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Bernardina Algieri

A Journey Through the History of Commodity Derivatives Markets and the Political Economy of (De)Regulation

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Abstract

The present study examines the dynamics and regulatory regimes of commodity derivatives markets through time. The historical perspective allows to identify the reasons behind the use of derivatives and the impact of changing rules on financial systems. It further permits to highlight the weaknesses and the strengths of derivatives markets and provides valuable lessons to tackle challenges, replicate practices, and prevent failures. The analysis shows that derivatives markets have a long history and have facilitated trading across time and geographical areas. The results of a quasi-experiment conducted for Japan and the US reveal that commodity price fluctuations were higher before the establishment of futures markets. The analysis further indicates that the unprecedented inflow of liquidity in derivatives markets was mainly facilitated by the deregulation policies adopted in the US, EU and elsewhere and was intensified by an increasing interest of investors in alternative asset classes. In the new millennium many product innovations flooded the market, reducing transparency and increasing market uncertainty. The study indicates that improved data quality and quantity are necessary conditions to enhance the understanding of derivatives markets. In addition, a sound legal and financial system is a must for thriving financial markets. Such a system creates a framework of checks and balances for the market, it contributes significantly to meaningful regulations and vibrant policies and helps to prevent or eradicate market manipulations.

Keywords: Derivatives markets, history, regulatory regimes

JEL classification: N20, G28, G15, Q14

1. Introduction

Following the stock market crash in 2001–2002, commodity futures have emerged as a popular asset class within investment portfolios for several financial institutions and investors. The potential diversification benefits of investing in commodity markets stimulated, in fact, the rapid growth of commodity indexes and triggered a process of financialization among commodity markets (Tang and Xiong, 2012). The levels of financial activity measured by open interest in commodity futures increased from $103 billion at the end of 2003 to $509 billion in July 2008 (Hong and Yogo, 2010), and the total value of commodity index–related instruments purchased by institutional investors rose from about $15 billion to $200 billion during the same period (CFTC, 2008). Alongside, a broad set of commodities across agriculture, energy and metal sectors registered synchronized sequences of large price swings, drawing renewed attention from policymakers and academics to the risk that speculation could cause price distortions in commodity markets which adversely affect the real economy.

In the US, the criticism received public attention when the hedge fund manager, Michael Masters, in his testimony before the Senate committee argued that futures markets speculation caused a bubble in energy prices in 2007–2008. The criticism was quickly extended to agricultural commodities in a report of the US Senate and got attention across the Atlantic in public statements by the British Prime Minister, the French President, the German Finance Minister, and Pope Francis. In a speech in November 2014, the Pope said that "market priorities" especially the logic of the "primacy of profit" has "reduced foodstuffs to a commodity like any other, subject to speculation, also of a financial nature". This logic is hindering the "struggle against hunger and malnutrition". In Switzerland, the Young Socialist Party even launched a public referendum on "No speculation on foodstuffs" which was declined in February 2016.

The role of speculation in financial markets currently remains a hot topic, especially in the context of the ongoing regulatory debate on tightening position limits[1] of commodity contracts on– and off–exchanges.

Starting from this premise, the present study aims at examining the history of derivatives markets, their importance and the regulatory framework through times with the objective to assess how derivatives markets have affected price volatility and how different regulatory regimes have shaped the functioning of financial markets. Throughout the analysis, the main financial market failures will be identified and the relative regulatory actions will be examined. The linkage to the history is important, given that lessons gained from centuries of historical development could offer a better understanding of the present and provide the best available rationale when any policy intervention is undertaken. Further, the historical perspective would shed some lights on government failures, i.e. the possibility that regulators could intervene inappropriately, thus causing price distortions and drops in investor confidence.

While the extant literature has investigated the effects of financialization and speculation on commodity markets and price volatility (e.g., Algieri 2016; Kalkuhl et al. 2016; Tadesse et al. 2014; Sanders et al. 2010; Robles et al. 2009; UNCTAD, 2009), a relatively limited attention has been devoted to the history of trading in derivatives and the inter-linkages between changes in regulatory regime and the financialization of commodity markets. The present study tries to fill this gap going to the roots of financial market functions and their transformation over time. Empirically, a quasi-experiment conducted on historical data in Japan and the US before and after the creation of the first futures markets, will provide evidences on how the presence and absence of futures markets have shaped price volatility. A comparison of three grains of similar nature, namely wheat, oats and barley, will offer an easy test to gauge how the existence and absence of futures markets have influenced price swings too. In addition, a simple econometric exercise will provide some evidences on the linkage between regulatory regimes and bank failures, given the involvement of "Wall Street" banks into risk activities also related to commodities derivatives.

The remainder of the study is organized as follows. Section 2 presents the main characteristics of commodity derivatives market. Section 3 outlines its historical development. Section 4 discusses the legal-regulatory structures in the US financial markets. Section 5 presents some policy interventions. Section 6 concludes.

2. Commodity Derivatives Market

In financial markets, the term 'commodity derivatives' is used to refer to a group of instruments that derive their value from some underlying commodity, such as grains, livestock, base metals, energy products, and precious metals. Futures[2], forwards[3], swaps[4], and options[5] are all types of derivative instruments widely used for hedging, speculative purposes or portfolio management strategies.

Commodity derivatives markets[6] have three main economic functions. First, they have a long tradition in supporting commodity producers to hedge their price risks. Second, they function as an important instrument for '*price discovery*' in spot markets, helping commodity traders to set benchmarks for current prices. Finally, derivatives markets provide transactional efficiency by lowering transaction costs. As a result, investments become more productive and price volatility can diminish.

Speculation[7] is an important feature of derivatives markets as it provides liquidity to the market, facilitates risk sharing and, in general, allows markets to perform their institutional role (Cheng and Xiong, 2014; Tang and Xiong, 2012; Hicks, 1939; Kaldor, 1939; Keynes, 1923). On the other hand, speculative behaviour could generate shocks and threaten financial stability. For instance, reduced risk propensity caused by investment losses may lead speculators to shorten their commodity futures positions (Cheng et al. 2015) with negative consequences for the market.

Commodity derivatives can be traded on exchange markets or off–exchange (over-the-counter, OTC) markets.

- In exchange-traded markets, derivatives contracts are standardized with specific delivery or settlement terms. Traditionally, negotiations between traders were conducted by shouting on the trading floor (open outcry), afterwards electronic trading systems became increasingly popular in every exchange. Exchange-traded derivative transactions are publicly reported and cleared in a clearinghouse. The presence of a clearinghouse safe-wards against counterparty risk because the clearinghouse assumes financial responsibility for the transaction if either party becomes insolvent or defaults. The solvency of the clearinghouse is protected by a system of margins or collaterals. This means that before trading, buyers and sellers have to deposit an initial margin payment with the clearinghouse to cover possible losses. At the end of each trading day, contracts are re-priced and those traders who have registered a loss (due to adverse price movements) have to post additional margin (called variation or maintenance margin) to cover the loss before the next trading session. The world's largest derivative exchange in volume terms is the CME Group with a total volume of 4.08 billion contracts traded in 2017, resembling an increase of 15.8% since 2015 (**Table 1**).

Other important exchanges are the National Stock Exchange of India, the Intercontinental Exchange, and the CBOE Holding (**Table 1**). With reference to agricultural commodities, the chief exchange markets are located in the US. The Chicago Mercantile Exchange and the Chicago Board of Trade are the benchmark for several commodities, especially wheat, maize, and livestock. Exchanges for agricultural commodities are less active in the EU, but the trading activity has increased in the latest years. The main agricultural contracts are traded on Euronext in London (cocoa, coffee, sugar, feed wheat) and Euronext in Paris[8] (milling wheat, rapeseed, maize). There are also other futures markets, namely the European Energy Exchange (EEX) in Germany, where both energy and agriculture derivatives (hogs, piglets, potatoes, butter, and skimmed milk powder) are traded, and MFAO in Spain (for olive oil). In Asia, the main commodity exchanges, Dalian and Zhengzhou Commodity Exchanges, are located in China (**Table 1**).

- OTC markets are decentralized markets with no meeting place or trading floor. Derivatives trades in OTC markets are bilateral in nature. All contract terms are 'tailor made', that is delivery, quality, quantity, location, date, and prices are negotiable between the two parties. OTC markets are self-regulated and lightly supervised, and before the financial crisis they were not cleared by a clearinghouse. Transactions can be arranged by telephone or other communication means. Prices are not reported publicly. To monitor OTC derivatives market is not an easy task. The World Federation of Exchange (WFE) and the Bank for International Settlements (BIS) conduct quarterly surveys and publish data on off-exchange transactions. According to the BIS survey (2017), the outstanding notional values in the OTC market advanced from $72.13 trillion in June 1998 to 672.56 in June 2008 and to $710.2 trillion in December 2013. These values decreased in the following years to reach $542.43 trillion in June 2017 and $531.9 trillion in December 2017. The patterns through time are reported in **Figure 1**.

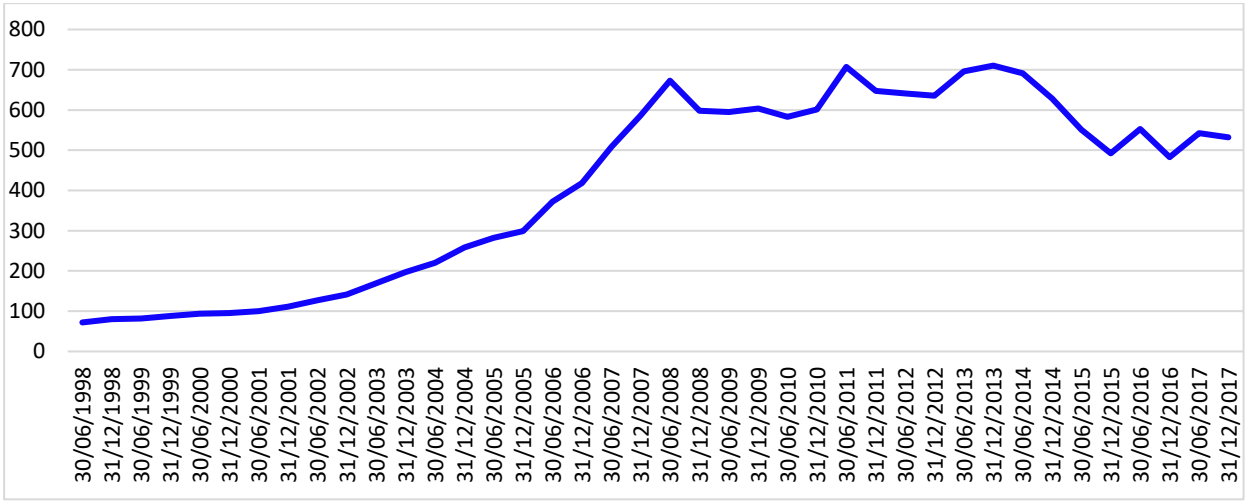

Figure 1: Outstanding notional values in the global OTC market, trillion $

Source: Own elaborations on BIS, Y-axis: trillion $
http://stats.bis.org/statx/srs/tseries/OTC_DERIV/H:N:A:A:A:A:A:5A:5J?t=D5.1&p=20171&x=OD_RISK_CAT.3.CL_OD_RISK_CAT&o=s:line,z:3

Outstanding OTC derivatives contracts are divided in different segments: interest rate contracts, foreign exchange (FX) contracts, credit default swaps (CDS) contracts, equity-linked contracts, and commodity contracts. The interest rate segment accounts for the vast majority of outstanding OTC derivatives. In June 2017, the notional amount of outstanding OTC interest rate derivatives contracts totalled $415.9 trillion, which represented about 77% of the global OTC derivatives market. FX derivatives are the second largest segment of the global OTC derivatives market. In contrast to interest rate derivatives, the notional amount of outstanding FX contracts has continued to climb in recent years (from 9.1% of the global OTC in 2010 to 14.2% in 2017). The CDS market has declined steadily in size since 2007 (its notional amount passed from 8.3% of the total OTC market in 2007 to 1.76% in 2017). The smallest segments of OTC derivatives are related to equities and commodities, which totalled $6.8 trillion and $1.4 trillion in June 2017, respectively. Together, equity and commodity derivatives accounted for only 2% of notional amounts outstanding. **Figure 2** sketches the evolution of outstanding notional values of the OTC commodity market in trillion $. Today, large international banks and hedge funds are involved in the vast majority of OTC transactions, which include instruments such as forwards, swaps, and options. **Figure 3** reports the percentage change of the outstanding notional values for each derivative category within the OTC market, considering the year 2004 as base year (2004=100). It is remarkable to notice that the main percentage increases were recorded for commodities and CDS during the period of the financial crisis.

Table 1: Top Derivatives Exchanges in Volume Terms: Number of contracts traded in millions

		Country	Commodity Type*	Jan-Dec 2017	Jan-Dec 2016	Jan-Dec 2015	% Market Share 2017
1	**CME Group**	US	A, E, M	4,088.91	3,942.20	3,531.78	16.23
	Chicago Mercantile Exchange (CME)		A	1,891.57	1,939.92	1,749.61	7.51
	Chicago Board of Trade (CBOT)		A, E, M	1,408.03	1,273.76	1,196.95	5.59
	New York Mercantile Exchange (NYMEX)		E, M	653.30	618.42	503.43	2.59
	Commodity Exchange (COMEX)		M	136.01	110.1	81.79	0.54
2	**National Stock Exchange of India (NSEI)**	India		2,465.33	2,119.46	3,031.89	9.78
3	**Intercontinental Exchange (ICE)**	US	A, E, M	2,125.40	2,037.93	1,998.96	8.43
	ICE Futures Europe		A, E, M	1,166.95	973.86	901.66	4.63
	ICE Futures US		A, E, M	354.50	370.17	365.43	1.41
	NYSE Arca			302.57	388.98	381.52	1.20
	NYSE Amex			293.55	296.49	344.46	1.16
	ICE Futures Canada		A	5.55	6.43	5.72	0.02
	ICE Futures Singapore			2.29	2	0.17	0.01
4	**CBOE Holding**	US		1,810	1,184.55	1,173.93	7.18
	Chicago Board Option Exchange			1,132.46	1,033.35	1,043.03	4.49
	C2 Exchange			141.21	91.03	79.23	0.56
	CBOE Futures Exchange			73.99	60.18	51.68	0.29
5	**B3 (former BM&Fbovespa)**	Brazil	A, E, M	1,809.36	1,487.31	1,358.59	7.18
6	**Nasdaq**	US		1,676.63	1,575.70	1,648.96	6.65
7	**Eurex**	Germany	A, M	1,675.90	1,727.77	1,672.65	6.65
8	**Moscow Exchange (MICEX)**	Russia		1,584.63	1,950.15	1,659.44	6.29
9	**Shanghai Futures Exchange (SHFE)**	China	E, M	1,364.24	1,680.71	1,050.49	5.41
10	**Dalian Commodity Exchange (DCE)**	China	A	1,101.28	1,537.48	1,116.32	4.37
11	**Korea Exchange (KRX)**	Korea	E, M	1,015.33	692.99	794.94	4.03
12	**Bombay Stock Exchange (BSE India)**	India		609.21	543.06	614.89	2.42
13	**Zhengzhou Commodity Exchange (ZCE)**	China	A	586.07	901.3	1,070.34	2.33
14	**JSE Securities Exchange (JSE)**	South Africa		382.94	479.2	488.52	1.52
15	**Hong Kong Exchanges and Clearing (HKEx)**	Hong Kong		372.19	344.64	359.36	1.48
16	**Japan Exchange**	Japan		322.41	337.54	361.46	1.28
17	**Taiwan Futures Exchange (TAIFEX)**	Taiwan		265.71	241.68	264.5	1.05
18	**Australian Security Exchange (ASX)**	Australia		248.45	242.63	234.18	0.99
19	**Miami International Holding**	US		232.22	247.11	252.61	0.92
20	**Multi Commodity Exchange (MCX)**	India	A ,E, M	198.61	245.08	216.35	0.79
21	**TMX Group**	Canada		183.17	201.12	179.94	0.73
22	**Singapore Exchange (SGX)**	Singapore	E, M	178.37	172.42	183.87	0.71
23	**Rosario Futures Exchange (ROFEX)**	Argentina		150.138	113.37	73.87	0.60
24	**Borsa Istanbul (BIST)**	Turkey		146.12	107.25	88.88	0.58
25	**Euronext**	UK, France, Belg	A	140.27	126.24	135.52	0.56
26	**Thailand Futures Exchange (TFEX)**	Thailand		78.99	69.58	48.54	0.31
27	**Tel Aviv Stock Exchange (TASE)**	Israel		46.64	52.1	66.05	0.19
28	**MEFF Mercado español de opciones y futuros financ.**	Spain		44.58	45.35	47.82	0.18
29	**London Stock Exchange Group (LSEG)**	UK		42.54	54.07	48.88	0.17
30	**Tokyo Financial Exchange (TFX)**	Japan		38.48	52.09	48.99	0.15
31	**China Financial Futures Exchange (CFFEX)**	China		24.59	18.34	321.59	0.10
32	**Tokyo Commodity Exchange (TOCOM)**	Japan	E, M	24.16	26.92	24.4	0.10
33	**Metropolitan Stock Exchange of India (MSEI)**	India		19.81	46.76	57.99	0.08
34	**Athens Derivatives Exchange (ATHEX)**	Greece		19.45	15.47	14.65	0.08
35	**Dubai Gold & Commodities Exchange (DGCX)**	UAE	M	17.44	19.67	14.51	0.07
36	**OneChicago (OC)**	US		14.93	12.39	11.71	0.06
37	**National Commodity & Derivatives Exchange (NCDEX)**	India	A, M	14.13	20.34	29.55	0.06
38	**Malaysia Derivatives Exchange (MDEX)**	Malaysia		14.01	14.23	14.06	0.06
39	**BMV Group**	Mexico		11.03	12.94	16.99	0.04
40	**Oslo Stock Exchange (OSE)**	Norway		10.79	11.44	13.72	0.04
41	**North American Derivatives Exchange (NADEX)**	US		10.42	8.75	5.81	0.04
42	**The Order Machine (TOM)**	Holland		8.97	23.79	26.02	0.04
43	**Warsaw Stock Exchange (WSE)**	Poland		7.62	7.98	8.21	0.03
44	**Budapest Stock Exchange**	Hungary		7.02	7.81	8.6	0.03
45	**Pakistan Mercantile Exchange (PMEX)**	Pakistan		3.16	3.48	3.89	0.01
46	**Minneapolis Grain Exchange (MGEX)**	US	A	2.8	2.19	2.32	0.01
47	**Dubai Mercantile Exchange (DME)**	UAE	E	1.57	1.95	1.71	0.01
48	**Bolsa de Valores de Colombia (BVC)**	Colombia		1.12	1.4	1.05	0.004
49	**Eris Exchange (DMC)**	US		0.44	0.47	0.66	0.002
50	**Osaka Dojima Commodity Exchange (ODE)**	Japan	A	0.34	0.45	0.41	0.001
51	**New Zealand Futures Exchange (NZX)**	New Zeeland	A	0.31	1.83	1.81	0.001

