

The History of Derivatives: A Few Milestones

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Introduction

This presentation contains a selection of records and events that constitute a part of the history of derivatives. It relates how derivatives date back as far as Antiquity. Derivatives were first instruments developed to secure the supply of commodities and facilitate trade as well as to insure farmers against crop failures. Over time, derivatives started to serve in addition other purposes such as a source of funding but also the search for quick profits. This presentation also shows that derivatives were regulated from the very beginning. The degree of regulation of derivatives varied across the years, among jurisdictions and depended on, for example, the political but also religious contexts. Some forms of derivatives were banned and later allowed or the other way round. The history of derivatives also provides evidence that the first derivatives markets were “over-the-counter” (OTC). However, negotiating and contracting mostly took place at specific locations, which, early in the history of derivatives, already displayed various characteristics of organised derivatives markets. Derivatives exchanges came later, but once established, trading of derivatives mainly occurred on their premises. The trend only reversed in the early 1990s.

The Cradle of Derivatives

“If any one owe a debt for a loan, and a storm prostrates the grain, or the harvest fail, or the grain does not grow for lack of water; in that year he need not give his creditor any grain, he washes his debt-tablet in water and pays no rent for the year.”

This text is the 48th law out of 282 contained in the Code of Hammurabi. Hammurabi was a king of Babylon who reigned, according to some sources, from around 1792 to 1750 BC. Hammurabi engraved the eponymous code on stone steles. This code counts among the oldest written body of laws known today and covers almost all the aspects of civil as well as

commercial laws of that time. It deals to a great extent with contractual matters, establishing for example the wages to be paid to an ox-driver or to a doctor. It is renowned to be the most complete code of the Mesopotamian laws that have been conserved until today.

In terms of contracts, one may recognise in this 48th law a kind of contract that once translated into a more modern language would stipulate the following: A farmer who has a mortgage on his property is required to make annual interest payments in the form of grain, however, in the event of a crop failure, this farmer has the right not to pay anything and the creditor has no alternative but to forgive the interest due. Experts in the field of derivatives would classify such a contract as a put option. In another word: If the harvest is plentiful and the farmer has enough grain to pay his mortgage interest, the put option would expire worthless. If his harvest fell short, however, he would exercise his right to walk away from making the payment.¹

In Ancient Mesopotamia, with a view to encouraging trade and securing the supply of commodities, both in time and geographical distance, the rulers' codes actually required that purchases, sales and other commercial agreements be in written form in order to provide buyers and sellers with the greatest possible legal certainty to engage in trade. The purpose was to minimise the “*your word against mine*” maxim in case of disputes. Merchants of the city-states of the region thus developed, in addition to the codes, commercial contracts. Records of such contracts have been found in cuneiform script on clay tablets. Some types of contracts were arrangements on the future delivery of grain that stipulated for instance before planting that a seller would deliver a certain quantity of grain for a price paid at the time of contracting. Such types of contracts not only dealt with grain but also with all sorts of commodities. Some of the contracts were “bearer” securities that could be transferred to third parties maturity. These types of contracts had the features of today's forwards and were used across borders. By about 1,400 BC, cuneiform script in the Babylonian language was even used in Egypt to record transactions with Crete, Cyprus, the Aegean Islands, Assyria and the Hittites. During the Ancient Mesopotamian period, derivatives contained, most of the time, a description of the parties, a description of the asset to be transferred, the price of the transaction, the date of delivery and



¹ Source: Robert E. Whaley, *Derivatives: Markets, Valuation, and Risk Management* (John Wiley & Sons: Hoboken, New Jersey, October 2006) 11.

sometimes a list and even a description of witnesses. Trading took place at the gates of the cities, at the quaysides in port cities and in the city centres, more precisely at the temples. In addition to their religious, political and military functions, the temples played a significant commercial role. They were directly and indirectly involved in trade and as a consequence in derivatives transactions. They functioned as trade repositories, were parties to contracts and offered warehouse facilities. They also provided quantity and quality measurement standards. Some functions of central clearing already appeared in Ancient Mesopotamia where temples operated as clearinghouses. Long-distance trade, including derivatives was regulated and supervised by the government.²

