OPTIONS EVOLUTION: THE INTRODUCTION OF ORGANIZED MARKETS IN THE U.S.A.

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ABSTRACT.— Options have had to deal with an unfortunate history related to their speculative nature and the lack of regulation to eliminate fraud. However, their use could improve the welfare of all investors, through the promotion of complete markets. Furthermore, options convey information about anticipated future volatility, cash dividends and interest rates that help to improve the informational efficiency of the financial markets.

Despite the advantages in the use of options, options markets only became important with the standarization of the contracts, which increased the liquidity of the markets and reduced transaction costs. This fact was clear in the U.S., where conventional markets were eclipsed by the introduction of organized, or registered, options markets.

RESUMEN.— Las opciones han sido protagonistas de hechos desafortunados debido a su naturaleza especulativa y su falta de regulación para eliminar el fraude. Sin embargo, su uso ayuda a mejorar la riqueza de todos los inversores a través de la promoción de mercados completos. Además, las opciones suministran información sobre volatilidad futura esperada, dividendos y tipos de interés lo cual mejora la eficiencia informacional de los mercados financieros.

A pesar de las ventajas derivadas del uso de las opciones, los mercados de opciones empiezan a cobrar importancia a partir de la estandari-

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zación de los contratos. Esta estandarización incrementa la liquidez del mercado y reduce los costes de transacción. Esta afirmación tiene su mayor exponente en Estados Unidos, donde la creación de los mercados organizados eclipsó a los mercados convencionales o extrabursátiles.

1. INTRODUCTION

In the evolution of options, 1973 was a crucial year. In that year not only did the Chicago Board of Options Exchange (CBOE) start its activities, but also two academics, F. Black and M. Scholes, developed an important model to evaluate options[1]. Since then, the flow of innovations and new applications of options has come these financial instruments to be an indispensable tools for any Chief Financial Officer (CFO).

Clearly, options have had a different meaning for the general public since 1973. In the following sections the history of options, their economic function, the main differences between the two types of options markets in the U.S. (conventional and organized), their regulation, the latest innovations, and the reasons for the success of organized markets are analyzed.

2. OPTIONS HISTORY

The option concept is at least as old as Greek civilization. Aristotele, in a passage about Thales the Milesian, indicates that options existed and were familiar to the ancient Greeks. In this passage Thales, buys the option, through a small deposit, to use presses for olives in Miletus and Chios far in advance of the harvest. As a result of a big harvest of olives, the presses were in great demand, and Thales exercised his option to hire the presses, which were then hired back to the final users. In this way, Thales was able to make a considerable amount of money. This transaction could not have been done if Thales had had to pay the whole amount of the rents in advance.

Other civilizations that used options were the Phoenicians and the Romans. In these cases the cargoes transported in their ships were the underlying asset of the option. After the Romans, the shadowy times of the Middle Ages came.

The seventeenth century is a remarkable period in the history of options. This is the first time that extensive use of options was made, the first time the options market broke down and the period when the first organized market in puts and calls on securities began.

1 See Black, F. and Scholes, M. *The Pricing of Options and Corporate Liabilities.* Journal of Political Economy, 81, 3, May 1973, Pag. 637-654.

This was the time of the Dutch and their tulip bulbs. The Dutch developed a large market of tulip bulbs options. Dealers and growers of tulip bulbs were involved in call and put options in order to adjust their risk exposure to what they considered appropriate levels. On the other hand, there were a bunch of speculators trying to take advantage of any imperfection in the market. The market was completely unregulated and unorganized, with neither margin requirements nor enforcement of the option contract. As a result, when the market of tulip bulb felt apart in 1636, there were many writers of puts who were unable to pay, hurting the economy for a while. After the period of a few years the Dutch continue to deal with options contracts, this time using the Dutch West India Company shares as the underlying asset. The tulip bulb options problem gave options a bad reputation throughout Europe at that time.

Puts and calls were traded in an organized market in London for the first time at the end of the seventeenth century. However, the activity of the market in these first stages was not great. In part the bad image of options was a consequence of the disaster that occurred with the tulip bulbs and its association with speculative activity.

From the beginning of the option market in London there was considerable opposition to it. The result was that options were declared illegal in London by Barnard's Act in 1733. The prohibition stood until 1860. However, options dealing continued throughout this period, 1733-1860, although on a small scale. Many of the securities firms present in London refused to participate in this first organized option market. In 1860 option trading was again declared legal.

