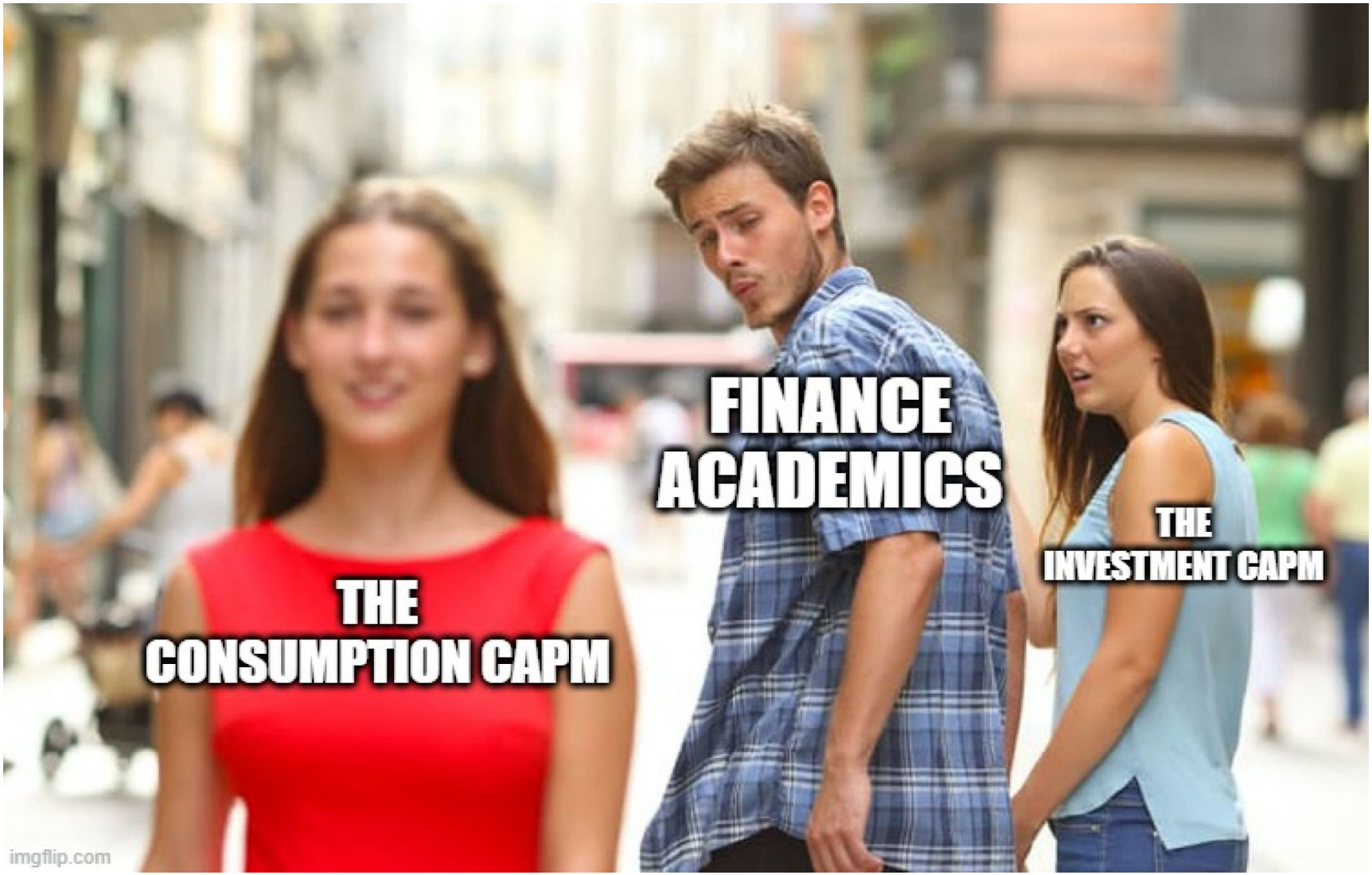
Drawing inferences on reality from empirical sciences: Transcendental deduction (Kant 1781, Bharskar 1975); naturalistic ontology (Kincaid 1996, Cartwright 1999, Ladyman and Ross 2007)

Small-scale models for approximate, local closures, contrasting Arrow-Debreu (large-scale models for global closures)

