10. Manias, Manipulations and Institutional Failures

> Rationality is thus an a priori assumption rather than a description of the world. (Kindleberger 1989, p.29)

The Modern View of Security Markets

The assumption that economic agents are rational is a defining feature of economic theory. The assumption is embedded in even the most elementary of economic statements such as 'more is preferred to less' and 'subject to a fixed budget constraint, increasing the relative price of good x will reduce consumption of good x'. However, modern economic theory has elevated rationality to new levels. Kindleberger (1989, p.29) captures this new spirit with a quote from Harry Johnson contrasting the difference between the views of 'old' and 'new' economists on the issue of fixed versus flexible exchange rates:

> The difference can be encapsulated in the proposition that whereas the older generation of economists is inclined to say 'the floating rate system does not work the way I expected, therefore the theory is wrong, the world is irrational and we can only regain rationality by returning to some fixed rate system to be achieved by cooperation among national governments,' the younger generation is inclined to say 'the floating rate system is a system that should be expected to operate rationally, like most markets; if it does not seem to work rationally by my standards, my understanding of how it ought to work is probably defective; and I must work harder at the theory of rational maximizing behaviour and the empirical consequences of it if I am to achieve understanding.' This latter approach is the one that is being disseminated, and intellectually enforced, through the [younger] network.

'Rationality is thus an a priori assumption rather than a description of the world'.

In academic years, the ascendancy of rationality is relatively recent. The view is clearly articulated in Milton Friedman's denial of 'destabilizing speculation'.[1] From this point, the *a priori* rationality assumption has been a primary impetus for important theoretical

developments such as rational expectations models, the theory of rational bubbles and the efficient markets hypothesis. In the analysis of modern security markets, a voluminous literature has evolved identifying and explaining, in terms of rational behaviour, anomalies that are inconsistent with market efficiency. Empirical regularities such as the January effect, the small firm effect, the day-of-the-week effect, and first day returns for initial public offerings have all been confronted with substantial theoretical efforts to reconcile the empirical evidence with the rationality hypothesis.

Almost inevitably, adherents of the new rationality were driven to conquer the historical record.[2] The Mississippi Scheme and the South Sea Bubble, together with the Dutch tulipmania of 1634-1637, are three singular financial events of the 17th and 18th centuries that have confronted modern economists. These classical examples of 'speculative bubbles', events that have historically been attributed to decided irrationality, have to be reinterpreted in the light of 'rationality'. With almost dialectical determination, various modern interpretations of 'speculative bubbles' and market manias, in general, have been presented. As expected, modern interpretations of these events are scattered between two polar extremes, representing philosophically and fundamentally different views of security pricing behaviour.

One polar extreme, populated by the 'old school', maintains that security markets are driven by the whims of capricious investors that generate the 'extraordinary popular delusions' associated with numerous bubbles and manias. The other polar extreme maintains that prices in security markets are always inherently rational and bubbles and other apparently irrational market phenomena can always be attributed to basic 'fundamentals' that are used by investors to determine security prices. Between these polar extremes, but decidedly closer to the rational pole, are models of contagion effects, rational bubbles and explosive bubbles. Moving somewhat in the direction of the non-rational pole are the analyses that attribute failures of fundamentals to explain market prices to institutional failure (Garber 1990b, pp.16-17).

On balance, modern interpretations have been predominately in the 'rational' vein. Even explanations identifying institutional failure are still in the realm of modern posturings designed to sustain *a priori* 'rationality'. Significantly, explanations giving a central role to the rationality hypothesis are seemingly at variance with the explanations advanced by those writing at the time. Manias, bubbles and other 'strange' episodes were typically attributed to market manipulations,

whether well intentioned or criminal. These manipulations worked by exploiting the irrationality of investors, willing to risk large sums to achieve remarkable returns. Ultimately, these returns were, for most investors, only fictions. The big gains were achieved by a small group: insiders, those with an intimate knowledge of the manipulation; the vultures, such as those who gained by lending at high rates to those caught up in the frenzy; and the very few investors with a keen sense of market timing.

Joseph de la Vega on Market Manipulation

Up to the time of Adam Smith and beyond, the view that security markets were 'rigged' by insiders is a common theme advanced by most writers on financial markets. Gresham, de la Vega, Malynes, Houghton, Defoe, Cantillon, Mortimer and many others all subscribed to the view that markets, in their time, were manipulated in some fashion. However, manipulation is not a generic operation. In one of the more remarkable contributions to the early history of financial economics, in the Fourth Dialogue of *Confusion*, de la Vega lists twelve different 'tricks' that compose 'the most speculative part of the business, ... the climax of Exchange transactions, the acme of Exchange operations, the craftiest and most complicated machinations that exist in the maze of the Exchange and which require the greatest possible cunning'.

The twelve tricks identified by de la Vega apply to the actions of a bear ring. It is only a speculative proposition to infer that de la Vega was passing on market lore about the Isaac la Maire bear raid. In any event, the ensuing discussion reinforces the claim of the *Confusion* as a classic of financial economics. The beginning of the relevant discussion in the Fourth Dialogue starts with a description of the bear ring:

> Some ten or twelve persons [will, for example,] get together at the Exchange and form a ring (which is called a 'Cabala', as already mentioned). When this ring thinks it advisable to sell shares, the means for prudently carrying out this purpose are given much thought. The members initiate action only when they can foresee its result, so that, apart from unlucky incidents, they can reckon on a rather sure success ...
>
> They [the ring of the bears] strike the first blow with time sales, reserving the cash sales for the moment of greater distress. They sell 50,000 pounds for various [forward] months, an operation through which a decline of prices is bound to occur. The declining tendency spreads, the [ring of the] bears

> receives help form other speculators, and it becomes obvious that, with so broad a participation, the object [of the machinations] is sure to be achieved. The leaders of such manoeuvres can be called 'Princes of the Tail', as Amadeo I of Savoy was called the 'Duke of the Tail' because of his numerous suites. This expression can be applied to the leaders of the bears because of the untold hosts of adherents, or because their followers cling to them, or because these followers should carry their leaders' trains. As there are so many people who cannot wait to follow the prevailing trend of opinion, I am not surprised that a small group becomes an army. [Most people] think only of doing what the others do and of following their examples ...

The final sentence speaks to the potential for market disturbances to arise because of 'an army' market participants 'think only of doing what the others do and of following their examples'. This establishes preconditions both for market manias and market manipulations.

One striking element in de la Vega's twelve tricks of the bear operators is the prominent role given to derivative securities transactions. For example, the first trick:

> The first trick [of the bears' ring] is the following: in order to prevent numerous extensions of the contracts by which the great financiers buy shares for cash and sell them on term, contenting themselves with [a spread in price equivalent to] the interest on the money invested, the ring arranges sales for later dates at the same price at which the shares are being sold for cash; in the hope of a greater profit, they do not pay attention to the loss of interest. They are like Aesop's dog which let go the meat because its shadow appeared bigger to him.

This bear strategy reflects a sophisticated understanding of the forward trading process. There is explicit recognition of the impact of liquidity on the process of investing in the cash-forward price differential to earn the carry return.

Depending on market conditions, the cash-forward price differential was an attractive investment relative to investing directly in the underlying security. By buying the cash security, investors would be entitled to the dividend during the term of the transaction. The typical forward premium would provide an enhancement to the dividend return. At maturity, the forward contract would be settled by differences, facilitating the investor extending the cash position for another term. Due to liquidity restrictions, this transaction is rendered infeasible by the presence of the bear ring quoting forward rates at no premium. Because this renders the cash-forward transaction to be unprofitable, this causes investors to sell stocks for cash, depressing the cash market

price. Observing that the bear ring has sold forward reveals the subtlety of this trick.

One difficulty with the first trick is that Holland permitted 'appeals to Frederick', a situation that would require the bear ring to acquire control of the floating supply of stock in order to perpetrate their bear raid. Forward sales would have to be matched with cash positions that could be delivered. This required much more complicated activities to perpetuate the manipulation. A number of tricks required complicity of brokers or investors who appeared to be at arms length to the ring. This is the essence of the second and third tricks:

> Secondly, a broker in whom the syndicate has confidence is given the order to buy secretly a batch of shares from an [avowed] bull, without revealing his real principal. But he sells the very same shares with a good deal of publicity, while it is shouted out that even the bulls are making sales. As the broker wants to sell to one bull the same shares he has bought from another bull, the first one sees that the story about the sales of the latter is true. Alarmed, the second bull sells his shares also. Seized by fear, everybody tries to forestall the sales of the others and regards any advice to buy as deceitful. Such a panic we call 'to be in tortures', and innumerable [traders] take to their heels ... when even the slightest suspicion is roused ...
>
> Thirdly, the syndicate of the bears sells some blocks of shares for cash to one of the wealthy people who live on the hypothecation of stocks. As it is known that the latter [as a matter of course] sell at once for future delivery the shares which they have bought for cash, the syndicate bids its broker [charged with the execution of the manoeuvre], before the fixing of the prices [of the day], to send a message very secretly to the agent of every business firm [represented on the Exchange], a communication which will soon be an open secret, to the effect that the great capitalist has received important news, and that alarmed by it he intends to sell stocks. When afterwards the sales are actually made, the swindle seems to be verified, the aim is reached, fear spreads, and a crash of prices is brought about. But the panic can easily be explained if the speculators suspect a change of opinion by their protectors and see their foundations shaken.

