

# Lecture 2

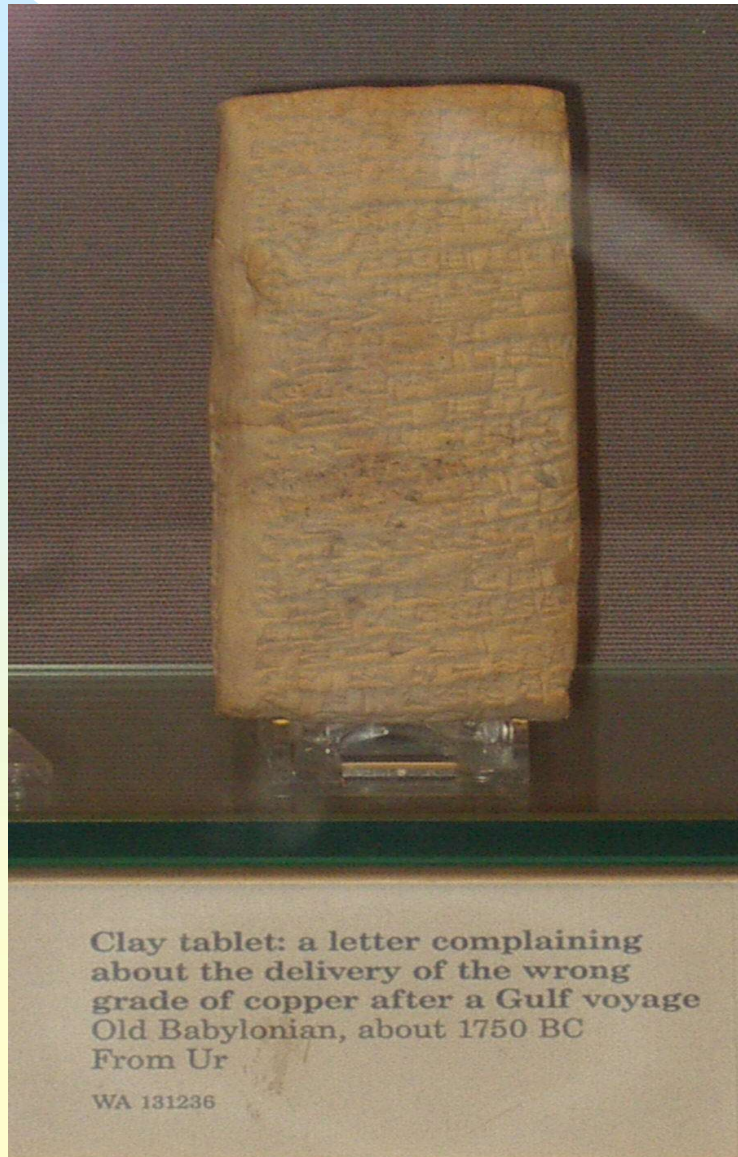
## History of Derivative Securities

- The Earliest Markets
- Aristotle on Option Contracts
- Religion and the Bill of Exchange Contract
- Antwerp and the 'Free Standing Derivative'
- Amsterdam and *Rescontre* Settlement
- Futures Contracts and the Japanese Rice Market