The option trade in America began late in the eighteenth century. Since then, there has been a continuous growth in option trading. In London, on the other hand, options have had periods in the twentieth century in which they were declared illegal. Options were declared temporarily banned during the financial crisis of 1931, for a period during World War II, and in the late 1950's. Finally, in 1958 option trading resumed on a small scale.

Nowadays, there are several organized options markets in Europe, America, Oceania and Asia. The largest market in Europe is the London Traded Option Market (LTOM), followed by European Options Exchange (EOE) in Amsterdam. Other options markets exist in France, Sweden, Finland, Norway, Germany, Italy, Switzerland and Spain. Within the United States the largest market is the Chicago Board Options Exchange (CBOE). Others markets include Philadelphia, NYSE, AMEX, Pacific Exchange, Coffee Sugar and Cocoa Exchange, Chicago Board of Trade, Chicago Mercantile Exchange, Commodity Exchange, New York Futures Exchange, Kansas City Board of Trade, Mid-America Commodity Exchange, Minneapolis Grain Exchange, New York Cotton Exchange and New York Mercantile Exchange.

Options have been a source of innovations, starting with the Ducth who used options to hedge against risk. The procedure of converting[2] puts into calls was an answer to the anti-usury laws. Finally, the rise of the CBOE produced a stream of innovations that continue today.

The procedure of converting puts into calls, along with the earlier experience of the Dutch and the tulip bulb options, are two examples of the undesirable consequences of options. In both cases, the situation came as a consequence of an unregulated option market that permitted abuses within option trading. In the United States most large-scale abuses of stock options disappeared with the passage of the securities legislation of the 1930's. The lawmakers directed their attention to specific abuses involving options and established a constructive regulatory framework that dealt effectively with the misuse of options without destroying these useful tools.

3. THE ECONOMIC FUNCTION OF OPTION MARKETS

As we have seen above, options have long had a bad reputation because their misuse in different periods of history led to undesirable situations. The bad reputation for options still continues today, since there is not an unanimous agreement about the benefits of the option market. The opponents of option markets argue that these markets, either organized or not, promote unnecessary speculation, disturbing other markets[3] without a real benefit. Some people consider options markets closer to gambling than to a financial market. The most common objection is that they attract risk capital out of the markets for the underlying assets, reducing the total volume of trading in these markets and therefore reducing their liquidity. These comments are unjustified. Option trading is a medium of controlling risk and not a means of fleecing the inexperienced investor.

On the other hand, the defendants of the options markets have found many reasons for the existence of these markets. Options may offer a pattern of returns that could not be obtained in some of the markets for the underlying assets[4], and they permit the easy readjusment of a portfolio when the investor decides to change her/his mix of stocks and bonds as stock prices changes. Options may offer an opportunity to borrow or lend

2 Conversion is the process of transforming a put into a call or a call into a put.

3 The opponents of options markets argue that these markets promote volatility in the underlying assets, destabilizing them.

4 For example, option markets permit any investor to hold almost no shares when the price of the stock is low and decreasing or to buy shares as the price of the stock rises. Furthermore, even if the investor can create the same pattern of returns in the market of the underlying asset, the difference in transaction costs would make it impractical for an individual investor.

at more favorable rates than can be obtained elsewhere[5]. Options may allow an investor to take a position in an underlying asset under more favorable margin restrictions than would be available directly in the market of the underlying asset[6]. Options may offer tax advantages unavailable in the underlying assets. Trade in options has, in general, lower transaction costs. Options may provide an opportunity to obtain a higher return than the underlying asset if one is able to find mispriced options. Options provide a means to hedge against unanticipated changes in the underlying asset. Finally, options help to short sell an underlying asset, when the short selling of this asset is prohibited in its own market.

These reasons suggest that the existence of options markets could improve the welfare of all investors, even those who don't trade in options. Furthermore, options are an aid to firm resource allocation and a source of information.

How can options improve the welfare of those investors who don't participate in the options markets? The answer is through the promotion of complete markets[7]. Options markets permit expansion of the number of opportunities in the market through options on existing securities, rather than through the creation of new basic securities, in a much simpler way[8]. So far, individual investors have benefitted more than institutional investors from the existence of options markets.

