

Abstract of the articles

RISK, UNCERTAINTY, PROBABILITY

IVÁN BÉLYÁ CZ

This paper attempts to find the answer in the framework of risk – uncertainty – probability to the question: what potential was created by the numerical problems of risk and probability in economics and financial economics, in laying the theoretical foundation of time-related investment decisions.

By the beginning of last century it became obvious for economic theorists, that at economic decision-making one fairly often does not have perfect and complete information about future consequences of decisions. One outcome of this recognition was to accept the role of probability. Gradually, it was proved that in theory only subjective probability was acceptable for financial economic decision – making, but because of lack of precise calculations its theoretical significance is greater than its practical applicability. Knight had a seminal role in examining the theoretical implications of risk – uncertainty – probability. Keynes was one of those great economic theorists who emphasized the significance of the uncertain nature of the future in decision – making. In Keynes's system uncertainty appeared in two contexts: on one hand as the apparent uncertainty of the economic environment, on the other hand the uncertainties of our cognition and understanding reality. The portfolio analysis that is bound together with Markowitz's name was a major step forward in analyzing economic risk. Treatment of the problems of risk radically changed with Markowitz both in theory and praxis. After the philosophical and psychological probability debates of the previous years, and the discussions about objective versus subjective choice, possibility of reducing risk, optimalization of portfolios on risk – return basis came to the fore, but problems of calculation of risk also remained on the agenda. Samuelson and his followers came very near to the recognition that became evident after the breakthrough of the methodology of option pricing. Black and Scholes formalized the stochastic process that describes the future course of share prices. Financial economics and economics found a solution to the dilemma of the cognizability of future outcomes: the stochastic model created by them describes share price generating processes.

SOME REMARKS ABOUT UNCERTAINTY, RISK AND PROBABILITY

PÉTER MEDVEGYEV

In the article the author presents some remarks on the application of probability theory in financial decision making. From mathematical point of view the risk neutral measures used in finance are some version of separating hyperplanes used in optimization theory and in general equilibrium theory. Therefore they are just formally a probabilities. Their interpretation as probabilities are misleading analogies leading to wrong decisions.

ARBITRAGE, ATTITUDE TOWARDS RISK AND THE FUNDAMENTAL THEOREM OF ASSET PRICING

TAMÁS BADICS

Although it is well known that the no-arbitrage condition assumes only the monotonicity of the investor's preferences, the implicit restrictions to investors' preferences emanating from the conditions of no free lunch and no free lunch with vanishing risk are less clear. Using the so called no market free lunch concept, introduced recently by Frittelli, one can not only carry out a formal analysis of the relationship between preferences and the concepts of arbitrage but can also offer a brand new, economic interpretation of some of the classical and profound mathematical theses of mathematical finance.

PROBABILITY, CHANCE, RELATIVE WEIGHTS

JÁNOS SZÁZ

There is a long debate (going back to Keynes) how to interpret the concept of probability in economics, in business decisions, in finance. Iván Bélyácz suggested that the Black–Scholes–Merton analysis of financial derivatives has a contribution to this risk vs. uncertainty debate. This article tries to interpret this suggestion, from the viewpoint of traded options, real options, Arrow–Debreu model, Heath–Jarrow–Morton model, insurance business. The article suggests making clear distinction and using different naming

- when the frequents approach and the statistics is relevant,
- when we just use consequent relative weights during the no-arbitrage pricing, and these weight are just interpreted as probabilities,
- when we just lack the necessary information, and there is a basic uncertainty in the business decision making process.
-

The paper suggests making a sharp distinction between financial derivatives used for market risk management and credit risk type derivatives (CDO, CDS, etc) in the reregulation process of the financial markets.

RISK – A LATENT CONCEPT

ERZSÉBET KOVÁCS

From statistical point of view risk, like economic development is a latent concept. Typically there is no one number which can explicitly estimate or project risk. Variance is used as a proxy in finance to measure risk. Other professions are using other concepts for risk.

Underwriting is the most important step in insurance business to analyse exposure. Actuaries evaluate average claim size and the probability of claim to calculate risk. Bayesian credibility can be used to calculate insurance premium combining frequencies and empirical knowledge, as a prior. Different types of risks can be classified into a risk matrix to separate

insurable risk. Only this category can be analysed by multivariate statistical methods, which are based on statistical data. Sample size and frequency of events are relevant not only in insurance, but in pension and investment decisions as well.

THE RISK APPEARING IN FINANCIAL DERIVATIVES

BARBARA DÖMÖTÖR

The modeling and management of financial risks became one of the most important topics of the last decade both in theory and financial practice. The mismanagement of financial risks can be mentioned among the reasons contributing to the eruption of the recent crisis. In order to use successfully the methodology of mathematics and physics in pricing of derivatives, we have to consider the assumptions and limits of the models. This paper introduces the main concepts – no arbitrage pricing and risk neutral valuation – in derivatives' pricing, then presents and quantifies the risk of some derivative products. I am arguing that the assumptions of the Black–Scholes and Merton model are injured at several points, so the pricing can not be perfectly cleared from all the risk preferences. All those risks, deriving from the difference of the reality and the model are priced in the volatility parameter in the practice.

RISK, UNCERTAINTY AND MODEL RISK FROM A RISK MANAGEMENT POINT OF VIEW

BÉLA KREKÓ

This paper is a direct response to P. Medvegyev's and J. Száz's paper in this volume. The author's views are primarily based on practical modelling experience and related philosophical discussions. The main point is, that in the author's view risk (repeatable stochastic mass events which can be handled by probability theory and statistics) and uncertainty (no repetition, no mass events, subjective probability only, if any) are only the boundaries of a continuum between these two extremes. In almost any practical problems in economy and society (even if we have a large amount of data) there is a certain level of inherent uncertainty (is the problem tractable by probability theory, will our statistical findings be valid in the future, etc). And the level of uncertainty increases as the amount of available data decreases. Various techniques are used to offset uncertainty: parallel models, benchmarks, structured human overrule, human judgement, etc.

Credit scoring systems are a good example for that: retail mass products (e.g. mortgage) can be typically handed by almost purely statistical scoring systems; large corporates are typically scored by hybrid systems (a statistical base enriched with human judgement), while countries are typically scored on a subjective basis (using certain quantitative elements).

So we have keep in mind that model risk is inherent in these applications (the less data the more risk). Ongoing monitoring and challenging are the most important tools to control this type of risk.