# The Earliest Markets

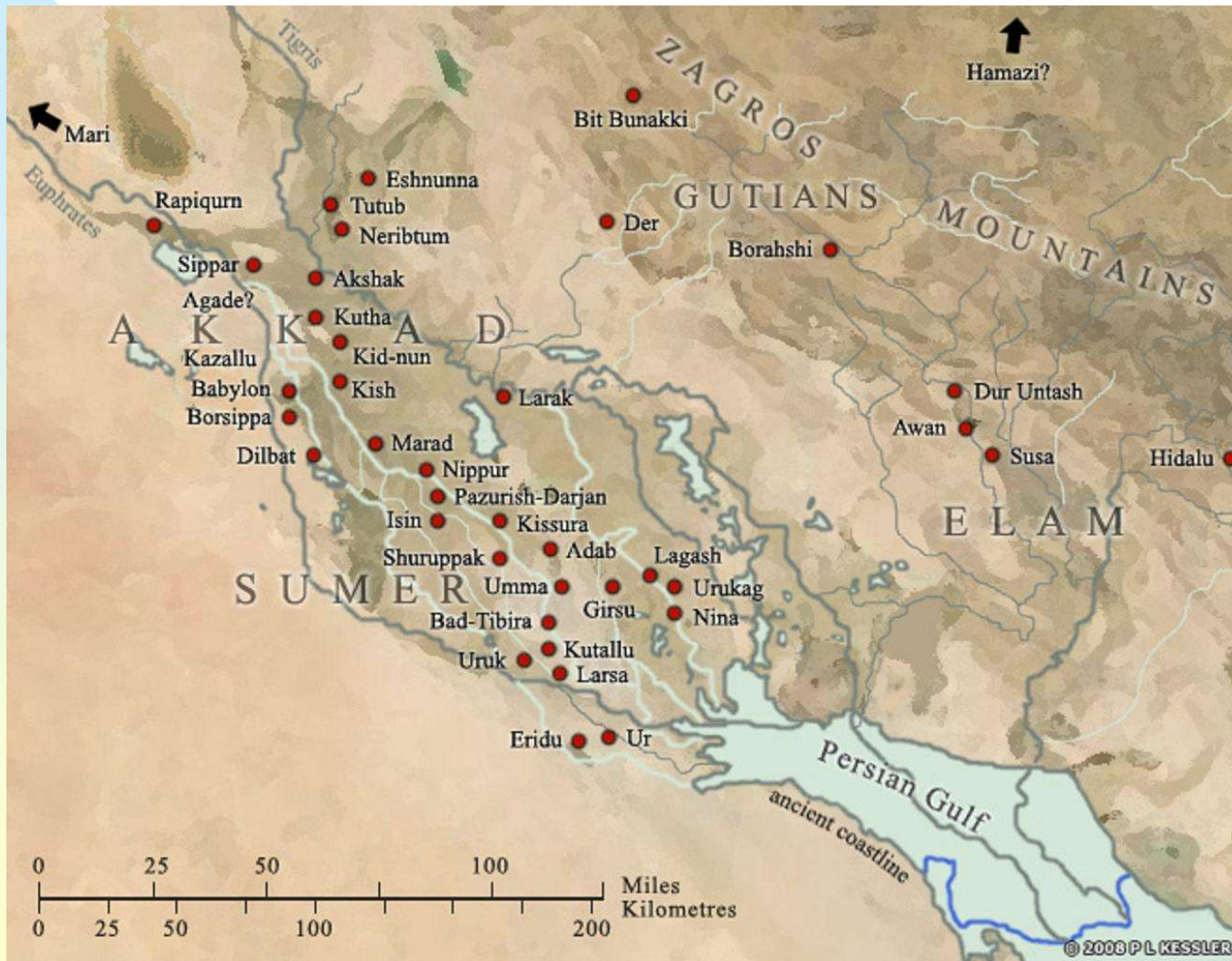
- Reading: Chapter 9, *Early History* (see also the time line)
- An essential feature of options, futures and forward contracts, the free standing derivative securities, is the action of setting a price today for a transaction to take place at a date in the future.
- In ancient markets, travel and transport was difficult and trading on samples was conventional, resulting in contracts for sale having