FINANCIAL INNOVATIONS AND THEIR EFFECTS ON THE DERIVATIVES MARKETS

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The past decades have witnessed a large number of important financial innovations, such as derivatives, risk transfer products, exchange traded funds, and different forms of tax-deductible equity. The process of “financial innovation” includes changes in financial instruments, institutions, practices and markets. For this reason, financial innovation has an important influence on the risk management, on financial markets and on the world economy. In this paper, the relationship between financial innovations and the development of derivatives markets is examined. How financial innovation occurs and what are the implications of it on the derivatives markets for long-term are analyzed. Particular emphasis is given on the extent to which financial innovation is spreading financial risks more widely.

Key words: financial innovations, derivatives, financial risks, risk management.

1. Introduction

The last twenty five years have seen dramatic changes in the global financial system and another wave of innovation in finance. The most dramatic developments in the global financial system are the enormous growth in instruments for risk transfer and risk management, the growing role played by non-bank financial institutions in capital markets around the world (especially the increased role of hedge funds in bearing risk in derivatives markets and the financial systems generally), and the much greater integration of national financial systems1. These changes appear to have made the financial system able to absorb more easily a broader set of shocks, but they have not eliminated risk.

2. Financial innovation

Financial innovation is defined as the introduction of a new instrument to a market or the production of an existing one in a new manner. Financial innovations appear because market participants are constantly searching for new modalities to make greater profits. The process of “financial innovation” includes important changes in financial instrument, institutions, practices and markets. Financial innovations include new forms of derivatives (credit derivatives, weather derivatives) insurance contracts, corporate securities, and pooled investment products; process innovations include improvements on securities-distribution methods and pricing transactions.

The most important forces behind the growing wave of financial innovations have been the reduction in the cost of computer and communications technology and the many advances in financial theory. Technological developments have radically modified the potential for making financial transactions around the world and have enabled large numbers of prices to be stored and extensive calculations can be made in various risk models. Furthermore, the volatility of market prices and complex global exposures increase the need for new risk management and hedging instruments. Financial innovation often seeks to avoid unintended restrictive regulations and take advantages of disparate accounting and tax rules.

Most of the financial innovations took place in derivatives markets. Derivatives are financial instruments whose promised payoffs are derived from the values of something else, generally called the underlying. The underlying asset can be: interest rates, foreign exchange rates, equities, other fixed-income instruments, equity indices, or commodities. Derivatives are used for several purposes, including the following:

- to protect against the market risk of financial losses on commercial transactions and financial instruments (to hedge);
- to reflect a view on the future direction of the market (to speculate);
- to lock in an arbitrage profit;
- to change the nature of an asset or liability;
- to change the nature on an investment without incurring the costs of selling one portfolio and buying another.

Examples of derivatives are futures, forwards, options and swaps. In the recent years new products have been developed such as: credit derivatives, weather derivatives, certificates, knockouts, warrants, etc.

a. Credit derivatives

Credit derivatives are the fastest growing segment in the global derivatives race and in 2001 the total notional principal for outstanding credit derivatives contracts was about $800 billion. By June 2006 this had grown to over $26 trillion, according to a study conducted by the International Swaps and Derivatives Association (ISDA). The British Bankers’ Association (BBA) estimated the credit derivatives market at $33 trillion in 2008,

which represents an increase of 65% compared to 2006\(^2\). This growth has been accompanied by significant product innovation, notably the development of synthetic collateralized debt obligations (CDOs), which allow the credit risk of a portfolio of underlying exposures to be divided into different segments, each with different risk and return characteristics.

Credit derivatives are contracts where the payoff depends on the creditworthiness of an agreed reference entity (a company or a country). Credit derivatives allow companies to trade risks in much the same way as they trade market risks, to diversify credit risks, and to transfer credit risks to a third party\(^3\). Most segments of the credit risk transfer markets are global markets with the counterparties often domiciled in different countries.

The simplest and most used type of credit derivative is the credit default swap (CDS). Under a credit default swap, one party (the protection buyer) agrees to pay an amount (the fixed amount), either initially or periodically, to the other party (the protection seller). The protection seller agrees to pay an amount to, or buy a debt obligation from the protection buyer on the occurrence of specified credit-related contingencies (each a credit event). The contract under CDS depends upon the default event and the cash flow transaction is triggered only when the default occurs and not otherwise. This not only helps market participants to seek protection, but also motivates them to buy and sell positions for reasons of speculation and arbitrage, without having the direct exposure to the underlying security.

Credit Default Swaps are widely believed to facilitate risk-sharing across financial intermediaries and, hence, to have reduced the probability that difficulties at a single intermediary could affect the entire financial system.