*A=agriculture, E=energy, M=metal. Source: Own elaboration on FIA, Future Industry Association, Market voice, 2018

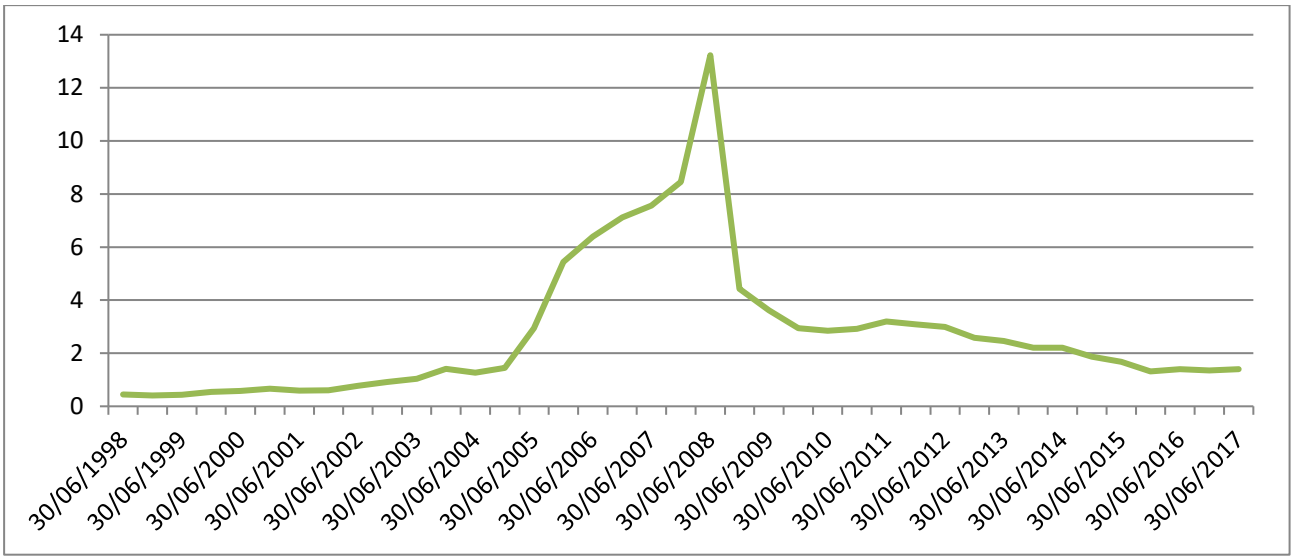

Figure 2: Outstanding notional values in commodity OTC market, trillion $

Source: Own elaborations on BIS. Y-axis: trillion $
http://stats.bis.org/statx/srs/tseries/OTC_DERIV/H:N:A:A:A:A:A:5A:5J?t=D5.1&p=20171&x=OD_RISK_CAT.3.CL_OD_RISK_CAT&o=s:line,z:3

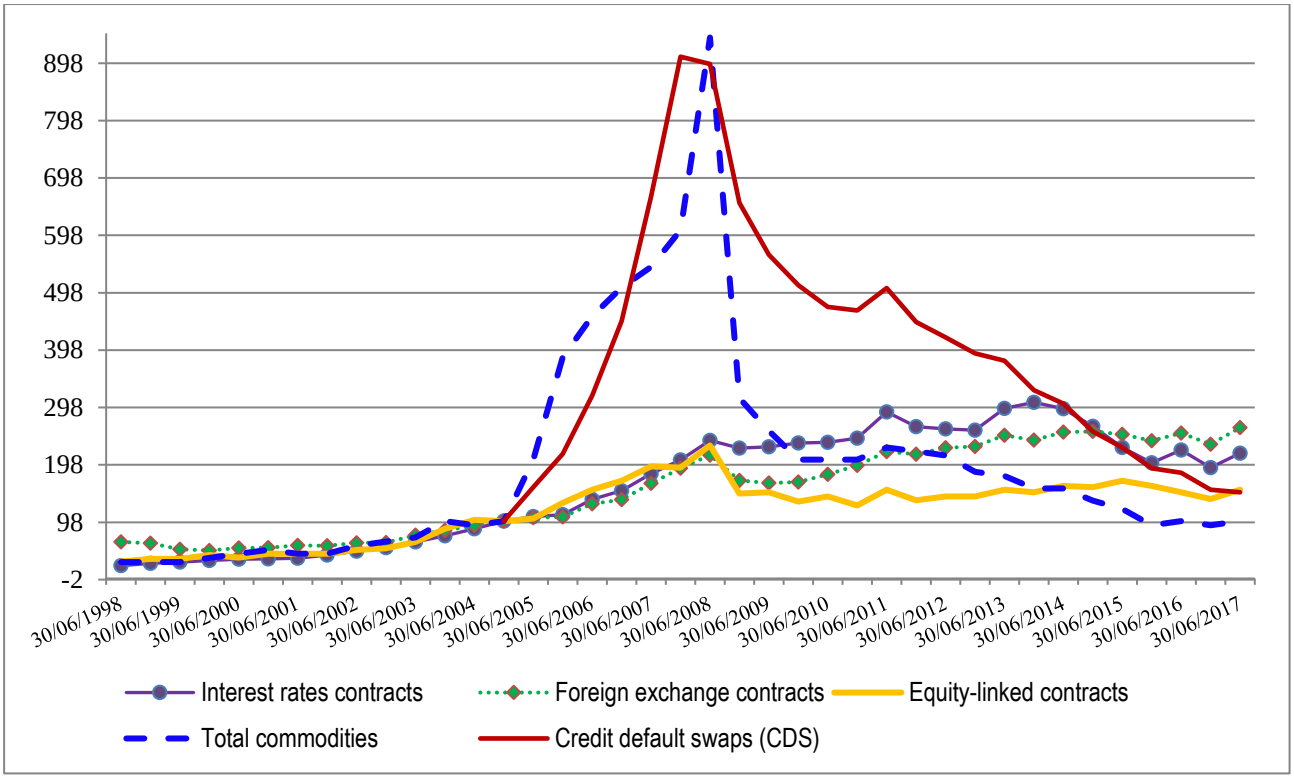

Figure 3: Outstanding notional values in commodity OTC market, % change (2004=100)

Source: Own elaborations on BIS. Y-axis: % change

Exchange and off-exchange markets complement each other, given that their different characteristics provide a trading platform to satisfy different business interests (Nystedt, 2004). On the one hand, exchange-traded derivatives markets provide better price

transparency, higher liquidity and smaller counterparty credit risks than OTC. On the other hand, OTC markets offer high flexibility and are better suited for trades with low order flows and special requirements (**Table 2**). In this context, OTC markets become an incubator for new financial products.

Table 2: Types of Derivatives markets

	Exchange	**OTC Pre Dodd-Frank**
Negotiations	Trading floor or electronic trading	No trading floor
Transparency	high	low
Counterparty risk	low	high
Contract standardization	high	low (tailor-made)
Type of contracts	Futures, options	Forwards, swaps, options etc.
Flexibility	low	high
Cleared	yes	no
Liquidity	high	lower than exchanges[9]

Source: Own elaboration.

Figure 4 simplifies the functioning of exchange and OTC markets. In exchange markets, two traders agree on a transaction on the exchange floor or on an electronic platform. Once the transaction is concluded, it goes to (1) the clearinghouse, which guarantees payment to both parties. (2) The original contract between long (buyers) and short (sell) traders is now two contracts, one between each trader and the clearinghouse. In the OTC, short and long traders do not interact directly (**Figure 4**). Instead of a centralized marketplace, there is a network of dealers that take long or short positions, and earn money on spreads and fees. Dealers absorb the credit risk of customer default, while the customer faces the risk of a dealer default. Dealers are usually financial institutions such as JP Morgan Chase, Goldman Sachs, Morgan Stanley, Bank of America, Citigroup, and Deutsche Bank. Before 2007, these financial institutions were generally viewed as solid and too big to fail; in 2008, this belief was profoundly shocked.

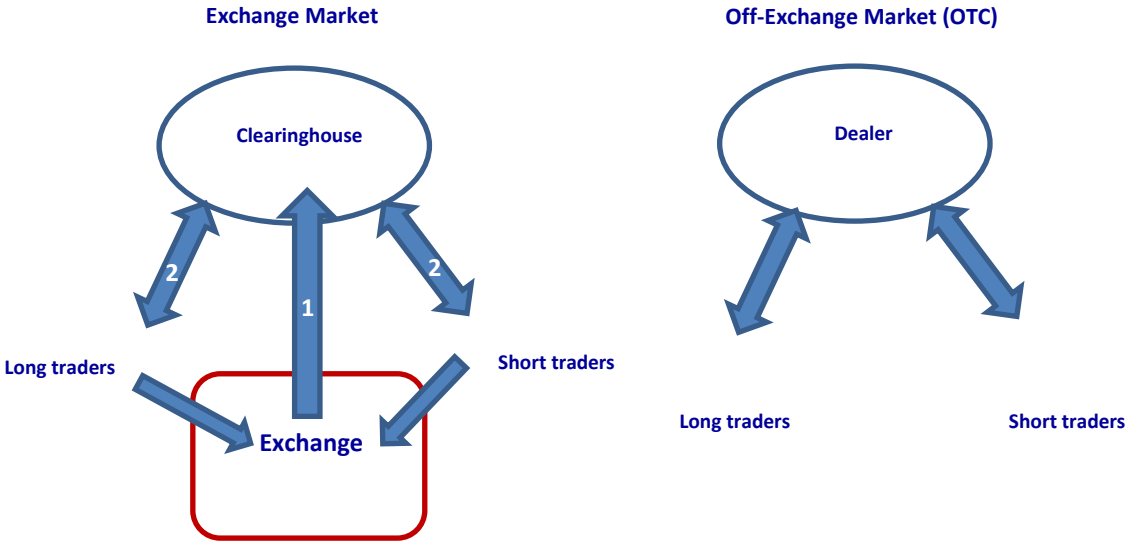

Figure 4: A comparison between exchange and off-exchange markets

Source: Own elaboration

3. History of Derivatives Markets

3.1 The Roots

Derivatives on commodities have a long history. The origins can be traced back to the early commerce in Mesopotamia in the 2000s B.C., when first contracts for future delivery of goods were written in cuneiform script on clay tablets[10] (**Figure 5**). These contracts contained, most of the time, a description of the parties, a description of the good to be transferred, the date of delivery, the price of the transaction and, occasionally, a list or description of witnesses. Trading, generally, took place at the temples of the cities, which, in addition to the traditional religious and political functions, had an important commercial role also for derivatives transactions. The temples in Ancient Mesopotamia offered warehouse facilities and provided quantity and quality measurement standards. They were operating as modern clearinghouses (Kummer and Pauletto, 2012; Poitras, 2000). The emergence of contracts for future delivery enhanced the efficiency of agriculture markets in Mesopotamia and they were a prerequisite for the expansion of long–distance trade. Contracts for future delivery of commodities were used during the Roman Empire[11] and afterwards during the Byzantine Empire as instruments to facilitate commerce across territories.

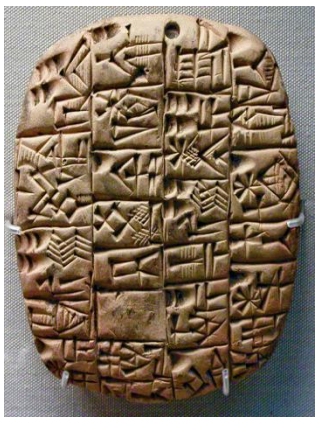

Figure 5 Clay tablet contract

In the Antiquity, most contracts were between private parties (e.g., merchant/seller), and were similar to the modern 'over-the-counter' derivative transactions, especially regarding forwards and options. The legal framework for contracts for future delivery established with the Roman commercial law remained in place during the Medieval time (Dark Age), when early forms of markets took place at the periodical fairs. Since in the larger fairs, such as those in Genoa (Italy) or Lyons (France), transactions between merchants were extensive, there was the necessity for dealings on credit instead of money. At the same time, to deal with transactions using different coinages and units of account, each fair organized a forum for settling exchange rates.

3.2 The Renaissance

During the Renaissance – a period of cultural and economic revival that lasted from the 14th to the 16th century – financial markets became more sophisticated in Italy and in the Low Countries (the Netherlands and Belgium). During that time, the slow speed in communication and high transportation costs represented a serious problem for traders (Swan, 2000). Merchants used derivatives contracts as a medium of exchange in long–distance trade. One of such contracts was the *bill of exchange*, which consisted in a promise to repay a certain amount of money in a specific location, in a different currency and at a future date. A *bill of exchange* was structured as a modern option. For instance, some bills offered the possibility for a buyer to take up the delivery at the agreed conditions or to pay a fixed fee instead of taking the delivery. Thus, bills of exchange, whose maturity typically ranged from a few days to 90 days, could generate a credit as well as a changing operation (Kummer and Pauletto, 2012). The holder of a bill earned interest because bills were traded at a discount that gradually diminished until maturity. Put differently, the buyer of some commodity accepted a bill of exchange and passed it to the payee instead of sending gold or silver coins. The payee, in turn, could either hold the bill until its maturity or sell it to a third party. As trade expanded, the exchange of such bills grew significantly, so that many merchants finished moving from trading commodities into dealing with bills of exchange. Because bills of exchange, especially in the form of contracts for difference[12], gave traders too much possibility to speculate and increase financial gain, these contracts were banned in 1541 for the fear of amplifying financial risk (nowadays known as systemic risk).

After their abandonment, forward contracts were introduced on a large scale in Bruges and Antwerp (Belgium), and then in Amsterdam (the Netherlands). Antwerp was initially the most important centre for trading in commodities. In 1531, the Antwerp Exchange opened and simultaneous trading using both forward and option contracts emerged (van der Wee, 1977). The concentration of liquidity on the Antwerp Exchange triggered speculation centred on the main merchants and large merchant houses that controlled financial activities or trading in goods. In 1565, the Royal Exchange opened in London on the model of Antwerp Exchange. The collapse of Antwerp in 1585 and the subsequent migration of important merchants contributed substantially to the rise of the important financial and commodity exchanges in Amsterdam and London.

Although Amsterdam was an important commercial midpoint prior to 1585, the creation of the Amsterdam bourse in 1611 marked the emblematic beginning of Dutch commercial hegemony. During the 17th and 18th centuries, trading of forward and option contracts on the Amsterdam exchange revealed many essential characteristics of exchange trading in modern derivatives markets. Amsterdam also registered the first speculative bubble in the history linked to the tulip market[13], known as *tulipmania*. In the 1630s, prices for bulbs of newly introduced tulips reached extraordinarily high levels and then abruptly collapsed (**Figure 6**). At the peak of *tulipmania*, in February 1637, some single tulip bulbs were sold for

more than 10 times the annual wage of a skilled craftsman (about 300 guilders a year) (Nusteling, 1985). The tulip 'Semper Augustus' was famous for being the most expensive tulip sold in the 1630s (**Figure 7**). *Tulipmania* was nurtured by euphoria and boosted by the entrance of purely speculative buyers into the tulip market, and speculation with tulip bulbs was done mainly with option contracts (Thompson, 2007). According to the Keynesian view, *tulipmania* can be considered as an example of the "animal spirits" theory, which reckons that financial markets are largely irrational and driven by herding behaviour, thus the "mania" was the consequence of a market failure. Conversely, according to the laissez-faire view of Smithian origin, the extreme prices were the consequence of governmental decisions, and therefore it was a government failure. In Thompson's words (2007): "the market for tulips was an efficient response to changing financial regulation - in particular, the anticipated government conversion of futures contracts into options contracts".

Derivative trading spread from Amsterdam to France at the end of the seventeenth century, and from France to Germany in the early nineteenth century. Thus, derivatives were originally intended to be used to effectively hedge certain risks and, in fact, were the reason behind their skyrocketing development.

