

Chapter 2 *History of Equity Securities*

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... the More Things Stay the Same

“Directly and indirectly banks and big commercial houses were involved. In a crash many of them would be ruined, and their bankruptcies would shatter the Paris money market and extend themselves as though by chain reaction to all the provincial centers, paralyzing business and unleashing social and political reactions. The minister Calonne, who directed royal finance during 1783-1787, understood the danger and feared it, not only for its political implications but also because any serious contraction of private capital would narrow the market for the annual loans on which his budgets depended. He therefore entered the market with treasury funds and tried to shore up prices by buying falling issues. At heavy cost he liquidated private speculative contracts which, by their volume, threatened to bring on a general collapse. Scandals broke out. They were publicized. Nobles, clergymen, even ministers figured in them. Rightly or wrongly the belief spread that the government was permitting irresponsible men to endanger public prosperity, and the ill-fated ministerial interventions in the Bourse undermined confidence in the government, sapped its prestige, and, like the failures in finance and foreign policy, helped create a demand for a representative regime.”

G. Taylor (1962, p.951) describing activities on the Paris Bourse approaching the eve of the French Revolution. Substitution of New York for Paris and Paulson for Calonne makes for an eerie connection with events of 2008-9.

2.1 Early History of Equity Security Markets

A. *Origins of Joint Stock Companies*

Equity Shares in Antiquity

The study of commercial life in antiquity is hampered by the limited and fragmented evidence available. Business activities during, say, the Middle Ages or following the introduction of the printing press in the 15th century, are captured in a substantial number of merchant archives, toll registers, company records, price *courants* and the like that have survived. In contrast, information about Roman, Greek, Egyptian, Persian, Sumerian and other ancient civilizations only survives in a relatively small number of sources. While archaeology has been able to fill in selected gaps, “the general inadequacies of the evidence accentuate the role of conceptualization in historical research” (Bang 2008, p.3). The sources that are available deal with only a small slice of ancient history and can not provide enough detail to construct an accurate historical record. Such sources typically deal only with a particular activity, e.g., classical literature or law, leaving no trace of many aspects of ancient life. Careful examination and scrutiny of available sources has to be supplemented by ‘artful’ interpretation. “Sources are ... not self-explanatory. They must be interpreted to bring us to the ancient reality” (*Ibid.*).

The problem of determining a value for equity claims in a business venture stretches back to the origins of capitalism in ancient societies. At least since Weber (1891), the peculiar characteristics of ancient capitalism have been recognized and explored. Due to the relative abundance of primary sources, the “political capitalism” (Love 1991) of the Roman Empire has received the most attention, though the Greek city states appear to have had a more developed capitalist system than the Romans. Unfortunately, the records from Greek times often reflect the attitude of Aristotle (*Politics*, Book I, ch. 11, sec. 5) where discussing “the various forms of acquisition ... minutely and in detail might be useful for practical purposes; but to dwell long upon them would be in poor taste”. Primary sources from even earlier times, such as the Sumerian cuneiform tablets and the Code of Hammurabi (*circa* 1780 BC), only provide hints about the contractual arrangements governing equity claims. However, the historical record is sufficient enough to indicate the relevance of such contractual relationships in those areas of ancient commerce where the pooling of capital resources was integral to the success of a business venture.

Financing of commercial ventures in ancient markets often involved a bundled combination of equity and debt financing with allowance for insurance considerations. For example, the Code of Hammurabi states: “If a merchant lent money to a trader for benefit, and he saw a loss where he went, he shall pay back the principal of the money to the merchant. If, when he went on the road, an enemy made him give up what he was carrying, the trader shall so affirm by God and then shall go free” (Lewin 2003, p.16). Such arrangements where wealthy individuals finance trading ventures also appear with the bottomry or sea loans of the ancient Greeks where some actual interest rate estimates are available. Circa 350 BC, Demosthenes gives accounts of a cargo of thousand wine casks to be transported in a large oared vessel. When interest rates for regular loans were 12%-18% without insurance, an interest rate of 22½% was charged on the sea-loan with provision for a further

increase to 30% if the return voyage was delayed (*Ibid.*). In other cases, one partner would provide financing for the trading venture while the other partner would do the work, with a predetermined sharing of the profits of the venture upon completion. However, the personal liability of the lender would no longer be limited to the amount on loan.

Various rudimentary forms of partnerships were the mainstay of commerce in antiquity. Such arrangements laid the foundation for the *societas* of the medieval Italian city states that evolved into more flexible partnership arrangements, especially the *commenda* and *compagnie* forms, e.g., Poitras (2000). In contrast to the flexible and impersonal modern corporation, kinship and close personal relations were often an essential component of business relationships in ancient times, if only because partners were severally liable for debts of a venture and personal bankruptcy attracted severe sanction. Long distance trade required a network of loyal factors in important entrepot centers. Because profits would typically be divided by the partners at the end of an individual venture according to the arrangements made when the venture was initiated, only when capital was allowed to continue in the business did the valuation of equity claims become relevant. Valuation of equity shares required for sale and transfer, such as might occur during probate, was complicated by the need to have partners with kinship or close personal relationships. As such, the need for accurate equity valuation methods was limited, if only because commercial equity was not sufficiently separated from the household balance sheet.

Given this background, the need to pool capital in ancient societies led to the development partnership arrangements that had legal status independent of the individual partners. This significantly increased the potential tradeability of partnership shares. Recognizing that similar arrangements likely appeared in earlier times, the Roman *societaes publicanorum* evolved a form of public trading in shares. While playing a fundamental role in tax farming, i.e., bidding on contracts for collection of taxes in specific parts of the Empire, the *publicani* were also involved in contracts for the construction and repair of major public works, billeting and supplying of the armies, and the transport of bulk cargoes within the Empire.¹ Beyond this, there is far from complete agreement among historians. By some accounts, e.g., Rostovtzeff (1957), around the time of Cicero and Julius Caesar, public trading in such shares was conducted at the Forum, in Rome near the temple of Castor. In 59 BC, Cicero provides a description of the trading in such shares (Love 1991, p.190). The *societas* office or individuals already owners of shares were sources for obtaining shares. It was common practice to trade ‘unregistered’ shares where purchasers did not become a *socii*; both Caesar and Cassius were reported to do so, presumably to evade the political fallout in the Senate associated with the perception of self-dealing.

Though the roots of the *publicani* stretch to the beginnings of the Roman civilization, the influence of the *societaes publicanorum* was greatest during the middle and late stages of the Republic. Around 150 BC, the Greek historian Polybius recounted the following (Chancellor 1999, p.5) in Rise of the Roman Empire:

All over Italy an immense number of contracts, far too numerous to specify, are awarded by the censors for the construction and repair of public buildings, and besides for the collection of revenues from navigable rivers, harbours, gardens, mines, lands – in a word every transaction which comes under the control of the Roman government is farmed out to contractors. All these activities are carried on by the people, and there is scarcely a soul, one

might, say, who does not have some interest in these contracts and the profits which are derived from them.

A Greek aristocrat held as hostage for 16 years in Rome, Polybius examined the growth of the Roman Empire with the aim of aiding Greeks to understand how Rome managed to rise to dominate the region. The subsequent growth in the Roman Empire led to evolution in the *publicani*. By the middle of the first century BC, immense tax farming opportunities were available at auction, primarily five year contracts for tax collection in Asia. Arguing for state support of the often abusive tax collection practices of the *publicani* Cicero observed: “financial confidence and the whole monetary system based on the forum here at Rome is bound up with and depends upon these Asian investments” (Love 1991, p.188). In 61 BC, when the *publicani* significantly over bid for the Asian tax farming contract, Cicero argued successfully in the Senate for releasing the *publicani* from this contractual obligation.

INSERT Figure 2.1.a Cicerobust.jpg
 Marcus Tullius Cicero,
 Roman statesman, senator and lawyer

While it is tempting to trace the origins of equity security trading to the *societaes publicanorum*, the historical record is insufficient to sustain such a claim. There is no specific evidence concerning either pricing or trading practices. It is known that the *publicani* had some elements of modern corporations, with ownership divided into shares (*partes*) with operational control by *magistri* that constituted a board of directors headed by the *manceps*, e.g., Badian (1972). However, Roman law was focused on the individual and had difficulties recognizing rights and duties for associations of individuals. Following Gierke (1977, p.100-1), the *publicani* were able to attain the appearance of continuous legal status that extended beyond the period for a particular contract because of the connection with Roman financial administration. In effect, the *publicani* “may be considered as vocational corporations but not as bodies derived from private law. Rather they appeared as political bodies that included social relationships of private law”. Legally, contracts were entered into with the *manceps* not with the *societas*. The specific listing of *socii* on contracts was only relevant to determining the collateral required to ensure fulfillment of the contract.²

Share Trading in 17th Century Amsterdam

Though shares in joint stock companies are only precursors of modern common shares, the associated equity valuation problems have many similar features. The joint stock form of ownership evolved somewhat slowly from earlier forms of business organization. Most of the early joint stock companies retained some of the essential features of partnerships. Hecksher (1955, p.392) makes an important distinction between partnerships and joint stock companies by referring to the latter as “capital associations of a corporative character”. As such, the early joint stock companies were an alternative form of business organization to the regulated companies which had a business structure evolved along the lines of the medieval guilds. The grant of monopoly for trade to a specific region required the corporative character of regulated companies. However, the capital was held by the

individual member partners and not held jointly. While this worked effectively for trade that was relatively predictable, the hazards of long distance trade to areas little known eventually required the resources of capital associations to make sufficient investments in infrastructure.

The regulated companies were associations of independent traders and merchants, each with their own independent capital, operating under a grant of monopoly in a specific type of trade. The Fellowship of Merchant Adventurers' is an important example of a 16th century English regulated company with a loose monopoly over activities of English merchants trading on the Continent, e.g., de Roover (1949). In contrast, joint stock companies combined the capital contributions of shareholders. There was permanence in the stock capital independent of the individual shareholders. Equally as important, the joint stock company was subject to the control of a single management. Given this, a key legal difference between joint stock companies and modern publicly traded corporations involves limited liability, e.g., Shannon (1931); Bryer (1997); Acheson and Turner (2008). It was not until the second half of the 19th century when legislative changes permitted limited liability to become commonplace in most countries. Prior to this time, limited liability required a special charter from the state. However, as Heckscher (1955, p.367-8) observes: "From the economic standpoint, the chief interest of limited liability is ... whether it contributed to the idea of independent company capital."

In addition to limited liability, joint stock companies had other differences from modern corporations. As late as the 18th century, transferability of joint stock shares was restricted in various ways. For example, there was a formal process requiring approval and registration of new shareholders in the record books of the company which required in-person attendance at the company transfer office. In addition, many of the earliest joint stock companies were involved in long-distance trade, with paid-in capital being dispersed together with any profits after the completion of a voyage. Sometime profits were distributed in the form of goods such as spice. Increases in capital were usually achieved by making calls on existing shareholders, rather than issuing new shares. It was during the 17th century that joint stock companies with modern features started to emerge (Gelderblom and Jonker 2005; Carlos et al. 1998; Parker 1974; Davies 1952). Starting with the creation of the Dutch East India Company (VOC) in 1602, significantly more modern joint stock companies emerged that included more readily transferred shares, a permanent capital stock, profits-only distributed as dividends and new equity capital requirements being raised by making additional issues of stock.

Legal characteristics of the evolving joint stock companies gave impetus to the trading of equity securities on exchanges. Trading venues where a range of commodity and financial items are exchanged have a history stretching back to antiquity, as evidenced in the Forum trading in ancient Rome. From ancient times, such trading venues featured a considerable amount of foreign exchange trading. Recognizing the widespread use of variations on the bill of exchange, foreign exchange transactions were tied to the extension of trade credit. For both foreign and local merchants, such trading venues were 'one-stop shops' for financing and purchase of goods to be transported to a distant trading venue where the goods would be sold and the financing paid off. Prior to the evolution of exchanges dedicated exclusively to the trading of shares in the late 18th and early 19th centuries, shares in joint stock companies were traded along side other items. The collapse of Antwerp in 1585 destroyed the most important exchange of the 16th century. The resulting diaspora of important merchants contributed substantially to the rise of the important exchanges in

Amsterdam and, to a lesser extent, in other centers such as London, where the Royal Exchange was established by Thomas Gresham in 1571 modeled after the Antwerp Exchange.

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 the new 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 of exchange and commodities. By the beginning of the 17th century, it was apparent that trading in Amsterdam had become the successor to the Antwerp exchange 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 forward contract and option contract trading techniques that had been successfully developed on the Antwerp exchange. Because these techniques facilitated speculative trading for future delivery, such derivative security trading was applied, almost immediately, to trading in Company shares.

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 exchange in 1611 marks a symbolic beginning of Dutch commercial supremacy. During the 17th and 18th centuries, trading of joint stock shares on the Amsterdam exchange exhibited many essential features of exchange trading in modern equity security markets. As early as the middle of the 17th century, trading on the Amsterdam exchange featured derivative securities for shares in the Dutch East Indies Company (VOC) and, to a lesser extent, the Dutch West Indies Company. This trade progressed to where contracts with regular expiration dates were traded and settled by payment of differences (Wilson 1941; Poitras 2009).³ By the beginning of the 18th century, the trade involved both Dutch joint stock shares and ‘British funds’. “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).

INSERT FIGURE 2.1.b
berckheyde_1690_amsterdam... .jpg

Despite isolated instances of joint stock trading in other centres, the market for trade in VOC shares started in Amsterdam from the founding of the Company by the States General in 1602.⁴ 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 Dutch East India Company 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).⁵ 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. Given the difficulties associated with share transfer and a limited supply of shares available for trade, dealing for time instead of cash was fundamental to these early equity markets.

Kellenbenz (1957, pp.139-42) provides a useful summary the various types of transactions in the

Amsterdam market during the second half of the 17th century:⁶

- 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 ...

Trading for future delivery was essential to the 17th century market for shares on the Amsterdam exchange (Barbour 1950).⁷ Such trading was necessary because the delivery and settlement process for traded shares was substantively 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.

Origins of Stock Trading in London

Chronological neatness suggests dating the commencement of stock trading in London with the ascendancy of William III of Orange in 1688.⁸ This date is also intuitively appealing as William III was accompanied by an influx of Dutch persons and practices. However, prior to 1688 London was already trading government securities, including Exchequer bills and navy bills. In addition, there was some limited trading in the stock and debt of joint stock companies, in particular the East India Company, Royal African Company and the Hudson's Bay Company (Cope 1978, p.2; Carlos et al. 1998; Michie 1999, ch.1). Still, despite the development of highly sophisticated joint stock trading in Amsterdam by the mid-17th century, dealing in joint stocks and shares in London was "haphazard and unorganized" before 1680, with a "highly developed market", complete with trading in options and time bargains, only in evidence by the early to mid 1690s (Houghton 1694; Morgan and Thomas 1962, p.21).

A number of key factors contributed to the rapid development of English stock trading starting around 1690. One factor was the supply of joint stock issues. Just prior to this date a number of new joint stock companies had been created in areas such as fire insurance, paper making and street

lighting. Combined with the established joint stock companies such as the East India Company and the Hudson's Bay Company, circa 1688 there were about "15 joint stock companies ... enjoying an active life" (Morgan and Thomas 1962, p.22). In addition, the political reforms associated with the Glorious Revolution permitted the commencement of the financial revolution in English government debt issues. Fueled by a "sudden surge" in patenting (MacLeod 1986, p.149), the period from 1688-1695 witnessed an explosion in new joint stock issues, in both shares and bonds, and in the supply of government debt. Included in these promotions the particularly significant initial subscription for the Bank of England in 1694.

Scott (1910) estimates by 1695 that there were no less than 140 joint stock companies. Clapham (1958) makes reference to "more than one hundred fifty companies, two-thirds English and one-third Scottish, (that) started lives most of which were brief and unfortunate" during the stock promoting boom of 1690-1695. Of all these issues, the Bank of England was the giant. The deal leading to the creation of the Bank had elements of the fantastic. The original plan has been attributed to the Scottish projector William Paterson, though "whether he was strictly the originator, or merely the mouthpiece of a City group, we cannot be quite sure". In any event, the government was anxious to obtain large amounts of funds to sustain the 1690-1697 war of the Grand Alliance against France and, in exchange for £1.2 million, Parliament granted a charter to a joint stock bank with an effective monopoly on the note issue.

The creation of some type of public bank in England by the end of the 17th century was expected. In the preceding century, various jurisdictions had evolved different forms of public banks. The Bank of Amsterdam, founded in 1609, played a key role in the settlement and transfer of funds. The Bank of Hamburg, an imitation of the Bank of Amsterdam, was founded in 1619 with the Bank of Sweden following in 1656. "On the coasts of the Mediterranean, the North Sea, the Baltic, English merchants of the seventeenth century came into touch with public banks: the influence of these merchants on government was on the increase and so were the public banks" (Clapham 1958, p.3). Yet, the Bank of England was to be considerably more than a public bank of the 17th century. The Bank became the model 'public bank' of the 18th century.

The Bank of England was novel in that it combined the notions of joint stock ownership and bank of issue. As the right to provide the circulating medium had historically been the preserve of the crown, it took a particular set of circumstances, combined with the loan of a considerable amount of cash to the government, to consummate the deal. Recognizing that payment by installment was common practice in purchase of public offerings of both shares and government debt, the original Act of 1694 authorizing creation of the Bank provided for a maximum authorized borrowing of £1.5 million with payment of £1.2 million by January 1695.⁹ In order for corporate privileges to be conferred, at least half of the subscription amount of £1.2 million had to be paid by the beginning of August 1694. This condition proved to be overly pessimistic. Within twelve days of the June 1694 subscription announcement date, the full amount had been subscribed (with 25% of the price paid up front).

From the government's perspective, the deal with the Bank of England involved a fully funded loan from the subscribers of the Bank. Derived from taxes on ship tonnage and duties on liquor the government undertook the obligation to pay 8% on the bulk of the £1.2 million. These regular debt payments contributed substantially to the success of the Bank subscriptions, compared to alternatives that were available in the security market (Clapham 1958, pp.19-21):

Water companies, most of them quite sound; treasure seeking companies, highly speculative; paper, linen, lead, copper, plate glass, bottle glass and mining companies; The Society for improving Native Manufacture so as to keep out the Wet, and the Company for the Sucking-Worm Engines of John Loftingh, merchant, at Bow Church Yard, Cheapside — a sucking-worm engine was a fire hose — had all been projected and supported less or more. Among these, the Bank with its parliamentary backing, its high sounding name, and its guaranteed income from the taxes was a very attractive proposition.

However, though the potential stability of dividend payments on Bank of England stock was attractive to some investors, for the prime movers in the deal the main objective was the gains to be obtained from the banking business.

INSERT Figure 2.1.c (RoyalExchange1751.jpg)

The Royal Exchange London, 1751
Etching by Robert Havell (1760-1832)

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 London stock trading was intimately connected to Exchange Alley.

Geographically, Exchange Alley is located across Cornhill Street from the Royal Exchange. Starting at Cornhill the Alley runs to Lombard Street (see Poitras 2000, Figure 8.2 for a map). The Alley contained various coffeeshops that were the focus of stock trading. Circa 1696, the chief coffeehouses for stock trading were Jonathan's and Garraway's, though Sam's Coffee House in the Alley and Powell's and the Rainbow in Cornhill were also of some importance (Cope 1978):

Jonathan's was founded about 1680 by Jonathan Miles, and was from the start connected with financial business. The Garraways were a City family of the period, who were landlords of the Sun Fire Office in its early days. The coffee-house was started by Thomas Garraway in the early 1670s. The trend to financial specialization, using coffee-houses as a place of business, is typical of the period: other examples are Edward Lloyd's Coffee House, a centre for marine insurance, and Tom's and Causey's Coffee Houses, used in their early days by the Hand in Hand Fire Office and the Sun Fire Office. Jonathan's as a centre for dealers gradually superseded Garraway's (which was concentrating on auction sales by the 1750s), and developed lineally into the Stock Exchange of 1772.

While there was apparently considerable, and almost certainly disreputable, ‘curb trading’ in Exchange Alley, various City orders, such as those of 1700 and 1703, were aimed at eliminating this type of trading.

Following the Glorious Revolution of 1688, many of the speculative practices used in Amsterdam were adopted in England. However, if only for the large number of joint stocks on offer, this trade took a substantively different form than in Amsterdam. Despite the presence of initial trading at the Royal Exchange, the development of shares trading 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 stock trading for ‘ready money’, 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 brief description, it is apparent that the process of procuring and transferring shares could be complicated. Lags in the share trade and transfer process were associated with not finding sufficient shares available for sale or an absence ‘monied men’ willing to purchase shares at a fair price. This led to the widespread use of derivative securities, both ‘time bargains’ and options, to provide sufficient liquidity to clear the market.

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.¹⁰ These activities were the main components of the ‘stockjobbing’ associated with the trading of securities for future delivery. Following Mortimer (1761, p.32):¹¹

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-JOBING.

While the liquidity enhancing element of stockjobbing was a needed activity in the context of equity trading at that time, the ultimate result of such trading is reflected in the history of stockjobbing in England which was met with considerable and generally disapproving interest in Parliament and attracted the venomous attacks from numerous writers of the time, such as Daniel Defoe and Jonathan Swift.

Types of deals in Early English Stock Trading:

A deal for ‘ready money’ or ‘money’: a transaction for immediate delivery, to be settled within no less than two days. Also called a deal for **cash**.

A deal for ‘time’: a transaction for future settlement, effectively a forward contract in the security. Where a *rescontre* settlement system was in place, the transaction would typically have the next *rescontre* as the settlement date. When used generally, could also include reference to puts and refusals.

Heavy horse and Light horse: Subscriptions to government debt issues could be paid by instalment, with the first deposit generally being 15% (Mortimer 1761, p.137), with further payments of 10 or 15% being required each month until the balance was paid. The full amount of the subscription could be paid in advance, with credit being given for the associated interest. During the period in which subscriptions were being paid, secondary market trading had to account for the unpaid balances on a specific security. Heavy horse referred to a security which was fully paid, while light horse had a balance remaining to be paid. Stockjobbers preferred to deal in the light horse, which required a smaller invested capital for the same notional principal, ‘they have an opportunity for sporting with, and gaining profit on, a nominal thousand, for the same money, that it would cost to buy a hundred, heavy’ (Mortimer 1761, p.138).

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”.¹² 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 Acceptor 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 Expend, 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, p.350-1). The use of standard contracts indicates that practices common in Amsterdam were adopted in London. As de la Vega 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 (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 reports, the organized options market that had emerged in London during the 1690's was a venue for market manipulation: ¹³

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.¹⁴

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.¹⁵ 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.

B. Early European Writers

Joseph de la Vega

The emergence and growth of joint stock trading was accompanied by considerable public discussion and debate which is captured in the pamphlet literature and Parliamentary records of the time. However, unlike the pricing theories for fixed income securities that were relatively well developed by the end of the 17th century, e.g., Poitras (2000, ch.6); Lewin (2003), much of the analysis of joint stock companies was concerned with describing manipulative trading practices by stockjobbers and proposing remedies for the “infamous practice”, rather than with developing methods of equity security valuation. For example, Di Marchi and Harrison (1994) describe the 17th century Dutch pamphlet literature which attacked the practice of short selling securities that were not owned by the individual making the short sale. Against the polemical backdrop of the pamphlet literature can be found a number interesting anomalies that stand out as early classics of security analysis: Joseph de la Vega's Confusion de Confusiones (1688) and Thomas Mortimer's Everyman his own Broker (1761).

To say that Confusion de Confusiones is an isolated gem in the history of Finance is an understatement. The book itself is an oddity, initially written in Spanish, published in Amsterdam by a Jewish writer of Portuguese descent. Joseph de la Vega was the second son in a family of four sons and six daughters. His parents were Isaac Penso and Esther de la Vega. Though his formal name was Joseph Penso de la Vega Passarinho, according to custom he typically used the shortened name derived from his mother. Isaac Penso was born in Spain though the family's ancestral roots appear to have been in Portugal. As was the case with many Jews in 17th century Spain, the Inquisition produced a forced emigration and his parents moved first to Antwerp, then Hamburg and finally Amsterdam. Joseph was likely born sometime around 1650, soon after the family had relocated to northern Europe. (Cardoso 2006; Kellenbenz 1957)

Isaac Penso achieved success as a banker in Amsterdam and became a prominent member of the local community. Though Jews in Amsterdam were relatively unrestricted in comparison to almost all other cities, there were still considerable barriers to Jewish participation in various trades. However, Jews were permitted to engage in activities such as wholesale trading in goods, shipping and banking functions such as money lending and money changing. Some Jews were also permitted to engage in brokering. Not surprisingly, Jews were central players in the business of trading stocks. Anecdotal evidence indicates that as much as 85% of Amsterdam stock trading circa 1700 was in the hands of Jews, many of which were of Iberian descent (Kellenbenz 1957, p.128). Based on this, de la Vega was in an excellent situation to gather the type of information needed to write a detailed account of stock trading on the 17th century Amsterdam bourse.

Confusion de Confusiones is written as four dialogues between a shareholder, a philosopher and a merchant. Each dialogue describes different features of the activities of the Amsterdam bourse in the later 17th century. In Confusion, de la Vega (1688, p.156) demonstrates a modern understanding of the use of fundamental information to value stocks:

The price of shares (in the Dutch East India Company) is now 580 ... it seems to me that they will climb to a much higher price due to extensive cargoes that are expected from India, because of the good business of the Company, of the reputation of its goods, of the prospective dividends and of the peace in Europe.

Recognizing the uncertainties in seaborne trade and the difficulty in obtaining information about incoming cargoes, de la Vega goes on to describe how some traders could profitably trade on information about incoming cargoes from the East. He correctly recognizes that such information alone is insufficient but would depend also on European conditions and the safe arrival and unloading of cargo.

Modern equity security valuation often involves determining the discounted value of expected future cash flows. This reliance of the valuation problem on expectations is explicitly recognized by de la Vega (1688, p.165), who gives this story a 'buy on the rumor, sell on the news' twist to this story:

The expectation of an event creates a much deeper impression upon the exchange than the event itself. When large dividends or rich imports are expected, shares will rise in price; but if the expectation becomes a reality, the shares often fall; for the joy over the favourable development and the jubilation over a lucky chance have abated in the meantime.

Recognizing that there are "natural reasons for this phenomenon", de la Vega attributes this share pricing behavior to a struggle between bulls and bears over market sentiment: "the leaves tremble in the softest breeze, and the smallest shadow causes fear".¹⁶

In the second dialogue, de la Vega (pp.158-9) provides four useful rules to guide investment activities in shares:

The first principle: ... Never give anyone the advise to buy or sell shares ... The second principle: Take every gain without showing remorse about missed profits ... The third principle: Profits on the exchange are the treasure of goblins ... The fourth principle: Whoever wishes to win in this game must have patience and money.

Variations of the second and third of these principles could easily pass as commonsense advice given to modern security traders. The fourth principle is evidence that de la Vega, an astute 17th century observer of stock trading, was an adherent to "long-run investment strategies". Combining this fourth principle with de la Vega's recognition of the importance of fundamental information anticipates the approach to equity security valuation pioneered by Benjamin Graham more the 250 years later.

Even though de la Vega identifies how the price of joint stocks can be determined by fundamental information, much of his dialogue is taken up in a description of how prices will deviate from the fundamental values based on the expectations of bulls and bears. In particular, the last of the four dialogues is concerned with detailing methods of market manipulation: "the acme of Exchange operations, the craftiest and most complicated machinations which exist in the maze of the Exchange and which require the greatest possible cunning" (Confusion, p.191).¹⁷ The manipulation of

securities markets in the 17th and 18th centuries was facilitated by the social practice of using securities for purposes of gambling. This practice was in keeping with the widespread public acceptance of gambling reflected, for example, in the use of lotteries to increase the attractiveness of government debt operations (Daston 1988, Sec. 3.4.1; Cohen 1953).

In addition to a detailed examination of the methods of market manipulation, de la Vega also makes a number of references to derivative security trading practices for joint stock shares 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 1650-1688, when the Dutch introduced first quarterly settlements of forward and option contracts for share transactions on the Amsterdam exchange. Prior to this time settlement procedures had been less formal.

Wilson (1941, p.83) provides the following description of the settlement process (p.181):

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 (1771), 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.”¹⁸

Thomas Mortimer

In contrast to the almost voluminous discussion of the nefarious practice of stockjobbing, 18th century English publications dealing with the use of security analysis to value joint stocks are relatively scarce. The success of Every Man His Own Broker by Thomas Mortimer speaks to the lack of such a guide prior to this time. Originally published in 1761 with a further fourteen editions to follow, the last being in 1807, the book was intended as a practical guide to investors seeking to make investment in the English security market without the aid of a broker. Cope (1978) describes Every Man his Own Broker as the first detailed account of the English stock market. Mortimer was compelled to write the book based on his experiences from dealing on his own at Jonathan’s without a broker in order to save the cost of brokerage. As a result of these activities, Mortimer managed to lose a “genteel fortune” and, in the process, acquired a genuine hostility to stockjobbers and other such speculators. The book goes far beyond the basic objective of being a how-to-book for trading in the British funds to provide numerous insights on the workings of the English stock market.

INSERT Figure 1.1.c (mortimer.jpg)
Front piece from Everyman

A constant theme in Every Man is the need to be wary of “this medley of Barbers, Bakers, Butchers, Shoe-makers, Plasterers, and Taylors, whom the mammon of unrighteousness has transformed into Stock-Brokers” (p.xiii). This wariness is not to be restricted to tradesman turned

stock brokers, for even stock brokers from the higher ranks of society can be corrupted as “both ancient and modern history, furnishes us with many remarkable instances of the basest actions being committed by men of high rank, and the most exalted stations in government, for smaller pecuniary advantages than those which might arise in cases here supposed” (p.45). As for the types of advice to be suspected Mortimer observes: “Always suspect the man who wants to engage you to be continually changing the situation of your money, to be influenced by some private motive, unless you are a JOBBER yourself” (p.22-3). Similarly, Mortimer also advises: “it is almost impossible for a broker, to give any gentleman, candid disinterested advice, when to buy into, or sell out of, the funds” (p.xvi).

As for the specific topic of joint stock valuation, Mortimer (1761, p.9) states:

Every original share of a trading company's STOCK must greatly increase in value, in proportion to the advantages arising from the commerce they are engaged in; and such is the nature of trade in general, that it either considerably increases, or falls into decline; and nothing can be a greater proof of a company's trade being in a flourishing condition, than when their credit is remarkably good, and the original shares in their stock will sell at a considerable premium.

This reference to stock selling at a premium harkens back to a time when stock was issued with a par value. Writing at a time when accounting information for publicly traded securities was cursory, at best, Mortimer suggests that the ability of a firm to borrow was an important signal of fundamental value. In modern times, this could be translated into a statement about factors that would provide a basis for a firm to access credit markets such as the credit rating as well as the state of a firm's balance sheet and debt service capacity. Mortimer also makes reference to the type of “advantages” of the particular business of the firm. This hints at the sector specific approach to common stock investing which is pervasive in the modern security industry.

Mortimer proceeds to explain this general valuation approach using one of the important British public companies, the British East India Company, as an example:

This, for instance, has always been, and still is the case of EAST INDIA STOCK in particular, not to instance any other. The present price of a share of £100 in the company's stock is £134. The reason of this advance on what cost the original proprietor only £100 is, that the company, by the profits they have made in trade, are enabled to pay £6 *per annum* interest or dividend for £100 share. But then it is uncertain how long they may continue to make so large an annual dividend, especially in time of war; for several circumstances may occur (though it is not likely they should) that may molest their trade in their settlements, and diminish their profits ...

It follows that Mortimer subscribed to the view that share price was driven by the sustainable level of dividend payout that, in turn, was affected by the various factors driving firm profitability. The dividend level is implicitly being compared to the prevailing level of interest rates. Dividends, firm profitability and interest rates drive stock valuation. This view is an early precursor of what, in modern times, is referred to as fundamental analysis.¹⁹

Perhaps the most interesting view presented in Every Man concerns Mortimer's views on the superiority of fixed income investments over joint stocks. For example (p.20-1):

That shares in annuities, bought at a great discount, that is to say, greatly under par, are the cheapest and most advantageous to the purchaser; and considerably more profitable than any STOCKS bought at a high premium. Because the probability of the premium (given on any STOCK) totally subsiding, in infinitely greater, than that the low price at present given for a 3 *per cent Annuities*, should fall much lower; and there is a greater probability of their rising, and a greater likelihood of its continuance, than there is, the premium now given on any STOCK should rise much higher, or continue so high as it is, for any number of years; therefore shares in STOCKS that bear a premium, are the dearest; and shares in funds or annuities under par, the cheapest to purchase.

