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From Antwerp to Chicago: The History of Exchange Traded Derivative Security Contracts

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ABSTRACT

This paper discusses the history of exchange traded derivative security contracts from initial trade in transferable forward contracts during the 16th century until the emergence of active trading in financial derivatives in the early 1970's. After discussing the contemporary significance of exchange trading in 'free standing' contracts for commodities and securities, essential institutional characteristics of the trade in such contracts are identified for the Antwerp bourse during the 16th century. Subsequent trading on the Amsterdam and London share markets in the 17th and 18th century is also reviewed. The characteristics of derivative security trading in the 19th century, as reflected in the emergence of the Chicago Board of Trade, is examined, together with the arguments advanced in support of bills in the US Congress to regulate derivative security trading. The article concludes with an overview of factors leading to the commencement of trade on the Chicago Board Options Exchange in the 1970's.

Keywords: Arbitrage; Forward Contract; Futures Contract; Option Contract; Put-call parity.

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The revolution in computing and communications technology of the last two decades has produced a radical realignment of traditional financial institutions. The patchwork framework of regulatory oversight has proved incapable of adapting to these changes resulting in systemic instability in the globalized financial system. Lessons gained from centuries of historical development are being ignored, e.g., Neal and Davis (2005); the current public debate on financial market reform reflects confusion about basic properties of the exchange trading in derivative security markets, e.g., Pirrong (2008); CFTC (2008).[1] One of the casualties has been the collapse of the transparent self-regulating, mutual form of exchange organization that has been replaced by a demutualized opaque network of electronic trading networks (ETNs) and automated trading system (ATS) platforms, e.g., Markham and Harty (2008); Kumpan (2006); Treptow (2006). The crude rationale given by regulators for permitting such fundamental changes, and the relatively limited associated public debate, is disturbing.[2] Counter-productive regulatory arbitrage, fragmentation of market liquidity and undermining of the price discovery and dissemination function of important commodity and financial markets are some implications of the changes.

Despite exchange trading being fundamental to a market economy, the history of such trading has received relatively limited academic attention.[3] The connections between public property rights, government regulation, exchange ownership, composition of the trading population and pricing efficiency have been generally ignored. Basic questions about the evolution of exchange trading remain unanswered, such as: does open-outcry pit trading of futures contracts represent a liquidity enhancing and risk reducing evolution of traditional, over-the-counter forward trading mechanisms? By tracing the historical evolution of exchange trading of derivative security contracts, this paper focuses on three key elements: the market participants involved in the trading process; the approach to regulating markets, e.g., registration and other barriers to entry; and, the contracting and trading methods employed. Where applicable, the public perception regarding

pricing efficiency is also considered. In the following, Section 1 examines complications that arise with basic definitions for 'derivative security contract' and 'exchange traded'. Section 2 examines the historical developments that led to the eventual emergence of exchange trading in transferable 'to arrive' contracts on the Antwerp exchange during the 16th century. Sections 3 and 4 detail the application of exchange trading techniques to forward and option contracts for shares in joint stock companies traded in 17th century Amsterdam and 18th century London. Specific attention is dedicated to considering the regulation of derivative security trading prior to the 19th century. Section 5 considers the emergence of futures markets in Chicago during the 19th century. The concluding section examines the substantive evolution of exchange trading in the 1970's to include derivative securities on financial assets.

1. Basic Definitions

Despite being widely used terms, it is difficult to precisely define either 'exchange traded' or 'derivative security contract'. In particular, all derivative securities involve a traded contingent claim, where some essential feature, typically the price, is derived from some future event. This event is often, though not always, associated with a security or commodity delivery to take place at a future date. However, defining derivative securities as tradeable contingent claims is not precise enough because financial markets are riddled with contingent claims, not just those associated with derivative security contracts. In addition, contingent claims may be combined with other security features or traded in isolation. In cases where the contingent claim is bundled with a spot commodity transaction, the traded value of the contingent claim and the spot commodity position is combined, e.g., bill of exchange; collateralized mortgage obligation; convertible bond. Recognizing that such bundled securities could also be defined as derivative securities, in what follows the definition is restricted to only include cases where the contingent claim contract is unbundled or "free standing" (FASB 2000).[4] This includes the following exchange traded contracts: forwards and futures; options, rights and warrants.[5]

Though the roots of derivative security trading stretch back to antiquity, the emergence of exchange traded, free standing derivative security contracts is more recent. The economic basis

for such contracts arises from the fundamental process of exchange in markets. This process involves two steps. First, a buyer and a seller agree on a market clearing price for the goods involved in the transaction. Second, the transaction is completed, typically with a cash payment being made in exchange for adequate physical delivery of the goods involved. In many transactions, time can separate the pricing agreement, the cash settlement or the delivery of goods. For example, a forward credit sale involves immediate pricing, delivery as specified in the forward contract and settlement at an even later date. Commercial transactions in early markets often involved a sale agreement structured as a forward contract with option features. The contract could vary from loosely structured to formal and notarized. Unstated terms and conditions of such agreements were often governed by merchant convention, e.g., Malynes (1622), Peri (1638). For example, because trading on samples was common in 16th and 17th century goods markets, an agreement for a future sale would typically have a provision that would permit the purchaser to refuse delivery if the delivered goods were found to be of inadequate quality when compared to the original sample. As reflected in notarial protests stretching back to antiquity, disagreement over what constituted satisfactory delivery was a common occurrence.[6]

Following van der Wee (1977) and Gelderblom and Jonker (2005), the first instance where a contingent claim was unbundled and traded as a separate security on an exchange was the transferable 'to arrive' commodity contracts traded on the Antwerp exchange during the 16th century. This event signifies the depth of liquidity and degree of trading sophistication associated with commodity transactions at a time when most commercial sales employed non-transferable forward contracts with multiple delivery dates. These contracts were typically executed as private deals between two signatories, usually employing *escripen*, notaries and "scriveners" to formalize the contract. As Malynes (1622, p.126) observes, if a broker was involved, a verbal contact could be used:[7]

> Verbal contracts are made between party and party, or by means of Brokers or Mediators, and that only by word without writing. Such are the daily buying and selling of commodities either for ready money, or payable at some dates of payment, wherein the mediation of a Broker is most necessary: For as it would be troublesome to use Scrivners

> in every bargain; so is it commodious to use the means of Brokers, the commodities are not only bought and sold with more credit and reputation, but all controversies which do arise by misadventure or otherwise are sooner determined, and a sworn Broker is taken as a double witness, if he do produce his book, with a *Memorandum* of the bargain, as the same was agreed between both parties, whereby many variances are reconciled, and differences (like to fall out) are prevented.

This brief discussion on the use of brokers in commodities transactions follows a longer discussion by Malynes (1622, p.124-6) regarding the use of "notarial contracts" in the trading business of the regulated company of "Merchant adventurers" where the systemic use of forward contracts in their commercial transactions is apparent.[8] In modern vernacular, the 16th and 17th sales contracts that Malynes describes for the sale of English cloth goods arranged on the exchanges in Antwerp, Bruges and other important centers were structured as non-transferable forward contracts with multiple delivery dates and option features.

'Exchange traded' requires 'exchange' to be defined. This is not as easy as might be expected as a number of conventional and technical definitions for an "exchange" are possible, e.g., Lee (1998, p.322-3). Almost all modern definitions identify an exchange with a physical location or building. One exception is Ehrenberg (1928, p.54) where the following definition is provided:

> A bourse or exchange is an assembly meeting at frequent intervals, usually daily, consisting of the merchants and other persons, who meet for the purpose of dealing without exhibiting, delivering or paying for their goods at the same time.

For historical purposes, this definition is more adaptable as some exchanges, such as the important Amsterdam exchange prior to 1611 or the London stock exchange prior to 1773, conducted trading at different locations until moving to fixed quarters.[9] This definition is also sufficient to distinguish an exchange from, say, a marketplace selling produce and is preferable to definitions that identify an exchange only as a physical location where buyers and sellers meet to trade goods.[10] Given this, exchange trading of a contract needs to be distinguished from a situation where a buyer and seller meet at, say, the Royal Exchange and agree to a forward sale of goods with a contract then drawn up by a 'scrivner'. In this situation, it is the goods that are being traded, not the forward contract. An exchange traded contract requires transferability and an exchange clearing mechanism to settle positions. In turn, transferability requires standardized contract terms

and relatively homogeneous deliverable commodity. A transaction where merchants meet at an exchange and agree to a non-transferable forward contract with multiple delivery dates would correspond, in modern terms, to an over-the-counter (OTC) derivative security transaction. As such, a technical distinction is being made that corresponds to the modern difference between trading on exchanges or OTC.

The beginning of exchange trading of derivative security contracts occurs when the parties involved in the completion of the contract are different from those initiating the contract. With this condition, a traded contract could be created for which there was no intention of completing the underlying goods transaction; in effect, the seller may not have possession of the goods and the buyer may not intend to take delivery. In this case, a contract can be created for which there is no resulting delivery of goods. This requires a clearing method for determining and settling gains and losses on contracts. Various prerequisite conditions are required for such trading to occur. The evolution was gradual, not dramatic, and depended on a range of informal restrictions on those participating in the trade. Recognizing that initial trade was in the bulk commodities of herring, whale oil and wheat – commodities that require special warehousing, grading and handling facilities – initial trade was associated with dealers directly involved in the bulk commodity trade willing to execute 'to arrive' forward contracts for which there was no associated goods transactions, seeking to offset the position prior to delivery or, if necessary, cover the position in the spot market upon arrival of the fleet. Given the vagaries of market liquidity, in the event the contract could not be transferred, both parties to the contract needed to be able to complete delivery.

2. The Antwerp Exchange

The evolution of exchange trading in free standing derivative security contracts for bulk commodities revolved around two important elements: enhanced securitization of the transactions; and the emergence of speculative trading. Both these developments are closely connected with the increasing concentration of commercial activity, initially at the large medieval market fairs and, later, on the bourses and exchanges. Securitization of bulk commodity transactions was facilitated

by applying trading methods that had been in use for centuries in the market for bills of exchange.[11] In addition to being focal points for goods trading activities, the medieval fairs were also important financial events. The fairs, such as those at Champagne, featured well organized money markets conducting manual foreign exchange transactions and substantial dealings in bills of exchange (de Roover 1954, p.204).[12] Because the larger fairs involved transactions between merchants from a number of different regions, it was not practical to settle all transactions using manual exchange of coin. This was a primary impetus for dealings on credit, as de Roover (1949, p.110) observes:[13]

> Today banks discount the trade acceptances or the promissory notes of merchants who are in need of credit. Such a procedure was ruled out as long as contracts involving the payment of interest were unenforceable at law. It is true that usury laws could be circumvented by various subterfuges. However, the easiest method for securing short-term credit was for merchants to "take up" money by exchange and not at interest. The result of this practice was that commercial credit was tied to the exchange. This point, although obvious, is so fundamental that its importance should be stressed ... the credit system rested on the exchanges.

As such, methods for clearing bill of exchange transactions were fundamental to the smooth operation of the international commercial and financial system.

Though the precise origin of the practice is unknown, 'arbitration of exchange' first developed during the Middle Ages. Around the time of the First Crusade (1095-1099), Genoa had emerged as a major sea power and important trading centre (Einzig 1964). The Genoa fairs had become sufficiently important economic and financial events that traders from around the Mediterranean were attracted. To deal with the problems of reconciling transactions using different coinages and units of account, a forum for arbitrating exchange rates was introduced. On the third day of each fair at Genoa, a representative body composed of recognized merchant bankers would assemble and determine the exchange rates that would prevail for that fair. The process involved each banker suggesting an exchange rate and, after some discussion, a voting process would determine the exchange rates that would apply at that fair. Similar practices were adopted at other important fairs later in the Middle Ages. At Lyons, for example, Florentine, Genoese and Lucca bankers

would meet separately to determine rates, with the average of these group rates becoming the official rate. These rates would then apply to bill transactions and other business conducted at the fair. Rates typically stayed constant between fairs in a particular location providing the opportunity for arbitraging of exchange rates across fairs.