embedded derivative securities (and possible delivery failures) → need to have option features if sample if not adequate.

# Ancient Mesopotamia



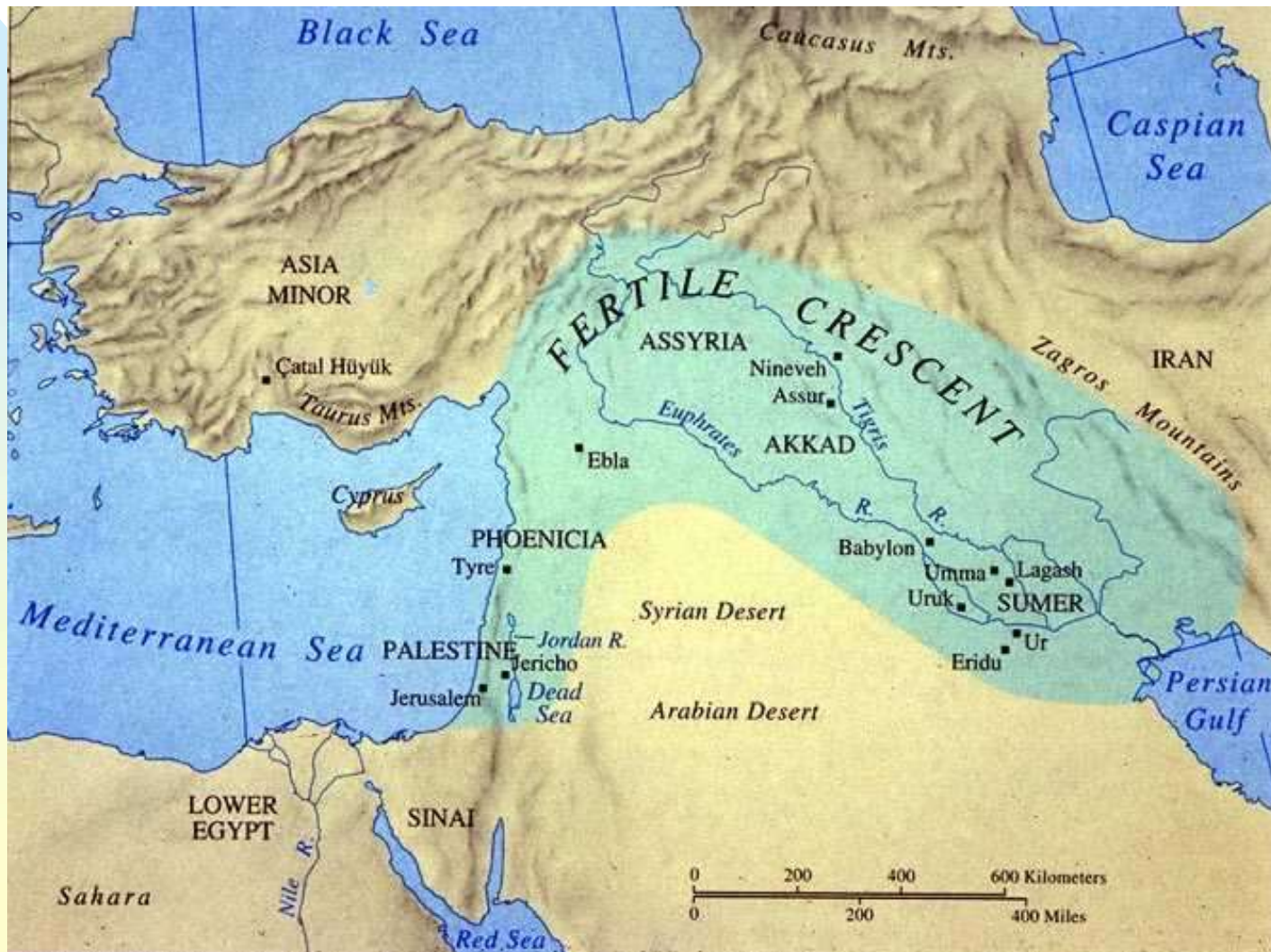
- A cuneiform tablet representing the earliest written language – concerned with a delivery failure
- Code of Hammurabi had laws relevant to use of ‘bills of exchange’ – if payment was in different ‘currency’ than initial loan the bill would embed a forward FX transaction