Though difficult to translate into modern terms due to the differing characteristics of today's security markets and those of 18th century England, Mortimer is clearly arguing in favor of the superiority of fixed income investment over stocks when interest rates are high relative to long term level of interest rates. This echoes the modern views of individuals in the trade such as Bill Gross of PIMCO Funds questioning the prevailing view that stock returns will outperform bond returns in the long run.

C. Manias, Manipulations and Institutional Failure

Isaac le Maire and the First Market Manipulation in Joint Stocks

Market manipulation, manias and institutional failure have been important features of stock trading since the earliest trades in joint stocks. General public sentiment about initial joint stock trading in Amsterdam was concerned with various schemes that were aimed at rigging the market. This concern generated much of the early analysis of joint stock trading, e.g., van Dillen et al. (2006), De Marchi and Harrison (1994), van Dillen (1930). Instead of developing analytical methods for determining the appropriate price of shares, much of the early discussion of joint stock trading centred on describing the negative features of the speculative trade that was taking place. Of course, ***attempts to manipulate markets did not originate with stock trading***. For example, Aristotle in *Politics* refers to a Sicilian who cornered the cash market for iron by buying up all available supplies. Anecdotal evidence for even earlier examples of market manipulations can be identified. In any event, manipulations distort the price at which an equity security can be traded resulting in substantial divergence between intrinsic value and market price.

The techniques of stock trading on the Amsterdam Exchange were inherited from those used to trade commodities on the Antwerp bourse (Gelderblom and Jonker 2005; Poitras 2009). ***Market manipulations were not uncommon in Antwerp***. Perhaps the most infamous case happened in 1540 when Gaspare Ducci, "formed a ring which succeeded in creating panic on the Antwerp *bourse* and in cornering the factor of the King of Portugal. Ducci apparently had piled up a huge store of money by selling bills of exchange on his accomplices abroad" (de Roover 1949, pp.159-60). When the King of Portugal, through his factor, entered the market to pay off maturing debts, Ducci was the only lender with sufficient funds to lend. Such manipulations in the 16th and 17th century bill markets were reflected in the views of Sir Thomas Gresham, Gerard Malynes and others who were strong proponents of the view that a banker monopoly rigged the exchange market.

Techniques required to corner or otherwise manipulate a security or commodity market were almost certainly common knowledge to the early stock traders in Amsterdam. Many traders had moved north from Antwerp following a sequence of events that undermined the political stability of Antwerp.²⁰ ***One such trader was Isaac le Maire***, who was able to obtain Fl.60,000 of Dutch East India shares in the initial subscription of 1602. Following the initial increase of 15%, the price of Dutch East India shares continued to appreciate steadily and, by 1607, had reached a high value of 300, triple the initial par subscription price of 100.²¹ By November 1608, the price had fallen to less than 140, and stayed in a range of 130 to 180 for the next two years. The significant decrease in prices precipitated a notarial protest against the management of the company for improper use of shareholder capital. Around this point, le Maire joined together with eight others to form a private association to deal in East India Company shares "for their common profit" (van Dillen 1935, p.25).

The most noteworthy of the market manipulations engaged in by le Maire and associates constituted a "bear raid" designed to depress the value of Company shares. The group combined short sales for forward delivery, presumably settled using "differences", with "cash" sales of Company shares. Many of the actual cash sales of Company shares were long-dated, with delivery dates well beyond the conventional one-month-or-less delivery date. These activities were further supplemented by using their personal influence to spread unfavourable rumours about the Company's prospects. As le Maire was at this time also engaged in attempts to found a rival French East India Company, these rumours had at least superficial validity. The profits on the transaction would be gained from the forward short sales and, possibly, by less-than-a-month-to-delivery repurchases of the Company shares, made at lower prices than the initial sales.

The trading activities of le Maire's group were apparently successful in holding down the price of VOC shares. The potential impact of the bear ring on share prices attracted the attention of the Directors and other politically connected investors. The result was a period of political debate that included some of the first writings on stock market structure and performance. The debate ended in February 1610 with the passing of the first substantive legislation designed to limit stock market manipulation. ***Selling of shares in blanco***, also known as the 'windhandel' or 'wind trade', was prohibited. More precisely, short selling of securities, defined to mean the sale of securities not owned by the seller, was banned. This ban covered both cash sales and forward sales. In addition, it was required that shares which were sold had to be transferred no later than one month after the transaction. Private sanctions included the expulsion of le Maire as a VOC shareholder.

Unlike modern securities laws, many 17th and 18th century prohibitions imposed on security trading activities did not have criminal sanctions. Rather, edicts such as the 1610 prohibition on short selling removed the protection of the courts for the purpose of enforcing contracts. The inability of ***the edict to control the 'wind trade' speculation*** in shares was evident with the establishment of the Dutch West India Company in 1621, when shares were sold on a 'when-issued' basis, prior to the initial subscription. This prompted the issuance of another edict reinforcing the ban on selling shares not owned by the seller. Any trader seeking to repudiate a short sale could find refuge in the courts. Similar edicts in 1630 and 1636, during the time Frederick Henry held the office of Stadholder, led to the use of the term 'appeal to Frederick' to refer to a trader invoking the protection of the prohibition on short sales to avert payment on a losing position. In addition to the ban on in blanco trading, the various edicts 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.

The connection between dealings for time and the potential for market manipulation and the early trade in VOC shares is recognized by Ehrenberg (1928, pp.358-9):

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 [in forward and option contracts for VOC shares] 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 (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".

John Law and the Mississippi Scheme

Almost from the beginning of trading in joint stocks, periods of seemingly irrational pricing have been observed. Providing theoretical explanations for such behaviour occupies a considerable amount of energy in modern financial economics. Yet, closer examination of specific historical events reveals an array of determining factors, with each event featuring its own particular profile. This observation is well illustrated in the two most significant episodes of seemingly irrational pricing in the 18th century: the Mississippi scheme in France and the related South Sea Bubble in England. Both these events came to a head in 1720, the collapse of the Mississippi scheme preceding that of the South Sea Bubble. Despite the proximity of these two events and similarities in certain details, the Mississippi scheme seems to have been the result of well-meaning but misguided policy while the South Sea Bubble had the distinct smell of fraud and manipulation.

The Mississippi scheme was the brainchild of John Law (1671-1729), that colourful Scottish exile Schumpeter claims is 'in the front rank of monetary theorists of all time'. The life and contributions of John Law have been examined in numerous sources, with Murphy (1997; 1991) being a particularly impressive account. The Mississippi scheme began in 1716 when Law was able to gain approval from the Duke of Orleans, the Regent of France, to establish the *Banque Generale* in Paris. Law's bank was given authority to issue notes and to participate in the management of royal revenues. Initially, the note issue was restricted in size and, as a protection against debasement of the coinage, was made payable on demand in the coin in use at the time of issue. While France had some experience with paper currency, in the form of the *billets d'etat* issued by Louis XIV, this

project was the first significant case in France of a private bank issuing paper currency.

Somewhat to the surprise of the regent, Law's bank met with resounding success and bank branches were soon established in other centres such as Lyons, Tours, Rochelle and Orleans. There was also a noticeable positive impact on credit conditions and payment of state taxes. Around this time, the finances and general economy of France were in serious disorder, having suffered greatly from the excesses of the recently deceased Louis XIV. The regent seized on the opportunity and, in December 1718, Law's bank was converted from a private to a public institution, the *Banque Royale*. This bank was conceived to be a note-issuing central bank, with provincial branches, to which was added a range of monopoly powers, over activities such as the sale of tobacco and the refining of gold and silver.

One of the first acts of the *Banque Royale* was to print unbacked notes in the amount of one thousand million *livres*. This step was a harbinger of the financial mayhem that was to follow. Law's private bank had been careful to restrict note issues to an amount that could be managed with the specie reserves that were within the control of his bank. Whether Law concurred with this unbacked note issue is not known, though his attentions were at least partly diverted by the granting in September 1717 of letters patent to a company with exclusive trading privileges on the western bank of the Mississippi River, in the area of the province of Louisiana. This company was formally known as the *Compaigne d'Occident* or, in slang, the Mississippi Company. The increasing value of the shares in this venture proved to be another success for Law, and in May 1719 the Mississippi Company was evolved into the *Compaigne des Indes*, which was granted further exclusive trading privileges in the East Indies, China and the South Seas.

The creation of the new *Compaigne des Indes* was accompanied by an offering of fifty thousand new shares. Accounting for the method of payment, Law promised an annual dividend on the shares exceeding 100% that triggered an almost staggering interest in the new issue. What followed was a sequence of arrangements: first, to lease the bulk of the indirect taxes, the General Farms, in August 1719; and, starting in October 1719, to use the proceeds of further issues of *Compaigne des Indes* stock to pay off virtually all of the debt of the French government. Throughout this period there was frenzied, almost unbelievable, trading in shares of the company. Propelled by the unbacked note issues of the central bank, the scheme started to slowly unravel during 1720, collapsing completely during September. On 29 September, 1720 the government announced *Banque Royale* notes would not be accepted for payments. In December, John Law fled to Brussels, fearing for his life.

Prior to the financial collapse associated with the Mississippi scheme, Paris was on a path to be included with London and Amsterdam as a key European financial center. Despite the political and economic importance of France, various French characteristics retarded the development of financial markets during the 17th century. France tended to be a nation of small farmers; the explorers and traders that brought glory to her neighbors were relatively absent. It was the state that dominated economic development rather than the individual entrepreneurs that thrived in Holland and, after the Glorious Revolution, in England. Major state sponsored commercial ventures – such as Richelieu's Company of One Hundred Associates (1627) and Colbert's Company of the West Indies (1664) – were relatively unsuccessful compared to similar efforts by the Dutch and English. At the time of the Mississippi scheme, Paris lacked the central bourse that characterized trade in London and Amsterdam. Despite these drawbacks, the economic importance of France meant that Paris was an

integral part of the international commercial network and that trading practices similar to those used in London and Amsterdam were the norm in financial markets, e.g., Neal and Quinn (2001).

INSERT Figure 2.1.d (rue_quincampoix.pdf)
Trading on the Rue Quincampoix during Mississippi Scheme

In the absence of a central bourse, stock trading and other financial activities such as trading bills of exchange took place at different locales around Paris. At the time of the Mississippi scheme, between 1716 and 1720, stock trading was centered in the Rue Quincampoix. It was here that John Law established the offices of the *Compagnie des Indes* (Mississippi Company) for the issue of shares in the company and, as a consequence, the legendary throngs gathered at the peak of share prices to purchase “les primes”, effectively at-the-money six month warrants to purchase a share of company stock (Murphy 1997, p.213-7). It is one of the ironies of the Mississippi scheme that Law issued primes to undermine the stockjobbing by private traders – in this case trading of three to six month time bargains in company stock at prices (12000-14000 livres per share) considerably above the price (10000 livres) that the stock had achieved at that point in the speculative bubble. Law reasoned that by issuing large amounts of primes with an exercise price of 10000 livres, this trade would be ended. What Law did not anticipate was that the speculation had progressed to where shareholders would rush to sell a share at 10000 to raise cash to purchase primes at a premium of 1000 that granted the right to buy 10 shares in the future at 10000 each. The resulting downward pressure on cash share prices led, ultimately, to the collapse of the scheme.

The South Sea Bubble

Since the collapse of the bubble in 1720, the story of the South Sea Bubble has been told and retold, sometimes profoundly.²² The actual story begins with the first of the three great English joint stock companies, the Bank of England. This flotation was particularly successful, both as a business venture and, more importantly, for validating the effectiveness of using company charters as a vehicle for funding government debt. The basic scheme was quite ingenious: the government has the ability to grant monopoly privileges for certain activities, such as the right to conduct trade to a particular region or the right to issue the ‘coin of the realm’. The market can be used as a mechanism to capitalize the value of these rights that, in turn, can be sold in exchange for funding government debts, either new or outstanding as the case may be.

The basic difficulty with this scheme is that the pool of such rights is small, with an even smaller number of truly valuable rights. The success generated by the Bank of England issue spurred calls for more such deals. However, the right to issue notes proved to be far and away the most lucrative monopoly that the British government could charter. The demand for new charters was such that (Morgan and Thomas 1962, p.29):

In 1698, the subscribers to a government loan were incorporated as, ‘The General Society entitled to the advantages given by an Act of Parliament for advancing a sum not exceeding two million for the service to the Crown of England’. The ‘advantages’ were that the subscribers were entitled to share in the trade to India, each in proportion to his subscription,

and that such of them as chose might form a joint stock for carrying on their trade.

The right to trade with India was an important concession that had already been conveyed on the East India Company. Yet, the government had a limited number of viable concessions that could be exploited.

English War Expenditure and Public Borrowing 1688-1763

Year	Total Expenditure	Total Income	Balance raised by loans	Col. (4) as % of (2)
	£	£	£	
1688-97	49,320,145	32,766,754	16,553,391	33.6
1702-13	93,644,560	64,239,477	29,405,083	31.4
1739-48	96,628,159	65,903,964	29,724,195	31.1
1756-63	160,573,366	100,555,123	60,018,243	37.4

Source: Dickson (1967, p.10)

English Government Long-term Debts, at Michaelmas 1719 (excluding life annuities)

D) Owed to companies	£	£
(a) Bank of England	3,375,028	
(b) East India Company	3,200,000	
(c) South Sea Company	11,746,844	
		Total 18,321,872
(2) Redeemable Government Stock		16,546,202
(3) Annuities for terms of years		
(a) Long annuities, £666,566 valued		
at 20 years' purchase	13,331,322	
(b) Short annuities, £121,669		
valued at 14 years' purchase	1,703,366	
		Total 15,034,688
		Total Long-term Debts 49,902,762

Source: Dickson (1967, p.93)

The creation of the New East India Company came at the expense of the 'old' East India Company,

creating an arrangement that was to prove unworkable. In 1702, the two East India companies were merged and once again Parliament made the traders pay for their privileges. The deal was for the company to assume the debt of the 1698 East India company, £2 million at 8%, together with an additional £1.2 million, at no interest, producing a total loan to the government of £3.2 million paying 5%. Such capitalized transactions were an immediate relief to a government spending, on average, 30% more than could be supported by revenue sources. By 1710, the pressures of financing a protracted war had become considerable. After tapping the two existing joint stock companies for additional funds, once again the government resorted to the granting of charters in exchange for paid-in share capital.

The 'Company of merchants of Great Britain, trading to the South Seas and other parts of America and for the Encouragement of the fishing', better known as the South Sea Company, was given royal assent on 11 June, 1711. During times of war, the government typically paid for the war effort using short-term debt such as Navy tallies and Army and Transport debentures. Circa 1711, the amount of this short-term unfunded debt was over £9 million. It was this debt that the South Sea Company agreed to assume. Compared to the operations associated with Bank and East India Companies, this deal was immense. For over two years the South Sea Company was engaged in taking subscriptions, ultimately raising £9,177,968 for which the government was to pay annually £550,678 interest and £8,000 management fees.

The early history of the South Sea Company was not good, due in part to funding the debt with tax sources that did not apply until 1715-1716, interest to be paid on the debt from general revenue of the Treasurer of the Navy. During the almost predictable period of suspended interest payments, shareholders were obliged to accept bonds in lieu of interest, further increasing their stake in the Company. However, by 1717 the various encumbrances on South Sea stock had been eliminated, and Parliament further enhanced the attractiveness of South Sea stock by an enactment requiring that any deficiencies in interest payments from funded sources would be met with payments from the General sinking fund. By 1717, there was also renewed prospects for the most important segment of the monopoly business granted to the South Sea Company: trading with Spanish America.

John Blunt is an oddity in the South Sea affair. He has, ultimately, been singled out as the kingpin of the manipulations that produced the South Sea Bubble, yet his initial involvement was by request of the Government. It was Robert Harley, the newly appointed Chancellor of the Exchequer, who, in August of 1710, sought out John Blunt, George Caswall and Sir Ambrose Crowley for their advice on dealing with the pressures of government finance. That both Blunt and Caswall were affiliated with the Sword Blade Bank, the former as secretary and the latter as partner, was eventually to prove a fatal error. 'Directors and officials of the Sword Blade held five seats on the Original Court of Directors of the South Sea Company and the provision of credit by the bank played an essential part in Blunt's manipulations' (Morgan and Thomas 1962, p.31).

Another key element in the South Sea Bubble mix was the presence of a complicitous Minister, in this case John Aislabie, Chancellor of the Exchequer. Aislabie was a man of mixed character. As one of his contemporaries, Arthur Onslow described him: 'a man of good understanding ... and very capable of business; but dark, and of a cunning that rendered him suspected and low in all men's opinion ... He was much set upon increasing his fortune and did that' (Dickson 1967, p.95). In the summer and autumn of 1719, the apparent success of John Law's scheme in France generated plans for similar 'projects' in Britain. One such project was proposed by John Blunt: to incorporate all of

the National Debt, including that embodied into the Bank of England and the East India Company. The result would be a company very much like the company constructed by Law, with powers of note issue combined with profitable trading monopolies to support the interest income from government.

Whatever John Blunt's precise proposals were, the deal that was ultimately consummated left the two other joint stock companies in place, with the South Sea Company to undertake a conversion of the remainder of the relevant government debt, some £31 million. This was a considerable undertaking for a company whose primary earning asset was, itself, government debt. From this point, the essence of the scheme is captured by Cantillon (1755, p.323): 'a Bank with the complicity of a Minister is able to raise and support of the price of public stock and to lower the rate of interest in the State... and thus pay off the State debt. But these refinements which open the door to making large fortunes are rarely carried out for the sole advantage of the State, and those who take part in them are generally corrupted.' In the case of the South Sea Bubble, the Bank involved was the Sword Blade bank and the minister was John Aislabie.

After a bidding process involving the Bank and the South Sea Company, the deal eventually reached was for the South Sea Company to be permitted to undertake the conversion of government debt into South Sea stock, with the South Sea Company agreeing to a reduction in the government debt payments to 4% in four years and an additional cash payment from the Company to the government that would range from £4 million to £7.5 million. For this deal to make financial sense, the company would have to convince current holders of the government debt to take less than equal par value in South Sea stock. If only the interest payments are compared, the promised income from South Sea stock would be considerably less than many debt holders were receiving. For the conversion process to be profitable, it was necessary to create the illusion that South Sea stock was more valuable than its potential earnings would justify.

The resulting machinations of Blunt and his confederates is surpassed only by the magnitude of the collapse of the Mississippi scheme (Morgan and Thomas 1962, p.32):

Even before the bill became law, South Sea stock had risen above par, and Blunt and his friends now used every means in their power to enhance the rise. Their technique included carefully staged offers of stock for cash at a little above the current price; the use of this cash together with the Exchequer bills which the Company had undertaken to 'circulate' and its credit at the Sword Blade to support the market; the making of loans against the Company's own stock, so enabling holders to buy still more; the promise of lavish dividends; securing the interest of prominent people by thinly veiled bribes; and extracting the utmost propaganda value out of current events from the peace negotiations with Spain to a carefully contrived reconciliation between the King and the Prince of Wales.

On April 14, 1720, one week after the passage of the Act, the company announced its first 'money subscription' at a price of £300 for £100 par value in South Seas stock. Debt holders were required to register for conversion by April 28, with terms of the conversion to be announced on May 19. To sustain the rate of conversion indicated by the first money subscription, the Company boosted the half-yearly dividend to 10%, where 3% was expected based on Company dividends prior to the conversion. Two additional, even fundamental, inducements were: the requirement of only a 20%

(£60) downpayment on the subscription; and, in conjunction with the Sword Blade Bank, loans against stock.

Following the debt-financed success of the first issue, the scheme proceeds with an additional £400 'money subscription' at the end of April, with the King and the Prince of Wales being the first subscribers. And so it goes, on 19 May the conversion rate for government debt holders is announced as £800/£100, and this is followed by yet another money subscription, on 17 June, at £1,000. These prices were sustained by the announcement of a 30% dividend for the year and a guarantee of a 50% dividend for the following ten years. The most remarkable feature of the South Sea Bubble is the extent to which the fraud succeeded. In particular, the £1,000 money subscription was a triumphant success, with subscription lists including half of the House of Lords and more than half of the House of Commons. Even the sole voice of reason who spoke out against the initial South Seas scheme, Robert Walpole, was tempted into this scheme.

Predictably, the scheme foundered. The Sword Blade Bank could not sustain the large loans that the South Sea Company was incurring to support the high price of the stock. In addition, the driving force behind the scheme was rising prices. In the early stages of the scheme, money could be borrowed for the initial subscription payment and the resulting subscription receipt sold 'light horse' in the market. In order to prevent an oversupply of subscription receipts, effectively in-the-money subscription warrants, the Company would enter the market and purchase both light and heavy horse securities, using credit extended by the Sword Blade Bank. In an upward rising market, the profit potential of this plan was immense. If the credit underlying prices collapses, prices peak and the ensuing price collapse is more intense than the rise. In the period between 8 September and the end of September 1720, South Sea stock fell from 670 to below 200.

When the dust had settled, Aislabie and the directors of the Company had been required to forfeit a large part of their estates and arrangements had been made to do 'rough justice' to other participants (Morgan and Thomas 1962):

The main points of the ultimate financial settlement were:

The £7 million liability of the company to the state was cancelled.

Borrowers against stock were to repay only 10% of their loan, but to have the stock which they had deposited against it cancelled.

Outstanding calls on money subscriptions were cancelled and stock allotted to all subscribers on the basis of £100 stock for each £300 cash already paid.

The parties to the August conversion received additional stock to bring their terms to the same as those of the May conversion.

The remaining stock, after discharging all these obligations was divided proportionately among all holders, old and new ...

The net result was ... to leave the cost of servicing the National Debt much as it would have been if the South Sea scheme had never been thought of.

Even though the scheme did not have a substantial fallout for the direct participants, there was one event produced by the South Sea Bubble that would have lasting consequences.

The South Sea scheme involving the government debt conversion did not take place in a vacuum. The fantastic promotion of John Law was in the process of unwinding just as the South Sea scheme

was beginning, though the full extent of the financial market collapse in France could only be guessed at the time. The markets in England and France were awash with speculative capital. In England, this produced a competing array of small joint stock promotions, involving companies either acting without a charter or using a charter that was not granted for the firm's current activities. Scott identifies 120 such issues appearing between September 1719 and August 1720, with a potential market capitalization of £220 million. To stem the flow of speculative capital out of the market for South Sea shares, the South Sea Company was able to get the so-called 'Bubble Act' invoked.

The Bubble Act was not a specific Act, per se. Rather, the Bubble Act was some clauses attached to a bill enabling the charter for two insurance companies, the Royal Exchange Assurance and London Assurance Companies; yet another instance of the government exchanging exclusive rights in exchange for the paid-in capital of the venture. These clauses prohibited promoters from 'presuming to act as if they were corporate bodies and pretending to make their shares or stocks transferable or assignable without any legal authority'. The prohibition was extended to companies operating 'under the authority of charters that were obsolete or had been given for some other purpose'. The effect of this Act was to severely restrict joint stock issues, leaving the two insurance companies, together with the Bank, the East India Company and what remained of the South Sea Company as the main components of the English stock market for the rest of the century. Little progress was made in joint stock company formation until the enabling of "letters patent" in 1834 and passage of the Joint Stock Company Act (1844), e.g., Todd (1932); Alborn (1998).

The Paris Bourse on the Eve of the French Revolution

The issuing of "*les primes*" by the *Compagnie des Indes* at the height of the Mississippi scheme speculation is, perhaps, the most remarkable event in the history of equity security speculation. The extent of the Mississippi scheme went far beyond the considerable losses of investors. For two generations and longer, the French were wary of financial securities such as bank notes, letters of credit and company shares. There were government efforts to organize a formal stock market, with a 1724 order authorizing the creation of a stock exchange in Paris. Restrictions on the number of brokers (*agents de change*) implicitly encouraged the trading of securities in informal markets organized outside the exchange. Though scepticism of joint stock financing was widespread, this arrangement suited the French government which, from the collapse of the Mississippi scheme until the closing of the Paris bourse in 1793, managed use the facilities of the Paris bourse to bring a considerable amount of debt to market (see Tables 2.4 and 2.6, Poitras 2000, p. 70-2 for listing of issues by type and amount of funds raised). In particular, from 1777-1788 "Necker and his successors obtained more the 776 million livres in return for life annuities of 8 to 10 per cent constituted on from one to four 'heads' without regard to life expectancy" (Taylor 1962, p.963)

During the 18th century, French government loans were of two types: long term fixed rate annuities (*rentes perpetuelles*); and, life annuities (*rentes viageres*). The life annuity issues that became an increasingly important element of French government finance as the 18th century progressed were the essential element in the emergence of exchange traded funds based on pools of such securities. Though life annuities could be traded, such trade was complicated by lack of market information about the life on which the annuity was written. Early attempts at creating a more tradeable security

used the life of a well known individual, e.g., Louis XV or Frederick the Great (Taylor 1962, p.962). The practice of issuing *viageres* without reference to age was not common prior to the dismissal of Turgot in 1776, while the ‘uniform rate’ for a life annuity after this time was “10 per cent on one ‘head’, 9 or 8½ on two, 8 on three or four” (Taylor 1962, p.961). Using actuarially sound pricing methods, the uniform rate prices for the single life annuity were fairly priced for an adult about age 50 (Velde and Weir 1992). For a number of reasons, interest rates on the life annuities, guaranteed by the monarchy, were high enough to be considered “scandalous” (Taylor 1962, p.965). This perceived mis-pricing led quite quickly to the creation of exchange traded funds based on pools of these annuities. Trading in these funds played a central role in the *agioteur* driven frenzies and manipulations that characterized the Paris bourse from the mid-1780's to the eve of the French Revolution.

The investment scheme, colloquially referred to as ‘*trente demoiselles de Geneve*’ initially involved a number of Genevan banks creating ‘investment trusts’ or ‘syndicates’ that were formed by pooling life annuities issued by the French government. Even though there was an expected gain to purchasing life annuities written on young nominees, there was still the risk of unforeseen events. Extending Taylor (1962, p.992-6), Velde and Weir (1992) observe that the Genevan banks:

developed lists of young girls from Genevan families to name as the contingent lives. The families were selected for their record of health and longevity. The girls were mostly between the ages of five and ten, and were selected only after surviving smallpox ... The Genevan banks purchased large amounts on each life to reduce transactions costs, but pooled together annuities on enough different lives to reduce the risk. The most common number of lives in a pool was 30, hence the name of the scheme.

The banks then “resold small fractions of their pools of annuities to individual investors”. Sometimes the cash flows from the life annuities were passed-through directly to investors, in other cases the cash flows were repackaged in other forms, such as tontines. Included among the investors were prominent speculators, including the banker Étienne Clavière (1735-93), the most well known of all the French speculators operating at the eve of the Revolution.²³ As Clavière observed in 1782, “The Genevans are the first who have seen in the annuity loan a means of increase of fortune as advantageous to cultivate as most of the other objects of which industry is practiced.”

INSERT FIGURE
Etienne_Claviere.jpg

All this reflects a relatively modern state of financial sophistication. In addition to capturing the gains from risk pooling, claims against the pools were “an easily negotiated asset ... because the bank's dispassionate selection of lives eliminated problems of asymmetric information and moral hazard” associated with life annuities written on single lives (Velde and Weir 1992). This process was facilitated by the substitution of “the paper of the investment trust for the paper of the annuities themselves”. In addition to capturing the French government's perceived ‘scandalous’ mis-pricing of life annuities written on young, healthy lives, the pools were able to capture the risk premium available from portfolio diversification. The result was that the claims against the pools could be

sold at yields well below those directly paid on individual life annuities issued by the French government. At what point the bankruptcy of the French monarchy could have been anticipated is difficult to determine. In any event, Taylor (1962, p.964-6) provides an insightful examination of the “rationalization of the risks taken” by the *agioteurs* as the bankruptcy approached.

Over time, the investment technology developed by the Genevan banks spread to other countries, most notably the Dutch republic.²⁴ The Dutch schemes, often organized by important brokers instead of banks, introduced an additional wrinkle. This involved using the surplus of interest received from the French government over interest paid to claim holders to buy back shares in the pool. In some cases, the allocation of surplus was not complete, with the residual cash flow going to the brokers who originated the scheme (Alter and Riley 1986, p.28). In any event, the ‘share buyback’ feature would act to reduce the number of claims on the fund, thereby increasing potential future returns of pool claimholders. In summary, the pooling scheme involved many modern notions including: the gains to diversification; investment trust/mutual fund origination; security pass-through; and share buybacks. These combination of these features provides strong support for the selection of the ‘*trente demoiselles de Geneve*’ as the most appropriate historical starting point for the theory of portfolio diversification.

The creation of tradeable equity claims against a pool of securities reflects the remarkable level of sophistication that financial markets at that time had achieved about the notions that Markowitz and others were to explore almost two centuries later under the guise of ‘modern portfolio theory’. In particular, the investment scheme that first appeared in 1771 reflected intimate understanding of the gains accruing to portfolio diversification (Taylor 1962; Alter and Riley 1986; Velde and Weir 1992). However, by the 1785 peak of an *agioteur* driven speculative frenzy on the Paris bourse (Taylor 1962, p.965-6), the bankruptcy of the state was all too apparent; the suspension of payments in 1788 and 1789 was a case of ‘not if but when’. Oddly enough, it was *agioteurs* that were willing to engage in large operations supporting the French government annuity loans as the end neared. For the *agioteurs*, “political action was an important technique of speculative success” and the use of “intrigue, propaganda and manipulation” had proved sufficient in the past. As Claviere observed in 1786: “My fortune, it must be said, is bound to that of the Kingdom. I cannot conceive of the risk of bankruptcy in a country so favored by nature”.

In the history of equity security markets, Étienne Clavière is remembered as the bear speculator able to commission the great French revolutionary, orator and politician M. le comte de Mirabeau (1749-1791) to distribute anti-*agiotage* polemics and tracts designed to support an uncovered bear squeeze of longs with forward contracts (*vente à terme*) in a number of joint stock companies starting around 1785.²⁵ A number of such operations were launched against the Paris Water Company. This trade was sustained by the reappearance of joint stock share issues starting around 1777 with the Paris Water Company and in 1778 with the Discount Bank. The bear squeeze involved spreading negative sentiment, depressing the cash price in order to permit the bear syndicate to purchase shares for values well below the delivery price on the short *vente à terme* position. The closing of the Paris Bourse and the abolition of French joint stock companies were two consequences of the turmoil of 1793. These events mark a symbolic end to the rudimentary financial transactions of the 18th century, just as the official recognition of the new-style Paris Bourse in 1801 marks the beginning of more sophisticated and accepted equity security trading practices.

2.2 Developments to Graham and Dodd (1934)

A. *Reminiscences of the Stock Operators*

Early Stock Exchanges

The valuation of equity securities is intimately connected to the methods employed to trade such claims. In turn, increases in the aggregate supply of equity securities over time have produced changes in trading mechanisms. The emergence of exchanges specializing in the trading of equity securities was a long process, starting in the early 17th century and continuing until the 20th century. For much of this time, stock exchanges were more important as venues for trading government debt securities – debt securities were commonly referred to as “stocks”, e.g., ‘debenture stock’, whereas “shares” was the terminology commonly used to denote equity claims in joint stock companies. In 1840, for example, of the £1.3 billion in securities available for trading on the largest securities exchange in the world – the London stock exchange – only 11% had not been issued by governments, with much of the remaining percentage attributable to the government linked Bank of England, East India Company and South Sea Company stock. Though joint stock shares from a variety of geographical locales were traded in London, it was common for ventures to be floated on the local stock exchange.

The earliest exchanges lacked formal organization, even where trade was conducted in a centralized location. In the 17th century, trade in VOC shares on the Amsterdam exchange was conducted in a fashion similar to commodities. Access to the exchange was open to the public with brokers and those seeking to trade shares gathering around one of the 46 pillars in the exchange building to conduct business. It was not until 1787 that brokers in Amsterdam established an organization aimed at controlling default risk by restricting access to trading. Following Michie (1999, p.3), a stock exchange can be defined as: “A market where specialized intermediaries buy and sell securities under a common set of rules and regulations through a closed system dedicated to that purpose.” Under this definition, the first stock exchange was established by government decree in Paris in 1724. However, because entry was restricted to the 60 *agents de change*, much of the trade was conducted outside the stock exchange building and at other venues around Paris. Hence, even though there was a formal stock exchange, it was not the primary venue for trading stocks. In addition, it was not until the 1780's that the French recovered from the distrust of joint stock shares created by the Mississippi, substantially restricted the overall trade in shares.

