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Stealing Second Base

Expected utility theory was the dominant paradigm used by economists and management scientists to explain decision making under risk in the decades following Von Neumann and Morgenstern's path-breaking work. Expected utility theory suggests that individuals accurately calculate the rational choice from available information. However, when decision situations are complex, when decisions must be made quickly, or when the information needed to calculate rational choices is not available, an individual's cognitive processing becomes simplified and the likelihood of making a decision consistent with rationality is reduced.

The early work that attempted to identify how such decisions are made did not identify how judgments will be biased. However, as a result of a series of lab studies, researchers discovered systematic biases that influence judgment. This body of literature, known as prospect theory, suggests that decision makers rely on simplifying mechanisms called heuristics, or mental short cuts, as ways to cope with complex information. While heuristics can help lower the cost of decision making, their use can lead to systematic biases.

Lab studies offer such benefits as enhanced control over extraneous variables, more precise operationalization of key constructs, and increased validity of conclusions concerning cause and effect relationships, but these studies do have their own weaknesses. One concern with lab studies is that subjects might not have sufficient experience to assess the circumstances of the decision situation accurately. Another concern is that subjects in lab studies may take decision scenarios less seriously than might be expected in actual business situations, given that the simulated lab environment often insulates decision makers from bearing the full consequences of their choices. In addition, subjects in lab studies are often presented with more precise and well-defined decision alternatives than they are likely to confront in real-life settings. Accordingly, although lab studies provide valuable insights into decision making, it is useful to supplement these findings with research from field settings.

Most studies of risk taking and prospect theory have been conducted at the organizational level of analysis. While organizational level risk taking studies have many benefits, such studies rely on average or aggregate data reflecting numerous decisions by many individuals made over long periods of time. Thus, specific decision scenarios are rarely analyzed. Prospect theory, however, is a theory about individual decision making, so application of the theory to the organizational level must be done with caution.

Field studies that explore decision making at the individual level often focus on gambling. Studies of gambling behavior are interesting in their own right, but shed little light on business decision making under uncertainty. Continued gambling is expected to result in a net loss to the individual gambler. Business decisions may have the opposite effect. Gamblers generally have a strong desire to return to the gambling table even though their past experiences have been negative. In contrast, business investments are eventually redirected when continued losses are experienced in a given venture. Moreover, gamblers receive intrinsic benefits from the act of gambling, even though their expected net monetary outcome is often negative. Conversely, business decisions are not made for their intrinsic utility, but for their expected profits.

Our understanding of individual based decision making under risk can be enriched by designing field studies to supplement and complement the findings of extant lab-based research. A paper by ***PERC* Research Fellow** Asghar Zardkoohi (Working Paper #0509), with co-authors Albert Cannella, Michael Holmes, and Michael Pustay, presents a field study that allows the authors to directly compare the predictions of expected utility theory and prospect theory.

The subject of their study is the decision of baseball managers to order their players to steal second base. In particular, they studied the decisions of managers of baseball teams to steal second base when offered the opportunity to do so in regular season games during the 1985 through 1992 seasons. Under the assumption that the ultimate objective of the manager is to win the game, the authors theoretically identify situations where expected utility theory predicts that stealing base would be the rational choice and utilize prospect theory to explain an alternative set of choices.

Psychology-based theories of decision-making—most notably prospect theory—are increasingly challenging the expected utility theory models as explanations and predictors of economic behavior. However, most of the empirical studies attempting to distinguish between prospect theory and expected utility theory have relied on lab studies. In this paper, the authors examine the actual decisions of baseball managers in a field setting. Their analysis suggests that if managers based their decisions on the dictates of expected utility theory, then managers of visiting teams would be more likely to attempt to steal if the game was tied, particularly in later innings. Similarly, managers of home teams would be more likely to steal if their team was behind, again particularly in later innings. However, the authors found that, *ceteris paribus,* managers are more likely to order their runners to steal if the team is ahead in the game. Moreover, this tendency increases as the team's lead increases but declines as the game progresses. Such findings are inconsistent with the predictions of expected utility theory but are consistent with prospect theory, the endowment effect, and regret theory.

