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an efficient multi-polar organization ?**

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The Paris financial market in the 19th century: an efficient multi-polar organization ?

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Abstract

The literature in financial history usually considers London as the only centre of the late 19th century's financial globalization, and explains it at least in part by the efficient microstructure (organization) of the London Stock Exchange (LSE). The LSE is characterized as having been a little regulated market, where entry was easy both for traders and issuers [Michie (1998), Neal (2004), White (2006)]. The LSE microstructure is also considered as the natural and optimal one by much of the theoretical literature on stock markets, which argues that free entry decreases transaction costs and increases both liquidity and diversification, resulting in economies of scale attracting traders, issuers and buyers. Our paper tries to explain why the Paris Bourse was able to be so successful in spite of the supposedly inefficient monopoly and regulations that the State imposed it. We focus on the fact that the Paris market actually included several different market places: the Parquet (the official Bourse, organized by the *agents de change*), the Coullisse, the Marché libre, and inter-bank direct operations. We argue that this multi-polar organization, was efficient, relying on the specialization it allowed, and the complementarities it helped develop among markets. We incorporate in the discussion the recent theoretical literature that shows that no single market can satisfy the heterogeneous preferences of all issuers and investors, so that a multi-polar organization can be a superior solution.

We demonstrate our claim by looking not only at the rules but also at the actual functioning of the Parquet thanks to its archives which we recently classified. These archives also allow us to build new statistical series which permit evaluating the performances of the Parquet during the 19th century: volumes traded, seat prices, transaction costs, and operational risks. If one supposes that the Parquet was the least efficient segment of the Parisian market, this will provide us with a lower bound for the global efficiency of that market, which should be compared with other markets on similar concrete grounds.

Résumé

L'histoire financière explique souvent le succès de Londres comme marché financier dominant au 19^e siècle par les microstructures efficaces de la Bourse de Londres (LSE). Le LSE se caractérise en particulier par une faible régulation, l'entrée libre des opérateurs, ce qui permettrait de réduire les coûts de transaction, d'accroître la liquidité et la diversification, attirant à la fois émetteurs et investisseurs. Nous montrons que les microstructures londoniennes ne sont pas nécessairement optimales et montre que des microstructures très différentes ont permis le succès de la Bourse de Paris, loin de l'idée reçue selon laquelle cette place aurait été victime d'un interventionnisme inefficace ou d'un monopole hostile à toute innovation. Nous étudions en détail l'organisation du Parquet parisien et ses complémentarités avec la Coullisse, le marché libre et les opérations des banques. Nous montrons qu'une telle organisation multi-polaire était efficace car elle permettait une spécialisation des agents (aussi bien intermédiaires qu'émetteurs et investisseurs) et des complémentarités qui permettaient au marché de joindre développement et stabilité. Grâce à l'usage des archives de la Bourse de Paris, nous pouvons construire des données sur les volumes échangés, les prix des charges, les coûts de transaction et les risques qui permettront à ce débat de prendre un tour plus empirique que jusqu'à présent.

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The Paris financial market in the 19th century: an efficient multi-polar organization ?

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Preliminary, comments welcome

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A large body of recent literature argues that financial markets microstructures are key to understand their relative success, which itself is important for economic growth (Coffee, 2001; Pagano & Roell, 1990, 1996 ; Madhavan, Porter & Weaver, 2005; Rousseau, 2003; Rousseau & Sylla, 2001; Neal, 1990; Levine, 1991, 1998; Beck, Levine & Loayza, 1999); . Since in the first era of globalisation, financial market development was similar to today (Rajan & Zingales, etc), it is tempting to study that hypothesis in retrospect. Recent research has improved our understanding of these issues (e.g. Davis & Neal, 2005, 2006; Michie, 1987, 1988; White, 2003, 2004, 2006; Riva, 2005, 2007; Baia Curioni, 1995), building on a stream of literature from the 19th c. itself (Boissière, 1908, Boudon, 1898; Gilson, 1889; Robert-Milles, 1912; Neymarck 1884, Les grands marchés financiers, 1912; Vidal, 1904, 1910). One important reason to do so is that London, New-York and Paris, the three major stock markets in the late 19th century, had very different organizations. If the London and New-York stock exchanges have been studied in much detail, research on the Paris Bourse has concentrated up to now on market capitalization and stock issues (Hautcoeur 1994), or new indices (Arbulu, 1998; Vaslin; Rezae). Comments on its organization are usually quite superficial, using old references more than primary sources, inspired by late 19th century