By the middle of the 18th century, the more substantial securities brokers in London “were looking for ways of conducting their business in greater comfort and away from the disreputable hangers-on of the market” (Morgan and Thomas 1962, p.68). An attempt in 1762 by a club of 150 brokers to obtain exclusive rent of Jonathan's failed when the courts upheld the rights of access by those being denied access. Subsequently, in 1773 a group of brokers acquired a building in Sweetings Alley off Threadneedle St. that was called the ‘Stock Exchange’. However, while some trade did gravitate to the new venue, there were no formal rules regarding membership, trading and the like. Access was open to the public on payment of an daily admission fee. In addition, trading continued to take place at various locales around London, especially in the Rotunda of the Bank of England building that had opened in 1765. In addition to free admission, the Rotunda building was where transfers

for Bank of England stock and, more importantly, government debt issues were executed. Though the volume of trade was much greater than in Paris, this London stock exchange was “neither exclusive or dominant” in the London securities market (Michie 1999, p.32).

The evolution of the London stock exchange took a dramatic turn starting with the French Revolution in 1789 and the closure of the Paris bourse in 1793. The subsequent occupation of Amsterdam by French troops in 1795 meant that two of the most important financial centers in Europe – Paris and Amsterdam – were disrupted. These events triggered an exodus of important bankers, brokers and other merchants to London, providing further impetus to the emergence of London as the dominant financial center for trading stocks and shares in the period from the early 19th century until WWI. Against this late 18th century backdrop, the British government greatly expanded the stock of national debt to fund military expenditures.²⁶ The eventual result was that “on 3 March 1801 a London Stock Exchange formally came into existence that not only provided a market for securities but also incorporated regulations on how business was to be conducted”. With this move, the exchange moved from an open to a closed market designed to ensure “that all those who participated both obeyed the rules and paid for the necessary administration” (Michie 1999, p.35-6). In effect, the first modern stock exchange was born.

From this beginning, there developed during the 19th century an international network of stock exchanges with London being the dominant exchange for international issues of stocks and shares with Paris having a greater role for Europe and the Mediterranean. This growth was facilitated by the sometimes massive increases in government debt and corporate share issues due to events such as the Napoleonic wars, the railway construction boom through much of the 19th century, the US Civil War, and the transition of businesses to publicly traded joint stock companies. Changes in communication technology, such as the telegraph and the telephone, contributed to the evolution of the local and regional exchanges from being sources of capital for smaller, locally located enterprises toward specialization in specific securities, e.g., South African exchanges for gold stocks; New York for American securities. The exchanges located in national financial centers increasingly “provided the most liquid market in which money could be readily employed or securities quickly sold” and so attracted business from throughout the country (Michie 1999, p.6).

Accompanying the development of stock exchanges was a gradual transition in the sophistication of the investing public and the businesses seeking to attract capital. Shares in joint stock companies came increasingly to be perceived as ‘investments’ instead of ‘gambling’ vehicles. The increasing liquidity of stock markets substantially reduced the difficulty of purchase and sale, further encouraging trade. While these social transitions took place somewhat more quickly in Paris and London, by the beginning of the 20th century New York was on a comparable footing. This somewhat later social development is consistent with the “dramatic expansion” that took place in US stock markets from the mid-1880's to the late 1920's (O'Sullivan 2007). Yet, these comparable historical developments mask fundamental differences in the workings of the financial markets in Europe and America. As it turns out, these differences – arising from ‘trading for account’ versus ‘daily cash settlement’ – had a significant impact on the development of security markets over the next century.

US Stock Operators

Almost from the beginning of equity securities trading in the US, it is evident from some articles in the financial press that the practice of equity security valuation was more than rudimentary. This is not that surprising when it is recognized that valuation practices in the US were transplanted from European centers, such as London, Paris and Amsterdam, where there was more than a century of prior development in equity securities trading. With this in mind, it is not easy to pick a starting point for a discussion of the relevant US contributions from those in the trade and financial press. In general, the published contributions chronologically increase in depth and understanding of equity security valuation issues. This development is roughly consistent with the growth of New York as the world's financial capital. As late as the 1820's, Philadelphia had as strong a claim as New York to be the nation's financial capital. In the period before the Civil War, London was still, by far, the world's dominant securities market. Even with the sizable influx of funding issues associated with the Civil War, around 1866 London still had a market cap of around \$10 billion compared to \$3 billion for New York (Gordon 1999, p.123).

Despite the availability of expertise in the industry, before Graham and Dodd (1934) there was no US source which systematically developed the techniques of the fundamental approach to equity security valuation. Armstrong (1848) is strongly in the genre that stocks are gambling transactions conducted in a trading environment characterized by corners, bubbles and "fancy stock manoeuvres". Biographical and autobiographical accounts of those involved in the industry, such as Henry Clews Fifty Years on Wall Street (1908) or Edwin Lefèvre Reminiscences of a Stock Operator (1923) present a similar picture. This does not mean that the methods of equity security analysis being used at the time were inadequate compared with those used today. Rather, the available studies were strongly influenced by the institutional and cultural milieu of the times. Insightful accounts of more modern equity valuation methods, such as Hartley Withers Stocks and Shares (1910), required a cultural maturation that permitted security investments to be seen as a socially acceptable means of financial improvement.

From the beginning of trading in joint stocks, a range of trade publications covering a number of different facets of the securities industry, in general, and equity security analysis, in particular, have appeared. In the US, the Commercial and Financial Chronicle was a key source until it was superseded by the Wall Street Journal (first published in 1884).²⁷ The business section of the major newspapers, such as the New York Times in the US and the London Times in England, also were important sources. As daily or weekly publications, these sources did not usually proceed much beyond a focus on current events until the turn of the century. By the 1920's, it was common for the financial press reporting on equity securities to feature a number of indexes, volume statistics and the like. Though the discussion in articles appearing in the financial press often involved valuation aspects of specific stock issues, there was no scope to present a reasoned development for the methods of security valuation. Much like a business reporter today, the financial reporter would gather information from those involved in the trade knowledgeable about security analysis as it pertained to the topic of the interest.

In examining the various stories and accounts of the activities of market participants, it is possible to go back as far as, say, 1792 when the twenty-one individual brokers and three firms signed the Buttonwood Agreement "not to buy or sell from this day for any person whatsoever any kind of Public Stock, at a rate less than one quarter per cent Commission on the specie value, and that we will give preference to each other in our negotiations" (Eames 1894, p.14). This arrangement was

eventually to evolve into the New York Stock Exchange (NYSE), a name that was introduced in 1863 as a name change for the Regular Board of the New York Stock and Exchange Board. The New York Stock Exchange emerged as the dominant exchange for trading stocks in New York with its merger with the Open Board of Brokers in 1869 (Gordon 1999, pp.95,124-5). The New York Stock and Exchange Board, formed in 1817 (Eames 1894, p.18), could trace its pedigree to the Buttonwood Agreement. The Open Board was a relative newcomer that flourished in the face of the flood of issues arising from the Civil War.

Until the emergence of a dominant exchange, stock trading in New York was scattered across a range of venues. For example, in 1856 Gordon (1999, p.87) reports there were 360 railroad stocks, 985 bank stocks, 75 insurance stocks, in addition to hundreds of corporate, municipal, state and federal bonds and other types of stocks being traded in New York. Of these most were not traded on the New York Stock and Exchange Board, the lineal precursor of the NYSE, as the Board did not trade new and untested issues. These issues were curb traded. The primary venue for curb trading was various lamp posts in the Wall Street area where brokers who were not Board members, as well as some Board members, would meet to trade securities. Though the volume of curb trading was usually higher than trading on the Board, the market cap of curb issues was lower. In contrast to curb trading, activities of the Board were conducted at daily auctions which were held in fixed quarters.

The tales of American stock operators predate the Buttonwood Agreement. Notoriety was, and still is, the result of doing something on a grand scale, often in conjunction with a massive bull market speculation, or the creation of colossal conglomerate or the execution of an immense market manipulation. An early example is William Duer who was at the center of a 1791-92 speculative scheme to inflate the value of bank stocks, particularly the Bank of New York (Gordon 1999, p.40-5). The scheme was based on leveraged speculation and trading on insider information. At the height of the speculative frenzy, a number of banks were incorporated that, ultimately, did not open. As such, these stocks represent an early US instance of bull market 'paper hanging'. The collapse of the scheme resulted in bankruptcy of many of the players, including Duer. The scheme prompted Alexander Hamilton to write: " 'Tis time there should be a line of separation between honest Men and knaves, between respectable Stockholders and dealers in the funds, and mere unprincipled Gamblers." This seeking of the line of separation is a task that has occupied regulators up to the present day.

The formation of the New York Stock and Exchange Board in 1817 also marks the beginning of the Wall Street career Jacob Little, the first of a long line of big-time Wall Street speculative operators (Gordon 1999, p.59-62, 89-90). Unlike Duer who only used Wall Street as a trading venue, Little made a career on Wall Street. Though Little was also a broker, gaining membership to the Board in 1825, it is his activities as a speculator that made his reputation. Little's trading strategies were typically short-term, aimed at anticipating market movements. During his career, Little made and lost four fortunes in speculative trading activities. In the end, he was unable to recover from his last insolvency brought on by the market panic of 1857. From that time, until his death a few years later, Little ended his Wall Street career as a trader of penny stocks and odd lots.

Though Little was primarily a short seller, he made his first fortune in a 1834 short squeeze involving the Morris Canal and Banking Company. The objective of a short squeeze in a stock issue is to gain control of the quantity of that stock available for trading (the 'float' or 'floating supply')

at a time when a sizable amount of stock has been sold short by traders who do not have a sufficient amount of stock to deliver. As was the case in the squeeze on Morris Canal and Banking, the capital requirements for gaining control of the stock for delivery usually involves a group or pool of speculators operating in concert. When the time comes for the short to make delivery of the stock, the short has to enter the market to buy – but there is no supply available because the short squeezers have already gained control. The result is a rapid rise in stock prices as short sellers bid up prices to tempt new supply onto the market (either from accounts of long-term investors or from the short squeezers). At Little's time, most short sellers were brokers that had sold stock they did not own to investors, speculators or other brokers. The short position was sometimes the outcome of longer settlement periods than in modern times. In other cases, the objective of both parties was to engage in speculative forward trading, resulting in delivery dates on the short that could be many months in the future.

Prior to the wide reaching regulatory reforms of 1933-34, stock market self-regulation was an important theme of government policy toward the securities market. Yet, self-regulation suffered from the conflicting interests of the legitimate brokers, who recognized the negative impact associated with widespread unscrupulous trading activities, and the big-time speculators, who saw the market as a conduit for achieving big profits from a range of trading schemes. Many practices that are illegal in modern markets were considered fair game, such as trading on insider information or the formation of pools to engage in trading activities aimed at creating price movements favorable to speculation on stock price changes. The process of reform using self-regulation was slow and problematic. It was not until November 1868, just prior to the merger of Open Board and the New York Stock and Exchange Board, that registration of securities and 30 days notice of new issues was required of companies listed on the two Boards.

The imposition of the listing requirement had an immediate impact on the activities of the big-time speculators, Daniel Drew, Jay Gould and James Fisk, involving the Erie Railway. The 1864-1869 manipulations associated with the securities of the Erie are almost epic, reflecting the state of securities markets of that time. On one side of the struggle was 'Commodore' Cornelius Vanderbilt, a giant in the transportation industry, who wanted to control the Erie in order to be able to control the pricing of railway freight rates into and out of New York City. On the other side was a group including Drew, Gould, Fisk and other big-time speculators who were seeking to control the Erie as a vehicle for making speculative gains through manipulation of the companies security issues. The machinations of the two camps has been captured in some of the early classics of business finance, e.g., Adams and Adams, Chapters of Erie (1871) and Henry Clews, Fifty Years on Wall Street (1908). The struggle between these two groups is the epitome of the problems that prevailed in securities markets of that time, e.g., Medbury (1870, ch.9), Gordon (1999, ch.6).

INSERT FIGURE

Bulls and Bears on Wall Street (W.H. Beard 1879)

beard_bullsandbears.jpg

Vanderbilt was concerned with securities markets only as a vehicle for creating and managing a business empire, primarily involving railways. As part of the ongoing process of expanding this empire, Vanderbilt moved to acquire a controlling position on the Erie board of directors during the

late summer and early fall of 1867. Vanderbilt had been involved with the Erie as recently as 1865, when he resigned from the board over concerns about the evident manipulations in the stock that took place during 1864-65. A major player in these manipulations was Daniel Drew, also a board member who, conveniently, served as treasurer. In his position as treasurer, Drew was able to issue securities, and in 1866 had done so by loaning the company \$3.5 million in exchange for 28,000 unissued shares and \$3 million in convertible bonds that had the provision that the 30,000 shares obtained from conversion could be reconverted back into convertible bonds. This provided Drew with the ability to expand and then contract about 10% of the outstanding stock – providing effective control of the floating supply.

When Vanderbilt was unsuccessful in using his influence to control the Erie board of directors, starting in January 1868 he moved to gain control of the company by making purchases of as much of the outstanding stock as could be obtained. The speculators saw this as an opportunity to issue more convertible bonds that became a conduit to print stock certificates that were then sold to Vanderbilt. From late February to mid-March, Drew and his group were able to sell 100,000 newly issued shares. The absence of registration and listing requirements prevented the New York Stock and Exchange Board from knowing what was happening. All this was set against a backdrop of corrupt judges issuing injunctions and arrest warrants and legislators being bribed to pass laws favorable to one or the other of these groups. On April 19, Vanderbilt was able to strike a deal with Drew, Gould and Fisk and recoup his potential losses from his stock dealing. Following this, Gould and Fisk continued to manipulate Erie stock issues, until the listing and registration requirements were introduced by the two Boards. Gould attempted to resist the requirements, even trying to establish a new exchange for the purposes of trading Erie stock. In September 1869, Gould capitulated and agreed to the new regulations. At that time, it was revealed that the number of Erie shares outstanding was around 700,000, about double the 351,000 shares outstanding at the time of the Vanderbilt agreement of April 1868.

To modern observers, events surrounding the Erie have the appearance of a classical farce. A business titan attempting to rest control of a railway company in order to implement a pricing cartel enters battle with a group of big time speculators seeking to use the company as a vehicle for generating profits from stock price manipulation. Drew, Gould and Fisk are usually lumped in with Andrew Carnegie, J.D. Rockefeller and Commodore Vanderbilt and recognized as the ‘Robber Barons’ who dominated American industry through their financial dealings in the 1870-1890 period, e.g., Geisst (1997, ch.3). The activities of the robber barons took place against a backdrop of increasing concentration of economic power in the hands of the trusts such as American Telephone and Telegraph, General Electric, Standard Oil and the American Tobacco Company. The trusts were formed largely as a way of dealing with the legal restriction that corporations had up to around 1900 that prevented the holding of stock of other corporations. During the 1890's there were about fifty trusts operating throughout the US, involving most of the major industries. This number includes some agricultural trusts that were concentrated primarily in the South.

Trusts were formed as a legal device largely to circumvent state corporation laws that restricted the ability of a corporation to expand using mergers and takeovers. Prior to the changes in state corporation law that started with New Jersey during the 1890's, the ability of a corporation to act as a holding company was quite limited. Trusts provided a legal avenue around these restrictions. In a trust, the companies being merged or taken over would exchange the common shares in the original

corporations for trust certificates that possessed a claim to earnings of the trust as well as voting rights to elect the trustees that ran the trust. Standard Oil, for example, had nine trustees. Trust certificates traded like common stocks on the stock exchanges. The trust was a useful legal mechanism for the takeover ambitions of the emerging industrialists. Instead of having to issue new shares to raise new capital for a takeover, trusts could pay for the takeover using trust certificates or internal sources of funds.

Due to changes in various state corporation laws, the trusts had a relatively short life span. The legal status of trusts did not prevent various states from initiating legal actions under other grounds, such as the common law restrictions on monopoly, aimed at preventing the increasing monopolization of specific industries. In addition, the public perception of economic and social problems posed by the trusts were addressed in 1890 with the passage of the Sherman Anti-Trust Act. Though this Act did not result in many successful prosecutions, it did provide a federal definition and jurisdiction for what constituted a monopoly. The trusts gradually reorganized as holding companies and trust certificates were replaced by common shares. Standard Oil, for example, completed the shift in 1899. Whether it was trading in trust certificates or the common shares, the changes in American industrial structure were good for Wall Street. The importance of trading in shares of these industrial companies gradually came to surpass the railroads. The volume and value of trade on the NYSE doubled between 1875 and 1885 with more growth on the horizon.

Yet, despite the growth, the securities markets of that era justly deserved the public perception as a speculator's haven. Henry Clews (1908, p.19), a veteran broker and investment advisor with fifty years experience on Wall Street from 1857-1907, provides an informed view of "How to Make Money on Wall Street":

To the question often put, especially by men outside of Wall Street, "How can I make money in Wall Street?" there is probably no better answer than the one given by old Meyer Rothschild to a person who asked him a similar question. He said, "I buys 'sheep' and sells 'dear'".

Those who follow this method always succeed. There has hardly been a year within my recollection, going back nearly thirty years, when there has not been two or three squalls in "the Street", during the year, when it was possible to purchase stocks below their intrinsic value. The squall usually passes over in a few days, and then the lucky buyers of stocks at panic prices come in for their profits ranging from five to ten per cent on the entire venture.

The question of making money, then becomes a mere matter of calculation, depending on the number of squalls that may occur during any particular year.

If the venture is made at the right time – at the lucky moment so to speak – and each successive venture is fortunate, as happens often to those who use their judgment in the best way, it is possible to realize a net gain of fifty per cent. per annum on the aggregate of the year's investments.

Coming from an individual so intimately connected to the dealings of 'the Street', it is difficult to deny the essential role played by speculation in US securities markets of the time. Given the numerous abuses associated with common stocks, the disposition of the small investor to favor bonds over stocks during this period is understandable.

Many of the systemic problems raised by the predominance of speculators in securities markets

persisted until the regulatory reforms following the Great Depression. The introduction of legislation such as the Securities Act (1933) involved a radical realignment of the federal government's role in securities markets. The collapse of securities markets from late 1929 to early 1933 was sufficient to end the period of self-regulation that had largely governed securities trading up to that time. Yet, the period of self-regulation was not without contributions. Many of the tools needed to lay the foundation that Graham and Dodd used to launch security analysis had evolved without government intervention. The growth of securities markets witnessed the emergence of professionals who made their living in the market and had a vested interest in making sure the game was played, if not always fairly, at least according to accepted rules. For example, the listing and registration requirements imposed by the newly formed NYSE were a direct assault on Jay Gould's manipulations of Erie Railroad Company securities.

B. Origins of Equity Indexing

The 'Vernacular' versus the 'Academic'

The distinction between "vernacular" and "academic" analysis has been introduced by intellectual historians and sociologists of science studying the popularization of investments in stocks and shares during the 19th century, e.g., Preda (2006, p.150).²⁸ Vernacular analysis is aimed at 'real time' financial decision making and is typically anecdotal, imprecise and uses language that is intellectually accessible by the broad population. It is "a heterogeneous set of practices, know-how techniques and rationalization procedures". In contrast, academic analysis is "a body of homogenous, abstract, formalized explanations" aimed at the community of academics staking claim to the subject area. It is theoretical, precise and involves language that is intellectually accessible mainly by academics involved in that community. Such a distinction continues to the present with modern Finance being the dominant school of academic analysis while trade publications, market commentary, newsletters and the like associated with 'the Wall Street approach' dominate the vernacular. Dating from the last quarter of the 19th century, the origin and development of equity indexing lie at the intersection of the academic and vernacular approaches.

While advice manuals and financial periodicals have a much longer history, the dramatic expansion of joint stock issue supply in the first half of the 19th century initiated a demand for information about equity securities from the general public. Especially after 1840, this expansion was associated with railway companies that often required substantially more capital than could be financed locally. This coincided with an increasing international integration of European and American markets for stocks and shares that took place in the second half of the 19th century, development that continued until the beginning of WWI. This transformation resulted widespread use of internationally diversified portfolios, particularly in the UK (Rutterford 2006).²⁹ In order to attract the middle class investor, the social and moral perception of security investments had to be transformed from one of 'evil gambling' to 'social good' based on rational and scientific principles. The result was the emergence of a vernacular 'science of financial investments' that has, from emergence to the present, had a complicated relationship with the development of the academic 'science of financial investments', e.g., Jovanovic (2006).

Considerable confusion has been created over time by a failure to identify the connection between

vernacular and academic approaches to the equity valuation aspect of the science of financial investment. Similar confusions can be found in almost areas where scientific ideas are needed, e.g., medical research, nuclear energy and global warming. A range of questions can be identified. Are vernacular and academic approaches basically the same, differing mainly by the level of rigor? Or, are vernacular and academic approaches “incommensurable” (Preda 2006, p.150-1) with aims and principles that are only marginally similar? Do vernacular approaches produce rationalizations for financial investment decisions that influence academic theories? To what extent do vernacular theories set the framework with which the general public interprets the results of academic contributions? In the context of equity security valuation, in general, and the use of equity indexes, in particular, answering such questions is made more difficult by the mixing of actors from the vernacular and academic realms.

In some ways, it is not surprising that equity indexes first appeared in the vernacular realm even though the introduction and subsequent use of indexes does represent a major advance in the sophistication of market participants. The almost simultaneous appearance of such indexes in 1884 by *Banker's Magazine* in the UK and the Dow, Jones and Co. *Customer's Afternoon Letter* is the first known appearance in trade publications (Hautcoeur and Petit-Konczyk 2006). Instead of using the stock index to determine the direction of the stock market, academics at the time were more concerned with the stock index as a predictor of business conditions, e.g., Mitchell (1910, 1916); Copeland (1915). The need for reasonable sample sizes, appropriate estimators and careful empirical analysis prevented an earlier examination of the subject. The divergence in usage is reflected in the following academic criticism of the Dow Industrial index by Copeland (1915, p.532-3):

The stock market index of the Wall Street Journal has been more commonly used for showing movements of security prices; but amongst the twelve industrials which it formerly included there was one quotation for United States Steel preferred, one for United States Steel common, one for United States Rubber preferred, and one for United States Rubber common. The weight thus given to steel and especially to rubber seems to have been unwarranted

The computational problems of generating an average value for 24,000 price quotations covering 40 NYSE stocks over a 26 year period was “bewildering” (Mitchell 1916, p.655) for academics but posed little difficulty for the less precise Dow index generated by the vernacular approach.

For various reasons, the literature on equity security analysis prior to WWI is populated primarily by contributions from the vernacular approach. Contributions from those in the trade and the financial press, such as Henry Clews (1908), Alexander Noyes (Klein 2001), Edwin Lefèvre (1923) and Hartley Withers (1911), were typical; though contributions with a more academic flavor were beginning to appear, e.g., Lowenfeld (1909); Babson (1910, 1911). Works written by academics, designed primarily to appeal to other academics, appear in strength following WWI. Included in this grouping are contributions by Irving Fisher, Edgar Smith, John Maynard Keynes and John Burr Williams.³⁰ Even though some members of the academic grouping, such as Irving Fisher and J.M Keynes, did make some contributions that could easily be included in the second grouping, there is generally a different flavor to the contributions of the two groupings.

This dichotomy between academic and trade publications serves to reinforce the importance and

relevance of Graham and Dodd (1934): a book written by individuals with academic standing that is fundamentally concerned with the types of problems that are at the core of what practitioners do. Graham and Dodd (1934) redefined the role of academics in relation to the practice of security analysis. Benjamin Graham (1894-1976), the senior author of the book, was well suited to this task. Born in London, England in 1894 as Benjamin Grossbaum, he immigrated to the US in 1895. Following an undergraduate education at Columbia University, Graham graduated in 1914 and went to work at the Wall Street firm of Newburger, Henderson, and Loeb, performing mostly lower level tasks. By 1920, Graham had worked his way up to partner. During the 1920's, Graham went on to form a number of investment firms in which he was a principal. It was a keen mind and a wealth of market experience that Graham brought to his classes at Columbia where, starting in 1928, Graham was a part-time instructor of investment classes at Columbia University. It was in one of these classes that David Dodd was a student.

Charles Dow and the Dow Indexes

A key historical initiative in the popular science of financial investments involved increasing the availability of accurate information to the individual investor. Similar to the telecommunications and computer driven technological revolution that has transformed modern securities markets, the 19th century witnessed: the development of telegraph lines in the 1840's; the introduction of the ticker tape in 1867; the availability of the local telephone line in the late 1870's, direct phone links via cables around 1890 and the use of congestion reducing private phone lines around 1900. The securities industry was at the forefront in implementing these new technologies. It was during the 1890's that the New York Stock Exchange required listed companies to produce annual reports. Though, even with this change, many of the annual reports that were produced did not have much substance by modern standards, the rise of the professional investment advisor necessitated that some useful information be made available. Though much of the trade literature of the time is largely concerned with pontificating on the good or evil of speculation, or glorifying the deeds of the big-time speculators or documenting use of the securities market to propel the rise of a business titan, the 'green shoots' of an emerging 'science of financial investments' is apparent by the turn of the century.

INSERT Figure
Charles Dow (charles_dow.jpg)

The financial press spearheaded a number of important innovations. Of particular importance is the introduction of price indexes to measure the performance of the aggregate stock market: it is Charles Dow (1851-1902) who is often credited with being the father of the modern stock market index. Dow is also important in having, together with Edward Jones and Charles Bergstresser, founded Dow Jones & Co., the company that created the Wall Street Journal. Charles Dow is a caricature of the changes that were taking place in the US securities markets of the later 19th century. Dow was a life long newspaper journalist who converted to covering financial news after covering a mining story for the Providence Journal in 1879. That Dow was able to achieve success in financial reporting by feeding the growing need for information to do security analysis. In 1880, Dow

moved to New York where he started with a stint reporting on mining stocks. In 1882, he joined together with Edward Jones, a fellow reporter from his days in Providence who also had relocated to New York, to form Dow Jones & Company. With offices behind a soda shop located next door to the entrance of the New York Stock Exchange, the main activity of the company was to collect and distribute ‘flimsies’ or ‘slips’ containing market news of the day. It was in this ‘Customers Afternoon Newsletter’ that on July 3, 1884 the first version of the index appeared. The price-weighted average was calculated by summing the prices of the stocks in the index and dividing by the number of stocks.

According to Siegel (1998, p.55), Dow began publishing a daily index of actively traded, high capitalization stock starting in February of 1885. The original index contained 10 railways and 2 industrials. This collection was roughly consistent with importance that railway stocks played in the stock market of that era. Dow expanded the index four years later to cover 18 railways and 2 industrials. The same year, Dow Jones & Co. started the Wall Street Journal. At this time the Commercial and Financial Chronicle was the most important financial newspaper. (Judging from accounts of Richard Wychoff (1930, p.44), the Chronicle continued to be the leading source of financial news until after Dow’s death.) Recognizing the importance of the emerging industrial sector, in May 1896 Dow changed the index to a 12 stock index of industrial stocks. The first version Dow Jones Industrial Average appeared in the Wall Street Journal in October 1896. The index of 20 railway stocks, the precursor of the modern Dow Transportation Index, was renamed the Rail Average.

INSERT Table 2.2.a
DJIA TABLE Current (2009)
INSERT Table 2.2.b
DJIA TABLE 1896, 1916, 1928, 1997, 2003

The original 12 stocks of the Dow Jones Industrial Average (DJIA) reflect the nature of the stock market at that time. The stocks were: American Cotton Oil, American Sugar, American Tobacco, Chicago Gas, Distilling and Cattle Feeding, General Electric, Laclede Gas, National Lead, North American, Tennessee Coal and Iron, US Leather and US Rubber. All but US Leather survives today in some form, though only General Electric remains in the DJIA. In 1916, the DJIA was expanded to 20 stocks and to 30 stocks in 1928. The use of 30 stocks has continued up to the present day. Only three stocks (American Sugar, General Electric and US Rubber) of the original twelve appear in 1916, with seven of the twenty from 1916 appearing in 1928. Oddly enough, American Tobacco and North American reappear in 1928 after being left off the 1916 list. This reflects the ongoing practice, still used today, to update the average to reflect the changing composition of trading, market capitalization and industrial composition of the leading common stocks.³¹

The Science of Equity Valuation

Following Jovanoic and LeGall (2000, 2001) and Jovanovic (2006) notions central to modern Finance – such as the random walk hypothesis and the associated ‘science of the stock market’ – can be traced to the latter half of the 19th century when French writers such as Jules Regnault (1834-

1894) and Henri Lefèvre (1827-1885) extended the positivist program of Auguste Comte (1798-1857) to financial markets. Alex Preda (2005, 2006) details the social and economic developments that laid the foundation for this early progress towards the modern theory of efficient markets. The needed cognitive and cultural background required transforming financial investing into a science, altering public perception to see financial securities as investments rather than gambling. Consistent with the central role of London in the global securities market, similar developments to those in France were emerging in the UK where the founding of the Foreign and Colonial Government Trust in 1868 "was the first British investment trust, designed to provide investors with the opportunity ... to allow ordinary investors to earn the higher yields that were available on overseas government bonds, compared with domestic Consols ... to reduce the risk of possible loss through default on coupon or final payment by investing in a range of different securities" (Rutterford 2009).

While French contributions to the science of the stock market included a number with an academic bent, UK contributions were decidedly in the vernacular realm.³² By the beginning of the 20th century, the vernacular contributions had progressed to where Lowenfeld (1909, esp. p.25) was able to use analysis of price charts for representative debt issues, preferred shares and ordinary shares in eight different countries to conclude the following "law" for "the foundation of profitable investment":

The realizable values of all securities controlled by the Stock Exchanges of any one country are entirely under the influence of the general state of trade of that country.

This law led to the lesson (p.26):

Every investor who places his money exclusively in the investments of any one country is simply speculating on the future trade prosperity of that country.

Recognizing that the "trade prosperity of each country differs from that of all other countries, so the price movement of stocks in each country differ from those of all other countries" (p.40), Lowenfeld proposes the following international diversification rule:

If an investor divides his capital equally among a number of stocks, every one of which is under a different trade influence, then each of these divisions of his capital will constitute a distinct investment risk, and a true system of arranging investment risks is thereby established.

This 'top-down' equally weighted by country approach to diversification differed from the more 'bottom up' conventional approach of selecting securities on the basis of a portfolio yield target and the associated quality of the securities being purchased.

The title of Lowenfeld (1909), Investment: An Exact Science reflected the remarkable transformation in public attitudes regarding stocks and shares that had taken place in the UK from around 1870 until WWI. Lowenfeld (1909) was one of a number of textbooks that extended contributions appearing in the Financial Review of Reviews, first published in 1905, and associated with the Investment Registry, founded in 1881. The Investment Registry was one of a number of

managed funds that used the portfolio management methods of ‘average investment trusts’ (Scratchley 1875; Hutson 2005). Based on the initial success of the Foreign and Colonial Trust, the key insights behind the average investment trust are outlined in the “Publisher’s Note” to Lowenfeld (1909):

The key to investment success lies in a true system of averages with the view to the depreciation in one portion of the securities held being counterbalanced by a simultaneous rise in another portion of them. The proper and systematic selection of stocks is the whole secret of Capital Stability, and in Capital Stability lies the whole science of successful investing.

From the perspective of the history of equity securities, it is the traded claims against the different managed funds that is significant.

Starting with the Foreign and Colonial, the “stocks” held by the funds were, initially, all bonds. This is consistent with the typical British investor of that period: “Many belonged to the upper and upper-middle classes ... who lived on the income from their invested capital. Security of capital and regular interest payments were therefore vital” (Hutson 2005, p.441). For example, Rutterford (2009) lists the eighteen debt securities of the 1868 Foreign and Colonial trust totaling about £1 million initial market value, spread over 14 countries, with the smallest market value being a £15,000 New South Wales (5%) and seven country positions being about £100,000: Spanish 3%; Italian 5%; Turkish 5% and 6%; Austrian 6% and 5%; Chilian 6% and 7%; Egyptian 7% and 7% Railway Loan; and, Peruvian 5%. The combined market value of the US (10/40), Nova Scotia (6%) and Brazilian (5%) positions was about another £100,000 with the remainder being made up of Russian Anglo Dutch company bonds (£80,000), Danubian (£60,000) and Portugese (£50,000). A number of the securities, such as the Spanish, Portugese, Italian and Turkish bonds, were selling well below par value, indicating the likelihood of default on coupon payments.

The ‘exact science of investments’ made a number of substantive contributions to equity valuation. Prior to this, ordinary shares were assessed for valuation on much the same principles as debt securities. Safety of capital and income received were the two chief characteristics. The initial average investment trusts aimed to employ equally weighted, geographically diversified portfolios to improve the safety of capital. As Lowenfeld (1909, p.10) observed: **“The safety of Capital is obtained by its even division over a number of sound stocks of identical width of fluctuation, and every stock held must also be subject to an entirely different market influence.”** Due to the declining coupon rates on British government and corporate bonds between 1870-1900, this approach to diversification also coincided with a potential increase in income received due to the higher, sometimes much higher, yields on foreign bonds. For example, the weighted average yield on the Foreign and Colonial Trust of 1868 was just over 8% at a time when British government bonds were yielding around 3.5%.