The actual clearing process differed from fair to fair (Parker 1974, p.546). At the Lyons fairs, clearing involved the participation of all merchants attending the fair. At other fairs, such as the fairs of Besançon or Medina del Campo, clearing was controlled by a restricted group of merchant-bankers who were responsible for setting exchange rates and for handling the book-transfers between the accounts of merchants at the various clearing member banks. Ehrenberg (1928, p.284) describes the clearing process used in Lyons:[14]

> Before the merchants attended the fair they entered in their 'market book' ... all the payments due from or to them in the fair. At the beginning of the fair these payments books were compared with one another. In the case of every entry found correct the person from whom the payment was due made a mark which was taken as a binding recognition of the debt; later he had to sign his whole name. The bill – for, generally speaking, there was no question of anything but bills – was *accepted* in this way. If an item was not recognized, the owner of the book would write by it 'S.P.' (*sous protest*).
>
> After the acceptance of the old bills there followed the new business with foreign markets, which originated wither at the preceding fair or as the result of the acceptance, or otherwise. Here we meet for the first time a peculiar arrangement, the settlement of an official average price for each species of bill, the so-called Conto.
>
> (T)he Conto in Lyons was done as follows: The bill dealers met on a certain day and formed a circle (*Faire la Ronde*); the Consul of the Florentines then asked the dealers of the different nations in turn what they thought the price ought to be. The answers were noted and an average taken. This was the official rate for bills which was noted in the bulletins ... and sent abroad. The dealers themselves were naturally not bound by this, their business was left free to bargaining. Yet the Conto at the beginning had some meaning for the market itself, as previously many transactions had been concluded at the average rate which had not yet been settled ...
>
> The payment proper closed the fair. It was affected chiefly by *viremant de parties, giro* or *scontro*, as follows: Two persons were commissioned to collect and compare ... all the fair books. They then canceled the payments against one another, and only paid the balances in cash ... The fair payments at Lyons owe their form to the Florentines, a fact which is clearly shown by the development of the Lyons Bourse.

Various features of the clearing process at Lyons were not only adapted for use at other important fairs, but also had an impact on the methods later employed on the Lyons bourse. The method of

offset used in the end-of-fair settling process was later reflected in the *rescontre* system adopted to settle exchange trading of shares in 17th century Amsterdam and 18th century England.

The Lyons fairs first assumed importance circa 1463 due to the explicit mercantilist policies of Louis XI. As early as 1419, various French kings had granted privileges to merchants doing business in Lyons in an attempt to counteract the success of the fairs held in Geneva. These privileges included freedom to engage in various financial transactions, such as manual exchange of coin and dealing in bills of exchange, activities that were tightly regulated elsewhere in France. Even more than the economic benefits associated with the commodities trade, the French monarchs were motivated by the gains associated with the financial dealings of the fairs. By the 15th century, the capital that could be raised at important fairs such as those of Geneva was substantial. This capital was essential to securing financing for the military adventures in which the national monarchs were, almost continually, engaged. The extension of commercial liberties beyond the time period of the fairs contributed significantly to the emergence of bourse trading. As early as the end of the 13th century, the dukes of Brabant encouraged the growth of Antwerp by granting privileges to alien merchants visiting the city (van Houtte 1966), such as not requiring that local brokers be used to transact commodity business. Such merchants trading in Bruges, the northern centre of European commerce during the 14th century, were required to use local brokers.

While the fairs served an important step in the growth of trade and payments, by the late 15th century economic activity was outgrowing the restrictions of the fixed fair dates. A network of international merchants had established permanent offices and warehouses throughout the key commercial centres of Europe. To support the associated trading activities, sizeable communities of foreign merchants were established. These changes meant that liquidity was sufficient to support trading throughout the year. This growth sustained the creation of bourses in various cities, designed to facilitate dealings in both physical and financial commodities. The bourses were, effectively, meeting places for merchants of various countries to transact financial and commodities business. The use of the term 'bourse' (beurs) is indicative of the historical development, the term being taken from a square in Bruges, named for an inn on the square owned

at one time by the van Beurs family, where the Florentines, Genoese and Venetians had their consular houses. This inn was a popular meeting place for foreign merchants. Though exchange trading of derivative securities was yet to come, some essential characteristics of exchange trading are discernible at the beginnings of the bourses: a self-regulating collection of merchants -- both brokers and dealers -- meeting for the mutual gain of enhanced liquidity. For the early bourses, access to credit and foreign exchange facilities were also important factors.

Bourse trading was a major development on trading at fairs and markets for at least two reasons. First, trading at the fairs was restricted to specific time periods. While initially useful as a method of concentrating mercantile activity, the growth of trade soon surpassed the narrow time windows provided by the fairs. Bourse trading involved both financial transactions and trading in goods. These two activities were complementary. Commercial trade in goods generated financial transactions, activities that were both facilitated by the concentrated activity of the fair. Yet, as evidenced in the activities of merchant bankers in centres such as Bruges (e.g., de Roover 1948), there were other reasons for financial activity independent of goods trading, such as trading in bills of exchange for investment and market making purposes. These financial activities formed the basis of an element of bourse trading that can been traced back to the Middle Ages in southern Europe, starting in the trading centers of Italy. By the 14th century, financial bourse trading can be found in certain northern European centers, most importantly Bruges (Ehrenberg 1928, p.55):

> in the trading cities of Italy, [bourse trading] arose from the business which developed at the banks of the money-changers native to the city, when the notaries likewise had stalls in the open air ... there arose ... the characteristics of the exchange business as early as the fourteenth century ... In the countries north of the Alps bill business ... developed in closest connection with the factories of the Italians. The streets and market places where they lived, and more especially where they had their consular houses or Loggias, were the localities where the bourse business first developed.

Bruges was geographically well situated to have the first significant bourse trading in northern Europe. The opening of seaborne trade routes through the Straits of Gibraltar contributed to the decline of fairs along the land trade routes, such as the Champagne fairs. In addition, the Hansards developed important seaborne trade from northern Europe. All this growth in seaborne traffic

contributed to the initial rise of Bruges as “the greatest market of Christendom in the fourteenth century” (van Houtte 1966, p.37).

In addition to being a main seaport, Bruges was also the locale for one of the five fairs of Flanders. The importance of Bruges peaked in the mid-1300s with the comparatively faster growth of commercial markets and bourses in other centres being due to two primary local factors: the silting of the waterway connecting Bruges to the ocean; and, the various restrictions imposed by Bruges on foreign merchants trading there. The international growth of trade meant that Portuguese, Spanish, South German and Italian merchants had sufficient reason to establish permanent colonies in locales such as Bruges and Antwerp where, before, these merchants sojourned to the fairs. In addition to geographical factors, the freedoms granted to alien merchants played a key role in determining where bourse trading was concentrated.[15] From the beginnings of bourse trading there was competition between exchange venues for business. A second factor favouring bourse trading was that fairs required goods to be transported to the fair's geographical location for inspection in order to conclude specific transactions. The goods were then transported to another district to be sold. As trade expanded, factors such as acceptable levels of standardization and the growth of mutual merchant confidence allowed goods transactions to be made without actual inspection of goods at the time the sale was completed. In turn, exchanges were located geographically close to the center of the underlying bulk goods trade. Such factors significantly reduced transactions, transport and other costs. By providing enhanced liquidity and cheaper execution, bourse trading was an essential impetus to the emergence of speculation in commodities which, ultimately, progressed into exchange trading of derivative securities.

Though the transition from fairs to exchange trading was gradual, the 16th century does provide a transition period: at the beginning of the century, the fairs still played an important role in providing fixed dates and locations at which concentrations of liquid capital were assembled; by the end of the century, general economic activity was such that bourse and exchange trading predominated. During the century, the emergence of exchange trading in Antwerp and Lyons was especially important, though by the end of the century both these centres were in decline. Of

these two centers, Antwerp was initially most important for trade in commodities while Lyons for trade in bills of exchange. In 1531, Antwerp opened a new exchange building designed exclusively for trading of commodities and bills of exchange. Tawney (1925, pp.62-5) describes the international money market of the 16th century:

> In its economic organization the machinery of international trade had reached a state of efficiency not noticeably inferior to that of three centuries later. Before the most highly-organized economic systems of the age were ruined by the struggle between Spain and the Netherlands, and by the French wars of religion, there were perhaps ten to twelve commercial centres whose money markets were the financial power-houses of European trade, and whose opinion and policy were decisive in determining financial conditions. In the Flemish, French and Italian cities where it reached its zenith, and of which England was a pupil, the essence of financial organization of the sixteenth century was internationalism, freedom for every capitalist to undertake every transaction within his means, a unity which had as its symptom the movement of all the principal markets in sympathy with each other, and as its effect the mobilisation of immense resources at the strategic points of international finance. Its centre and symbol was the exchange at Antwerp, with its significant dedication, '*Ad mercatorum cujusque gentis ac linguae*' where ... every language under heaven could be heard, or the fairs at Lyon which formed, in the words of a Venetian, 'the foundations of the pecuniary transactions of the whole of Italy and of a good part of Spain and of the Netherlands'.

The public good characteristic of such a centralized exchange location was recognized and adapted in other centers, with Sir Thomas Gresham personally advancing the funds for the building of a similar exchange in London, the Royal Exchange, opening in 1571. By 1613, trading had fully started at the new building for the Amsterdam Exchange.

Fully developed exchange trading in commodities emerged in Antwerp during the second half of the 16th century (Tawney 1925, pp.62-5; Gelderblom and Jonker 2005). The development of the Antwerp commodity market provided sufficient liquidity to support the development of trading in 'to arrive' contracts associated with the rapid expansion of seaborne trade during the period. Various sources report that speculative transactions in 'to arrive' grain that was still at sea were particularly active, with trade in whale oil, herring and salt also being important (Gelderblom and Jonker 2005; Barbour 1950; Emery 1895). Unger (1980) provides detailed information on the herring industry during this period. The Dutch herring trade to the Baltic was intimately connected to the grain trade to southern Europe. Due to a number of technological developments introduced

over the fourteenth to sixteenth centuries, the Dutch herring fleets dominated this trade until the second half of the 17th century. The evolution of the herring fishery depended on increased capital requirements; as a consequence the role of brokers also evolved: "By the mid-fifteenth century the brokers were becoming owners and operators of ships as well. They were merchants with an interest in more assured supplies of preserved fish ... even individuals with no direct connection with fishing can and did invest in the boats and their supplies" (Unger 1980, p.258).

That 'to arrive' contracts came to be actively traded by speculators also directly involved in trading the underlying physical commodity is not surprising. Because transport by sea was a risky business and information about cargoes to arrive at a later date could be sketchy, the quality and quantity of physical commodity available for delivery could not be known prior to arrival of the fleet; a forward sale of such cargoes would be inherently speculative. The concentration of speculative liquidity on the Antwerp Exchange centered around the important merchants and large merchant houses that controlled either financial activities or the goods trade (Van der Wee 1977). The milieu for such trading was closely tied to medieval traditions of gambling and insurance where wagering on the safe return of ships, a rudimentary form of early insurance (Lewin 2003), was often connected with the conclusion of commercial transactions. A key step in the evolution of exchange traded contracts came when trading in 'to arrive' contracts involved standardized transactions in fictitious goods for a future delivery that was settled by the payment of 'differences'.[16] Purchasers of such contracts would speculate on the rise in prices before the due date. If such a rise occurred, the contract could then be sold and the speculator pocketed the difference in price. This 'difference dealing' was also conducted by goods vendors, selling for future delivery betting that prices would fall.