This practice of placing misinformation in the market using brokers and others is a theme that appears in market manipulations even up to the present day. For example, the 1697 Act in England 'To Restrain the number and ill Practice of Brokers and Stockjobbers' was aimed at three types of activities: 'promoters of companies were encouraged to sell their rights at a profit to inexperienced persons, so that the management of the companies suffered ... Dealers "confederated themselves together" to raise or lower prices to their own profit and injury to their clients. And option dealings were abused and became a means of fraud'

(Morgan and Thomas 1962, pp.24-5). The second and third of de la Vega's tricks are consistent with the presence of a dealers' confederation.

This theme of spreading misinformation appears in a number de la Vega's other tricks:

> The eighth trick [of the syndicate of the bears] is the following: it is of importance to spread a piece of news which has been invented by the speculators themselves, they have a letter written and [arrange to have] the letter dropped as if by chance at the right spot. The finder believes himself to possess a treasure, whereas he has really received a letter of Uriah which will lead him into ruin. On his own initiative, he makes known the contents of the letter to his coterie and points out the reasons which will move the syndicate to sell when it receives news of this kind. And if a storm breaks out on the Exchange that very day, the news seems thus to be confirmed, the suspicion ratified, and the apprehensions explained ...
>
> Ninthly, the syndicate encourages a friend whose judgment is esteemed, whose connections are respected, and who has never dealt in shares, to sell one or two lots of stock while the risk of loss is borne by the group. The notion [lying behind this manoeuvre] is the belief that anything new attracts attention, and that therefore the decision of this person [to sell stocks] will produce astonishment and will have important consequences ...
>
> The tenth trick [of the syndicate] is to whisper into the ear of an intimate friend (but loud enough to be heard by those who lie in wait for it) that he should sell if he wants to make money ... 'the stones speak', says the prophet, and 'the walls have ears', says the proverb; and our conspirators know this truth to be verified by experience. If their secret spreads, their advice [seems to have met] with approval, and [when] it becomes obvious that they sell blocks of stock, the walls and the stones do [appear] to talk; people seek the secret reasons of the [whispered] assertions; one is grateful for the hint: and, as cheating a close friend is thought impossible, the manoeuvre meets with success, the fish take the bait, the net becomes filled, the victory is celebrated, and the intention of the ring is very advantageously achieved.

Though the spreading of false rumours may seem to be an obvious dodge for those engaged in market manipulation, the actual process of getting misinformation into a market which was, undoubtedly, sensitized to the possibility was problematic. It appears that there were various avenues and techniques used to spread misinformation.

Another insightful technique of market manipulation involved impacting the supply of money available for lending in securities trading:

> Fourthly, at the beginning of a campaign, the syndicate borrows all the money available at the Exchange and makes it apparent that it wishes to buy shares with this money. Afterwards, however, large sales are executed. Thus two birds are killed with one stone. First, the Exchange is supposed to believe that the original plan is altered because of important news; secondly, the bulls are prevented from finding money for hypothecating their shares. They are, therefore, compelled to sell, since they do not have the money to take up the stock [or else fall into the trap described as the seventh stratagem] ...

Once the supply of loanable funds is obtained, a further step in the manipulation is permitted:

> The seventh stratagem is to recognize that the bulls are in need of shares to survive the siege; and so [the bears] give them money. Then [the bears] sell the hypothecated shares again and, with the difference between what they receive on the sales and what they loan on the shares, they are able to engage in further call and put operations.
>
> This is a devilish trick, since, as it were, immortality is promised and death is given. It seems as if the bears give life to the bulls by lending them money [when they hypothecate] the stocks which the latter have bought; [but the ring turns around and sells these shares, so that the bulls have] to buy again the stocks which they had hypothecated ...
>
> Although the bears lack shares, they do not blush to create the appearance of an abundance. The shares change hands, often fifty times in one week, rising and falling like balls [in a game], but this changing of hands is indicative only of the ruin of the business in shares ... What meaning does it have that the bears buy one share, when, protected by their alliance, they sell ten shares? What does it mean when they take over the hypothecated shares in order to pass them out again immediately? How can one suppress anxiety [about this situation] and how can one avoid lamentations? ... Would scholars consider incorrect [a statement to the effect] that I cannot regard the purchase of one share a [bona fide] purchase when four are sold simultaneously, that I cannot consider a [bona fide] taking-up of one share [any transaction which entails that] ten shares be delivered simultaneously? ...

The statement regarding 'the difference between what they receive on the sales and what they loan on the shares, they are able to engage in further put and call operations' has puzzled both the English and German translators of the original text, that was written in Spanish. The English translator provides the exact translation from the Spanish but footnotes: 'the German translator believes that de la Vega made here a double mistake: he should have written "money" instead of "shares" in the first sentence, and he should have seen that the reference to put and call operations introduces an unnecessary, somewhat irrelevant idea'. But is this interpretation correct?

In opposition to the views of the translators, it is difficult to believe that de la Vega was so far off base. The fifth and sixth tricks refer to put and call operations:

> The fifth stratagem [of the syndicate] consists in selling the largest possible quantity of call options in order [apparently by the absorption of available loan funds] to bring pressure on the payers of premiums to sell the stocks if they exercise their right to call.
>
> The sixth stratagem is to enter into as many put contracts as possible, until the receivers of the premiums [assumed to be bulls] do not dare to buy more stock [on their own initiative]. [Their hands will be largely tied] because they are already obliged to take the stock [covered by the put premiums, if requested so to do]. Therefore the speculation for a decline has free course and is an almost sure success. We say of those who buy by means of a forward call contract and sell at a fixed [future] term or of those who sell by means of a put contract and buy at a fixed [future] term that they shift the course of their speculation. But as [the course chosen] may turn out to be the wrong [line of] speculation and the right way can thus be missed, [such a shift] is rarely made.

Option dealings in the 17th and 18th centuries were often used as vehicles to manipulate prices. To make reference to the put and call operations as irrelevant to the seventh trick seems misplaced. The key is to observe that put and call operations were not pure gambles but, rather, were tied to transactions in underlying securities that had to be settled at the following *rescontre*.

The last of de la Vega's tricks, the eleventh and twelfth, are somewhat distinct from the others. The eleventh trick is predicated on a subtle understanding of the structure of dealer operations. By the late 17th century, trading of VOC shares on the Amsterdam bourse involved sophisticated dealer operations, profiting from bid/offer trading, option conversions, and so on. These dealers also made markets in Dutch government securities. Dealers typically operate on limited capital, using borrowed funds to finance the bulk of their security positions. A squeeze on dealer capital induced by trading in VOC shares leaves dealers exposed to extension of the bear operation into other markets:

> Eleventhly, the Contremine [i.e., the syndicate] carries out the following trick in order to reach its aim: they are not content to wound their enemies with their tongue, which Jeremiah compares to an arrow, and to fight them with their teeth ... and with arguments. In order to insinuate that their own concern is founded on grave considerations and does not refer exclusively to the situation of the Company, the bears sell government obligations. Thus the bulls are to be made to believe that discord is dominating the state and that

> there is a reason to be alarmed about and to pay attention to a possible outbreak of war ... This recourse to selling long and short-term state obligations may seem to be of but small importance for the business [in stocks], but whoever thinks so is in error ... Our speculators [i.e. the bulls] are paralysed in their stock dealings, and are bled by their engagements [to protect the market] in state bonds, [all because of a trumped-up allegation of a] situation perilous to the country, dangers threatening the Company, and a breakdown of the share market.

The description of the eleventh trick correctly grafts misinformation into the strategy. If the dealers were able to recognize the implications of the bear ring activities, the dealers could take offsetting actions, such as raising more capital and not undertaking the unprofitable security positions.