Derivatives Designed by Greek Philosophers

A subsequent trace of derivatives in history can be found in Aristotle's *Politics*. Aristotle tells



the story of Thales, another philosopher but also mathematician, who lived from around 625 to 550 BC in Miletus, which was one of the major cities of Ancient Greece. During wintertime, Thales predicted an unusually large olive harvest. He seized the opportunity to negotiate with the olive press owners the right, but not the obligation, to hire all the olive presses in the region for the following autumn. To secure this right, Thales made a cash deposit. It happened that the harvest was as

predicted and the demand for the use of olive presses soared. Thales was then able to lease the presses at a substantial premium and made a fortune. Aristotle sought to demonstrate how easy it was for philosophers to become rich if they so desired, despite it not being their aim, but he did not seek to create a financial product that experts would today name a call option.³

The Influence of Roman Law on Derivatives

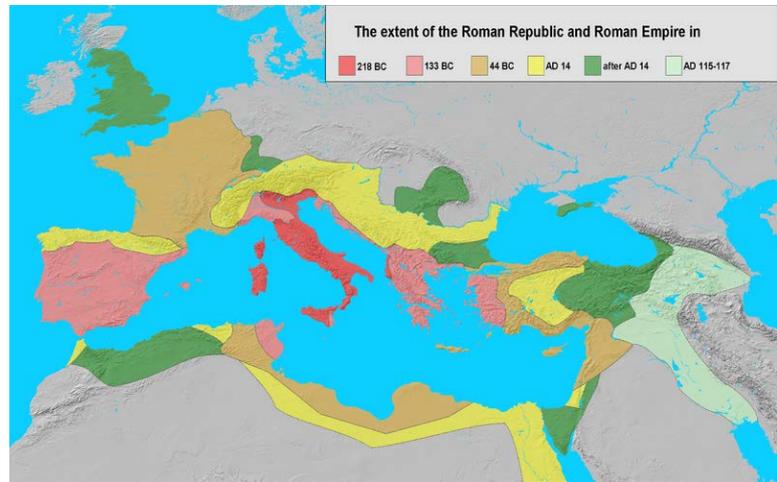
The Roman Era was not a land of welcome for derivatives, at least not at the beginning. However, commercial realities imposed the use of contracts for future deliveries. Pompey, military and political leader of the late Roman Republic, realised that long-term planning was necessary in order to secure the supply of food for the growing city of Rome, and he allowed private grain merchants to contract for periods of years. The Romans also organised

² Source: Edward J. Swan, *Building the Global Market: A 4000 Year History of Derivatives* (Kluwer Law International Ltd: London, 2000) 27-50/278-284.

³ Sources: Geoffrey Poitras, *The Early History of Financial Economics, 1478-1776* (Edward Elgar Publishing Ltd: Cheltenham, 2000) 340. Robert E. Whaley, *Derivatives: Markets, Valuation, and Risk Management* (John Wiley & Sons: Hoboken, New Jersey, October 2006) 11.

commodity markets with specific locations and fixed times to facilitate trading throughout their territories.

Under Roman law, two types of forwards could be identified. The first was a promise for future delivery of goods at the delivery date and the second was a purchase of “expectancy” as a Roman lawyer wrote in the 2nd century AD. The legal difference between the two was



that the first was void if the delivery of goods failed to materialise, but the second was valid even if the seller could not deliver on the promise. In this case, Roman law would enforce the intentions of the parties, even if they were speculative. Roman law had influence on derivatives trading and regulation for centuries, but its main contribution to the development of derivatives markets in Continental Europe, in the UK and later in the USA was the greatest barrier set by the Romans’ own use of derivatives. In early Roman law, the transferability of the rights and obligations of contracts was not legally recognised. Assignment of contracts only became recognised by the end of the Empire.⁴

Derivatives in the Middle Ages

In the Middle Ages, derivatives continued to be an instrument facilitating trade. One early example of derivatives is a form of *commanda* which was used by Italian merchants from the 10th century on. *Commandas* were a kind of commercial partnership contract for sea or land ventures. One partner put up the money, whereas the other travelled on the venture. Many of these contracts could be considered as commodity forward contracts, as in exchange of the invested capital, the “venturer” agreed to acquire specified commodities.