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polemics on the monopoly of the official brokers or *agents de change*¹; they also suffer anachronism and some whig bias (Hannah, 2007), supposing implicitly that the only possible efficient organization is the London one. They don't discuss the paradox of an inefficient monopoly building in a few decades the second most important stock exchange in the world, in a country widely considered as less modern than the German or the US ones. They also forget a recent literature on financial markets organization which is less generally favourable to the London organization. In this paper, we try to integrate various different theoretical arguments on the organization of stock exchanges into a broader and more historical explanation of the development of the Paris market. We use detailed archival records of the *Compagnie des agents de change* (CAC) in order to understand both the various episodes of microstructure transformation and to construct the new statistics that allow a measure of the impact of these changes (Lagneau & Riva, 2007).

In a first part, we present recent theoretical developments which show that other organizations than the London one can be efficient; in particular, we discuss the possible efficiency of a multipolar organization, in which various organized exchanges co-exist and complement each other in the same financial centre. In the second part, we present the history of the Paris Bourse as a competitive multi-polar organization. In the third part, we try to provide some new measures allowing a quantitative evaluation of that organization's success, focusing on transaction costs, the security of transactions and the growth of transactions. Unfortunately, these data are only available for the official exchange. Nevertheless, since that exchange is usually considered by the critics of the Paris organization as the least efficient of the Paris markets, we can consider that they provide an upper bound of their costs.

I. Theory

Much of the literature on the Paris market explains the coexistence of the official market (the *Parquet*) and the unofficial market (the *Coulisse*) only by the legal monopoly of the former, which allowed him to survive in spite of the superior efficiency of the *Coulisse*. This literature is based on a simple model of the optimal organization of a financial exchange, and neglects that the coexistence of various exchanges in the same financial centre may enhance its efficiency. The former coexistence of various markets in New-York or the contemporary one

¹ A recent paper by E. White (2006) goes one step beyond by integrating statistical data to a theory of the microstructures of the Parisian market in the late 19th century, dealing with the 1882 krach. We will argue below that it did not go in sufficiently detail in the organization of the market.

of the NYSE and the Nasdaq or of two derivative markets in Chicago suggests just that. Economic theory also provides arguments in that direction.

Traditional theory only focuses on the gains from competition among brokers in a unique exchange organization, on the model of the London Stock Exchange (LSE). More recent theory emphasizes two levels of competition: one among brokers in an exchange, and one among exchanges in a financial centre. Regulation of these markets can go from centralized (under the government's authority), to decentralized, the government only validating "internal regulatory models" as in the recent Basle agreements, with many intermediary solutions.

An organization with a unique exchange maximizes economies of scale and scope, and externalities in liquidity, fixed costs are amortized on more transactions, leading to lower transactions costs, better prices and more incentives for firms to list their shares. These increasing returns suggest that a single exchange is the natural an optimal outcome of competition (Arthur, 1989; Economides, 1995; Pagano, 1989, 1993; Hagel & Armstrong, 1997; Stigler, 1961; Demsetz, 1968; Telser, 1981; Glosten, 1994; Di Noia, 2001). Nevertheless, a single exchange faces a dilemma that the literature has emphasized: if its organization is very decentralized (as the LSE), maximizing competition among brokers who realize a constant flow of operations using the services of market makers (jobbers in London), the prices remain essentially private and quite opaque (at least before computers); on the other hand, if it is more centralized, all participants bring the securities they want to sell or buy to a single confrontation or fixing, leading to a very representative and transparent price (so the preference of Walras for this organization). A decentralized market is likely to be efficient for largely traded securities, and is preferred by important investors who don't suffer the results of insider trading or information asymmetries and can negotiate low transaction costs with the brokers; for the less liquid securities, it can lead to heavy inequalities among participants and important spreads. A centralized market protects small investors but inefficiently restricts useful operations on major securities. In order to work as it intends, it must restrict the entry of brokers and impose them stricter rules of behaviour, which precisely make it an integrated (the term of the art in neo-institutional economics), more like hierarchical organization, like a firm.

