

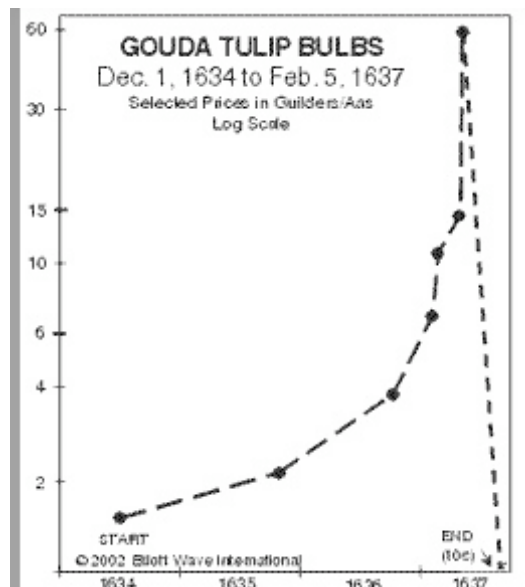
Case study: Tulip Mania

Tulips were introduced in Holland in the 1590s. Apparently, the growing conditions are perfect there. They quickly became the fourth largest export behind gin, herring, and cheese. Rich deep colors in flowers were unknown in Europe at the time. A virus struck the Tulip crop and created "breathtaking" patterns in the flowers. This is before they had the internet.

Demand for the flowers increased and prices began to rise, especially for the more exotic patterned flowers. Tulips became a status symbol and an example of Thorstein Veblen's "conspicuous consumption." Owning one proves your worth and demonstrates your wealth since they were very expensive. It wasn't long before merchants tried to control the market in bulbs by preordering shipments before the harvest and holding bulbs off the market. Both were an attempt to monopolize the market and hence fix prices in order to earn large profits.

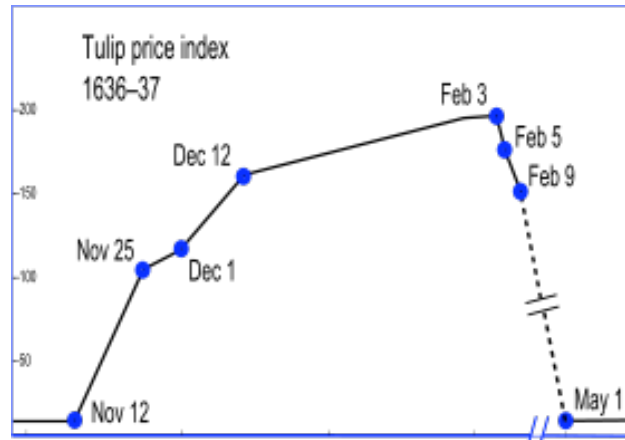
Agents began buying and selling futures contracts on the price of tulips. Eventually, tulip options were traded allowing people to trade in fractions of a bulb. This helped poorer investors get around a "denomination" problem; a poor investor couldn't afford a whole bulb but could afford a fraction of one. At the peak of "tulip mania" a single rare bulb cost 10 times the average workman's annual wage!!!! Some took out loans and second mortgages and began selling other assets, e.g., land, to invest in tulips. The price of bulbs and contracts in bulbs began to increase dramatically. A wealthy merchant could invest \$1000 in bulbs and then resell them shortly for \$20,000. This buying frenzy began to drive the market. Diaries indicate that many buyers of futures contracts never even saw a bulb and some didn't even know what a bulb was!

The following graph depicts the price bubble starting in 1634.



Earl Thompson (2007) argued that the cause of the bubble was a lull in the Thirty Year's War and a change in contracts where a buyer of a futures contract didn't have to actually buy the tulips. Instead they could compensate the seller of the contract with a

nominal fee, e.g., about 3.5% of the option price, if they didn't take receipt of the actual bulbs. Thompson provided the following price information for the collapse of the bubble.



(Source: Figure 1, Thompson (2007))

The Dutch government stepped in to reduce the bubble, Feb 2, 1637 by starting to regulate tulip sales. Merchants decide to "take profit" and began selling in volume. Because tulips were so valuable, more bulbs were planted as prices were rising and this dramatically increased the supply. Of course, an increase in supply would put downward pressure on prices even before the harvest. Why? Because agents could figure out the harvest was large and begin trading in futures contracts that reflected this.

Price peaked and the bubble begins to burst in February. Panic begins and the price crashes. In fact, tulip prices fell 90% in six weeks. The market collapsed as the price began to fall. Everyone wanted to sell bulbs and no one wanted to buy. Eventually, owners of bulbs in the spring of 1637 couldn't sell their bulbs at even a fraction of their purchase price. Dutch courts ruled contracts could not be enforced if a payment of 3.5% of the price was paid. This provided only minor relief and only relief to buyers not sellers.

An increase in the money supply accompanied the bubble in 1636. This provided easy credit for those who wanted to get into the market. Buyers could borrow at low rates to buy bulbs. (Data – there was a dramatic increase in bank deposits at the Bank of Amsterdam) There is anecdotal evidence that the crash caused an economic downturn. Credit dried up, banks cut back, and this led to manufacturers laying off workers in the major cities.

Thompson argues that prices for futures contracts moved in an efficient manner and that "tulip mania" is not an example of *irrational* buying leading to an inefficient market. According to him, the market was actually surprisingly efficient because the prices of the contracts followed a pattern implied by the supply and demand conditions. He argued that this is actually evidence of an efficient market.

Of course, price reflecting the supply and demand conditions of the market does not necessarily imply the market was efficient according to the Efficient Market Hypothesis. Agents acquire an asset for a particular reason involving the fundamentals of the asset under that hypothesis, i.e., the income stream the asset will produce. Thompson doesn't explain why there was such an increase in demand for tulips, which are not really a productive asset like a factory or a farm. At best, one could buy part of a tulip and then

sell at a profit if the price increased. Second, the fact that many people were buying these futures contracts without even knowing what a tulip was is somewhat disconcerting. Finally, many became highly leveraged to buy the contracts. An expansionary monetary policy providing cheap credit fueled this process and in fact accommodated it. A collapse can magnify the negative shock to the economy when the asset is highly leveraged as borrowers face intense pressure to repay the loans.