# Cities of Ancient Mesopotamia





# Map of Ancient Mesopotamia



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# Stele of the Code of Hammurabi



- Stele was discovered at a dig in Elam (not Babylon)
- 'Eye for an Eye'
- Stele is currently located in the Louvre in Paris

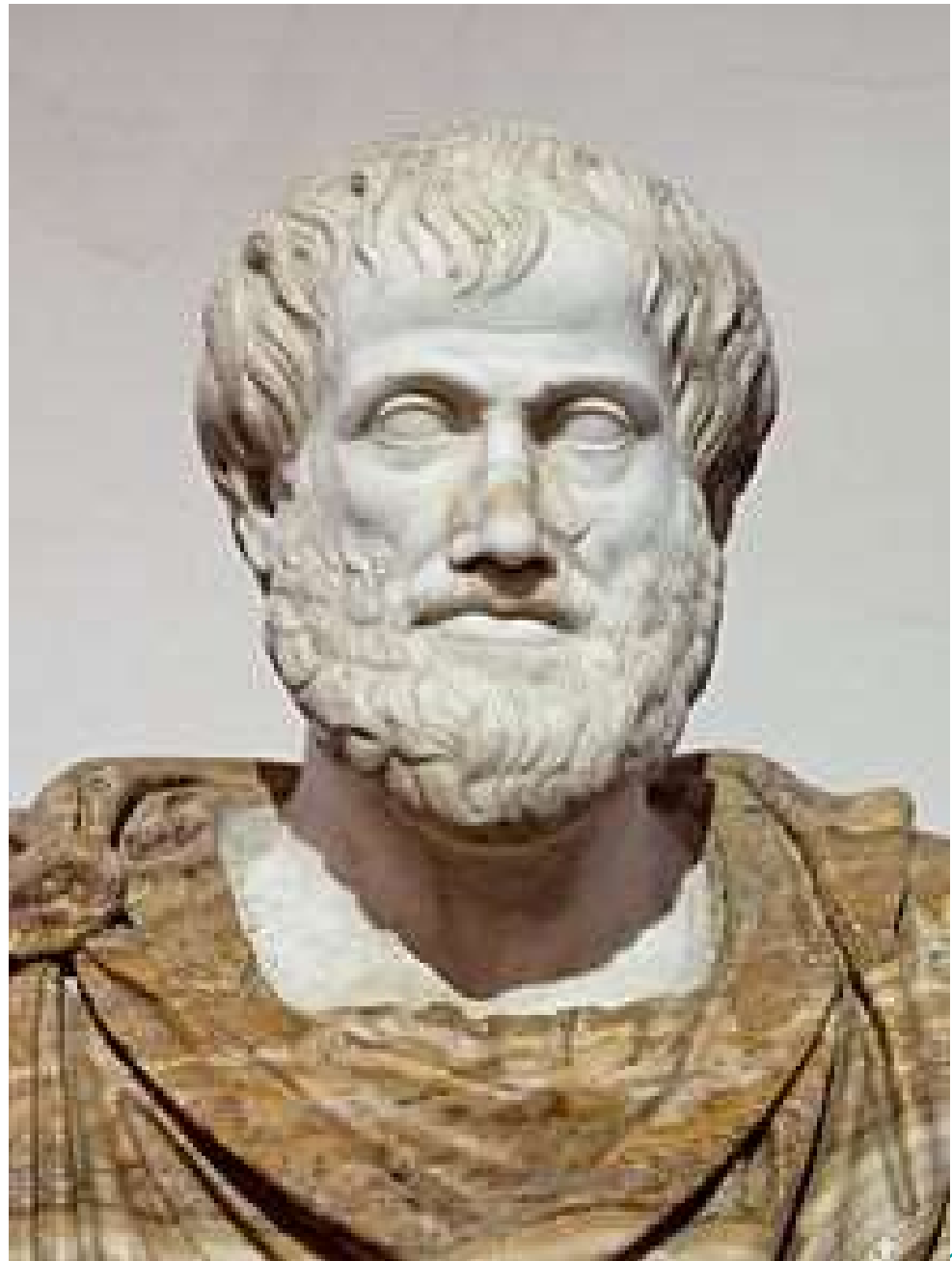
# Aristotle on Options Trading

- During the Greek civilization, options trading was an accepted type of commercial transaction. Aristotle in his *Politics* provides a reference to the use of options involving the philosopher Thales.
- According to Aristotle, being a careful observer of local olive growing conditions, Thales was able to forecast that the coming year's olive crop in Miletus would be much larger than normal. He then proceeded to take options on the use of all available olive presses in the surrounding area for the harvest season. When the bumper crop materialized, Thales was able to lease the presses at a substantial premium thereby making a considerable fortune.
- Aristotle maintained that to consider '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'

**A Roman marble bust of Aristotle (384-322 BC) based on a Greek bronze bust circa 330BC – located at Rome Coliseum**

**Aristotle is acknowledged as a tutor for Alexander the Great (356-323 BC)**

**Aristotelian philosophy was an important influence on the medieval scholastics**





# The Dark Ages, Christianity and the Scholastics

- Reading: Chap. 3, *Early History*
- The Dark Ages were the European period often identified with the time from collapse of the Western Roman Empire to the Renaissance
  - Vague term, sometimes referred to as the Middle Ages or medieval period, sometimes a shorter period from the 5<sup>th</sup> C. to the first Crusade (1096-99) is used
- Medieval Christianity dominated the cultural, political and economic landscape
  - Scholastic doctrine (scholasticism) – an evolving body of precepts -- provided rules governing Christian behavior

# St. Thomas Aquinas – the most famous Scholastic



- St. Thomas Aquinas (1225-1274)
- Scholastic doctrine evolved over time with contributions reaching to the 16<sup>th</sup> century
- Scholasticism evolved into natural law philosophy

# Scholastic Doctrine and Derivative Securities

- Doctrine on risk, gambling, exchange (just price) and usury relevant are relevant to contracts with embedded derivative securities
- Justice, not profit, was the basis of scholastic doctrine on economic relations
- Usury prohibition was important in the making commercial borrowing transactions and FX
  - Embedding a forward FX transaction in a loan via a bill of exchange introduced risk making the loan licit

