EXPERIMENTAL BUSINESS RESEARCH

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Preface

This volume includes papers that were presented at the First Asian Conference on Experimental Business Research held at the Hong Kong University of Science and Technology (HKUST) on December 7–10, 1999. The conference was organized by the Center for Experimental Business Research (cEBR) at HKUST and was chaired by Amnon Rapoport. The organizing committee members were Paul Brewer, Soo Hong Chew, and Rami Zwick. The papers presented at the conference and a few others that were solicited especially for this volume contain original research on individual and interactive decision behavior in various branches of business research including, but not limited to, economics, marketing, management, finance, and accounting.

The impetus for the conference, reflected in the mission of cEBR, is to promote the use of experimental methods in business research, expand experimental methodology through research and teaching, and apply this methodology to solve practical problems faced by firms, corporations, and governmental agencies. Three agendas have been proposed to accomplish this mission: research, education, and networking and outreach programs. The conference organized by cEBR and the resulting volume contribute in various degrees to all three agendas by presenting original research ideas in the field of business to a wide audience, fostering stronger ties among researchers, and enhancing communication between researchers and industry representatives.

Richard Feynman, one of the leading theoretical physicists of the twentieth century, wrote: "The principle of science, the definition, almost, is the following: The test of all knowledge is experiment. Experiment is the sole judge of scientific 'truth'." In today's postmodern approach this might seem to be an old-fashioned view. Nevertheless, we accept it as self-evident, and proceed on what might be considered a naïve faith in the contribution of experiments to science. We make a few introductory comments below about the place and role of experimentation in the social sciences. More comprehensive discussions of this issue can be found in Kagel and Roth (1995) and the various references in the present volume.

Experimental methods have played a critical role in the natural sciences. From the beginning of the 20th century, in an attempt to achieve scientific legitimacy, social scientists have believed that progress could be achieved by embracing the experimental methodology advocated by the natural sciences while abandoning the subjective, introspective methodology that was so common earlier. Ignoring the debate whether it is appropriate to base the social sciences on the foundations erected by the natural sciences, experimental methodology is now as common in the social sciences as in the natural sciences.

Progress in adopting the experimental methodology has been uneven. Several social science disciplines, most notably psychology, have embraced the experimental methodology enthusiastically. Experiments presently constitute a central part of theory development and testing in these disciplines. Mastering the experimental methodology, including experimental design, data analysis, and reporting represent a major effort in educating graduates and postgraduate students in these fields. Other social science disciplines, most notably economics, have been more reluctant to adopt the experimental methodology. The different attitudes toward experimentation within the various disciplines of social science reflect the scientists' evaluation of the status of their field vis-à-vis the nature of the inquiry. If the scientific inquest relates to how people should behave under well specified conditions, including goals and beliefs of self and others, then no experimental evidence can provide any deep insight, except for the observation that people follow or do not follow the normative prescription. On the other hand, if the goal of the scientific inquiry is to understand the underlining reasons why people do, or do not, follow normative principles and to uncover systematic and replicable patterns of behavior, then experimental evidence is essential. Fields of social science that perceive their main domain to be normative and prescriptive have been slower to adopt the experimental methodology. Only when these fields have come to recognize that no meaningful prescription is possible without understanding the human cognitive system that experimental methodology has assumed it rightful status.

Academic business professors often seem to exhibit schizophrenic symptoms in the practice of their discipline. Perhaps these symptoms may better be described as multiple personality disorders because the schism in schizophrenia is a split with reality. The person in active schizophrenia has lost touch with reality, whereas the schism in the business disciplines is exactly the awareness that reality does exist and by the nature of the inquiry must be relevant. The various business disciplines are invariably described as scientific, professional, applied, and concrete. We provide professional education that contains management principles and offers basic tools for practicing them. We teach theory, develop abstract principles, and at the same time advocate concrete practices that businesses can emulate. We espouse ideas that originated

in a wide gamut of fields from the natural sciences to spirituality, and teach from books that are labeled "The art and practice of . . ." and "The art and science of . . ." We quote from both hard-core scientists, and feel equally justified borrowing from motivational speakers and management gurus. We teach concepts that have achieved religious-like status such as reengineering, total quality, and CRM, and at the same time teach game theory and equilibrium concepts. No wonder that some business professors struggle daily to assert their identity.

We believe that the experimental methodology can provide partial relief to these split personality syndromes. Experiments can provide the link as well as the justification for the scientific inquiry in the business discipline. To support this argument, let us first briefly describe the main ingredients commonly found in business experiments. The first is the environment, which specifies the initial endowments, preferences, goals, and costs that motivate the decision-makers. Second, an experiment also uses an institution, which defines the language (messages) of market communication (e.g., bids, offers, prices, rejections, acceptances), the rules governing the exchange of information, and the rules under which messages become binding contracts. These institutions are typically implemented by instructions that are commonly computer-controlled. Finally, there is the observed behavior of the participants as a function of the environment and institution that constitute the experimental variables (Smith, 1994).

Each of the three components of the business experimental setting constructs and at the same time confirms the link between reality and the stylistic experimental environment. The direct relevancy of the findings is judged vis-à-vis the assumptions about the environment and the institutions. This is not to say that experiments that investigate an environment or study an institution that does not exist outside the realm of the experiment are not relevant or important. On the contrary, such findings can often point out possibilities that have not been taken advantage of. The question is not whether or not such an environment or an institution already exists, but rather whether it can exist. If the answer is positive, the informational value of the study can often exceed that of a study that explores an existing setting.