Another example of derivatives is the *monti* share. *Monti* shares were issued by Italian merchant cities in order to raise money. These shares were promises by the governments to repay debts in the future. It began as the sale of future government revenues to investors. By the 13th century, these shares were traded in secondary markets and were even used as a

⁴ Edward J. Swan, *Building the Global Market: A 4000 Year History of Derivatives* (Kluwer Law International Ltd: London, 2000) 75-84/284-286.

regard to the “counters”. Over time, periodical medieval markets lost their importance in trade in favour of permanent trading places located at the junction of port sites and land routes.⁵

Development of Derivatives in the Low Countries

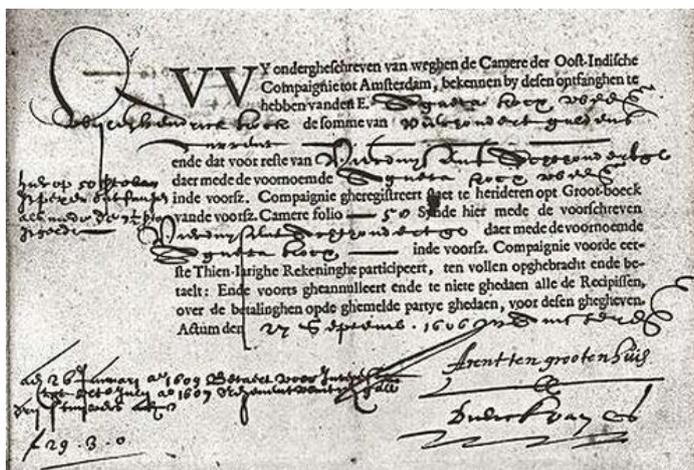
At the dawn of the modern world, Antwerp became the location where local and international traders gathered to conduct business all year round. Antwerp opened an exchange where regulation was kept to a minimum. Antwerp as a trading and financial centre preceded major cities such as Amsterdam and London, where examples of derivatives are not scarce.

In Antwerp, there was a widespread use of contracts for future delivery which mainly took the form of bills of exchange. These contracts were structured as options related to, among other things, delivery dates and quality at delivery. Some options offered the possibility for the buyers to take up the delivery at the agreed conditions or to pay a fixed fee instead of taking the delivery. The concentration of trade and the liquidity of the commodity market furthered the development of a secondary market. Many merchants began to move from trading commodities into dealing with bills of exchange. They realised that there was no need to settle the contracts by delivering the underlying commodity. They did not need to store or to transport any commodities and there was less risk and a better chance of profit. The regulatory framework put in place by Charles V between 1537 and 1539 recognised the transferability of bills of exchange to third persons prior to the maturity date of the underlying commodity and also recognised the negotiability of these bills. Charles V condoned the development of a contract market where trading of contracts for future delivery was a source of speculative profit. There is also evidence that contracts for difference, where a losing party could compensate the winning party for the difference between the delivery price and the spot price at the time of settlement, were largely used. Because they gave traders too much leverage to speculate, these contracts were banned in 1541. Despite the ban in Antwerp, contracts for differences continued to be used in Hamburg, Rouen and Amsterdam as regulation of derivatives was not uniform throughout these market places.⁶

⁵ Sources: Geoffrey Poitras, *The Early History of Financial Economics, 1478-1776* (Edward Elgar Publishing Ltd: Cheltenham, 2000) 339. Edward J. Swan, *Building the Global Market: A 4000 Year History of Derivatives* (Kluwer Law International Ltd: London, 2000) 96-138/286-290. Ernst Jürg Weber, *A Short History of Derivatives Security Markets* (University of Western Australia, 2008) 10. Robert E. Whaley, *Derivatives: Markets, Valuation, and Risk Management* (John Wiley & Sons: Hoboken, New Jersey, October 2006) 11.

⁶ Sources: Geoffrey Poitras, *The Early History of Financial Economics, 1478-1776* (Edward Elgar Publishing Ltd: Cheltenham, 2000) 340-346. Edward J. Swan, *Building the Global Market: A 4000 Year History of Derivatives* (Kluwer Law International Ltd: London, 2000) 141-151/290-292. Ernst Jürg Weber, *A Short History of Derivatives Security Markets* (University of Western Australia, 2008) 11-12.