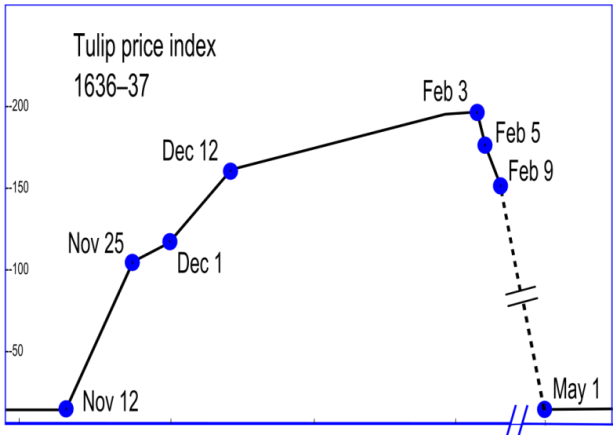

Figure 1: Standardized price index for tulip bulb contracts

Source: E. Thompson, 2007. Data between February 9 and May 1 were not available, thus the shape of the decline is unknown. The tulip market however is known to have collapsed abruptly in February.

Figure 2: The tulip 'Semper Augustus'

Note: Its bulb was valued at approximately 6,000 guilders (florins) in 1637. For comparison, a ton of butter was priced around 100 guilders and "eight fat swine" costed 240 guilders.

3.3 The Dojima Rice Exchange

While forward and option contracts were used in Europe, the first evidence of 'futures' contracts was found in 1650 at the Yodoya rice market in Osaka, a Japanese city called the 'kitchen' of the country. The first organized futures exchange in the world – the Dojima rice market[14] – was established in the same city in 1730. The years from about 1603 until 1868 are known as the Tokugawa period, or the Edo period, since Japan was ruled by the Tokugawa *shogunate*. Edo, literally "bay-entrance" or "estuary", is the former name of Tokyo (**Figure 8**). Rice played a special role in the Tokugawa period. Land was measured in terms of its output of rice, and feudal Japanese land lords (*daimyos*) received annual tax in form of rice, whose surplus was shipped to their storage warehouses (*kuruyashiki*) in Osaka in order to be sold on the market. Every year about 2.000.000 koku of rice (corresponding to about 9.920.000 bushels, one koku equals a ton of rice) were shipped to Osaka warehouses, whose number reached more than 100 units by the year 1700 (Matao, 1999). Daimyos employed merchants to manage their warehouses and rice was sold at auctions by tenders to officially authorized rice brokers. Rice brokers who made a successful bid received a "rice ticket" which promised future delivery of rice at a specified price. The rice tickets, on the one hand, allowed landlords to lock the prices at which rice was bought and sold, reducing the risk they faced. On the other hand, tickets were freely transferable and thus started to be traded significantly to third parties. In 1697, the Yodoya rice market moved to Dojima, a small island at the delta of the three main rivers in the northern part of Osaka, and became the Dojima Rice Exchange (**Figure 9**). The Dojima Rice Exchange was officially authorized as rice exchange by the government of the Tokugawa Shogun in 1730 and comprised two types of rice markets: the *shomai* (literarily 'true rice') and *choaimai* ('rice on the book'). The *shomai* market was the spot and *choaimai* was the futures market.

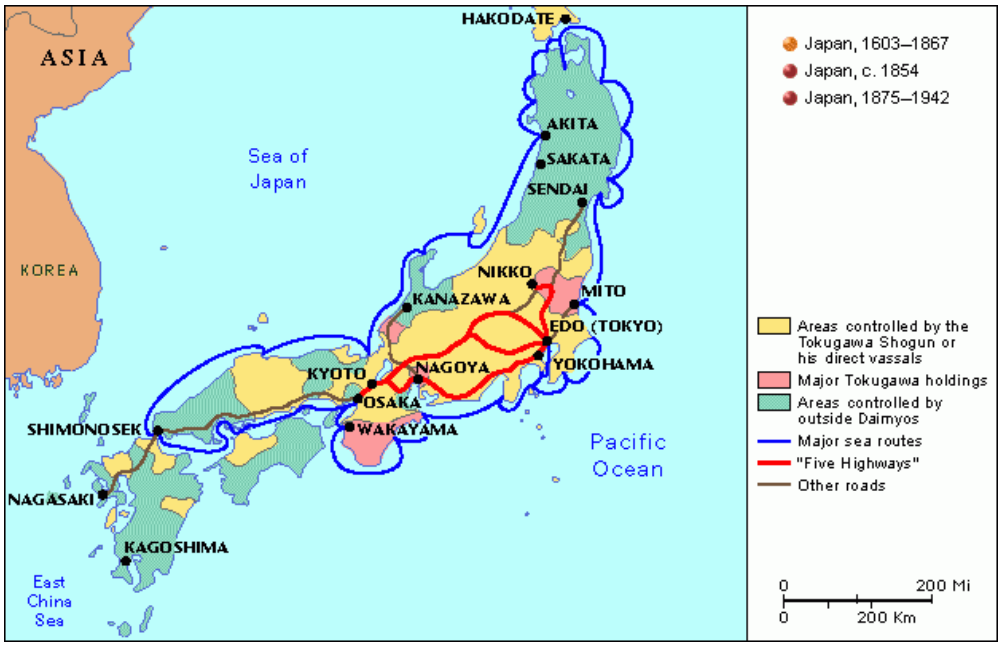

Figure 3: Japan, Tokugawa period, 1603-1867

Source: Grolier Atlas

The Dojima Rice Exchange was subjected to specific laws. Each rice trader, in fact, needed to be registered and hold a license to operate on the Dojima exchange. In addition, traders were assigned to trade on fixed periods (generally, a year was divided into three periods corresponding to the spring, summer, and winter markets, respectively: January 4 – April 8, April 17 – October 8, and October 17 – December 24), and contracts traded as futures were standardised (the standard trading unit was 100 koku[15], each contract was equal to 100 koku, and minimum price movements were measured at one koku) as well as the rice quality (Schaede, 1989; Wakita, 2001; Ross 2009). On the last day of the trading period, all positions had to be cleared in cash or by physical delivery through a clearinghouse, each trader was to have a line of credit with a clearinghouse and clearinghouses took on contract obligations in case of a trader's default. The government of the Shogun, on its side, granted controls over the market, especially with respect to rice futures trading. The rules governing trading on the Dojima Rice Exchange were thus much like today's futures markets. The Dojima market was active until the end of the Tokugawa period (1603-1868), but the destabilization of the shogun's government contributed to the decline of its rice distribution control policy. Consequently, the Dojima Rice Market declined and the market closed in 1869.

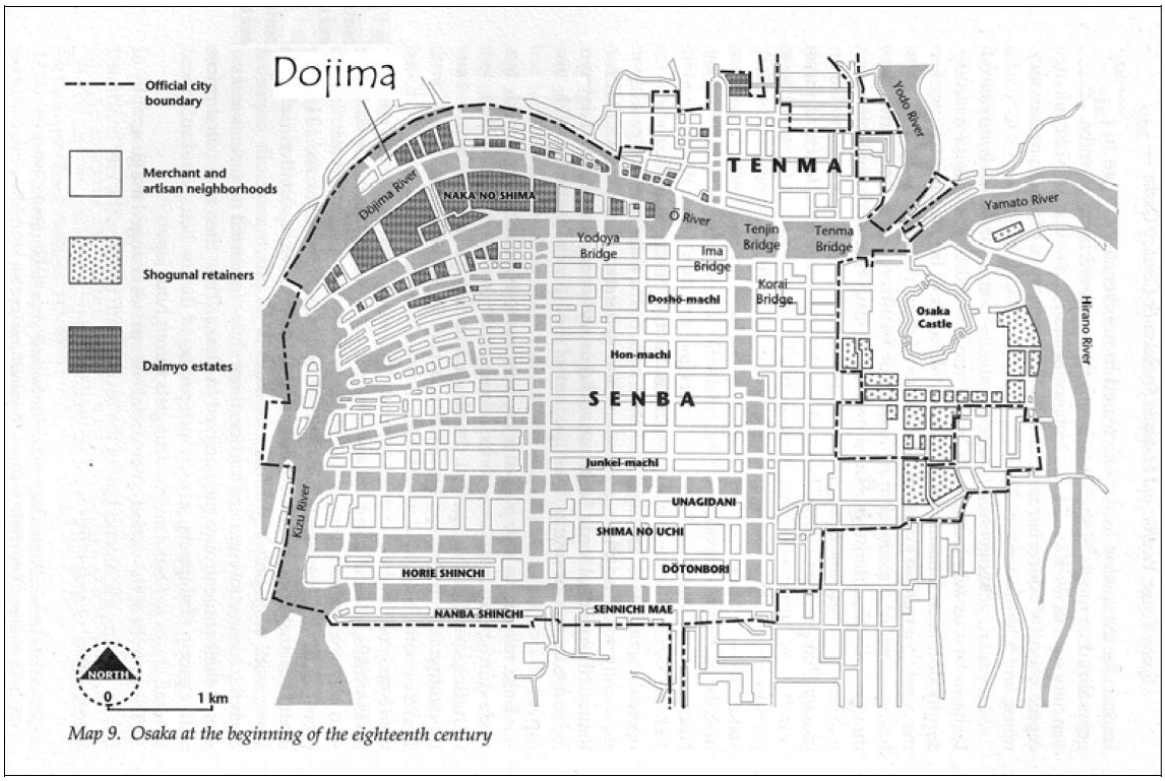

Figure 4: Osaka at the beginning of eighteen century

Source: James L. McClain, "Space, Power, Wealth, and Medieval Urbanism in the Osaka Region," in *Osaka: The Merchants Capital of Early Modern Japan*, eds. James L. McClain and Wakita Osamu (Ithaca, NY: Cornell University Press, 1999), p. 66.

3.3.1 A quasi-experiment for the Dojima market: rice price behaviour and futures market

To determine whether the Dojima futures market had any effect on the historical behaviour of rice prices, a quasi-experiment that distinguishes between the absence ('control period') and the establishment ('treatment period') of Dojima rice futures market has been conducted. Futures data from the period of Tokugawa is scarce, thus it is challenging to gauge exactly how much prices were developing before and after the foundation of the first Japanese futures market. To this purpose, data concerning shomai spot price in Osaka and other Japanese provinces were collected from the International Institute of Social History, which holds one of the largest archives for labour, price, and social history information in the world.

In particular, following the study by Jacks (2007), I determine the general level of volatility of rice price when Dojima futures market was active (after 1731) and prior to its foundation in 1731. Specifically, I compute:

1) the coefficient of variation of logged rice spot prices (given by the standard deviation of the considered sample divided by its mean, i.e. σ/μ);

2) the average of the absolute value of the year-on-year rice price change, namely $\frac{\sum_{t=2}^{n}|\ln p_t - \ln p_{t-1}|}{n}$.

The coefficient of variation enables to capture the general volatility effect and the price change permits to seize intra-seasonal variation. Different time horizons were considered: exactly 15, 20, 25, 29 years before and after the establishment of Dojima futures market.

To have a first idea of price behaviour, the rice spot prices in Osaka between 1701 and 1830 have been reported in Figure 5. The latter shows the yearly time-series before and after the creation of the Dojima futures market — defined by the red vertical line. It emerges that before 1731 rice prices fluctuated more than after the establishment of the Dojima futures market.

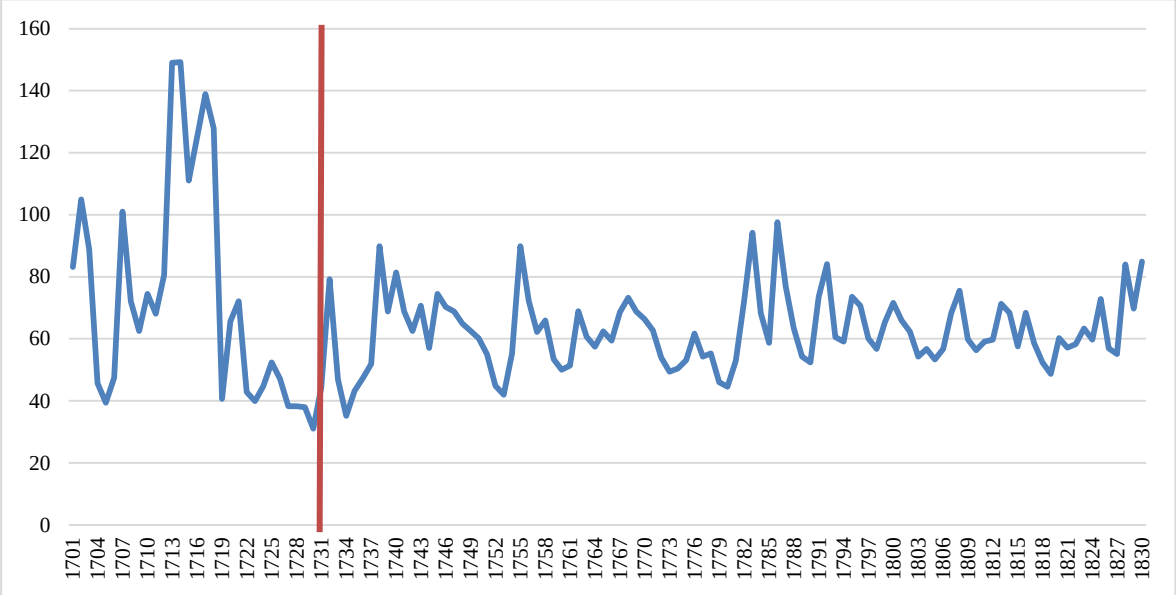

Figure 5: Rice price pattern in Osaka, 1701-1830

Source: Own elaboration

Note: The solid vertical line indicates the year of the establishment of Dojima futures exchange. y-axis: price of one koku of rice given in Monme, the silver currency of Japan during the Tokugawa period. Data source: Elaborations on International Institute of Social History http://www.iisg.nl/hpw/data.php#japan Rice prices in 14 regions, 1620-1867.

The results of the coefficient of variation (**Table 4, Panel A**) and the average of the absolute value of the year-on-year price change (**Table 4, Panel B**) support the explanation that the establishment of the Dojima futures exchange has generally reduced rice price volatility. In particular, during 15 and 20 years before the creation of the Dojima futures market, volatility was 7-8 % higher than the period after its foundation. These results support the thesis that derivatives markets have a curbing effect on price movements and the creation of the Dojima future markets was, indeed, associated with dampened rice price volatility, regardless of the time horizon considered. Certainly, this analysis has the caveat that other factors might have

driven price volatility, but the findings give a first indication that exchanges tend to stabilize prices or minimize their fluctuations.

Table 1: Rice price volatility in Osaka before and after the establishment of the Dojima futures markets, 1701-1830

Panel A coefficient of variation	without futures market	with Dojima futures market	Volatility difference in %
15 years before/after 1730	0.121	0.047	7.44
20 years before/after 1730	0.121	0.043	7.76
25 years before/after 1730	0.114	0.057	5.72
29 years before/after 1730	0.110	0.065	4.43

Panel B average of the absolute value of year on year change	without futures market	with Dojima futures market	Volatility difference in %
15 years before/after 1730	0.234	0.149	8.47
20 years before/after 1730	0.228	0.153	7.48
25 years before/after 1730	0.245	0.172	7.37
29 years before/after 1730	0.257	0.205	5.16

Source: Own elaboration

3.4 The Derivative markets in the US

Moving forward 200 years, in the early 1800s Chicago emerged as an important centre for the storage, sale and distribution of grain thanks to its strategic location on Lake Michigan, the expansion of the city's harbour, and the railroad system. In 1848, the oldest commodity derivatives exchange still operating in the world, the Chicago Board of Trade (CBOT), was created in the town by a group of businessmen who tried to adjust the Midwest's disordered grain market. Farm prices, at that time, were characterized by booms and busts: prices were high in winter, when grain was scarce; they were low during the harvest time, when grain was abundant. To avoid too low prices, often farmers finished to destroy or withdraw their grain from the market. The Board of Trade offered farmers a way to get a guaranteed price for their goods ahead of time by negotiating forward contracts, the so called 'to-arrive contracts'. At planting time, a farmer could negotiate the price he would get at harvest time. At the same time, a large buyer of grain could secure for himself in advance a specific supply. These contracts, therefore, allowed farmers to lock-in the price and later deliver the crop.

Soon CBOT became a predominant place to trade in grains, so that in 1855, France moved its grain purchasing from New York to Chicago. One of the first improvements undertaken by the CBOT was the creation of a department responsible of classifying and certifying grades of grain

in 1858. Under the old system, a farmer's lot of grain had to be inspected at many points in the selling process, to make sure it was of the quality and cleanliness it was supposed to be. If a farmer stored his grain with other farmers' lots, grains of differing qualities often went mixed, affecting the price later. The department instituted a new system where grain was graded before storage and stockpiled with grain of the same quality. The farmer received a receipt for *y* amount of grain of *y* quality; one of the grades was 'standard'. The usage of the receipts facilitated trading of large volumes of grain. Instead of buying and selling sacks of wheat or maize, brokers could trade the receipts. Soon they began vigorously trading grain futures. For the farmer, futures contracts guaranteed a certain price in a distant month. For speculators, futures contracts represented a way to profit from price changes.

This generated confidence for the buyers and gave the basis for the development of the market. In 1888, about 25 quadrillion ($25*10^{15}$) bushels of wheat passed from hand to hand through futures contracts even though farmers harvested only 415 million bushels of wheat in that year (Levy, 2006).

Futures markets facilitated the efficient distribution of grain and contributed to a well-functioning market by steadying prices. A comparison of three grains of similar nature – wheat, oats, and barley – can be used as a simple test to support this statement (Table 2). Wheat and oat were traded on futures market, barley was not.

