Financial Derivatives in Emerging Markets: Experience of Korea and Turkey

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Derivatives Markets and Their Economic Role

Derivatives have been used for hundreds of years to help users manage the impact of price increases or decreases, in addition to other types of risk. A derivative is a financial asset whose value is determined by (or is derived from) the value of a second (or underlying) asset. The main types of derivatives contracts are: forwards and futures (over-the-counter and exchange-traded contracts (agreements) to buy or sell another asset at a future date for the price agreed upon today, respectively), options (exchange-traded or over-the-counter contracts that give the holder the right to buy or sell another asset at or before a future date for the price agreed upon today), and swaps (over-the-counter contracts to change cash flows whose values depend upon two different assets), although this article focuses on futures contracts and markets. Derivatives meet a crucial economic need by facilitating risk management, and enabling price discovery. Price discovery occurs when an asset is traded and new information about its value is incorporated into its price. Academic research has shown that trading in derivatives markets helps market participants form expectations about underlying asset prices and to manage the risks associated with price changes.

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In the United States, organized futures exchanges first appeared in the mid-19th century in Chicago, in response to price uncertainty in agricultural markets. Farmers, bringing commodities such as wheat and corn to market after a harvest, faced plummeting prices as they glutted the markets with their products. Mills and other users of grain faced exorbitant prices in between harvests as the grain needed for production became scarce. So, farmers and millers began to meet prior to the harvest, or in between harvests, to agree upon the price and quantity of goods to be delivered at a future date. Hypothetically, farmers could agree in June to deliver 5,000 bushels of corn to a mill in September and accept a payment of 232 cents per bushel. The derivatives market provided a central location where farmers and millers could meet to agree upon prices and quantities to be delivered. In this case, the derivative is the agreement between the farmer and miller to deliver/accept delivery of a product at a future date at a price agreed upon today. The future contract’s value depends upon how the commodity’s price fluctuates between the date the price is agreed upon and the date the commodity is delivered. Agricultural commodities and metal products have dominated the trading in derivatives markets for more than 100 years.
In the 1970s, financial risk emerged as a primary concern for business because, for the first time, currency exchange rates were permitted to fluctuate (float) as the supply of, and demand for, currency changed. Advanced economies responded to this new environment of increased volatility in exchange rates, interest rates and commodity prices by creating derivatives whose values depended upon these same items: exchange rates, interest rates and commodities that were not just agricultural. Hence, the techniques used by farmers and millers in the 19th century were applied to manage financial risk in the 1970s.

The economic benefits that organized derivatives exchanges provide in developed countries are well documented. For example, in an influential article, Peck (1985) demonstrates both theoretically and empirically the direct effect futures markets have on commodity prices, and their indirect impact on production, consumption and storage decisions. She also provides empirical evidence that seasonal and annual commodity prices are more stable in economies with futures markets. His results demonstrate that futures markets fulfill an economic role by decreasing price volatility. Silber (1985) provides a sound explanation for the economic contribution of financial futures and indicates that increased liquidity and risk reduction facilities available to portfolio managers and other investors reduce the cost of capital to businesses, which ultimately translates into greater capital formation for the economy as a whole.

Until the late 1980s, organized derivatives exchanges were limited to developed countries. However, the late 1980s and early 1990s witnessed a growing interest in launching derivatives exchanges in emerging markets. In general, financial markets in developing countries are referred to as emerging markets. Given the high level of economic and financial risks faced by market participants and investors in emerging countries, derivatives markets are expected to contribute to a country's economic development by making these risks manageable. On the other hand, the development of successful futures markets requires a certain level of development in a given country. So it is crucial, although not easy, to identify the level of development at which the introduction of a derivatives market will complement the development of the financial infrastructure of a country.

**Market Readiness for Derivatives Contracts**

Research pertaining to launching derivatives exchanges in emerging markets consists primarily of survey results or descriptive studies. However, a limited number of empirical studies, which generally focus on one specific derivatives contract, exist. Bricheux, Savre and Tachon (1992) describe the important factors for developing a successful futures contract:

1) **Conditions for creating a futures market (legal, regulatory, political and economic environments).**

2) **Conditions for creating a futures contract (price volatility, underlying asset’s risk, large cash market, maturity of the spot market, and existence as well as involvement of dealer community).**

3) **Conditions for futures contract success (futures market environment, well-designed contract, and exchange perseverance).**