The development of difference dealing was accompanied by the emergence of 'premium contracts' where: "The buyer made a contract for future delivery at a fixed price, but with the condition that he could reconsider after two or three months: he could then withdraw from the contract provided that he paid a premium to the vendor (*stellegelt*)" (Van der Wee 1977). Little is known about the precise evolution of the contracts used for speculative trading, but the premium

contract appears well suited to difference dealing by speculators. The 'premium' form of contract for forward sale became a staple of the European securities trade into the 20th century, e.g., the contract for the German *prämiengeschäfte*. Such contracts differ from the options traded in modern markets which have inherited characteristics associated with historical features of US option trading. Following Emery (1896, p.53), the *prämiengeschäfte* "may be considered as an ordinary contract for future delivery with special stipulation that, in consideration of a cash payment, one of the parties has the right to withdraw from the contract within a specified time".[17] As such, this option is a feature of a forward contract with a fee to be paid at delivery if the option is exercised. Circa 1908 on the Paris and Berlin bourses, the premium payment at maturity was fixed by convention and the 'price' would be determined by the setting the exercise price relative to the initial stock or commodity price, e.g., Courtadon (1982).

Characteristics of exchange trading of derivative securities contracts in Antwerp formed the basis for later trading at other venues. Elements of that trade are still of contemporary relevance. While access to the Antwerp exchange was unrestricted, those unconnected to the bulk commodity trade and seeking to speculate required a broker to establish a position. Brokers could also be dealers in the commodity. The exchange was a largely self-regulatory entity with broker-dealers clearing derivative security trades with other broker-dealers. Rules of conduct for trading were largely governed by merchant convention. Penalties for violations involved loss of reputation and an ensuing inability to conduct business. The State provided official recognition to certain 'sworn brokers' and established a civil court system for settling disputes. Physical infrastructure and a sympathetic legal and taxation environment were provided to promote the development of trade. Difference dealing was facilitated by the use of premium contracts. Following traditions developed in the bill of exchange market, the clearing of positions in difference dealing was done by brokers coordinating with other brokers.

3. Exchange Trading in 17th Century Amsterdam

The collapse of Antwerp in 1585 and the resulting diaspora of important merchants contributed substantially to the rise of the important exchanges in Amsterdam and other centres such as

London, where the Royal Exchange was established in 1571. While Amsterdam had developed as an important commercial center prior to 1585 (van Dillen 1927; Gelderblom and Jonker 2005), the establishment of a permanent building for the Amsterdam bourse in 1611 marks a symbolic beginning of Dutch commercial supremacy. During the 17th and 18th centuries, trading of forward and option contracts on the Amsterdam exchange exhibited many essential features of exchange trading in modern derivative markets. By the middle of the 17th century trading on the Amsterdam bourse of derivative securities for shares in the Dutch East Indies Company (VOC) and, to a lesser extent, the Dutch West Indies Company, had progressed to where contracts with regular expiration dates were traded (Wilson 1941; Gelderblom and Jonker 2005).[18] By the 18th century, the trade involved both Dutch joint stock shares and "British funds". This trading on the Amsterdam bourse is the first historical instance of exchange trading in financial derivative securities. "With the appearance of marketable British securities, and the application to them of a speculative technique that was already well understood, the Amsterdam bourse became the scene of international finance at its most abstract and most exciting – gambling in foreign securities" (Wilson 1941, p.79).

While information about derivative security trading in Antwerp is scattered and sparse, detailed accounts of such trading in Amsterdam are available in Josef de la Vega (1688) and Isaac de Pinto (1762). Both sources discuss trading of joint stocks; trading in commodities is not directly examined, though following traditions developed in Antwerp, such trade was also a common source of speculative trading. As such, exchange trading in Amsterdam marks the beginning of the distinction between derivative securities for bulk commodities versus financial assets, in particular shares in joint stock companies. While trading of derivative securities in the bulk commodity trade was controlled by a network of brokers and dealers directly connected to the underlying goods trade, the same was not the case with shares. Amsterdam is the first instance in the history of exchange traded derivative securities where the distinction between financial assets and bulk commodities as deliverables assumes importance. Though there was speculative trade in bulk commodities – grain, herring, spices and whale oil– the trade in shares captured the bulk of

this activity.[19]

Despite isolated instances of joint stock share trading in other centres, the first developed market for company shares arose with trade in VOC shares in Amsterdam starting from the founding of the Company by the States General in 1602.[20] Creation of the Company led to a call for initial subscriptions of capital. Prospects for the Company were generally perceived to be favorable among the moneyed individuals willing to invest in such a venture and the closing of the VOC subscription lists found numerous individuals still desiring shares. These individuals turned to the Amsterdam exchange to purchase shares and, when this could not be done at par, a 14-16% premium emerged within a number of days (Ehrenberg 1928, p.358).[21] With such immediate returns, the potential for gain became apparent to exchange traders and the speculative trade in shares began in earnest with the selling of shares for deferred delivery not owned at the time of the sale.

Circa 1602, the Amsterdam Exchange was held in the open air on the New Bridge. It was not until 1613 that trading completely moved to a building dedicated for the Amsterdam exchange. Trading in shares was only a small portion of the general activity on the Amsterdam Exchange, which was predominately in bills and commodities. By the beginning of the 17th century, it was apparent that trading in Amsterdam had become the successor to the Antwerp bourse that had fallen on hard times due to a combination of political, geographic and economic factors. In conjunction with the shift in trading activity, many of the traders also eventually relocated from Antwerp to Amsterdam and brought with them the trading techniques that had been successfully developed on the Antwerp exchange. Included among these techniques was speculative trading for future delivery. This technique, almost immediately, was applied to trading in Company shares. Ehrenberg (1928, pp.358-9) provides some fundamental insight into methods used for trading in shares:

> From the beginning, the speculation in shares ... as a means of gain depending on taking advantage of future price changes, made it appear extremely desirable to postpone the fulfilment of the bargains. In the case of bears, who had sold shares which they did not possess, this was an absolute necessity.
>
> Speculative future dealings made possible a twofold simplification of the technique of

> dealing. First, speculative dealings could be realized before the date of delivery. Secondly, settling days made it possible to use the same procedure that had done so much in the methods of payment, namely, set off. Both together resulted in an incalculable increase in turnover, since now only a little ready money and stock were required for very large dealings.

Significantly, "it was speculation which made the first modern stock exchange". Speculators provided the liquidity essential for continuous trading and 'accurate' pricing. In turn, hedgers and traders seeking to acquire or dispose of stock positions provided the 'honest' liquidity needed to clear the market. De la Vega (1688, p.164) suggests that the relative composition of the speculative trading population changed over time, whereas "formerly twenty speculators ruled the exchange ... Today there are as many speculators as merchants".

Kellenbenz (1957, pp.139-42) provides a useful summary of de la Vega's discussion of the various types of transactions in the Amsterdam market:

> a. There were sales of real stock against immediate payment of cash.
> b. There were comparable sales where the money to cover payments was borrowed from individuals, up to four-fifths of its value.
> c. There were transactions in which future settlement dates were specified – that is, beyond the regular monthly settlement dates. These future contracts were seemingly used for both speculative and hedging purposes, both by speculators and by the lenders on securities. De la Vega implies that the latter parties always hedged by means of such contracts. Hypothecation, which was mentioned as early as 1610 (in the edict of that year), was permitted to the seller presumably during the period of the forward contract. Arrangements also were possible, and were fairly frequently resorted to whereby the date of the termination of a future contract could be postponed, apparently by mutual consent of the parties. This action was called 'prolongation'. A large proportion of the foregoing future sales were really sales 'in blanco' – or short sales, as we would label them – even though such transactions were prohibited by laws of the state and of the city
> d. There were options contracts. These were at least of the 'call' and 'put' varieties, which have persisted ever since ... Option contracts were utilized sometimes for hedging purposes by *bona fide* investors, but more commonly for mere speculation ...
> e. In addition there were purchases and sales of 'ducaton' shares. (Such transactions were of recent origin in 1688, and actually had been abandoned in the slump that had occurred just as de la Vega was writing his book.) What this 'ducaton' trading amounted to is a bit uncertain on the strength of what de la Vega actually says. Scholars who have worked on this period assert that the ducaton shares were fictitious ...

Trading for forward delivery was essential to the 17th century trade in shares on the Amsterdam bourse (Barbour 1950).[22] Such trading was necessary because the delivery and settlement process

for traded shares was much different than the modern process. Though shares could be transferred, the process required the seller to be present at the Company offices for the transfer and to pay a transfer fee. The practice of same day settlement, delivery and transfer, as practiced in modern stock markets, was not usually possible – even for trades arranged at the transfer office.[23] Agreements to sell shares typically included a future settlement and transfer date which could be months in the future, though delivery dates longer than one month in the future were discouraged by statutes dating from 1610.

Perceptions of speculative abuse associated with the delivery process appeared almost from the start of trade in VOC shares (van Dillen et al. 2007).[24] Following the activities of a bear ring, formed "in early 1609 ... to challenge the company on the exchange. It is not clear that the ring did more than help to hold down the already slumping prices, but the company lodged a protest with the States of Holland and West Friesland in the summer of 1609 to have a ban placed on the sale of shares 'in blanco'" (De Marchi and Harrison 1994, p.51). The result was the Dutch edict of 1610 banning short sales 'in blanco', where, at the time of the short sale, the seller does not actually possess the shares being sold. In addition, the edict required that share transfers be made within one month of the sale date. The ban on short sales was not permanent and the "occasion of renewal brought out anew sentiment for and against VOC" (p.51). Despite opposition, the ban on 'selling in the wind', or *windhandel* trade, was repeated in 1624, 1630, 1636 and 1677. It is important to recognize that the *de facto* impact of the ban on in blanco short selling was to make such contracts unenforceable in the courts. There was no direct criminal penalty for entering into such contracts which provided the basis for difference dealing.

Confusion de Confusiones (1688; Fridson 1996) is a remarkable book (Cardoso 2006). Though the central concerns are much broader, de la Vega does make a number of detailed references to derivative security trading practices on the Amsterdam exchange. For example, there is a general description (Fridson 1996, p.155) of the potential gains to options trading: "Give 'opsies' or premiums, and there will be only limited risk to you, while the gain may surpass all your imaginings and hopes." This statement is followed by a somewhat exaggerated claim about the

potential gains: “Even if you do not gain through ‘opsies’ the first time ... continue to give the premiums for a later date, and it will rarely happen that you lose all your money before a propitious incident occurs that maintains the price for several years.” Presumably, de la Vega has call options trading in mind, the possibility of trading put options appears later (p.156). The reference to extending contracts is further elaborated in de la Vega's discussion of the *rescontre* system (p.181), a major technical innovation in clearing trades that emerged between 1650 and1688, when the Dutch first introduced quarterly settlements of share transactions on the Amsterdam bourse. Prior to this time settlement procedures had been less formal. Wilson (1941, p.83) provides the following description of the settlement process:

> The technique of speculation in the British Funds at Amsterdam ... was a kind of gamble carried on every three months: no payments were made except on *rescontre* (settlement or carry-over), i.e., the period for which funds were bought or sold and for which options were given or taken. *Rescontredag* (contango day) occurred four times a year, and on these occasions representatives of the speculators gathered round a table to regulate or liquidate their transactions, and to make reciprocal payments for fluctuations or surpluses. Normally these fluctuations were settled without the actual value of the funds in question being paid – only real investors paid cash for their purchases. Speculative buyers paid to sellers the percentage by which the funds had fallen since the last contango day, or alternatively received from them the percentage by which funds had risen in the same interval. After surpluses had been paid, new continuations were undertaken for the following settlement. In such a *prolongatie* (continuation) the buyer granted the seller a certain percentage (a contango rate) to prolong his purchase to the next *rescontre*: in this way he stood the chance of benefiting by a rise in quotations in the interval, without tying up his capital: he was only bound to pay any possible marginal fall.

A key feature of the *rescontre* was the concentration of liquidity that, for example, permitted prolongations to be done more readily (Dickson 1967, p.491; van Dillen 1927). The term ‘rescontre’ was derived from the practice of Dutch merchants to “indicate that a bill had been paid by charging it to a current account — ‘solvit per rescontre’ as distinct from ‘per banco’, ‘per wissel’ and so on” (Dickson 1967, p.491; Mortimer, *Everyman*, 5th ed., p.28n).