Outline

Two Dogmas

Why does the consumption CAPM fail? Anthropocentrism, reductionism



Two Dogmas

What is the relation between individuals and society?
The individualism-holism/agency-structure/micro-macro debate (Udehn 2001)

Mill's (1843) psychologism: "The laws of the phenomena of society are, and can be, nothing but the laws of the actions and passions of human beings united together in the social state ([1974], p. 879)"

Jevons (1871), Menger (1871), Walras (1874)

Comte (1830–42), Marx (1887), Durkheim (1897), Weber (1922): Sociology separated from psychology

Emergentism (whole $\neq$ the sum of parts): Bharskar (1979), Archer (1995), Lawson (1997), Elder-Vass (2010); Dupré (1993), Cartwright (1999), Bunge (2003), Humphreys (2016)

1. Individuals with non-relational properties (individuals)
2. Individuals, relations to physical environment (PE)
3. Individuals, relations to PE, other individuals
4. Individuals, relations to PE, other individuals, social context
5. Individuals, relations to PE, other individuals, social context, social structures with causal inference
6. Individuals, relations to PE, other individuals, social context, social structures with causal inference; lower-level social entities with non-relational properties, relations to PE, social context, high-level social structures with causal inference

Two Dogmas

Against reductionism: The consumption CAPM neither sufficient nor necessary for asset pricing

Atomism: Leucippus/Democritus, Descartes/Newton, Walras

The Lucas (1976) critique calls for causality in macroeconomics

Microfoundation installs intentionality (first principles) as causes

Micro-reductionism: A unified, superb model ("a FORTRAN program") as the end goal of all economics (Lucas 1980)

Intentionality yes, but no microfoundation, with the representative agent as idealization (Maki 2005, Hoover 2010)

Macro-reductionism: Impossible to trace every investor, so work with the "marginal investor," Lucas's demon (1978)

Anthropocentrism follows from Markowitz (1952)

Macro-reductionism: Investors have homogeneous expectations (beliefs), holding the same optimal, tangent portfolio

Maki (2004): The beta-return relation as the CAPM's truth-bearer, but anomalies (as potential truth-maker) reject the CAPM

Markowitz's model lives on; the CAPM is dead

Macro-reductionism: Factors must be aggregate (the risk/pricing kernel doctrine): Assuming the conclusion (petitio principii)

Micro factors from the investment CAPM: The covariance-characteristics debate ill-grounded

At the end of each September, all shareholders of Apple Inc. elect a marginal investor, who represents the best interest of all

S/he then marches into Tim Cook's office and dictates to him Apple's cost of equity for the next fiscal year

After receiving the order, Tim then works out Apple's operating, investing, and financing decisions for the next fiscal year

Under this ontology, we should have seen detailed evidence linking investor characteristics (betas) with expected returns

Its absence refutes the anthropocentric ontology

Tim Cook does whatever to maximize Apple's market value

Tim already has a sense of what his cost of equity is via years of trial and error ("tâtonnement")

Some shareholders like what Apple is doing and buy and hold its shares; others vote with their feet by selling their shares

Under this ontology, we should have seen detailed evidence linking firm characteristics with expected returns

Its presence establishes the natural necessity of this ontology

Why does the consumption CAPM succeed in macro finance?

The dappled world: Macro/micro finance as two separate, autonomous strata with different causal structures

Emergent macro finance (non-aggregativity): H_2O

While revolting against it in micro finance, I am defending the consumption CAPM in macro finance

When putting $_i$ onto returns, $E_t[M_{t+1}R_{it+1}] = 1$, but not $_i$ for M_{t+1}, we are making a ton of presuppositions

Ludwig Wittgenstein (1889–1951): From the atomistic, picture theory (1921) to the use theory of language (1953)

What is a game? Football, tennis, chess, video game, publication, scientific revolution, election, language game ...

What is asset pricing? "Family resemblance:" Macro finance, micro finance, behaviorial finance, household finance, corporate finance, macro labor, capital markets research, computational economics

From Arrow-Debreu to emergent social theory

From the rationality-irrationality to agency-structure debate

Outline

Cochrane vs. Cochrane

Cochrane (1991) as the intellectual father of investment-based asset pricing

"The logic of the production-based model is exactly analogous [to the consumption-based model]... Its testable content is a restriction on the joint stochastic process of investment (and/or other production variables) and asset returns... If we fix the investment process, it is a production-based asset pricing model. For example, the production-based asset pricing model can make statements like 'expected returns are high because (a function of) investment growth is high' (p. 210, original emphasis)."