# Scholastic Usury Doctrine and the Bill of Exchange

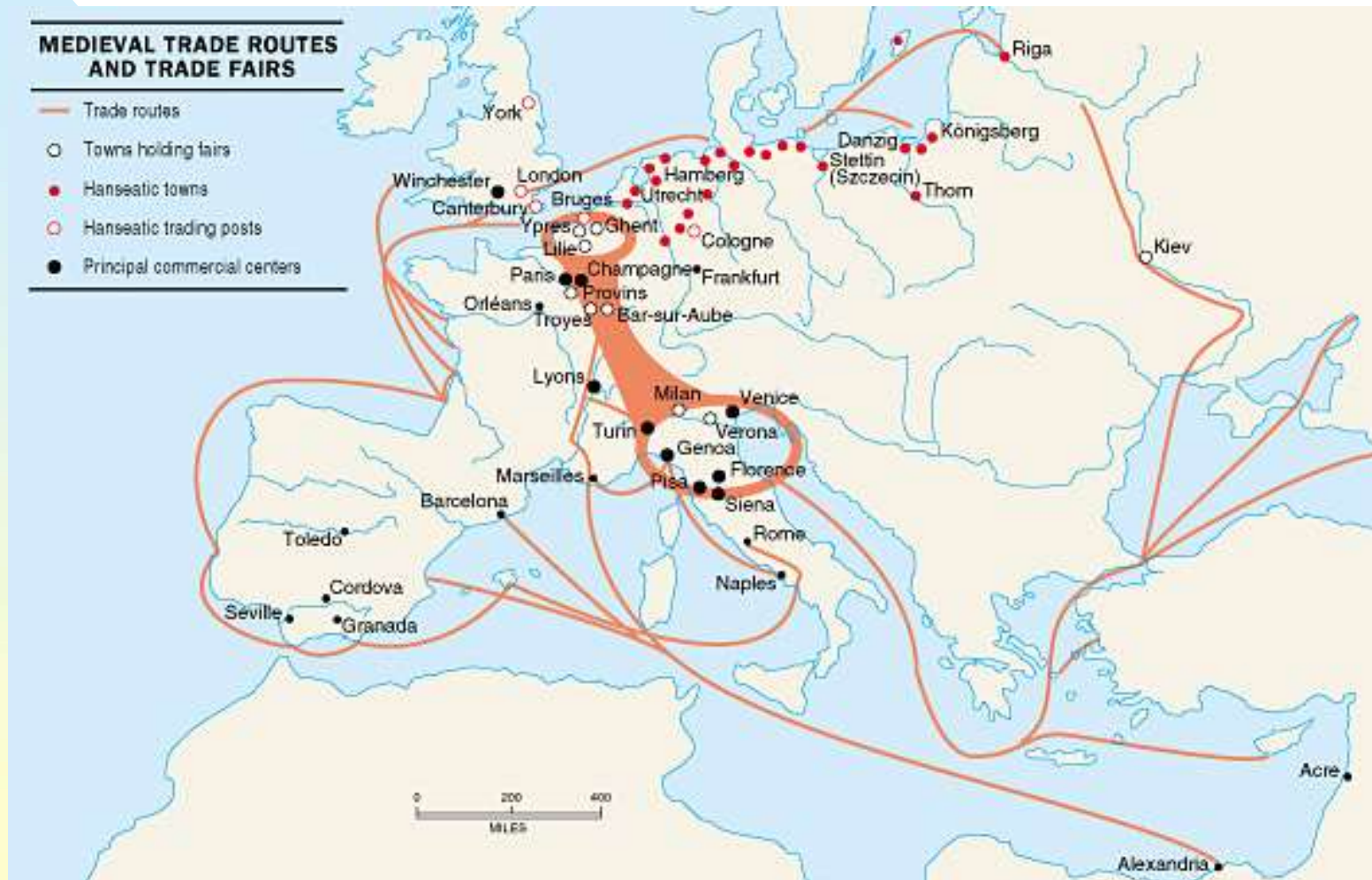
- Basic notion: '**Money is sterile**', it is un-Christian to expect payment beyond what was lent if the item returned was the same as the item returned *and the risk of the 'loan' resided with the receiver of the loan*
- Scholastic doctrine on usury slowly evolved cases where payment of interest was permissible
  - Bill of exchange, involving a loan in the currency of one location and repayment of the currency in and of another location was permissible due to the presence or risk
  - *Damnum emergens* (loss to the lender), *lucrum cessans* (profit ceasing) and *poena* (penalty for late return) also valid reasons
  - Payment on debt raised by the government (*montes*) also was permitted



## Example of early Italian bill of exchange



# From the Dark Ages to the Renaissance



# The Growth of Trade and Payments

- The Crusades representing an important turning point in European economic growth by opening up trading routes to the Levant and connecting the Italians to the overland routes to the Far East
  - There were four Crusades with First Crusade (1096-1099) and Second Crusade (1147-1149)
- Crusades were not restricted to Europeans conquering cities in the Holy Land → part of a wider and longer struggles between the Muslim Caliphates in N. Africa and the Middle East
  - Moorish control of Spain starts in 8<sup>th</sup> century and continues until 1492

# From the Medieval Fairs to the Antwerp Exchange

- By the late 13th century Bruges was a major cloth-trading centre and was connected to the woolen industry in England
- By the 14th century Bruges was a key member of the Hanseatic League of Seventeen Cities, and the city reached its economic peak. Important Italian city states established trade houses -- ships laden with exotic goods from all over Europe docked at the Minnewater, a small lake to the city's south.
- The emergence of Antwerp in the 15<sup>th</sup> century was due to the silting of the Zwin, the waterway connecting Bruges with the Channel, and to preferences given to foreign merchants, especially the English and Hanseatic League, compared to rules in Bruges → the foreign trading houses and wealthy financiers were transferred from Bruges to Antwerp



# The Canals and Buildings of Medieval Bruges



# The Antwerp Exchange and Trading Posts



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# 16<sup>th</sup> Century View Scheldt River, Antwerp



# Emergence of Free Standing Derivatives

- Concentration of trading on the new Antwerp exchange that opened in 1531 permitted the application of a trading method associated with the bill of exchange to trading of commodities.
  - Traditional trading for forward delivery involves long purchaser being the user of the commodity and the short position being the producer → no substitution of those involved in the contract
  - Unbundled derivative security trading in Antwerp involved trading of contracts where the long or the short or both are not involved in the final exchange AND contracts could be cancelled prior to delivery → emergence of speculative trading to enhance liquidity.