In addition to the references to extension of the option expiration dates, with regular marking-to-market, de la Vega takes up the uncertain legal interpretation of option contracts at a later point (p.183) and explicitly recognizes that the Dutch restriction on short sales could impact

put and call options differently:

> As to whether the regulation (banning short sales) is applicable to *option contracts*, the opinions of experts diverge widely. I have not found any decision that might serve as a precedent, though there are many cases at law from which one [should be able to] draw a correct picture. All legal experts hold that the regulation is applicable to both the seller and buyer [of the contract]. In practice, however, the judges have often decided differently, always freeing the buyer from the liability while holding the seller [to the contract] ... If ... the opinion is correct that it applies only to the seller, the regulation will be of no use to me [as a person wanting to seek shelter] when I receive call premiums, for in this case I am in fact a seller; but it will help me if I have received a put premium, as I am then the buyer of stocks. With regard to the put premium... law and legal opinion, the regulation and the reasons for the decisions are contradictory. The theory remains uncertain, and one cannot tell which way the adjudication tends.

The bulk of option market participants appear to have been speculators, attracted primarily by the urge to gamble, usually "men of moderate wealth indulging in a little speculation" (Wilson 1941, p. 105). In contrast, drawing from de Pinto (1762), Wilson (p.84) observes that for trading conducted on the Amsterdam exchange during the 18th century: "Options were the province of the out-and-out gamblers."[25]

4. Exchange Trading in 18th C. London

Following the Glorious Revolution of 1688, many of the speculative practices used in Amsterdam were adopted in England where stock trading had a developed spot market by the mid-1690s with about 140 joint stock companies available for trading by 1695. However, from the perspective of exchange trading of derivative securities, this trade took a substantively different form than in Amsterdam. Despite the presence of the Royal Exchange, the development of exchange traded derivative securities for shares was hampered in England by a combination of factors. Houghton's 1694 contributions to his circular *A Collection for the Improvement of Husbandry and Trade* can be fairly recognized as containing possibly the first coherent and balanced description of early stock trading in London, e.g., Neal (1990, p.17), though the description provided by Houghton is so brief that Cope (1978, p.4) credits Mortimer (1761) with being the "first detailed description of the market". In addition to providing a description of cash stock trading, the bulk of the contribution by Houghton is on the specific subject of options trading.

For seven weeks in June and July 1694, Houghton dedicated the first page of his circular to discussing various aspects of stock trading. About 2 1/2 of the seven weeks are dedicated to trading in "puts and refusals". On June 22, 1694, Houghton provides the following discussion of the process for cash trading of shares at that time:

> The manner of managing the Trade is this: The Monied Man goes among the *Brokers*, (which are chiefly upon the *Exchange*, and at *Jonathan's* Coffee House, sometimes at *Garaway's* and at some other Coffee Houses) and asks how *Stocks* go? And upon Information, bids the Broker buy or sell so many Shares of such and such Stocks if he can, at such and such Prizes. Then he tries what he can do among those that have stock, or power to sell them; and if he can, makes a Bargain.

From this, a question arises: can there be an 'exchange' if there is no specific physical location where all trading takes place?

Even if it is accepted that the separated trading venues, represented by the coffeehouses in Exchange Alley and the company transfer offices, can still be considered an exchange, there is still the issue of clearing. While it is not possible to precisely date the beginning of the regular three month *rescontre* (called "rescounters" in London) for time bargains on stock in London, Dickson (1967, p.508) "tentatively" puts the date in the early 1740's. Dickson attributes the emergence of the rescounters to the impact of Barnard's Act on the use of option contracts and to the subsequent emergence of "dealing on margins, where the penalties on the broker were less severe, and harder to enforce." In turn, dealing on margins "made the case for regular settlement days (like the Dutch Rescounters) increasingly urgent. The institutional development required for regular clearing to emerge contributed significantly to the formal establishment of the London Stock Exchange (1773)." Though standardized contracts were in use from the early beginnings of share trading in London, conditions were not sufficient to qualify as exchange trading of derivative securities until a method of clearing was in place. As such, the London experience prior to the introduction of the rescounters reflects the difficulties of permitting OTC style trading of derivative securities. Attempts to directly suppress the contracts used for such speculative trading only led to trading of leveraged cash securities, e.g., Shea (2007).

Prior to 1696-1697, there were two venues for London stock trading, the Royal Exchange and Exchange Alley. In the Royal Exchange dealers in stocks and shares "had a 'walk' near the centre of the building between the salters, the Italian merchants and the Canary merchants" (Morgan and Thomas 1962). However, due at least partly to abuses arising from the 1696 price collapse of various joint stock promotions, stock traders left the Royal Exchange, conducting business after that date in the environs of Exchange Alley. "There is a certain amount of mystery about [the stock dealers] withdrawal [from the Royal Exchange]. Scott refers to their being turned out, whereas Duguid insists that they were so harassed by their fellow traders, and so short of space that they went voluntarily and in spite of the efforts of the City to prevent them" (Morgan and Thomas 1962, p.27). Until 1773, when a group of brokers acquired a building in Threadneedle Street that was, for the first time, called the Stock Exchange, the history of derivative securities trading in London for stocks was intimately connected to Exchange Alley. Not being associated with a single physical location, Exchange Alley was incapable of providing the exchange clearing conditions needed for exchange trading of derivative securities on shares until the emergence of the rescounters.

Until well into the 18th century, London share trading was impacted significantly by Dutch investors and speculators conducting a considerable amount of their British securities trading outside the Amsterdam exchange at various locations in London. By construction, such trades took time to complete – if only for the time needed to draw bills of exchange between Amsterdam and London. Trading in both "time bargains" and option contracts was widespread.[26] These activities were the main components of the 'stockjobbing' associated with the trading of securities for future delivery. Following Mortimer (1761, p.32):[27]

> the mischief of it is, that under this sanction of selling and buying the funds for time for foreigners — Brokers and others, buy and sell for themselves, without having any interest in the funds they sell, or any cash to pay for what they buy, nay even without any design to transfer, or accept, the funds they sell or buy for time. The business thus transacted, has been declared illegal by several acts of parliament, and this is the principal branch of STOCK-JOBBING.

While stockjobbing would be considered a basic activity in the context of exchange trading of derivative securities, the result of the widespread OTC trading of such securities is reflected in the history of stockjobbing in England which was met with considerable and generally disapproving interest in Parliament.

A number of attempts were made to regulate stockjobbing, starting in 1697 with an Act "To Restrain the number and ill Practice of Brokers and Stockjobbers".[28] In addition to restricting the number of practices of commodity brokers, this Act was designed to deal with three main difficulties associated with the trade in shares: unscrupulous promotion activities; manipulation of prices for shares; and, misuse of options. The pressures to further regulate stockjobbers intensified leading to the Bubble Act of 1720 and, following the South Sea Bubble, to the passage of "An Act to prevent the infamous Practice of Stock-jobbing" in 1733, also known as Barnard's Act. While this Act contained substantial penalties for speculative trading in options, the primary contractual vehicle for speculators, the Act was quite ineffective in eliminating this trade. However, Barnard's Act was successful in removing legal protection for these transactions, making the broker a principal in speculative transactions, responsible for completion of transaction in the event of default by a client. In turn, this led to the increased use of 'dealing on margins' as a method of speculation and the subsequent introduction of the London rescounters. The increased need for honesty and integrity in the settlement process was a significant factor leading a loose knit group of brokers to form the London Stock Exchange where access by the general public could be restricted.

That speculating in shares using option contracts was present from the beginnings of London share trading in the 1690's is evident from the discussion in Houghton (1694):

> Another time he asks what they will have for Refuse of so many Shares: That is, How many Guinea's a Share he shall give for liberty to Accept or Refuse such Shares, at such a price, at any time within Six Months, or other time they shall agree for.
>
> For Instance; When *India* Shares are at Seventy Five, some will give Three Guinea's a Share, Action, or Hundred Pound, down for Refuse at Seventy Five, any time within Three Months, by which means the Accepter of the Guinea's, if they be not called for in that time, has his Share in his own Hand for his Security; and the Three Guinea's, which is after the

> rate of Twelve Guinea's profit in a year for Seventy Five Pound, which he could have sold at the Bargain making if he had pleased; and in consideration of this profit, he cannot without Hazard part with them the mean time, tho' they shall fall lower, unless he will run the hazard of buying again at any rate if they should be demanded; by which many have been caught, and paid dear for, as you shall see afterwards: So that if Three months they stand at stay, he gets the Three Guinea's, if they fall so much, he is as he was losing his Interest, and whatever they fall lower is loss to him.
>
> But if they happen to rise in that time Three Guinea's, and the charge of Brokerage, Contract and Expence, then he that paid the Three Guinea's demands the Share, pays the Seventy Five Pounds, and saves himself. If it rises but one or two Guinea's, he secures so much, but whatever it rises to beyond what it cost him is Gain. So that in short, for a small hazard, he can have his chance for a very great Gain, and he will certainly know the utmost his loss can be; and if by their rise he is encouraged to demand, he does not matter the farther advantage the Acceptor has, by having his Money sooner than Three Months to go to Market with again; so in plain *English*, one gives Three Guinea's for all the profits if they should rise, the other for Three Guinea's runs the hazard of all the losses if they should fall.

This insightful description is quite remarkable in that, unlike de la Vega or de Pinto, Houghton was not an active participant in the market; Houghton was "not much concern'd in Stocks, and therefore (had) little occasion to Apologize for Trading therein". As Houghton does not provide a discussion concerning speculation using 'time bargains', it is likely that many speculations were executed using options contracts.

An important, but overlooked, feature of Houghton's 1694 discussion appears in the contributions of June 29 and July 6 where samples of put and call option contracts are given in detail, e.g., Poitras (2000, pp.350-1; Poitras 2009a). The use of standard contracts indicates that practices common in Amsterdam were adopted in London. As de la Vega (1688, pp.181-2) observes for Amsterdam trade:

> For ... time bargains the brokers use printed *contract forms* with the customary stipulations and conditions of the business. On these forms spaces are left only for names, dates, and prices ... For the *option business* there exists another sort of *contract form*, from which it is evident when and where the premium was paid and of what kind are the signatories' obligations.

With standardized forms and rescontre clearing, brokers were the vehicles for executing trades. As to the types of brokers, practices similar to those in Amsterdam appear to have been adopted in London. On practices in Amsterdam, de la Vega (1688, p.185) reports:

> There are two kinds of brokers. Some are appointed by the municipal authorities and are

> called “sworn” brokers, for they take an other to do business on their own account. Their number is limited, and it changes only in the case of death, or through special privilege, which is seldom conferred. The other class of brokers is called “free” brokers ... clemency and indulgence toward these brokers prevail, instead of the sworn brokers attending actively to their own interest.

Unlike Amsterdam where free brokers “appear so faithful and concerned about their customers that they compensate by zeal what they lack in reputation”, the derivative security trading activities of free brokers operating in the London share market almost immediately involved some unscrupulous activities.

During the emergence of trade in free standing option contracts, the conventional legal view in both Holland and England was that, while technically a gambling transaction, such contracts could be entered into by private parties willing to conduct such business without the guarantee that the courts could be used to enforce such contracts. However, in periods of speculative excess, the abuse of derivative security contracts, in general, and option contracts, in particular, produced a subsequent demand for further regulation. As Houghton (1690) reports, the organized options market that had emerged in London during the 1690's was a venue for market manipulation: [29]

> But the great *Mystery* of all is, That some Rich Men will join together, and give money for REFUSE, or by Friendship, or some other way, strive to secure all the Shares in a Stock, and also give Guinea's for Refuse of as many Shares more as Folk will sell, that have no Stock: and a great many such they are, that believe the Stock will not rise so high as the then Price, and Guinea's receiv'd or they shall buy before it does rise, which they are mistaken in; and then such takers of Guinea's for Refuse as have no Stock, must buy of the other that have so many Shares as they have taken Guinea's for the Refuse of, at such Rates as they or their Friends will sell for; tho' Ten or Twenty times the former Price.