Some of the reasons for that asymmetric result are that institutions, because of their scale, have access to better rates in borrowing and lending and have purchasing power in negotiating the commissions and margins that individuals don't have. Moreover, individuals are at a tax disadvantage, since many institutional investors are tax exempt or have all sources of income taxed at the same rate. Furthermore, most institutional investors prefer to invest directly in bonds and stocks than through options, either because of the existence of legal restrictions that bar them from investing in options or because of the deficiencies of the current market that limits the maximum number of option contracts on the same underlying asset held by any one investor. Nonetheless, there are many advantages in the use of options by institutional investors. They can control risk taking in a

5 Through option replication one can create a portfolio in which one borrows or lends at the rates available in the options markets. These rates are normally more favorable than the investors could obtain on their own.

6 The reason in the different margin requirements in the option markets and in the markets for the underlying assets.

7 A market is complete whenever the number of different securities equals the number of possible states. A security is considered different when its pattern of returns cannot be duplicate by a portfolio of the other existent securities. This means, that any desired return across the states can be constructed, either holding one of the different securities or by a combination of them. A complete market is desired from a social point of view, since it provides individuals with a wide range of opportunities.

8 See Cox, J.CV. and Rubinstein, M. *Option Markets*. Englewood Cliffs. New Jersey, 1985. pag. 436-443.

more efficient way as well as gaining diversity. In addition, any changes in the portfolio mix of the institutional investor can easily be arranged using options. Finally, the heart and attraction of option trading are leverage, operated in such a way that profits are highly leveraged, but losses are not. One only loses the premium paid.

Another important reason in favor of options is that they promote financial market efficiency. In the same way that stock and bond prices reflect available information about corporate prospects, assisting the efficient allocation of real resources, options prices, through the increase of the number and diversity of individual preferences and expectations about corporations, contribute to the efficient allocation of real resources. The options markets reduce the transactions costs of assuming particular positions, helping to reflect all available information in the markets.

The prices of options contain predictions and expectations about future events. An option's price will depend on and contain information about anticipated future volatility, cash dividends, and interest rates.

Although options markets have been linked with recent negative events like the crashes in 1987 and 1989, it seems that the pro-options position has made its way. There are several option markets in the U.S. and around the world, with trading volumes[9], in the case of the US, similar to, or higher, than the major stock exchanges. What's more, whereas some stock exchange have suffered from reductions or low growth in the number of new companies being listed, options markets have been increasing the variety of option contracts traded.

4. OPTIONS MARKETS IN THE U.S.

The first registered securities exchange for the purpose of trading in options appeared in Chicago in 1973, the Chicago Board Options Exchange. Prior to 1973 options were traded in the conventional market or over the counter (OTC) by and through major banks and other financial institutions. In the next sections the main characteristics of each of these two types of markets are explained.

4.1. CONVENTIONAL OPTIONS MARKETS (OVER THE COUNTER)

The volume of activity in the conventional market today is much lower than it was prior to the inauguration of the CBOE in 1973. The brokers and dealers of the conventional option market are members of the Put and Call Brokers and Dealers Association. This association was formed by 30

9 The volume of a securities market is measured by the number of contracts traded.

members prior to 1973; nowadays that number has shrunk because of the reduction in the activity of the market.

The Conventional option market is a custom market. Each option trade is tailored to the needs of the buyer and seller of the option.

The option market charges competitively negotiated commission rates. Their rates are usually high compared with the organized markets. This is because the conventional option market is a custom market.

The option market transaction typically has up to six players: the buyer of the option, the NYSE firm that represents the buyer, the Put and Call broker of the buyer, the Put and Call broker of the seller, the NYSE firm of the seller and the seller. Of course, the number of players could be reduced if some of them played several roles. One of the reasons for the high transaction costs is that the final clients have to pay commissions either for the option or for the underlying asset, once the option is exercised.

All of the options traded through members of the Put and Call Brokers and Dealers Association are endorsed by a NYSE member who guarantees that the option will be honored. Normally, the performance of the option is guarantee by the NYSE member firm representing the option writer.

Conversion is frequently necessary because buyers are interested in call options, while options writers prefer to write straddles[10]. As a consequence, some of the options have to be converted from call to puts or vice-versa in order to meet the market demand and supply.

Conventional options contracts spell out the basic adjustments of the striking price for: cash dividends, rights, warrants, stock splits, stock dividends, and reverse splits. Basically, the strike price and the number of shares subject to the option contract are changed with any of the events above cited, in order to keep the option's buyer's net position unaffected.