In 1585, after the sacking of Antwerp by Spanish troops, international trade moved to Amsterdam. One of the most significant developments in derivatives which may be accredited to Amsterdam was the emergence during the 17th century of stock derivatives trading. In need of funds to finance maritime trade, companies of Amsterdam merchants issued shares to create in 1602 the Dutch East India Company, a joint stock company. These shares were transferable and were not only sold for cash but also on term. Regular forward trading of such shares in Amsterdam, on the Stock Exchange and outside, began once investors had paid for their shares in full. Forward contracts on shares were usually settled as contracts for difference.



In 1608, Isaac le Maire, an Antwerp merchant formed a syndicate and organised a first short-selling attack with a view to depressing the value of the company. The syndicate borrowed shares and then sold them. The attack could only be profitable if the syndicate could repurchase shares and return them to the owner at a lower price in the future. The raid of the syndicate was apparently successful at least in the short term, but it failed to force down the long-term share price. Several traders who also engaged to speculate on their own account went bankrupt as they had to buy shares at prices much higher than the ones they negotiated for future delivery. One of the consequences of the attack was the ban on short selling in 1610. However, it appeared that it was not effectively enforced.⁷

Dojima Rice Exchange

One of the first records of an organised market for derivatives trading comes from Osaka and dates back to the 17th century. Osaka emerged as the major trading centre for rice in Japan. At that time rice played an important role in the economy, as rice was the main agricultural commodity and was the basis of national income. Rice from all over the country was sent to Osaka and stored there. It was sold by way of auctions and once deals were done, the sellers

⁷ Sources: Oscar Gelderblom and Joost Jonker, *Amsterdam as the Cradle of Modern Futures and Options Trading, 1550-1650* (University of Utrecht) 8-11. Geoffrey Poitras, *The Early History of Financial Economics, 1478-1776* (Edward Elgar Publishing Ltd: Cheltenham, 2000) 279-281/346. Edward J. Swan, *Building the Global Market: A 4000 Year History of Derivatives* (Kluwer Law International Ltd: London, 2000) 158. Ernst Jürg Weber, *A Short History of Derivatives Security Markets* (University of Western Australia, 2008) 13-14.

issued a certificate of title to rice in exchange for money. The certificates were called rice bills. In the early stage, the rice bills were issued upon making a so-called “good-faith” deposit which was directly and fully paid after the auction and with delivery of rice within a short period. Merchants could hold the bills or could sell them in the hope of a quick profit within the defined period. However, as the market developed the deposits shrank and the delivery dates extended. The rice bills represented the right to take up delivery of an agreed quantity of rice at a future date but at a current price. They could be classified today as forward contracts. By the middle of the 17th century, so-called “prepayment bills” or “empty bills” were introduced. Sellers issued such bills to buyers on the basis of rice that had yet to be harvested. They mainly responded to the need of money of many regional lords - the Samurai - whose income depended on the value of rice, and who sold their crops sometimes years in advance to solve their current cash-flow problems. By issuing such bills promising future delivery of rice, the Samurai could get direct credit from merchants.

In order to facilitate trading in bills, they became standardised. At the beginning, the bills were mainly traded in the city centre. However, during the last decade of the 17th century, as Osaka merchants increasingly engaged in “prepayment bills” trading, the governor of the city



and then the military leader who ruled during the period - the Shogun - banned this kind of trading, which they viewed as a form of gambling causing the rise of the rice price. Despite the prohibition, merchants still continued to trade these bills. The rice market developed in the city centre moved to Dojima in 1697 and became the Dojima Rice

Exchange. It was only in 1715 that it became officially authorised by the Shogun.

Over the 1720s, the government of the Shogun - the Shogunate - only enforced the rules when the price of rice was high but relaxed the enforcement when the price was considered to be too low. When the price of rice fell to record lows in the late 1720s, the Samurai saw their economic position fall relative to the merchant class, whose growing economic power worried them. The Shogun responded by easing restrictions on futures trading, but without officially authorising a new market at which futures contracts could be traded.

