

TERRORISM FUTURES: A VIABLE DECISION-MARKET TOOL

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ABSTRACT

This paper examines and thereafter models “terrorism futures,” recently created by the U.S. Pentagon but subsequently terminated when revelation of their existence caused a sharp congressional outcry. The termination is regrettable because this type of market – commonly referred to as a “decision market” – has proven itself to be a consistent and accurate predictor of future events. Using this “decision support” tool to predict potential acts of terrorism, and thereafter deter (or, at least, hedge against) such acts, would have enormous social utility.

Introduction

The U.S. Pentagon recently created a “terrorism futures” market but subsequently terminated it after revelation of its existence caused a sharp congressional outcry. The termination is regrettable because this type of market – commonly referred to as a “decision market” or a “decision support market” – has proven itself to be a consistent and accurate predictor of future events. Needless to say, the ability to predict potential acts of terrorism, and thereafter deter (or, at least, hedge against) such acts, would have enormous social, political, and economic utility.

This paper examines the terrorism futures market and attempts to ascertain the ability of such a market as a “decision support” tool to actually reveal planned acts of terrorism. The paper is organized as follows.

The next section traces the evolution of decision markets from original concept to current practice. The section thereafter reviews the ability of such markets to actually predict future events. Finally, the mechanics of decision markets are explained, particularly with respect to terrorism futures.

Decision Markets

Decision markets – also known as “prediction markets” – are not new. The concept traces its origin to at least the 1600’s. Debus [3] examines science and education in the 17th century and finds that scientific research at that time was essentially a “medieval guild” in which a few powerful universities held a monopoly on research (subjects, methodologies, researchers, etc.), ignoring the work of outsiders who were not part of their inner circle. Many of these outsiders argued that their theories should be judged by empirical observation, and not by whether or not their theories agreed with the “prevailing wisdom” of the inner circle. In an attempt to dismantle this research monopoly, 17th-century chemical physicians – outsiders at the time, and thus barred from teaching in British medical schools -- proposed the following wager:

“On ye Schooles...Let us take out of the hospitals, out of the camps, or from elsewhere, 200 or 500 poor people, that have fevers, pleurisies, etc. Let us divide them into halfe, let us cast lots, that one halfe of them may fall to my share, and the other halfe to yours;...we shall see how many funerals both of us shall have; But let

the reward of the contention or wager, be 300 Florens, deposited on both sides: Here your business is decided.”

(c. 1651, as cited by Debus [3].)

Surprisingly, this suggested methodology lay dormant for more than three centuries until the late 1900's. In 1988, the Iowa Electronic Markets -- perhaps the most famous of the various decision markets -- was established to predict U.S. election outcomes and, later, U.S. monetary policy. The Foresight Exchange was founded in 1990 to predict, literally, anything. The NewsFutures Exchange is another “comprehensive” decision market in which participants try to predict the outcome of any event -- political, economic, scientific, cultural, athletic, and so on, including many trivial and frivolous issues.

TradeSports and the Athletic Exchange are decision markets in which participants try to predict, respectively, the outcomes of sporting events and the performance of athletes. The Hollywood Stock Exchange trades both “stocks” and “bonds.” More specifically, “Movie Stocks” are pegged to the box-office success of movie releases, while “Star Bonds” are tied to the future success of movie stars.

Trading in all of these markets is conducted online with either real money or artificial money (with real-cash prizes often accruing to the latter). These markets (several of which are discussed below) and their respective web sites can easily be accessed by conducting a search on the terms “decision markets” and prediction markets” using an internet search engine such as google.

Predictive Ability

The predictive ability of these markets is impressive. (The mechanics of decision markets are discussed in the following section.) It's well known -- see, for example, Dobbs [4] -- that the Iowa Electronic Markets have successfully predicted every U.S. presidential election since their inception in 1988. Moreover, Berg, Nelson and Rietz [2] and Forsythe, et al [5] find that that the IEM consistently predicts the percentage of votes garnered by the major candidates in each election more accurately than any other existing alternative, including polls and expert opinion. Plott [10] finds similar results for experimental decision markets.

Surowiecki [13] reports that Hollywood Stock Exchange (HSE) traders predict the opening weekend revenues of movies more accurately than even the movie industry's own official forecasts. At the 2003 Academy Awards, HSE traders successfully predicted 35 of the top 40 Oscar nominees.

Dobbs [4] and Surowiecki [13] report that Hewlett-Packard uses decision markets for its unofficial sales forecasts. Selected H-P employees buy and sell “sales futures” according to what they think H-P's future sales will be. Impressively, H-P's decision markets have outperformed the company's official forecast 15 out of 16 times.

