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Introduction

1 Foundations

This volume brings together a collection of articles that reflect the influence of biological ideas in economics. Such an undertaking was considerably more challenging than we first thought

evolutionary biology, ecology, evolutionary and social psychology, economics, finance

field of study.

in the 19th century) – to arrive at the dire economic consequences that earned the field the moniker “dismal science.” Charles R. Darwin was clearly influenced by this idea and published

Joseph A. Schumpeter and Armen A. Alchian were among the first economists to formally

exploratory actions generated by the pursuit of “success” or “profits.” This was completely

and fixed states of knowledge.

firms, and financial markets. These developments, in turn, inspired a new and growing literature

between economics and sociobiology comprehensively and noted their mutual influences, and

2 Sociobiology, Evolutionary Psychology, and Behavioral Ecology

The frst concerted attempts to apply evolutionary principles to the study of human behavior

ecology, with many interrelated connections within each of these felds.

6) was the frst to put forward the great insight that individual ftness is not maximized by social evolution; inclusive ftness is. Trivers (1971, Part I Chapter 7) showed how “reciprocally

individual organism could be the ftness-maximizing unit was completely revolutionary at the

These ideas from sociobiology were subsequently subsumed by the felds of behavioral ecology

of probability matching in fsh (Behrend and Bitterman 1961, Part I Chapter 14) and pigeons

financial markets, and the theory of firms and institutions.

economic pre-determinism, evolutionary arguments can explain or "endogenize" the specific

of utility functions derived the expected utility from fixed environments and non-expected

consumption-leisure choice and concluded that preferences with maximum biological fitness

environment and a well-defined and stable system of preferences. Simon (1955, Part I Chapter 31) was the first to propose the notion of "bounded rationality," which was meant to replace

limited access to information and finite computational capacity. From an evolutionary

from rationality, including foraging in ants and herding in financial markets (Kirman 1993,

strategy" (ESS). An ESS is an equilibrium refnement of the Nash equilibrium that is stable

Biological ideas have also played an important role in the study of fnancial markets. As an alternative to the Effcient Markets Hypothesis, fnancial markets can be viewed within an

2). Under this view, fnancial agents are highly interconnected and engaged in complex

Effcient Markets Hypothesis with behavioral economics: the neoclassical models of rational

rationality – loss aversion, overconfdence, overreaction, and other behavioral biases – are, in

More specifcally, evolutionary principles have been used to explain the survival of the "fttest" investment strategies and traders, and their impact on market dynamics. Blume and Easley (1992, Part II Chapter 1) studied wealth fows between investors and found that ft rules need not be rational and rational rules need not be ft. In the context of trading with market

fuctuations all of which slows the progression to effciency. He went so far as to argue that the timescale for effciency is years to decades. Brock et al. (2005, Part II Chapter 8) modeled the

traders can have a signifcant impact on asset prices even when their wealth becomes negligible.

fnancial market data and laboratory experiments with human subjects. Sugihara et al. (2012, Part II Chapter 10) studied causal networks in complex ecosystems including fnancial markets.

Psychological and physiological effects in fnancial traders and stock markets have also been

that sunshine is signifcantly positively correlated with stock returns, which is diffcult to

emotional responses to price fluctuations cause financially ruinous biases, and it has been documented that even the most seasoned trader exhibits significant emotional response, and

Biological analogies in the theory of the firm can be traced back to Alchian (1950, Part I Chapter

selection mechanism in firms and argued that it only supports the profit-maximization

equilibrium as profit maximization, even if firms behave irrationally. More recently, Darwinian

which includes economic behavior; hence, the emerging field of behavioral genomics. In the

series of studies on the neural basis of decision making, giving rise to the new field of

specific types of financial choices (Kuhnen and Knutson 2005, Part II Chapter 18), and highlight

mathematical prescriptions for how to make a decision, and then identified neural substrates

out that by exploring the neuroscientific basis of cognition and behavior, including fear and greed, we may be able to identify more fundamental drivers of financial crises and improve

making. In the context of the "ultimatum game," men who rejected low offers had significantly

is difficult to reconcile with the standard view of economic rationality where any positive offer

trading floor, a trader's morning testosterone level predicted his day's profitability, and his

campus, salivary testosterone levels were significantly correlated with Zuckerman's sensation-

in the context of both bridge and financial gambles (Dreber et al. 2011, Part II Chapter 30).

a fifth and a third of the variance in stock market participation and asset allocation among

4 gene were significantly more risk loving

R−

biases including the lack of diversi f cation, excessive trading, and the disposition effect can be

5 Conclusion

Upon deeper re f ection and introspection, the close connections between biology and economics

product of natural selection than f at money, property rights, and derivative securities.

In fact, the biggest barrier between the f elds of biology and economics is the "physics envy"

and economics – both f elds will be the richer from such engagement. Biology is messier and

Acknowledgments

agency, any of their af f liates or employees, any of the contributors to this volume, or any of

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