In 1730, the Dojima Rice Exchange was officially acknowledged as a rice exchange and rice traders needed to register and obtain a license against an annual fee. The Shogunate in return granted controlled market access with regard to rice trading, especially to rice futures trading. It also exercised close surveillance over the market.

The rules governing trading on this exchange were similar to those of modern-day forwards and futures exchanges: For instance, there were fixed trading periods, participants were members of the exchange, contracts traded as futures were standardised, as was also the rice quality, on the last day of the trading period all positions had to be cleared in cash or by physical delivery through a clearinghouse, each participant had to have a line of credit with a clearinghouse, and clearinghouses assumed contract obligations in case a trader defaulted. Clearing was central and by the first half of the 18th century Osaka had registered sixty clearinghouses.

Trading of futures contracts became so established that in the mid-1700s, 110,000 bales of rice were freely traded on the Dojima Rice Exchange while there were only 30,000 bales in existence throughout Japan. The Shogunate was forced to intervene in the market on numerous occasions to set price floors and caps and watch traders. Because of the role of credit in the economy that rice futures played, the Shogunate began guaranteeing all rice bills in 1773, by effectively changing the deficit financing bills into Shogunate-backed bonds.⁸

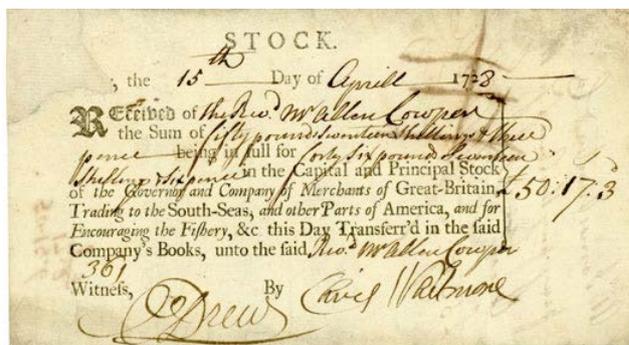
England Catching Up with Derivatives

During the 18th century, three major events in the history of derivatives took place in England. The first was the rise of England which started to dominate maritime trade. London became the major commodity trading centre and financiers of Amsterdam who had followed William III of Orange to England transferred their knowledge which formed the basis of derivatives trading in the City. The second was the recognition under English law of the transferability and negotiability of bills of exchange about 200 years after Charles V. The third, and probably the most prominent event of this period, was the South Sea Bubble, and its importance went beyond that of giving rise to the term “bubble” that has remained in the English language ever since. In 1711, the South Sea Company was established as a joint stock company and was given the exclusive right to trade with Spain’s South American colonies. Expectations that this trade would generate enormous profits provoked rampageous trading of the South Sea

⁸ Sources: David Moss and Eugene Kintgen, *The Dojima Rice Market and the Origins of Futures Trading* (Harvard Business School: Boston, 10 November 2010). Ulrike Schaede, *Forwards and Futures in Tokugawa-Period Japan: A New Perspective on the Dojima Rice Market* (Journal of Banking and Finance: North-Holland, 1989) 487-513.

Company's shares but also of shares of all sorts of commercial and financial projects, often realised by the creation of new companies with dubious business plans. These companies were called "bubbles" and they competed with the South Sea Company, at least in the financial market. In 1720, in order to protect the interests of the South Sea Company, the Parliament enacted the Bubble Act which prohibited all joint stock companies not authorised by royal charter. The enactment triggered a wave of panic in the financial market. Agents massively sold their securities and as a result the share prices of the "bubbles" but also of the South Sea Company slumped. The panic that led to the bubble was caused, according to the results of a long investigation which followed the crash, by the ones who dealt with options, mainly call options named "refusals".