The twelfth trick is described as 'one of the most powerful available stratagems for influencing the wavering elements'. This trick continues the theme of misinformation:

> Finally, the ring practices a twelfth manoeuvre. In order to be well-informed about the tendency of the market, even the bears [before launching their big operation] begin with purchases and take all items [offered]. If the shares rise in price, they pocket the quick profit; if the prices fall, however, they sell at a loss, content to have ascertained the weakening tendency. Moreover, the interest which the timid public takes in their proceedings is already useful to them, since the public thinks that conditions must be serious when the speculator sell at a loss. This is one of the most powerful available stratagems for influencing the wavering elements. If [the timid souls] see the bears buy, they do not know whether the latter buy in order to sell later (which in the Exchange language means to 'look for powder'), or whether they buy because they have changed their opinion or given up their position and therefore really want to buy. If the Contremine decides upon this dissimulation, they offer for the stocks more than the price of the day (what we call 'inflating' the price). They influence the price in this way in order to sell [short] at the higher figure and thus to gain in the end. God with one breath breathed life into Adam, whereas the bears take the life of many people by inflating the price [of the shares] ...

This trick reinforces the position that manipulations are predicated on using misinformation to induce other traders to take positions that, in some way, benefit the trickster. The twelfth trick correctly observes that a significant number of traders are influenced by observations of actual trading activity. Rumours, not reflected in cash trading, can only influence other traders so far.

Other Accounts of Market Manipulation

At the time of the Glorious Revolution, the use of derivative securities to manipulate cash market prices was well understood in Amsterdam. Not surprisingly, these techniques appear to have been carried over to England and applied to the burgeoning securities market of the early 1690s. In the 13 July, 1694 edition of *A Collection...*, Houghton provides the following account of a market manipulation involving options:

> 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 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 favoured vehicle for manipulating security prices; hence, the emergence of the 'villanous' practice of stockjobbing. Judging from the vitriol on this subject, the restriction to forward trading was not effective.

Public suspicions about market manipulation were not restricted to the market for joint stocks. And, not all manipulations were done to produce profits for the manipulators. Sir Thomas Gresham is a case in point. Gresham was a staunch proponent of the view that the international money markets were controlled by a cabal of continental bankers.[3] This view was an important underpinning for Gresham expending a vast amount of personal wealth on the building of the Royal Exchange in London, in order to provide English merchants with a trading venue that was not dependent on the market in Antwerp. Gresham was, himself, a proponent of manipulating the international money markets to further the interests of the British crown. Gresham's manipulation was a complicated sequence of transactions designed to create 'a corner in the money market (in Antwerp) available for purchase of bills on London'.

Gresham's manipulation was tried for the first time in October 1552, again in May 1553, and in other years, including 1556, 1559, 1560 and 1561. The general aspects of the scheme have been listed by Buckley (1924, p.597):

> (1) The merchants ship at least 40,000 or 50,000 cloths and kerseys.
> (2) The plan must be kept secret, and nothing done till all the cloths are waterborne.
> (3) A note to be taken from the Customer's book, of exactly what is shipped and 'who be the great doers'.
> (4) Send for the heads of the Company (of Merchant Adventurers) and demand 20 shillings sterling on every cloth, this sum to be paid in Antwerp at the rate of 25 shillings Flemish to the pound sterling and repaid in London at Double Usance.
> (5) They must not be allowed to bring this price down in the bargaining below 22 shillings or as much more as the exchange may be in Lombard Street when the money is paid, since Gresham 'would in no wise have them accustomed to make a profit at Her Majesty's hands'.
> (6) They must be bound to pay in permission money, as the Queen is bound to pay her debts. This is not to be mentioned till the rate is agreed![4]
> (7) This bargain, he says, will 'raise the Exchange to an honest price. As for example; the exchange in King Edward's time, when I began this practice, was but 16 shill. Did I not raise it to 23 shill., and pay his whole debt at 20 shill. and 22 shill. —— whereby wool fell in price from 26 sh. 8d. to 16 shill., and cloths from £60 a pack to £40 and £35 a pack with all other of our commodities and foreigners'; whereby a number of clothiers gave over the making of cloths and kerseys; wherein there was no man touched but the merchant, for to serve the Prince's turn; which appeared to the face of the world that they were great losers, but to the contrary, when things were brought to perfection, they were great gainers thereby'.

The key role played by secrecy in this manipulation cannot be understated, as with the costs of the scheme that were imposed upon merchants. Gresham sought to offset these costs by working to strengthen the monopoly privileges of the Merchant Adventurers, for example, in the attack on the Hansard merchants operating in England at the 'Steelyard'.

The success of Gresham's manipulation is a subject of debate. Gresham certainly found value in the scheme, as did the royal decision makers who took refuge in the scheme when government finances dictated. Though explicitly recognizing the impact of the adverse exchange movements on merchant activities, Gresham was reluctant to admit that this was, on balance, negative, if only because the higher exchange also reduced the cost of raw material imports as well as

increasing costs of manufactured exports. There is also debate about whether Gresham was as successful in moving the exchange as he claimed.

Tulipmania: The Historical Context[5]

Together with the South Sea Bubble and the Mississippi scheme, the tulipmania is considered to be a classic example of a speculative mania. Even though the tulipmania has some decidedly different characteristics, the modern identification of these three events for special attention is likely due to the modern resurrection of Mackay (1852). In particular, the tulipmania was not a financial crisis. The commodity of interest in the mania, tulip bulbs, had rather unique characteristics, such as uncertainty as to quantity, quality and even storability. The main point of interest to the history of financial economics was the apparent abuse of forward contracting procedures by uninformed speculators unconnected to the actual tulip trade. There is strong evidence that this speculative trade did temporarily disrupt pricing in the cash market where unexplainable price increases were observed.

For an event that has received such substantial attention from modern economists, the Dutch tulipmania of 1634-1637 has been surprisingly misrepresented. Malkiel (1985, pp.29-32), for example, makes the following comments:

> The instruments that enabled tulip speculators to get the most for their money were 'call options' similar to those popular today in the stock market. A call option conferred on the holder the right to buy tulip bulbs (call for their delivery) at a fixed price (usually approximating the current market price) during a specified period. He was charged an amount called the option premium, which might run from 15 to 20 percent of the current market price. An option on a tulip bulb currently worth 100 guilders, for example, would costs the buyer only about 20 guilders. If the price moved up to 200 guilders, the option holder would exercise the right; he would buy at 100 and simultaneously sell at the then current price of 200. He then had a profit of 80 guilders (the 100 guilders' appreciation less the 20 guilders he paid for the option).
>
> As happens in all speculative crazes, eventually prices had been high for so long that some people decided they would be prudent and sell their bulbs.
>
> And what of those who had sold out early in the game? In the end, they too were engulfed by the tulip craze. For the final chapter of this bizarre story is

> that the shock generated by the boom and collapse led to a prolonged depression in Holland. No one was spared.

Malkiel also relates an anecdote about a sailor unknowingly eating an expensive tulip bulb thinking it was an onion.[6] Though more detailed, elements of Malkiel's discussion can be found in numerous modern references to the tulipmania.

The reference to call option trading during the tulipmania, which appears in numerous modern sources, is difficult to support.[7] There is considerable evidence that forward contracts were the method used in trading for future delivery during the tulipmania. Malkiel (1985, p.352) claims: 'My discussions of the tulip-bulb craze ... rely heavily on Mackay's description'. However, Mackay makes numerous references to 'bargains', which was a conventional reference to forward contracting. Mackay (1852, p.95) describes a typical trade:

> Confidence was destroyed, and a universal panic seized upon dealers. *A* had agreed to purchase ten *Semper Augustines* from *B*, at four thousand florins each, at six weeks after signing the contract. *B* was ready with the flowers at the appointed time; but the price had fallen to three or four hundred florins, and *A* refused either to pay the difference or receive the tulips.

Malkiel (1985, p.31) also seems confused on the point, making the statement that: 'Dealers went bankrupt and refused to honour their commitments to buy tulip bulbs'. This problem would only be a problem if put options were being traded, not call options.

What actually did happen during the tulipmania? Garber (1989, 1990a) and Posthumus (1929) are modern sources that detail the events and market activities. Prior to these studies, information about the tulipmania could be derived from various sources. Due to the attention given by modern sources such as Malkiel (1985), Mackay (1852) has received considerable credit for chronicling the event. Similar treatments of the tulipmania are reflected in other sources from this period, such as Francis (1850) and Wirth (1858). Garber correctly observes that much of Mackay's relatively brief discussion is plagiarized from Beckmann (1846). The most essential primary source for Beckmann was the Gaergoedt and Waermondt (1637) (GW) dialogues, that are a series of three pamphlets, written in dialogue form by a now anonymous author.[8] An English translation of key parts of the GW dialogues is contained in Posthumus (1929).