An essential insight from the science of investments for equity valuation is that value is conceived in a portfolio context. In addition, there is explicit recognition that the values of stocks within a given country are, more or less, all subject to “the influence of the general state of trade of that country”. In the context of modern Finance, this would correspond to the one factor model where expected returns on individual stocks depends on a combination of the riskless rate of interest and

the expected return on the market. However, unlike modern Finance theories of equity value, the problem of identifying an appropriate market index is avoided by exploiting the low correlations between 'stock' markets in different geographical locations that applied at that time. The equity value of a geographically diversified portfolio was distinguished from the value of a domestically diversified portfolio involving "a mixed assortment of British stocks ... That any counterpoise of this sort is ever to be derived from an all-British Investment List is an absolutely vain hope" (Lowenfeld 1909, p.23).

British Equity Valuation on the Eve of WWI

The 1890's is a potential reference date for exploring the origins of the 'value investing' approach to equity valuation, e.g., Graham and Dodd (1934, p.14) make specific reference to "the last three decades" of security analysis. This suggests the first decade of the 20th century as a possible starting point for examining early contributions to the value investing approach. Though written by a financial journalist from "the City" in London, Hartley Withers (1867-1950) was not without 'scientific' stature in the vernacular world of pre-WWI British security markets, e.g., Withers (1908). As such, Withers (1910) provides an helpful benchmark for examining the techniques of equity security analysis that predate Graham and Dodd. Though written by a journalist, Withers' objective was "to glean among the best brains of the world of finance" and "to pass on the gleanings to readers". There is ample attention given to both English and US securities markets. Withers (1910) contains twelve chapters. After an initial chapter on the historical evolution of securities, starting from the 16th century, Withers proceeds with a chapter on the form of securities, dealing with the topics such as the definitions of stocks, shares and bonds and the difference between registered and bearer securities. While this material is somewhat pedestrian, the next four chapters are recognizable precursors of Graham and Dodd (1934).

The first of the four chapters details how the capital structure of companies relate to the various classes of securities. In this chapter there are the expected topics such as the role of the shareholders in choosing the board of directors, the difference between preferred and ordinary shares and stock splits. The presentation is structured around the fictionalized creation of the "Hygienic Tooth-powder Company" by "Mr. Cleanbite" who lives in Brixton and has a small dental practice in Finsbury Circus. The dentist has developed an effective toothpowder but does not have the capital for making it on a large scale. As chance would have it, one of his business neighbors in Finsbury Circus, "a certain Mr. Mortimer ... who carries on the mysterious profession of company, promoter, underwriter, financier, and organizer of syndicates" happens to visit Cleanbites dental office for treatment of a painful molar. The machinations and complications of the ensuing formation of a public company, complete with issuing of stock, selection of the board of directors, watering of stock and so on reflects a solid understanding of the initial public offering. Having laid this foundation, Withers proceeds to a chapter with detailed examination of prospectuses.

Chapters five and six can fairly be considered as early gems of equity security analysis, in the sense of the Graham and Dodd mantra: "All security analysis involves the use of financial statements". Chapter five is a detailed dissection of the balance sheet and income statement of Babcock and Wilcox Ltd., a well known engineering firm at that time. After going over items on the liabilities side of the balance sheet, Withers (p.127) observes:

It is when we come to the assets side of the balance-sheet that its difficulty really begins. On the liabilities side we have been faced with sums about which there is no doubt. Every penny that the company has to account for to its shareholders or pay to its creditors is a definite penny, no more and no less. But when we look into the assets that it holds against these liabilities there is room for infinite variety in the meaning of the figures attached to them.

Withers goes on to demonstrate that the simple process of accounting for asset values according to the values paid for purchase is “quite useless as a guide to its actual position at the moment”. This lays the basis for chapter six which is concerned with the notions of depreciation and profitability. The connection of these concerns with Graham and Dodd (1934) are apparent where Part VI is composed of four chapters concerned with the implications of asset values for balance sheet analysis. In addition, Part V is concerned with analysis of the income account and has a chapter on “the relation of depreciation and similar charges to earnings power”.

Accounting standards were considerably less well defined at the time Withers was writing. Rules and practices that are taken for granted today were either non-existent or subject to dispute. Legal decisions associated with bankruptcies, securities frauds and the like often acted as a barrier to implementing sound accounting practices. This leads Withers (p.151) to make the following statement about the position of the auditor:

The position of an auditor of a joint stock company is doubly difficult, from the indefinite and hazy nature of his duties, and from his relation to the shareholders and the Board. As we have seen, his duties are reduced by legal pronouncements to those of a checking-clerk, and the fees that he receives are very inadequate to the real importance of his task; while in practice, if a company gets into difficulties, the auditors are always likely to be blamed for not having pointed out that its published figures, though correct, were not veracious. Though originally, as a rule, appointed to be watch-dogs in the interests of the shareholders, to see that the Board and the officials are publishing true and correct statements. Their duty is to the shareholders, but their direct relations are with the Board and officials. When they take a high view of their duties, and call attention in their reports to matters which ought to be amended, it sometimes happens that their action is very foolishly resented by the shareholders, whose best interests they are trying to serve, and they sometimes get removed from office for having done their duty well.

In light of the recent historical events surrounding the Enron bankruptcy and the collapse of one of the big five accounting firms, Arthur Anderson, this statement seems almost prophetic.

After three chapters, one on government and municipal securities, one on the stock exchange, and one on stock exchange transactions, Withers concludes with three remarkable chapters that explicitly deal with the implications of the distinction between speculation and investment, a distinction that also plays a key role in Graham and Dodd. Yet, Withers in these chapters goes beyond Graham and Dodd in some ways. The last three chapters of Withers have many elements that later appear in J.M. Keynes (1936, ch12). It is difficult to do justice in a short discussion. Chapter 10 is concerned with the price movements of securities. In this chapter, Withers starts by recognizing the role of psychological factors in determining stock prices, “price movements are chiefly a psychological

question” (p.283). After an insightful observation about the impact of dealers on pricing (“it often happens that an unexpectedly favourable traffic return or dividend announcement makes the dealers in a market raise the price of stock because they infer a quick rush of buying that will follow it”), Withers recognizes that share pricing ultimately has to be supported “by the action of the public”.

Withers follows this introduction with a discussion that is clearly reminiscent of Keynes:

One curious result of this dependence of securities on public opinion in the matter of their price movements, is that it is often dangerous to be too clever and far-seeing concerning the influences that may be expected to improve or depress prices. It has happened before now that long-sighted operators have foreseen trade developments or other happenings that could not fail ultimately to have an important effect on prices, have backed their opinion by buying the securities likely to be affected, and have lost money by being too keen of vision. All that they foresaw may have happened, but if its effects did not dawn on the intelligence of a large enough number of buyers, the stocks that ought to be affected would not move ... It is not enough for a stock to be worth buying. It must be recognized to be worth buying by the multitude before it will go up in price. Further, the fact that a stock may be absurdly over-valued will not for a moment prevent its rising still further if there are folk enough who believe that it is still cheap and are prepared to back their opinions by buying it.

This is not the only connection to Keynes (1936, ch.12). After examining the bull and bear operations of speculators, Withers observes that the impact of such operations on security prices are “more or less temporary” and “what finally determines the price of a security is what the real investor thinks about it. Bulls and bears produce the waves on the surface, real buying and selling are the flow and ebb of the tide which determine the depth of the water” (p.293-4). This followed by the remarkable statement: “The real investor ... is likely to be guided by convention”. Though the connection to the elaborate process of decision making under ‘true uncertainty’ is unrecognized, Withers does dedicate substantial discussion to the social status of the real investor, “in most cases a member of the upper or middle classes of society” and the various social and psychological factors that would influence the conventions that guide their investment decisions, e.g., “old-time convention had been very much in favour of investments at home”. It is difficult to tell whether Keynes was aware of Withers (1910) as Keynes did little referencing of the ideas gleaned from others and no reference is given to Withers in Keynes (1936).

The last two chapters of Withers (1910) are devoted to detailed examination of ‘the real investor’ and ‘the speculative investor’. After recognizing that making such a distinction is artificial because “every investor is a speculator, and the difference between the two classes is finally, like most other differences, one of degree”, Withers observes that real investors “look most of all to security of income and least to the hope of capital appreciation, while the pure speculator sets no store by income, and looks entirely to the chance of being able to make a big profit by a resale” (p.317). Between these polar extremes are a range of speculative investors and investing speculators. The motivations of these speculative investors and investing speculators are of interest. In particular, much like the ‘value investor’ of modern times, the investing speculator can follow the course “of buying good securities which the investing public is at present neglecting, knowing that some day or other it will come back to them, and in the meantime earning a good round yield on his money

by buying stocks which are discredited”.

A final point of interest in Withers (1910) are two “well known saws on the subject of investment” that are explored: ‘the higher the yield, the lower the security’ and ‘never put all your eggs in one basket’. On the latter saw Withers makes the remarkable (why?) statement: “expert advisers of the public are fertile in schemes for scientific distribution of risks by climate, or by geography, or by industries, etc., etc.” Withers finds that neither of the old saws is “quite sound”. The text ends with an exhortation (p.344-5): “... the preceding pages have been written in vain if they have not shown that stocks and shares and market movements are a weltering chaos of uncertainty and haphazard guesswork, based on figures that often mean nothing – or worse than nothing, because they seem to mean so much – and on gusts of opinion blown hither and thither by causes which have no logical connections with the merits of the stocks affected. Whosoever is wise will ponder these things and try to be a real investor, exposing himself as little as possible to speculative anxieties and pitfalls”. Sounds like a strong vote for bonds over stocks, circa 1910.

Roger Babson and the Barometric Indices

It is a quandary that Roger Ward Babson (1875–1967) is remembered today primarily for founding Babson College in Wellesley, Massachusetts instead of other important contributions that transformed equity security markets. In particular, together with his wife Grace, Babson founded Babson's Statistical Organization, the first US investment advisory company aimed at providing advice to individual as well as institutional investors.³³ The founding of the Babson Institute (later Babson College) was part of the pioneering effort that revolutionized the US financial services industry, making Babson a considerable fortune in the process. A graduate of MIT in 1898, Babson acquired a considerable academic reputation over his career. Initial contributions included a number of influential papers in the Annals of the American Academy of Political and Social Sciences (Babson 1910, 1911) and a paper presented at the 1911 meetings of the American Statistical Association (1912). Babson (1910a) is a useful survey of financial information sources available at the time. From that point, Babson went on to publish over 40 books, including Business Barometers, which reached eight editions, to be followed by Business Barometers for Profits, Security, Income, which had ten editions. He was a Fellow of the Royal Statistical Society of London.

In the academic realm, Babson was part of the pre-history of the institutional school of economists that commences with the manifesto of institutional economics – Hamilton (1919) – and the establishment of the National Bureau of Economic Research (NBER) in 1920. Institutionalism was, arguably, the dominant school in American economics in the inter-war period. While institutionalism as an intellectual force was not able to recover from the post-WW II ‘measurement without theory’ criticism leveled by Koopmans (1947) and others, this school of economic thought made contributions to the conduct of economic policy and government practice that survive to present. Following Rutherford (2001), the institutionalist agenda emerged in the immediate aftermath of WWI and was propelled by a desire to support an enhanced role for government in the economy to achieve much needed social and economic reform. This created a demand for improved economic data and policy analysis that were the touchstones of institutionalism. Proposing a “modern” and “scientific” empirical approach analogous to that used in the natural sciences, institutionalism aimed

to replace the theoretically driven neoclassical approach to economics that dominated economics prior to WWI, e.g., Yonay (1994).

By the time that institutionalists were in vogue, Babson was firmly ensconced in the vernacular realm. In addition to a newspaper column, which commanded 16 million readers, he also wrote hundreds of magazine and newspaper articles. The intellectual influence of Babson within the vernacular community is evident from Hamilton (1922), The Stock Market Barometer, which is the defining work of the classical Dow Theory. In the US, Babson pioneered the use of ‘barometers’ to guide a market timing strategy of equity selection (see Figure 2a). Being a Dow theorist, Hamilton based his barometer on the behavior of market generated data, especially the Dow indexes. The Babson barometer was based on “twelve headings” covering “twenty-five subjects”. The headings are: building and real estate; bank clearings; business failures; labor conditions; money conditions; foreign trade; gold movements; commodity prices; investment market; condition of crops; railroad earnings; and, social conditions. Each of these “twelve main subjects have by custom come to be known among merchants as the twelve barometric indices of the condition of trade” (Babson 1910, p.114).

INSERT Figure 2.2.z
Babson (1910, p.122)

The ‘scientific’ approach to equity valuation of the American Babson stands in stark contrast to the ‘scientific’ approach of the British Lowenfeld (1909) and the ‘average investment trusts’. Instead of diversifying geographically to maintain stability of capital and specified level of regular income, Babson proposes a market timing strategy based on the leading indicator properties of the barometer:

The safest and most successful method of investing is to watch the barometer figures on the twenty-five subjects ... and then to buy and to sell only when these subjects plainly show which to do, *confining all purchases to the very highest grade securities*. By such a method purchases are made only at the end of a long period of declining prices, after which securities are held from two to four years until the figures on these twenty-five subjects show that prices have about reached the top. Then they are sold, the proceeds reinvested in short-term municipal notes and high-grade bonds maturing in from one to three years, or else deposited in banks. During these years a panic invariably comes when this money will again purchase, at from 20 to 50 per cent less price, the same high-grade securities that were sold a few years previous. (Babson 1910, p.132)

Babson further observes: “By this process an investor averages an annual income of about 8 per cent. from money invested in the highest grade bonds, and about 16 per cent. from money invested in the highest grade stocks.” While the numbers depend on the specific sample that Babson used for calculation, the basic point is clear: accurate market timing is the safest course to higher returns.

In a dinner organized by the American Statistical Association (ASA) in April 17, 1925 on forecasting security prices, Frederick Macaulay was asked to provide a critical review of the use of the barometer chart presented by Roger Babson. “He raised the question, in regard to Mr. Babson’s chart, as to whether it was not just as difficult to predict areas above and below trend, as to forecast

the course of the stock market” (ASA 1925, p.249). The point illustrates the growing divide between the vernacular and academic approaches to Finance that were emerging in the US during the 1920's. For Macaulay and other institutional economists of the era, the stock market was one of a number of exogenous variables that could be used to predict the general direction of the economy. It was difficult to predict the economy, let alone the direction of the stock market. For Babson, the objective was to provide a method for combining available data relevant for predicting the direction of the stock market in order to implement a market timing strategy. This requires an infrequently occurring, discrete random variable to be predicted. Hence, Macaulay and Babson may have been talking at cross purposes.

Throughout the 1920's a variety of ‘barometer’ measures were developed. For example, consider the April 17, 1925 ASA dinner again. In addition to Babson, William Peter Hamilton (The Stock Market Barometer 1922) also presented at the dinner; as did Paul Clay of Moody’s Investors’ Services who also engaged in forecasting “the course of the stock market” using, first and foremost, “our trade barometer, which is a weighted average of the barometrical trade returns. Trade conditions are bullish or bearish in accordance with the movement of this trade barometer, except that an excessive rise far above normal is bearish, while an excessive decline far below normal is bullish.” That Hamilton and Babson were familiar provides an interesting connection between two of the most remarkable equity security market predictions. On September 5th, 1929, Babson gave a speech saying “Sooner or later a crash is coming, and it may be terrific”. Later that day the stock market declined by about 3%. This became known as the “Babson Break”. Hamilton wrote his last editorial as editor of the Wall Street Journal on Oct. 25, 1929 titled: "The Turn of the Tide".

The Founding of Babson College (from www.babson.edu)

Beginning in 1908, Roger Babson offered through Babson's Statistical Organization a correspondence course on how to sell bonds. This endeavor was an instant success and courses in economics, finance, and distribution soon followed. He then saw the need for a private college that specialized in business education. In June 1919, in a special letter to clients of the B.S.O., Roger Babson announced the establishment of a school of business administration to provide not only practical but also ethical training for young men wishing to become business executives. On September 3, 1919, with an enrollment of 27 students, the Babson Institute (renamed Babson College in 1969) held its first classes in the former home of Roger and Grace Babson on Abbott Road in Wellesley Hills.

From the very beginning, Roger Babson set out to distinguish the Babson Institute from other colleges offering instruction in business. The Institute provided intensive training in the fundamentals of production, finance, and distribution in just one academic year, rather than the standard four. The curriculum was divided into four subject areas: practical economics, financial management, business psychology, and personal efficiency, which covered topics such as ethics, personal hygiene, and interpersonal relationships. The program's pace did not allow time for liberal arts courses and it was assumed that students would learn these subjects elsewhere.

Believing experience to be the best teacher, Roger Babson favored a curriculum that was a combination of both class work and actual business training. Seasoned businessmen instead of career academicians made up the majority of the faculty. To better prepare students for the realities of the business world, the Institute's curriculum focused more on practical experience and less on lectures. Students worked on group projects and class presentations, observed manufacturing processes during field trips to area factories and businesses, met with managers and executives, and viewed industrial films on Saturday mornings.

The Institute also maintained a simulated business environment as part of the students' everyday life. The students, required to wear professional attire, kept regular business hours (8:30 a.m. to 5:00 p.m., Monday through Friday, and 8:30 a.m. to noon on Saturday) and were monitored by punching in and out on a time clock. They were also assigned an office desk equipped with a telephone, typewriter, adding machine, and Dictaphone. Personal secretaries typed the students' assignments and correspondence in an effort to accurately reflect the business world. Roger Babson prepared his students to enter their chosen careers as executives, not anonymous members of the work force.

C. Irving Fisher, Stock Valuation and the 1929 Crash

Fisher's Prediction

The roots of modern Finance can be traced, without much difficulty, back to Irving Fisher. As time has advanced, a tendency has emerged to start the chronology of modern Finance with Markowitz., e.g., Markowitz (1999); Rubinstein (2002). Given the substantive institutional changes in securities markets that have taken place since WW II, this tendency is understandable. However, Fisher's seminal contributions spanned so many related areas, from index numbers to the theory of interest to the use of mathematical analysis in valuation problems, that Fisher can reasonably be identified as having laid the foundations for the theoretical superstructure that dominates the landscape of academic Finance. Siegel (1998, p.44), for example, refers to Fisher as "the founder of modern capital theory". Yet, Fisher's importance to security analysis extends beyond his academic contributions. Fisher harks back to an era when leading academics, such as J.M. Keynes, also played important roles outside the academic realm. In addition to writing investment newsletters and giving speeches to business leaders on financial topics, Fisher also started a profitable card indexing firm based on an invention that he had patented. Prior to the stock market collapse of 1929, his personal net worth was around \$10 million.³⁴

Based on this background, it is somewhat unfortunate that, in the annals of securities analysis, Fisher is most remembered for comments and prognostications made just prior to the stock market collapse of 1929 and in the following year, e.g., Fisher (1930). Siegel (1998, p.43-44) provides a lively description of a most telling incident:

It was a seasonably cool Monday evening on October 14, 1929 when Irving Fisher arrived at the Builders' Exchange Club at 2 Park Avenue in New York City. Fisher, a professor of economics at Yale University and the most renowned economist of his time, was scheduled to address the monthly meeting of the Purchasing Agents Association ... Members of the association and the press crowded into the meeting room. Fisher's speech was mainly designed to defend investment trusts, the forerunner of today's mutual funds. But the audience was most eager to hear his views on the stock market.

Investors had been nervous since early September when Roger Babson, businessman and market seer, predicted a "terrific" crash in stock prices. Fisher had dismissed this pessimism, noting that Babson had been bearish for some time. But the public sought to be reassured by the great man who had championed stocks for so long.

The audience was not disappointed. After a few introductory remarks, Fisher uttered a sentence that, much to his regret, became one of the most quoted phrases in stock market history: "Stock prices have reached what looks like a permanently high plateau".

On October 29, two weeks to the day after Fisher's speech, stocks crashed. Fisher's "high plateau" transformed into a bottomless abyss.

Keen to promote the notion of "Stocks for the Long Run", Siegel is something of an apologist for Fisher. The depth of Fisher's misconceptions are not adequately explored or recognized. For example, the actual quote by Fisher could be more accurately given as: "Stocks have reached what

looks like a permanently high plateau ... I expect to see the stock market a good deal higher than it is today within a few months” (Klein 2001, p.201). Fisher was not the only prominent academic bulling the stock market. For example, just prior to the crash, Charles Amos Dice, a professor at Ohio State, published New Levels for the Stock Market (1929) which provided a range of arguments as to why stock prices had to continue climbing.

Irving Fisher and Equity Valuation

Though Fisher was only a leading voice in a chorus of academics cheering the virtues of stock investment, it is disturbing to see the soundness of his arguments being undercut by the brutal reality of the collapse in stock prices. Fisher’s outstanding academic and public reputation was justly deserved. He was a careful and methodical researcher employing valuation models that are similar to those employed today. For example, Fisher (1930, p.xxii) explicitly uses discounted cash flow valuation to arrive at estimates for common stock prices:

Since every stock price represents a discounted value of the future dividends and earnings of that stock, there are four reasons that may justify a rise in the price level of stocks: (1) Because the earnings are continually plowed back into the business instead of being declared in dividends, this plowing-back resulting in an accumulation at compound interest, so to speak; (2) Because the expected earning will increase on account of technical progress within the industry; (3) Because less risk is believed to attach to those earnings than formerly; (4) Because the “basis” by which the discounting is made has been lowered.

Writing at the end of 1929, following the 40+% decline in stock prices of September to mid-November, Fisher (1930) explores all of these four points in detail and concludes (p.267-9): “the general plateau of the stock market is still the plateau of 1926-1929, still 55% higher than it was in 1926, and still higher than any previous plateau ... For the immediate future, at least, the outlook is bright”.

Fisher went far beyond a simple recognition that earnings were the key factor driving stock prices (p.67): “The percentage increase in prices of stocks should be equal to the percentage increase in earnings per share if the ratio of price to earnings were to remain constant.” Yet, the available data indicated that from 1922-27 industrial stock prices increased at 14.1% per year while “total profits” (earnings?) increased only 9%. This difference Fisher attributed to the gains to common stock from the low “rate of return on preferred stock” that permitted a greater share of the earnings growth to be captured by the common stock. In addition, the plowing-back of earnings permitted industrial corporations to purchase new plant and equipment that enhanced earnings capacity. Fisher recognized that the plow-back rate for industrial corporations had increased since 1927 and viewed this as a reinforcing force (p.80): “During the long bull market there was the record of increased real income, while plowed-back earnings gave promise of future values resident in the productive and consuming plant of the nation that were properly reflected in a heightened level of stock prices.”

Fisher (1930, p.67) credits Edgar Smith with the argument that the plowing-back of earnings was the main factor driving the increase in common stock prices. Fisher (p.66) puts the argument this way:

The increase both in dividend payments and in plowed-back earnings during 1929 over 1928, was not only a primal cause of the new plateau of stock prices, but gave promise of continuing prosperity to business for 1930. This increase should minimize the effects of the panic, which was largely restricted to the stock market.

When earnings are turned back into a business it is in order to increase the rate of profits according to the same method by which interest is compounded on savings. There has always been a plowing-back of earnings, but it has been especially done in the last few years.

Having proposed the importance of plowing-back of earnings, Fisher (p.81) asks the question: “Are the conclusions ... with respect to the increased rate of plowed-back earnings, stated with too great optimism?” Fisher addresses this question with a reasoned analysis of the behavior of the aggregate price-earnings (P/E) ratio.

Modern security analysts are well versed in the difficulties of interpreting P/E ratios. Earnings can be an elusive number that, to be adequately interpreted, requires careful inspection of additional information from the financial statements and other sources. Unlike modern stock market prognosticators, Fisher was hampered by lack of data on earnings and many other variables that are considered essential today for doing security analysis. For example, data on both a price index of industrial stocks and the associated earnings of those companies, calculated by the Standard Statistics Company (later to merge with the publisher of Poor's Manual to form Standard and Poors), are only available from May 1927. Fisher was able to obtain his estimate of the increase in earnings of industrial companies over 1922-27 of 9% from a government report (Committee of Recent Economic Changes). From the bulletin of the National City Bank of New York he was able to obtain evidence that the increase in earnings from 3Q 1928 to 3Q 1929 was 14%. Excluding railways and utilities, the remaining manufacturing and trading companies had a gain of 15%.

Given the state of financial reporting requirements prior to the Securities Act (1933), the crude earnings numbers that Fisher had to work with are somewhat suspect. Fisher (1930, p.88) observes: “There are also difficulties to be faced in the choice of stocks that publish annual earnings figures, and in those stocks where there is concealment of earnings for tax evasion purposes.” Fisher is also somewhat unclear about what P/E multiple to apply to individual stocks:

The price-earnings ratios of the old-fashioned type should be perhaps ten times annual earnings, which is the traditional ratio for a fair selling price for stocks during the period prior to 1922. But for the new type of rapidly expanding corporation the price-earnings ratio might be 100 to 1, or even literally to infinity in the initial stages of investment when earnings are not being realized.

With the background, Fisher proceeds to examine aggregate stock price index and earnings data from the Standard Statistics Company (see Table 2.x). Examining the aggregate data (industrials including railways) Fisher concludes that the 9.8 P/E for November 1925 was justified. It was 40% below the peak of 16.2 in January 1929 and lower than the previous low of 11.2 for May 1927 “the earliest month for which such statistics are available”.

In addition to examining the aggregate P/E data, Fisher made a number of astute observations

about the behavior of aggregate and individual stock prices in the months surrounding the crash. In particular, Fisher observes that the run-up in prices was selective (p.93): “As the market marched to its peak about half of the groups listed (on the NYSE) receded in price, while half went up.” It was the high flyers that came crashing down. Using his own index for aggregate stock prices that took in all NYSE groups, Fisher estimates that stocks fell 38% overall during the crash, with railways down only 28%, the most speculative stocks fell over 50%. He attributes the downturn in “the best stocks” to the impact of “overextension of loans” to buy stocks. After reviewing the data surrounding the crash, Fisher remained a bull (p.98): “... the precipitous fall in the market went too far, in the light of sound reasons justifying the long bull market, namely, justifiable expectation of great and increasing earnings, the fact they were so generously plowed-back, the warranted expectation of safety through diversification of investments and, finally, a consequent lowered basis of discounting the future as apparently reflected in price earnings ratios.”

INSERT TABLE 2.2.x P/E Ratio from Fisher 1930, p.82
(Fig_2-2-x_Fisher_PE.tiff)

The Common Stock Theory

As were many others at the time, Fisher was deeply impressed with the work of Edgar L. Smith on the long run performance of common stocks versus bonds. Prior to the appearance of Smith’s Common Stocks as Long-Term Investments (1924), Fisher (1912) held to the prevailing view that stocks would outperform bonds in periods of rising prices, while bonds would outperform stocks during periods of falling prices. Smith carefully demonstrated that this view was mistaken. Harold (1934, p.46) summarizes what subsequently came to known the common stock theory:

Proponents of the theory do not claim that a given stock is a better investment than a given bond nor that any group of stocks are better than any group of bonds. The theory, as expounded by Smith and Van Strum, is that over long periods diversified portfolios of common stocks in leading corporations yield the investor more income, more safety, more market value per portfolio, and also that such common-stock investments, as a group, keep better pace with the cost of living than do bonds as a group.

Smith took care in recognizing that the stock holdings had to be well-diversified across companies that represented the major industries. In addition, stocks had to be held a sufficient period to permit liquidation at favorable prices. Smith recognized that the length of the holding period to liquidation could be as long as 6 years – extending to 15 years in extreme cases. Fisher (1930, p.198-200) explicitly recognized the contribution of Smith (1924) to “a material change during (1923-30) in the estimate of the public as to the risk of investing in common stocks.”

Fisher (1930) is well off the mark in terms of predicting future stock price movements. Yet, Fisher (1930, ch.13) is an excellent illustration of why Fisher can be considered as laying the methodological foundation for modern Finance. The chapter is concerned with “Flight from Bonds to Stocks” – developing a theoretical basis for the rationale of why stocks are a superior long run investment than bonds. Fisher first explores the notion that bonds are “far safer” than stocks.

Working with Smith's data, Fisher adjusts for the impact of price level changes and estimates the yield on a bond investment for 1866-1885, a period of falling prices, as 11.7% in real terms (6.8% nominal), the same calculation for 1901-22 was 1.1% real (4% nominal). "This analysis indicates clearly enough that during periods of marked fluctuations in the general price level, bonds have a speculative character ... bonds are not, as compared with a well-selected and diversified stocks, what they have been cracked up to be ... even when prices are falling they are not usually superior to stocks" (p.202).

In a precursor of modern portfolio theory, Fisher (p.203) identifies "five reasons for the now proved fact that stocks are a better investment than bonds":

first, because the stockholder stands to win as well as to lose; second, because modern dividend policy is toward steadiness; third, because a portion of stockholders' earnings is reinvested for him and ultimately yields further dividends; fourth, because the unstable dollar tricks the bondholder, but any effect on the shareholder is largely neutralized; and fifth, because diversification can correct the irregularities of the stockholder's income but not that of the bondholder.

Fisher recognizes that Smith, K. van Strum and other writers emphasize the importance of diversification — he does not claim originality on this point. Yet, Fisher was a vocal and active proponent of "investment trusts" run by "expert counsel" — precursors of modern closed end funds and mutual funds. For Fisher, diversification had to have another element added: "It is the principle of constant inspection or check-up as to the status of companies issuing stocks, and constant turnover accordingly ... For the sound investor in common stocks must turn them over constantly, selling those that are losing in value and investing in those that are gaining" (p.207). The skilled investment counsel situated in investment trusts were an essential element to achieving the gains associated with diversification that allowed stocks to be a superior investment than bonds.

Based on the limited data available, Fisher was able to observe the phenomenon, common to periods of intense speculation in stocks, of substantially increased equity issues at the end of the 1920's. A comparison is made between corporate financing during the first eight months of 1925 (\$2.353 billion in long and short term corporate bonds with \$804 million in stock issues) with the first eight months of 1929 (\$2.360 billion in long and short corporate bonds with \$4.794 billion in stock issues). Fisher also observes that the bond issues in 1929 had a relatively more equity related provisions such as conversion features. Oddly enough, Fisher interpreted this data as a positive development for stock valuation. Fisher failed to foresee the precipitous fall in stock prices in the two plus years from 1930-1932. More importantly from the standpoints of individual investors at that time, he also failed to foresee that the general level of US stock prices would not recover to 1929 levels until after WWII.³⁵ As late as Fisher (1939), when the extent of the stock market collapse was all too evident, Fisher still argued: "there is considerable evidence to support the conclusion that stocks in general sold at about three-quarters of their true value as measured by the return to the investor."

In continuing to support "the common-stock theory" in the aftermath of the collapse of equity values associated with the Great Depression, Fisher is not alone. Bierman (1991,1998) continues a tradition stretching back to Eiteman and Smith (1953) and Harold (1934, p.59) where, at the depths

of the equity security market downturn, it was concluded: “the common-stock theory stands upon a firm base, shaken by the developments of 1932, but not destroyed.” Similar empirical results were presented in Bosland (1937) for the 1890's to the early 1930's. However, Bosland (1937, p.73) reflected an increasing wariness of the common stock theory by US observers: “no criticism of the common stock theory of investment is so impressive as the one which warns that the findings of the past may be of little value for the future. Specifically, the question is whether the factors favorable to increased common-stock earnings in the earlier period are likewise favorable for the period we have now entered, or, if not, whether new factors affecting common stocks have entered the picture.”

Fisher never wavered in support of common stock theory, despite considerable empirical evidence suggesting otherwise. It is convenient to look back on what Fisher said and conclude that he was just another prognosticator that got it wrong. Yet, Fisher was so much more than another prognosticator. With all the skills and information at his disposal, Fisher fails to provide an able answer to the problems confronting vernacular Finance, such as the American question. Though modern Finance academics may want to ignore Fisher's foibles, perhaps this is a reflection on the goals associated with academic approach to equity security valuation. Based on as careful an implementation of the scientific approach as he could muster, Fisher was a strong proponent of stocks for the long run – a view that, in his time, proved to be profoundly incorrect. Perhaps more personally disturbing to Fisher was that his long time academic rival, J.M. Keynes, was so much closer to the mark both academically and in the world of vernacular Finance.