Risk and Return

The relationship between the return on an asset and its variance, as a proxy for risk, is an important topic in financial research. Theoretical asset pricing models typically link the return (or the price change) of an asset to its own return variance, or to the covariance between its return and the return on the market portfolio. However, the determination of whether such a relationship is positive or negative has been controversial. Most asset pricing models postulate a positive relationship between a stock portfolio's expected returns and volatility. On the other hand, there is also a long tradition in finance that models stock return volatility as negatively correlated with stock returns. Furthermore, some have argued that across time, there is no theoretical agreement about the relationship between returns and volatility within a given period of time and that either a positive or a negative relationship between current stock returns and current volatility is possible.

Numerous empirical studies have been conducted to investigate the relationship between stock market returns and volatility. The findings of early studies are mixed. Inference from early studies may not be reliable because the studies do not make efficient use of the data. More recent studies have typically used Generalized Autoregressive Conditional Hertero-scedasticity (GARCH)-in-Mean models to allow for volatility to be time-varying. Surprisingly, most find an insignificant relationship between returns and conditional variance in international stock markets. Although a significant positive relationship between US stock market returns and the conditional variance of these returns has been documented by some, others report that such a positive relationship is weak and almost nonexistent. More recently, a positive but insignificant relationship between stock market returns and the conditional variance in many other international stock markets has been found. Obviously, the empirical findings remain inconclusive.

The finding of an insignificant relationship appears puzzling. Though a significant impact of volatility on the stock prices can take place only if shocks to volatility persist over a long period of time, it is well documented that stock

market volatility is persistent. Hence, many of the previous studies challenge the appropriateness of using the conditional variance (as modeled by a parametric GARCH process) to proxy for risk and attribute the finding of the weak relationship to the lack of a proper measure of risk. In view of the above mixed results, a recent paper by ***PERC* Research Fellow** Qi Li, along with co-authors Young-Jae Chang, Cheng Hsiao, and Jian Yang, uses a flexible semiparametric specification of conditional variance to examine the relationship between expected returns and volatility in twelve major stock markets (Working Paper #0501). The use of a flexible functional form for conditional variance is appealing because estimation of a parametric GARCH-M model is sensitive to model misspecification. Consistent estimation in the GARCH-M model requires that the full model be correctly specified. In contrast, a semiparametric specification of the conditional variance allows flexible functional forms, and therefore can lead to more reliable estimation and inference. The authors propose a semiparametric test for testing the null hypothesis of zero GARCH-M effect. The simulation results show that the proposed test has good finite sample performance compared with a parametric test based on Exponential -GARCH (EGARCH) specification.

The authors also present an empirical analysis and show some evidence that a significant negative relationship between (current) stock market returns and (current) market volatility prevails in most major stock markets, which has not yet been reported in the literature.

The authors show that the estimated relationships between return and volatility are sensitive to the way volatilities are estimated. When parametric EGARCH-M models are estimated, they obtain results that are similar to previous findings. Ten out of twelve markets exhibit a positive but statistically insignificant relationship. On the other hand, using a flexible semiparametric specification of conditional variance, the authors show that negative relationships between returns and volatility prevail in most of these markets. Moreover, the negative relationships are significant in six markets based on the whole sample period and seven markets after the 1987 international stock market crash.

Given the fact that the semiparametric specification is more robust than a parametric conditional variance specification, the result of this study lends some support to the claim that stock return volatility is negatively correlated with stock returns. One explanation of such a negative relationship is based on leverage. A drop in the value of the firm's stock (negative return) increases financial leverage used by the firm and its debt-to-equity ratio, which makes the stock riskier and increases its volatility.

Another explanation based on volatility feedback suggests that if volatility is priced, an anticipated increase in volatility raises the required return on equity, leading to an immediate stock price decline (negative return). The authors' results contradict the prediction of a positive relation made by many asset pricing models and the empirical finding of an insignificant relationship consistently reported in the previous literature.

The findings of this study have some important implications. For example, the negative relationship between market volatility and expected market return implies that the time-varying risk premium theory is not a valid explanation of stock market behavior. Further investigation may be conducted on whether such a negative relationship is time-varying and also prevails in emerging stock markets. It is also of interest to examine whether different explanations exist for such a negative relationship in international stock markets. For example, the explanations based on leverage effects and volatility feedback may explain the negative (contemporaneous) relationship between stock returns and volatility but carry different implications for causality between the returns and volatility. Future research may also employ the semiparametric specification of conditional variance used in this study to explore other topics concerning the relationship between mean and conditional variance, such as that between inflation rate and inflation volatility.