By comparing their price fluctuations on the Chicago market for the period 1899-1916, it is possible to notice that price movements in barley were much more intense than the fluctuations in prices for wheat and oats. Indeed, only once in 1916, did wheat show a fluctuation of over 100 per cent, oats recorded a similar variation twice (in 1901 and 1902), while barley showed such a price fluctuation eight times in eighteen years. This would suggest that futures trading in grains did stabilize prices.

Some similar results were obtained by comparing the fluctuations in the price of wheat per bushel before and after futures trading started. Considering the data by Boyle[16] (1921) and applying the same quasi-experiment carried out for the Dojima market, I find that volatility was much higher when the futures market was not active. As before, however, other factors, such as transportation improvements may have contributed to lessen price swings. The raw data are reported in the appendix.

Table 2: Cash price fluctuations in percentage

Year	Wheat %	Oats %	Barley %
1899	24.2	46.7	57.1
1900	42.6	25	97.6
1901	26.6	107.5	73.2
1902	41	103.4	93.3
1903	32.5	44	72.2
1904	50.3	62.9	103.3
1905	59.2	38	57.1
1906	42.9	48	52.7
1907	71.8	68.6	175
1908	31.4	31.5	130.4
1909	61.2	72.2	91.9
1910	44.7	64.7	114.3
1911	40.5	65.8	152.6
1912	43.5	93.4	233.3
1913	43.1	37.1	102.4
1914	70.1	52.6	79.5
1915	70.4	68.2	87.5
1916	207.3	52.5	120.6

Source: James E. Boyle 1921, Speculation and the Chicago Board of Trade (New York: The Macmillan Company), p. 123.

Table 3: Wheat prices in the US before and after the establishment of the Chicago futures markets, 1793-1913

	without futures market 1793-1848*	with CBOT futures market 1874-1913**	Volatility difference in %
Coefficient of variation	0.288	0.216	7.20
Average of absolute value of the period-to-period change	0.314	0.162	15.2

Note: *Computed on the price of wheat per bushel at Albany, New York, on the first day of January in each year. **Computed on the price of No. 2 wheat per bushel Chicago CBOT, on the first business day of each year. Prices are not taken in log to avoid negative coefficients of variations.

Additional expansions in the US trading derivatives market occurred in the 1970s. This period coincided with the collapse of the Bretton Woods fixed exchange rate regime and the development of computers and their growing use in finance, which allowed complex models and computations to be rapidly and efficiently solved. At the same time, new financial innovations were introduced by exchanges. For instance, the Chicago Mercantile Exchange launched futures contracts written on financial instruments in 1972. In 1973, the theoretical advances presented in the study by Fischer Black and Myron Scholes[17], 'The Pricing of Options and Corporate Liabilities', allowed traders to compute the price of options and create a hedged position using options on equities. In the same year, the Chicago Board of Trade opened the Chicago Board Options Exchange. In 1975, the Chicago Board of Trade introduced the first interest rate futures contract.

In the second half of the 1980s, 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. In 1991, the notional amount of OTC derivatives trading surpassed exchanged-traded derivatives. The next important development for derivatives was electronic trading, which was launched initially by the Chicago Mercantile Exchange in 1992, and immediately gained wide acceptance. The mid 1990s saw, among other things, the emergence of modern financial instruments, such as credit default swaps, and profound changes in derivatives trading facilitated by two Congressional Acts, the Financial Services Modernization Act and the Commodity Futures Modernization Act (see Section 4).

Starting from the new millennium, derivatives markets (**Figure 6**) registered a marked expansion to reach in 2017 the level of 25 billion contracts traded, a value more than double compared to 2006. This number, however, masks considerable variation between types of derivatives (futures and options): futures volume, after reaching the record level of 15.5 billion in 2016, slowed down to amount 14.5 billion contracts in 2017; options volume, which tends to register smaller values than futures contracts, increased in 2017 compared to 2016. In terms of asset breakdown, the most actively traded exchange derivative product category, accounting for 48% of total volumes, is equity, followed by commodities, interest rates, currencies, and other products.

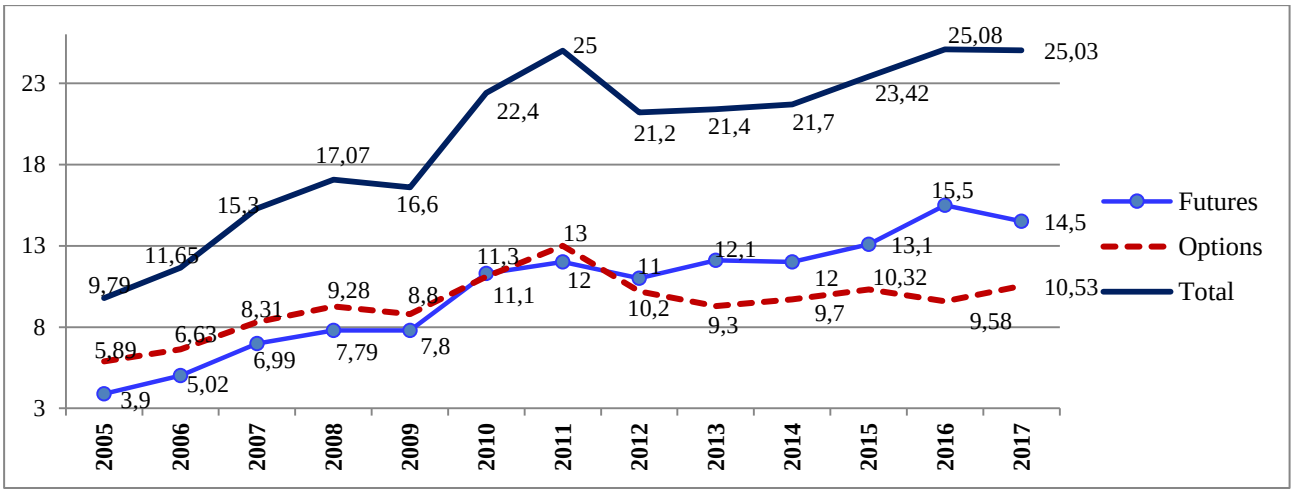

Figure 6: Worldwide derivatives volume: Number of futures and options contracts traded in billions

Source: Own elaboration on World Federation of Exchanges, 2018
http://www.world-exchanges.org/home/index.php/statistics/annual-statistics

The dynamics of derivatives volume for category is shown in **Figure** 7. In particular, the percentage quotas of equities has contracted since 2009, commodity and currency categories have instead registered a rise in the percentage composition, with the exception of 2017 for commodities. Within the commodity group, energy and agricultural derivatives show the highest volumes traded (**Figure** 8). The expansion, which consistently involved the agricultural sector, was fostered by the period of deregulation in the US and in many other countries worldwide. The liberalization of pricing and loosen controls brought about higher volatility, which, in turn, fuelled an extra usage of financial derivative products that culminated in the global financial crisis which left a permanent trace in the history of derivatives (Stout, 2011).

Within the agricultural sector, the main contracts traded in 2018 have been Soybean Meal Futures traded at the Dalian Commodity Exchange, Corn Futures at the Chicago Board of Trade, and Rapeseed Meal Futures traded at the Zhengzhou Commodity Exchange (FIA[18], 2018).

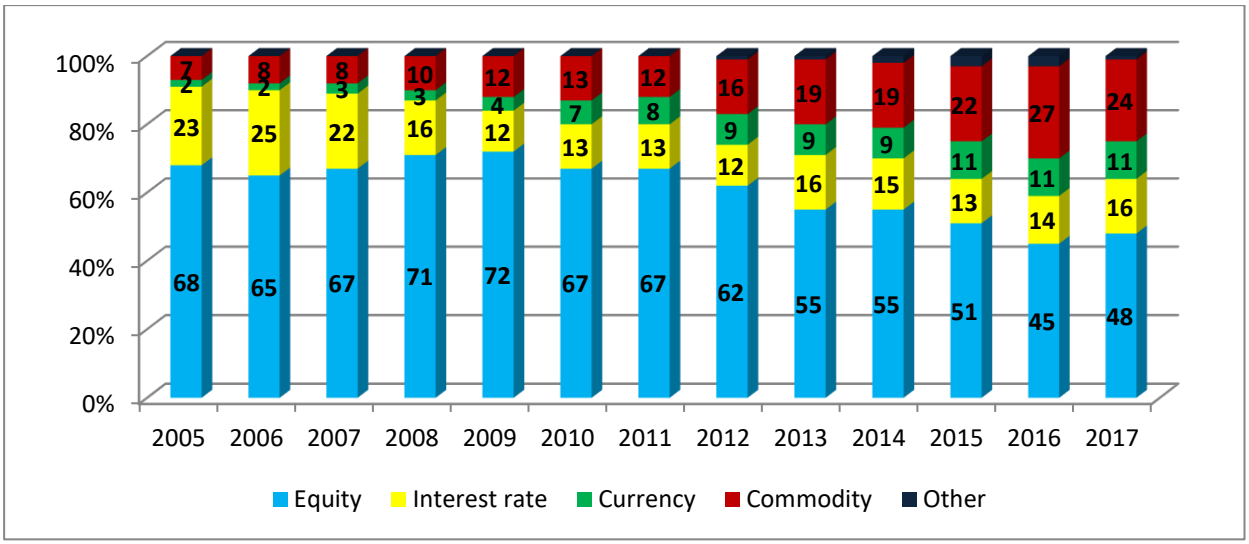

Figure 7: Product composition of derivatives market in % by number of contracts traded. 2005-2017

Source: Own elaboration on World Federation of Exchanges, 2018
http://www.world-exchanges.org/home/index.php/statistics/annual-statistics

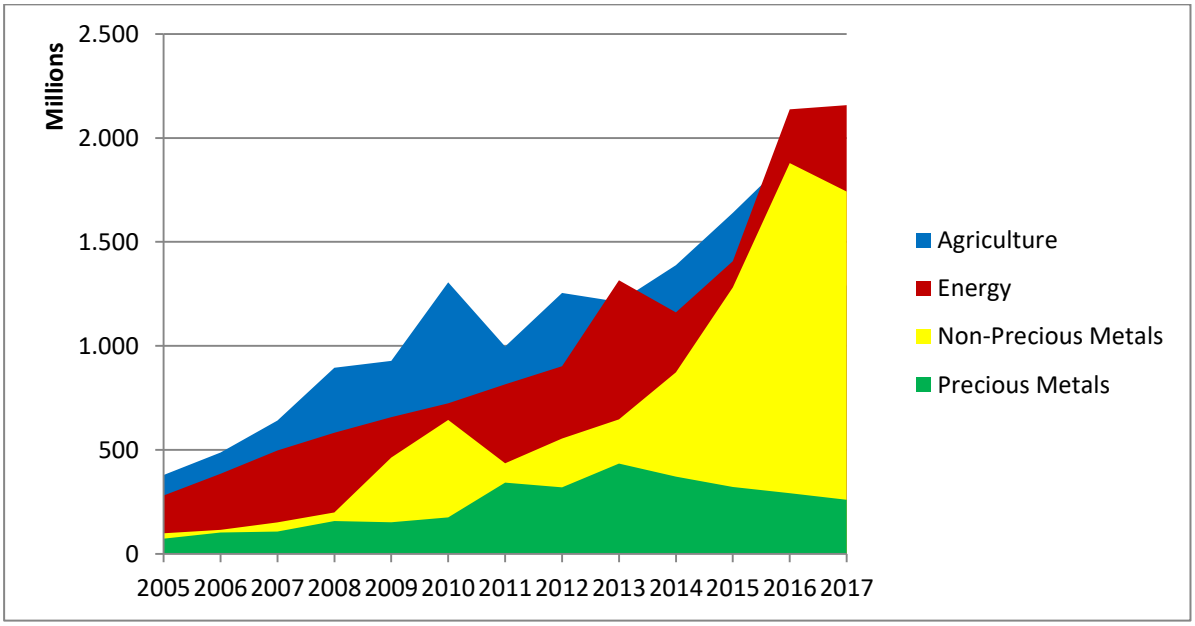

Figure 8: Trading volume. Number of futures and option contracts traded, millions

Source: Own elaboration on Futures Industry Association FIA, 2018. Y-axis: trading volume. https://marketvoice.fia.org/articles/global-futures-and-options-data-q1-2018

4. The Regulatory History of the US Financial Derivatives Markets

4.1 Early developments: The Grain Futures Act and the Commodity Exchange Act

Laws and regulations have been particularly important to the development of derivatives markets. Originally, laws and regulations in the US were designed to coordinate geographically dispersed agricultural markets, afterward the legal infrastructures became a key element in the construction of a highly speculative financial system (Muellerleile, 2015).

In the late 1800s, laws and regulations in agricultural commerce were often intended to generate an efficient price mechanism and speculation was seen as a mean to reach market efficiency. In the beginning of the 1900s, the US government took a relatively adverse attitude towards speculative trading because of its alleged effect on prices and price variability. The US agricultural futures markets became thus strongly regulated. Specifically, in 1922 the US Congress enacted the first federal regulation of grain trading by passing the **Grain Futures Act**. This Act was approved after the grain price collapse following World War I, when CBOT speculators were blamed of the adverse price dynamics. The farm lobby put pressure on the Congress to ban totally futures trading, accusing the 'predatory' behaviour of speculators and the 'gambling' activities of the CBOT (Muellerleile, 2015). The Grain Futures Act of 1922 established that all grain futures trading could only take place on regulated exchanges which were required to prevent manipulation of prices or cornering[19] of the market. The Grain Futures Act implemented a large trader reporting system, under which each clearing member was required to report on a daily basis the market positions of each trader exceeding a specified size. This large trader reporting system remains an integral part of the Commodity Futures Trading Commission's (CFTC) oversight scheme to this day.

Between 1922 and 1936 there were very little changes in federal regulation of grain exchanges, but a very important transformation took place in the banking sector. In 1933, in fact, the Glass-Steagall Act, a law that separated commercial and investment banking activities, was passed under President Franklin Delano Roosevelt. The Act was a response to the 1929 stock market crash and the subsequent Great Depression, and aimed at restricting the use of bank credit for speculative operations and conveying bank credit into more productive uses, such as industry, commerce and agriculture. Essentially, commercial banks were no longer allowed to underwrite or deal in securities, while investment banks, which could underwrite and deal in securities, were no longer allowed to have close connections to commercial banks. The financial regulations of the 1930s were valuable to the extent that they tried to tackle the main sources of market failure at the time, explicitly, uncertainty and excessive risk-taking by institutions in an effort to insulate depositors' savings from being used to finance high-risk investments in the financial markets.

In 1936, the **Commodity Exchange Act** (CEA) amended the Grain Futures Act. One of the CEA's main requirements was that all futures contracts were to be traded on a regulated exchange. The CEA thus strictly prohibited trading in 'off-exchange futures' (OTC derivatives) and ensured that speculative trading in commodities like wheat, maize, and silver remained largely confined to the organized and regulated exchanges.

The CEA further extended federal regulation to a list of commodities including cotton, rice, mill feeds, butter, eggs, and Irish potatoes as well as grains. All references to 'grains' in the Grain Futures Act were changed to 'commodities'. The Congress created a federal agency, the Commodity Exchange Authority, housed in the US Agriculture Department, to monitor commodity exchanges and prevent market manipulation. At the same time, the Commodity Exchange Act granted the Commodity Exchange Commission the authority to regulate commodity exchanges by establishing Federal speculative position limits[20] for speculators who were not *bona fide* hedgers (i.e., commercial traders of the physical commodity, such as farmers, grain elevator operators and food processors). The Commodity Exchange Act also required futures commission merchants to segregate customer funds that were deposited for purposes of margin, prohibited fictitious and fraudulent transactions such as wash sales[21] and accommodation trading[22] and banned all commodity option trading[23] and bucket shops[24].

This strong regulatory approach avoided that speculative trading in futures and other derivative contracts caused significant problems for other parts of the economy. Indeed, the Commodity Exchange Act's regulations were grounded on a belief that futures markets were susceptible to manipulation and control by large traders. Excluding the rare market manipulation scandals (e.g., onions in the 1950s[25]), organized future exchanges functioned smoothly and the Commodity Exchange Authority rarely took meaningful actions to change the rules.

The status of derivatives markets as a narrow and largely agrarian financial place started to change in the early 1970s. With the objective to capitalize on the exchange rate volatility following the breakdown of the Bretton Woods fixed exchange rate system, the Chicago Mercantile Exchange (CME) began trading futures contracts on foreign currencies in 1972 (Awrey, 2013). Soon after, the Chicago Board Options Exchange (CBOE), a branch of the CBOT, was created to facilitate trading in options and futures on individual securities. On the first day of operation, 911 contracts in 16 underlying securities were executed on the CBOE.

4.2 Further developments: The Commodity Futures Trading Commission and other acts

Spurred in large part by these developments, in 1974 the Commodity Futures Trading Commission Act (CFTCA), which amended the Commodity Exchange Act, created the Commodity Futures Trading Commission (CFTC), an independent federal agency responsible for ensuring the integrity of the market by regulating commodity futures and option markets in the US. The CFTC, which replaced the former Commodity Exchange Authority, had powers

greater than those of its predecessor agency. For example, while the 1936 Commodity Exchange Authority only regulated agricultural commodities enumerated in the Commodity Exchange Act, the 1974 Act granted the CFTC exclusive jurisdiction over futures trading in all commodities including "all other goods and articles…and all services, rights and interest in which contracts for futures delivery are presently or in the future dealt". This meant that anything traded as part of a futures contract on a contract exchange was defined as 'commodity'. In short, the US Congress gave the CFTC exclusive jurisdiction over all contracts having 'the character of' futures contracts including physical or financial commodity and mandated that such contracts, with certain exemptions, should only be traded on CFTC-regulated exchanges. No other federal agency nor any state government entity or law could interfere with the development of futures markets. The 1974 Act also hardened the old state common law rule by strictly prohibiting trading in 'off-exchange futures', and the CFTC was in charge to conduct daily market surveillance and order specific actions to guarantee the financial and market integrity of the exchange.