Investment Activities of J.M. Keynes

Among inter-war economists with high academic standing, it is often claimed that J.M. Keynes stands out when vernacular measures of valuation performance are used. In other words, it is claimed that Keynes was an ‘exceptionally gifted’ investor. Though there is some truth in this, the record is far from transparent. *The overall record is a mixed bag of successes and failures.* Included in the failures was a 1919 partnership with O.T. Falk that invested mostly in foreign exchange. Beginning with an initial capital of £30,000 raised from personal savings and those of family and friends, Keynes was decimated on a bullish dollar play that found the partnership being wound up in April 1920 with a £22,275 loss, almost all of the initial capital. Almost bankrupt, Keynes was able to call on Sir Ernest Cassel from his network of influential friends to provide an emergency loan of £5000. That Keynes eventually managed to leave an estate of about £450,000 (including valuables such as pictures and rare books) at a time when his annual income from academic sources seldom exceeded £3000 indicates some vernacular success. However, the bulk of this amount came at the end of his life, during the years of WWII, where his financial assets increased from £188,353 in 1940 to £436,000 in 1945.

The considerable amount of detail that has been accumulated on the activities of Keynes the fund manager, speculator and investor is primarily because of the academic importance that Keynes achieved. This is not to say that Keynes was unrecognized in the world of vernacular Finance. For example, Keynes did have some impact changing the security selection and portfolio management policies of certain types of investment funds. These relationships started in November 1919 when Keynes commenced a relationship managing funds for King's College, Cambridge; initially as second bursar, becoming first bursar in 1924. *Keynes was a director of a number of investment trusts --*

the A.D. Investment Trust (1921-7), the Independent Investment Company (1923-46), and the P.R. Finance Company (1924-36) -- in addition to important duties with two insurance companies. The most noteworthy of these duties involved a creation of a separate fund, the Chest Fund, that engaged in active management of ordinary shares, currency and commodity futures.

Information on the security market activities of J.M. Keynes can be found in a number of biographies, e.g., Skidelsky (1983); Muni (1994). There are also secondary sources such as Muni (1995; 1996), that examine the overall investment record in order to dispose of the “myth about Keynes that he was exceptionally gifted as an investor”. In contrast, Chua and Woodward (1983, p.232) explicitly examine only the performance of the Chest Fund and conclude “Keynes was an outstanding portfolio manager”. The definitive source on the basics of “Keynes as an Investor”, the Collected Writings of John Maynard Keynes, vol. XII, chapter 1 (Moggridge 1983), makes considerable use of the Keynes papers in the King’s College Archives, Cambridge and numerous other primary sources, such as the records of the investment funds Keynes was involved in managing.³⁶ Using tax information, Keynes’ income is broken down by years into academic (including royalties for books) and other (mostly investment and trading income) annually from 1908-1946 (Table 1, p.2). This source indicates that by 1914-15, Keynes was generating almost 30% of his income through investment activities: “operating on his own account on a modest scale and providing investment advice for friends” (Moggridge 1983, p.1). While interesting, the income figures associated with taxation become less interesting as Keynes investment activities took on scale following 1919. Additional information on the sources of Keynes’ investment income by source (Table 4, p.12) indicates that Keynes investment and trading income was considerably under reported due to dividend income from US sources being excluded.

The intricate details of Keynes trading activities appear in Tables 3-6 (CWK, p.11-14). Recognizing that Keynes also engaged in futures speculation that would not appear on a report of assets, Keynes was heavily invested in ordinary shares throughout the entire period. Over the quarter century from 1920-1945, holdings of common stocks ranged from a high of 98.1% of the market value of securities held in 1930 (!), to a low of 43.1% in 1932 when 55% of the assets were bonds -- the only year over the period when bond holdings exceeded 25%. In turn, from 1927-1939 the portfolio leverage ratio of loans to purchase securities to net asset value of securities held was often over 1 and always well above ½. In 1930, the leverage ratio was almost 5 times. Starting from a negative net asset position of -£1,837 on Aug.20, 1919, Keynes is able to rebuild a modest capital of £40,000 by 1926. It is at this point that ***Keynes embarked on a program of leveraging***. Following a considerable reduction in outstanding loans from £65,000 in 1930 to £11,965 in 1931, Keynes embarked on a massive increase in leveraging that took the loan position to almost £300,000 in 1936 with net assets growing from £12,525 to over £500,000.

Following immense losses in 1937, when net value of security assets fell from £506,522 to £214,244, Keynes began to gradually unwind the overall position leverage. When the dust settled the gains that remained originated largely on trading US equity securities that began in 1932 with an initial 10% of the security portfolio market value being invested also exclusively in common stocks. By 1937, this had grown to 43% of market value with 26.6% in US common stocks and 16.4% in US preferred shares. The dollar value of gains on US equities goes from \$15,900 in 1932 to \$212,500 in 1934, \$526,800 in 1935 to \$585,200 in 1936. This increase in value was fueled by an increase in leveraged purchases that resulted in an increasing larger number of shares that

generated further capital gains, that increased the collateral permitting further borrowing until a massive (-\$733,000) loss appears in 1937. Over a lifetime, gains from currency speculation and commodity futures speculation were modest compared to the considerable gains achieved mostly by leveraged purchasing of UK and US common stocks.

2.3 Derivative Security Renaissance

A. *Evolution of Stock Jobbing*

To the uninitiated, much confusion is created by applying modern security market norms to historical events. As a consequence, valuable historical lessons can be misinterpreted, to the detriment of those seeking insights such as investors attempting to value equity securities or regulators seeking to maintain a level playing field for efficient equity security trading. The use of derivative security contracts in the trading of equity securities is a case in point. Poitras (2002) refers to a ***“derivative security renaissance”*** that characterized the last quarter of the 20th century. In combination with a revolution in computing and communications technology, the removal of a plethora of restrictions on derivative security trading and related ‘stockjobbing’ types of transactions has transformed trading practices in modern equity security markets. Innovations such as ‘credit default swaps’ and ‘double short exposure’ exchange traded funds on equity indexes and commodities raise important questions concerning “unnatural” (Armstrong 1848) fluctuations in market prices associated with the availability of such securities. Centuries of history detailing the abuse of derivative security contracts has been ignored in favour of a ‘brave new world’ vision for financial security trading.

With this in mind, consider a theme that appears repeatedly in stock market history since the late 17th century: ***the nefarious practice of ‘stockjobbing’***. Following Attard (2000, p.7), “the term ‘stockjobber’ has been used pejoratively since the seventeenth century to describe any person who dealt fraudulently, speculated, or simply traded on his own account.” The considerable contemporary discussion and analysis of early English stockjobbing activities was particularly venomous. Consider, for example, the full title of a Daniel Defoe work on the subject: *The Anatomy of Exchange Alley or, A System of Stock-Jobbing: Proving that Scandalous Trade, as it is now carried on, to be Knavish in its private practice, and Treason in its Public* (1719). Stockjobbing, it seems, was much more than simple dealing in shares and government funds. Defoe's views on stockjobbers is quite clear:

if you talk to them of their occupation, there is not a man will own it is a complete system of knavery; that it is a trade founded in fraud, born of deceit, and nourished by trick, cheat, wheedle, forgeries, falsehoods, and all sorts of delusions; coining false news, this way good, this way bad; whispering imaginary terrors, frights, hopes, expectations, and then preying upon the weakness of those whose imaginations they have wrought upon, whom they have either elevated or depressed.

Though Defoe is among the best at thrashing the stockjobber, Thomas Mortimer provides a much more insightful description of stockjobbing activities that is consistent with the modern colloquial

interpretation of stockjobbers as cheats and fraudsters.

Defoe's interpretation of stockjobbing fails to identify key features of this activity with particular relevance for modern equity security markets. For example, consider Adam Smith's (1763, p.251) description of stockjobbing in the *Lectures*:

The practice of stock-jobbing, or the buying of stocks by time has, too, on all occasions, a very considerable influence on the rise and fall of stocks. The method in which this practice is carried on is as follows. A man who has not perhaps £1000 in the world, subscribes for £100,000, which is to be delivered at several fixed times, and in certain portions. He therefore hopes to get these several portions sold out to great advantage by the rising of the stocks before they fall due, but as anything he is worth would go if the stocks should fall, he uses all means to make them rise, he spreads reports at Change Alley that victories are gained, that peace is to be concluded, &c. On the other hand, they who want to purchase a stock, and want that it should fall, propagate such reports as will sink the stocks as low as possible, such as that war will continue, that new subscriptions are thought on, &c. It is owing to this that, in time of war, our newspapers are so filled with invasions and schemes that never were thought of.

The stockjobber is being depicted as a gambler using the leverage obtained through time contracts, manipulating the market with rumours aimed at facilitating a quick profit.

In contrast, Mortimer (1761, pp.33-4) gives a precise description of the 'sorts' of individuals involved in stockjobbing:

STOCK-JOBBERs may be divided into three different sorts.

The first are foreigners, who have property in our funds, with which they are continually JOBBING.

The second are our own gentry, merchants, and tradesmen, who likewise have property in the fund, with which they job, or, in other words, are continually changing the situation of their property, according to the periodical variations of the funds, as produced by the divers incidents that are supposed either to lessen, or increase the value of these funds, and occasion rises or falls of the current price of them.

The third and by far the greatest number, are STOCK-BROKERS, with very little, and often no property at all in the funds, who job in them on credit, and transact more business in the several government securities in one hour, without having a shilling of property in any one of them, than the real proprietors of thousands transact in several years.

Mortimer explicitly identifies the blurring of the dealer and broker functions. This is reflected in the common language of the time that 'used broker and jobber as interchangeable terms' (Dickson 1967, p.494).³⁷ However, Mortimer is quite clear that stockjobbers also include others than just brokers.

What was stockjobbing? Mortimer (1761, p.27) has a useful description:

Now, the Dutch and other foreigners have so large an interest in our public funds, has given rise to the buying and selling of them for time, by which is to be understood, the making of

contracts for buying and selling against any certain period of time; so that the transfer at the public offices is not made at the time of making the contract; but at the time stipulated in the contract for transferring it; and this has produced modern STOCK-JOBING, as I shall presently shew.

Nothing could be more just or equitable than the original design of these contracts, nor nothing more infamous than the abuse that has, and still is made of it.

In keeping with the modern-day renaissance of derivative securities, stockjobbing in the 18th century was also associated with forward trading of securities. According to Mortimer (p.32):³⁸

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-JOBING.

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.

Almost from the beginning of English stock trading, attempts were made to severely restrict stockjobbing. The first important piece of legislation was the 1697 Act 'To Restrain the number and ill Practice of Brokers and Stockjobbers'. This Act did not actually have much application to stockjobbing, as conceived by Mortimer. Rather, stockjobbing was conceived as 'pretended' brokerage. From the preamble to the Act (Morgan and Thomas 1962, p.23):

whereas divers Brokers and Stock-Jobbers, or pretended Brokers, have lately set up and on most unjust Practices and Designs, in Selling and Discounting of Talleys, Bank Stock, Bank Bills, Shares and Interests in Joint Stocks, and other Matters and Things, and have, and do, unlawfully Combined and Confederated themselves together, to Raise or fall from time to time the Value of such Talleys, Bank Stock, and Bank Bills, as may be most Convenient for their own private Interest and Advantage: which is a very great abuse of the said Ancient Trade and Employment, and is extremely prejudicial to the Public Credit of this Kingdom and to the Trade and Commerce thereof, and if not timely prevented, may Ruin the Credit of the Nation, and endanger the Government itself.

Stockjobbers were seen as interlopers in the legitimate trade of brokerage. As a consequence, the Act specifically restricted the trade of brokerage to those brokers licensed by the City of London. The Act then limits the number of licensed brokers to one hundred.

Though it had some impact, the Act of 1697 was insufficient to stem the stockjobbing abuses, as reflected in the need for subsequent English legislation. Unlicensed brokers continued to operate throughout the 18th century and licensed brokers were often involved in dealing activities, for example, Dickson (1967, pp.493-7). Trading practices in both Amsterdam and Paris also involved licensed and unlicensed brokers. Though there were definitely political considerations in its passage,

the English Bubble Act of 1720 was designed to eliminate the rampant ‘stockjobbing’ in the initial public offerings of the numerous bubble promotions (Harris 1994). That options still played a significant role in stockjobbing activities, both during and after the South Sea Bubble, is reflected in the specific inclusion of restrictions on options trading in Barnard's Act of 1733, which also attempted to restrict speculative time bargains. Various other unsuccessful attempts to get anti-speculation and anti-stockjobbing bills passed were launched.

Some general themes of modern interest emerge from a closer inspection of the activities involved in the nefarious practice of stockjobbing. The negative outcomes that were identified arose from a combination of factors, including: the lack of separation between brokerage and dealing functions; the abuse of time contracts and privileges; and, the inability to regulate access to market trading by fraudsters and manipulators. Each of these factors continues to plague modern equity security markets, despite ongoing efforts by government regulators and self regulatory organizations to mitigate undesirable outcomes. It was around the last quarter of the 18th century that the functions of jobbing and dealing began to converge. Regulations on the London Stock Exchange aimed to prevent conflict of interest between jobber and brokerage activities by prohibiting member firms to engage in both capacities date from 1847. Following a restatement of the ban in 1878, the Exchange entrenched the separation of brokerage and jobbing functions in regulations of 1908 and 1912. Following Attard (2000), the separation of function was removed in the Big Bang financial reforms of 1986.

Brokers have been an essential feature of markets since ancient times. Brokers were used to do business in a wide range of commodities, from cloth and wool to copper and saltpetre.³⁹ Various jurisdictions imposed laws governing the ability of individuals: to engage in brokerage; and, when brokers were required in a business transaction. For example, a 1697 English law restricted to 100 the number of brokers permitted to transact business in joint stocks. Similar restrictions were imposed by the French government in setting up the Paris bourse following the collapse of the Mississippi scheme, though trading by unlicensed brokers on the *Coulisse* in the 19th century did play a fundamental role in bourse development (Walker 2001). Another example is from medieval Bruges, where alien merchants were required to use local brokers even where a broker was not necessary.⁴⁰ Heuristically, **brokers do business by connecting buyers and sellers**, charging a commission for this service. A broker does not take a position in the security being traded. In contrast, dealers buy and sell for their own account. Dealer activity can take various forms, some of which can create conflicts of interest with the brokerage function.

Modern equity markets have blurred the distinction between brokers and dealers. Even the UK abolished the long established distinction in the Big Bang financial reforms of 1986. This has led to a variety of difficulties. In particular, during the lead up to the collapse of the technology stock bubble in 2000 inaccurate brokerage house recommendations touted IPO's that the investment banking arm of a number of broker-dealers were bringing to market. In the most high profile case, the subsequent **prosecution of Frank Quattrone**, former star investment banker with Credit Suisse First Boston, illustrates the difficulties in penalizing such manipulations.⁴¹ That Quattrone was able to obtain hundreds of millions in ‘overdue’ compensation payments after his 2004 conviction was overturned on appeal reflects the modern difficulties of preventing firms from exploiting the advantages of combining the investor information aspect of full service brokerage with the dealing function associated with equity IPO distributions. In the US broker-dealers are subject to oversight

by the SEC and by the self-regulatory functions of exchanges. The SEC reacted to this most recent round of difficulties associated with lack of sufficient broker-dealer separation by introducing Reg. AC in April 2003.

What is a Derivative Security?

The negative feature of stockjobbing most often identified by informed observers at the time was the abuse of time contracts and privileges, referred to as derivative securities contracts in modern markets. This has a number of implications for equity security valuation. In an insightful early examination of security markets, *Sir Robert Giffen (1877, p.85-93) identifies four general causes for differences in security prices*: “the security and safety of the income yielded by the investment”; “the difference of marketability”; “the effect of extrinsic regulations, such as those of the law courts, which direct the investment and re-investment of funds”; and, “the estimation of the public ... in favouring some securities more than others by qualities unconnected with the solidity of income or mere marketability”. The advantages of derivative security trading relate to the first two causes and the disadvantages with the last. Disentangling these elements has created problems from the first trades in equity securities. Yet, while severe bans and restrictions on various aspects of derivative security trading that were imposed prior to the current renaissance period were reasonably successful in curbing speculative abuses, the bans and restrictions also resulted in losses associated with reduced market liquidity and increased price volatility.

Despite being a widely used term, it is difficult to precisely define a ‘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 some cases where the contingent claim involves an equity security transaction to take place at a later date, such as with a convertible bond or convertible preferred share, the traded value of the contingent claim and the underlying security is combined. Recognizing that such bundled securities could also be defined as derivative securities, the definition is usually restricted to only include cases where the contingent claim contract is unbundled or “free standing” (FASB 2000).⁴² This includes the following types of contracts: forwards and futures; options, rights and warrants.⁴³

Significantly, the historical use of derivative securities in equity security trading developed differently in the US from Europe due to *differing cash market settlement practices*. More or less from the beginning of security trading 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). In effect, the UK and continental stock exchanges used settlement methods that directly involved the use of extendible, short dated time contracts. On settlement day, there was a continuation process for a buyer seeking to delay delivery that involved 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 with regularly scheduled settlement dates and allowance for continuation as in Europe, it was often more expedient to speculate by selling (shorting) stocks and buying stocks on margin. Armstrong (1848, p.10) makes a telling observation: "When such a time operation as is desired cannot be conveniently obtained, it is customary to buy the stock for cash, and then borrow as much money upon it as possible, and deposite the certificate of Stock with the lender as security for repayment of the amount borrowed. The market value less five or ten per cent. can almost always be obtained." As Poitras (2002, p.6) observes, derivative securities are difficult to define because similar payouts can often be obtained by combinations of other securities. For example, a long position in a time contract for purchase of stock with delivery in 30 days and a margin deposit of 5% has similar cash flows to a purchase of stock using a 30 day loan for 95% of the purchase price.

Use of day-to-day 'hypothecation' to finance inventories instead of 'trading for the account', at times, has had severe implications for liquidity in the US short term credit markets, especially following the Great Depression and, more generally, during the gold standard period. In addition to the important contributions on this issue by Keynes, other economists of the time were also concerned with this issue, e.g., Machlup (1940). As a consequence of a largely cash market for equity securities, the venue for evolution of derivative security trading in the US 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."

The start of the modern Renaissance in equity derivative security trading can be identified with the commencement of trading on the Chicago Board Options Exchange in 1973. Though equity option trading in the US began as early as 1790 and time bargains even earlier, both played a significant role at one time or other in various market manipulations. As early as the 1890's, option pools were in operation. 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 financial 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.

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, 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 twenty-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.

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 an 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 common use of options contracts to trade equity securities can be traced to the 17th century. Such contracts made sense in the equity markets of the time, due to the difficulties of locating shares for sale. For a time contract, a deposit would be paid – typically similar in size to the premium on an options contract – and a price established for future delivery. The buyer's right to refuse delivery would produce a higher settlement price than for a time contract. The abuse of time contracts, in general, and options contracts, in particular, led to various regulations restricting usage. While important merchant manuals of the 18th century, such as Jacques Savary, *Dictionnaire Universel de Commerce* (1730) and Malachy Postlethwayt *The Universal Dictionary of Trade and Commerce* (1751), have detailed discussion of the trade in *actions*, there are no entries for privileges, *prime à délivrer* or *prime à recevoir*; premiums; *jeu d'actions*; or puts and refusals. With the exception of Houghton (1694), the important sources on the 17th and 18th century stock options trade are either sufficiently obscure or were part of the numerous legislative attempts to regulate or abolish the trade. It is not until the 19th century that knowledge and understanding of equity options trading moved outside the narrow confines of a small group of specialized traders and gradually acquired increased reputation in Europe (Poitras 2009).

The German option contract (*prämienengeschäfte*) that concerned Bronzin early in the 20th century (Hafner and Zimmermann 2009) differs 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 *prämienengeschäfte* “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". 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. In Castelli (1877, p.7), the premium to be paid at maturity "fluctuates according to the variations of the Stock to be contracted". In contrast, the modern call option is a tradeable 'privilege' of 'refusal' with fixed terms where an agreed upon fee would be paid in advance. In the modern approach, both puts and refusals are buyer's options. The seller writes the options. If the option is a feature of a forward contract, a call option arises because the buyer for future delivery can refuse to take delivery, a put option arises because a seller for future delivery can withdraw.

A Modern View

Like so many other innovations in equity markets, both practical and theoretical use of derivative securities alters the equity valuation problem. Following Giffen (1871), precisely how the valuation problem is impacted depends on the ability of "extrinsic regulations" to adapt to the changes. History suggests a predictably *ad hoc* reaction of government regulators to challenges posed by the derivative security renaissance and the related technological revolution in equity trading. In the present circumstance, important self-regulatory functions performed by stock exchanges have been undermined by the emergence of competing ETN's, pay for order flow practices and 'dark pools' for off-exchange securities trading that dramatically increase the potential for 'stockjobbing' behavior. Despite the possibility of severe market disruption indicated by a sequence of accumulating events stretching back at least to the crash of 1987, it was not until the "unnatural" collapse of various key financial institutions in late that government regulators began the move to reverse the direction of change in the regulatory environment..

The deficient regulation of the stockjobbing activities of hedge funds, private equity and venture capital funds is another example of the general incoherence in the regulatory environment. Little seems to have changed since Abken (1994, p.19) summarized the regulatory status quo on OTC contracting which, ultimately, was the trading venue responsible for distributing the bulk of the toxic assets that created the financial crisis of 2008:

The central policy issue in derivatives regulation is whether further federal regulation is appropriate or whether the existing structure can oversee these markets. The six federal banking and securities regulators believe that the current regulatory structure is capable of supervising the OTC derivatives markets. Policy makers need to be cautious about changing regulatory structures because such alterations often bring unintended and unforeseen consequences.

As Poitras (2002) observes: "regulatory denial conveniently sustains a status quo solution." The Securities Act (1933, as amended 2008) makes specific reference to both options and futures contracts written on securities. Extending the scope of the Securities Act to include derivative securities captured the growth and importance of these contracts. Yet, the resulting jurisdictional conflict between the SEC, CFTC and other governmental entities has inhibited the integration of

cash and derivative securities markets, creating an ideal environment for stockjobbing across regulatory environments.

Poitras (2002; 2009) dates the modern renaissance in derivative securities from the creation of the Chicago Board Options Exchange in 1973 and the introduction of a range of exchange and OTC traded derivative securities over the following decades. Historically, derivative securities trading, especially options trading, has been the subject of considerable criticism and legislative sanction due to the potential for speculative abuses. The last quarter of the 20th century is remarkable in the breadth and depth of derivative security trading. Securities markets both in the US and globally have embraced these new products. The financial engineering industry has become an important profit center for many of the largest firms in the securities industry. Within academic Finance, the virtues of derivative securities are expounded in introductory investment texts and advanced courses. The importance of financial engineering has permitted a proliferation of advanced graduate programs with titles such as Masters in Financial Engineering.

Yet, the renaissance in derivative securities has had its blemishes. Due to a significant number of high profile and expensive losses, trading of derivative securities attracted considerable attention during the 1990s (e.g., Poitras 2002, ch.1). The list of companies involved is striking, as is the size of the losses. From Barings Bank to Sumitomo Corporation to China Aviation Oil, from Long Term Capital Management to Proctor and Gamble to Amaranth, losses ranging from hundreds of millions to billions of dollars have been reported. Such events induce a state of uneasiness among policy makers, corporate managers, investment professionals, even academics. While it is tempting to draw glib generalizations about the apparent misunderstanding of risk management practices, closer inspection reveals a decidedly more complicated situation. In some cases, the relevant lessons that could be learned cannot be convincingly determined, due to the veil of corporate secrecy surrounding specific events. In cases where the activities and motivations of the participants can be precisely determined, it seems that different debacles raise different types of quandaries. Upon closer inspection, it seems that some so-called debacles were not debacles at all.

Large losses associated with derivative security trading are not unique to recent times. Even though the largest losses in absolute terms have happened more recently, this is consistent with the increasing use, availability and complexity of derivative products. This has produced an evolution in the types of problems which are arising. Since dawn of the renaissance in the early 1970s, there has been a progressive relaxation in the US of a range of restrictions on derivative security trading, many of which had originated in the anti-speculation atmosphere of the post-Depression era. In conjunction with this relaxation, there has been an almost bewildering expansion in the variety of derivative securities being traded, both on the OTC markets and on the futures and options exchanges. From financial commodities to energy to equities to currencies, it is difficult to keep track of the rapid progress which has been and is being made in the development and application of derivative securities.

Short View of Short Selling

Following Poitras (2002), the renaissance in derivative securities has created an incoherent regulatory environment due to conflict among: regulators competing for jurisdiction; and, different political jurisdictions competing for trading order flow. At the heart of the conflict is the regulation

of short selling. By design, derivative security contracts provide the ability to replicate a given cash flow with different combinations of securities. Hence, ignoring transactions costs and other sources of equity market pricing friction, the presence of a functioning options market readily permits the creation of short positions. This poses a problem where there are restrictions on short selling the same equity security in the cash market. As illustrated by Bris et al. (2007, Table 1, p.1037-1040), restrictions on cash market short selling vary widely across jurisdictions. Most emerging markets do not permit any short selling or lending of securities. Even in developed markets where some form of short selling is usually permitted, a range of regulations restricting cash market short selling are in place. Perhaps more importantly, these regulations have been evolving in the direction of removing restrictions on short sales.

Replication of cash flows is an essential characteristic of derivative security trading. In a perfect market, combining a written call position with a purchased put at the same exercise price and time to expiration will produce the payoff on a short forward position if the net premium is ignored. In contrast, a short sale position in the cash market typically originates with, say, the stock purchased on margin at a broker-dealer. Such stock is eligible for securities lending. Other sources of stock for short sales are: broker-dealer inventory; stock available for lending from other broker-dealers; specialized firms that locate stock for a fee; and, off-shore entities. The short sale involves the broker-dealer lending this stock to a short seller that has a margin account with the firm. The stock is then sold in the market and the funds deposited in the short sellers account. The account is then subjected to margin requirements on the value of the stock sold short that depend on a variety of factors such as: the exchange the stock is traded on; and, the particular broker-dealer involved in the short sale.

The following margin requirements for short sales were obtained from a popular US discount brokerage firm:

<u>Short Sales Stock Value</u>	<u>Minimum Margin Required</u> (as % of the market value)
\$5 & over + Option eligible	130%
\$3 & over	150%
Between \$1.50 and \$2.99	\$3 per share
Between 25¢ and \$1.493	200%
Under 25¢	100% + 25¢ per share

Precisely how it is determined which non-cash assets are eligible for satisfaction of margin requirements will depend on the particular broker-dealer involved in arranging the short sale. Given this, it is apparent the cash market has rules in place to prevent excessive speculative leveraging using short sales of stocks to generate funds for alternative uses. In order to prevent a replicating strategy using written calls, purchased puts and borrowed money to counteract the cash market restrictions, it is necessary to impose sufficient margin requirements on written option positions. Incoherence emerges when jurisdictions compete and rules needed to deter speculative excesses are relaxed or eliminated as being 'no longer necessary to maintain market volatility' or 'contrary to the goal of achieving the lowest possible execution price'.

A Letter from Jim Cramer

The presence of derivative securities, combined with rapid market information transmission and inexpensive trade execution, opens a range of replication trades to hedge traders and other risk arbitrageurs. As it turns out, profitable trades often appear involving portfolios with a short stock position. To satisfy the almost insatiable demand from hedge funds and others seeking speculative profit from trades involving a short stock position, a number of specialist firms have emerged that locate stock available for short sale. Dealers and other trading firms participate in the creation of 'naked' short positions. The regulatory response of 2009 was to seek amendment to Rule 201, Regulation SHO, introduced in 2007, that replaced Rule 10a-1 that permitted short sales only on an uptick. Rule 10a-1 was in place since 1938 and the political role of large investment banks and hedge funds seeking to eliminate this rule for stockjobbing purposes is a history yet to be written. The erratic and volatile market behavior of equity prices since Regulation SHO was introduced produced regulatory response to amend Reg SHO to reintroduce a modified form of uptick rule. The public comment period included the following submission from Jim 'Booyah' Cramer and friends that succinctly summarizes many of the important issues at hand.

To: SEC Chairman, Mary Schapiro
 From: Jim Cramer, William Furber, Eric Oberg, Scott Rothbort
 RE: Reinstatement of the Uptick Rule

We the undersigned believe in not just free markets, but fair markets. While the practice of short selling equities can contribute to the market in terms of liquidity and price discovery, if left unchecked the practice can impede capital formation. We believe that a relatively simple check that was in place for nearly seventy years, the "Uptick Rule", helped serve the markets well in balancing various participants' interests. We therefore urge the SEC to reinstate such a price test rule, and specifically would urge a plus tick rule over other alternatives such as a "best bid" or "circuit breaker" test.

When the Uptick Rule was initially implemented in the late 1930's, there was an implicit acknowledgment that companies were not commodities. There was recognition that the capital markets served the broader purpose of capital formation; that companies create products, provide services, employ citizens and pay taxes and thus there was an interest to promote market integrity and protect interstate commerce.

In 1963, the SEC's Special Study reiterated the Uptick Rule as being a simple, but effective, mechanism for balancing the various competing interests: allowing for relatively unrestricted short sales in advancing markets, eliminating short selling as a tool for driving the market down by preventing short sales at successively lower prices, and preventing short sellers from accelerating a declining market by exhausting all available liquidity thus leaving long sellers to sell at successively lower prices. Indeed in 2007, with their report on the Regulation SHO Pilot Study, the SEC's Office of Economic Analysis made the express point that in the context of a "Tick Test", short sellers were liquidity providers, but without such a price test they could readily become liquidity takers. An Uptick Rule validates short sellers as liquidity providers, thus should help remove stigma with the practice.

When considering the objectives of protecting investors and capital formation, it seems that the Tick Test seems to balance the interest of both the short seller and market integrity, and therefore ought to be reinstated. Furthermore, the undersigned not only support the letter of the rule, but also the spirit and intent of the rule. A rule with myriad exemptions and carve-outs will not fulfill its purpose. Therefore, we urge the SEC to enforce not just the letter of the law, but also be mindful of the principle of the rule.

There has been considerable attention around the topic of the Uptick Rule because of a confluence of issues that, while independent are inter-related around the practice of short selling. One of the most obvious related areas of unease is the practice of naked short selling. This is a fraudulent practice that appears to have been laxly enforced in the past. Naked short selling is essentially the creation of shares out of "wholecloth", shares that never had to undergo SEC review, diluting the rights of existing shareholders, placing a price control on a stock and thereby inhibiting capital formation. No doubt, there is genuine concern from all market participants to put an end to this egregious practice; this is not an issue of "balancing interests", but instead an issue of enforcement, and we urge the SEC to continue to step up their efforts in this regard. Naked short selling simply can not be tolerated.

Another question that has arisen is the proliferation of levered "shortside" sector based ETFs. These funds have mushroomed with the elimination of price tests, and have raised innumerable issues in the markets. These ETFs were somehow approved by the Commission, despite seemingly obviating the margin rules set forth by the Federal Reserve. There is an entire body of evidence that shows a relaxation in margin constraints brings more noise to a market by drawing in uninformed traders. These funds have exacerbated volatility and created significant selling pressure during the downturn.

The great irony is that these products, due to their construct, do not even work for longer term holders, so in reality these are speculative instruments meant for intraday trades, not for hedging or for investment. As intra-day speculative short selling vehicles unchecked by a plus tick test, they are sopping up available liquidity, rather than providing liquidity. In the past there was a "diversification exemption" for Rule 10a-1. While such an exemption may be understandable for a broad based ETF, it does not seem to make much sense with regards to these "shortside" ETFs. If such an exemption was applied here with regards to the underlying hedging activity, then people would simply use these funds as a dodge for the Uptick Rule much as they are used as a dodge for the margin rules.

The proliferation of complex, algorithmic trading has also contributed to rapid-fire, unchecked short selling. There have been many comments about how embedded the code is in these program trades that would be impossible to reverse. This is a very specious argument. If the programmers can create code to trade thousands of stocks a second, they can surely accommodate a plus tick test.

To be appropriately comprehensive, the Commission will need to address these concerns, as well as many others including married put abuse and "dark pool" trading, in order to level the playing field for all participants. It is when too many exceptions are created, or rules are not enforced, that integrity and confidence suffer.

In conclusion, we the undersigned urge the Commission to promote market integrity and capital formation, and to help uphold free and fair markets. We support the re-

implementation of the Uptick Rule in not only form, but in substance, as it best balances the interests of all market participants.

Thank you for your consideration,

[signed] Jim Cramer, William Furber, Eric Oberg, Scott Rothbort .