Using a survey, Tsetsekos and Varangis (1998 and 2000) investigate the extent of difference between the exchange architecture (electronic versus floor trading) and microstructure (order matching and transaction costs) across markets, and they consider if such differences can be linked to broader economic conditions. Ensen and Karagozoglu (2003) analyze the readiness of emerging markets for the establishment of derivatives trading. They report that, between 1989 and 2000, 183 derivatives contracts were introduced by 10 derivatives exchanges in emerging countries and that they were mostly futures contracts on financial (equity, exchange rate and interest rate) assets. They indicate that 45 percent of the contracts launched by emerging country exchanges failed on average after 2.75 years and were no longer offered for trading. They show that among the successful derivatives, equity, interest rate and exchange rate contracts attain the highest volume of trade, respectively. Ensen and Karagozoglu (2003) develop a model based on macroeconomic, financial, risk and market size variables to explain the trading in derivatives contracts in emerging markets.

Although studies show that futures markets and other derivatives markets provide economic benefits, concerns about financial derivatives have been expressed by some regulators and academics. These include fear of a massive shift from trading in cash (spot) markets to trading in derivatives markets because futures contracts are less expensive with regard to trading costs and collateral requirements. Further derivatives markets facilitate the establishments of short positions, which are positions taken by a seller, and have simpler settlement procedures. Should this shift occur, some argue that price volatility is likely to be transmitted from the futures to the cash market. Although there are mixed theoretical findings when this issue is studied, the consensus is that well-designed futures contracts help increase the efficiency of spot markets. Evidence on the introduction of futures contracts also supports the view that futures markets either bring stability to the underlying cash market or have insignificant effects on the cash market’s volatility.

**Success of Derivatives Contracts**

Organized derivatives exchanges aim to develop successful contracts. Historically, futures exchanges have
been membership organizations, and they have measured the success of their contracts by trading volume. The main functions of futures markets are facilitation of risk transfer (between hedgers and speculators) and price discovery, as explained by Peck (1985). For a given underlying asset, if there is sufficient demand for risk transfer and need for price discovery, a properly designed futures contract on such an asset would generate high trading volume and would result in high revenues for exchange members, who profit from transactions through commission and exchange fees. While from the exchange point of view success is measured by trading volume, economically the successful contracts are those that facilitate hedging as well as price discovery.

By focusing mainly on contracts from U.S. derivatives markets, prior studies have argued that factors contributing to the success of a futures contract can be contract as well as market specific. For instance, Silber (1985) indicates that financial futures considerably reduce cost of transacting, increase market liquidity (trading volume) and facilitate risk reduction. Sandor (1973) asserts that, among others, price variability of the commodity, existence of a viable cash market, and proper contract specifications are prerequisites for a successful futures market. Sandor and Sosin (1983) indicate that success of new futures contracts tend to depend on their use by both commercial (hedging) and speculative interests. Optimal contract design based on such factors is fundamental for the success of derivatives contracts.

The issue of contract size in optimal contract design requires a careful consideration of the tradeoff between volume and transaction costs. Too small a contract size increases the costs of transacting, whereas too large a contract size makes it prohibitive for some traders to enter the market. Thus, contract size is an essential element of successful futures contract design. Contract size and margin requirements are particularly important contract-specific factors that have the potential to amplify trading volume. In general, it can be argued that for a given demand for the futures contract, the smaller the contract size and the lower the margin requirements are, the larger trading volume will be.

**Unique Case of Korean Futures Market**

The Korean Stock Exchange (KSE) introduced the KOSPI 200 Index futures contract on May 3, 1996, when Korea was classified as an emerging economy. The Korean futures market has been among the fastest growing derivatives markets in the world. In the first half of 2003, the KOSPI 200 Index futures contract was ranked, in terms of trading volume, No. 10 among all futures contracts and No. 3 among stock index contracts traded globally. Hence, the KOSPI 200 Index futures contract can be considered very successful when success is measured by volume of trade.

Ciner, Karagozoglu and Kim (2006) analyze the factors contributing to the success, as measured by trading volume, of the KOSPI 200 Index
They indicate that contract specifications of KOSPI 200 Index futures do not exhibit an obvious deviation from those of other global stock index futures, suggesting that contract-specific factors alone are not deriving the high trading volume. Their findings indicate that the value of the open futures positions is very small compared to the market capitalization of the underlying index, suggesting that hedging-oriented positions on the KOSPI 200 Index futures are few and unlikely to generate growth in trading volume.

Ciner, Karagozoglu and Kim (2006) conclude based on their results, from both a Generalized Methods of Moments-based structural model and a recent approach to modeling links between price changes and trading volume, that there is little support for hedging-motivated trades being the cause of the KOSPI 200 Index futures contract's success. They also indicate that at the 2004 Asia-Pacific Futures Research Symposium in Hong Kong, where their research was presented, anecdotal evidence was introduced by Asia-Pacific exchange officials reinforcing the findings of their research that activity in Korean derivatives is driven primarily by speculative trading by retail investors. The KOSPI 200 Index futures contract appears to satisfy the Korean investors' demand for investment alternatives with higher returns.