At that time, the South Sea Company was issuing new shares which had to be bought in cash but could be settled by instalment payments. At the subscription date, buyers had to pay 10-20% of the issue price. Then, they could make payments over several periods. Refusals gave the right to the holders, when making the payment of an instalment, to pay the next



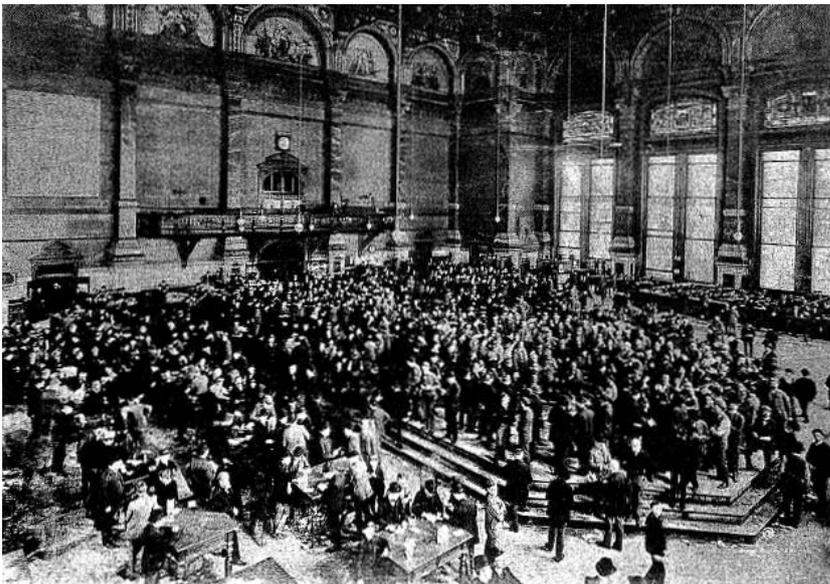
instalment, thus keeping alive the option to eventually own the shares. If the share price fell below a certain value, the subscriber could refuse to make the next instalment payment, thus giving up the option on the share. He would lose the instalments he paid, *i.e.* the premium. After each instalment payment, the company issued subscription receipts which were then traded "over-the-counter". It was also found later that the multiplication of payment defaults by the subscribers was not the only cause of the bubble. A number of influential nobles and members of the government had been given refusals, without payment, as bribes. Moreover, in order to hold back the fall in the shares of their enterprise, the directors of the South Sea Company announced the distribution of dividends of 50%, but at the same time, they undertook short-sales of the shares of their company hoping to buy them back at a lower price. The legal consequence of the bubble was that after long debates the Parliament passed the Sir John Barnard's Act which banned options in shares as well as short-selling of shares.⁹

⁹ Source: Edward J. Swan, *Building the Global Market: A 4000 Year History of Derivatives* (Kluwer Law International Ltd: London, 2000) 181-193/292-294. Ernst Jürg Weber, *A Short History of Derivatives Security Markets* (University of Western Australia, 2008) 20-22.

First Derivatives Exchange in the USA

In 1848, a first derivatives exchange was created in Chicago, United States. It is the Chicago Board of Trade (CBOT), the oldest organised futures market still operating in the world. However, it merged with the Chicago Mercantile Exchange in 2007 to become the CME Group.

Chicago, thanks to the Midwestern grain and its strategic location, was developing as a major centre for the storage, sale and distribution of grain. A group of merchants formed the CBOT



originally as a centralised market place for exchanging grain, but forward contracts so called “to-arrive” contracts were soon negotiated. It allowed farmers to lock in the price and later deliver the crop. Due to the seasonality of grain, Chicago’s storage facilities were unable to absorb the increase in

supply that followed the harvest, but the same facilities were underused during the low season. Prices of grain were very volatile and it appeared that when fluctuations were too great, parties to deals backed out. The counterparty risks were significant. Moreover, these contracts were not standardised according to quality or delivery time.

One of the first improvements undertaken by the CBOT was to establish a department in 1858 which was in charge of classifying and certifying grades of grain. It elaborated a system in which one of the grades was the “standard”. It created confidence for the buyers but also the basis for the development of the market. From 1865 on, the CBOT made three important changes to the structure of its trading market. It established defined areas specifically for futures contracts on agricultural commodities. Contracts were standardised in terms of quality, quantity, and time and place of delivery. This change was later accompanied by the introduction of a clearinghouse that reduced the counterparty risk that had plagued - as some

financial economists argue - OTC trading. The third change was the introduction of a margining system.