From this, there is at least one conclusion to draw regarding the impact of ‘extrinsic regulation’ on equity valuation: do not assume that government will be effective in eliminating stockjobbing practices that distort market pricing. For that matter, it is even possible that regulators will unwittingly change the rules to favour those engaged in ‘nefarious’ practices that produce ‘unnatural’ equity market outcomes. Equity markets have always attracted participants that seek to gain unfair advantages from weakness in the rules. At times, the volatility and mis-pricing created by the activities of such participants is sufficiently widespread that profitable equity security trading opportunities can arise. While reasonably successful at eventually identifying problems, legislators and governments typically react in an *ad hoc* fashion, and only act forcefully in response to market failures. Neither is forward looking; not seeking to adapt in advance to changes, even though sound analysis to guide such adaptation is available. For example, Langevoort (1985) details many issues that eventually emerged in the 1990's and Stout (1988) questions the dedication to pricing efficiency that now threatens the traditional system of self-regulation with government oversight, e.g., Markham and Harty (2008).

The mechanisms of self-regulation are blunt and often take some time to establish. The financial market milieu within which self-regulation takes place also tends to: favour the *status quo*; prevent competitive pressures; and, resist technological improvements. In particular, the self-regulatory function of exchanges has been under attack in the face of substantial changes in transactions technology. The traditional mutual, non-profit form of national or regional exchange ownership has been replaced by international exchange networks that are publicly traded entities. One of the challenges confronting modern equity valuation is to make sense of the implications of such factors, especially the revolution in market trading and communications technology. The available universe of equity securities has been increased dramatically, both domestically and internationally. Gradual deregulation of traditional brokerage fees that began in the 1970's has significantly reduced the cost of trading equity securities. However, regulatory changes accompanying these developments have substantively increased the systemic uncertainty associated with equity trading.

B. The History of Programmed Trading

What is Programmed Trading?

In a sense, programmed trading could be traced back to the introduction of the telegraph, the ticker tape and the telephone in the 19th century. These technological advances permitted profitable trading opportunities from inter-exchange arbitrage and increased brokerage and related market making opportunities due to enhanced market liquidity. For example, a ‘programmed’ inter-exchange arbitrage would be manually executed by clerks paid to monitor the system used to track the prices. When the differential of the same securities in two markets reached a certain point, a trade would

be attempted to sell in the expensive market the same security simultaneously purchased in the cheaper market. More than a few firms were engaged in this type of activity, so considerable effort was dedicated to having the most efficient price gathering network. At various times, exchanges have imposed specific rules to regulate the process. Large firms with a brokerage or dealing business that also made it profitable to maintain a trading unit had a particular advantage in this business.

While interesting, such historical examples only serve to highlight *the importance of technological change for the equity trading process*. For purposes of practical equity valuation, the trading process determines the market value of the equity claim relative to the unit of account. Whatever the theoretical intrinsic value, it is the market value at which the equity security will be traded that is ultimately of interest. It follows that an assessment of the changes in telecommunications and computing technology that have altered the modern equity trading process is required. The transformation has been nothing short of astounding. In a relatively short period of time, information and execution costs for virtually all market participants have fallen dramatically. Information flow about market prices and ability to execute trades is almost instantaneous. A range of 'new' and 'innovative' derivative securities were introduced, especially on the lightly regulated OTC markets. All this opened a range of both speculative and market making trading strategies that were previously unavailable. Regulators have reacted to these changes with relative indifference, if not encouragement.

The nomenclature associated with the study of programmed trading is unsettled. As defined here, the class of 'programmed trades' includes the 'program trades' associated with portfolio insurance strategies; equity index arbitrage and other cash and carry arbitrage trades connecting derivative markets and cash markets; and, execution related cash and derivative security trades such as inter-exchange arbitrage and 'flash trades'. The basic element is that *the trade can be executed computer to computer*, without the need for human intervention. Modern programmed trading can be traced to the introduction by the NYSE of an automated order execution system -- the Designated Order Turnaround (DOT) system -- in 1976 that was upgraded in 1984 to include the Super-DOT system for limit orders. Initially intended to automate small orders, the system also was useful to those placing large dollar value orders divided into smaller components, as with index arbitrage and many program trades. The DOT system had the desirable execution feature that market orders were executed by the specialists within three minutes. Initially set at lower share quantity levels, by the time of the 1987 crash orders up to 2,100 shares were eligible for DOT execution. Larger orders were eligible for trade at the opening and, more significantly for program traders, on limit orders.

When orders for a large number of stocks are combined, as in the case of index arbitrage or program trading, the order size can be considerably larger than intended for a system designed to execute small orders. Prior to the crash of October 1987, combining the maximum number of shares permitted under DOT for each company in the S&P 500, for example, added up to approximately \$40 million (Wigmore 1998, p.40). At the time of the crash, the number of such trades submitted for DOT execution was so substantial that the execution system could not handle the order flow. It is ironic that the lack of trading system computing power played such a role at the end of the 1980's whereas the next two decades have been characterized by the opposite: the rise in competition among various trading platforms due, in part, to an increasing abundance of computing power. As detailed by Markham and Harty (2008), "the ECN's arrived in force in financial markets beginning in the early 1990's in the form of automated trading systems for institutional traders in the third market."

The electronic communications network (ECN) and related automated trading system (ATS) has grown from this beginning to engulf the traditional trading practices of equity security markets.

Stock exchanges, in some form, have always been a fundamental component of equity trading. To function effectively, exchanges and those participating in the exchange process, such as exchange members and market makers, have to be at least modestly profitable. ECN's and related systems have revolutionized the ways that profits can be earned from the exchange process. Broadly defined, ECN's encompass a variety of computer-based systems for trading. This includes *electronic order routing systems*, associated with processes involved in routing a customer's order to a particular trading platform. The legitimate market making firm associated with the infamous Bernard Madoff recently pioneered the introduction of a pay-for-order-flow market making model where large broker-dealers and other institutions would be provided free execution in exchange for the right to capture order flow. Historically, order routing has been a source of both broker-dealer and exchange member profits. In order to access the trading process, the customer would be assessed a brokerage charge, with negotiated portions paid to the broker-dealer and the exchange. Due to the relentless progress of technology, this model has broken down.

The fatal blow to the traditional brokerage fee model of profit generation at the NYSE was the removal of Rule 390, approved by the SEC in 2000. Similar to Rule 5 on the AMEX, Rule 390 was a NYSE rule associated with the self-regulatory function of exchanges. The rule prohibited off-exchange trading also referred to as "off-board trading" of listed stocks. At least since the introduction of SEC Rule 19c-3 in 1980 permitting such off-exchange trading, the stock exchanges have resisted the introduction of this rule. The position of the SEC is reflected in the lengthy discussion of justifications for rescinding the rule detailed in Release No. 34-42758:

Off-board trading restrictions such as Rule 390 have long been questioned as attempts by exchanges with dominant market shares to prohibit competition from other market centers. On their face, such restrictions run contrary to the Exchange Act's objectives to assure fair competition among market centers and to eliminate unnecessary burdens on competition. The NYSE has defended Rule 390 on the basis that it was intended to address market fragmentation by promoting interaction of investor orders without the participation of a dealer, which also is a principal objective of the Exchange Act. Even granting the importance of this objective, however, Rule 390 is overbroad as a tool to address market fragmentation - it applies in many situations that do nothing to promote investor order interaction. In the after-hours context, for example, it creates an artificial incentive for trades to be routed to foreign markets. Rule 390 also effectively restricts the competitive opportunities of electronic communications networks ("ECNs"), which use innovative technology to operate agency markets that offer investors a high degree of order interaction. To avoid the anticompetitive effect of the Rule, some ECNs even have indicated that they would accept the very substantial regulatory responsibilities associated with registering as a national securities exchange, thereby foregoing the streamlined requirements available under Regulation ATS. Rescission of Rule 390 will eliminate these distortions of competition. The Commission will address legitimate concerns about assuring an opportunity for interaction of investor orders in the context of its ongoing review of fragmentation issues.

The drive to achieve an “anticompetitive” solution to equity security trading that produces the cheapest possible price for a particular type of trade fails to recognize the threat to the self-regulatory structure that has historically been responsible for restraining many ‘stockjobbing’ practices. Reducing these threats to the status of an “ongoing review of fragmentation issues” is inviting yet another regulatory failure.

The decimation of traditional brokerage fees that accompanied the rise of computerized trade execution has produced a number of other initiatives to offset losses of traditional sources of profitability. In particular, given the relatively low cost associated with individual trade execution, exchanges and exchange members are driven to seek higher order volume in order to produce revenue offsets. This change has affected all financial markets, including the derivative exchanges. As Markham and Harty (2008, p.939) observe, the drive to higher volume trading has produced systemic changes in the marketplace:

The exchanges’ focus on electronic trading highlights the change in their best customers; from smaller volume commercial hedgers and locals, to large volume special investment vehicles. This change ushered in a growing demand for greater electronic access to the marketplace, and trade matching algorithms that are efficient, volume-centered, preserve anonymity, and promote a marketplace where market news is decentralized.

In the equities markets, ‘special investment vehicles’ include high frequency traders, often operating as hedge funds. As in the derivative security markets, the global challenge of increasing volume and inter-exchange competition has been met with an ongoing consolidation of exchanges in the equity markets. Following a conversion of stock exchanges to publicly traded equity securities during the 1990's and later -- the NYSE demutualized and become publicly traded only in 2005 -- this has generated the creation of global exchange networks such as NYSE Euronext which absorbed the AMEX in 2008.

Maintenance of the self-regulatory function of exchanges becomes complicated when exchanges are globalized and have publicly traded equity. Because each of the component exchanges is responsible to a national regulatory body, there has been a drive to achieve harmonization of regulations across exchanges. In 2004, the NYSE component of NYSE Euronext created NYSE Regulation, Inc., a not-for-profit corporation with responsibilities to enforce marketplace rules and federal securities laws of the New York Stock Exchange. NYSE Regulation also oversees NYSE Arca Regulation and NYSE Amex Regulation through regulatory services agreements undertaken when the NYSE merged with Archipelago in March 2006 and with the AMEX in October 2008. In 2007, NASD Regulation merged with NYSE Regulation to form the Financial Industry Regulatory Authority (FINRA). Harmonization of rules in Europe have reached the point where there is single rulebook governing trading on Euronext’s equity security and derivatives markets. Passage of the Markets in Financial Instruments Directive (MiFID) in Nov. 2007. In addition to placing more emphasis on home state supervision, the MiFID abolishing of the ‘concentration rule’ that, similar to NYSE Rule 390, permitted member states to require broker-dealers to route client orders through regulated markets.

Even with increased volumes, ECN’s still reduce per trade exchange profits from brokerage, a traditional source of exchange revenue. However, it is the *automated trade execution* feature

inherent in ECN trading that poses a greater threat to the life blood of exchange floor execution. Specialist trading systems, such as that on the NYSE, or pit trading, as on the Chicago derivative exchanges, are antiquated compared to the anonymous trade matching algorithms of an ECN. As a consequence, the NYSE-Euronext merger “was followed by a dismantling of a considerable portion of the NYSE floor, and resulted in the layoffs of hundreds of NYSE employees. The number of people employed by specialists on the NYSE floor was cut in half and the number of specialist firms was reduced to seven, down from 40 in the 1990's” (Markham and Harty 2008, p.910). In this process, the cost of trading equity securities has declined dramatically. Offsetting the associated gains for equity valuation is the increased uncertainty associated with the exchange process arising from systemic changes in the marketplace for equity securities.

Path Independent Portfolio Insurance

By fragmenting trading activity and providing a plethora of platforms for regulatory arbitrage, programmed trading related to the exchange process threatens the centerpiece of the national self-regulatory process: the securities exchanges. In contrast, *programmed trading related to ‘program trading’* involves the implementation of risk management strategies that fall under the general title of portfolio insurance.⁴⁴ Whatever the source, it is likely that significant reductions in execution costs and data transmission times will amplify the equity market pricing implications of program trading. This follows because the associated market destabilizing trading strategies will be available to a greater group of players. Since the implementation of curbs on program trading following the market crash of October 1987, regulators have slowly moved to ease the ability to execute program trades to the point where, on November 7, 2007, the NYSE abandoned curbs on program trading citing ineffectiveness in curbing market volatility as the reason.⁴⁵ A more likely reason was the drive to increase exchange volume, as program traders and index arbitrageurs can account for as much as 50% of exchange volume on some trading days. The loss of this business to competing exchanges, ECN’s and off-shore trading platforms was a substantial threat to the publicly traded NYSE Euronext.

In the context of equity valuation, the elimination of regulatory restraints on program trading supports the expanded use portfolio insurance schemes based on dynamic trading strategies. This creates a quandary. On the one hand, for the individual investor the presence of inexpensive portfolio insurance based on dynamic trading expands the payout universe associated with equity securities. Hopefully, this increases the intrinsic and, eventually, the market value of equity securities. On the other hand, such dynamic trading strategies also create systemic uncertainty by increasing the potential for destabilizing or ‘unnatural’ price volatility that other types of portfolio insurance do not. This follows because dynamic portfolio insurance trading strategies require the sale (purchase) of equity securities as the market is falling (rising). As such, dynamic trading has different cash market implications than other forms of portfolio insurance arising from the replication properties of derivative securities. In turn, concepts from financial engineering can be used to illustrate the different security allocations in portfolios associated with different insurance schemes.

The basic mechanics of “path independent” portfolio insurance can be isolated from the put-call parity arbitrage condition for a non-dividend paying stock: $S + P = C + X e^{-rt^*}$. Following Vaidya

et al. (1995), for a warrant bond the call (warrant) is deep in the money, implying that the put is deep out of the money and the warrant bond approximately unbundles the payoff on the stock position. Where the concern is portfolio insurance, S refers to the price of a portfolio of stocks (instead of an individual stock), X is the exercise price (strike price), t^* is the time to expiration measured as the fraction of a year remaining to expiration, P is the price of a put written on the portfolio with exercise price X and time to expiration t^* , C is the call price written on the portfolio with the same X and t^* as the put, and r is the riskless interest rate. Dividends have been ignored for simplicity of exposition. As stated, put-call parity provides two path independent insurance strategies. One strategy is $S + P$, buy puts against the portfolio. If S is an index portfolio, relevant exchange traded puts may be available. Another strategy is $C + X e^{-rt^*}$, buy calls and invest the remainder in appropriately dated bonds. Again, if the portfolio is an index portfolio, exchange traded calls may be available. One important advantage of this strategy is that transactions costs in bond markets are typically lower than transactions costs for stocks and the bond portfolio can be actively managed, e.g., by riding the yield curve, to earn potentially higher returns than the $S + P$ approach.

While the path independent strategies have some desirable features, there are some drawbacks. One disadvantage is the inability to accurately replicate insurance for portfolios that do not track an index for which there are traded options, i.e., the relevant portfolio options are not available. Constructing a portfolio of options using options on the individual stocks will be more expensive and there is the possibility that not all stocks will have traded options. Using index options as surrogates for the portfolio options eliminates the potential for gains from individual security selection. Combining index options with options on individual stocks raises the problem of finding the appropriate combination of these options to replicate the payout on the desired portfolio. Another disadvantage is that the maturity dates for options may not be long enough to match the portfolio's investment horizon, i.e., there is insufficient "time invariance". This requires options positions to be rolled forward which is more expensive and has pricing risk.

Dynamic Trading Strategies

To handle these types of problems, dynamic trading strategies have been developed that involve actively trading portfolios composed of stocks and bonds in order to replicate the payoff on an insured stock portfolio. Such strategies are intuitively appealing to large institutional investors such as pension funds and insurance companies that already hold stock/bond portfolios that are actively managed. These strategies can be illustrated by substituting the Black-Scholes formula into the put-call parity condition:

$$S + P = S N[d_1] - X e^{-rt^*} N[d_2] + X e^{-rt^*} = S N[d_1] + X e^{-rt^*} (1 - N[d_2]) = w_1 S + w_2 X e^{-rt^*}.$$

where $N[d]$ is the cumulative normal distribution evaluated at d with d_1 and d_2 as specified in the Black-Scholes formula, e.g., Poitras (2002, p.441). The weights w_1 and w_2 indicate the proportions of the portfolio held in stock and bonds in order to achieve insurance with an exercise price of X and time to maturity of t^* . Unlike the portfolio optimization models, the weights here will not sum to one, as the relationship is derived to equate values on the rhs and lhs. The sum of the weights will be close to one but not equal to one unless the put value is zero.

From a practical perspective, it is important for the potential portfolio insurer to identify why dynamic replication strategies, i.e., strategies dynamically replicating a call option payoff using stock/bond positions, should be used. Related to this are subsidiary issues concerning how to replicate and when to replicate. In this vein, large fund managers would consider the liquidity needed to establish large enough positions using derivatives and whether there are suitable X and expiration dates available. For example, while a well-diversified fund (e.g., an index fund) could make use of options or futures written on the appropriate index, funds targeted at non-systematic risk are more likely to be obligated to use dynamic replication strategies. However, even a well-diversified fund may find that available expiration dates on traded derivatives are not long enough, i.e., sufficient "time convexity" cannot be achieved. Because the dynamic replication strategies can be designed to theoretically achieve almost any desired expiration date and exercise price, this provides another reason for the use of these strategies.

To illustrate the use of dynamic replication where dividends are paid on the portfolio, consider the creation of a synthetic put option for an index portfolio. Given that the dividend yield on the index is q , Hull (1989, p. 204) shows that the delta of a European put on the index is:

$$\Delta_p = \exp\{-qt^*\} [N[d_1] - 1] = \exp\{-qt^*\} (\Delta_c - 1)$$

where:

$$d_1 = \frac{\ln\left\{\frac{S}{X}\right\} + (r - q + \frac{\sigma^2}{2})t^*}{\sigma\sqrt{t^*}}$$

Assuming that $S = 300$, $X = 290$, $r = .09$, $q = .03$, $\sigma = 0.25$ and $t^* = .5$, evaluation of the delta of the put gives $\Delta = -0.322$. It follows that if dynamic replication of a put is being used that 32.2% of the index fund should be sold and invested in (riskfree) fixed income securities. From the properties of the put delta (Poitras 2002, p.486), as the value of the index fund drops, the delta of the put will become more negative, indicating that a larger proportion of the index fund has to be sold, i.e., a large fraction of the portfolio will be invested in fixed income securities. A similar result would hold where the value of the index was increasing. In this case the delta of the put would be less negative, indicating that fixed income securities should be sold to purchase more units of the index fund. In this case, the proportion of the portfolio invested in the index fund would increase.

In practice, dynamic trading strategies have to deal with the realities of discrete trading. Rules have to be determined about how large a movement in S is required before the rebalancing decision is executed. There are a number of possible methods of specifying a rebalancing trigger value. A common approach, e.g., Rubinstein (1985), is to assume that the trigger value is 5%. From this point, upside movements of S will produce increasing weights for S which lag the continuously rebalanced weights, resulting in a slight reduction in portfolio value. A similar result happens for downside movements of S where the reduction in S weights lacks the continuously rebalanced weights, again resulting in a slight reduction in portfolio value. Hence, the simple introduction of discrete rebalancing results in a deterioration of the performance of the dynamic replication strategy. Being **path dependent**, the terminal portfolio value can take a range of values, depending on the particular time path realized by S . For the **path independent**, case where S is insured by buying P , the distribution of portfolio value can be determined precisely because the terminal portfolio value

does not depend on the particular time path realized by S . This does not happen with discrete rebalancing. As discussed in Poitras (2002, p.523-4), there is nothing unique about a portfolio of domestic stocks. The notions of portfolio insurance can be applied to any commodity. One useful extension involves insuring the domestic currency value of a foreign stock position. Much as with dynamic portfolio insurance for domestic stocks, dynamic portfolio insurance for a portfolio of foreign stocks can be derived by combining put-call parity for domestic stocks with put-call parity for currency options. The objective is to dynamically trade a portfolio composed of domestic bonds, foreign bonds and foreign stocks in order to achieve the same payout as a path independent portfolio composed of a foreign stock plus a foreign put option for the foreign stock portfolio and a currency put option. To protect the foreign current value of the foreign stock, the trading between the foreign stock and bond positions proceeds much as in the domestic case. To achieve currency protection, if the exchange rate increases, the value of the domestic currency rises relative to foreign currency, then the dynamic strategy involves selling foreign bonds and buying domestic bonds. If the exchange rate deteriorates, the domestic bond is sold in favour of buying the foreign bond. With some manipulation, the Black-Scholes formula for a call can again be substituted into the put-call parity condition to derive the appropriate portfolio weights.

Alternative Paths to Portfolio Insurance

Though portfolio insurance techniques were popularized during the 1980's, heuristic forms of portfolio insurance have been used for decades. For example, a form of portfolio insurance can be achieved with the systematic use of order placement strategies, such as stop-loss and limit orders which have been acceptable market practice at least since the 19th C. These types of trading dependent strategies suffer from the defect of being "path dependent", an undesirable property of insurance schemes. In addition to trading related techniques, option replication strategies using stock/bond combinations were also likely in use, though in the realm of proprietary management practices. These techniques also suffer from the defect of path dependence and, in the absence of 'Greek' information, would probably have been imprecise (Poitras 2002, ch.9). The application of option replication to specifying dynamically traded stock/bond portfolios was not of academic interest until much later, after the development of the Black-Scholes formula.

As for the history of insurance related financial products, some of the insurance schemes of the late 17th and 18th century did offer payouts based on specific outcomes associated with joint stock performance. Being introduced prior to the development of actuarial science, these insurance schemes were more like gambling than insurance. In more recent history, Benninga and Blume (1985) report the selling of insurance against investment losses in the UK as early as 1956. In the US, Gatto et al. (1980) report on portfolio insurance plans offered to individuals by both the Harleysville Mutual Insurance Company and Prudential Insurance Company of America. Brennan and Schwartz (1987) observe that the Harleysville plan was the first without any element of mortality insurance. Academically, Brennan and Schwartz (1976) were the first to make the connection between the potential for integrating insurance and equity returns. Leland, O'Brien, Rubinstein and Associates were important proponents in the marketing of dynamically traded option replication strategies to institutional clients.

The explosion in the use of the various types of portfolio insurance techniques can be traced to the

introduction of exchange trading in options. Liquid options markets made possible the implementation of numerous portfolio insurance strategies. Even more strategies were permitted with the development of futures and options markets for stock indices. Analytical contributions based on Black-Scholes resulted in further portfolio insurance strategies being introduced. Many "alternative paths to portfolio insurance" (Rubinstein 1985) were proposed and implemented. The widespread use of dynamically traded portfolio insurance techniques has been identified as an important contributing factor in the Oct. 1987 stock market "crash", e.g., Tosini (1988). Academic understanding of notions associated with portfolio insurance have expanded considerably since the early work by Leland (1980) and Rubinstein and Leland (1981). The 1987 "crash" provided a textbook illustration of the inadequacies of the academically inspired option replication strategies; sizable unexpected losses were experienced by investors holding what were expected to be "insured" portfolios.

One of the fundamentals driving institutions to use dynamic trading strategies was the absence of risk management products with maturities and other characteristics that captured the time profile of their particular risk exposures. Since the crash, an array of OTC and exchange traded risk management products have been introduced which greatly enhance the ability to implement path independent strategies. Included in the list of such new products would be: long dated exchange traded option products, such as LEAPS for individual stocks and longer dated index options and equity swaps. Despite these improvements, the bulk of contract liquidity on both the exchanges and OTC is still concentrated in short dated contracts (see Table 2.3-z). The relative absence of strict mark-to-market rules in OTC contracts provides a strong incentive to use short dated contracts.

An important element in the modern Renaissance in derivative securities was the emergence of trading in stock index futures. Sufficient liquidity in these futures contracts has facilitated the trading of futures options on these indexes. The first stock index futures contract, based on the

An excerpt from the testimony given by George Soros to the US House Committee on Banking, Finance and Urban Affairs, 13 April 1994.

I must state at the outset that I am in fundamental disagreement with the prevailing wisdom. The generally accepted theory is that financial markets tend toward equilibrium and, on the whole, discount the future correctly. I operate using a different theory, according to which financial markets cannot possibly discount the future correctly because they do not merely discount the future; they help to shape it. In certain circumstances, financial markets can affect the so-called fundamentals which they are supposed to reflect. When that happens, markets enter into a state of dynamic disequilibrium and behave quite differently from what would be considered normal by the theory of efficient markets. Such boom/bust sequences do not arise very often, but when they do they can be very disruptive, exactly because they affect the fundamentals of the economy ...

Generally, *hedge funds* do not act as issuers or writers of derivative instruments. They are most likely to be customers. Therefore, they constitute less of a risk to the system than the dynamic hedgers at the derivatives desks of financial intermediaries. Please do not confuse dynamic hedging with hedge funds. They have nothing in common except the word "hedge".

Value Line Index, was introduced in Feb. 1982 on the KCBT. The most important stock index futures contract, the S&P 500 traded on the CME/IMM, was introduced shortly thereafter in April 1982. A raft of stock index futures contracts has appeared since that time, starting with the introduction of the NYSE Composite on the NYFE in May 1982 and the Major Market Index on the CBT in 1984. More recently, there has been the introduction of foreign indexes traded on US exchanges, such as the Nikkei 225 on the CME. This has been accompanied by the trading of domestic equity indexes on futures markets around the world, including markets in Japan, Hong Kong, Holland, Australia, England, France, Germany, Switzerland, and Canada. Another recent development has been the start of trading in the DJIA index futures in October 1997. The slow pace associated with the introduction of the DJIA was not due to a lack of interest in such a contract. On the contrary, perceiving considerable demand, the CBT had attempted to introduce a DJIA contract as early as July 1984. However, these plans were thwarted by Dow Jones and Company which initiated legal action to prevent trading of the contract. What ensued was a process lasting over a dozen years, ending with the CBT eventually introducing DJIA futures and options contracts.

INSERT TABLE 2.3-z (Stock Index Futures Prices)

The Crash of October 1987

The beginning of the modern Renaissance in derivatives trading starts with the launch of the CBOE and the subsequent beginning of trade in selected financial derivatives, both on the exchanges and OTC. As equity markets adopted derivative securities, techniques of financial engineering progressively were adopted to assist in the risk management activities of institutional investors. Adoption of techniques progressed to the point where delta hedging and portfolio insurance played a central role in the stock market crash of October 1987. Unlike like previous market manipulations involving derivative securities, this event was not generated by the desire for unwarranted gains but, rather, as fallout from the desire to innovate, to apply the techniques of financial engineering in pursuit of enhanced portfolio management outcomes. *Ex post*, the equity price volatility related to this event created undervaluations sufficient to provide remarkable trading opportunities. The recent *ex post* re-emergence of these techniques in the slow market crash of 2008-9 argues for a close inspection of events surrounding the crash of '87.

The causes of the stock market crash of October 19-20 1987 have been debated *ad nauseum*. The analysis includes: reports by the exchanges, e.g., the CME and the NYSE; the regulators, e.g., reports by the SEC, the GAO, the CFTC and the Brady Commission; and academic studies, e.g., Edwards (1988), Tosini (1988). For sheer attention and regulatory impact, the crash of 1987 could be the disaster of disasters. Incremental reforms were made to market practices, ranging from the introduction of trading circuit breakers triggered by large market moves to rules impacting the capitalization of specialists on the NYSE trading floor. Physical hardware changes were also made to the execution system for processing orders on the NYSE. As reflected in the comments of George Soros, another fallout from the crash was the drastically reduced use of stock markets for dynamic trading strategies designed to achieve replication of an untraded option payoff. Such schemes had been actively promoted to institutional investors by a number of the leading finance academics, including Fischer Black and Mark Rubinstein.⁴⁶

In retrospect, the crash of 1987 still has many lessons for the present, if only these lessons could be adequately understood. Too often, it seems, analysis of the crash has the flavor of an apology for the current method of oversight. Tosini (1988, p.35), a director at the CFTC at the time of the crash, is an excellent example: “there are many profound, complex and far-reaching issues before the CFTC, as well as other federal agencies and the Congress, concerning stock market and derivative market activities and performance during October ... the call for ‘further research’ has hardly ever been more timely.” The various reports made some key observations, e.g., the Brady Report (1988) (US Dept. of Treasury 1988) recognized that the markets for stocks, stock options and stock index futures were actually one integrated market “linked by financial instruments, trading strategies, market participants and clearing and credit mechanisms.” Despite this integration, the regulatory and institutional structure which was designed for separate markets was unable to deal with “inter-market” pressures. The Brady Commission recommended a number of reforms designed to provide for a more integrated approach to market oversight.

The crash of 1987 speaks directly to the problems raised by the systemic change in financial markets brought on by the modern Renaissance in derivative securities trading. Various events were replayed in the 1990s because some lessons were not fully understood. This happened because the analysis of the event, on the whole, focussed on the specific events and did not adequately account for the singularity of the event. Katzenbach (1987) details the chain of events. As measured by the Dow Jones Industrial Average (DJIA), the US equity market had achieved a peak of 2722 in August of 1987. P/E ratios for the S&P 500 were averaging 23, relatively high considering the potential for negative market sentiment. In modern parlance, the equity market was due for a correction. On Wed. Oct. 15, 1987 there was a news release reporting an unexpectedly large US trade deficit, banks raised prime rates and there was considerable downward pressure on equity prices. The S&P 500 fell from over 314 to below 306. Despite a calming statement by Treasury Secretary Baker on the Thursday, the S&P 500 fell again to 298. When some negative PPI and industrial production numbers hit the market at the open on Friday, the stage was set. Significantly, even though things were gloomy, none of this was a shadow of events about to unfold. This leads to a key observation about the crash: it was an severe event which was not associated with a correspondingly severe negative information inflow to the market.

The crash actually started on Friday October 17, 1987. In the face of the somewhat negative sentiment, the DJIA fell a record 108 points. The S&P 500 started the day at 298 and fell to around 282. These were significant market moves that, all things considered, may have presented some buying opportunities. Over the weekend, there was some chatter about a dispute between the US and Germany over interest rates, leading to speculation that the US might let the dollar fall, an event which would be negative for US equities. There was the usual carry over on foreign markets, such as Tokyo and Australia, though the wave of intense selling had not yet hit international markets. The New York market opening was confronted with news that the US had attacked Iranian oil platforms in the Persian gulf, which almost surely added to the rush of sell orders. At the open the DJIA was down 67 points. The S&P 500 futures contract on the CME fell 18 points at the open. At a time when 100 million share volumes were uncommon events, the NYSE processed 50 million shares in the first half hour. Despite the market turbulence, a 10 am meeting of NYSE officials and major brokerage houses did not feel a trading halt was needed.

The sequence of events which was to follow was structured around two institutional procedures.

The first concerns the method of executing stocks on the NYSE. Historically, stocks trades on the NYSE involved a floor broker for a member firm to walk the order to NYSE trading post for that stock and execute the trade directly with the specialist or with another broker using open outcry. At the time of the 1987 crash, this was still the case for block trades involving 10,000 or more shares. This manual method of trading was inefficient and costly for trades involving large bundles of stocks which have to be sold at once. Such trades were not only being done by index arbitragers, but also be a wide range of market participants. To improve market performance for these traders, the NYSE introduced the Designated Order Turnaround (DOT) in 1976. This system permitted the computerized execution of small trades. Effectively, brokers with member firms could enter trades into a computerized order system, permitting trades to be entered in brokers' offices. Upon receiving the order, the DOT system would automatically route the trade to the appropriate NYSE specialist, where it would be executed. The whole process takes a matter of minutes.

The success of the DOT system led to a new and improved version, the Super-Dot, being implemented in 1984. This new system enhanced the execution times and access. This remarkable progress in information technology created its own demand from a growing legion of program traders. This category includes a range of trading strategies, including portfolio insurance and index arbitrage. Program traders could enter the exact weights for a portfolio of stocks which could be executed simultaneously by computer entry. Prior DOT and Super-Dot execution risk in such strategies was an important deterrent. Yet, the interaction between the progress in information technology and the ability to introduce new financial engineering products were not well understood at the time. Hints of the crash of October 1987 were observed on Sept. 11-2, 1986 and on Jan. 23, 1987 when 'excessive' stock market volatility was observed. These preliminary tremors attracted some attention, and efforts were made to track the activities of program traders through the DOT system. A poll by NYSE of specialists and floor traders found that, almost without exception, program trading was done through the DOT. On average, in the year leading up to the crash, DOT orders from program traders were found to average around 18% of all DOT trades with over 28% of all order on Oct. 19, 1987 being due to program traders.

In addition to the DOT, the other essential institutional feature to consider in evaluating the crash of 1987 is the short sale rule. More precisely, the SEC Act prohibits short selling of securities, except when the short sale either: takes place below the last sale price of that security; or, at the last price, if that price is above the preceding price. Like the SEC Act, this rule has origins in the anti-speculator atmosphere of the post-Depression era. The idea is that the rule prevents excessive and accelerating downward pressure on prices during a market downturn. However, there is no such rule on futures markets. As such, dynamic portfolio insurance strategies could be implemented by shorting stock index futures, instead of attempting to short the underlying stocks. In addition, the single digit percentage margins on futures contracts were only a small fraction of the 50% margins on stocks. These substantive differences across markets can be attributed to the regulatory competition between the CFTC, which regulates futures, and the SEC, which regulates securities markets.