The tulip was first imported into Europe from Turkey. Early reports have tulips in eastern Europe during the 1550s. By the later part of the

16th century the tulip had appeared in the northern Netherlands. The tulip trade expanded quite rapidly, being centred around Haarlem where, even today, the tulip fields extend north and south for forty or more miles. Though it is possible to propagate tulips from seed to flowering bulb over a seven to twelve year cycle, the primary method of propagation is from bulbs. During a growing season, that goes from September to June, the bulb that was planted will be propagated into a new bulb, a clone of the first. If all goes well, the new primary bulb will also have some additional buds, outgrowths referred to as excrescences. By this process of propagation, it was possible to increase the tulip stock of normal bulbs 'at a maximum annual rate of from 100 to 150 percent'.

Trade in tulips is done with bulbs. In certain cases, excrescences can also be traded but this is riskier. The outgrowth has to be separated from the motherbulb and, depending on size, can take from 1 to 3 years to flower. An additional risk with excrescences is that growing into a flowering bulb is not certain. Two general categories of bulbs can be distinguished based on an important quality difference between various bulbs. 'Pound goods' are run-of-the-mill bulbs that were sold by weight (pounds or thousand *azen*), by the bed, or by the garden.[9] 'Piece goods' are the rarer varieties of tulips that are sold by the bulb. Heavier bulbs would have more outgrowths and would, as a consequence, be more expensive. Because the propagation process produces clones, a rare bulb would eventually become common as more bulbs were produced from the original bulb.

The process of creating rare bulbs created an additional source of uncertainty. The rare bulbs originate from 'breaking', the invasion of the bulb by a virus that produces unique colouring patterns on the flowers. Though it is now recognized that the virus is spread by aphids, this was not known in the 17th century and there was considerable mystery about the breaking process. What was known is that breaking could not be replicated with seed propagation, only bulbs retained the unique colour pattern. Because breaking is due to a disease, 'broken' bulbs had generally lower propagation rates and, possibly, could fail to survive entirely. Because heavier bulbs were more likely to have a larger number of excrescences, a heavy bulb with a unique and valued colour pattern would be a very unusual commodity. It was these bulbs that commanded seemingly outrageous prices.

Bulbs can safely be removed from beds in June, but had to be replanted by September. Conventional practice in the cash market for tulips was to trade physical bulbs during the summer. In addition to

cash market trading, forward trading was also common (Posthumus 1929, p.439):

> It often happened that the price was not fixed in money; the most heterogeneous lot of goods was accepted in payment, such as cows, fruit, wine, yards of cloth, clothes, silver dishes, horses and carriages, land, houses, shops, and paintings. The usual condition was for these various goods to be delivered at once, often long before the bulb had been taken out of the ground.

In effect, the tulip trade was conducted using forward contracting methods that were common practice in agricultural areas, albeit adapted to the special features of the tulip. However, a new type of 'bulb trading' appeared during the tulipmania that was, decidedly, unconventional.

The tulipmania was precipitated by the entrance, around the end of 1634, of purely speculative buyers into the tulip market (Posthumus 1929, pp.438-40):

> People who had no connection with bulbgrowing began to buy after (early 1634). Among these were weavers, spinners, cobblers, bakers, and other small tradespeople, who had no knowledge whatsoever of the subject. About the end of 1634 ... the trade in tulips began to be general, and in the following months the non-professional element increased rapidly. Rumours about rising prices paid for tulips in Paris and the North of France accelerated the movement. New ways of selling were organized ... Towards the boom in 1636 ... buyers of bulbs often knew that the seller possessed none; so they did not pay or deliver their goods till they were certain the tulip would really come into their possession. At the height of business most transactions took place without any basis in goods. The trade in (forward positions) had degenerated into the purest gamble, the seller selling bulbs he did not have against a counter value, mostly money at this period, which the buyer did not possess. Each succeeding buyer tried to sell his ware for higher prices; and, in the general excitement, one could make a profit —— at least on paper —— of several thousand florins in a few days. The craze spread rapidly with these high profits. All classes of population ended by taking part in it —— intellectuals, the middle classes, and the labourers.

GW trace the collapse to 3 February, 1637. By the end of February 1637, there was widespread default on forward contracts. After a short period of political and legal wrangling, the bulk of contracts outstanding at the time of the collapse were voided on the basis of 'appeals to Frederick'. Where payments of differences were made, these payments were almost always in the 1-5% range of the actual losses.

What did the price of tulips do during the tulipmania? Drawing primarily on GW, Garber (1989, 1990a) provides detailed information on certain extreme price movements during the speculative updraft in prices. Yet, the bulbs examined by Garber are selective. GW report the following prices for the period from 1635 to early 1637:

> To mention a few out of so many, just as you know the lion by its claw. A plant Gheele en Root van Leyden of 515 aces had been sold in the first instance for 46 gld., and then for 515 gld.; a Gouda of 4 aces first for 20 gld., later for 225 gld.; and Admirael de Man of 130 aces first for 15 gld., then for 175 gld.; a Generalissimo of 10 aces first for 95 gld., and then for 900 gld.; and so on with the other plants. This only lasted for a month or six weeks; then they started selling by the thousand ace and by the pound. A pound yellow Croonen could be bought first for 20 or 24 gld.; in a month's time it was 1,200 gld. and over. A pound of Switzers first cost 60 gld., later 1,800 gld. A pound of White Croonen first cost 125 gld., later 3600 gld. ...

GW report similar price behaviour for various other bulbs. Garber (1989) has evidence from a small sample of bulbs indicating that, as is common in speculative frenzies, there was a steep increase in prices in the last couple of months prior to the collapse. In any event, the price increases reflect the temporary social obsession that speculating in tulip bulbs had in Holland

The claim about widespread options trading during the tulipmania is puzzling, especially as there is a fairly detailed record of the types of contracts used. The tulip trade during the mania period was conducted using a number of different methods, from the 'promises and vouchers' of the most speculative and uninformed traders, to the formal notarized written contracts of tulip dealers. GW provide numerous examples of the text of contracts. Some are quite basic, such as: 'Sold to N.N. a quarter of Witte Kroonen for the sum of 525 gld. when the delivery takes place; and four cows at once, which may be now taken from the stable and led to the seller's house.' A more detailed example for the sale of a piece good is:

> I, the undersigned, acknowledge to have bought from N.N., on conditions hereunder mentioned, one Gouda of 48 aces standing planted in N.N.'s garden, for the sum of 520 gld. in sterling. But in case 8 days after the notifying, the buyer were not to come to take the bulb, the seller may take it out of the ground, in the presence of two praiseworthy persons, and seal it in a box. And if a fortnight after this, the bulb has not been fetched by the buyer, the seller may sell it anew. If he gets more for it, the first buyer will not profit by it, and, when less, has to pay the difference. In case of any obscurity or

> misunderstanding or dispute arising out of this transaction, it will remain with two praiseworthy people, who know these things and who live in the place or town, where this transaction has taken place. And by default of payment of the aforesaid sum, I hereby engage all my goods, movable and immovable, submitting same in the power of all rights and magistrates; all this without arch or cunning. Have signed this. Act in Haarlem on December 12th, 1636.

Perhaps some speculative fringe players in the tulipmania engaged in pure gambles that were configured as options transactions. However, such deals, if any were ever done, were only obscure incidents in the tulipmania.[10] Evidence for such dealings is not available in important primary sources, such as GW, or in key secondary sources.

What lessons can be drawn from the tulipmania? Aside from the obvious observations about the social and economic consequences of the mania, there are the fundamental insights about the relationship between forward contracting and the underlying commodity being traded.[11] The mania was largely driven by the excesses induced by forward trading by uninformed speculators. Significantly, because the forward contracts were traded on bulbs that were in the ground, the underlying commodity had elements of *non-storability*. Insofar as there was an insufficient supply of unplanted bulbs available for purchase during the period from October until June, there was no possibility of doing cash-and-carry arbitrages either for piece goods or pound goods. This permitted the forward price to be determined, almost exclusively, by the uninformed speculators who dominated the tulip trade between 1635 and 1637.