An April, 2003 report by Credit Suisse First Boston found that decision markets have “proven to be uncannily accurate” in predicting all types of events. (As cited in the *Wall Street Journal*, July 30, 2003, p. C1.)

Given a proven track record of successful predictions, the critical question becomes, Why are decision markets able to predict so well? One explanation is repeatedly cited in the literature. Surowiecki [13], Berg and Rietz [1], Plott [10], Hanson [8], and Forsythe and Lundholm [6] point out that decision

markets are highly efficient at aggregating information very quickly from around the world, thus tapping into the collective wisdom of knowledgeable people everywhere, including insiders. Berg and Rietz [1] further note that the information in decision markets is continually updated by the free-market pricing process – unimpeded, as Sorowiecki [13] points out, by political pressures and personal agendas

The Mechanics of Decision Markets

Plott [10] and Forsythe and Lundholm [6] model prediction markets within the context of “rational expectations.” In essence, decision markets operate just like pari-mutuel horse races. Anyone in the world can enter a “claim” in a prediction market, and bettors will thereafter bet for or against the particular claim. A claim is simply a statement that something will happen by a certain date.

Typically, a claim in a decision market pays \$1.00 if the claim comes true, and \$0.00 otherwise. Since the \$1.00 payoff in a decision market represents 100% probability (i.e., certainty), and \$0.00 payoff represents no probability, the cost of a claim in a decision market is interpreted as the market’s estimated probability of a particular claim coming true. (For an elaboration on this subject, see Hanson [7].)

Terrorism Futures

The terrorism futures market created by the U.S. Pentagon would have operated in the same manner as the Foresight Exchange and Iowa Electronic Markets, as explained above. The market, officially known as the Policy Analysis Market (PAM, online at www.policyanalysismarket.com), was established to be a joint venture between the Pentagon and two private companies: 1) Net Exchange, founded privately by several California Institute of Technology (“Cal Tech”) faculty members, and 2) the Economist Intelligence Unit, which is the business-information division of the *Economist* magazine.

By design, the Net Exchange would conduct the actual trading of terrorism futures, while the Economist Intelligence Unit would essentially act as the sole registered member of this exchange, executing trades for anyone. The Pentagon would not have had access to the traders’ identities or funds.

Claims were to be traded on political, economic, civil, and military events in Iraq, Saudi Arabia, Iran, Egypt, Jordan, and Turkey. Any trader could nominate any possible event, such as the assassination of a prominent political figure. Examples given at PAM’s web site include the assassination of Yasser Arafat, and a biological-weapons attack on Israel. All claims had to set a completion date by which the event was to occur. Trading was supposed to begin on October 1, 2003, and the Pentagon estimated that, eventually, approximately 10,000 traders would buy and sell contracts in this market. In order to ensure that terrorists could not use PAM to earn huge profits by creating a particular claim, betting on it, and then making it come true, the Pentagon intended to limit traders to \$100 per contract.

The underlying idea, of course, was that this market would flush out information otherwise unavailable, tipping off the Pentagon to planned and/or potential acts of terrorism. Presumably, the Pentagon intended to eventually grow this market to allow claims in other parts of the world, including the U.S. which, currently, is a prime target for terrorists. Statistically, claims whose spread

values were high (say, significantly greater than .50) would indicate a planned act of terrorism, while rapidly rising spreads would suggest impending terrorism.

When existence of this market was made public in late July, 2003, the U.S. Congressional outcry was swift and sharp. Senators and representatives alike denounced the program as “repugnant,” “morally wrong,” and “unbelievably stupid.” (Dobbs [4]), as well as “ridiculous” and “grotesque.” (*USA Today*, July 29, 2003.) The Pentagon responded by immediately canceling the program. Further, its creator, retired admiral John Poindexter, tendered his resignation.

As stated in the introduction to this paper, the termination of this program is regrettable. Decision markets such as this one have a proven record of successfully predicting events of all types. Needless to say, the ability to predict potential acts of terrorism, and thereafter deter (or, at least, hedge against) such acts, would have enormous social utility.

Conclusion

Given the proven ability of decision markets to predict outcomes, coupled with the significant social/political/economic desire to eradicate or at least abate terrorism, it's most likely just a matter of time before some private concern such as an independent think tank – not subject to Congressional funding or pressure – recreates this market. In fact, the *modus operandi* of this market has already been structured and is currently in place. The only variable missing is for some private concern to replace the Pentagon in its joint venture with Net Exchange and the Economist Intelligence Unit. Such a market would be a small monetary investment with, potentially, huge returns, i.e., the benefit/cost ratio of this market is simply too high to ignore.

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