In modern parlance, this is a classic example of a short squeeze being executed against uncovered call option writers. The Act of 1697 limited some of the potential abuses that were perpetrated with options, but did not eliminate such trading. This left forward trading as the favored vehicle for manipulating security prices, an undesirable outcome of the “villanous” practice of stockjobbing.[30]

There was considerable disagreement in the London broker community about whether options transactions were reputable. While potentially useful in some trading contexts, reputable brokers

felt that options contributed to the speculative excesses common in the early financial markets. While trading in options and time bargains did contribute to the most important English financial collapse of the 18th century, the South Sea Bubble of 1720, this event was due more to the cash market manipulations of "John Blunt and his friends" (Morgan and Thomas, ch. 2). In any event, dealing in time bargains and, especially, options were singled out as practices that were central to "the infamous practice of stock-jobbing". In 1721, legislation aimed at preventing stockjobbing passed the Commons but was not able to pass the Lords. It was not until 1733 that Sir John Barnard was able to successfully introduce a bill under the title: "An Act to prevent the infamous Practice of Stock-jobbing." This Act is generally referred to as Barnard's Act. Unlike the Dutch regulatory actions aimed at *in blanco* selling, the British approach was designed to regulate those features of stock dealings associated with excessive speculation, e.g., Morgan and Thomas (1962, p.62).

The main provision of Barnard's Act (1733) states:

> All contracts or agreements whatsoever by or between any person or persons whatsoever, upon which any premium or consideration in the nature of a premium shall be given or paid for liberty to put upon or deliver, receive, accept or refuse any public or joint stock, or other public securities whatsoever, or any part, share or interest therein, and also all wagers and contracts in the nature of wagers, and all contracts in the nature of puts or refusals, relating to the then present or future price or value of any stock or securities, as aforesaid, shall be null and void.

A penalty of £500 was levied on any person, including brokers, who undertook any such bargain. All bargains were to be "specifically performed and executed", stock being actually delivered and cash "actually and really given and paid", and with a £100 penalty for anyone settling a contract by paying or receiving differences. Consistent with the 17th century Dutch restrictions on *in blanco* selling, it was further provided: "whereas it is a frequent and mischievous practice for persons to sell and dispose of stocks and securities of which they are not possessed"; anyone doing so would incur a penalty of £500. There is disagreement among modern writers, such as Cope (1978) and Dickson (1967), concerning the extent to which Barnard's Act actually limited options trading. That it had some impact is evident. However, the extent of the impact is less clear.

Despite Barnard's Act making options trading illegal, options trading continued to the point where, in 1820, a controversy over the trading of stock options nearly precipitated a split in the London Stock Exchange.[31] A few members of the Exchange circulated a petition discouraging options trading. The petition passed, and members formally agreed to discourage options trading. However, when an 1823 committee of the Exchange followed up on this with a proposal to implement a rule forbidding Exchange members from dealing in options (which was already illegal under Barnard's Act), a substantial number of members voted against. A dissident group even began raising funds for a new Exchange building. In the end, the trading ban rule was rejected because options trading was a significant source of profits for numerous Exchange members who did not want to see that business lost to outsiders. The upshot is that, once the derivative securities contracts became exchange traded by traders already subject to the discipline of the fortnightly clearing process for shares, this was sufficient to prevent the significant speculative abuses that had plagued the previous OTC trading of option contracts and time bargains.

5. US Markets during the 19th Century

By the beginning of the 19th century, a number of characteristics associated with exchange trading of derivative securities had emerged. In particular, the exchange clearing process imposed self regulatory requirements on exchange participants needed to ensure settlement of positions. Both informal and formal rules were introduced to control access to the exchange process, e.g., the use of sworn brokers; restrictions on participation in the clearing process; private ownership of the exchange building. When exchange trading of derivative securities was concentrated around a small group of merchants directly involved in the trade, self regulation was generally sufficient to prevent speculative excesses. However, as trading expanded to include those unconnected to the trade, government oversight was required to prevent speculative abuses and unscrupulous practices associated with OTC style derivative security trading, where deals were directly done between counter parties. The connection of exchange trading of derivative securities for bulk commodities to the underlying goods trade restricted speculative participation in comparison to

such trading in stocks and shares. Competition among exchanges was muted by the need to locate trading geographically close to the associated goods trade, e.g., the transfer offices for shares; the wholesale goods market for commodities.

Though primary sources are scarce, it is likely that some form of derivative security trading in the US was present from the 18th century beginnings of trade in securities, perhaps earlier in the produce markets, e.g., Markham (1987, 2002). Significantly, over time this trade developed differently from Europe due to differing settlement practices. In the US, "each day is a settling day and a clearing day for transactions of the day before ... This is a marked difference from European practice" where "trading for the account" involves monthly or fortnightly settlement periods with allowance for continuation of the position until the next settlement date (Emery 1896, p.82). The continuation process for a buyer seeking to delay delivery involves the immediate sale of the stock being delivered and the simultaneous repurchase for the next settlement date. As this transaction would involve the lending of money, an additional 'contango' payment would typically be required. Daily or short dated settlement had dramatic implications for derivative security trading in the US stock market. Instead of trading for time, it was more expedient to speculate by selling (shorting) stocks and buying stocks on margin. As a consequence, the venue for evolution of derivative security trading was in the bulk commodity markets where, during the 19th century, exchange trading of derivative securities experienced a revolution that can be attributed to the subtle impact American culture had on specific business practices. Writing in 1896, Emery (1896, p.7) captures the main theme: "The American people are regarded by foreigners as the greatest of all speculators." This drive to speculate facilitated American innovations in derivative securities. "It was not until the (19th) century ... that the system (of dealings for time) became widely developed and not until the great expansion of foreign trade in the last fifty years that it became of great importance."

An important theme in progress of exchange trading of derivative securities is the public good benefits provided by enhanced participation of speculators in the exchange process. Among other benefits, enhanced speculation increases market liquidity and can improve price discovery. Yet,

speculative activity can have decided disadvantages, such as the increased incentive and ability to manipulate markets. Periods of turbulence in specific markets – where price discovery apparently failed – are often associated with the entrance of speculators not directly connected to physical trade in the underlying commodity using the leverage associated with derivative contracts to distort market pricing for private gain. Though there was time dealings being conducted in a number of centers throughout the 19th century, the beginning of exchange trading of derivative security contracts in the US commences with futures contracts traded on the Chicago Board of Trade (CBT) in mid-19th century Chicago, a city which was first incorporated as a village in 1833 growing into a city of 4,107 by 1837. In order to promote commerce, the Board of Trade of the City of Chicago was founded on April 3, 1848 with 82 members. This event, in itself, was not particularly noteworthy. The usefulness of boards of trade in promotion had been recognized for quite some time. For example, around 1700 John Law of the infamous Mississippi scheme promoted the creation of a board of trade for the city of Edinburgh (Murphy 1997).

Inherent conflicts between the exchange as a promoter of trade and interests of members and the exchange as a self-regulatory entity were not recognized, e.g., Lurie (1972, p.221):

> A basic purpose of the Board was to facilitate profitable economic activity by members. Thus its directors had to sense with some accuracy how far they could go in the areas of rule enforcement. If rules were enforced too harshly, board members could either ignore them or decline to remain in the organization. Yet, another purpose of the exchange was to rationalize the commodities market through efficient and effective regulation. The efforts of the directors to reconcile this inherent tension between private economic activity and an ordered national market represent a recurring theme throughout Board history.

The CBT initially served as a marketplace for members of the grain trade. A system of wheat standards was developed together with a system of inspecting and weighing grain. In 1859, the Board of Trade was authorized by Illinois state to engage in the measuring, weighing and inspecting of grain, effectively corn and wheat. As Hieronymous observes: “The development of quality standards and an inspection process and the substitution of weighing for the measurement of grain greatly facilitated trade. The substitution of weight for volume measures made the development of grain handling machinery possible. Increase in physical efficiency was important

in the development of Chicago as a great grain terminal." (p.73) These developments facilitated the handling of grain in bulk, through the use of grain elevators. This permitted interchangeable warehouse receipts to be introduced, instead of having to deal in unstandardized, specific lots. Not unlike the bulk commodity trade in 16th century Antwerp and 17th century Amsterdam, conditions in the goods market were evolving to where standardized contracts on physical commodities could be traded.

The grain trade of that time typically involved merchants at various points along major waterways such as the Illinois-Michigan canal purchasing grain from farmers which was then held in storage, often from fall or winter into spring. In this operation, the merchants' capital investment involved: paying the farmers for their crops at delivery; costs of building and maintaining storage facilities; and, providing funds for shipment of grain when required. In order to avoid the risk of price fluctuation and to satisfy bankers, merchants started to go to Chicago and make contracts for future, spring delivery of grain, at prices which were determined that day. While there was ad hoc OTC style forward trading of grains previously, the first "time contract" in Chicago was made on March 13, 1851 calling for delivery of 3000 bushels of corn in June at one cent below the March 13 cash price. The time contracts called for delivery of a standardized grade at a later delivery date. Similar contracts for wheat appeared in 1852. However, while there were similarities to exchange traded futures contracts, the absence of other conditions such as a clearing mechanism, the contracts were specific to the original parties to the transaction and created with the objective of delivery. As such, the initial trading in time contracts did not quite qualify as exchange trading.

The development of futures markets in Chicago was significant because, in the years immediately following the introduction of time contracts, individuals not connected to the grain trade became interested in taking positions. The resulting contracts often changed hands numerous times before being purchased by a market participant actually interested in taking delivery of the grain. This marks the introduction of a fundamental feature of futures markets, the essential participation of speculators not concerned with completing the underlying commodity

transaction. Exchange trading and purely speculative participants were characteristics not associated with trading in the often non-transferable 'to arrive' contracts and 'privileges' which had characterized American commodities trading previously (Williams 1982). This trade was concentrated primarily in flour. To arrive contracts in wheat, corn, rye and pickled hams were also conducted with activity centering on New York. In contrast to time bargains, to arrive contracts typically featured short delivery dates, limited standardization of the deliverable commodity and the expectation that delivery would be completed. While there is some evidence of limited speculative dealings in these 'to arrive' contracts and 'privileges' associated with the flour default of May 1847, participants to these transactions usually involved merchants directly involved in the commodity business. In keeping with use of such contracts in Liverpool, cotton trading did employ 'to arrive' contracts that had elements of futures contracts.

The increasing speculative interest in time contracts led the Board of Trade to introduce a number of resolutions to curb abuses. Many of the abuses were consistent with speculative participation and longer delivery dates. "It seems that when time for settlement arrived some of the contracting parties were difficult to locate." (Hieronymous p.76) Out of the early self regulatory process came the beginnings of formal trading rules for futures contracts. In 1863, the Board adopted a rule which suspended the membership of anyone failing to comply with a contract, either written or verbal. On Oct. 13, 1865 the General Rules of the Board of Trade explicitly acknowledged futures trading and adopted rules which included all the essential elements of a modern futures contract including: standardized contract terms; restriction of futures contract trading to exchange members; margin deposits to guarantee performance; and, standardized delivery procedures.[32] Prior to this date, individual traders had been responsible for establishment and enforcement of the terms of the contract. This development followed a similar move in 1864 by the Liverpool Cotton Brokers' Association introducing formal regulations for 'to arrive' contracts in cotton (Forrester 1931).

Exchange trading of derivative security contracts progressed dramatically since the first corn futures trade on the CBT in 1865. Many other futures exchanges emerged in the period between

the Civil War and World War I. The New York Cotton exchange was formed in 1870 and the New Orleans Cotton Exchange in 1871, though time contracts did not play an important role on the latter exchange for almost a decade. In 1874, the Chicago Produce Exchange was formed by dealers trading in produce of various kinds. The Coffee, Sugar and Cocoa Exchange was initially founded in 1882 as the Coffee Exchange of New York City with the specific intent of trading in time contracts for coffee. Initially founded in 1872 to trade in butter, eggs and cheese, a decade later the exchange acquired its current name, the New York Mercantile Exchange (NYMEX).[33] In 1898, a subgroup of the produce exchange known as the Produce Exchange Butter and Egg Board withdrew from the Produce Exchange and formed the Chicago Butter and Egg Board. This group is of present interest because it had established an active trade in time contracts for eggs, even though such trade was only a small proportion of the Butter and Egg Board's activity. When margin rules for time contracts were finally written in 1911 there was considerable controversy among the members. Finally, in 1919, a complete set of futures trading rules was written and the mandate of the Butter and Egg Board was changed to include futures trading. The end product was the emergence of the Chicago Mercantile Exchange, which started contracts for trading butter and eggs on Dec. 1, 1919.