These two solutions (market vs hierarchy) for the organization of a stock exchange permit understanding why the difference between a financial centre and a stock exchange is not always clear. If a stock exchange is decentralized and very similar to a pure market with free entry, the very looseness of its organization makes it difficult to organize a competitor: all brokers are incited to participate that organization, which maximizes liquidity and network

externalities. On the other hand, a centralized stock exchange leads easily to the emergence of competitors, coordinating those brokers who have not been admitted to the exchange (see table 1 for all possible structures).

Possible financial centres as concerns secondary markets

	Strong organisation	Loose organisation
Single exchange	Impossible	London
Various exchanges	Paris, New-York	Diluted market : OTC

Such a financial centre where various exchanges compete can appear as inefficient from the point of view of economies of scale and liquidity maximization. Nevertheless, it can also have some advantages, which must be balanced with these costs (Schwartz 89, 95; Parlour & Foucault, 1999; Gehrig, 2000; Coffee, 2001; Allen & Gale, 2000). First, the competition among exchanges can lead to more innovations at the exchange-management level (settlement or payment organizations, etc). Second, various exchanges can also be complementary. The competitors of the most centralized exchange may have a more decentralized organization, and deal more efficiently with those categories of securities and investors the centralized exchange favours less. This does not impede these organizations to compete at the margin.

In such a model, various financial centre structures can be efficient, each one having its main advantages, and their comparison is an empirical open question, which must focus on measures of the various services of a stock exchange: price quality, liquidity, transactions' security, stability, adaptability to shocks or innovations.

We propose to analyze the Paris Parquet using such a model. This suggests considering the Parquet as only one (important) element in the Paris securities market, and understanding the behaviour of the *Compagnie des agents de change* (CAC) (the *corporation* or “guild” of stock brokers which sets up the Parquet) in a broader framework than the monopoly-competition one. In such a framework in particular, a complete monopoly is not only inefficient but impossible; actually, monopoly provisions are only one – likely changing – element shaping the structure of the financial centre. One advantage is explaining the existence of some degree of monopoly without the unsatisfactory hypothesis that a (captured) government imposes for

long periods an inefficient organization, which contradicts with an otherwise open economy and the succession of very different governments (and even political regimes)².

II. Major changes in the organization of the Paris official stock exchange

The usual description of the Paris stock market considers it as the conflict between a monopoly granted by the State to the conservative CAC and an “underground” free market, the *Coulisse*. Actually, this dual structure is not stable at all, since the structure of the *Parquet* (much better known than that of the *Coulisse*) evolved with time, and relationships between the *Parquet* and the *Coulisse* were as much of cooperation and complementarity as of competition. We focus here on the main changes affecting the organization of the *Parquet* and their effect on the services it provided to firms and investors. We mention three categories of organisational changes: those concerning the way operations were handled (pricing techniques, negotiation groups, settlement and payment, price list publication); those affecting the guarantees operators benefited; and those related to the relations (cooperation, competition) among exchanges (*Parquet* vs *Coulisse*). These categories are not independent: if the birth of the *Parquet* resulted very much from a legal monopoly imposing some obligations concerning pricing methods or price publications; and its development as a small homogeneous and closed group was a consequence of both the collective guarantees it developed and the quality of the pricing it provided. This justifies a chronological exposition of its history.

1. 1801-1832

From the reopening of the Bourse in 1801 to 1832, most of the markets activity concentrated on the State *rentes*, the public debt consolidated in 1797 in a single 5% perpetual fund after the “two thirds default”. The First Consul and later Emperor did not appreciate the government policy to be quoted in a market, and he took advantage of the first crisis (1805) to change the spirit of the market as it had been established (and considered in the first version of the Code de commerce), and tried to control it by re-establishing the monopoly of the *agents de change*, creating a *Compagnie des agents de change* (CAC) under government supervision, and having the government nominating all new *agents* (he also intervened in the markets through the network of Treasury agents and the Bank of France) (Locré, 1827). From

² One can even not exclude in our framework the possibility that an exchange appearing only for rent-seeking purpose under privileged status becomes part of an efficient market structure..

its start, the market maintained the French tradition of the “*cri*”, by which the market for the leading securities – and especially the *rentes* – was centralized and public, guaranteeing the price sincerity and then the security of the public, and probably also facilitating the government’s control.