Tulipmania: The Modern View

The tulipmania of 1634-1637 in Holland is often cited as a classic example of a 'speculative bubble', though Garber (1989, 1990a) has recently attempted to challenge the conventional wisdom. Garber bases his position on two, somewhat incongruent, claims. The first claim (1989, pp.557-8) speaks to a general epistemological point about using observed data to sustain theoretical claims:

> the impossibility of distinguishing empirically between hypotheses that asset price dynamics are driven by a rational speculative bubble and that researchers have not adequately measured the future market fundamentals anticipated by market participants. More generally, data will not distinguish between a claim that market participants suffer from some mania because behaviour does not conform to the prediction of some researcher's theory and a claim that the

> theory is flawed or misspecified. Because of this observational equivalence, economists who take a position in the debate over the existence of bubbles are making a commitment that cannot be based on the analysis of experience.

While academically interesting, this claim speaks more to the difficulty of theoretical modelling than to whether there was a tulipmania. The inability of theoretical models to verify whether a mania happened or not does not mean that a mania did not occur. Precisely what type of evidence Garber requires to verify the occurrence of a mania is unclear. 'A mania by any other name is still a mania'.

Garber's other claim is that there is insufficient evidence to support the hypothesis that there was a tulipmania:

> While lack of data precludes a solid conclusion, the results of the study indicate that the bulb speculation was not obvious madness, at least for most of the 1634-7 'mania'. Only the last month of the speculation for common bulbs remains as a potential bubble, although the nature of the market, the contractual commitments, and the surrounding events are unclear enough that one could seriously embrace one side of the fundamentals versus bubbles dispute only on the basis of strong prior beliefs.

Garber bases this claim on an apparently detailed analysis of the empirical evidence. After a useful review of previous studies on the tulipmania, the institutional structure of the tulip market is examined and the price performance of various types of tulips over long time periods presented. From an examination of the long time period price data Garber concludes that: 'the magnitude of prices for valuable bulbs and their patterns of decline are not out of line with later prices for new varieties of rare bulbs'. Garber also indicates 'the absence of descriptions of economic distress in accounts of the period not engaged in antispeculative moralizing'.

Is Garber correct about the tulipmania? Has a 350 year old myth been exposed? Garber starts from an appropriate point by examining the previous literature. However, the crux of Garber's empirical argument is that observed prices for rare tulip bulbs, so-called 'piece goods', were consistent with typical market pricing for this type of bulb. This conclusion is based largely on a comparison of the rate of price depreciation of selected piece goods prices over three periods: from the peak of the mania in February 1637 until 1642; and for 1707-1722 and 1722-39, neither of the 18th century periods being associated with a tulip speculation or crash. Observing that the average piece goods depreciation rate of 32% for the 17th century period was

comparable to a 28.5% average for the two 18th century periods, Garber concludes: 'the crash of February 1637 for rare bulbs was not of extraordinary magnitude and did not greatly affect the normal time series pattern of rare bulb prices'.

Garber also applies the same empirical approach, based on comparison of price depreciation rates, to the price behaviour of common bulbs, so-called 'pound goods'. Oddly enough, Garber finds inexplicable price behaviour for pound goods during a one month period in early 1637. This is attributed to specifics such as 'the nature of the market, the contractual commitments, and the surrounding events'. As the mania gained steam and increasing numbers of uninformed speculators were gathered to the trade, the cumbersome trading method of using notarized contracts became problematic. In particular, these pound good prices were generated by an unusual type of trading arrangement known as the 'colleges' that was introduced in 1636. There were many such colleges, which met in public houses 'where the speculators also ate and drank' (Posthumus 1929, p.440). Garber (1989, p.557) concludes: 'It is clear that the colleges generated these prices (for common bulbs), although they are echoed in some written contracts ... These markets consisted of a collection of people without net worth making ever-increasing numbers of "million-dollar bets" with each other with some knowledge that the state would not enforce the contracts'

There is considerable ground to cover in order to debunk Garber's somewhat incongruent dual hypotheses: that the tulipmania was not a real mania; and that it is impossible, based on an examination of empirical evidence, to sustain any conclusion about speculative manias, in general, and the tulipmania, in particular. Evaluating whether the tulipmania qualifies to be called a 'mania' or, to use a modern expression, a speculative bubble, is complicated by the limited amount of data available. That there is insufficient evidence about an event that happened over 350 years ago is not surprising. As Garber recognizes, both piece goods and pound goods prices suffer from a number of practical limitations. For example: 'With the end of large-scale bulb trading after February 1637, records of transactions prices virtually disappeared.' The 1642 prices that Garber uses were obtained from the records of a single sample of purchases later revealed at a 1643 estate auction.

Despite this paucity of data, Garber chooses to ignore empirical evidence that would seem to support the possibility of a mania. Like a good prosecutor, Garber highlights those facts that support a

conviction, leaving facts that favour the defence for presentation by the defence attorney. In particular, while the information about depreciation rates is interesting, isn't the main issue concerned with the inexplicably rapid increase in prices for a wide range of bulbs? GW provide numerous instances of bulb price increases from 20 gld to 225 gld or from 95 gld to 900 gld, values that can, apparently, be justified in terms of Garber's depreciation analysis, leaving the tenfold increase still unexplained. GW indicate that these prices are for actual bulbs, not from trading in the colleges. As such, Garber's depreciation analysis ignores the empirical evidence that is at the core of the mania: the inexplicably rapid and irrational increase, and subsequent collapse, in prices during the early part of 1637. The key issue is not whether the ultimate level attained by prices can, somehow, be explained but, rather, it is the process by which prices were determined that is at issue. In the absence of convincing evidence to the contrary, it is difficult to provide a more plausible explanation for the tulipmania than the explanation that the event was, in essence, a mania.

Cantillon on Manias and Manipulation

The widespread social use of joint stocks for speculation was an important precondition to the South Sea Bubble. On the subject of manias versus manipulation, Richard Cantillon (1685?-1734) provided an important source of support for the market manipulation perspective.

Cantillon was a successful, if somewhat unscrupulous, banker whose contribution to the development of political economy was overlooked for many years, being rediscovered years later by W. Stanley Jevons (1881). Based on his assessment of Cantillon's contribution to both the theory of value and monetary economics, Jevons refers to the *Essai* as 'the Cradle of Political Economy'. Though he never directly addresses the causes of the South Sea Bubble, the *Essai sur la Nature du Commerce* (1725?, published 1755) was written during the period of the worst excesses. Based on what Cantillon did offer, it is apparent that the *Essai* is decidedly in favour of manipulation as a necessary factor in observed irrational pricing behaviour.

Like the early reckoning masters and other important contributors to early financial economics such as Chuquet, de Witt and de Moivre, Cantillon drew on his commercial experiences to motivate his analysis.[12] In Chap. VIII, Part III of the *Essai* Cantillon provides a significant insight into early issue bank operations in the government debt market (p.323):

> If the Bank alone raises the price of public debt stock by buying it, it will by so much depress it when it resells to cancel its excess issue of notes. But it always happens that many people wishing to follow the Agents of the Bank in their operations help to keep up the price. Some of them get caught for want of understanding these operations, in which there enter infinite refinements or rather trickery ...

Perhaps Cantillon was familiar with de la Vega's twelve tricks?

Having recognized the important role of participation in the markets by uninformed traders, Cantillon goes on to observe (p.323):

> It is then undoubted that 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.

This statement appears as a veiled generality, in close proximity to a discussion about the manipulative debt market actions of a bank of issue. Precisely what situation Cantillon was referring to is not immediately identifiable, though strong suppositions can be made.

In particular, Cantillon continues with the following statement: 'if some panic or unforeseen crisis drove the holders (of banknotes) to demand silver from the Bank the bomb would burst and it would be seen that these are dangerous operations'. In this connection, it is likely that Cantillon was making reference to the collapse of John Law's system in France, though it is possible that he was describing the role the Bank of England may have played in the South Sea Bubble. In any event, he is recognizing the potential for the directors of some bank of issue, with the acquiesence of the government, of engaging in debt market manipulation for their own self-enrichment. This accusation could be applied to either the South Sea Bubble or the Mississippi scheme.[13]

The Joint Stock Bubbles

Though the South Sea Bubble occurred at around the same time as the Mississippi scheme and, almost certainly, was influenced by the events in France, the details of the two events are substantively different. The legacy of the South Sea Bubble is comprised of two not independent parts. One part of the bubble legacy is concerned with the market

manipulations arising from the use of South Sea Company stock for conversion of government debt (Neal 1990a). In a four month period between April and August of 1720, the manipulations led to apparently irrational price behaviour involving an increase of approximately ten times in the value of South Seas Company stock, followed by an almost equally precipitous price fall in the following month. Those taken in by the fraud involved a wide range of British society, including the King and the Prince of Wales.