Using this framework, several prominent reasons for conducting business experiments have been forwarded. First, several of the important roles of experimentation involve its relation to theory. Experiments may provide evidence in support of a theory, refute a theory, hint to the mathematical structure of a theory, and serve as evidence presented by researchers to the scientific community when two or more theories are competing to explain the same phenomenon. This is accomplished by comparing the behavioral regularities to the theory's predictions. Examples can be found in the auction and portfolio selection literature. Second, business experiments have been conducted to explore the causes of a theory's failure. This exploration is essential to any

research program concerned with modifying a theory. Examples are to be found in the bargaining literature, accounting literature, and literature on the provision of public goods. Third, although experiments often take their importance from their relation to theory, they often have a life of their own, independent of theory. Because well-formulated theories in most sciences tend to be preceded by systematically collected observations, business experiments can and have been used in order to establish empirical regularities as a basis for the construction of new theories. These empirical regularities may vary considerably from one population of agents to another, depending on a variety of independent variables including culture, socio-economic status, previous experience, expertise of the agents, and gender. Fourth, experiments can be used to compare environments, using the same institution, or compare institutions, while holding the environment constant. Fifth, perhaps less known is the use of experiments as a testing ground for institutional design. For example, Smith (1994) mentions early experiments that studied the one-price sealed bid auction for Treasury securities in the USA, which subsequently helped motivating the USA Treasury in the early 1970's to offer some long-term bond issues. Experiments can and have also been used to evaluate policy proposals. Examples can be found in the area of voting systems, where different voting systems are evaluated experimentally in terms of the proportion of misrepresentation of the voter's preferences (so called "sophisticated voting"). In the past decade, both private industry and governmental agencies in the USA have funded studies of the incentives for off-floor trading in continuous double auction markets, alternative institutions for auctioning emissions permits, and market mechanisms for allocating airport slots. Six, experiments have been used as demonstrations to communicate with the non-academic world, in a way that theorems about equilibrium behavior, for example, can not do. As new markets are designed, experiments will have a natural role to play as scale model tests of their operating characteristics, and even as demonstrations to skeptical patrons and potential users. Finally, there is now ample evidence that learning through experimentation is a very effective way of acquiring new concepts and procedures and gaining insights into business processes. Consequently, gaming and experimentation are now common in MBA and executive education worldwide.

At the same time, there is an extensive and long tradition of using experiments to guide business decisions in various industrial functions in the private and public sectors, most notably in marketing, independent of the academic inquiry. For example, testing a range of creative executions and media scheduling in different test markets often precedes introduction of a large-scale advertising campaign, and a new product introduction and corresponding pricing decisions are made with the help of laboratory and field experiments. These experiments that are performed for purely utilitarian purposes are nev-

ertheless not devoid of theory. The researcher presumes understanding of the underlining forces that would make, for example, an advertising campaign attractive and persuasive, or a desirable product often direct the researcher to narrow down the set of theoretically infinite versions to a manageable number of levels to be manipulated experimentally.

The interplay between testing and experimentation is not unique to the business discipline. Although the physics of flying is relatively well understood, no pilot would feel safe to fly an airplane that has not been extensively tested in wind tunnel. Similarly, firms can maximize their learning by testing several different approaches in small-scale experiments. By evaluating radical ideas through an interactive process of prototyping, testing, and refinement, companies can successfully manage the risk of future endeavors. Experiments in this sense are the scouting units of the company, pointing dead ends and suggesting alternative and attractive (profitable) new paths to pursue. Business experiments can range in scope from small lab studies with few participants to a large field study that is virtually the "real thing" except limited in scope along geographical, demographic or other relevant variables. Generalizability and control are, of course, the variables the researchers trade off when determining the scope of their study.

Several previous conferences and edited books such as "Games and Human Behavior" edited by Budescu, Erev, and Zwick (1999), or the proceedings of the conference on the behavioral foundations of economic theory held in 1985 in Chicago (Hogarth & Reder, 1986) have explored the different perspectives of economic and psychology on human decisions in individual and interactive contexts. One of the main issues for comparison was the differences and similarities between economics and psychology with regard to the use of experiments. This issue seems to be well understood, and numerous articles have been written on this subject (for a recent review see Hertwig & Ortmann, 2001). We find it interesting that echos of this dichotomy can be heard within the various branches of the academic business disciplines, where the more psychological oriented disciples of marketing, organizational behavior, and to a lesser extent accounting adopted the experimental methodology quite early and mimicked, for the most part, the experimental psychology tradition. On the other hand, economics and to some extent finance, have developed the experimental methodology along independent lines. Similar to the benefits derived from integrating economic and psychological approaches to experimentation, we believe that it is important to open a line of communication among experimentalists within the various academic branches of business administration. The present volume is step in this direction.

This volume includes 16 chapters coauthored by 37 contributors. The authors come from many of the disciplines that correspond to the different

departments in a modern business school. In particular, the chapters represent different experimental approaches in accounting, economic, marketing, and management. The book is organized in four sections: six chapters on co-ordination and dynamic decision-making, four chapters on auction, three chapters on learning and constructions, and three chapters on bargaining and contracts. They are all unified not by their themes but by the experimental methodology.

This volume should be viewed as work in progress rather than a state of the art summary, or a guide for future research. The conference and the resulting book were designed to provide a place for intellectual exchange of ideas between experimentalists within the various business disciplines. We hope that the exposure we provide for the experimental method in business will inspire the reader to pursue the method and take it to new heights.

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Rami Zwick and Amnon Rapoport
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