# Variations of Exchange Trading

- Most sales of commodities were on a **cash basis**, merchants would enter the exchange, go to the trading post for the commodity and locate a seller with goods in warehouse to purchase
- Some commodities that were in production or in transit (herring or whale oil on ships, crops ready for harvest) would be traded on a '**to arrive**' basis → buyer and seller were both making physical sales to the counterparty
- Because it was not always certain the actual amount of deliverable would be available, Antwerp developed trading in '**time bargains**' where the buyer or seller or both may not be intending to engage in physical delivery → settlement by **differences** and use of options-style (as opposed to forward-style) contracts

# From Antwerp to Amsterdam

- Sack of Antwerp by Spanish troops in 1576 was savage and an important event in the Eighty Years war (1568–1648), also known as the Dutch War of Independence → Protestant Dutch vs. Catholic Spanish that controlled the territory
- Sack of Antwerp caused diaspora of the wealthy, mostly to the north to Amsterdam, bringing speculative methods of trading for future delivery that were adapted and developed by the Dutch to the joint stock (VOC) that was issued in 1602.
  - When issued trading prior to initial offering and first market manipulation involved derivative trading

# Two paintings of the Amsterdam Exchange



# Isaac Le Maire and the VOC bear raid

- An important theme in the history of derivative securities is the use of such contracts in **market manipulations**
- The initial issue of VOC shares found greater demand than shares available → shares for delivery had to be located resulting in long dated forward sales by individuals not in possession of deliverable shares at time of short sale
- The 'bear raid' by Isaac Le Maire (an important shareholder) and a group of confederates used long dated forward sales to depress price (objective to close out contracts at lower prices)

# *In blanco* sales ban and types of manipulations

- Collapse of bear raid led to passage of Dutch legislation banning the sale of commodities/shares not in possession of the seller at the time of a sale for future delivery
  - The restriction was not criminal but civil, evidence of an *in blanco* sale meant the purchaser could refuse to take delivery and make payment without penalty
- Bear raids are not a common form of manipulation → ‘**short squeeze**’ is most typical of forward/futures trading
  - Short squeeze involves: i) a group of speculators gain control of the supply of the commodity deliverable against the relevant contract; ii) enter long forward contracts and then stand for delivery → shorts that sold without possession of commodity need to enter the cash market to purchase for commodity for delivery → PROBLEM, profits are not all in cash but also in the commodity position

# The Dutch tulip mania (1634-37)

- Reading Chapter 10, *Early History* + Posthumous (1929)
- Considered to be one of the classic speculative manias due to inclusion in Isaac Mackay, *Extraordinary Popular Delusions and the Madness of Crowds* (1852).
- Mechanics of the mania
  - Different types of tulips → tulips entered Europe circa 1550 → common 'pound goods' and rare 'piece goods' → bulk of crazy prices were in piece goods → process of 'breaking' to produce unusual colors involves virus
  - This was not a financial crisis, confined to tulip traders and some speculators (mostly in taverns) – 'Appeal to Frederick' possible.



# Dutch tulips



# Trading Financial Derivatives with *Rescontre* Settlement

- A major technical innovation in securities trading emerged between 1650-1688, when the Dutch introduced the quarterly *rescontre* days for settlements of share transactions on the Amsterdam
- The *rescontre* settling process involve a gamble carried on every three months: no payment 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 → “difference trading”

# de la Vega and the *Confusion of Confusions* (1688)

- First detailed description of stock trading on the Amsterdam exchange (or anywhere) – written by an observer not a participant – structured as a conversation (dialog) between a merchant, a shareholder, and a philosopher
  - Many interesting observations
    - de la Vega describes twelve different types of market manipulations
    - Identifies the use of ‘*opsies*’ (options) and *ducaton* (small unit) shares
    - Attempts to describe the vagaries of market pricing and make connections between ‘religion’ and stock trading

# CONFUSION DE CONFUSIONES

Dialogos Curiosos

Entre un Philosopho agudo, un Mercader discreto, y un Accionista erudito

*Describiendo el negocio de las Acciones,  
su origen, su ethimologia, su realidad,  
su juego. y su enredo,*

Compuesto

*por Don Iosséph de la Vega,*

Que con reverente obsequio lo dedica  
al Merito y Curiosidad

*Del muy Ilustre Señor*

*Duarte Nunez da Costa.*



En AMSTERDAM.

Año 1688.