The 1974 amendments to the CEA also included the 'Treasury Amendment', which excluded foreign currencies and certain specified financial instruments (such as government securities or mortgages and mortgage purchase commitments) from the jurisdiction of the CFTC if they were traded off-exchange. The justification behind the Treasury Amendment was that market participants engaging in this kind of activity were most likely to be banks and other financial institutions and therefore did not need the protection of the CEA. The Treasury Amendment did not deal with innovative derivative contracts such as swaps. What resulted was legal uncertainty about whether certain privately negotiated derivatives contracts were illegally traded off-exchange since they did not enter the definition of contracts specified in the Treasury Amendment.

In January 1983, President Reagan signed the Futures Trading Act of 1982, renewing the CFTC's mandate to regulate futures trading for four more years and clarifying Commission jurisdiction in a number of areas. Among other things, this Act codified the Shad-Johnson Accord, which gave the CFTC jurisdiction over broad-based stock index futures and banned single-stock and narrow-based stock index futures.

At the end of the 1980s and 1990s, a period of deregulation took place pushed by a free market-oriented policy vision. In 1980, President Jimmy Carter signed the Depository Institutions Deregulation and Monetary Control Act which deregulated banks, while simultaneously giving the Fed more control on non-member banks. It also deregulated interest rates paid by depository institutions such as banks, making them a matter of private discretion (previously this was regulated under the Glass-Steagall Act) and improved the competitiveness of banks and thrifts. This Act is considered the first significant reform in the banking industry since the Great Depression. In those years, trading in stocks and new financial instruments, such as swaps, soared and a new debate over whether or not to regulate them began. Under the pressure of the financial industry, the CFTC—headed by Wendy Gramm, the

conservative economist wife of Republican Senator Phil Gramm— issued a 1989 'safe harbor' policy statement according to which the CFTC would not take any action to preclude the effectuation of or to regulate swap transactions. In 1992, Congress gave the CFTC clear legislative authority to exempt various types of derivatives from regulation. The 1992 amendments also explicitly stated that federal law could have blocked any state law which considered OTC derivatives illegal or unenforceable. In 1993, the CFTC used its new power to formally exempt OTC swaps from the CEA and from any other state law's control. Soon after the swap market considerably expanded to include, in addition to interest rate swaps, also commodity swaps comprising agriculture, metals, and energy products. Thus, several banks started selling customized OTC commodity swap contracts to clients who were seeking exposure to commodity price swings either to diversify their investment portfolios or to speculate on commodity price movements. In the wheat derivatives market, for instance, exemptions allowed several swap dealers to hold a variable quantity of wheat contracts, ranging from 10,000 to 53,000 contracts (US Senate, 2009). As a consequence of this liberalization process, also some swaps 'disasters' materialized. In 1994, Protect & Gamble Co. announced a loss of $157 million for speculating in interest swaps. A few months later, Orange County Pension Fund went bankrupt and, in 1998, the hedge fund Long Term Capital Management was on the verge of a collapse threatening the entire US financial system.

In the summer of 1998, the lawyer Brooksley Born, the new head of CFTC, worried by the swap transactions disasters and the opaque and unregulated markets, issued a concept release indicating that CFTC could have started again to exercise regulatory authority over financial derivatives. This strong change in policy implied that OTC derivatives would be treated as illegal off-exchange futures. Thus, the OTC derivatives industry, which was a very powerful and influential interest group during that period, rapidly responded to the CFTC's threat by flooding the Congress with requests to stop any federal regulatory effort. Under pressure, the Congress enacted legislation to limit the CFTC's rulemaking authority over OTC financial derivatives.

Brooksley Born resigned from her CFTC position, and a Presidential Working Group was entitled to provide recommendations on how best to 'modernize' derivatives regulation. The Working Group—whose members included Federal Reserve Chairman Alan Greenspan, Treasury Secretary Robert Rubin, and Treasury Undersecretary Lawrence Summers— produced a report in 1999 that weakened the CFTC's concerns and criticized its attempt to exercise jurisdiction over OTC derivatives. The Group further recommended that OTC derivatives should have been completely deregulated and the CEA should have been amended to bring 'legal certainty' and enforceability to all off-exchange derivatives trading (Treasury gov., 1999).

The cover letter to the report explained the Working Group's reasoning for the recommendation, saying, "[a] cloud of legal uncertainty has hung over the OTC derivatives markets in the United States in recent years, which, if not addressed, could discourage

innovation and growth of these important markets and damage U.S. leadership in these arenas by driving transactions off-shore" (Rechtschaffe, 2000).

In the same year (November 1999) the Gramm-Leach-Bliley Act (also known as Financial Services Modernization Act) under the Democrat President Bill Clinton, repealed large parts of the Glass-Steagall Act, which had separated commercial and investment banking since 1933. The Act enabled deposit-taking banks and investment institutions to merge their operations and affiliations. As a consequence, many commercial banks, securities firms and insurers became financial 'supermarkets' offering an array of services, including sophisticated derivative instruments in agricultural and energy commodities. In short, the 1999 Act returned the banking financial environment to the pre-1933 conditions that encouraged banks to take high risks and invest in risky assets.

About one year later, the Congress, persuaded by the Working Group's recommendation, passed the Commodity Futures Modernization Act (CFMA) on December 15, 2000, in the wake of the dot-com bubble. The 262-page deregulatory bill was signed into law by President Bill Clinton on December 21, 2000. The Commodity Futures Modernization Act represented the most crucial point of the deep transformation registered in the legal infrastructure of derivatives markets. It removed centuries-old restraints on off-exchange derivatives speculation, not only in swaps, but also in other financial derivatives, including commodity futures transactions. This legislation, paradoxically, was publicized as essential to reduce systemic risk, but indeed set the stage for the big 2008 credit crisis (Stout, 2011; Ghosh, 2010).

The Act allowed for the exemption of energy products from position limits (later to be called the 'Enron loophole' when the energy firm collapsed) and the exemption of over-the-counter swaps and derivatives from the Commodity Futures Trading Commission oversight. In addition, the Act enabled investment banks to dramatically increase leverage, and this was an incentive for banks and financial institutions to take on excessive risks.

The Act consisted of four titles: Title I included several changes to the Commodity Exchange Act, comprising the limitation of the scope of the CEA. Title II amended the Securities Act of 1933, the Securities Exchange Act of 1934, the CEA, and the Shad–Johnson Jurisdictional Accord, with the purpose to streamline and eliminate unnecessary regulation for the commodity futures exchanges. Title III provided guidelines for SEC regulation of equity based swaps. Title IV further limited the scope of the CEA by specifying that nothing in the CEA applies to given swap agreements (including credit and equity swaps), hybrid instruments, and other products commonly offered by banks. This meant that over-the-counter derivatives transactions offered by banks and other highly sophisticated end users remained outside the jurisdiction of the SEC and CEA.

As a result of the CFMA and laxer controls, several speculators joined the market, especially after the beginning of 2006. New investors included banks such as Goldman and Sachs, JP Morgan, and Deutsche Bank; pension funds, such as the California State Teachers' Retirement

System and hedge funds that started trading commodity futures contracts without any position limits, disclosure requirements or regulatory oversight.

Therefore, the value of the unregulated 'virtual' trading boomed and finished exceeding the value of physical trading in commodity on regulated exchanges. The value of outstanding OTC commodity derivatives excluding precious metals increased from US$ 0.77 trillion in 2002 to US$ 5.85 trillion in June 2006, US$ 7.05 trillion in June 2007 and US$ 12.39 trillion in June 2008 (BIS, 2009). Investors began also to purchase commodity-linked exchange traded funds (ETFs) directly on stock exchanges. The efforts of swap dealers and other sellers of index products to offset their exposures to the products they sold generated growing demand for agricultural futures. Morgan Stanley estimated that the number of outstanding contracts in maize futures increased from 500,000 in 2003 to almost 2.5 million in 2008. Contextually, holdings in commodity index funds skyrocketed from US$ 13 billion in 2003 to US$ 317 billion by 2008.

The period of 'laissez-faire' facilitated the proliferation of securitization practices and a massive web of hidden interconnections, which led to misunderstandings of risks and investor losses. The CBOT also embraced this deregulatory spirit by relaxing speculative position limits from 600 contracts per commodity in the 1990s to 22.000 for maize, 10.000 for soybeans, and 6.500 for wheat in 2005. These values more than doubled when food prices reached their highest peak in 2008 (Berg, 2011).

Eight years after the Commodity Futures Modernization Act, several systemically relevant financial institutions involved in OTC derivative transactions suddenly imploded leading to the most dramatic financial crisis after the 1929 Wall Street Crash.

The financial crisis was, thus, not primarily due to 'financial innovations' in the markets or the legal system's inability to 'keep pace' with finance, but was triggered especially by *changes in the law* (Stout, 2011). Deregulation, coupled with lax lending standards to promote homeownership, led the US to experience its worst financial crisis since the Great Depression. The history indicates that the crisis was the direct consequence of the Commodities Futures Modernization Act's extensive removal of centuries-old legal constraints on speculative trading in over-the-counter derivatives, so that the deeply flawed global financial system even exacerbated the impact of supply and demand movements in food commodities (Stout, 2011; Ghosh, 2010).

Table 4 provides a synthesis of the history of regulatory and deregulatory actions undertaken by different US governments.

Table 4: History of (De)Regulatory regimes in the US

Date	(De) or Regulations	Main features	Government
1922	Grain Futures Act	Federal control over futures trading. Exchanges were required to • be licensed • provide for the prevention of price manipulation	Warren G. Harding, Republican
1933	Glass-Steagall Act	Separation between commercial banking and investment banking	Franklin Delano Roosevelt, Democrat
1936	Commodity Exchange Act (CEA)	Speculative trading is enabled only on regulated exchanges. Ban on off-exchange derivatives (OTC).	Franklin Delano Roosevelt, Democrat
1974	Commodity Futures Trading Commission Act	CEA amendment "to expand the definition of a commodity to include virtually anything tangible or intangible." Creation of the CFTC with exclusive jurisdiction over futures and options	Gerald Ford, Republican
1980	Depository Institutions Deregulation & Monetary Control Act	Bank deregulations and extended power to the Fed. Interest rates deregulation	Jimmy Carter, Democrat
1983	Codification of the Shad-Johnson Accord	Jurisdictional boundaries for the CFTC and the SEC; ban of futures contracts on single-stock; permission of options	Ronald Reagan, Republican
1989	The Financial Institutions Recovery and Enforcement Act	Bailout plan for the savings and loan industry. Strengthening of the authority of federal supervisors to promote safe banking practices and ensure compliance with applicable laws	George H. W. Bush, Republican
1999	Gramm Leach Bliley Act (Financial Services Modernization Act)	Removal of barriers between banks, insurance companies, and investment firms (abrogation of the Glass-Steagall Act)	Bill Clinton, Democrat
2000	Commodity Futures Modernization Act	Deregulation of commodity trading, OTC trading was excluded from CFTC oversight. Laissez-faire phase	Bill Clinton, Democrat
2010	Dodd-Frank Act	More regulations in financial markets	Barack Obama, Democrat
2018	First Dodd-Frank Act amendment ?	No oversight for banks with less than $250 billion in assets ?	Donald Trump, Republican

Source: Own elaboration

4.3 The Dodd-Frank Act

In 2008, the US financial system was on the verge of a complete breakdown. The crisis was of a magnitude the US had not seen since the 1930s. When faced with the collapse of Bear Sterns, the American International Group, and Lehman Brothers, the government understood that restoring restraints on speculative derivatives trading could be essential to preventing crises in the future.

In 2009, the world's leaders convened at the G20 Summit in Pittsburgh (Pennsylvania) committed to bring transparency to the OTC derivatives market through global cooperation. In 2010, the 111th Congress responded by passing the Dodd-Frank Wall Street Reform and Consumer Protection Act, (also known as Dodd-Frank or Wall-Street reform), which came into law under Barack Obama Presidency on July 21, 2010. The Dodd-Frank Act, which adopted many of the principles agreed upon at the 2009 G20 summit, has been considered from experts an ambitious and complex legislation designed to deeply transform the way the financial system operates (Mader, 2011), to inhibit financial shocks and avoid failures in the future. The passage of Dodd-Frank marked a return to strict governmental regulation of both capital markets and large financial institutions for the purpose of re-establishing the financial stability by improving accountability and transparency in the financial system of the United States. The Dodd-Frank is made of more than 2,300 pages, 290 new regulations, and 13 new agencies.

The Dodd-Frank, which effectively cancelled much of the Commodity Futures Modernization Act, is built around three pillars:

1. Financial Stability—New rules require banks to be better capitalized and more focused on the business of banking, in order to provide credit to consumers and protect savings. In this way, the costs of excessive risk-taking in the financial system are not borne anymore by taxpayers. Further, the Wall Street Reform creates the Financial Stability Oversight Council with the scope to monitor the financial system, identify emerging risks and bring large parts of the shadow banking system into the sunlight.

2. Transparency in Financial Markets—Before the Dodd-Frank Act, the $600 trillion derivatives market was a massive grid of hidden interconnections. Today, standardized derivatives are required to be centrally cleared and traded transparently on exchanges or trading platforms with appropriate margining systems. To foster transparency, the Office of Financial Research has been established to monitor activities across financial markets by collecting and standardizing financial data.

3. Consumer Protection—During the 2000s, soft lending practices and unclear underwriting standards produced risky mortgages that hurt consumers and ultimately threatened financial stability. The Dodd-Frank Act bans several practices in mortgage markets that contributed to trigger the crisis and requires more stringent rules to take loans. To safeguard consumers, the

Dodd-Frank Act has established the Consumer Financial Protection Bureau, which is dedicated to protect consumers from predatory practices in consumer financial products and services.

One of the most important parts of the Dodd-Frank Act is Title VII, which deals with OTC derivatives by providing a comprehensive framework for the regulation of the OTC swaps markets. Title VII defines and distinguishes between 'swaps' and 'security based swaps'. It establishes that the CFTC retains jurisdiction over swaps and the SEC regulates security-based swaps. Any product that exhibits features common to both a swap and a security-based swap (i.e., a 'mixed swap'), will be regulated jointly by the CFTC and the SEC.

Subtitle A of Title VII (147 Sections 721, 723(a), and 725(c)) imposes a "clearing requirement" on all speculative financial derivative contracts establishing that

"[i]t shall be unlawful for any person to engage in a swap unless that person submits such swap for clearing to a derivatives clearing organization that is registered under this Act."

It further indicates that, to be registered with the CFTC as a 'derivatives clearing organization', an organization should either be a recognized futures exchange or fulfil the same trade-guarantee and private enforcement functions[26] carried out by exchanges since the 19th century. In very broad terms, clearing agencies should interpose themselves between the counterparties to bilateral OTC transactions, assuming the obligations of each party to the other. In this way, Title VII creates a legal barrier to the public enforcement of financial derivative contracts that are not also enforced privately by an exchange or other "clearing organization." Dodd-Frank further imposes similar requirements on both swaps and security-based swaps, including, among other things, the registration of dealers and major participants and increased trade reporting.

Title VII provides, however, an exemption from the clearing requirement if one of the two parties to the swap "is using swaps to hedge or mitigate commercial risk." Title VII leaves the definition of 'commercial risk' to the CFTC, and contextually (Section 723) states that 'financial entities' cannot rely on the 'commercial risk' hedging exemption to escape the clearing requirement. Hence, Title VII permits and protects OTC trading in derivatives for *hedging purposes*, while simultaneously confining *speculative trading* to clearinghouses that perform the contract-guarantee and to organized commodity futures exchange.

Title VII, Section 619, also contains the 'Volcker Rule,' which partially reverses another statute, the Gramm-Leech-Bliley Act, passed by Congress in 1999, which increased speculative trading by commercial banks by eliminating Depression-era prohibitions on banks engaging in speculative trading for their own accounts. In particular, the Volcker Rule aims to reduce systemic risk from speculative derivatives trading, by curbing excessive risk-taking by banks and requiring them to focus on the traditional business of banks. To this purpose, it imposes the following restrictions on *banking entities*[27]*:*

– They cannot engage in *proprietary trading*[28]*,* subject to certain exemptions.

– They cannot make or retain an ownership interest in, or sponsor, a *private equity fund* or *hedge fund,* subject to certain exemptions.

– A banking entity that advises, manages, or sponsors a private equity fund or hedge fund – and all of the banking entity's affiliates – is banned from engaging in certain transactions with the fund.

The Volcker rule exempts smaller banks that do not engage in investments in funds from reporting requirements and unnecessary compliance.