\subsection*{b. Weather Derivatives}

Recently, firms have used weather derivatives, relatively new type of derivatives that allow them to purchase protection against unexpected weather conditions. More and more companies’ revenues and earnings are adversely affected by the weather. The U.S. Department of Energy has estimated that nearly 20% of the US economy is directly affected by the weather, and that the profitability and revenues of almost every industry depend to a great extent on the vagaries of the temperature\(^4\). Weather conditions directly affect agricultural outputs, the demand for energy products, and indirectly affect retail businesses, entertainment, construction, travel and others. For instance, earnings of the power industry depend on the retail prices and the sales quantities of electricity, which in turn are affected by weather conditions. An exceptionally warm winter can leave utility and energy companies with excess supplies of oil or natural gas (because people need less to heat their homes).

Until 1997, insurance has been the main tool used by the firms for protection against unexpected weather conditions while volumetric risks were largely left uncovered. The need to hedge the volumetric risk caused by unexpected weather conditions has created a new class of derivatives, the weather derivatives. The first over-the-counter (OTC) weather derivative trade took place in 1997 and the field of weather risk management was born. In September 1999, the Chicago Mercantile Exchange introduced exchange-traded weather futures and options on futures - the first products of their kind. CME weather futures and options on futures are standardized contracts traded publicly on the open market in an electronic auction, with continuous negotiation of prices and complete price transparency. The contracts are on the cumulative HDD (Heating Degree Days) and CDD (Cooling Degree Days) for a month observed at a weather station. These derivatives are legally binding agreements made between two parties and settled in cash.

\subsection*{3. The effects of financial innovation on derivatives markets}

The role played by the financial innovation in financial markets is very controversial. First of all, the main benefits of financial innovation in derivatives markets is that the financial institutions are able to measure and manage risks much more effectively. OTC derivatives markets developed from innovations among international financial institutions in response to increasing needs for hedging services among their institutional clients and take advantages of potential arbitrage opportunities across national debt markets\(^5\).

On the other hand, innovations in financial products have given rise to some new challenges for market participants and their supervisors in the areas of systemic risk. An important feature of periods of financial innovation is that the rapid increase in new products and changes in the structure of those markets can outpace the development of the risk management and processing and settlement infrastructure (in the credit derivatives sector the gaps in the infrastructure and risk management systems are considered the most conspicuous)\(^6\). The complexity of some financial innovations and the relative immaturity of the various approaches used to measure the risks in those exposures amplify the uncertainty involved.

Furthermore, because the financial innovation takes place in a period of generally favorable economic and financial conditions, we do not know how these markets will function in condition of stress.

\begin{itemize}
  \item \(^2\) Eichhorn, M.; Eichhorn-Schurig M., - „Kreditderivate: weiteres Wachstum, neue Strukturen”, Review „Zeitschrift fur das gesamte Kreditwissen”, Frankfurt am Main, No. 22/2006, p. 25.
  \item \(^4\) Idem, p. 552.
\end{itemize}
The growing use of derivatives brings some new risks for the financial system. First, there are three major types of risks implied by the derivatives activities: market risk, credit risk, and operational risk. Secondly, we should mention the risks posed by concentration in certain derivatives markets, notably the over-the-counter market for U.S. dollar interest rate options. In the USA the 25 largest banks account for more than 99 percent of the total notional amount of derivatives, while the largest 5 banks account for 96% of the total notional amount of derivatives. Moreover, the top derivatives dealers hold approximately 30 percent of the global derivatives market in terms of national values with just a few international institutions filling out most of the remaining market. The main concerns are that the failure of a leading dealer could result in counterparty credit losses for market participants and a leading dealer’s exit may bring market illiquidity.

The exponential development of derivatives market in the last years rises questions regarding the impact of financial derivatives on the stability of the financial system and whether they are good or not for the financial system. In the last years, financial derivatives have been associated with important financial losses such as: the collapse of Barings (the Queen’s bank), the collapse of Long-Term Capital Management – a hedge fund with Myron Scholes and Robert Merton partners, and with the fall of Enron in 2002. The collapse of Long-Term Capital Management is often cited as an example of how a financial crisis caused by the miscalculation of derivatives could bring a worldwide collapse.

The opinions regarding the derivatives’ potential benefits and disadvantages for the financial system are surprisingly varied. Some see derivatives as “time bombs… financial weapons of mass destruction, carrying dangers that, while now latent, are potentially lethal”7. Others consider that “by far the most significant event in finance during the past decade has been the extraordinary development and expansion of financial derivatives”8 and see the emergence of more complex financial derivatives as essential “to the development of a far more flexible, efficient and resilient financial system”.

4. Conclusions

Over the last thirty years the global markets for financial derivatives have grown spectacularly within a highly complex industrial environment driven by the process of financial innovation. Due to the financial innovations, derivatives markets – at least in the developed countries – have edged ever closer towards completeness, making them hugely more effective in allocating resources and risks across sectors and regions and over time. A better spread for risks and improved risk management can contribute to better absorption of shocks to the financial system.

References:


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7 The quotes are from Warren Buffet, Chairman of Berkshire Hathaway, in this critique of the markets for financial derivatives (2003).
8 The quotes refer to Alan Greenspan, ex-Chairman of the US Federal Reserve Bank, in his comments about the derivatives markets (2002).