Digitized by Google



# The Climate of Speculation

- If one were to lead a stranger through the streets of Amsterdam and ask him where he was, he would answer, “Among Speculators,” for there is no corner [in the city] where one does not talk of shares.
  - Confusion of Confusions, p.188
- de la Vega seeks to portray the ‘art’ of speculating on the stock exchange → it is not proper for a philosopher to speculate but the dialog is full of speculation

# The Glorious Revolution and London Trading

- Glorious revolution of 1688 involved William of Orange taking over the crown of England → with William came financial practices developed by the Dutch on the Amsterdam exchange (*rescontre* settlement does not appear until the 18<sup>th</sup> century, when is not clear)
- Trading was initially on both the Royal Exchange and in Exchange Alley though after market failure of 1694 trading moved out of the Royal Exchange
- Difficulties of supply for joint stock meant that trading for future delivery had to have option like features → payment of a premium by long to enter contract



# Waddling out, a 18<sup>th</sup> century British Cartoon

(notice the lame duck in the foreground)



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# Houghton (1694) on London stock trading

- 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? ... 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.
- Example of contract used in trading can be found in *Early History*

# The Rebuilt Royal Exchange at mid-18<sup>th</sup> C.



# Map of the Royal Exchange and Exchange Alley (1748)





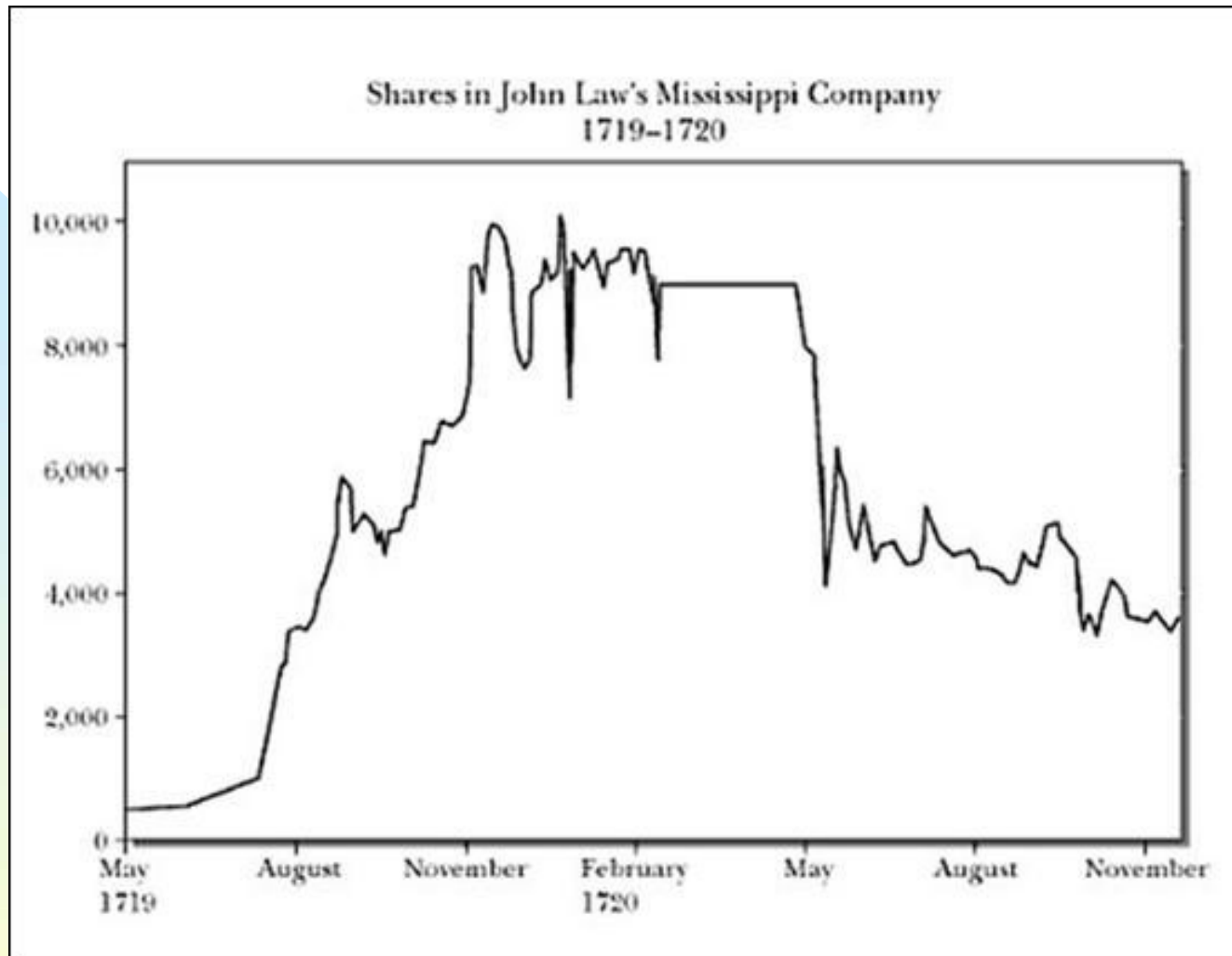
# Derivatives and the Manias of 1720

- Mississippi scheme in France and South Sea bubble in England both collapsed in 1720 leading to severe restrictions on issues of joint stocks without a company charter issued by the Crown or legislature
- Collapse of Mississippi scheme occurred with issue of '*primes*' → options entitling purchase of 10 shares for payment of premium = 1 share → sale of shares to raise money for premiums led to price collapse
- South Sea bubble collapse led to **Barnard's Act** which banned the use of options trading
- Ban was generally ignored (civil not criminal penalties)