4.3.1 The Dodd-Frank Act and agricultural commodities

With reference to agricultural commodities, Section 737 of the Dodd-Frank Act explicitly requires the Commodity Futures Trading Commission to implement "strong measures to limit speculation", which should materialize in tighter and more elaborate position limits on exchange-traded contracts of 28 core[29] physical commodities, including agricultural products. Position limits are aimed at combating excessive speculation and market manipulation, while also protecting market liquidity (for bona fide hedgers) and price discovery. The CFTC's first attempt at position limits under Dodd-Frank (76 Fed. Reg. 71626, October 28, 2011) was rendered null in 2012 by U.S. District Court[30] Judge Robert Wilkins on grounds that the CFTC did not provide evidence that excessive speculation was causing unwarranted changes in commodity prices as required by the 1936 Commodity Exchange Act. The Commission re-proposed position limits for derivatives on November 7, 2013 (78 Fed. Reg. 75680, December 12, 2013) and issued a supplemental proposal including certain exemptions and guidance on May 27, 2016 (81 Fed. Reg. 38458, June 13, 2016). In light of the new comments received, the Commission re-proposed position limits for derivatives again on December 5, 2016. The Commission announced federal limits on speculative positions in 25 core physical commodity futures contracts and their "economically equivalent" futures, options, and swaps (collectively "referenced contracts"). Currently, CFTC regulations apply position limits on nine agricultural futures contacts (Table 5).

Table 5: Position Limit Levels

Position Limit Levels (in contracts)		
Contract	**Spot-Month**	**Single and All-Months**
Legacy Agricultural		
CBOT Maize (C)	600	62,400
CBOT Oats (O)	600	5,000
CBOT Soybeans (S)	600	31,900
CBOT Soybean Meal (SM)	720	16,900
CBOT Soybean Oil (SO)	540	16,700
CBOT Wheat (W)	600	32,800
CBOT KC HRW Wheat (KW)	600	12,000
MGEX Hard Red Spring Wheat (MWE)	1,000	12,000
ICE Futures U.S. Cotton No. 2 (CT)	1,600	9,400
Other Agricultural		
CBOT Rough Rice (RR)	600	5,000
ICE Futures U.S. Cocoa (CC)	5,500	10,200
ICE Futures U.S. Coffee C (KC)	2,400	8,800
ICE Futures U.S. FCOJ-A (OJ)	2,800	5,000
ICE Futures U.S. Sugar No. 11 (SB)	23,300	38,400
ICE Futures U.S. Sugar No. 16 (SF)	7,000	7,000
CME Live Cattle (LC)	450	12,200
Energy		
NYMEX Henry Hub Natural Gas (NG)	2,000	200,900
NYMEX Light Sweet Crude Oil (CL)	10,400	148,800
NYMEX NY Harbor ULSD (HO)	2,900	21,300
NYMEX RBOB Gasoline (RB)	6,800	15,300
Metals		
COMEX Gold (GC)	6,000	19,500
COMEX Silver (SI)	3,000	7,600
COMEX Copper (HG)	1,000	7,800
NYMEX Platinum (PL)	500	5,000
NYMEX Palladium (PA)	100	5,000

4.3.2 Critics to the Dodd-Frank Act and its future under the Trump Presidency

The Dodd-Frank Act has been highly criticized for its length and complexity and for having increased the number of regulatory agencies (Nwogugu, 2015; Boggs et al., 2011; Green, 2011; Mader, 2011). Given the complexity, most of the provisions of Title VII became effective on July 16, 2011, that is 360 days after enactment of Title VII on July 21, 2010. The regulations of the Volcker Rule were technically effective on April 1, 2014, and the conformance period for banking organizations to come into compliance with the Volcker Rule ended on July 21, 2015. Two additional one-year extensions may be available at the discretion of the Federal Reserve; an additional (but limited) five year extension for 'illiquid funds' is also available.

Some observers, mainly belonging to the Republican view, blame the Dodd-Frank to have made basic financial services less accessible to small businesses and lower-income Americans (e.g., Financial Services Committee, 2017; Mattingly, 2011;). According to them, the Dodd-Frank which was claimed to be targeted to the end of 'too big to fail' institutions, has finished to hamper households and small- and medium-sized community financial institutions. In fact, instead of ending 'too big to fail,' Dodd-Frank created 'too small to succeed' (Lux and Greene, 2015; Pierce et al. 2014; Rapoport, 2014; Brewer and Jagtiani, 2013). This is because the largest Wall Street firms were the *beneficiaries* rather than the victims of Dodd-Frank: the law has both cemented their status as 'too big to fail' and has conferred an advantage on firms with the size and scale to absorb the complex new regulatory mandates (Prabha and Wihlborg, 2014).

According to Jamie Dimon, JP Morgan Chase CEO, the post-crisis regulatory regime has created a 'bigger moat' that protects 'too big to fail' banks from competition by new entrants and small firms that cannot so easily digest the costs of the Dodd-Frank regulatory requirements. On September 13, 2016, Republicans offered a bill, the Financial Choice Act, sponsored by Chairman Jeb Hensarling, which would alter many parts of the Dodd-Frank Act by changing financial policies and rulemaking process.

With the new Republican President Donald Trump, a new course for the Dodd-Frank Act is prospected. In May 2018, Trump signed a bill that produced some changes to the Dodd-Frank Act. Specifically, the major change has been the increase of the so-called 'Bank SIFI' threshold, which increases the size at which a bank is subject to enhanced regulation by the Federal Reserve. The Dodd-Frank Act set the threshold at $50 billion, unindexed for inflation or economic growth. Trump's law raises this value to $250 billion, with an important caveat that the Federal Reserve retains the discretion to apply enhanced regulatory standards to any specific bank greater than $100 billion, if the Fed feels that is warranted. This means that Trump's legislation will leave fewer than 10 large banks in the United States subject to stricter federal oversight, freeing thousands of banks with less than $250 billion. It is likely that the Trump administration will introduce further amendments to the Dodd-Frank Act or will repeal some part of it.

4.4 Regulatory regimes and Bank Failures

Since the early 1980s, banks substantially entered the commodity derivatives business and a phase of creative finance. The hyper growth of derivatives trading was possible thanks to the deregulatory policies adopted over time (**Table 4**). Thus, it appears interesting to explore the nexus between (de)regulatory regimes and the vulnerability of the banking system. **Figures 14** and **15** report the number of failed banks over time (1920-2017) in the US under different regulatory regimes. It appears to be a correlation between the failures of financial institutions and the adopted policy interventions. In the years before the New Deal regulation of banks (**Figure 9**) and after the easing of regulations started in 1980 (Figure 10), bank failures were quite high.

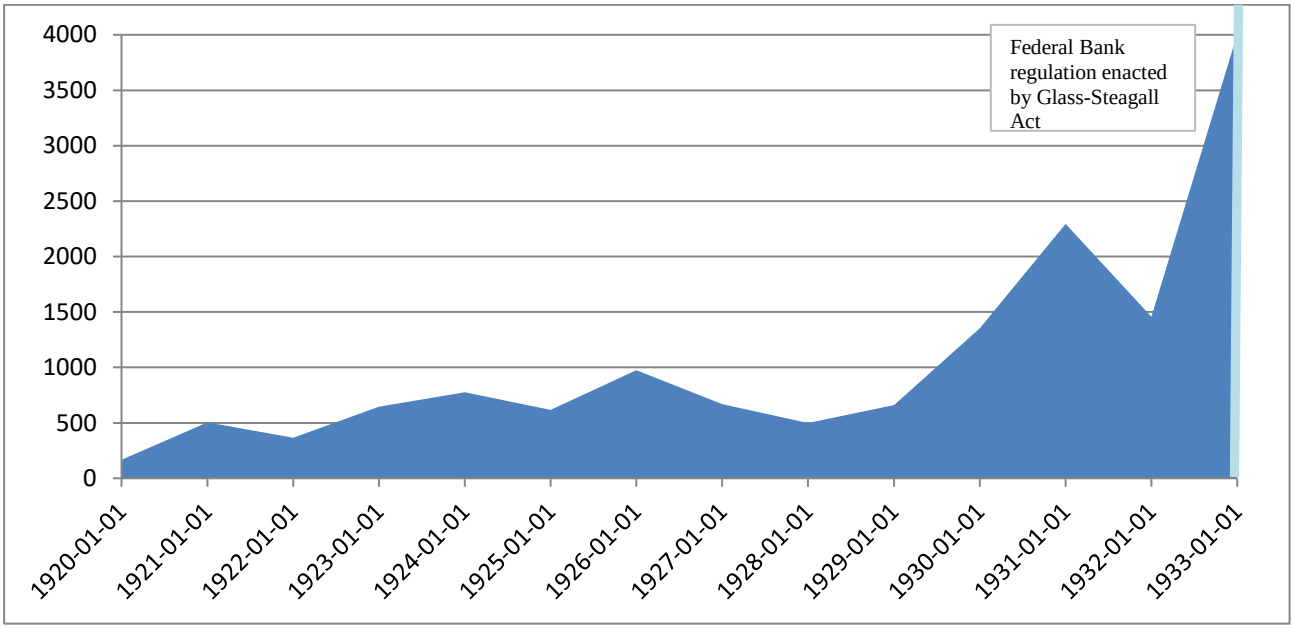

Figure 9: Failed Banks in the 1920s in the United States, Number of Institutions, Annual values.

Conversely, from 1933, when the federal regulation of banks enacted by the Glass-Steagall Act was put in place, to 1980, when the liberalization theories by the Chicago School began to shape policy, bank failures were rare. Correlation is not causality, but the fact that bank failures soared as financial market regulations were eased seems likely. Unbound by restraints, banks got into all sorts of excessive risk taking activities, breaking the fundamental link between reward and responsibility and incentivizing moral hazard behaviours with managers gaining large bonuses, but facing limited liability in case of financial losses.

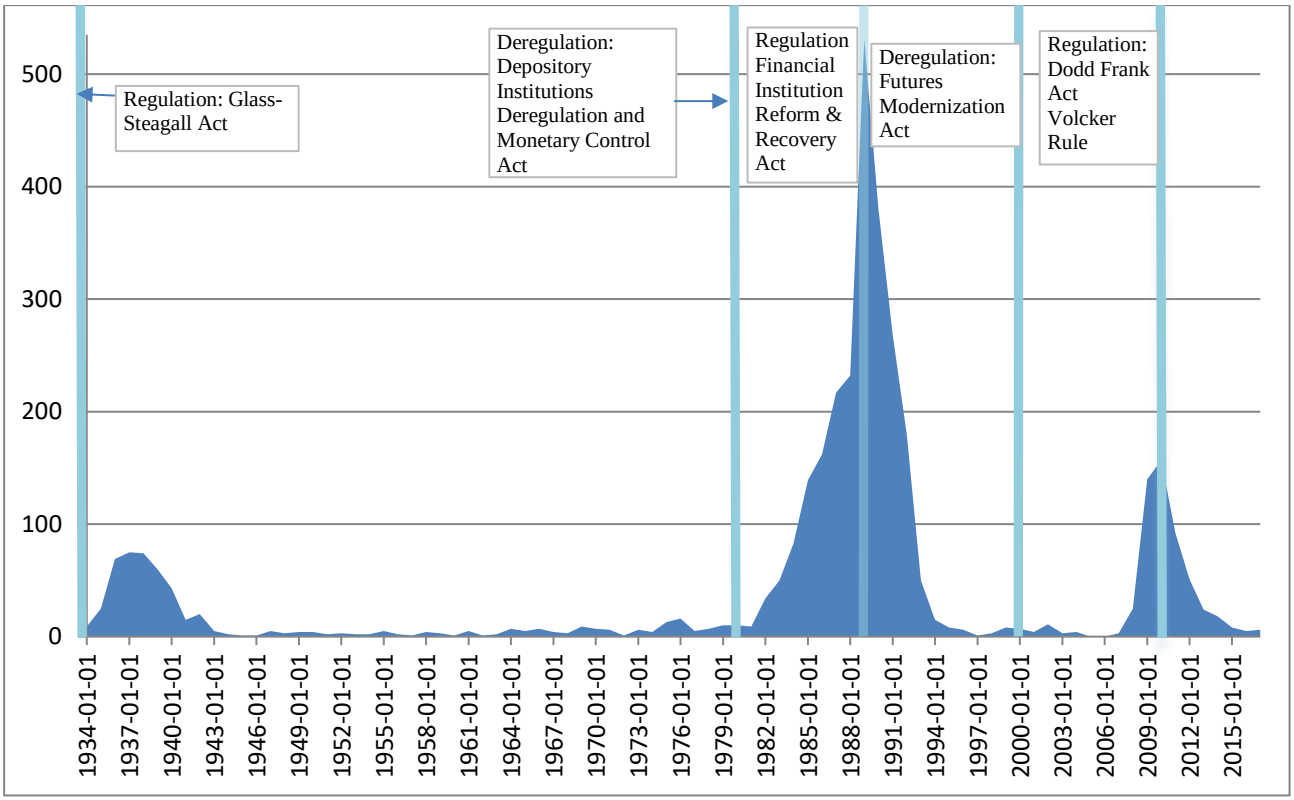

Figure 10: Failed Banks over time in the United States, Number of Institutions, Annual values.

Source: Elaborations on data from the Federal Reserve Bank of St. Louis, code series: BKFTTLA641N

To support this view, an OLS and a Poisson GLM regression were performed to assess the relation between the number of failed banks and the US financial market regulatory regime. The regulatory regime is evaluated as a dichotomous variable that takes the value of 1 in presence of deregulation and 0 in case of regulation. A control variable, the real US GDP (code: GDPCA), was added. Yearly data spanning from 1920 to 2017 were taken from the Federal Reserve Bank of St. Louis and Measuring worth.com. The results of the OLS and Poisson GLM estimations indicate that when GDP raises the number of bank failures decreases, moreover when deregulation amplifies the number of failures raises. In particular, the OLS estimation suggests that the number of bank failures tends to be 16 time larger ($e^{2.83}$) in periods of deregulation than in periods of regulation and the GLM estimation indicates that the number of bank failures tends to be 12.8 time larger ($e^{2.55}$) in periods of deregulation compared to more regulated times.

The results would suggest that to avoid excessive bank failures it seems reasonable to increase law enforcement. Instead, enforcement was cut. Based on data (Figure 11) compiled by the private Transactional Records Access Clearinghouse at Syracuse University, criminal prosecutions involving financial institutions increased in 1989 with the Financial Institution Reform and sharply decreased around 1999.

Table 6: Failed Banks and Regulatory regimes in the US

	OLS	GLM
	Coefficient	*Coefficient*
constant	6.805***	10.339***
	1.386	*0.073*
Policy Dummy (deregulation=1)	2.834***	2.548***
	0.342	*0.026*
Real GDP	−0.567***	−0.872***
	0.163	*9.00E-03*
N observations	96	98
R-squared/McFadden R-squared	0.486	0.696
Adjusted R-squared	0.475	0.696
Log-likelihood	−177.260	−9046.921
Breusch-Pagan test/Arch test for heteroskedasticity *p*value	0.05	0.926

Dependent variable: Failed banks. Variables are in logs. Standard errors in italics. Years of analysis 1920-2017

Afterwards, an uninterrupted, decade-long decline in the number of federal prosecutions for financial institution fraud was recorded. In a report in late 2011, the clearinghouse showed more than 3,000 of such prosecutions per year in the 1990s, but only 1,349 for 2011.

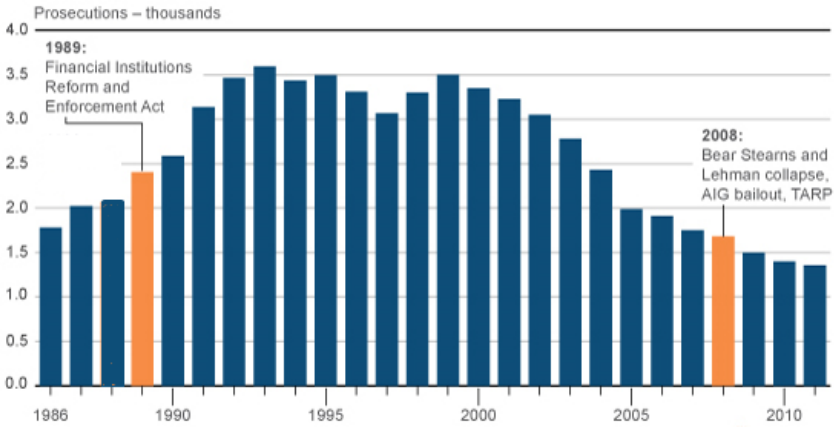

Figure 11: Federal Financial Prosecutions

Source: Transaction Record access Clearing House, Thomson Reuters

4.5 Recent trends in regulation policies of financial markets in the EU

The European Union has taken a very similar approach to derivatives regulation in the aftermath of the financial crisis. The main two pillars of the EU legislation are: the European Markets and Infrastructure Regulation (EMIR) and the Markets in Financial Instruments Directive (MiFID)[31] Review – restructured in two more recent pieces of legislation: the Markets in Financial Instruments Directive II (MiFID 2) supplemented by the Markets in Financial Instruments Regulation (MiFIR). EMIR, which entered into force in August 2012, intends to build a new infrastructural system for OTC derivatives – including OTC agricultural derivatives – based on a central clearing system (the 'clearing obligation' is found in Article 4 of EMIR) and mandatory reporting scheme. EMIR promotes transparency in derivatives markets and aims to reduce systemic risk. The Directive MiFID2 and the accompanying Regulation MiFIR entered into force on July 2, 2014. The financial application went into effect in January 2018. MiFID2 and MiFIR deal with securities and derivatives trading, manipulation of foreign exchange rates and other enforcement issues. The new Directive and Regulation seek to transform the European securities market by increasing transparency provisions, reinforcing the financial market infrastructure, modifying the microstructure of the markets (market making, algorithmic and high frequency trading, requirements regarding the security mechanisms of trading venues and market participants, tick sizes) and improving of the quality and availability of market data.