The late 19th century Renaissance in exchange trading of derivative securities was accompanied by a rash of speculative manipulations that ultimately led to vociferous attacks from agrarians and Populists, e.g., Cowing (1895), Hicks (1961). Though referred to as 'anti-option' bills, the focus of the attacks was futures contracts. The anti-speculation reasoning behind the attacks was described around that time by Cowing (1895,p.5):

> The seemingly orthodox futures contract, occasionally used before the Civil War and an outgrowth of earlier "to arrive", and "forward delivery" agreements, began to receive unprecedented attention from speculators. Persons not previously connected with the commodities business had been attracted, and were buying and selling futures contracts in the central markets, especially in Chicago and New York. The number of bushels and bales traded on the exchanges exceeded the annual production from 1872 on and in several years toward the end of the century amounted to sevenfold the annual crop. Prices had moved widely before the war because of weather, economic instability, and imperfect crop information, but it appeared that the new volatility was due to maneuvers by speculators

> with large purses. Thus "speculator" became more than ever a term of opprobrium; the physiocratic bias against those who produced no primary products was more bitterly asserted as the agrarian population shifted consciously to the defensive. The mysterious and remote commodity speculator seemed more of a parasite to the farmers than the local physician who was holding land for appreciation. Farmers identified the commodity speculator as the villain responsible for erratic price changes in Chicago, Minneapolis, and New York, especially around harvest time. The stage was set; the national crusade against the exchange speculator was about to begin.

Various efforts were made by the exchanges, as well as state and federal legislatures, to control the perceived market manipulations. At the federal level, between 1880 and 1920, there were some 200 bills introduced in the US Congress aimed at regulating derivative security trading, though few bills made it out of committee (Markham 1987, p.6-9). State legislatures that did pass bills, e.g., an 1874 Illinois statute prohibiting 'corners', were unsuccessful in curbing such activities. Various states passed laws prohibiting futures trading for which there was no intent to take delivery. Such laws were voided by the courts on grounds that "pro forma assertions of interest with respect to delivery were sufficient to preclude application of the statutes" (Markham 1987, p.6; Lurie 1972).

The decline in agrarian conditions following the post-1886 droughts generated sufficient political will to produce the Hatch-Washburn bill of 1892, the most concerted effort at legislation prior to passage of the Grain Futures Act in 1921. Instead of outlawing futures trading, this bill aimed to impose a prohibitive tax on speculative dealings in futures. The Congressional debate on the issue surrounding the Hatch-Washburn bill is an essential primary source on 19th century views on derivative securities. The committee meetings leading up to votes on the bill included testimony from important agrarians, such as J.H. Brigham, Master of the National Grange and C.W. Macune of the Farmers' Alliance and Industrial Union. Not only farmers were in favor of the bill, the testimony also included statements from millers, such as Charles Pillsbury, as well as grain and hog merchants. Pillsbury held that "neither grower nor miller had as much influence over prices as a few men around the wheat pit in Chicago. Short selling by these few made prices erratic and unstable; opinions based upon supply and demand were worthless in the face of this manipulation" (Cowing 1965, p.7). Pillsbury also maintained that the use of futures to hedge

would not be necessary if price volatility due to speculation was eliminated.

In 1893, the Hatch-Washburn bill successfully passed the House, 167 to 40, and passed the Senate, 40 to 29, though there were some amendments which had to be returned to the House for approval.[34] However, this placed the bill too far down the calendar to be dealt with before the end of the session. A suspension of House rules was required for the bill to become law. However, suspension of rules requires a two-thirds majority and the vote, 172 to 124, fell short by 26 votes. The gradual return of prosperity dampened, but did not eliminate, the drive of the anti-speculator forces. However, it was not until after WWI that sufficient legislation, such as the Grain Futures Act (1922), was in place to curb the alleged abuses of the middlemen and speculators using the exchanges. By this time, the extreme anti-speculator position of the agrarians had faded. Though the Act did contain provisions against manipulation these were largely ineffective. The Act was successful in bringing the futures exchanges under federal supervision and in providing for "continuous fact-finding and supply of continuous trading information" (Hieronymous 1971, p.314). However, the failure to recognize and exploit the fundamental role of exchange self regulation in identifying and penalizing market manipulation still survives to the present.

The history of options trading in the US reflects the general confusion surrounding exchange trading of derivative securities. In considering this history, a distinction between stock and commodity options is needed. Though there were instances of earlier trading, initial US trade in *commodity* options is usually associated with the beginnings of the CBT, where options were known as "privileges". Bid and offer privileges roughly corresponded to modern day puts and calls. The similarity of privileges to gambling, as well as the prominent use of options in a number of market manipulations, led to numerous unsuccessful attempts by the CBT, various state and federal legislatures and the courts to halt commodity options trading. As early as 1865, the CBT introduced a rule which denied the protection of the exchange to privilege traders. This rule was found to be both unpopular and ineffective and was withdrawn in 1869, illustrating the ineffectiveness of self-regulation when the governance of the exchange is controlled by the members being regulated. Various legal challenges were launched to privilege trading, including

an Illinois Supreme Court ruling which found privileges to be illegal. In 1890, the US Congress attempted to ban commodity options but was unsuccessful in getting the legislation passed. The trade in commodity options continued under different guises, e.g., calling the contracts "indemnity of sale or purchase" (Markham 1987, p.9), until the trade was banned by the Commodity Exchange Act (1936). However, without the sanction of the exchange, it is debatable whether this commodity option trade qualifies as exchange trading of derivative securities.

The social resistance to commodity option trading during this period was propelled by farm based "populist" political movements which associated erratic price behavior with excessive speculation. These views were not without foundation. The limited amount of regulation of commodity and stock markets in the pre-WW I period permitted numerous corners and other market manipulations. Charles Taylor (1917) relates the role of privileges in one of the more "outstanding of these (corners that) had to do with oats, and was operated by Mr. Chandler, a prominent merchant. He peddled 'puts' about the city, inducing speculation on the part of a large number of people not ordinarily in the market. Chandler and his friends did not count on a large inrush of oats attracted to Chicago by the high prices and the corner failed. Many people lost money and there was much public indignation." (Hieronymus, p.85) There was a prevailing belief among populists that brokers were using the exchange process to extract money from farmers. This view was carried forward into the Grain Futures Act (1922) which contained a section maintaining derivative security "prices are extremely sensitive to speculation and manipulation" (Markham 1987, p.14). The social importance of many of the underlying commodities meant that commodity options received substantially more scrutiny than stock options.

For a variety of reasons, including a history of speculative abuses, option trading was held in low esteem by the bulk of stock and commodity market participants in the US.[35] Until the emergence of the CBOE, absence of exchange sanction prevented the exchange trading of such derivative securities. As a consequence, the trade was generally conducted by a specialized group of OTC traders catering to a relatively small clientele. Circa the end of the 19th century, trading in privileges was only conducted in the after market and on 'the curb' as such trading was prohibited

on all US stock and commodity exchanges. By the end of the 19th century, all US stock and produce exchanges had banned option trading, though some OTC trade did take place in other venues and other various guises. Evidence for such trade in stock options is provided by Kairys and Valerio (1997, p.1709) where an 1873-5 sample of over-the-counter US option contacts is examined. This sample was obtained from advertisements in the *Commercial and Financial Chronicle*. The prices were only ask quotes, exclusive of bids, and were aimed at generating business from buyers of options. The option prices were found to favor the option writer. Following the European practice, these contracts determined prices by keeping the premium constant and adjusting the exercise price:

> Whereas current option prices are quoted after fixing the strike price, the cost of a privilege was fixed at $1.00 per share for all contracts and the strike price was adjusted to reflect current market conditions. Furthermore, the strike price was expressed as a spread from the current spot price of the underlying stock with the understanding that the spread was then the "price" that was quoted for the privilege contract.

Based on Emery (1896), this method of pricing options was also customary in the Chicago grain markets where contract maturities varied from one day to a week. This indicates the prevalence of European practices in the US option market at this time.

Kairys and Valerio (1997, p.1719) pose the question: why did the option markets fail to develop further given the apparent level of refinement? Unfortunately, the explanations provided are lacking. In contrast, Emery (1896, p.80) provides a more insightful explanation for the disappearance of stock options trading:

> In the last few years ... privileges have been less common than they formerly were. The trade in privileges depends chiefly upon a few men of large means. The public buy, but seldom sell, privileges, and if the men who are accustomed to dealing in that way stop selling, the field for such practices becomes very circumscribed.

The disappearance of the 'men of large means' in 1875 is possibly due to the substantial deterioration in the public perception of options induced by the stock projector Jacob Little's use of options to manipulate the price of Erie stock in that year. According to Clews (1915, p.10): "Mr. Little had been selling large blocks of Erie stock on seller's option, to run from six to twelve

months." The resulting attempt to corner the stock and squeeze Little is one of the fascinating stories of the 19th century robber barons. The upshot was, yet again, a public black eye for stock option trading in the US and the imposition of a restriction on the maximum term of stock option contracts to sixty days.

6. The Emergence of the CBOE

"The strategic direction of derivative security regulation, both in the US and internationally, is almost incoherent" (Poitras 2002, p.22). The emergence of the Chicago Board Option Exchange (CBOE) and the International Monetary Market (IMM) divisions of the CBT and the CME in the early 1970's reflects this incoherence in the regulation of the derivative securities trade which continues to the present. Various substantive questions can be used to identify some key issues. Why did a self-regulating futures exchange specializing in bulk commodities, the CBT, undertake and be permitted to trade options on stocks? Why did this trade not originate with the stock exchanges? Why did the CME, another exchange associated with trading in bulk commodities, create a division dedicated to the trading of currency futures (but not option) contracts, a commodity for which there was a well developed OTC market between financial institutions? Why did this trade not originate with the financial institutions? The regulatory confusion created by the conflict between exchanges as promoters of trade and as self regulatory organizations is reflected in the lack of attention to the process of self regulatory oversight and exchange governance in present regulations, e.g., Pirrong (1995), Mahoney (1997), Markham and Harty (2008).

Following the introduction of taxes on privilege earnings in 1921, the Grain Futures Act (1922) represented a significant step in curbing market abuses associated with derivative security trading. Following Markham (1987, p.15): "Although [the Grain Futures Act] was subsequently replaced by the Commodity Exchange Act of 1936, it nonetheless forms the core of the current regulatory scheme." This Act required commodity exchanges and their members to maintain and file privilege trading reports. The Act also required commodity exchanges to act to prevent price manipulation. Combined with the authority of the Secretary of Agriculture to investigate exchange

operations, this led to a substantial curtailment in commodity options abuses. However, some commodity options trading still continued and, following the collapse of agricultural prices associated with the Great Depression, pressure from farm lobbies led to the outright ban on commodity options trading, in selected commodities, legislated in the Commodity Exchange Act (1936). Included in the restricted list were wheat, cotton, rice, corn, oats, and barley. However, despite the restrictions, considerable OTC trade continued in unlisted commodities such as coffee, silver, copper and platinum, together with commodity options trading offshore, especially in London.

In the US, trading in *stock* options began as early as 1790. Much as with commodity options, stock option trading also played a significant role in market manipulations. As early as the 1890's, option pools were in operation.[36] Two general types of pools were present in the 1920's: trading pools and option pools, with the latter being the most common. While trading pools acquired stock on the open market, option pools would acquire all or most of its securities by obtaining call options contracts to purchase stock at favorable prices. These options were acquired OTC from various sources, such as the corporation, where the options took the form of warrants, as well as large stockholders, directors, officers, large speculators and banks. While there was considerable diversity in the maturity of the options granted and the types of schemes involved, the primary objective of the option pool was to benefit through manipulation of the common stock price. The option pools were symptomatic of the types of abuses that contributed to the 1929 stock market collapse. The regulatory response implemented in the 1930's, culminating in the Securities Act (1934) was to prohibit all activities aimed at manipulating market prices and trading on insider information.