The second part of the bubble legacy is concerned with the associated run up and collapse in prices for almost all other joint stock issues, especially for the spate of new joint stock issues that took place around that time. Many of these new issues were 'hopelessly ill-conceived, and some downright fraudulent' (Morgan and Thomas 1962, p.37). It is estimated that in the period between September 1719 and August of 1720, 190 new issues were brought to market. Share purchases, both of South Sea stock and in other joint stocks, were facilitated by widespread use of speculative buying with little or no margin. Positions in stock were often taken with the purely speculative objective of closing out the position prior to settlement date on the loan.

It is tempting to attribute the South Sea Bubble to the degree of asymmetric information present in early 18th century security markets, for example, Baskin (1988). Appropriate financial accounts were not available to the investing public, creating a situation where investors where heavily reliant on entrenched management's vision of the future prospects of the firm. Consider the first money subscription of £2,250,000 at a price of £300 for a share of South Sea stock. A week later the Company authorized loans against stock and announced a half yearly dividend of 10%, where 3% had been expected based on Company payouts prior to the start of the conversion. Investors did not have sufficient information to determine whether the dividend increase was sustainable, based on actual company cash flows.

To what extent did accounting play a role in the early stock market bubbles? Even though the technique of double entry bookkeeping was well developed and disseminated by this time, basic concepts of accounting were not widely understood (Yamey 1949, p.111):

> The evidence is largely against the view that the merchants of the period required anything more from their ledgers and journals than a clear and ready record of transactions for easy reference, and descriptive details of their cash, merchandise, and other assets sold ... This conclusion is not surprising. The majority of merchants were probably so intimately concerned with the details of their own business affairs that they did not need elaborate accounting

> calculations to inform them of the size of their fortunes or to acquaint them of the results of their enterprise, that accounting data would be necessary to supply him, however imperfectly and inadequately, with information he would otherwise not possess, and which he would require in the 'rationalistic pursuit' of profit. Accounting techniques ... do not seem to have been designed to meet requirements of this order.

The ability to commit frauds was enhanced by the lack of information to investors. However, the execution of the fraud depended on the desire of politicians to profit from their office. Because the conversion of government debt was involved, important individuals within the government would almost certainly have been privy to the actual condition of the Company's accounts.

For a company with limited potential of income from profitable trading prospects, it is difficult to understand how reasonable individuals were duped into believing that there was some panacea, some magic potion, sustaining the price of South Seas stock. At £300, where the primary asset is government stock paying 4%, the current yield is 1⅓%, hardly attractive to a government debt holder with a security that promised to pay 6% and more, even if those payments were temporarily suspended and the principal may be redeemable. All this speaks to the ability of projectors and manipulators to give the appearance of events being much different than reason would suggest.

Manipulation, Mania or Institutional Failure?

Institutional failure is the slippery slope of the 'new rationality'. If this argument is invoked, it is an admission that an irrational security market outcome was observed. However, rationality can still be sustained by claiming that market participants operated rationally but were guided to an irrational outcome by the institutional framework that was, somehow, defective. For example, Neal (1990a, p.53) uses an institutional failure argument to explain the South Sea Bubble:

> The South Sea Bubble should be viewed not simply as a wild mania or as a massive swindle. These played a role, but the driving force in the bubble was the technical problem of converting government war debts that were predominately short-term, high interest, and difficult to trade into easy-to-exchange, low interest, long-term securities. All parties —— the government, the public, and the South Sea Company —— could gain from such a conversion by sharing the benefits of increased liquidity. Earlier conversions had been successful, but the bubble was created because the South Sea Company overreached itself and promised more than it could deliver to all the interested

> parties. Part of the rise in share prices was justified by the benefits of increased liquidity. However, the Company's machinations to meet its commitments could not succeed and provoked a financial crisis. This popped the bubble and delivered the Company into the hands of its archrival, the Bank of England.

From this, it would appear that the 'driving force' behind the South Sea Bubble was a 'technical problem' that caused the South Sea directors to make 'promises' that 'overreached' the potential gains.

As illustrated by Capie (1990), attempting to rescue the rationality hypothesis by attributing events of observed irrationality to institutional failure raises a wide range of difficult questions. For example: 'What was it that encouraged people to exchange the asset they had for another, at the prices recorded? Were they duped —— that is, given false or inadequate information? Was there a remarkable innovation? Or were they just plain silly, that is to say, irrational?' Most investors were, almost certainly, attracted by the potential for significant capital gains. This is rational. Yet, the information upon which the expectation of capital gain was predicated was fundamentally unsound, to the point of being irrational. 'Prices have doubled in the past month so they will have to double in the next month'.

Writing from the 'old school' perspective, Capie (1990, p.65) provides a reasoned view of the attempts to use rationality to explain events such as the South Sea Bubble and the tulipmania:

> History can be thought of as society's memory. If it is fuzzy or inaccurate we may be condemned to relive it. There does seem to be a danger that the application of some recent developments in economics, such as extreme versions of the rational expectations approach, are in danger of depriving us of manias, panics, crashes, and even modest booms and slumps. This may not be helpful in terms of society's memory. But perhaps a certain amount of this is a matter of semantics or emphasis. Those who argue that it is rational to buy when prices are rising if the expectation is that prices will keep rising sound entirely reasonable. Those who say it is folly are surely simply shifting the emphasis to the fact that we do not know when the terminal condition, that is the change in fashion or whatever, will come. To describe all of these episodes as rational surely stretches the definition of rationality to an unhelpful extent.

Along this line, explanations pointing to institutional failure can be seen as an apology for rationality. Absent 'technical problems' investors would have acted to produce security prices that conformed to 'rational expectations'.

A central but implicit assumption underpinning the modern theory of rational bubbles is that there is an identifiable generating process for asset prices, for example, Evans (1991). Classical empirical tests for speculative bubbles involve a null hypothesis about the 'true' model generating prices. Whether this scientific approach produces informative conclusions depends on a wide range of issues, including the power of the statistical tests to reject the null hypotheses. Yet, the appearance of scientific validity can obscure certain basic observations. For example, what motivates a well-to-do gentlemen, or not-so-well-to-do tradesman, to risk several times their personal wealth trading pieces of paper that represent claims against income and assets that, at best, they only vaguely understand?

Manias have roots that stretch beyond the narrow focus of the specific event. Such events are not limited to 17th and 18th century financial events. Consider the pictures of a miles long line of aspiring gold miners trudging from Skagway, Alaska through the deep snow, up the steep mountain slopes, to reach the Klondike. Surely, these individuals knew that the prospects of making a gold strike were remote, at best. It is difficult to ascribe much in the way of rational motives to such activities. To risk life and limb, in inhospitable terrain, seeking a goal that almost all the gold miners had no possibility or capability of achieving is difficult to rationalize. Such events transcend the specific event, speaking instead to the social fabric of the time. Arguably, this is the case with the speculative manias of the 17th and 18th centuries.

Allowing for the possibility of irrational manias does not mean that such events are regular events. Quite the opposite, such events are quite singular. The proximate causes will differ, sometimes considerably, from mania to mania. In some cases, the mania is orchestrated by a group of projectors seeking to profit from market manipulation. This theme can be found in both the South Sea Bubble and, in modern times, in the Hunt silver manipulation of the early 1980s. In other cases, the mania is driven by misconceptions of market participants. This theme can be found in the both the tulipmania and, in modern times, in the stock market mania of October 1987 that was driven by institutional selling programmes aimed at achieving dynamic replication of option outcomes. Though market manipulation is often an underlying factor in market manias, market manipulation is neither a necessary or sufficient condition for a mania to occur.

Economic science strives to attain a rational explanation for singular events. Such is the case with market manias. Similarly, economic

science has typically failed to systematically address the various facets of market manipulation. In and of itself, market manipulation is not an undesirable activity. What is undesirable are the cases where the manipulation is aimed at obtaining fraudulent gains. However, just as there is wide variation in possible manipulative techniques, there is also variation in both initial motivations and ultimate objectives. In certain cases, the manipulation is aimed at a gain that is, arguably, socially beneficial. Gresham manipulated the bill of exchange market in Antwerp for the benefit of the British crown. John Law manipulated the market for Mississippi Company shares to support refunding of the French government debt. In the latter case, the manipulation produced disastrous results, but that does not undermine the positive social objectives of the scheme.

Appendix: 'The Bubble', Jonathan Swift (1721)

A number of English writers of literary fame made passing contributions to the history of financial economics. Included among these contributions are Samuel Pepys's musings in his *Diary* about the coffeehouse in Exchange Alley and Daniel Defoe, author of *Robinson Crusoe*, contributing tracts such as *The Villany of Stock-Jobbers detected*. Generally, these contributions are descriptive or polemical, with little seminal analytical content.