If an unexpected event happens, the Put and Call Brokers and Dealers Association determine how the option contract has to be settled.

Conventional option contracts are difficult to reverse. The buyer of the option only can reverse it by selling the option to the writer or to the Put and Call broker. The writer only can reverse the option by buying back the option from the original buyer. Therefore, in most cases, the options are terminated either by exercise or by expiration.

4.2. ORGANIZED OPTION MARKETS

The surge of the CBOE represents a major shift in the options markets and a source of innovation through today. As previously stated, CBOE was the first registered or organized securities exchange trading in options.

10 To sell or write a straddle means to write a call and put with the same strike price and expiration date. The writer benefits if the market for the underlying assets stays around the strike price.

It started in 1973, trading calls in 16 common stocks. Other registered markets followed; the American Exchange, Philadelphia Exchange, and Pacific Exchange started trading call options on stocks in 1975-76. Today, fifteen[11] exchanges trade options in the United States.

The main characteristics of the registered exchanges in trading options were first introduced by the CBOE. These characteristics involve: strike price, expiration date, settlement, interchangibility, trading facilities and transactions costs.

The main innovation introduced by the CBOE was the standarization of the strike price and the expiration date. The strike price of a listed option always ends in $5 or $0 unless a stock dividend or other capital change occurs after trading in the option begins. The expiration dates are limited to 4 times in a year. The expiration date will be the Saturday after the third Friday in the month. The months of expiration will be January, April, July and October for some stocks and underlying assets, or February, May, August and November for others. These standarizations reduced the number of different contracts traded at any point in time, increasing the volume of trade in the contracts available. At the same time it permitted the development of a secondary market, thereby increasing the liquidity of the market.

Strike prices are not reduced in order to compensate for cash dividends. In this way, published trading summaries are simplified. However, other changes in the underlying asset such as stock dividends, stock splits, etc., are handled in the same way as in conventional markets.

Another characteristic is centralized trading facilities. The exchange combines centralized order flows with standarized contract terms, which improves the marketability of the option and expands trading interest.

All exchange traded options are settled through a clearing house, either the Options Clearing Corporation (OCC) for stocks or the clearing house for a particular futures exchange when dealing with options on futures contracts. In this way the credit risk is eliminated. In the conventional market, the buyer of an option is tied with the credit risk of the NYSE firm that guarantees the option. In addition, the OCC does not issue an actual option contract, certificate-less clearing, which reduces the paperwork and eliminates physical movement of securities between brokerage firms.

A further characteristic is interchangibility of option contracts. Option contracts with the same strike price, expiration date and underlying asset are interchangeable. This has two benefits: it facilitates the secondary market, and it permits settlement by offset.

11 Chicago Board Options Exchange, American Stock Exchange, Philadelphia Stock Exchange, Pacific Stock Exchange, New York Stock Exchange, Coffe, Sugar and Cocoa Exchange, Chicago Board of Trade, Chicago Mercantile Exchange, Commodity Exchange, New York Futures Exchange, Kansas City Board of Trade, Mid-Amercia Commodity Exchange, Minneapolis Grain Exchange, New York Cotton Exchange and New York Mercantile Exchange.

One of the benefits of standarization is the reduction in transaction costs. The low transaction costs have a positive effect on trading volume and on market liquidity.

The result of these innovations was a quick acceptance of the new markets, which grew very fast.

5. OPTIONS MARKETS REGULATION

The main regulatory concern is to reduce incentives for fraudulent behavior. In the listed options markets these incentives could be greater because they have been around for a short period of time enjoying extremely rapid growth. At the same time, the regulation has to permit the normal evolution of the markets.

It is possible to say that the regulatory environment has been, so far, very constructive. This regulatory environment tries to assure that buyer and writer of an option have the same information, that the market will not be manipulated and that the writer will honor the contract.

There are two federal agencies with regulatory jurisdiction over options: The Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC). In 1981 they reached an accord about the jurisdiction of each with respect to options. Under the accord the SEC is to regulate options on securities, certificates of deposit, foreign currency, exempted securities and stock indexes. CFTC is to regulate futures and options on futures on: exempted securities, except for municipal securities, certificates of deposits and indexes of securities. However, the jurisdiction line between the two federal agencies is not completely clear. As a result, both agencies are lobbying to increase their jurisdiction.