Portfolio insurance is a category which includes a range of trading strategies. One important strategy involves dynamically trading stock index futures in order to replicate the payoff on a portfolio composed of the underlying index and a put option. The reason that dynamic trading was used is associated with the relatively limited array of path independent option products available.

Exchange traded option maturities were a maximum 9 months, not all stocks had traded options, index options were relatively illiquid and the OTC market lacked sufficient liquidity to provide options with the exercise price variation and longer term maturity dates that many institutional investors desired. Even though absence of arbitrage requires that cash -and-carry arbitrage conditions apply to the spot and futures markets, the sheer volume of trading on Oct. 19 meant that a wide spread between the stock index futures and the stock index was seemingly inevitable. What emerged was much worse: an information technology breakdown. The rush of sell orders effectively crashed the DOT system. At 11:45 am the ticker was approximately 1 hour behind and a number of stocks had yet to open because of the lack of an orderly market. By 2 pm volume had reached 400 million. The final numbers for Oct. 19 were 603 million shares traded, with a drop of 508 points (23%) on the Dow and 80.75 points on the S&P 500, a loss of nearly 30%. At the bell the ticker was approximately 130 minutes behind.

This slaughter on the stock exchanges led to a flurry of overnight activities. As the US market collapse spread overseas, there was complete or almost complete trading halts on Tokyo and Hong Kong. There was an unprecedented drop on the London FT Index. The opening of the New York market was preceded by reassuring statements and actions from the FRB, major banks were lowering prime rates and the NYSE shut down the DOT system to prevent the execution of program trades. A temporary and partial trading halt just after 11 am as the market approached 180 on the S&P futures, while the cash market was trading just below 220. This seemed to spell the end of the crash. Prices recovered and by 2 pm the spread between cash and futures narrowed close to normal levels, though the spread did widen as the close approached. At the end of the day, the DJIA was up 102 points on volume of 608 million shares. Due to actions taken to combat the crash, there was strong recovery of the dollar and a decline in interest rates. The low prices combined with the sudden brightening of the economic picture led to a buying spree, both in the US and offshore. By the close Thurs. Oct. 20, the market had recovered about half of what was lost on Monday.

The crash of 1987 was, at the time, considered to be an unprecedented security market event. It exposed serious weaknesses in a regulatory system that was designed to fight the battles arising from old technology. The problems originated from an inability to assess and structure the rapid changes in equity and derivative securities markets. The crash was a debacle that was created by a well intentioned need to innovate, to improve portfolio management of large financial institutions. As it turns out, the portfolio insurance programs based on dynamic trading were generally unable to deliver the protection *ex post* which was claimed *ex ante*. The situation for which the insurance was most important, the protection of losses in the event of a market collapse, led to preconditions which prevented the outcome from being achieved. The programs could only get so big and it was not possible for more than a small fraction of market participants to successfully pursue such strategies. In addition, there are numerous untold stories of other strategies, such as delta hedging by option traders, which also contributed to the crash. Undoubtedly, such traders also contributed to the selling via the DOT and floor trading which only added to the downward pressure on prices.

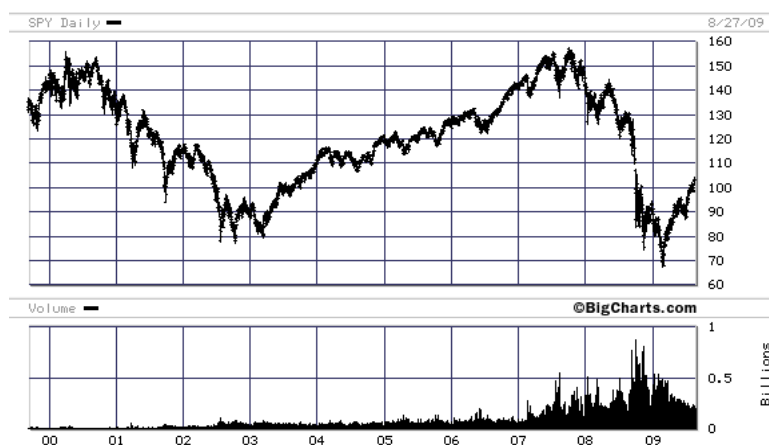
The Slow Motion Crash of 2008-2009

The crash of 1987 is a fitting backdrop for the equity market valuation event that began in September 2008 and terminated in March 2009. The Dow Jones Industrial Average fell 22.6 percent

on Oct. 19, 1987, its steepest one-day decline ever, according to the Stock Trader's Almanac. During the final half-hour of trading, the Brady Commission reports that program trading represented about 12.2 percent of total trades. The slow motion market crash actually began two decades later in October 2007 with the S&P 500 approaching 1600. Perhaps it was a coincidence that the NYSE dropped curbs on program trading in November 2007. The precipitous market drop represented by the price of SPY from that point until the end in March 2009 with the S&P breaking below the 700 the S&P was near 1300 level (see Figure 2.xx). The bulk of the drop happened from Sept. to November (2008) where the price of SPY appears discontinuous in the scale used in Figure 2.xx. It is difficult to shake the suspicion that the wholesale removal of impediments to short selling and enhancement of market technology to facilitate program trading strategies over a relatively short calendar time period did not play a central role in the unprecedented slow crash of 2008-9. The dramatic spikes in SPY trading during the slow crash only serve to reinforce suspicions.

In the context of equity security valuation, this raises a number of questions and issues. In a world where the direction of change is left unchecked or allowed to continue, it is difficult to avoid pessimism. Equity security markets have historically imposed ***a layering of rules that aimed at smoothing downside moves in the equity market.*** Consider the traditional uptick rule for short sales. This rule aims to reduce the volatility of upside moves fueled through margin buying by increasing the supply of stock available for short sales during such events. Similarly, short sellers are prevented from adding to a general 'rush to the exits' by long-only investors. In addition, it is possible that short sale positions may be liquidated as the supply of stock available for short sale is reduced by margin calls and sales associated with stock purchased on margin. From a vernacular Finance perspective, the removal of such rules imply greater market volatility and, over time, a *ceteris parabus* reduction in the value of equity securities due to the removal of the implied real insurance premium provided by the short sales restrictions.

Figure 2.xx
10 year price history of SPY (08/99-08/09)



Available statistical evidence indicates that “in markets where short selling is either prohibited or not practiced, market returns display a significantly less negative skewness” (Bris, et al. 2007, p.1029). The practical implication of such results is “not that extreme returns become more frequent”, rather that without short sales restrictions that extreme returns “become more negative” (*Ibid*, p. 1032). Not surprisingly, academic reaction to empirical evidence that **short sales restrictions “hinder price discovery”** is to focus attention on the theoretical connection with market efficiency. An influential early contribution, Diamond and Verrecchia (1987), establishes a connection between short sales constraints and the speed of adjustment to changes in market information. More precisely, short sales constraints create an asymmetric impact for negative and positive information events. The significantly less negative skewness reported by Bris et al. (2007) is consistent with this theoretical result. More recent theoretical studies along these lines, e.g., Abreu and Brunnermeier (2002; 2003); Hong and Stein (2003), even claim that short sales constraints can produce bubbles and generate excessive volatility.

Academics are generally pleased with results such as Danielsen and Sorescu (2001) that find the reduction of short sales constraints results in statistically negative future returns, in this particular study due to increased short sales using options. “This suggests that negative information is incorporated into price slowly when short selling is constrained ...Not only do short sales constraints reduce overall price efficiency, but also such an effect is stronger when there is negative information” (Bris et al. 2007, p.1035). Being an “impediment to price discovery”, numerous academic studies provide considerable backing for regulators seeking to reduce short sales constraints. However, from an equity security valuation perspective, it is as if J.M. Keynes never wrote anything about the negative impact that the casino element in stock market pricing has on aggregate economic activity. Given revolutionary advances in computer and communications technology, the need for an orderly equity market withdrawal in the face of severe headwinds has been increased, not decreased, as academic studies and the regulatory trend would suggest. Restrictions on cash market short selling

are more, not less, necessary.

A useful ‘rule of thumb’ from vernacular Finance regarding the value investing approach to equity valuation is: “Follow the money”. Businesses are not necessarily run for the shareholders. For example, the car companies, professional sports teams and ‘rust belt’ industries have found out that present and contingent future employee compensation can exhaust shareholder claims against cash flow, even though the business may outwardly appear viable. In this vein, who benefits from easing of the rules on short selling? At the top of the list is a narrow constituency of hedge funds and related speculative vehicles and speculators that employ trading strategies depending on short sale positions, e.g., Bekaert and Harvey (2000). For example, derivative markets are replete with instances of ‘short-the-cash’ and carry arbitrage opportunities, e.g., Poitras (2002, esp. ch.4). Another beneficiary is the program traders that are able to use cash market short sales as an alternative route to portfolio insurance, whatever the implications for the aggregate value of equity securities. Finally, the exchanges or ECN’s that are able to capture the considerable trading associated with such activities will also benefit.⁴⁷ Figure 2-xx illustrates the implications for those unable to follow the money.

C. Equity Fund Hodgepodge

What are Managed Funds?

The management of funds has a history that dates back to antiquity. Political, religious and clan organizations have, at various times, been responsible for the management of social resources to provide for the destitute, sick and elderly or to meet the needs of government. For example, the *publicani* of the Roman empire were involved in the collection of taxes within the territories of the empire. This required management of funds that accumulate as taxes are paid and involved arrangements made for disbursement of these funds to the government in Rome. In contrast, ***the history of managed funds is much shorter***. In the context of equity security valuation, a managed fund requires at least two basic characteristics: there needs to be a fund manager; and, more importantly, there needs to be a tradeable equity claim associated with the fund. In a sense, the early royally chartered English joint stock companies such as the Bank of England and the East India Company were managed funds. This follows because the equity capital raised from the joint stock issue was exchanged for government debt resulting in a balance sheet that had a sizeable portion of government loan stock on the assets side of the balance sheet.

Due to the legitimate business component of the early English joint stock companies associated with the grant of monopoly in the royal charter, the managed fund component of the equity security price was not traded in isolation. Such a broad definition of managed funds supports the view that managed funds have been part of equity security markets from the beginning of trade in VOC shares. Joint stock companies evolved out of partnerships where the need to pool capital to fund ventures was required. The VOC in particular was formed by combining the equity of smaller Dutch trading companies. In effect, ***joint stock shares are a claim against a closed end fund of equity capital*** used to create and perpetuate a business venture. The managers of the fund are those in charge of running the company. While this stretches the definition of ‘fund’ considerably, the basic principle is clear: a tradeable share in a managed fund has similar characteristics to other types of tradeable equity securities.

As evidenced in the Mississippi scheme and the South Sea bubble, in many situations it was not the government debt component of the asset value that drove market pricing of the equity security. A similar comment applies to the actuarially sound life insurance companies that commenced operation during the last half of the 18th century, e.g., Lewin (2003), even earlier if companies selling other types of insurance such as the London Assurance and Royal Exchange Assurance chartered in 1720 are recognized. Such companies managed a fund of financial assets and had a traded equity security. However, again there is a mix of a legitimate business component and the managed fund element. All this leads to an additional restriction: ***the assets held by the managed fund must be tradeable securities***. In effect, a managed fund is a tradeable equity security that holds other tradeable securities. In this amended definition, tradeable is broadly defined to include, say, no load mutual funds. In this case, the broker-dealer sponsoring the fund makes a market by being willing to buy or sell at net asset value.

Recognizing that managed funds involve the creation of tradeable securities, it follows that such funds can capture payoff characteristics not achievable with, say, individual common stocks. The practical realization of this result during the 18th century marks a feasible beginning to what has evolved into the modern managed funds industry. One of the insights of modern Finance is that the expected return on a capital asset depends only on the risk of that asset within an efficiently diversified portfolio, after adjustment for the level of the risk free return. In other words, it is only the undiversifiable or systematic part of risk that matters for determining the expected return, “and this can be defined only in the context of an investment portfolio” (Levi and Sercu 1991, p.26). By reducing transactions costs and the like, intermediaries can benefit investors by creating tradeable funds composed of individual security combinations. The precise method or ‘style’ used to create a particular fund differs considerably over time, depending in part on the types of securities available. The decidedly uneven evolution of this industry reflects the relative sophistication achieved by national and global securities markets at a given point in historical time.

Structure of Early Managed Funds

The earliest managed funds were closed end funds, traded on the Paris bourse and other venues starting in the 1760's, invested in debt securities of the French government. The managers were, initially, Genevan bankers though the investment schemes were soon adopted in other centers, such as Amsterdam, and applied to other securities, such as the debt of different sovereign governments (Taylor 1962). The use of debt issues was at least partly due to the relative lack of joint stocks available, though gross mis-pricing by the French government of the life annuities being purchased by the earliest funds also was an important initial impetus. Restrictions various European countries adopted following the bubbles of 1719-20 hampered the ability to issue joint stock, reducing the available supply of such equity securities for inclusion in managed funds. Not until the 20th century do funds composed exclusively of ‘ordinary shares’ or common stocks become popular. Funds that purchased common stocks for earnings compounding and capital gains purposes instead of the higher dividend yield on common shares than preferred or debenture stock do not appear until the 1920's.

A confusing semantic feature appearing in primary sources for pre-20th century equity markets is the use of ‘stock’ for debt issues and ‘shares’ for common stock. These definitions were conventional in 18th and 19th century British security markets at a time when dividend yield comparison was a

common method of equity valuation. Following Armstrong (1848, p.5-6), 'stock' was standard American usage for both "shares of stock", i.e., common stock, and "government and state stocks ... upon which a certain rate of interest is allowed". However, when common stock valuations were being specifically discussed, reference is made to "par value of the shares of this Company". By the time Lowenfeld (1909) refers to "the selection of stock for investment", 'stock' was defined loosely to include a range of debt, preferred shares and ordinary shares. While modern 'stock' markets are primarily secondary markets that trade common stock, it was not until the latter part of the 19th century that 'ordinary shares' attracted much attention on the 'stock exchanges' where trading of debt securities was, by far, the most important. At this time, valuation of ordinary shares was driven by factors that were characteristic of debt security selection: safety of capital and stability of income.

During the 1868-1914 period when 'average investment trusts' were popular, ordinary shares were only gradually assuming importance in the UK. From a legal perspective, this is understandable as it was not until the Companies Acts of 1856 and 1862 that limited liability and readily available company registration encouraged funding using ordinary shares. In any event, other sources of financing were available for companies and, in addition, there was a plentiful supply of foreign sovereign debt issues to attract the UK investor seeking to make up for the progressively falling British government bond yield during this period. For example, the yield on British consols fell from about 3.5% in the early 1860's to below 2.5% around 1900 (Hutson 2005, p.445). In contrast, with consols yields around 3.25%, the Foreign and Colonial Government Trust was able to obtain attractive yields between 5 and 6% on the highest quality (New South Wales; Nova Scotia) British colony bonds and yields as high 15.5% on the least attractive Turkish bonds. Those coupons may be suspended from time to time on low quality sovereign credits, the full force of the British government could be used to ensure at least some return of principal on such sovereign issues.

The evolution of managed funds proceeded considerably during this period (Burton and Corner 1968; Rutterford 2009). Though a number of building societies, mutual savings associations and friendly societies organized previously had features of managed funds, the Foreign and Colonial Trust was different enough to be considered the first of the British investment trusts. The trust was chaired by Lord Westbury, the Attorney-General that had championed the Fraudulent Trustee Bill (1857) and the Bankruptcy and Insolvency Bill (1861). The legal structure of a trust was preferred to that of a limited liability company due to the unsavory reputation that companies had attained following the panic of 1866 fueled by the registration of less than credible limited liability companies following passage of the Companies Act. This panic was another instance of speculative excess that had characterized the first half of the 18th century including: the foreign government bond craze of the 1820's and 1830's; and, the railway bubble and bust of 1845-7. The Foreign and Colonial was established primarily with the aim of providing investors of lesser means, that depended on receiving a steady investment income, with a 'safe' diversified investment vehicle capable of achieving returns above those being offered on British government securities.

The success of the Foreign and Colonial led to five subsequent issues by 1872 and the creation of eight other investment trusts by 1874 (Burton and Corner 1968, p.17). Circa 1875, the London Stock Exchange listed 18 trusts growing to 70 listed trusts by the end of the decade, numbers that included different issues by the same investment trust (Rutterford 2009). Some of these early trusts were not well designed and there were abuses, such as the over-judicious use of founder shares. A legal challenge in 1879 led to virtually all trusts converting to limited liability companies, e.g., the Foreign

and Colonial converted from trust to investment company status in 1879. This marks the historical beginning of another semantic confusion between the ‘investment trust’ – which is legally organized as a trust with trustees and contractual similarities to a bond indenture – and the ‘investment trust company’ or investment company – which is a limited liability company. Among other implications, conversion to company status permitted managed funds: to issue different classes of debt, preferred shares and ordinary shares; and, to depart from the fixed investment list and, to some extent, actively trade securities. The relevance of the legal distinction between trusts and companies continues to modern times with the ‘Halloween 2006 massacre’ of the corporate tax exemption for the unit trust structure by the Government of Canada that decimated retirement savings of small investors.

The early investment trusts charged a small front-load fee and annual management fee to pay for fund expenses, not unlike modern managed funds. There was also considerable variation in the investment style of the early trusts. For example, whereas the Foreign and Colonial selected government bonds outside the UK, the Scottish American Investment Trust selected only US railway bonds. Investment trust features prior to the conversion to company status were dramatically different from modern managed funds (Hutson 2005, p.448-50). In particular, the funds were fixed. A trust was created by issuing shares or participation certificates and the funds raised used to buy specific amounts from a predetermined list of securities. Once selected, the portfolio could not be changed except in narrowly defined circumstances. The trust had a fixed life – 24 years for the Foreign and Colonial – and promised to pay a fixed dividend. To allow for the creation of a reserve against unforeseen events that could impact future dividend payments and to make allowance for future capital to redeem shares, an actuary was employed to determine the correct initial difference between the underlying portfolio yield and the fixed fund dividend payment so that ‘in all probability’ all certificates could be redeemed within 24 years with a capital surplus still remaining (Rutterford 2009).

The theoretical sophistication of the early investment trusts reflects a careful attention to actuarial detail. These ‘average investment trusts’ were built on: “The principle of distribution of risk by embodying in a Trust a number of undertakings” (Share Investment Trust prospectus, 1872). Unfortunately, the subsequent history of investment trusts and investment trust companies did not fulfill the early promise. Even before the conversion to corporate status, problems were emerging in the governance structure and with the use of leverage. Unlike modern mutual funds that are restricted in the use of leverage, there was a number of reasons for early managed funds to use leverage. For example, it was common for initial subscriptions to be partly paid, with the balance to be carried by the company using loans that would be paid down as subscriptions became fully paid. It was a small step to where the fund would be constructed using borrowed money to purchase additional securities that would result in a higher residual payment to founder shares. The abuse of leveraging became particularly acute as the conversion to corporate status permitted funds greater discretion to actively manage the security portfolio and to adjust the composition of equity securities issued by the fund between ordinary, founder and preferred shares.

From Investment Trusts to Mutual Funds

The contributions of Henry Lowenfeld, Sir John Fowke Rolleston and others associated with the Investment Registry that supported the Financial Review of Reviews were inspired by the various

failings that emerged in UK investment trust companies during the last two decades of the 19th century. Whereas the prudent use of reserve funds had protected the early investment trusts from the bond defaults arising during the 1874-6 economic downturn, this was not the case for the 55 investment trust companies – up to 100 if hybrids investing in other than tradeable securities are counted – that had been listed on the London stock exchange by 1890. The spread of the Barings crisis that began in 1890 saw dividends being suspended, many trusts folded and merged, and trust share values collapsed. By the end of the recession of 1893, only seven trusts had market value greater than issue price (Hutson 2005, p.448). In this process, a number of poorly managed trusts with self-serving management practices were exposed. In the aftermath of this debacle, Lowenfeld and others sought to restore the actuarial foundations that the original investment trusts had established.

Despite the efforts of Lowenfeld and others, investment trusts in the UK did not regain the luster of the late 1880's until the boom years of 1924-29. By this time, the US had been propelled by World War I into a position of economic importance that was reflected in the size and development of equity security markets. “By mid-1928, the US investment trust sector had overtaken that of the UK, with an aggregate capital of \$1.2 billion compared with an equivalent \$1 billion in capital for British investment trusts” (Rutterford 2009). It was during the 1920's that managed funds, traded primarily in the US equity markets, emerged with investment styles and characteristics closer to actively managed funds traded in modern equity markets. In particular, from the classical closed-end, fixed investment trust model inherited from the UK, the American equity security markets of the late 1920's developed the closed end fund, active investment management company model. This allowed for actively managed funds that invested exclusively in common stocks: emphasizing capital gains to obtain the compounding power of reinvested earnings; and, hopefully, to make speculative gains from a combination of leveraging and experienced management producing sound stock selection and market timing decisions. Such trusts also attracted interest from UK investors during the 1924-29 period.

Though examples of investment trusts in America go back to the 19th century, the few US trusts that appeared prior to 1924 followed the UK closed end, fixed trust model with the exception that common stocks of US companies were the primary assets of the trusts. By 1924, only 18 investment trusts had been formed in the US (Chamberlain and Hay 1931, p.104). Following Rutterford (2009), an important factor in the investment trust boom that developed in the period from 1924-1929 was: “the support given to investment trusts [by] a number of influential authors, most notably Edgar Laurence Smith, Leland Robinson, P.W. Garrett, Irving Fisher and Marshall Williams.” The leading figure in the common-stock theory, E. L. Smith, was president of The Investment Managers' Company and had a direct business interest in establishing legitimacy for the practices of the ‘new style’ investment management companies. In addition to touting stocks for the long run, Smith (1924) also recommended the use of professional investment managers able to periodically alter the composition of the fund portfolio.

In addition to being a strong proponent of the ‘common stock theory’ advanced by Smith, Irving Fisher was also a strong proponent of actively managed funds run by investment professionals. “Incessantly vigilant management” was needed to see that ‘blue chips did not turn pink’ (Rutterford 2009). This recommendation was based on a seemingly obvious point that inflexibility in the holdings of a fixed trust reduced overall returns as poorly performing securities could not be replaced.

This point would have little relevance for the type of UK fixed trust that the Foreign and Colonial had become since 1905. The conversion to corporate status in 1879 resulted in the five individual trusts, each with less than 20 securities, being combined into a single fund holding 90 securities. By 1905, there were 280 securities held by the fund almost exclusively selected for purposes of geographical diversification, stability of income and safety of principal (Rutterford 2009). Unlike the classical fixed investment trust, the averaging inherent in a particular investment list was not predetermined and some variation in the portfolio, and the capital structure of the fund, was permitted because the number of securities held was large.

Not unlike the excesses of the UK investment trust companies in the decade prior to the Barings crisis, tragic excesses appeared in the flexible US investment trusts and investment management companies of the late 1920's. In the explosion of new issues that saw a more than doubling of managed fund assets from 1928-9, the lack of available common stock for purchase saw trusts and investment companies purchasing the equity securities of other trusts and investment companies. In contrast to the classical fixed UK investment trust that invested in a published list of globally diversified portfolio of "Class I" fixed income securities -- sovereign and high quality corporate bonds and preferred stock -- US investment company managers concentrated on the common stock of a small number of large domestic corporations. The flexible fund feature and corporate structure permitted investment managers to avoid the publication of the specific securities held in the managed fund at any time. Another aggravating factor in the excesses was the use of fixed income securities -- primarily associated with preferred shares, though some companies also issued debt -- to finance fund capital while fund assets were almost exclusively in common stock.

The failure of the US investment management companies of the late 1920's marks a key event in the history of equity security analysis. More precisely, it was the speculative investing practices of the actively managed US investment trusts that inspired Graham and Dodd (1934, p.52) to identify the "new era" theory of investing:

Certainly, through many years prior to 1928, the typical investor had been interested above all in safety of principal and continuance of an adequate income. However, the doctrine that common stocks were the best long-term investments resulted in a transfer of emphasis from current income to future income and hence inevitably to future enhancement of principal value. In its complete subordination of the income element to the desire for profit, and also in the prime reliance it placed upon favorable developments expected in the future, *the new-era style of investment -- as exemplified in the general policy of the investment trusts -- was practically indistinguishable from speculation*. In fact this so-called investment could be accurately defined as speculation in the common stocks of strongly situated companies. [emphasis added]

Though Irving Fisher, one of the leading figures in the pre-WWII history of academic Finance, is considered infamous in vernacular Finance for the brutal call on the stock market in 1929, in the history of equity securities it was touting of the shares in US investment management companies that was arguably more tragic. Oddly enough, J.B. Williams "followed Irving Fisher in valuing an asset as the present discounted value of a stock as the present discounted value of the expected stream of income from owning it, so that the value of a stock would be the discounted present value of the

expected stream of dividends, reduced by some factor to compensate for uncertainty” (Dimand 2009, p.91). It was this discounted cash flow model that Graham, Dodd and Cottle (1962) later used to identify intrinsic value.

Following Rutterford (2009), at the peak of the market in 1929 there was some 675 investment companies in the US and UK holding over \$7 billion in assets. This included 193 investment ‘management’ companies with \$2.7 billion in assets, with both US and UK investors participating in these actively managed funds. The benefits of the conservative UK fund structure is evident in the managed fund performance during the market downturn that started in October 1929. From a peak in 1929 to June 1931, the Standard Statistics common stock index of 30 US investment trusts had fallen more than 75% while the Institute of Actuaries common stock index for 15 UK investment trust fell just 17% from the March 1928 peak to March 1931 low (*Economist*, June 30, 1931). Allen (1938, p.237) presents somewhat different numbers with the same general dimensions. Describing the US investment fund industry (Allen 1938, p.233) observes: “From 1930 to 1934, nearly 200 of the 540 management-company units of all types in existence at the end of 1929 had disappeared through merger, voluntary dissolution, or failure.” Where some 200 US investment trusts disappeared, there were no similar impacts on UK trusts. At the worst, a number of UK trusts had to pass dividends. The inevitable outcome was a dramatic change in US managed funds during the 1930's.

Investment Company Act (1940)

Together with the Investment Advisors Act (1940)(IAA), the Investment Company Act (1940) (ICA) was the last of a number of pieces of major legislation that reformed US securities markets following the collapse of equity security prices from 1929-33. The initial piece of legislation, the Securities Act of 1933, was concerned with the issuing of new securities. The Securities Exchange Act of 1934 deals with regulations for the trade in securities after issuance. It is this Act that governs: the registration of exchanges; the registration of securities listed for trade on the exchanges; and, sets rules for fair conduct. The Securities and Exchange Commission was created by this Act to oversee these activities. While these two Acts covered much of the ground needed to establish a firm legal foundation for US securities trading, there were still some more focused issues that need to be legally clarified. These issues were sorted out by passage of the Trust Indenture Act (1939), that dealt with bond issues and, finally, to deal with the excesses of the US investment companies, the IAA and ICA. This historic transition roughly marks the beginning of the modern mutual fund industry.

Initially, the US managed fund industry responded to the collapse of the flexible, actively managed closed end investment company model with a fixed, open end unit trust model. About 150 such US trusts with capital of \$400 million were issued in 1929-31 (Rutterford 2009). These funds had some similarities to classical UK investment trusts such as: no use of loans to buy securities; a fixed and published investment list; and, passive security selection strategy. While this explicitly prohibited active management, the open-ended feature made some trading necessary. Over time, this created difficulties as the list of available securities was limited. This was made even more difficult by the preference for common stocks of large US companies and rules requiring the sale of shares if the dividend was passed. Not only did rules regarding passed dividends further restrict the initial list, it also exacerbated a bear market in shares of these favored companies brought on by a negative

dividend event, as these unit trusts acted in concert with forced sales of shares.

Allen (1938) provides helpful background on the state of the US investment management industry, in the period leading up to the passage of the ICA. In particular, there was the relatively poor performance of investment company common stocks: “Over the entire period 1930-36, their composite record did not quite equal that of the stock average and was decidedly inferior to that of bonds or of a bond-stock composite. Their record, moreover, was inferior to that of the older British companies over the same period” (p.236-7). Recognizing that none of the so-called investment trust were legally trusts, Allen (p.251) divides the common stock of investment companies into ‘leveraged’ and ‘nonleveraged’. Having identified the poor performance of leveraged investment company stocks since 1929 and characterizing the shares in such investment companies “among the most speculative stocks in the market”, the unleveraged investment company stocks are divided into: mutual; and, nonmutual. Of these, the rapid development of mutual companies since 1929, where “the shareholder is able to resell his holdings at any time at (approximately) liquidating value”, was identified as “highly desirable” (p.253). As early as 1936, the federal government was providing Revenue Act incentives for management companies to convert to the “good” form of mutual fund organization – incentives that eventually evolved into the ICA model of non-leveraged, managed and diversified, open ended mutual funds that still dominate the modern managed funds industry.

In contrast to the income driven, geographically diversified UK investment trust that invested primarily in fixed income securities and high quality, dividend paying common stocks, the early American investment company was concerned with “managed diversification in common stocks” which requires that “the long-run record of investment companies in this country will rest in large part on the validity of the common-stock theory of investment”(Allen 1938, p.234, 248). Similar to Cowles (1944), Allen explores the strategies used by the cohort of most successful investment companies: “This group included such well-known companies as State Street Investment Corporation, Lehman Corporation, General American Investors, National Bond and Share, Fourth National Investors, U.S. and Foreign Securities, and Tri-Continental Corporation” (p.239). In addition to a group of investment companies with successful security selection strategies involving both debt and equity, “a number of these investment companies built their portfolios around a flexible common-stock policy, involving a sharp shift into (primarily) cash and United States government securities in 1930-32 and back into common stocks just preceding or at the beginning of recovery” (p.247).

A World of Exchange Traded Funds

The ICA imposed a range of restrictions on the activities and capital structure of US investment companies. Tight control was placed on the use of debt which is prohibited for open end funds, including mutual funds. Closed end funds are permitted to have one issue of preferred and one class of debt, covered by at least 200% and 300% with assets at market value. In addition, the ICA also facilitated the development of the open ended fund that had become popular in the 1930's. From passage of the ICA in 1940 until the present, open ended mutual funds with managed diversified portfolios have proved to be an overwhelming success compared to all other types of managed funds. The Investment Company Institute (www.ici.org) provides a variety of statistics on investment funds. Virtually all of the data provided is for the US only, such as the assets of money market funds, though information on global mutual fund assets is also reported. At the end of July 2008, the following

asset values were reported.

Global Mutual Funds	\$18.15 trillion
US Mutual Funds	\$10.431 trillion
US Money Market Funds	\$3.579 trillion
US Exchange-traded funds (ETFs)	\$639.93 billion
US Closed End Funds	\$201.15 billion
US Unit Investment Trust deposits	\$2.08 billion

Though mutual still dominate the managed fund landscape, Table 2.3.aa illustrates the dramatic collapse in asset values for mutual funds, in general, and equity security mutual funds, in particular. From a peak in 2007 at over \$12 trillion, equity mutual funds are now at one half that value and could soon be surpassed in size by money market mutual funds.

INSERT Table 2.3.aa
ICI Statistics for Global Mutual Fund Investment

Though calls for the demise of the managed diversified mutual fund may be premature, there are a number of factors other than the global decline in the equity markets to account for the dramatic drop in assets under management at mutual funds. One factor, the impact of higher fees on fund performance, has been recognized at least since Allen (1938, p.242) observed: “that expense-tax ratios have been excessively high for investment companies as a group is indicated by the inferior record which these companies have made over the period”. At a time when most managed funds were closed end, Allen also observed that the ‘closed end fund discount’ can be explained by poor performance relative to fees charged: “investment company shares continue to sell on the market at prices below liquidating values, evidence that investors feel that operating results after expenses have not been as satisfactory as returns from direct investment in common stocks.” Faced with a decline in assets under management during the bear market of 2000-2003, “the GAO estimates that the largest mutual fund managers in the United States raised their fees by an average of 11% from 1999-2001.

As illustrated in Figure 2.3.aa, the equity security component of the US mutual fund industry faces systemic problems associated with the poor performance of equities over the past decade. It is difficult to achieve sufficient upside performance to justify management fees when the overall market is down. In addition to the systemic problem of attracting and retaining funds when returns are poor to negative, mutual funds sustained a serious image hit in 2003 as a result of illegal late trading and market timing practices by certain hedge fund and mutual fund companies. Coming shortly after the \$1.4 billion settlement reached with the SEC surrounding the fraudulent touting of investment banking clients by the research department of the brokerage division, the mutual fund scandal was more technical in character and conducted on a much smaller scale. However, the perception of wrong doing was widespread and well published due to the prosecution of the case by the same white collar crime buster responsible for initiating the stock touting investigation: New York State Attorney General Eliot Spitzer.