One of the literary giants of 18th century English literature, best-known for the biting satire of *Gulliver's Travels* (1726), Jonathan Swift (1667-1745) also made a passing effort at capturing one of the important financial events of his time, the South Sea Bubble. This effort, a poem, was sent by Swift to a friend, Charles Ford, with instructions to have the poem published. The covering letter attached to the original manuscript is dated Dec. 15, 1720. The original manuscript bore no title, though the title 'The Bubble' was inserted, presumably by Ford, when the poem was first published in January of 1721 (Williams 1937, pp.248-50).

The Bubble

Ye wise Philosophers explain
What Magick makes our Money rise
When dropt into the Southern Main
Or do these Juglers cheat our Eyes? (1)

Put in Your Money fairly told;
Presto be gone —— Tis here ag'en
Ladyes and Gentlemen, behold,
Here's ev'ry Piece as big as ten. (2)

This in a Basin drop a Shilling
Then fill the Vessel to the Brim,
You shall observe as you are filling
The pond'rous Metal seems to swim; (3)

It rises both in Bulk and Height,
Behold it mounting to the Top,
The liquid Medium cheats your Sight,
Behold it swelling like a Sop.

In Stock three hundred thousand Pounds;
I have in view a Lord's Estate,
My Mannors all contig'ous round,
A Coach and Six, and serv'd in Plate: (5)

Thus deluded Bankrupt raves,
Puts all upon a desp'rate Bett,
Then plunges in the *Southern* Waves,
Dipt over head and Ears —— in Debt.

So, by a Calenture misled,
The Mariner with Rapture sees
On the smooth Ocean's azure Bed
Enamell'd Fields, and verdant Trees;

With eager Hast he longs to rove
In that fantastick Scene, and thinks
It must be some enchanted Grove,
And in he leaps, and down he sinks.

Rais'd up on Hope's aspiring Plumes,
The young Advent'rer o'er the Deep
An Eagle's Flight and State assumes,
And scorns the middle Way to keep:

On *Paper* Wings he takes his Flight,
With *Wax* the *Father* bound them fast,
The *Wax* is melted by the Height,

And down the towring Boy is cast: (10)

A Moralist might here explain
The Rashness of the *Cretan* Youth,
Describe his Fall into the Main,
And from a Fable form a Truth:

His *Wings* are his *Paternall Rent*,
He melts his *Wax* at ev'ry Flame,
His Credit sunk, his Money spent,
In Southern *Seas he leaves his Name.*

Inform us, You that best can tell,
Why in yon dang'rous Gulph profound
Where hundreds and where thousands fell,
Fools chiefly float, the *Wise* are drown'd.

So I have seen from *Severn's* Brink
A Flock of *Geese* jump down together,
Swim where the Bird of Jove would sink,
And swimming never wet a Feather.

But I affirm, 'tis false in Fact,
Directors better know their Tools,
We see the Nation's Credit crackt,
Each Knave hath made a thousand Fools. (15)

One Fool may from another win,
And then get off with Money stor'd,
But if a *Sharper* once comes in,
He throws at all, and sweeps the Board.

As Fishes on each other prey
The great ones swall'wing up the small
So fares it in the *Southern* Sea
But Whale *Directors* eat up all.

When *Stock* is high they come between,
Making by second hand their Offers,
Their cunning retire unseen,
With each a Million in his Coffers.

So when upon a Moon-shine Night
As Ass was drinking at a Stream,
A Cloud arose and stopt the Light,
By intercepting ev'ry Beam;

The Day of Judgment will be soon,
Cryes out a Sage among the Croud,
An Ass hath swallow'd up the Moon,
The Moon lay safe behind the Cloud. (20)

Each poor *Subscriber* to the Sea
Sinks down at once, and there he lyes,
Directors fall as well as they,
Their Fall is but a Trick to rise:

So Fishes rising from the Main
Can soar on moistned Wings on high,
The Moysture dry'd they sink again,
And dip their Fins again to fly.

Undone at Pley, the Femal Troops
Come here their Losses to retrieve,
Ride o'er the Waves in spacious Hoops,
Like *Lapland* Witches in a Sieve:

Thus *Venus* to the Sea descends
As Poets fein; but where's the Moral?
It shews the Queen of Love intends
To search the Deep for Pearl and Coral.

The Sea is richer than the Land,
I heard it from my Grannam's Mouth,
Which now I clearly understand,
For by the Sea she meant the *South*. (25)

Thus by *Directors* we are told,
Pray Gentlemen, believe your Eyes,
Our Ocean's coverd o'er with Gold,
Look round about how thick it lyes:

We, Gentlemen, are Your Assisters,
We'll come and hold you by the Chin,
Alas! all is not Gold that glisters;

Ten thousand sunk by leaping in.

Oh! would these Patriots by so kind
Here in the Deep to *wash their Hands*,
Then like *Pactolus* we should find
The Sea indeed had *golden Sands*.

A Shilling in the *Bath* You fling,
The Silver takes a nobler Hue,
By Magick Virtue in the Spring,
And seems a Guinnea to your View:

But as a Guinnea will not pass
At Market for a Farthing more
Shewn through a multiplying Glass
Than what it allways did before;

So cast it in the *Southern* Seas,
And view it through a *Jobber's* Bill,
Put on what Spectacles You please,
You Guinnea's but a Guinnea still.

One Night a Fool into a Brook
Thus from a Hillock looking down,
The *Golden* Stars for Guinneas took,
And *Silver Cynthia* for a Crown;

The Point he could no longer doubt,
He ran, he leapt into the Flood,
There sprawl'd a while, at last got out,
All cover'd o'er with Slime and Mud.

Upon the Water cast thy Bread
And after many Days thou'lt find it,
But Gold upon this Ocean spred
Shall sink, and leave no mark behind it.

There is a Gulph where thousands fell,
Here all bold Advent'rers came,
A narrow Sound, though deep as Hell,
CHANGE-ALLY is the dreadfull Name;

Nine times a day it ebbs and flows,
Yet He that on the Surface lyes
Without a Pilot seldom knows
The Time it falls, or when 'twill rise.

Subscribers here by thousands float,
And justle one another down,
Each padling in his leaky Boat,
And here they fish for Gold and drown:

Now bury'd in the Depth below
Now mounted up to Heav'n again,
They reel and stagger too and fro,
At their Wits end like drunken Men.

Mean time secure on Garr'way Clifts
A savage Race by Shipwrecks fed,
Ly waiting for the foundred Skiffs,
And strip the Bodyes of the Dead.

But these, you say, are factious Lyes
From some malicious Tory's Brain,
For, where Directors get a Prize,
The *Swiss* and *Dutch* whole Millions drain. (40)

Thus when by Rooks a Lord is ply'd,
Some Cully often wins a Bett
By vent'ring on the cheating Side,
Tho not into the Secret let.

While some build Castles in the Air,
Directors build 'em in the Seas;
Subscribers plainly see 'um there,
For Fools will see as Wise men please.

Thus oft by Mariners are shown,
Unless the Men of *Kent* are Ly'rs,
Earld Godwin's Castles overflown,
And Castle roofs, and Steeple Spires.

Mark where the Sly *Directors* creep,
Nor to the Shore approach too nigh,
The Monsters nestle in the Deep

To seise you in your passing by:

Then, like the Dogs of *Nile* by wise,
Who taught by Instinct how to shun
The Crocodile that lurking lyes,
Run as they drink and drink and run.

Antaeus could by Magick Charms
Recover Strength whene'er he fell,
Alcides held him in his Arms,
And sent him *up in Air* to Hell.

Directors thrown into the Sea
Recover Strength and Vigor there,
But may be tam'd another way,
Suspended for a while in Air.

Directors; for tis you I warn,
By long Experience we have found
What Planet rul'd when you were born;
We see you never can be drown'd:

Beware, nor over-bulky grow,
Nor come within your Cullyes Reach,
For if the Sea should sink so low
To leave you dry upon the Beach,

You'll ow Your Ruin to you Bulk;
Your Foes already waiting stand
To tear you like a foundred Hilk
While you ly helpless on the Sand:

Thus when a Whale hath lost the Tide
The Coasters crown to seise the Spoyl,
The Monster into Parts divide,
And strip the Bones, and melt the Oyl.

Oh may some *Western* Tempest sweep
These *Locusts* whom our Fruits have fed,
That Plague, *Directors*, to the Deep,
Driv'n from the *South*-Sea to the *Red*.