The main rules[12] concerning options involve:

1. Initial and maintenance margins required.
2. Suitability. Only those investments suitable to the client can be recommended by the broker-dealer.
3. Account opening. A customer has to be approved for options trading prior to any transaction.
4. Disclosure. Options investors have to receive a basic option disclosure document.
5. Options advertisement and sales literature have to meet the required standards.
6. All the registered representatives have to pass an exam.
7. The firm members have to supervise their options business.

12 In order to see a more detail explanation about these rules see Amihud, Y. et al. *Market Making and the Changing Structure of the Securities Industries*. Lexington. Massachusetts, 1985. Pages 193-203.

8. No performance fees are permitted.
9. Protection against broker insolvency.
10. Several provisions of the federal securities laws grant investor remedies.
11. Brokers and dealers have to have a minimum capital requirement.
12. Funds deposited by a customer must be segregated from a broker-dealer's own funds.
13. Dual trading is prohibited.
14. All transactions have to state the time of execution.
15. Insider trading is illegal
16. The gains or losses incurred by dealing in options are considered capital gain or losses for tax purposes.

6. INNOVATIONS IN ORGANIZED OPTIONS MARKETS

Since the innovations introduced by the CBOE in 1973, both organizational and process, centering on the standarization of option contracts, changes have been focused on the type of option contract.

CBOE started trading call options. In 1977 standarized put options were traded. In 1983 options in stock indexes and in futures contracts were developed. During the 8O's organized markets started to offer option contracts in stock indexes, commodity futures, US treasury bond futures, and foreign currency futures.

By far the most successful type of option is the stock index option. By 1985 these contracts accounted for more than half of all options traded. Options on stock indexes permit diversification with a low transaction cost, plus the advantage of cash delivery- which simplifies the settlement of the contract. Within the options on futures, the US treasury bond futures options are the most popular. Without a doubt, the large market for the U.S. debt helped.

7. REASONS FOR THE SUCCESS OF ORGANIZED MARKETS

Table 1 shows that from the beginning, organized markets were much more successful than conventional markets. The growth of option trading in the registered markets has been exponential. There are several reasons that explain the quick acceptance of organized markets and its popularity.

An important historic fact behind the development of the option market is the constructive regulatory environment in the United States. The regulation has tried to constrain speculative fervor.

Transaction costs are lower in organized markets because of the standarization of the option contracts. The reduction in transaction costs brought new people to the option market. Other benefits of standarization are higher flexibility to exercise the option and the existence of secondary markets.

The introduction of centralized trading facilities improved the operational efficiency of the market, lowering the operating costs. The rate of technological progress in computers contributed to the reduction of that costs. At the same time, improvements in communications systems reduced the significance of geographic barriers.

YEAR	CONVENTIONAL MARKET	CBOE MARKET
1940	1,205	
1945	2,108	
1950	2,631	
1955	6,012	
1960	8,561	
1965	15,256	
1970	19,681	
1971	29,516	
1972	32,851	
1973	18,920	109,800 (**)
1974		564,458
1975		1,443,102
1976		2,149,802
1977		2,483,863
1978		3,427,735
1979		3,537,960
1980		5,291,692

* Thousands of shares of underlying stock.
** Includes only since April 1973

Source: Henin, C.G. and Ryan, P.J. (1977).

TABLE 1. *Trading Volume.*(*)

Another key development of the organized markets was the Clearing House. The clearing house not only contributed to the efficiency of the markets but also reduced credit risk to zero. In the organized markets one's counterpart in an option contract is the clearing house, making things much clearer and simpler.

The organized option markets convey to the general public the idea of trustworthiness that the conventional markets failed to convey. Because of the standarization, organized markets are more easy to follow, which translates into trust in these markets. Conventional markets are tailored to the need of the clients that don't typically attract the attention of the general public.

A further reason for the rapid growth of options markets is that the level and volatility of inflation and interest rates greatly increased in the

70's and 80's. These events led to the use of options as a tool for the redistribution of interest rate risk. This is a role that options still keeps today.

The conclusion is that options have developed more in the last 17 years than in all the prior centuries. Several factors occurred at the same time: high levels of inflation and interest rates that encountered the use of options to manage risks, the tremendous progress in computers and communications reduced costs and eliminated barriers, and regulation became obsolete creating opportunities for innovation that avoided that regulation. Options have played an important pat role in the process of coping with the changes in the financial environment facilitating that process.

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