Franklin and Colberg (1958, p.29-30) illustrate the importance of options trading in the 1929 market collapse:

> Testimony before the Senate Committee on Banking and Currency in 1932 and 1933 disclosed that many of the financial abuses of the 1920's were related to the use of options. A favorite device of large stockholders was to grant options without cost to a pool which would then attempt to make these profitable by "churning" activities designed to bring the

> general public in as buyers of the stock. In addition, long-term and even unlimited-period option warrants were issued frequently in connection with new stock issues.

During the wave of securities market reform following the market collapse of 1929-33, considerable attention was given to terminating option trading all together. One of the most profitable pools was the Sinclair Consolidated Oil option pool of 1929. While Sinclair stock was selling in the $28 to $32 range, a contract was obtained from Sinclair granting the pool an option to buy 1,130,000 shares at $30 per share. The pool then purchased 634,000 shares in the open market to bid up prices. The pool exercised its option, then liquidated all its holdings while the stock was selling in the $40 range. The pool also sold 200,000 shares short as the price fell. The pool's total profit was approximately $12.5 million from the following sources: $10 million profit from optioned shares purchased at $30 per share, $500,000 profit from shares purchased in the market, and $2 million profit from the short sales.[37]

In the process of developing a regulatory response to the market abuses which contributed to the financial market turbulence of 1929-33, it was accepted that the abuses associated with option pools would become illegal. However, in addition to the use of options in pool operations, there were other, more legitimate reasons for stock option trading. In the end, the brokerage industry was able to avoid the outright ban associated with commodity options. The initial legislation aimed at regulating the securities markets, the Fletcher-Rayburn bill (1934) called for a total ban on stock options. The brokerage industry was able to prevent this result. Instead, the Securities Act (1934) empowered the newly created Securities and Exchange Commission (SEC) to regulate the market and introduced the Put and Call Brokers and Dealers Association (PCBDA) (1934) which was designed to act as a self-policing agency, working closely with the SEC and other agencies to avoid further direct government regulation. It was member firms of the PCBDA which formed the basis for the OTC market trading of options which took place in the period leading up to the creation of the CBOE.

To appreciate the major advance that the CBOE represented, it is necessary to consider the state of equity option trading prior to the CBOE. Franklin and Colberg (1958, p.22) describe the

general state of equity option trading at the end of the 1950's:

> Practically all of the Put and Call business in the US is handled by about twnty-five option brokers and dealers in New York City. The brokers operate through (the PCBDA). All the contracts in which they deal are guaranteed or indorsed by member firms of the New York Stock Exchange ... The Put and Call business is largely self-regulated, but a great deal of the aura of secrecy which surrounds this activity seems to stem from the early 1930's when the threat of strict regulation or even legislative extermination haunted the entire options trade. Testimony before the Senate Committee on Banking and Currency in 1932 and 1933 disclosed that many of the financial abuses of the 1920's were related to the use of options.

At this time, the options market was relatively small. Self-regulation, both by the exchanges and by the PCBDA, coupled with the ability of the SEC to require reporting of options trading, were sufficient to prevent the abuses of previous years. However, the markets were relatively illiquid and it was difficult to resell positions. Upon closer inspection, though the options being traded through the PCBDA were transferable and, in a sense, protected by a clearing mechanism, some common drawbacks of OTC trading of derivative securities were present. In addition to illiquidity, trading in the market primarily involved large institutional investors writing overpriced options to small investors seeking to gamble in stocks with limited capital. In effect, OTC trading was aimed at capturing rents from control of the information and transactions technology of options trading.

Among other significant regulatory changes introduced by the Securities Act, the SEC required all options sellers to post margins. Unscrupulous activities such as granting brokers options for touting a stock were banned together with the use of options to trade on inside information. In addition to the increased government regulation, self-regulation by the PCBDA also played on important role. Despite the success in reducing market abuses, the options traded in the OTC market were often illiquid, making it difficult to resell or transfer a given options contract to another party. In 1972 this started to change with the creation of the Options Clearing Corporation, as a subsidiary of the Chicago Board Options Exchange (CBOE). In following years, the American, Philadelphia, Pacific and Midwest stock exchanges also introduced options trading. Trading on the CBOE commenced in April 1973 with 16 stock options. While initial interest in options trading was limited, by 1977 volume had increased substantially to the point where put

options were introduced. The ensuing implications of inter-exchange competition undermining the self-regulatory function of exchanges, a phenomenon which has overtaken derivative markets in recent years, was not adequately appreciated at the time. The advantages associated with combining options with cash trading, a tradition on European exchanges stretching back to early 19th century France (Viaene 2006), is unrecognized.

The implications and advantages associated with exchange trading of options are much as with futures. Strike prices and expiration dates of contracts are standardized to facilitate liquidity. The security of doing trades with the clearinghouse instead of a specific counterparty means positions are easier to unwind. Transactions and other costs are also lower. The subsequent importance of stock option trading was reflected in the cost of exchange seats: before the recent wave of demutualization, mergers and ETN's, seats on the CBOE were the most expensive of any exchange in the world. The successful introduction of exchange trading for stock options was not, initially, matched by commodity options. The creation of the CFTC in 1974 in combination with a number of large commodity options frauds originating in London commodity options led, in 1978, to the CFTC banning all London options, dealer options and domestic exchange traded options, except under certain restrictive conditions.[38] This rules were altered substantially in 1981 when new regulations on trading in commodity options were introduced. In 1982, trading began with options on futures for gold, heating oil, sugar, US Tbonds and certain stock indices. Over time, commodity option trading has been extended to currencies, Eurodollars, and a variety of other commodities.

Despite having decades to deal with the problem, there is still regulatory confusion over how to deal with exchange trading of derivative securities. The confusion is apparent in the regulation of options where the SEC generally has jurisdiction over options on physical securities, while the CFTC is responsible for options on futures, unless those futures are on stocks, etc., etc. The situation has become even more complicated with the Congress granting regulatory authority to entities for specific commodity markets, such as the Federal Energy Regulatory Commission (FERC). The competition between exchanges for business that characterized the emergence of the

CBOE is reflected in the experience of the IMM division of the CME where financial futures first appeared in 1972 in the guise of foreign currency futures contracts, followed shortly thereafter by interest rate futures and, eventually, stock index futures. In this case, the competition between exchanges was supplanted by the competition between the exchanges and OTC trading platforms – a theme which continues to the present with the competition between exchanges and OTC ETN and ATS trading platforms. Against this backdrop, various important market participants such as hedge funds are seeking exemptions from regulatory oversight leading to situations such as the Amaranth Advisors LLC in 2006 where both the FERC and CFTC battled over jurisdiction to prosecute market manipulation involving trading across both exchange and OTC ETN platforms, e.g., Cuillerier and Fleitas (2008).

The history of exchange traded derivative securities contains numerous lessons being largely ignored in the current calls for regulatory reform. There is limited recognition of the danger to market liquidity and oversight from the fragmenting of trading activity through the emergence of OTC ETN and ATS aimed at capturing the rents associated with control over information and transactions technology. Given the historical difficulties with legally proving manipulation in courts, the role of the self-regulatory exchange in maintaining 'fair and orderly' markets is being undermined by an ongoing process of demutualization and trading platform fragmentation. It seems the modern solution to the conflict between the private and public functions of the self-regulating exchange is to allow the exchanges to capture via privatization the rents associated with reducing the costs of maintaining the public self-regulatory function. Where trading is still concentrated on exchanges, regulatory costs are reduced by exempting important players and not incurring filing costs associated with determining the composition and strategies of market participants. Despite claims that modern derivative security markets dominated by OTC trading are 'innovative' and 'flexible', the history of exchange traded derivative securities suggests, instead, that encouraging such trading will only lead to counter-productive regulatory arbitrage, fragmentation of market liquidity and undermining of the price discovery and dissemination function of important commodity and financial markets

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NOTES

[1] The current debate on financial market reform is widespread and has many volumes of contributions. Relevant parts of the debate of immediate interest to this paper are reviewed in Pirrong (2008) where the misconceptions of the US regulators are identified. Even Pirrong (2008) does not make a sufficient connection between the self-regulatory function of exchanges and the mechanisms for clearing and execution. CFTC (2008), prepared against the backdrop of escalating oil prices, is a further example of the confusion among regulators. The conclusion of the Interagency Taskforce employs Granger causality tests to support the view: "based on available evidence to date … changes in futures market participation by speculators have not systematically preceded price changes." As many hedge funds and other alternative investment

vehicles currently operate under exemptions from reporting requirements, it is difficult to see how these key speculative players have been identified.

[2]. Treptow (2006, ch.3) and Pirrong (1999) review many available studies. Hart and Moore (1996) demonstrate theoretically that closed ownership structures for exchanges, such as the mutual form, can result in inefficiencies in governance leading to economic inefficiencies. Lack of technological innovation, higher transactions costs, reduced liquidity and monopoly rent extraction are a number of undesirable outcomes. However, Hart and Moore fail to consider the gains associated with using self-regulation to restrict manipulation. Both empirically, e.g., Pirrong (1995), and theoretically, e.g., de Marzo, et al. (2005), it has been demonstrated that self-regulation can only be effective with accurate government oversight.

[3]. Exceptions include Gehrig and Fohlin (2006), Neal and Davis (2005), Rajan and Zingales (2003), Chance (1995), Michie (1986), Lurie (1972) and the references cited in Markham and Harty (2008, p.867-82).

[4]. The modern Renaissance in derivative security trading has posed considerable problems for the accounting profession. In order to address the accounting problems raised by the use of derivative securities by firms for risk management and other purposes, the notion of "free standing derivatives" was introduced. This reference to free standing derivatives is precise accounting terminology borrowed from the financial accounting standard FAS 133. Being 'free standing', derivative securities pose fundamental problems for conventional methods of preparing accounts. This point has not been lost on the accounting profession which has been engaged in ongoing attempts to produce a set of standards that permit an accurate financial presentation of the accounts of the firm, which do not permit substantial discretionary variation in the accounts. In a perfect world, two otherwise identical firms, both involved with using derivative securities, would not be able to present accounts which were substantively different, based on discretionary accounting choices, such as the method used to recognize gains or losses on the offsetting spot position.

[5]. Of these contracts, rights and warrants are not examined. Though commonly used, there are difficulties with this definition. For example, combinations of bundled contingent claims can produce payoffs that are approximately identical to the payoffs for combinations of derivative securities, e.g., simultaneous buying and selling of equal cash value in bill of exchanges with different maturity dates produces a payoff with is equal to a calendar spread using currency forward contracts.

[6]. Some of the earliest examples of written language, the Sumerian cuneiform tablets, contain such notarial protests. See, for example, http://www.sfu.ca/~poitras/Brit_Mus.ZIP which provides a picture of a Sumerian tablet circa 1750 BC from the British Museum collection: "A letter complaining about the delivery of the wrong grade of copper after a Gulf voyage."

[7]. In the following quotes, the old English spelling used by Malynes in the original text has been modernized, e.g., "booke" to 'book', "necessarie" to 'necessary'. No alternations have been made to grammar.

[8]. "In 16th century England, the bulk of the export trade was in the hands of the Merchant

Adventurers, but the import trade was largely controlled by the merchant strangers, especially Italians, Spaniards and Flemings" (de Roover 1949, p.110).

[9]. Kellenbenz (1957, p.134) gives more precise information on the evolution of the Amsterdam Exchange: "The institution began as an open-air market in Warmoestreet, later moved for a while to New Bridge, which crosses the Damrak, then flourished in the 'church square' near the Oude Kerk until the Amsterdam merchants built their own exchange building in 1611". The Amsterdam bourse was fully open for business in 1613.