May He whom Nature's Laws obey,
Who *lifts* the Poor, and *sinks* the Proud,
Quiet the Raging of the Sea,
And Still the Madness of the Crowd.

But never shall our isle have Rest
Till those devouring *Swine* run down,
(The Devils leaving the Possess't)
And headlong in the Waters drown.

The Nation too late will find
Computing all their Cost and Trouble,
Directors Promises but Wind,
South-Sea at best a mighty BUBBLE. (55)

What is to be learned from Swift's poem on the South Sea Bubble? Swift, though well educated for his time, was not an expert on financial affairs.[14] Though Swift's inspiration for the poem is not certain, it may have been inspired by the frustrations his close friends had in their South Sea dealings, for example, Williams (1958, p.250). Whatever the case, 'The Bubble' reflects widely held public views about the bubble. At least three general points of current interest can be identified: the perceived role of the Directors of the South Sea Company; the lack of sophistication exhibited by public investors, expressed in the 'Madness of the Crowd' mania that was founded on a 'Castle's in the Air' view of South Sea prospects; and, the animosity toward market practices, such as leveraged purchases, and toward specific market participants seen to be gaining from the mania, the jobbers in 'Change-Ally' and 'Swiss and Dutch' foreign investors.

In addition to themes of interest in the early history of financial economics, 'The Bubble' also contains numerous satirical threads that are woven into Swift's later opus, *Gulliver's Travels* (1726). In particular, Part III of *Gulliver's Travels* is set in Laputa, an island in the sky, populated by 'a Race of Mortals so singular in their Shapes, Habits, and Countenances. Their Heads were all reclined to the Right, or the Left; one of their Eyes turned inward, and the other directly up to the Zenith'. This island in the sky is populated by people who are parodies of scientists and absent-minded philosophers. Part III is centrally concerned with condemning the ascendancy of abstract scientific values, associated with the Age of Reason, at the expense of traditional religious values, and the associated morality and ethics. In Spanish, 'la puta' means 'whore', likely a reference to Martin Luther's reference to 'that Great Whore, Reason'.

Turning to the text of 'The Bubble', the first sentence reveals an early reference to the animosity towards 'Philosophers' that was to play such an important role in *Gulliver's Travels*.[15] The second stanza reflects the animosity toward market practices, maintaining that prices were determined by magic to increase tenfold. In stanza 6, Swift demonstrates an appreciation for the risks involved in the use of debt for financing security positions. The reference to 'Puts all upon a desp'rate Bett' perpetuates the belief that stock trading is only gambling. Stanzas 8-11 propose, in somewhat veiled terms, that the basis of the South Sea speculation was a fiction. Stanza twelve recognizes the, possibly closely felt, loss of family fortunes to leveraged involvement in this speculation. In stanza 15 Swift proposes that the Directors of the South Sea Company are behind the deception, 'Each knave hath made a thousand Fools'.

In stanzas 17-34 Swift sets about describing the manipulative trading practices of the Directors and the stockjobbers, 'Their Fall is but a Trick to rise'. Stanzas 35-7 focus directly on the role of stockjobbers, 'CHANGE-ALLY is the dreadfull Name'. In a vicious attack on the ethics of stockjobbers, stanza 39 states: 'Mean time secure on Garr'way Clifts/ A savage Race by Shipwrecks fed,/ Ly waiting for the foundred Skiffs,/ And strip the Bodyes of the Dead.' Stanza 40 makes a reference to the commonly held view that most of the profits were made by foreigners, 'The Swiss and Dutch whole Millions drain'. Stanza 42 contains another reference that finds a prominent place in *Gulliver's Travels*, 'While some build Castles in the Air'.

Stanzas 44-55 are concerned primarily with the Directors. Stanza 44 identifies the Directors of the South Sea Company as being primary instigators of the bubble: 'The Monsters nestle in the Deep/ To seise you in your passing by'. Yet, Swift recognizes that the Director's too large profits from the scheme are going to be their undoing, their foes are waiting to get them: 'To tear you like a foundred Hulk/ While you ly helpless on the Sand'. The poem ends with a plea that the Directors be brought to justice. This plea was heartfelt and germane as it was not until the summer of 1721, with the report of the Committee of Enquiry into activities surrounding the South Sea Bubble, that those primarily responsible for the financial debacle were finally penalized.

Notes

1. Though Friedman is often 'credited' with an extreme position on the impossibility of 'destabilizing speculation', for example, Kindleberger (1989, p.30): 'Milton Friedman ... has claimed ... there can be no destabilizing speculation'. Close reading of Friedman, for example, (1953, pp.174-6), reveals that Friedman only denies the possibility of 'persistently destabilizing' speculation.

2. Garber (1989, pp.538-9) provides numerous references to modern studies modelling bubbles, fads, manias and panics. 'Major conferences and journal volumes are now devoted to the study of how crowd psychology affects asset prices'.

3. De Roover (1949, pp.218-9) observes: 'Gresham fully believed that the bankers ruled the exchange and made it high or low as it pleased them. He certainly had an exaggerated opinion of his own and others' ability to manipulate the exchange rates, and we should not accept at face value all the claims which he advanced in his reports to the government ... Although Gresham did not accomplish as much as he claimed, one should not conclude that his boasts were all humbug and that his manoeuvres did not yield results. A careful examination of the facts seems to warrant the conclusion that he deserves credit for paying off the foreign debt at a higher rate than would have been possible without his manipulation of the money market'.

4. Coinage in Gresham's time was subject to debasements and other manipulations, phenomena which were not restricted to England. In Flanders, 'the prevalence of bad money led the Flemings to devise as a remedy the official valuation of certain coins, which were designated as "Permission" or "Valued" money. It was customary to stipulate the payment of bills of exchange and repayment of loans in permission money' (Buckley 1924, p.590). Permission money almost always sold at a premium, particularly at fair time.

5. Early sources on the tulipmania, such as Francis (1850) and Mackay (1852), refer to the 'tulipomania'.

6. The source of this anecdote is Mackay. Garber (1989, p.540, n.12) casts considerable doubt on the validity of Mackay's account.

7. Reinach (1961) is another source which provides a detailed account of option trading during the tulipmania. Yet, no primary or secondary sources are referenced on this point, or on any point, as Reinach (1961) is devoid of references.

8. Waermondt and Gaergoedt translate loosely as True-Mouth and Greedy-Goods. The dialogue format was popular in the 16th and 17th centuries. This approach was used in a number of other important financial works of this period, such as de la Vega (1688) and Wilson (1572). As for the primary literature, Posthumus (1929, p.436) reports that: 'At least fifty booklets written by defenders and opponents were published, as well as a great number of prints and caricatures'. Posthumus states that the best source of information is the GW dialogues.

9. The *aas* or *ace* (plural *azen*) is a Dutch unit of weight which equals about 1/20 of a gram.

10. The basic mechanics of tulip production argue against widespread option trading for those directly involved in the tulip trade. Tulip growers wanted to sell bulbs for future delivery. Due to potential and actual limitations in the supply of bulbs, other potential market participants were not in a position to quote call option prices from created hedged positions.

11. There is little support for Malkiel's point about the devastating economic consequences of the mania. Though there were a few traders who lost large downpayments which had been made, most of the contracts resulting from the crash were either cancelled or settled with nominal payments. Posthumus (1929, p.448) concludes that 'socially the losses had been very small. The growers had been affected most of all by the crisis, having grown and sold their bulbs, without getting any money in return'.

12. Like de Moivre and Chuquet, Richard Cantillon was also the subject of plagiarism, in this case by a relative Phillipe Cantillon (Jevons 1881). The theme of plagiarism also occurred with Kersseboom and Struyck, both accusing the other.

13. In the case of the South Sea Company, it was the Sword Blade Bank, rather than the Bank of England which acted as a conduit for the extension of credit fuelling margin buying of South Sea shares.

14. In addition to 'The Bubble', Swift made other useful contributions to the history of economic thought. In particular, Swift had numerous other references to financial matters in his various works, for example, Dickson (1967). These scattered contributions include a 1728 pamphlet on economic conditions in Ireland, where Swift observed that, at some point, an increase in the excise tax rate would lower the total revenue received from the tax. For this insight, Swift has also been given 'some small credit for developing the Laffer curve' (Bartlett 1992).

15. In Swift's time, the term 'philosophers' took a more general meaning than the narrow modern usage. Instead of the narrow meaning of 'philosophers' as those who study philosophy, in Swift's time philosophers were 'men of science'. In Swift's usage, Isaac Newton would be a philosopher.