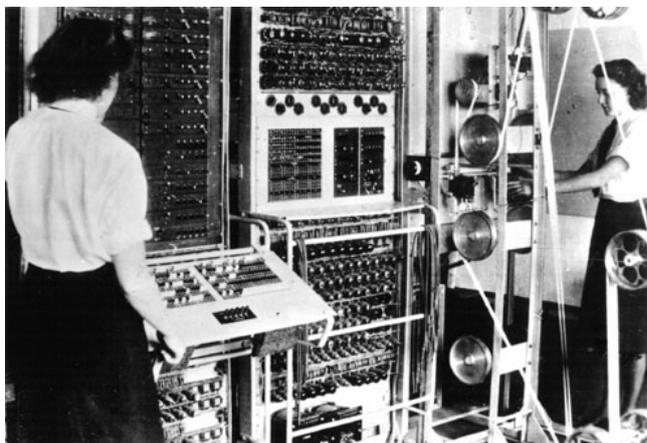
Until the beginning of the 20th century, regulation was left to state legislations, self-regulation and regulation by state and federal courts' decisions. It is only in 1916, after several attempts to regulate futures exchanges at the federal level, at least partially, that the first federal act, the Cotton Futures Act entered into force. The continual changes of its own regulations made by the CBOT were reactions to take account of courts cases, to make trading acceptable in the eyes of, among others, state legislators, and later federal legislators, and to assure the performance of the contracts traded under its premises.¹⁰

Regulation of Derivatives in Switzerland

Switzerland used to regulate derivatives in the 19th century, at least to some extent. The Swiss Federal Law on the Issue and Reimbursement of Banknotes of 1881 prohibited banks issuing banknotes to participate in contracts for future delivery of securities and goods, both on their own account and for the account of third parties, unless they could back them with securities or they had a guarantee of a canton.¹¹

Financial Innovation and the Rise of Modern OTC Derivatives

From the 1970s on, the USA has been the cradle of innovation in derivatives. The development of computers and their growing use in finance, which allowed complex models and computations to be quickly solved, but also the lenient regulatory regime constituted key elements for innovation.



Financial innovations were first introduced by exchanges. For instance, the Chicago Mercantile Exchange launched futures contracts written on financial instruments in 1972 or the Chicago Board of Trade introduced the first interest rate futures contracts in 1975.

¹⁰ Sources: Edward J. Swan, *Building the Global Market: A 4000 Year History of Derivatives* (Kluwer Law International Ltd: London, 2000) 234-271. Robert E. Whaley, *Derivatives: Markets, Valuation, and Risk Management* (John Wiley & Sons: Hoboken, New Jersey, October 2006) 12-19.

¹¹ Source: Ernst Jürg Weber, *A Short History of Derivatives Security Markets* (University of Western Australia, 2008) 42.

Financial innovations in OTC derivatives occurred in the early 1980s. In the second half of the eighties, the first collateralised debt obligations were issued by a Wall Street investment bank. However, derivatives trading still mainly took place on exchanges, but not for long. Already in 1991, the notional amount of OTC derivatives trading surpassed exchanged-traded derivatives.

The nineties saw, among other things, the emergence of modern credit default swaps and then about a decade later... came the subprime crisis which will undoubtedly leave a permanent trace in the history of derivatives.¹²

Conclusion

These few milestones of derivatives in history show that the first derivatives were developed to secure the supply of commodities both in time and geographical distance as well as to protect against changes in prices and to mitigate risks. Derivatives fostered trade and contracts evolved over history primarily to meet the specific needs of commodities traders. In addition, derivatives were for instance instruments for farmers to insure themselves against a crop failure, for merchants to finance their future commercial activities, for “venturers” to obtain funds for their expeditions but also for governments and churches to raise money.

At the early stages of their history, derivatives were also instruments used to realise quick profits, but with the risk of default. Records of market abuse also appeared relatively early in derivatives transactions. Governments had to step in to protect consumers and investors and to mitigate systemic risk. Regulations prohibited some forms of derivatives or restricted their use and introduced tight supervision.

One lesson we can draw from the history of derivatives is that regulation varied through the years and between the contemporary jurisdictions, but appropriate regulation was always an important objective in this context.

¹² Source: Robert E. Whaley, *Derivatives: Markets, Valuation, and Risk Management* (John Wiley & Sons: Hoboken, New Jersey, October 2006) 12-19.