The initial case uncovered by Spitzer, acting on a phone tip, involved a New Jersey hedge fund, Canary Capital Partners LLC, conducting ‘late trades’ with a Bank of America run mutual fund. Soon

joined by the SEC, the investigation grew to include ‘market timing’ violations by some major mutual funds, including: Janus; Bank One (One Group); and, Strong Capital. As with the initial Canary Capital Partners case, hedge funds were often involved as counter parties. In some instances, a financial intermediary affiliated with the mutual fund would lend the hedge funds the money being used to purchase the fund shares. For late trades, the fund permits trading in fund shares after 4:00 PM at the closing price for trades done prior to 4PM. As Spitzer observed in the initial indictment, this is “like allowing betting on a horse race after the horses have crossed the finish line.” Less insidious is market timing, where the fund permits certain individual traders to do more trading than permitted by the fund prospectus. Fees and expenses for mutual funds are based on an estimate of how often the shares will be exchanged. Permitting certain traders to engage in additional trading, especially where the trading strategies involve switching between the funds and cash, imposes unwarranted costs on the other fund investors

The travails of the managed, diversified mutual fund model has led to a market demand for other types of managed funds. This has led to the development of a new type of managed fund: the unleveraged, fixed, open ended exchange traded fund. Though relatively low transaction fee index funds were made available through a few mutual fund companies previously, the first attempt at a launch of an ETF was the Index Participation Shares, an S&P 500 proxy, traded briefly on the AMEX and the PHLX. A lawsuit by the CME which traded a similar futures index was successfully in getting a trading halt. This makes the Toronto Index Participation Shares (TIPS) that commenced trade on the Toronto Stock Exchange in 1990 as the first continuously traded ETF. In Jan. 1993 the AMEX launched SPDR, known colloquially as “Spiders”, now trading as SPY. This particular ETF soon achieved the largest asset value of any ETF. From these early beginnings in index funds, the number and size of ETF’s has grown dramatically, to include securities and commodities across geographical boundaries. Table 2.3.bb illustrates the recent development of exchange traded funds.

INSERT Table 2.3.bb
ICI Statistics for ETF’s

One advantage of the fixed fund model is lower management fees. As such, the incentives for ETF trading originating in Canada were the highest. Based on a 20 country study by Kohrana et al. (2009) and a US/Canada study by Ruckman (2003), Canadian investors were saddled with the highest equity security mutual fund fees of any country. Such fees can be broken into: fees paid directly for fund manager services (MGT); total expenses, which when divided by the market value of funds under management gives the management expense ratio (MER); and, a load fee adjusted MER (AMER) that adjusts for differences in load fees across funds not included in the MER. Total expenses includes management services, administration, servicing the account, transfer agent fees, audit and legal, and so on. Kohrana et al. (2009, p.1287-8) provide the following comparison of equity security mutual fund fees (in percent):

<u>Country</u>	<u>MGT</u>	<u>MER</u>	<u>AMER</u>
Australia	1.09	1.17	1.41
Canada	1.96	2.56	3.00
France	1.04	1.22	1.88

Germany	1.05	1.17	1.97
Switzerland	1.47	1.47	2.03
UK	1.07	1.18	2.28
US	0.62	1.11	1.53
20 Country Mean	0.90	1.29	1.80

The incentive to innovative based on shortcomings in the managed, diversified, unleveraged mutual fund has not been limited to ETF's. As Edwards (1999, p.191), observes: "hedge funds are to a large extent the creation of the legal restrictions imposed on mutual funds and other institutional fund managers."

What is a Hedge Fund?⁴⁸

Hedge funds are a fitting metaphor for the uncertain state of equity markets early in the 21st century. It was a network of feeder hedge funds that Bernard Madoff used to pull off the largest Ponzi scheme in history, lasting from the early 1990's until the collapse in late 2008. It was hedge funds run by Bear Stearns that were implicated in the distribution of the toxic mortgage assets that led to the financial market meltdown of late 2008. Another hedge fund, Amaranth Advisors LLC, lost \$6 billion trying to manipulate the natural gas market in Feb. and April 2006, the bankrupt firm eventually being required to pay a \$7 million fine to the CFTC for market manipulation. The first hedge fund distributed to Canadian retail investors in 2004 – Portus Alternative Asset Management – was soon discovered to be an intricately designed legal structure aimed at providing the fund manager with unlimited discretion to move capital offshore into a network of offshore hedge funds. The collapse of the fraud in February 2005 resulted in hundreds of millions in losses to investors, some of which was ultimately covered by the investment management companies that directed clients to these products. At least since the collapse of LTCM, similar red flags to those appearing in the Madoff, Bear Stearns, Amaranth and Portus case have been apparent in US hedge fund activities.

The term "hedge fund" is generic, being used to describe a variety of different fund strategies that loosely share some similar characteristics. In the aftermath of the LTCM debacle (Dunbar 2000), the President's Working Group on Financial Markets (PWGFM) (1999, p.40) defined the term "to refer to a variety of pooled investment vehicles that are not registered under the federal securities laws as investment companies, broker-dealers, or public corporations". A similar definition appears in an SEC staff report on hedge funds appearing in 2003 (SEC 2003), with the clarification that a hedge fund "is not registered as an investment company under the Investment Company Act". This recognizes ongoing efforts by the SEC to regulate hedge funds under the Investment Advisors Act (1940), e.g., Pekarek (2007). The continuing lack of regulatory oversight is not due to vigilance by US regulators. Despite repeated recommendations and attempts to regulate hedge funds dating to the 1960's, the defining characteristic of hedge funds is still: "pooled investment vehicles that are not registered under federal securities laws". To achieve this, hedge funds are organized as limited partnerships or, in some jurisdictions, limit liability companies with shares that are not publicly traded (van Berkel 2008). While this seemingly disqualifies a hedge fund from consideration as a tradeable equity security, hedge funds are designed to avoid the restrictions imposed on tradeable securities, without losing certain essential characteristics that would otherwise require such consideration.

Much is made by Finance academics of the different hedge fund categories and that "hedge fund

investment strategies provide greater diversification opportunities and may result in higher risk-adjusted returns for investors” (Edwards 2006, p.46). Some even claim: “the hedge fund industry may have played more of a role in creating liquidity and making markets efficient than the mutual fund industry” (Stulz 2007, p.193). On balance, Stulz (2007) captures the ‘bullish’ stance of academics on hedge funds: “regulation should leave alone financial innovators who dream of new strategies and find savvy well-funded investors to bet on them.” Prior to the market downturn of 2008-9, there was even considerable progress toward retailization of ‘alternative asset classes’ such as hedge funds and private equity funds because such funds “can pursue investment and speculative strategies that are not open to other institutional fund managers, ... avoid the costs associated with regulatory oversight, and ... use whatever fee structure they believe to be optimal” (Edwards 1999, p.191).

Viewed as a type of managed fund, the characteristics of classical hedge funds are: actively managed; leveraged; regulatory free rider; and, *de facto* investment companies disguised as limited partnerships. Though a hedge fund does not directly issue securities, because fund size changes with redemptions and additional investments, hedge funds can also be classified as open ended funds with restrictions on redemptions. In any case, hedge funds possess essential characteristics of the types of managed funds that the ICA and IAA were designed to stamp out. There are sound historically based rationales for restricting highly leveraged speculative trading activities by unregulated entities. The costs associated with regulatory oversight are important to maintaining the stability and integrity of financial markets. Free rider funds that are able to avoid such regulatory costs are at an advantage to funds that do pay such costs. From an historical perspective, permitting unregulated financial entities that operate in securities markets with the sole objective of making speculative profits is ill conceived and reckless and results in increased potential for severe market disruption.

Regulation of Hedge Funds

In order to avoid the registration requirements specified under US federal securities laws for securities companies, hedge funds have to satisfy a number of specific conditions. Exemption from the Securities Act (1933) is achieved by having no public offering. This is an issue with using the ‘funds of hedge funds’ approach as a strategy to retailize hedge fund investing. Whether it is possible to issue a tradeable equity security holding assets that would not otherwise be considered be tradeable depends on the jurisdiction. Similar regulatory quandaries arise with the exemption from the ICA achieved by being a ‘private investment company’. Hedge funds have two possible avenues to qualify as private investment companies, either the ‘100 person exemption’ (Sec. 3(c)(1)), or the ‘qualified purchaser exemption’ (Sec.3(c)(7)) that permits up to 500 qualified investors. While there is often the perception that hedge funds are privately structured and closely held entities qualifying because the primary investors are high net worth individuals, in practice the 100 person exemption is not used because the institutional investors in hedge funds satisfy the test for ‘qualified purchaser’. Each institution, such as a pension fund or investment bank, is counted as a separate investor. Because such institutions could contain investments from thousands of investors, the actual ‘size’ of the hedge fund would be much larger than the small number of institutions investing in the fund.

Hedge funds have been an ongoing headache for regulators. Since the collapse of LTCM, there has been a parade of hedge fund related problems. Still, a formal legal definition of a hedge fund is

lacking: “The term ‘hedge fund’ is not defined or used in the federal securities laws” (PWGFM, p.40). One of the attractive features of hedge funds is the avoidance of certain legalities associated with registration, information filing, taxes and so on; though some US hedge funds do register under the IAA. To achieve exemption from federal securities regulations, a hedge fund is typically structured as a pooled investment vehicle, that is privately organized, closely held among a small number of partners and run by professional investment managers, typically on an incentive fee basis. The master-feeder organizational structure of such funds often involves a corporation domiciled outside the US in tax havens such as the British Virgin Islands or Bermuda, e.g., Greene et al. (2007). The various characteristics of a hedge fund all interact to create a type of managed fund that falls through many of the cracks in the US securities laws.

One avenue for dealing with hedge funds is enhanced regulation to bring such funds within the scope of regulatory oversight. To date, such legislation is still not forthcoming though the determination to act is apparent. Even though hedge funds do not fall within the scope of the SEC Act or the Investment Company Act, regulators still have made ongoing efforts to subject hedge funds to a number of other US statutes, especially the IAA. To date these efforts have been thwarted in federal court proceedings, especially the Bulldog Investors case upholding the exemption of hedge funds advisors from the IAA, e.g., Pearson and Pearson (2007); Pekarek (2007, 2007a); Mann (2008). Barring direct regulation, indirect regulation of hedge funds occurs through the array of financial institutions which hedge funds need to conduct business. For example, the SEC imposes capital, margin and reporting requirements on broker-dealers, which are essential counter-parties or clearing members for hedge funds. Included among these requirements are risk assessment rules specified in the SEC Act to “establish record keeping and reporting requirements for subject broker-dealers and their affiliates whose business activities are reasonably likely to have a material impact on the financial and operational conditions of the broker-dealer” (PWGFM, p.42).

Hedge Fund Strategies

The situation surrounding regulation of hedge funds is complicated because hedge funds are not the only managed funds which seek such specific exemptions from US securities laws. For example, venture capital pools, private equity funds, venture capital funds, asset securitization vehicles, family estate planning vehicles and investment clubs can receive such treatment. As a consequence, another defining feature of hedge funds is the types of strategies which the funds pursue. Given the restricted scope of other types of funds seeking exemptions, hedge funds can exhibit considerable variation in strategies. “There is no single market strategy or approach pursued by hedge funds as a group. Rather, hedge funds exhibit a wide variety of investment types, some of which use highly quantitative techniques while others employ more subjective factors” (PWGFM 1999).

The MARhedge hedge fund categories

MARhedge is an important source of information and news about the hedge fund industry. Data available through MARhedge has been thoroughly examined in Ackermann et al. (1999). In order to provide some degree of organization to this mishmash of hedge fund strategies, MARhedge ([www. MARhedge.com](http://www.MARhedge.com)), classifies hedge funds into eight broad categories:

Global Macro funds: take positions on changes in global economic conditions in equity, FX and debt markets. Use derivatives, including index derivatives, and leverage.

Global funds: similar to macro funds but targetted at specific regions, often involving stock picking.

Long-only (US Opportunistic) funds: are like traditional equity funds but with the hedge fund characteristics of leveraging and incentive fees for managers. Strategies for these funds include Value, Growth and Short-term trading.

Market-neutral funds: the basic objective of these funds is to be long in one group of securities and short in another group, such that market risk is controlled or neutralized. This can be done in a number of ways: by going long one group of stocks and short another group, seeking to benefit from superior stock picking skills; conversion arbitrages, which are long in underpriced convertibles and short in the underlying stocks; stock index arbitrages; and, fixed income arbitrages, which are long, say, off-the-run Treasuries, and short on-the-run Treasuries.

Sectoral hedge funds: have an industry focus; short-sale funds, which short sale over-valued securities, investing the balance in indexes or fixed income securities

Event-driven funds: target special situations, specifically distressed securities of firms in reorganization or bankruptcy as well risk trading in takeovers, e.g., buying the target and selling the acquirer.

Short Sales funds: the fund is positioned to benefit from market declines. These funds can be index driven or can be based on stock picking.

Funds of hedge funds: funds of hedge funds, sometimes leveraged.

Within each of these general group, a variety of different strategies could be pursued. Similarly, some funds may be involved in activities covering more than one fund category.

The diversity of hedge fund strategies extends to the types of securities traded (PWGFM, p.9):

Many hedge funds trade equity or fixed income securities, taking either long or short positions, or sometimes both simultaneously. A large number of funds also use exchange-traded futures contracts or over-the-counter derivatives, to hedge their portfolios, to exploit market inefficiencies, or to take outright positions. Still others are active participants in foreign exchange markets. In general, hedge funds are more active users of derivatives and of short positions than are mutual funds and many other classes of asset managers.

However, behind all the confusion about hedge fund typology, the basic intuition is relatively clear: hedge funds combine long positions in certain securities with short positions in other securities. Such ‘hedging’ strategies can be relatively low risk where the securities being traded are highly correlated., e.g., the ‘on-the-run’ ‘off-the-run’ Treasury security arbitrage run by John Merriweather, first at Salomon Brothers and subsequently at LTCM. Because the price differences involved in achieving a profit are small, substantial leverage is required and warranted. Such hedge fund strategies will, directly or indirectly, involve leveraging. However, many other hedge fund strategies do not have sufficient correspondence between the short and long positions to warrant the degree of leverage that is being partially hidden from public view by the managed funds operating under exemptions from securities laws designed to deter such excessive leveraging.

Hedge funds are not conventional investment vehicles. Investor liquidity is often compromised with “lock-up periods of one year for initial investors and subsequent restrictions on withdrawals to quarterly intervals” (Ackermann 1999, p.834). The regulatory exemptions that hedge funds work under severely restricts the ability of hedge funds to advertise. Another untypical feature of hedge funds concern the management (Ackermann 1999):

Hedge funds are ... characterized by strong performance incentives. On average, hedge fund managers receive a 1 percent annual management fee and 14 percent of the annual profits. For most funds this bonus incentive fee is paid only if the returns surpass some hurdle rate or "high-water mark" -- meaning there is no incentive fee until the fund has recovered from past losses. Although incentive fees and high-water marks could lead to excess risk taking under some conditions, there are countervailing forces that may dampen risk. Hedge fund managers often invest a substantial amount of their own money in the fund. Furthermore, the managers of US hedge funds are general partners, so they may incur substantial liability if the fund goes bankrupt.

In contrast to mutual funds which have a much longer history that has been intensively studied, hedge funds only started to receive academic attention in the mid 1990's, though work on managed futures funds and commodity pools, which started somewhat earlier, is also applicable, e.g., Irwin and Brorsen (1985); Elton, Gruber and Rentzler (1987); Edwards and Ma (1988); Cornew (1988); Irwin et al. (1993); Edwards and Park (1996). As data has accumulated on hedge fund activities, a voluminous number of studies has appeared on various aspects of hedge funds. Among the useful studies directly on hedge funds are: Klein and Lederman (1995); Fung and Hsieh (2000, 2002); Brown et al. (1999, 2001); Schneeweiss and Spurgin (1998); Ackermann et al. (1999); Liang (2000); Gregoriou (2002); Goetzmann et al. (2003); Patton (2009); and, Griffen and Xu (2009).

NOTES

1. Because aggregate production was primarily agrarian, the bulk goods trade was important in ancient markets. While the movement of higher value goods by land was the basis of the caravan travel, waterborne transport was the mainstay for moving grain, pottery, wine, oil and other bulky commodities needed to sustain urban centers. Even as late as the Roman Empire, “the huge number

of grain ships bringing supplies from Egypt and Africa to Rome have left hardly any trace in the archaeological record”. As such, the organization of this trade could have been closer to the bottomry loans common in seaborne trade of the Greeks. However, a surviving document from the second century AD, the Muziris Papyrus (Rathbone 2003), provides evidence of political capitalism dominating such trade. This interpretation is consistent with the need to have political influence to ease the burden of onerous customs duties and other charges that were common in the Roman Empire, especially after the collapse of the republic.

2. Much more could be said about the extent of trading in *publicani* equity claims than is possible here. Further discussion requires considerably more background on the rigid, wealth determined Roman social structure. As Duncan-Jones (1982, p.2) observes: “The Roman state was firmly oligarchic and timocratic. The ownership of wealth was the essential prerequisite for all the high statuses of public life ... Entry to the Senate, the body of knights (*equites*), the judiciary, and the local town council was in each case controlled by a property qualification ... The formal structure of civilian wealth qualifications represented ratios of 1:2:4:12 ... the senator [must have] three times the wealth of the knight.” It was the *equites* that dominated the *publicani*. Recognizing that the *equites* roughly corresponded to the officer class, throughout Roman history building activity by the standing army during times of peace was commonplace. The *publicani* provided an expedient method of organizing such activities and compensating those involved. The organizational skills past and present army officers was also well suited to the control and direction of large numbers of slaves involved in public works projects. Though much of the collection of tax farming revenues was done by local officials, the *equites* were well suited to managing any fallout from the often aggressive methods used by local tax collectors. If senators such as Caesar and Cassius traded unregistered shares this was likely done for political reasons and not for the possible income to be received. As such, the equity valuation involved is political and is not related to the modern equity valuation problem. Available evidence indicates that the wealth of senators was based on income from large landed agricultural estates with income from loans or ‘usury’ of not more than 5-10% (Duncan-Jones 1982, p.17-32). Recognizing the substantial difficulties with trading registered shares, it is likely that the Forum was used as a meeting place for those *equites* and possibly a senator or two seeking to trade unregistered shares. However, it is inaccurate to depict such trading as “an immense stock exchange where monetary speculation of every kind was going on” (Cunningham 1913, p.164). It is even exaggeration to claim: “crowds of men bought and sold shares and bonds of tax-farming companies, various goods for cash and on credit, farms and estates in Italy and in the provinces, houses and shops in Rome and elsewhere, ships and storehouses, slaves and cattle” (Rostovtzeff 1957, p.31). Following Chancellor (1999, p.4), the Roman comic playwright Plautus was probably more accurate in describing the Forum as a collection of “whores, shopkeepers, moneylenders, and wealthy men.” The observation by Polybius about the widespread use of *publicani* contracting in Roman society is only consistent with an efficient oligarchic contracting method for determining compensation for the construction of public works and the collection of taxes.

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

4. 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).

5. 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).

6. Kellenbenz also observes: “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 ...) What this ‘ducaton’ trading amounted to is a bit uncertain ... Scholars who have worked on this period assert that the ducaton shares were fictitious ...

7. 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).

8. For example, Dickson (1967) identifies the Revolution of 1688 as a defining event for London stock trading.

9. Shea (2007a) examines the pricing relationship between subscription shares and fully paid shares. Payment by installment was common practice, as was trading for future delivery. For example, a contract for the purchase of shares or government debt could be structured as a time bargain, with delivery in, say, a month and payment by installment from that date. Buyer and seller would then agree as to the appropriate deposit when the contract was created. The potential for speculative trading and stockjobbing is apparent.

10. 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).

11. 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.

12. 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.

13. 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.

14. 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.

15. Cope (1978) takes a somewhat different view of these events.

16. De Marchi and Harrison (1994, p.62) appear to claim that de la Vega proposed a model where stock prices were a random process, quoting de la Vega as saying: 'shares are enveloped in a veil of almost religious mystery such that the more one reasons the less one grasps, and the more cunning one tries to be the more mistakes one makes'. The solution, according to de la Vega, is to trade randomly. Is it possible to claim de la Vega was a precursor of the random walk model of stock prices.

17. De la Vega recognizes that the motives of gamblers and speculators were often somewhat nefarious, and that the presence of manipulation makes accurate pricing a difficult exercise: "shares are enveloped in a veil of almost religious mystery such that the more one reasons the less one

grasps, and the more cunning one tries to be the more mistakes one makes', e.g., de Marchi and Harrison (1994, p.62).

18. 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."

19. Modern security analysis has a much more refined treatment of firm profitability, based on exploiting the much more elaborate accounting information now available. Graham and Dodd's dictum that security analysis involves the use of financial statements would have been lost on Mortimer because, at his time, accounting information was quite rudimentary and was often proprietary.

20. These events included the Dutch river blockade of 1572 and the siege of Antwerp by Spanish troops in 1585.

21. Barbour (1950) differs from De Marchi and Harrison (1994) in the description of the early price history of the VOC. The latter source has been taken as accurate in the following discussion. Following Barbour (1950), the impact of the bear ring on VOC prices was substantially greater.

22. Dickson (1967, p.90) references most of the sources available up to 1967. Neal (1990) includes some more recent references and Shea (2007) is a useful recent contribution. Dickson (1967, chs. 7-8) is also an essential source for examining in detail the period of financial reform and reconstruction following the bubble. Of the available references on the bubble, Anderson (1764, 1787-1789) is seminal. As a clerk working for the South Sea Company during the bubble period, Anderson had first hand knowledge of events and practical details. Many of the insights found in later works can be traced to Anderson. Scott (1910-1912) has, perhaps, the most in-depth account though there are a number of points at which the discussion is incorrect.

23. Taylor (1962) provides a detailed discussion on the activities of Clavière and observes (p.952): "We must remember that he was not the only speculator and in respect to the volume of his affairs not even in the first rank". Clavière receives considerable modern interest because the quality of the primary sources – correspondence and accounts – associated with his activities. He also attracts modern interest due to his connection to Mirabeau. For a variety of reasons, not the least of which is an active desire to prevent public disclosure of trading activities, primary sources for the most important *agioteurs* or speculators have not survived. The most important secondary source on the correspondence of Clavière with other speculators is still Bouchary (1938)

24. Precisely when schemes to capture the benefits of diversification appeared is unclear. Such schemes likely appeared gradually as the supply of different types of securities became widely available for trade. For example, Goetzmann et al. (2005, p.2) report on a 1774 scheme (*Negotiatie onder de Zinspreuk Eendragt Maakt Magt*) where the manager of the fund was directed to hold, as closely as possible, “an equal-weight portfolio of bonds from the Bank of Vienna, Russian government bonds, government loans from Mecklenburg and Saxony, Spanish canal loans, English colonial securities, South American plantation loans and securities from various Danish American ventures, all of which were traded in the Amsterdam market at the time”.

25. Étienne Clavière (1735-93) was another of the remarkable figures that populated 18th century equity security markets. Originally from Geneva, Clavière was involved with the democratic leaders of the Geneva Republic and, as a result of the collapse of the popular revolution, was forced to take refuge in Britain in 1782 together with other Swiss expatriates. Many of these expatriates later moved to Paris, where some were engaged in ‘banking’ before the revolution. Clavière, in particular, became acquainted with Mirabeau, Brissot, and other popular leaders. Mirabeau, who had a high opinion of Clavière's talents, used his assistance in composing speeches and essays on financial matters. Another important expatriate Swiss, Etienne Dumont, claimed the Swiss banker was the author of almost all of Mirabeau's works on finance. Clavière was chosen deputy to the National assembly in 1791, and was Girondist minister of finance from March till June, 1792. He was arrested with other influential Girondists in June, 1793, on account of Girondist opposition to the extreme measures of Robespierre and other revolutionary leaders. In December 1793, Clavière committed suicide to escape the guillotine. His wife poisoned herself two days afterward.

26. Michie (1999, p.34) reports that the English national debt increased by about £500 million to £744.9 million between 1790 and 1815. Following Kaplan (2006) and Ferguson (1998), the substantial increase in the supply of debt available for issue and trade precipitated the creation of banking dynasties, most notably the House of Rothschild.

27. Wendt (1982) discusses the history of the Wall Street Journal.

28. In examining opinion on futures market speculation during the late 19th and early 20th centuries, Jacks (2007) refers to “populists” versus “theorists” which also corresponds to a distinction between the vernacular and the academic views. Jacks connects ‘theorists’ with “professionals”, which is consistent with the absence of a sizable community of ‘academic’ theorists. As the vernacular ‘populists’ were typically anti-speculation and the ‘professional’ theorists were usually involved in the trade and opposed to government intervention.

29. For example, Hautcoeur (1997) identifies 238 financial periodicals published in Paris during 1881. A somewhat similar list could be assembled for London, with some important sources being: *Chadwick's Investment Circular*; *Beeton's Guide*; and the *Investor's Monthly Manual*. Following Ott (2008), O'Sullivan (2007) and Michie (1986) the retail investor in the US emerged somewhat later than in Europe, with 1885-90 being identified with “the origins of conservative belief in the ability of laissez-faire financial markets to provide economic security and justice for all” (Ott 2008, p.619). Means (1930) is an early study documenting these changes.

30. Though Edgar Smith was also a financial analyst and investment manager during the 1920's, he is included in the academic group as many of his contributions were targeted at the academic audience, e.g., Smith (1927, 1931). In McCloskey's terminology, Smith was actively involved in conversations with academics.

31. The complete history of changes in the Dow Jones Averages can be downloaded from the Dow-Jones website: www.dowjones.com.

32. This is not to say that there were no academic contributions. Giffen (1877), for example, considers the causes of fluctuations in the prices of stock exchange securities. After considering the relationship between prices and the quantity of money, Giffen examines the impact of changes in money supply on "the state of credit" and the associated impact on the price of securities. Market manipulations, security price cycles and the sources of panic on the stock exchange are all considered. In Chapter IX, Giffen gives direct consideration of the valuation of securities. Equity securities are considered as part of a continuum of income producing investments: "After the best securities [of first-rate states such as France, England, Germany and the United States] come the obligations of all but the first-rate governments; the shares, whether preference or ordinary, in railways, gas-companies, banks, ships, and other undertakings, the variety being endless and the estimation most various" (p.87-8).

33. The original company was founded in 1904 as Babson's Statistical Organization (BSO). The company was later called Business Statistics Organization and then Babson's Reports. Combined with some forecasts made prior to 1904, the continuous forecasts for BSO and later named versions is consistent with the same used for the 'best forecaster' in Cowles (1944). In 1986, Babson's Reports was sold to United Business Service Company which became Babson-United Investment Advisors, Inc. and the weekly newsletter became United & Babson Investment Report. In 2001, this Report ceased publication. Further information can be obtained at www.babson.com.

34. The life of Irving Fisher extended well beyond the world of academics, e.g., Klein (2001, p.86-8). Born in 1867, the son of a Congregationalist minister, Fisher studied mathematics and political economy at Yale University. The claim that Fisher was a self-made business success has to be tempered by the fact that in 1893 Fisher married Margaret Hazard, daughter of Rowland Hazard, a wealthy woolen manufacturer. As a wedding gift, the happy couple was presented with a palatial abode in New Haven. It was not until 1912 that Fisher developed his card index system that he marketed through his Index Visible Company. In 1926, this company was merged with its major competitor to form what was eventually to become the Remington Rand Company. During the 1920's he was able to turn part of the house into a home for his Index Number Institute, staffed by more than a dozen people. The Institute prepared a weekly newsletter that was distributed to various newspapers around the world. Having suffered and survived tuberculosis in 1898, Fisher was for the rest of his life devoted to pursuing and promoting clean living. This part of his life found him to be a confirmed prohibitionist and one of the founders and organizers of the American Eugenics Society. This Society was an active promoter of the cause of "race betterment".

35. This was not the case in the UK where aggregate stock price levels had recovered to 1929 levels by 1936.

36. Mini (1995, p.50) provides a detailed breakdown of the performance of the P.R. Finance Company, founded in 1923. The fund is of particular interest because prominent members of the Bloomsbury group were substantial shareholders. It is likely that Keynes took a particular interest in the management of this fund. It is unfortunate that the fund was wound up in 1935, just prior to Keynes achieving his most remarkable personal investment performance. Given this, £1 invested in the fund in 1923 would have returned £1 7s. 7.68d in 1935. The loss of over £98,000 on fund capital of £115,000 during the 1929-31 period also cannot be ignored. On balance, the return received does not represent the quality investment performance that would receive merit in the vernacular Finance.

37. Dickson (1967, pp.493-7) has a detailed analysis of the available evidence on dealer activities as reflected in the transfer records.

38. In contrast, 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. One quote of interest is: 'the bear-skin men must commute, and pay differences money' (p.148), indicating that forward trading mechanisms similar to those used in Amsterdam were in place in London, circa 1719.

39. In the Advertisements section of *A Collection for the Improvement...* Houghton would provide various lists, such as those for Counsellors and Attorneys on 20 July, 1694. In a 6 July, 1694 listing which also included Coaches and Carriers, Houghton provided a list of Brokers, in this case for Corn (2), Dyers Wares (3), Exchange (6), Grocery (7), Hemp (1), and Silk (10), with the number in brackets representing the number of names listed as brokers.

40. 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".

41. This is not to say that CSFB and Quattrone were the central players in the misuse of analysts ratings to tout questionable stocks. Rather, the April 28, 2003 press release by the SEC, NASD, NYSE and New York state attorney general Eliot Spitzer names 10 Wall Street firms in the landmark \$1.4 billion settlement for conflicts of interest with Salomon Smith Barney getting the highest

penalty at \$400 and CSFB and Merrill Lynch at \$200. Morgan Stanley and Goldman Sachs also had fines greater than \$100 million. It was the investigation of the internet research analysts at Merrill Lynch, led by Henry Blodget, by Eliot Spitzer that commenced in 2001 that eventually led to the settlement with a much larger number of firms that were found to be engaging in predatory activities.

42. 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.

43. 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 which is equal to a calendar spread using currency forward contracts.

44. Prior to the elimination of curbs on program trading, the NYSE defined a “program trade” as the execution of trades involving a basket of at least 15 stocks from the S&P 500 or where the value of the basket is at least \$1 million.

45. While program trading curbs were ended, market circuit breakers did not. Each quarter the NYSE sets circuit breaker levels at 10%, 20%, and 30% of the average closing price of the DJIA for the month preceding the start of the quarter. First quarter 2009 levels are 850 points, 1,700 points, and 2,600 points respectively. Depending on the point drop that happens and the time of day when it happens, different actions occur automatically: Prior to the program trading rules being removed, the NYSE curb on program trading was imposed for moves in the NYSE Composite Index of greater than 190 points from the previous close. Curbs remained in place for the rest of the trading day or until the gain or loss had decreased to 90 or fewer points. When “curbs were in”, program sales (buys) were only permitted only on upticks (downticks).

46. Katzenbach (1987) gives a partial listing of key players implementing portfolio insurance strategies for large institutional investors as: Leland O’Brien Rubinstein Associates, Aetna Life and Casualty, Putnam Adversary Co., Chase Investors Mgmt., JP Morgan Investment Mgmt., Wells Fargo Investment Advisors, and Bankers Trust Co. This list does not include the wannabes at Goldman Sachs, Salomon Bros., Nomura and other firms seeking to gain status in this area.

Goldman Sachs was the firm which employed Fischer Black at this time.

47. Using a new SEC database started in 2005, Diether et al. (2009) report that short sales represent 24% of NYSE and 31% of Nasdaq share volume with most short selling being done by institutions as opposed to individuals. Cohen et al.(2007) discusses the costs of cash short selling while Diether et al. (2009) overview possible short selling trading strategies. Dechow et al. (2001) examine the implications of short selling for fundamental analysis.

48. Estimates for the size of hedge funds vary, if only because it is difficult to track entities that are not registered. In 2007, Price Waterhouse Cooper estimated had \$2.17 trillion in assets under management compared to over \$24 trillion for mutual funds (Cumming and Johan 2008, n.1). Given the substantial leverage used by many hedge funds, the actual capital invested would be much less. Poitras (2005, p.566-8) examines the history of hedge funds, starting with Alfred Jones (1901-1989) research for a Fortune article in March 1949 that led to creation of the first limited partnership hedge fund in 1952. Evans (1965) is an early contribution to the history and development of certain hedge fund strategies.