In particular, MiFID 2 aims to strengthen the current European rules on securities markets by

- ensuring that organised trading takes place on regulated platforms;
- introducing rules on algorithmic and high frequency trading;
- improving the transparency and oversight of financial markets – including derivatives markets – and addressing some shortcomings in commodity derivatives markets; and
- improving investor protection and expanding conduct of business rules as well as conditions for competition in the trading and clearing of financial instruments.

MiFIR sets out requirements on

- mandatory trading of OTC derivatives on organised trading venues (exchanges/regulated markets) in the EU or in third countries (Art. 28);
- obligation to centrally clear OTC derivative contracts according to EMIR;
- disclosure of data on trading activity to the public;
- disclosure of transaction data to regulators and supervisors;
- removal of barriers between trading venues and providers of clearing services to ensure more competition; and
- specific supervisory actions regarding financial instruments and positions in derivatives

At a disaggregated level, Germany put into law the Second Financial Markets Amendment Act (*Zweites Finanzmarktnovellierungsgesetz, 2. FiMaNoG*) in June 2017. The Second Financial Markets Amendment Act transposes the revised requirements of MiFID 2 and MiFIR as well as the Regulation on indices used as benchmarks in financial instruments and financial contracts (Benchmark Regulation). The implementation of the Act requires several amendments to the German Securities Trading Act (*Wertpapierhandelsgesetz*), which has been in place for over 20 years, the Banking Act (*Kreditwesengesetz*), and the Stock Exchange Act (*Börsengesetz*). Furthermore, changes will be made to the German Insurance Supervision Act (*Versicherungsaufsichtsgesetz*) and the Capital Investment Code (*Kapitalanlagegesetzbuch*) which has regulated fund managers, funds, and their activities. The Act thus harmonizes the financial markets with the rest of the European Union. Most parts of this amending act entered into force on January 3, 2018. The key elements of the Act comprise the regulation of organized trading facilities (i.e. multilateral trading venues), additional disclosure obligations for financial instruments, and the regulation of data reporting services providers; stricter supervision of commodity derivatives by imposing position limits and controls; the regulation of algorithmic trading and in particular high-frequency trading; stricter rules for business organization and conduct for investment firms as well as increased supervision and enforcement powers by the Federal Financial Supervisory Authority (“BaFin”); and tightened sanctions for violations of the applicable obligations.

5. Lessons from the Past

Lessons from the history have shown that the use of derivatives has existed since the beginning of commerce and they are important features of financial markets. While times and technology have moved on, the essential functions of commodity exchanges and speculation – reduced transaction costs, price discovery and risk transfer – remain as relevant today as in the past. This implies that excluding food commodities completely from speculative transactions would be counter-productive as it would impede the price identification process and would increase price volatility. The empirical analysis carried out on the Dojima futures market, the US grain futures market, and the comparisons among three grains reveal that derivatives markets have indeed lessened price swings. This result is in line with the analysis by Jacks (2007) that showed that the prohibition of the Chicago onion futures market in 1958 generated a massive increase in the average price of onions and high price volatility.

The historical experiences have further shown that when financial markets are largely uncontrolled they can be subjected to market manipulation, violent fluctuations and crashes. Financial markets, as other markets, can 'fail'. When deregulation policies become too intense they spur risky product innovations, reduce transparency and produce extreme speculation adversely affecting economic and financial systems. The empirical exercise has highlighted that in periods of financial deregulation, banks crashes have been 13-16 times larger than in periods of regulations.

From a policy perspective, considering the past experience, it would be desirable:

1. **To reform the global financial system by setting clear laws and regulations to avoid uncertainties.** It would be important to have sound, clear and worldwide harmonized legal infrastructures for financial markets. More linkages between regulated futures, OTC and related commodity markets should be established; and more international cooperation and harmonization (regarding trading information, position limits, categories of traders) amongst different exchanges (particularly in the EU-US) should be encouraged. Defined common international regulatory standards and improved international cooperation would be important elements to facilitate the functioning of global financial markets. Indeed, when rules and systems lack or differ across markets there is risk of arbitrage and crises.
2. **To increase global transparency in derivatives markets**. To this purpose, information dissemination and reporting obligations should be fostered. This means that regulatory authorities should i) provide accurate disaggregation of trader categories (see Box 1, appendix); ii) make publicly available position data on a daily basis[32]; iii) implement a clearer traders' positions reporting system[33]; and iv) identify clear measures of 'excessive speculation'[34].

3. **To carefully monitor commodity derivatives markets, especially regarding speculative positions.** A robust framework of regulatory oversight is necessary to ensure the integrity of derivatives markets. Policymakers should remain vigilant and scrutinize mainly those traders with highly speculative nature, such as managed money traders, large reportables traders, and commodity index traders, with the aim to reduce risks and vulnerabilities. In case of market distress, regulatory authorities could (1) tighten speculative position limits, (2) impose transaction taxes, and/or (3) enforce higher margins. These measures, however, should be temporary and not permanent: In general, they should be implemented during turbulent phases and relaxed during calm periods. They should be, therefore, counter-cyclical to avoid any disorderly commodity market functioning. Position limits could be framed within moving bands, according to the agitated or turbulent phases of the market. Transaction taxes, in Tobin's spirit, should be also temporary and levied on global scale, not just in specific countries. An alternative approach through the use of the tax system could be to raise the tax rate on short-term capital gains and reduce the tax rate on long-term gains. Also, Central Banks could have a role in monitoring commodity financial markets and investment portfolios of financial institutions, given that agricultural and energy prices enter headline inflation.

4. **To enhance socially responsible investment by institutional investors.** Institutional investors[35], including investment banks, hedge funds, private equity funds, sovereign wealth funds, pension funds, and agribusiness firms should devote more attention to promote responsible investment practices, including those linked to agriculture. Responsible investment[36] describes an approach that aligns the long-term interests of asset owners and investment managers by incorporating environmental, social, and governance (ESG) concerns into investment analyses and decisions (Lydenberg, 2013). A range of initiatives promoting responsible agricultural investment emerged following the 2007-08 food crisis, such as the Principles for Responsible Agricultural Investment that Respects Rights, Livelihoods and Resources (PRAI) in 2010 and Principles for Responsible Investment in Agriculture and Food Systems (PRIAFS) in 2014 (Clapp, 2017). Holding financial investors responsible for outcomes in derivatives markets is challenging given the complexity and abstraction of financial investment derivatives and the difficulty to disentangle investors from one another. The complexity of financial derivatives stems from the innumerable relations among different investor groups, which also makes it difficult to consider a specific investor group as being responsible for a particular investment trend. Even financial analysts find it difficult to track the activities of these investors involved in various types of agricultural-linked investment products. Hedge funds, for instance, are not obliged to publicly disclose their investments (McNellis 2009). Furthermore, these investor groups are often cross-investing in one another. This complexity renders it extremely problematic to recognize which operators are driving investments and which should be held

responsible for outcomes. Nowadays, reliable information which tracks these investments is not readily available, for which reason, as aforementioned, supplementary transparency in derivatives markets should be encouraged.

More information, harmonization, and controls would avoid that complex and often-opaque markets which operate through a massive web of transactions increase the probability of extreme events with unreasonable or unwarranted price fluctuations.

6. Conclusion

Basic derivatives emerged into the structure of commercial life for centuries since the ancient Mesopotamian civilization. Derivatives trading had its origins in agriculture, afterwards most derivatives have been written on financial variables, such as foreign exchange, interest rates, stock prices, and bonds. Derivatives markets contribute to facilitate trading and reduce price volatility. A quasi-experiment carried out for the Dojima futures market during the Towungata period and for the US grain market showed that the creation of a futures market was associated with lower levels of commodity price volatility. At the same time, derivatives inflated into what is considered the first speculative asset bubble of the history: the Dutch 'tulipmania' of the 1630s. Caused by several reasons, but always nurtured by euphoria, bubbles show a tendency to blow up for a certain period until they implode through a wave of falling prices and insolvencies.

While a number of early derivatives markets such as the Chicago Board of Trade eventually achieved a relatively high degree of formal organization and sophistication, the basic structure of early derivatives and their underlying nature remained essentially unchanged until well into the 20th century. In the 1970s, derivatives markets started expanding on large scale facilitated by technological innovations, the disruption of the Bretton-Wood system, and a period of government deregulations.

A radical change in the US legal infrastructure took place in year 2000, when the 111th Congress passed the Commodity Futures Modernization Act, which rendered financial markets completely free to self-regulate. This Act had an important role – although often overlooked by many economic analysts – in triggering the 2008 financial crisis. Indeed, the weakened lending standards for mortgages (subprime), the boom in commodity financialization, and the introduction of extremely risky and obscure financial vehicles were facilitated by the CFMA. This Act was, accompanied by loose monetary policies and failures of rating agencies to assess securities, the root of the global financial crash.

To provide accountability and transparency in financial markets, the Obama Administration passed in 2010 the Dodd-Frank Act which has tried to restore the same sort of legal infrastructure that has been used to regulate derivatives trading in the US for most of the last two centuries. Title VII of this act imposed higher capital and margin requirements, mandated electronic trading and central clearing, increased reporting and recordkeeping requirements and introduced more rigorous business conduct standards. With the new Republican President Donald Trump, however, a new course for the Dodd-Frank Act is prospected.

The study has highlighted that an important lesson from the past is that all markets, including financial markets, must be built on sound legal infrastructures to function correctly. Completely free markets without laws can implode and lead to dangerous situations. For this reason, certain steps should be undertaken to avoid the emergence of market failures. In

particular, a robust framework of regulatory oversight is necessary to ensure the integrity of derivatives markets and special attention should be paid to speculative positions. Regulation is important because it provides a number of crucial functions: It protects investors from irresponsible or unscrupulous practices by exchanges, counterparties or intermediaries; regulation maintains financial integrity through effective management of systemic risk; and it safeguards against attempts to manipulate or corner the market. To be effective, legal infrastructures should be harmonized worldwide and international cooperation should be improved. Similarly, it would be desirable to increase global transparency in commodity financial markets by providing accurate disaggregation of trader categories, daily information on position data, clearer traders' positions reporting systems, and a more comprehensive measure of 'excessive speculation'. These practices would render complex and often opaque markets more transparent and would decrease the probability of extreme events with unreasonable or unwarranted price fluctuations.

References

Algieri B. (2016). Conditional price volatility, speculation, and excessive speculation in commodity markets: sheep or shepherd behaviour?, *International Review of Applied Economics*, 30(2): 210-237.

Awrey D. (2013). Toward a Supply-Side Theory of Financial Innovation, *Journal of Comparative Economics*, 41: 401–419.

Berg A. (2011). The Rise of Commodity Speculation: Form Villainous To Venerable, in A. Prakash (ed.), Safeguarding Food Security in Volatile Global Markets, FAO.

BIS (2009). OTC Derivatives Market Activity in The First Half Of 2009, November 2009 http://www.bis.org/publ/otc_hy0911.pdf

Blank S.C., Colin A.C., and Brian H.S. (1991). Futures and Option Markets. Prentice-Hall, Englewood Cliffs, NJ.

Boggs J.C., Foxman M., and Nahill K. (2011). Dodd-Frank at One Year: Growing Pains, *Harvard. Business Law Review* 52, http://www.hblr.org/?p=1614.

Brewer E. III and Jagtiani J. (2013). How much did banks pay to become too-big-to-fail and to become systemically important?, *Journal of Financial Services Research*, 43(1): 1-35.

Clapp J. (2017) Responsibility to the rescue? Governing private financial investment in global agriculture *Agriculture and Human Values,* 34(1): 223-235.

CFTC (2008). Staff report on commodity swap dealers & index traders with commission recommendations, September 2008. CFTF Press Rel. # 5542-08, Sep. 11. http://www.cftc.gov/PressRoom/PressReleases/pr5542-08

Cheng I.H., Kirilenko A., and Xiong W. (2015). Convective Risk Flows in Commodity Futures Markets, *Review of Finance*, 19:1733–1781.

Cheng I.H. and Xiong W. (2014). Financialization of Commodity Markets, *Annual Review of Financial Economics*, 6: 419–441.

Clapp J. and Helleiner E. (2012). Troubled futures? The global food crisis and the politics of agricultural derivatives regulation, *Review of International Political Economy,* 19(2): 181–207.

Dash M. (1999). Tulipomania. New York: Three Rivers Press.

Duffie D. (1989). Futures Markets. Prentice-Hall, Englewood Cliffs, NJ.

Eichengreen B. (2015). Hall of Mirrors: The Great Depression, the Great Recession, and the Uses – and Misuses – of History, Oxford University Press.

Fabian A. (1999). Card Sharps and Bucket Shops: Gambling in Nineteenth-century America (Routledge, New York).

FIA (2018). Futures Industry Association, https://fia.org/industry-data

Financial Services Committee (2017). The Financial CHOICE Act. A Republican Proposal to Reform the Financial Regulatory System, April 24.

Green E.F. (2011). Dodd-Frank and the Future of Financial Regulation, *Harvard Business Law Review, 79*, *http://www.hblr.org/?p=1728.*

Greising D. and Morse L. (1991). Brokers, Bagmen, and Moles: Fraud and Corruption in the Chicago Futures Markets, Hoboken: Wiley.

Ghosh J. (2010). The unnatural coupling: Food and global finance, *Journal of Agrarian Change*, 10(1): 72–86.

Hamilton J., Wu J.W. (2015). Effects of Index-Fund Investing On Commodity Futures Prices, *International Economic Review*, 56(1): 187-205.

Hicks J.R. (1939). Value and Capital. Cambridge, UK: Oxford Univ. Press.

Hong H. and Yogo M. (2012). What Does Futures Market Interest Tell Us About The Macroeconomy And Asset Prices?, *Journal of Financial Economics,* 105: 473–490.

Jacks D.S. (2007). Populists Versus Theorists: Futures Markets and The Volatility of Prices, *Explorations in Economic History,* 44: 342–362.

Kummer S. and Pauletto C. (2012). The History of Derivatives: A Few Milestones, EFTA Seminar on Regulation of Derivatives Markets, Zurich, 3 May.

Kaldor N. (1939). Speculation and Economic Stability, *The Review of Economic Studies*, 7(1): 1-27.

Kalkuhl M., von Braun J., and Torero M. (2016). Food Price Volatility and Its Implications for Food Security and Policy. Springer Netherlands.

Keynes J.M. (1923). Some Aspects of Commodity Markets. Manchester Guardian Commercial. European Reconstruction Series, Section 13: 784-786.

Levy J.I. (2006). Contemplating Delivery: Futures Trading and the Problem of Commodity Exchange in the United States, 1875-1905, *American History Review*, 111(2): 307-335.

Lydenberg S. (2013). Responsible investors: Who they are, what they want. *Journal of Applied Corporate Finance,* 25(3): 44–49.

Lux M. and Greene R. (2015), The State and Fate of Community Banking, M-RCBG Associate Working Paper No.37 (February)

Mader D. (2011). A Consultant's View of Dodd-Frank, *Harvard Business Law Review,* 2: 68-72.

Mattingly P. (2011) *Republicans Would 'Remedy' Unwanted Dodd-Frank Effects,* Bloomberg, Feb. 1, 2011, http://www.bloomberg.com/news/print/2011-02-01/house-panel-to-remedy-dodd-frank-s-unintended-consequences-draft-shows.html.

McClure J.E., Thomas D. C. (2017), Explaining the timing of tulipmania's boom and bust: historical context, sequestered capital and market signals, *Financial History Review,* 24(2): 121-141

McNellis P.E. (2009). *Foreign investment in developing country agriculture—The emerging role of private sector finance*. FAO Commodity and Trade Policy Research Working Paper (28).

Muellerleile C. (2015). Speculative boundaries: Chicago and the regulatory history of US financial derivatives markets *Environment and Planning,* 27(9): 1805-1823.

Nwogugu M.I.C., (2015). Failure of the Dodd-Frank Act, *Journal of Financial Crime*, 22(4): 520-572.

Nystedt J. (2004). Derivatives market Competition: OTC Markets Versus Organized Derivative Exchanges, WP/04/61, IMF Working Paper.

Nusteling H. (1985). Welvaart en Werkgelegenheid in Amsterdam 1540–1860, een relaas over demografie, economie en sociale politiek van een wereldstad, Amsterdam: Bataafsche Leeuw.

Pierce H., Robinson I. and Stratmann T. (2014), *How Are Small Banks Fairing under Dodd-Frank?*, George Mason University Mercatus Center Working Paper No. 14-05 (February).

Poitras G. (2000). The Early History of Financial Economics, 1478-1776, Edward Elgar Publishing Ltd: Cheltenham.

Prabha A.P. and Wihlborg C. (2014). Implicit Guarantees, Business Models and Banks' Risk-Taking Through the Crisis: Global and European Perspectives, *Journal of Economics and Business*, 76: 10-38.

Rapoport M. (2014). Small Banks Look to Sell as Rules Bite, *Wall Street Journal*, April 2, 2014

Rechtschaffen A.M. (2000). International Symposium on Derivatives and Risk Management, *Fordham Law Review,* 69(1): 13-15.

Robles M., Torero M., and von Braun J., (2009). When speculation matters, Issue Brief 57, Washington, DC: International Food Policy Research Institute, available at http://ifpri.org/pubs/ib/ib57.pdf

Ross D. (2009). The Dojima Rice Market and the Origins of Futures Trading. *Harvard Business School Publishing*, 9-709-044.

Sanders D.R., Irwin S.H. and Merrin R.P. (2010). The Adequacy of Speculation in Agricultural Futures Markets: Too Much of a Good Thing? *Applied Economic Perspectives and Policy,* 32: 77-94.