[10]. Max Weber (1924, 2000, p.339) provides an example of such a definition: "A stock or commodity exchange is a *market* in which the purchase and sale of large quantities of goods and money, of stocks and commercial bills of exchange, take place between professional businessmen". Weber (1894, 2000) aims to defend the exchange process from the view that "one is dealing with an wholly dispensable organization – one that must be judged by its very nature to be a sort of 'conspirators club' aimed at alying and deception at the expense of honest laboring people."

[11]. The term 'bill of exchange' is being used loosely. The subtle differences in the features of the bill of exchange contract, e.g., transferability, that evolved over time are being ignored. Munro (2000) and de Roover (1949) discuss these differences in some detail. Until the latter part of the 16th century, the bill of exchange was the dominant means of settlement in southern Europe, while the bill obligatory (letter obligatory, writings obligatory) was prevalent in the north: "The bill of exchange was definitely not unknown in the north; on the contrary. But before 1550 the bill of exchange was certainly not yet the characteristic, dominant instrument of foreign trade. Within the Hanseatic League the bill of exchange remained marginal. From the second third of the sixteenth century...use of the bill of exchange quickly became general in the north... The letter (or bill) obligatory, based on extension of payment, had from the late Middle Ages been the characteristic, dominant security in the foreign trade of the north. It continued to hold this position in the fifteenth and sixteenth centuries" (van der Wee 1977, p.324-5).

[12]. De Roover (1954, p.205) traces the progression of the banking practices from the fairs to fixed metropolitan locations: "By 1325...the role of the fairs of Champagne was played out, both as trading and financial centres. In the fourteenth and fifteenth centuries, the banking places of Europe were: Bologna, Florence, Genoa, Lucca, Milan, Naples, Palermo, Pisa, Siena, Venice and the court of Rome in Italy; Avignon, Montpelier, and Paris in France; Barcelona, Valencia, and Palma de Mallorca in Spain; Bruges in Flanders; and London in England... Paris declined shortly after 1400... and its place was taken by the fairs of Geneva and, after 1465, by those of Lyons. There were no banking places east of the Rhine, although the fairs of Frankfort-on-the-Main began to emerge as a clearing centre toward the end of the fifteenth century."

[13]. Relevant English legislation on enforce ability of interest payments is detailed in de Roover (1949, p.110, n.31). Henry VIII made the first substantive effort in 1545.

[14]. A similar description can be found in van der Wee (1977, p.318-9).

[15]. Buckley (1924, p.590) makes the following observation about the treatment of the English merchants of the Staple in Bruges: "It was, apparently, an important concession which the city

Bruges made to the English merchants of the Staple in 1559, when it was agreed that the latter should be free of brokers when buying. It was asserted in 1562 that in most foreign countries no 'stranger' bought or sold except through a sworn broker, and the English Statute Book contains a number of regulations of similar import. Such arrangements were general, being due to the universal prejudice against foreigners". Buckley (p.591) also makes another observation which is indicative of the pervasiveness of brokers at Gresham's time: 'Dealings in Bills of exchange without the intervention of a broker were exceptional'.

[16] . The identification of this early trade as 'futures' contracting is found in Gelderblom and Jonker (2005). This approach is at variance with the conventional view that futures trading began in Chicago in the 19th century or the less conventional view that such trading began in the17th century Japanese rice market (West 2000; Schaede 1987).

[17]. Emery (1896, p.51-3) provides a number of references to late 19th century German and French sources on options trading. The connection between German and English terminology is also discussed (p.91). Courtadon (1982) examines option trading practices on the Paris bourse.

[18] . The acronym VOC is a reference to the English to Dutch translation of the Dutch East India Company, as the *Verenigde Oostindische Compagnie*.

[19] . There was also speculative trade in tulips that was curtailed by the speculative 'tulipmania' of 1634-7. This mania was precipitated by the entrance, around the end of 1634, of purely speculative buyers into the tulip market which, prior to this time, had been conducted among merchants directly involved in the tulip trade. Following Posthumus (1929, pp.438-9): "People who had no connection with bulb growing began to buy ... Among these were weavers, spinners, cobblers, bakers, and other small tradespeople, who had no knowledge whatsoever of the subject. About the end of 1634 ... the trade in tulips began to be general, and in the following months the non-professional element increased rapidly." The speculators were attracted by the specific characteristics of the tulip market: the significant separation in time of the purchase agreement from the delivery and payment provided a commodity where speculative buyers of bulbs, not intending to take delivery, could trade with sellers that did not possess the bulb on the purchase agreement date. Payment and delivery considerations did not enter until it was certain that the actual tulip bulb was available for possession. "At the height of business most transactions took place without any basis in goods. Each succeeding buyer tried to sell his ware for higher prices; and, in the general excitement, one could make a profit – at least on paper – of several thousand florins in a few days. The craze spread rapidly with these high profits. All classes of population ended by taking part in it – intellectuals, the middle classes, and the labourers" (Posthumous 1929, p.440). However, following Garber (1989) and Poitras (2000), the bulk of the speculative trade was in the 'colleges' and not on the Amsterdam exchange so this trade does not qualify as 'exchange traded derivative securities'.

[20] . In addition to share trading in Amsterdam, van Dillen et al. (2006) makes reference to trading in shares also occurring in Hamburg, Frankfurt, Middleburg, Cologne, Rouen and in other locations. However, there is no evidence that this trade was anything other than small, occasional and generally unorganized (Barbour 1950, p.76).

[21]. As shares were issued by specific chambers, trading was confined almost exclusively to those issued by the Amsterdam chamber. Even at later dates where trading in shares of other chambers emerged, shares of the Amsterdam chamber still demanded a substantial premium, for example, Barbour (1950, p.77).

[22]. The primary documentation associated with the Dutch Edict of 1610, which removed legal protection for 'windhandel' contracts, contains an important *memoir*, probably written by Isaac le Maire, which outlines arguments in favour of retaining short sales (van Dillen 1930; De Marchi and Harrison 1994). A number of arguments draw on the similarity of the trade in shares to the trade in goods: "the authors proceed from free trade in goods (perfectly conventional from a common weal point of view), move on to the freedom to make forward purchases of commodities (accepted practice for at least several decades), and end with the freedom to trade in shares. This bundling, as well as the progression itself, may have been intended to persuade the reader that (all) share trading practices should unquestionably be regarded as no different in principle from trade in goods" (De Marchi and Harrison 1994, p.55).

[23] Though the actual recording of the transfer could be effected within the day, there were often delays associated with settlement if cash was not paid directly, e.g., the sale could be made by installments and the transaction would require a contract to be drawn up. Problems could also arise in verifying the identity of the person transferring the shares and where bills of exchange were required for payment, e.g., the seller was an off shore investor.

[24]. The acronym VOC is a reference to the Dutch translation of the Dutch East India Company, the *Verenigde Oostindische Compagnie*.

[25]. Wilson (1941, p.84-5) describes the options trade: "A *prime à délivrer* (a call) was the option which A gave to B, obliging him to deliver on the following *rescontre* certain English securities — say £1000 East India shares — at an agreed price. If the speculation of the giver of the option was unsuccessful, he merely lost his option: if, on the other hand, the funds rose, he had the benefit of the rise. The *prime à recevoir* (a put) was the option given by A to B by which B was pledged to take from A on *rescontre* £1000 East India shares, say, at an agreed price. B became, in fact, a kind of insurance for A, obliged to make good to him the margin by which the funds might diminish in the interval."

[26] . There was variable use of the terms to describe derivative security contracts. 'Time dealings' was used to refer to both forward and option contracts. Though 'time bargain' was occasionally used to refer to all types of time dealings, de la Vega and others use 'time bargain' to refer only to forward contracts. In the terminology of the time, a time bargain was a usually a long dated, transferable to arrive contract that did not involve the expectation of delivery. The confusion between the types of derivative security contracts appears in the US debate over 'anti-option' bills which were primarily aimed at curtailing futures and forward contract trading. The intricate dealings that were involved in the South Sea Bubble are discussed in various sources, including: Morgan and Thomas (1962, ch. 2); Wilson (1941, ch. IV); Hoppit (2002); Shea (2007).

[27]. Mortimer makes no reference to the use of options in stockjobbing activities, giving some support to the position that Barnard's Act of 1734 was effective in deterring this activity. In

contrast to Mortimer, another early source – Defoe (1719) – makes no reference to forward trading, using examples which usually relate to cash transactions, for example, using false rumours to influence the stock price, the idea being to buy low on negative rumours and selling high on positive rumours (pp.139-40). However, it is not clear that Defoe had the best grasp of the financial transactions which were being done.

[28] . A broker in this period was an intermediary or mutual agent who served as a witness, for a commission, to contracts between two parties. In London, legal brokers had to be licensed and sworn. While much of the commodity and joint stock business was conducted through brokers, dealing was not confined to sworn brokers and, at various times, many unlicensed dealers operated in the market.

[29] . The early history of options trading in England can be found in Morgan and Thomas (1962). An early discussion can be found in Duguid (1901). Barnard's Act was repealed in 1860.

[30] . The abuses associated with stockjobbing were due, at least partly, to the standard market practice of a significant settlement lag for purchases of joint stock. While there was a cash market conducted, often at or near the company transfer office, dealing for time had a legitimate basis in the practical difficulties associated with executing a stock transfer. This meant that when stock was sold for time, the short position had a considerable lead time to deliver the security. Trading involved establishing a price for future delivery of stock and paying a small deposit against the future delivery. In cases where the selling broker did have possession of the underlying stock when the transaction was initiated, there was little or no speculative element in the time bargain. However, this was not the case when the seller did not possess the stock. In addition, the purchaser for time did not usually have to take possession of the stock at delivery but, rather, could settle the difference between the agreed selling price and the stock price on the delivery date.

[31] . Cope (1978) takes a somewhat different view of these events.

[32] The search for rules to regulate financial trading could be found in various venues, not just Chicago. In addition to the discussion surrounding such trading in England associated with the Liverpool cotton contracts, such debates led to the attempt of Jules Regnault in France to create a financial science (Jovanovic 2006).

[33]. Of the various recent exchange mergers, in 1999, the NYMEX merged with the COMEX to form the New York Board of Trade. Markham and Harty (2008) have a detailed discussion of more recent mergers and developments.

[34] . The Senate debate included a vote on the George amendment which aimed to ban futures trading altogether. This amendment was prompted by the concern of Southern members about the use of tax-to-destroy as a method of dealing with the anti-speculation arguments of the agrarians and Populists. This amendment was defeated by 51 to 19. However, as it turns out, the Southern supporters of the George amendment held the balance in the House vote to suspend rules which lead to the defeat of the Hatch-Washburn bill.

[35] There were similar views regarding options trading in France, e.g., Preda (2006), Jovanovic (2006). Poitras (2009a) documents the increasing acceptance of options trading within a wide

group of trading in the last quarter of the 19th century.

[36]. "A pool is a temporary association of two or more individuals to act jointly in a security operation of a manipulative character. There is no inherent reason why manipulation should be carried out through the use of pools; many such manipulations have been carried on with great financial success by single operators, such as Drew, Little, Vanderbilt, Gould and Keene. During the 1920's, however, the pool developed a high degree of popularity. The possibility of combining capital, trading skill, experience and corporate connections into one cooperative venture appeared so attractive that it became the typical organization procedure of manipulators of that era. There was no particular size of the pool of the 1920's and early 1930's. The Radio pool, one of the largest, had about 70 members, the first Fox pool had 32, and the second 42. The profitable alcohol pool of 1933 had only eight participants." (Teweles and Bradley, p.269)

[37] ."Stock Exchange Practices," Senate Report 1455, 73rd Congress, 2nd Sess., p.63, quoted in Teweles and Bradley (1985).

[38]. Wolf (1982) provides background on the specific events that were associated with the CFTC options ban. Since the creation of the CFTC in 1974 to replace the Commodity Exchange Authority which had been part of the USDA, changes to commodity futures and options regulations have usually been associated with the regular four year reauthorization of the CFTC. For example, the 1982 reauthorization contained the Shad/Johnson Accord Index Act which specifies the authority of the SEC and CFTC for stock related products. This Act gave the CFTC exclusive jurisdiction over stock index futures and options while the SEC was given control over options on securities and currencies.