Like Wittgenstein, Cochrane has changed his mind

Cochrane vs. Cochrane

Cochrane (2001, 2005)

Cochrane (1996): 2 aggregate investment growth in the SDF

"Asset pricing theory all stems from one simple concept... price equals expected discounted payoff. The rest is elaboration, special cases, and a closet full of tricks that make the central equations useful for one or another application (p. xiii)."

"The major advantages of the discount factor/moment condition approach are its simplicity and universality (p. xv)."

"All asset pricing models amount to alternative ways of connecting the stochastic discount factor to data (p. 7, original emphasis)."

Anthropocentrism, macro-reductionism

Cochrane vs. Cochrane

Cochrane (2008, p. 314)

"The general equilibrium approach is a vast and largely unexplored new land. The papers covered here are like Columbus' report that the land is there. The pressing challenge is to develop a general equilibrium model with an interesting cross section. The model needs to have multiple 'firms'; it needs to generate the fact that low-price 'value' firms have higher returns than high-price 'growth firms'; it needs to generate the failure of the CAPM to account for these returns, and it needs to generate the comovement of value firms that underlies Fama and French's factor model..."

Lucas's "FORTRAN program" talk

Gomes, Kogan, and Zhang (2003), Zhang (2005), Bai et al. (2019)

Reductionism vs. emergentism, global vs. local realism

Cochrane vs. Cochrane

Cochrane (2011, p. 1074, my emphasis)

"Many finance puzzles are stated in terms of returns. To make that connection, one can transform [the investment model] into a relation linking asset returns to investment growth. Many return puzzles are mirrored in investment growth as the Q theory suggests."

An (extremely unfair?) mischaracterization of my work

Scientific explanation: Causation (Salmon 1984), unification

Insisting on explaining anomalies with betas: An epistemic fallacy, collapsing ontology onto epistemology

Asking Copernicus to make the Ptolemaic model work (Brahe)

Cochrane vs. Cochrane

Cochrane (2017, p. 974)

"It is curious that macro-finance has spent quite so much effort on a tenuous new fact, the term structure of equity premiums, and so little on the much more extensively documented finance factors. That may be a selection bias that nobody has gotten a positive result so far." "But it is also possible that most of the above macro-finance approaches will not be useful to understand the zoo of cross-sectional premiums, and they will be the province of institutional or frictions finance."

Scientific ontology: Different causal structures across strata
(invisible hand: Individual scientist faces ontological constraints)

Institutional/frictions finance? Hou, Xue, and Zhang (2020)

Cochrane vs. Cochrane

Cochrane (2021, p. 52)

"Whether one can say this approach 'explains' the anomalies and if so 'rationally' is a contentious question... But both investment and stock returns are endogenous variables. Both could be driven by fads and irrationalities on the part of consumers."

Whose rationality? Anomalies are social, not individual, facts

"I also think the word 'investment CAPM' is a bit misleading. The word 'CAPM' suggests that expected returns line up with covariances of returns with some variable, and promises a theory that in principle can explain any asset return as the CAPM does."

Capital, Asset Pricing, Model ("family resemblance" again); the SDF unification: An ontological illusion, a scientific failure

Fama and French (1996, p. 57): "[The] empirical successes of [the three-factor model] suggest that it is an equilibrium pricing model, a three-factor version of Merton's (1973) intertemporal CAPM (ICAPM) or Ross's (1976) arbitrage pricing theory (APT). In this view, SMB and HML mimic combinations of two underlying risk factors or state variables of special hedging concern to investors"

Squeezing epicycles into the Ptolemaic model: No causal linkages between risk factors and (unspecified) ICAPM state variables

Ptolemy's epicycles: "ad hoc" (Lakatos 1978)

The investment CAPM as the local closure in micro finance

Firms, not investors, are the primary causal powers of their own asset prices (a Copernican revolution) (moderate individualism)

The dappled world: The consumption CAPM in macro finance, the investment CAPM in micro finance

Emergentism resolves most debates (arising only from imposing the causal structure of one stratum onto another)