Schaede U. (1989). Forwards and Futures in Tokugawa-period Japan: A new perspective on Dojima Rice Market. *Journal of Banking and Finance*, 13: 487-513.

Swan E.J. (2000). Building the Global Market. A 4000 Year History of Derivatives, The Hague: Kluwer Law International.

Stout L.A. (2011). Derivatives and The Legal Origin Of The 2008 Credit Crisis, *Harvard Business Law Review,* 1:1-38.

Tadesse G., Algieri B., Kalkuhl M., and von Braun J. (2014). Drivers and triggers of international food price spikes and volatility. *Food Policy*, 47: 117-128.

Tang K. and Xiong W. (2012). Index investment and financialization of commodities, *Financial Analysts Journal,* 68(6): 54–74.

Thompson E. (2007). The Tulipmania: Fact Or Artifact?, *Public Choice*, 130(1–2): 99–114.

Treasury gov. (1999). Over-the-Counter Derivatives Markets and the Commodity Exchange Act, Report of The President's Working Group on Financial Markets https://www.treasury.gov/resource-center/fin-mkts/Documents/otcact.pdf

UNCTAD (2009). The Global Economic Crisis: Systemic Failures and Multilateral Remedies, Report by the UNCTAD Secretariat Task Force on Systemic Issues and Economic Cooperation, United Nations, New York and Geneva.

van der Wee H. (1977). Monetary, Credit and Banking Systems, in Rich and Wilson (eds) (ch. V).

Venkata Subramani R. (2011). Accounting for Investments, Fixed Income Securities and Interest Rate Derivatives: A Practitioner's Handbook, Wiley & Sons.

Wakita S. (2001). Efficiency of Dojima Rice futures market in Tokugawa-period Japan. *Journal of Banking and Finance*, 25: 535-554.

Weber E.J. (2009). A Short History of Derivative Security Markets, Chap. 21 in Vinzenz Bronzin's Option Pricing Models: Exposition and Appraisal ed. Hafner, W. and Zimmermann, H. Springer Berlin

Appendix

Table 7: **Wheat Price US before and after the establishment of grain futures markets, 1793-1913**

Wheat price per bushel in $ at Albany, New York, on the first day of January in each year.						No.2 wheat price per bushel in $ Chicago CBOT, on the first business day of each year.					
year	$	year	$	year	$	year	$	year	$	year	$
1793	0.75	**1812**	1.87	**1831**	1.25	**1874**	1.17	**1893**	0.72	**1912**	0.93
1794	1	**1813**	2.25	**1832**	1.25	**1875**	0.9	**1894**	0.59	**1913**	1.07
1795	1.37	**1814**	1.87	**1833**	1.25	**1876**	0.95	**1895**	0.53		
1796	2	**1815**	1.62	**1834**	1	**1877**	1.24	**1896**	0.57		
1797	1.5	**1816**	1.75	**1835**	1	**1878**	1.07	**1897**	0.81		
1798	1.25	**1817**	2.25	**1836**	1.5	**1879**	0.82	**1898**	0.9		
1799	1.18	**1818**	1.87	**1837**	2.25	**1880**	1.32	**1899**	0.67		
1800	1.56	**1819**	1.75	**1838**	1.62	**1881**	0.98	**1900**	0.66		
1801	1.81	**1820**	1	**1839**	1.75	**1882**	1.27	**1901**	0.73		
1802	1	**1821**	0.75	**1840**	1.12	**1883**	0.93	**1902**	0.78		
1803	1.12	**1822**	1.12	**1841**	1	**1884**	0.94	**1903**	0.71		
1804	1.25	**1823**	1.25	**1842**	1.25	**1885**	0.78	**1904**	0.82		
1805	2	**1824**	1.25	**1843**	1.87	**1886**	0.84	**1905**	1.15		
1806	1.43	**1825**	1	**1844**	1	**1887**	0.79	**1906**	0.85		
1807	1.37	**1826**	0.87	**1845**	0.93	**1888**	0.77	**1907**	0.71		
1808	1.12	**1827**	1	**1846**	1.18	**1889**	0.99	**1908**	0.91		
1809	1	**1828**	1	**1847**	1.12	**1890**	0.77	**1909**	1.03		
1810	1.56	**1829**	1.75	**1848**	1.31	**1891**	0.88	**1910**	1.21		
1811	1.75	**1830**	1			**1892**	0.88	**1911**	0.92		

Source: Boyle (1921)

Box 1. Traders in derivatives markets for agricultural commodities

The US Commodity Futures Trading Commission has developed three reports (namely, the Commitments of Traders (COT) report, the Supplemental Commitments of Traders (SCOT) report and the Disaggregated Commitments of Traders (DCOT) report) that provide data concerning different types of traders operating in agricultural and livestock derivatives markets. The correspondence between reports however is not precise and there is not much transparency on some trader categories. Initially, the CFTC published the COT report, in which traders were categorized in hedgers (commercials), speculators (non-commercials) and non-reportables. In 2006, the CFTC introduced the SCOT report[37], which added a new trader category to the existing ones, namely, commodity index traders (CIT). CIT are partitioned into traditional hedgers and speculators. The commodity index traders classified as speculators (non-commercials) are managed funds, pension funds, ETFs and ETNs, and other institutional investors seeking a long commodity index exposure. The commodity index traders classified as hedgers (commercials) are financial institutions such as OTC swap dealers who sell commodity index return swaps to institutional investors and then hedge by taking long positions in commodity futures. The OTC swap dealers are by far the largest group of commodity index traders. In 2009, the CFTC introduced the DCOT report which simply further disaggregates the COT commercial and non-commercial trader categories in the following groups: 1. producers/merchants/processors/users, 2. swap dealers, 3. managed money, 4. other reportables (large traders), and 5. non-reportables (small traders). Commercial traders comprise producers/merchants/processors/users and swap dealers. Non-commercial traders comprise managed money (MM) and other reportables. Figure 12 provides a comparison of data provided under the three reports.

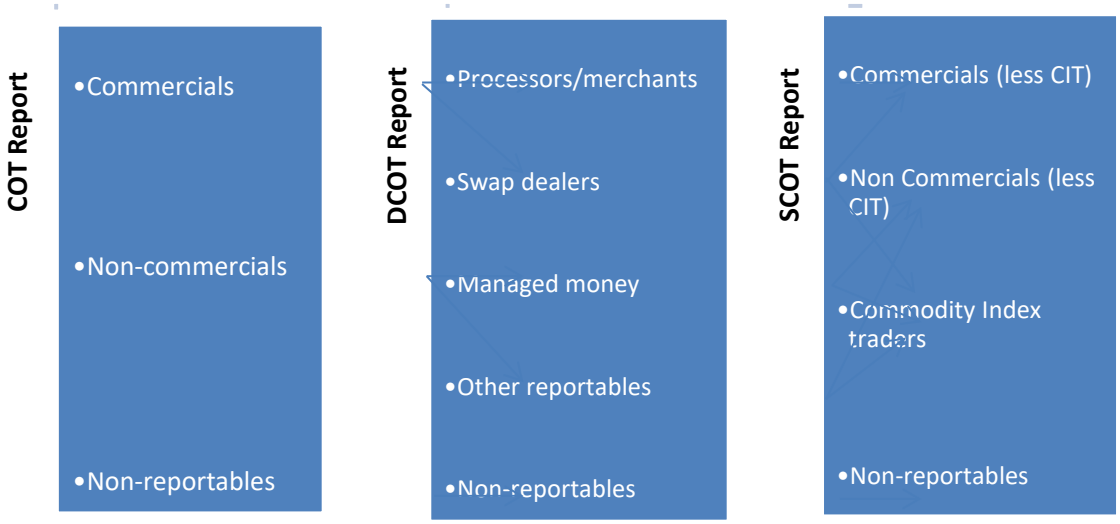

Figure 12: The Commodity Futures Trading Commission reports

Source: Own elaborations on CFTC Reports

From Figure 12, it emerges that there is not a perfect match between the reports, in particular, to improve transparency and avoid asymmetric information, it would be necessary to have more clarity on CIT and swap dealer positions whether they represent more underlying speculative or hedging positions. This uncertainty should be eliminated by a finer disaggregation of this typology of traders.

In the EU, trading in financial instruments including agricultural commodity derivatives is regulated by the Markets in Financial Instruments Directive (MiFIDII) supplemented by the Markets in Financial Instruments Regulation (MiFIR). The latter are the European rulebooks for regulation of financial markets (equivalent to the US Dodd-Frank Act). In the EU, there are not obligations to publish information by category of traders, therefore the EU financial market is even more opaque than the US. In this sense, an authority/agency that specifically defines traders and disseminates information publicly should be set up.

[1] Speculative position limits are limits on how many open derivatives contracts specific categories of traders could hold.

[2] Futures are standardized contracts to buy or sell a fixed quantity of a particular asset such as a commodity at a pre-determined price in the future. The contract can be physically settled, through delivery of the underlying, or cash settled.

[3] Forwards are non-standardized contracts to buy or to sell a specific quantity of a commodity, or other asset, at a specified future time at a price agreed upon today. Forwards are not traded on-exchange.

[4] Swaps are types of derivative in which counterparties to a bilateral contract agree to exchange cash flows at specified intervals for an agreed-upon amount of time. Common types of swaps include: interest rate swaps, commodity swaps, currency swaps, credit default swaps (CDS), equity swaps and total return swaps.

[5] Options are derivative contracts offering the buyer the right, but not the obligation, to buy or sell a financial asset at an agreed upon price during a certain period of time or on a specific date.

[6] A derivatives market is a financial market that deals with the trading of derivatives.

[7] Speculation can be defined as trading in assets "in order to profit by the rise or fall in the market value, as distinct from regular trading or investment" (Oxford Dictionary of Economics).

[8] Euronext in London and Euronext in Paris are also known with the acronyms LIFFE and MATIF, respectively.

[9] Exchanges are far more liquid because all buy and sell orders as well as execution prices are exposed to one another.

[10] About half a million clay tablets have been found so far. The cuneiform digital library initiative (CDLI), created by the *Max Planck Institute for the History of Science* and the *University of California at Los Angeles*, has digitalized about 225,000 tablets, making them available online and providing translations and comments. Web sites are: http://www.mpiwg-berlin.mpg.de/en/research/projects/DEPT1_10_12Damerow-CDLI and http://cdli.ucla.edu.

[11] According to the writings of Sextus Pomponius, a lawyer of the second century AD, there were two types of contracts in the Roman Empire. The first, *vendito re speratae*, which was invalid if the seller did not have the goods at the delivery date, provided insurance against crop loss and the hazards of long-distance trade, including the loss of ships in maritime trade. The second, *vendito spei*, was a straightforward forward contract that did not provide for any exoneration to the seller in case he was unable to deliver the goods. It is unclear whether *vendito re speratae* involved the same rights as a modern put option because the seller may have been obliged to deliver the goods if he had them (Weber, 2009).

[12] A losing party could compensate the winning party for the difference between the delivery price and the spot price at the time of settlement.

[13] The tulips were introduced from Constantinople to Holland in the middle of the 16th century by the Ambassador of the Holy Roman Emperor, Ogier Ghislain de Busbecq (McClure and Thomas, 2017; Dash, 1999). By 1634, tulips' popularity grew significantly among the rich so that 'it was deemed a proof of bad taste for any man of fortune to be without a collection of them.' Also the middle classes were infected by tulip fever. Tulips and tulip bulbs were bought and sold frantically, at the expense of which some people even sold their houses at extremely low prices. It only took few years for some people to realize that the market had lost all logic. People started panicking, prices started plummeting and soon the market crashed.

[14] Important books on futures markets, such as Duffie (1989) and Blank et al. (1991), identify the Dojima rice market as "the world's first well-established futures market", and the Chicago Commodity Exchange Handbook explicitly indicates that futures trading originated in Osaka.The studies by Miyamoto (1988) and Schaede (1989) offer an excellent examination of the development of the Dojima rice market.

[15] A koku of rice was the amount of rice consumed in a year by an average adult and amounted to about 180 liters (or about 150 kilograms).

[16] Appendix 7, Speculation and the Chicago Board of Trade (New York: The Macmillan Company).

[17] Scholes received the Nobel Prize in Economics for his work in option pricing in 1997.

[18] https://marketvoice.fia.org/articles/global-futures-and-options-data-q1-2018

[19] In finance, to corner the market is to get sufficient control of a particular commodity, stock or other asset to allow the price to be manipulated. The most direct strategy to corner the market is to simply buy up a large percentage of the available commodity and store it so that its price goes up. With the advent of futures trading, a cornerer may buy a large number of futures contracts on a commodity and then sell them at a profit after inflating the price.

[20] There are three basic elements to the regulatory framework for speculative position limits. They are: i) the size (or levels) of the limits themselves; ii) the exemptions from the limits (for example, hedged positions); and iii) the policy on aggregating accounts for purposes of applying the limits.

[21] Wash trading occurs when a trader buys and sells the same securities simultaneously. Wash trades benefit brokers who earn commissions from the trades and can also be used to create the false impression that there is investor interest in the security.

[22] A type of trading in which a trader accommodates another by entering into a non-competitive purchase or sale order. An accommodation trade is often executed when two traders are participating in illegal trading, such as a sale at a below market price intended to create a short-term trading loss for tax purposes that is later reversed.

[23] The option ban remained in effect until 1981.

[24] Bucket shops were businesses that offered small investors the opportunity to speculate on the price of commodities.

[25] The Onion Futures Act, passed on August 28, 1958, is a US law banning the trading of futures contracts on onions. The regulatory action was taken when two onion traders, Sam Siegel and Vincent Kosuga, cornered the onion futures market on the Chicago Mercantile Exchange. The trading of onion futures is banned in the United States to this day. Onion futures trading began on the Chicago Mercantile Exchange in the mid-1940s and by the mid-1950s, onions futures contracts were the most traded product on the Chicago Mercantile Exchange. In 1955, they accounted for 20% of its trades (Greising, and Morse, 1991). In 1955, Siegel and Kosuga bought enough onions and onion futures so to control 98% of the available onions in Chicago. By late 1955, they had stored 30,000,000 pounds of onions in Chicago. Soon after, Seigel and Kosuga started to short sell onion futures, effectively betting that the price of onions was about to drop precipitously. They began to sell their stockpiled onions, causing a glut of supply and forcing the price of onions down. In August 1955, a 50-pound bag of onions in Chicago cost about $2.75; in March 1956, the same amount of onions fell to 10 cents due to their market manipulation. Seigel and Kosuga became millionaires, and left the onion market in shambles with onion producers going bankrupt.

[26] These enforcement functions include: assuming liability for performing the trade, setting membership eligibility, capital requirements and margins to guarantee performance, making daily settlements of contracts, and setting standards for accepting contracts for trading

[27] Insured depository institutions, their holding companies, non-US banks with branches or agency offices in the US, and any affiliate or subsidiary of such entities

[28] It refers to the purchase or sell of *covered financial position* which encompasses securities, derivatives, and commodity futures and options.

[29] These Core Referenced Futures Contracts are: CBOT Corn, Oats, Rough Rice, Soybeans, Soybean Meal, Soybean Oil and Wheat; Chicago Mercantile Exchange Feeder Cattle, Lean Hogs, Live Cattle and Class III Milk; Commodity Exchange, Inc. Gold, Silver and Copper; ICE Futures U.S. Cocoa, Coffee C, FCOJ–A, Cotton No.2, Sugar No. 11 and Sugar No. 16; Kansas City Board of Trade ('KCBT') Hard Winter Wheat; Minneapolis Grain Exchange Hard Red Spring Wheat; and New York Mercantile Exchange Palladium, Platinum, Light Sweet Crude Oil, New York Harbor No. 2 Heating Oil, New York Harbor Gasoline Blendstock and Henry Hub Natural Gas.

[30] International Swaps and Derivatives Association v. United States Commodity Futures Trading Commission, 887 F. Supp. 2d 259 (D.D.C. 2012)

[31] Before the enforcement of MiFID in 2007, securities trading in the EU was primarily influenced and regulated by national law. The predecessor of MiFID, the Investment Services Directive of 1993, allowed member states to regulate many details concerning securities trading at their own discretion, because it provided framework legislation that was not accompanied by further implementing measures.

[32] All data information from the CFTC is publicly available at weekly basis and it would be advisable to have open interests by position (long and short) and categories of traders publicly available at a daily frequency. In the EU, public information on speculative and non-speculative positions is not always accessible at a weekly frequency. A further way to improve transparency would be to have detailed data on OTC activities in agricultural commodities, which are not publicly available neither in the US nor in the EU.

[33] There is room for improvements in the US classification of traders, which is currently based on the information provided by traders themselves in the CFTC's Form 40. A full account of activities of different types of traders is not systematically available for EU commodity exchanges. Definitions of traders should be developed at EU level and it would be appropriate to introduce similar disaggregation as in the US.

[34] Since the passage of the Commodity Exchange Act (US, 1936) excessive speculation on exchanges has been prohibited, but not clearly defined. Indeed, the metrics that is currently used to measure it is the Working T-index which is dated 1960. Given the new types of traders in the market, it would make sense to set up a more comprehensive metrics to capture speculation in excess.

[35] Institutional investors are financial organizations that invest, usually in a fiduciary role, large sums of money in securities, real estate, in companies and in a wide variety other investment assets on behalf of third parties.

[36] The Principles for Responsible Investment were established in 2006 on the initiative of the United Nations Environment Program Finance Initiative UNEP FI and the UN Global Compact.
[37] The SCOT report focuses on 12 agricultural markets.