New Futures Market in Turkey

In 1995 the first derivatives market in Turkey was planned with an introduction of a cotton futures contract. However, the development of such a contract and derivatives market was not found to be viable at the time. The current Turkish Derivatives Exchange (TURKDEX) was established in 2003, and formal trading in futures contracts started in February 2005. There is considerable interest in the potential success of this new market because of its role futures contract. They investigate both contract- and market-specific factors to distinguish between alternative explanations. Their findings can be particularly useful for developing futures contracts in emerging markets. For instance, if contract specifications are the main cause of the success of KOSPI 200 Index futures, exchanges in emerging markets could adopt similar structures while developing new contracts.

Ciner, Karagozoglu and Kim (2006) show that the structure of the KOSPI 200 futures contract does not seem to be significantly different from that of the other major stock index contracts traded globally. They analyze the market specific characteristics and the trading motives for the KOSPI 200 Index futures contract, focusing on the link between variables of market activity, such as trading volume, volatility and bid-ask spreads, within the context of a structural model. They particularly investigate how well KOSPI 200 Index futures facilitate risk transfer, i.e., utilized as a hedging vehicle, and thus, provide evidence on the economic success of the contract.
in price discovery and risk management prospects for the Turkish capital markets.

One of the contracts introduced by TURKDEX for trading is written on the Istanbul Stock Exchange (ISE) 30 Index. Successful trading in this equity index futures contract would provide risk management solutions for fund managers and also supply alternative investment opportunities for investors.

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Although one year of historical data on the trading activity in a newly developed futures market would not be enough to analyze success, a preliminary analysis of trading activity in the ISE 30 Index futures contract would be of interest to market participants as well as regulators.

**Comparison of KOSPI 200 Index and ISE 30 Index Futures Contracts**

In terms of its trading volume, the KOSPI 200 Index futures contract is considered to be a very successful contract, especially for an emerging derivatives market. Comparison of KOSPI 200 and ISE 30 Index futures contracts during their initial stages of trading could reveal valuable information about the ISE 30 Index futures contract's potential for success. However, a formal comparative analysis of both contracts should take into account the differences in underlying equity market characteristics. Although the following analysis is based on the first 176 trading days (approximately nine months) of both index futures contracts, for a more conclusive forecast, similar analyses need to be conducted using longer trading data when it becomes available for the ISE 30 contract.
Concluding Remarks

Financial derivatives provide risk management tools as well as alternative investment opportunities to market participants. Their economic role and value-added have been well documented in developed financial markets, and further evidence is being produced as derivatives exchanges are established in emerging markets. Experience of Korean derivatives markets presents an excellent research opportunity with the availability of a relatively longer history. The case of the new derivatives exchange in Turkey also provides a unique opportunity to investigate the trading activity at an early stage of market development and to conduct a comparative analysis against the Korean experience.

References


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In his academic and professional work, Dr. Karagozoglu’s primary research interests are in the area of futures markets, option pricing, market microstructure, interest rate derivatives and risk management. With many publishing credits to his name, Dr. Karagozoglu’s research has appeared in the Journal of Futures Markets, Financial Review, Journal of International Financial Markets, Institutions & Money, Review of Quantitative Finance and Accounting, Review of Futures Markets, and Journal of Fixed Income. He has presented papers at the annual conferences of the Financial Management Association, Eastern Finance Association, Midwest Finance Association, Multinational Finance Society, and International Association of Financial Engineers. He has also presented his research at the Asia-Pacific Futures Research Symposium and the Commodity Futures Trading Commission, and was invited to participate in the Chicago Board of Trade Research Seminar.

Prior to joining Hofstra University’s faculty, Dr. Karagozoglu taught full-time at Baruch College, both at the graduate and undergraduate levels. He received a B.S. in industrial engineering from Bogazici University, Istanbul, Turkey, and an M.B.A from the University of Wisconsin, Oshkosh. Dr. Karagozoglu earned a master’s degree in philosophy of business and a Ph.D. in finance at Baruch College of the City University of New York, where he received the Oscar Lasdon Best Dissertation Award. In 2000 Dr. Karagozoglu received the Dean’s Research Award in the Frank G. Zarb School of Business. He was recently selected as the 2006 faculty inductee for Beta Gamma Sigma Honor Society. –WB