# Crowds of speculators outside Company offices on Rue Quincampoix at the height of the speculation







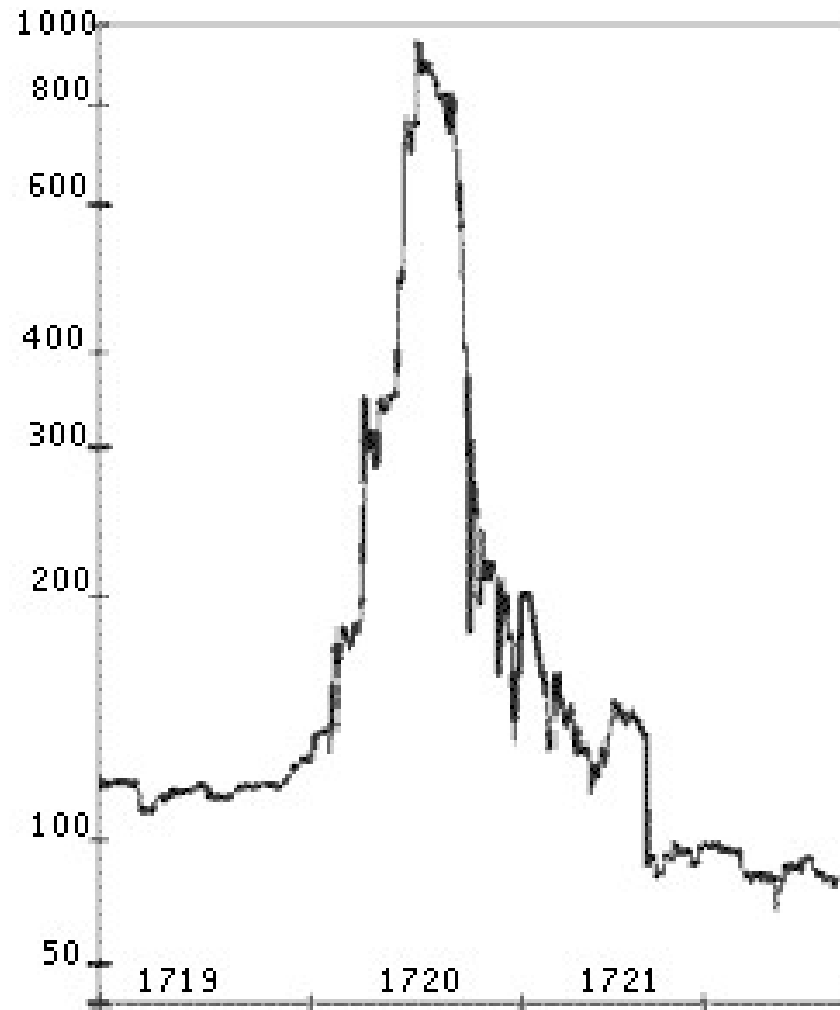
**Note: Shares were sold by subscription (initially partially paid)**

# Trading in Subscription Receipts

- Stock was usually not fully paid when issued → price would be paid in installments
  - Trading 'light horse' (with installments still to be paid) and 'heavy horse' (fully or almost fully paid)
- Trade in 'light horse' shares was a form of trading in securities with embedded derivative (the unpaid value of the shares) → pay 20% and acquire the associated change in price for a fully paid share.

**Collapse of bubble happened when subscriptions on partially paid public shares had to be made starting in Summer 1720**

**Key Question in the Bubble is why individuals were tempted to 'purchase' shares in a company that did not have a significant profit record**



# The Japanese Rice Bill 'Forward' Market

- Some argue for possible origins of futures trading in 18<sup>th</sup> century Japanese rice market (**Dōjima Rice Exchange**)
  - Japan at this time was feudal and generally closed to outside world but Dutch did have a trading monopoly (at Nagasaki) starting in 17<sup>th</sup> century
  - Rice market was centered in Osaka with large rice merchants and storehouses of feudal lords → trading in large quantity **rice bills** for future delivery → not unlike the evolution of 'to arrive' contracts to 'time bargains'
  - Rice bills were warehouse receipts, a title to rice stored in a warehouse. Following an auction to determine the price of the rice, the rice bill was issued upon making a 'good-faith' deposit. Up to the early 17<sup>th</sup> century, the margin requirement was 100% with delivery within 30 days. However, as the Osaka market developed margin deposits fell to around 30% → trade in rice bills

# Japanese cities involved in the Rice Trade

