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Contents

PART I FOUNDATIONS

VII

58

20

XXXIII

PART II SOCIOBIOLOGY

7

46

5

17

24

53

314

82

PART III EVOLUTIONARY PSYCHOLOGY AND BEHAVIORAL ECOLOGY

74

4

181

30

68

84

9

106

106

1

PART IV THE BIOLOGICAL FOUNDATIONS OF UTILITY

80

84

68

XXXIX

70

99

111

PART V RATIONALITY AND INTELLIGENCE

69

7

108



Acknowledgements

181
314
80
84
84
84
XXXIII
XXXIX
16
16
99
157
5
7
VII

7

17

68

7

30

68

24

53

90

106

106

111

69

108

4

9

58



20

46

82

70



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 first concerted attempts to apply evolutionary principles to the study of human behavior ecology, with many interrelated connections within each of these fields.

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

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

These ideas from sociobiology were subsequently subsumed by the fields of behavioral ecology of probability matching in fish (Behrend and Bitterman 1961, Part I Chapter 14) and pigeons

3 Economic Sciences

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 refinement of the Nash equilibrium that is stable

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

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

Efficient Markets Hypothesis with behavioral economics: the neoclassical models of rational rationality – loss aversion, overconfidence, overreaction, and other behavioral biases – are, in

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

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

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

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

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

that sunshine is significantly positively correlated with stock returns, which is difficult 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

4 Neuroscience, Hormones, and Genomics

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

R- 4 gene were significantly more risk loving

biases including the lack of diversification, excessive trading, and the disposition effect can be

5 Conclusion

Upon deeper reflection and introspection, the close connections between biology and economics product of natural selection than fat money, property rights, and derivative securities.

In fact, the biggest barrier between the fields of biology and economics is the “physics envy”

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

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agency, any of their affiliates or employees, any of the contributors to this volume, or any of

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| 4. | J. , A. D. (2003), B :A AD C , ,BE (1), ,324 43 | 96 |
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| 9. | A . ,D . B . (2005), F G F :AC D - , B@ (2), ,352 9 | 226 |
| 10. | G , ,H ,C - H ,E D , F (2012), D C C E , ,EEA\$(6106), , 496 500 | 234 |
| 11. | A . (2012), A , CA (2), A ,18 29, E | 239 |

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