Although it appears to have been under quite authoritarian rule, the market didn’t suffer much. The monopoly wasn’t respected. The CAC had no actual control on the *agents*. Partly because of political uncertainty and partly because of a lack of organization, the market fluctuated heavily. At a first stage, the difference between official *agents de change* and outside brokers (later called *coulissiers*) was limited and both groups cooperated daily, in particular because no transfer of *rentes* (which were all nominative securities) was possible without the intermediation of the *agents* in spite of much the forward market being among non-*agents de change*. The Parquet’s end of month settlement, created in 1805, served then for the entire market. Second because the high turnover among the *agents de change* made them appear as risky as the *coulissiers*: from 1801 to 1814, 115 *agents* were nominated, among whom 65 left the profession before 1815, 46 because of bankruptcy³.

The invasion of France in 1815, the Restauration and mostly the war indemnity required by the Allies imposed a change: contrary to previous governments, the new one had to issue a huge amount of debt on the market (around 25% of GDP) in order to make the foreign troupes leave. Guaranteeing a free and secure market to new investors became a priority. The development of the liquidity of the market was a second objective.

The priority given to security led first to maintain the centralized and public quotation process. The role of the opening fixing was to provide a guarantee to small investors: it was an investment in reputation, not so much towards investors than towards the general public and the political sphere. But in order to allow for the increase in liquidity, the fixing could be followed in the same day by a number of prices, which allowed for intra-day speculation by market makers. Nevertheless, the main characteristic of a centralized price-setting mechanism was never modified.

Four solutions were discussed in order to reinforce the security of transactions and the stability of the market: restrictions to securities listing; restrictions to the entry of new *agents de change*; better selection of the *agents*; mutual guarantee among them.

³ PVCSPARIS, 20/6/1814

The problem with restricting the listing of securities was that it was contradictory with the monopoly of the *agents*. It was also almost impossible to impose. In practice, it was to lead to the development of a “second class” market: the *Coulisse*. But during that first period, such a division was not yet accepted, and the development of trade on foreign (mostly Napolitan and Spanish) government bonds led the government in 1824 to accept their listing on the official market (under government authorization) after years of cooperation between *coulissiers* and *agents*.

The *numerus clausus* of *agents de change* had been suppressed in 1791. Under the first years of the re-established monopoly, the number of *agents* increased without clear limit. The *numerus clausus* was imposed in 1816 only, because of the number of failures in the previous years, under the argument that mutual knowledge and control was a condition for solvability control and risky behaviours’ limitation⁴. In 1816, the number fixed (60) was considered too high for the *agents* to make a decent living on their trade, and some charges remained vacant. The strict selection of candidates to the position of *agent de change* was considered as necessary to limit moral hazard problems in a group which reputation depended on the behaviour of all its members. It was first organized by the government (helped in principle by the Chamber of commerce). The failure of that solution was recognized in 1816 because of the high rate of bankruptcies during the Empire. The selection was transferred to each individual agent in 1816 when the property of their *charges* was guaranteed, but after a conflict between the Finance Minister Corvetto and the *Chambre syndicale* (the governing body of the CAC), the selection was transferred in 1818 to the *Chambre syndicale*, even if each *agent* could still propose candidates for his own charge. The selection bettered from then, but remained restricted to the entry of new *agents*, little control during their activity being possible yet. Nevertheless, a mutual social control was to develop all over the century (e.g. AG CAC 29/11/ 1841 mentions that the *Chambre syndicale* must watch over the private life of the *agents*).

The 1818 change was crucial since it transferred crucial powers to the CAC and especially to the *Chambre syndicale*, with the responsibility of conciliating liquidity and security. The *Comité* (the body preceding the *Chambre syndicale*) had been requiring for years without success more power on selection, definition of the internal rules of the Bourse, police of the

⁴ It has been argued frequently that the *numerus clausus* and the property-rights of the agents on their offices had been created for budgetary reasons, but the offices were never sold out, and the *cautionnement* – the guarantee deposited at the Treasury – was only fixed in 1818 (*décret* of January 9, 1818).

operations⁵, as well as confirmation of the monopoly and the property rights of *agents* on their *offices*. They obtained these guarantees and powers in 1816 by convincing the government that the market self-regulation would be more efficient and create more confidence than an external regulation⁶.

The principle of mutual guarantee was discussed very early as a solution to the interdependence of the risks supported by the *agents* and as supporting the reputation of the market as a whole. It was rejected by most *agents* during that period on moral hazards grounds (see e.g. discussions at the CAC meeting in 1817 on the Pillot bankruptcy). In 1818, when a grave crisis provoked three bankruptcies among the agents and serious problems for many of their colleagues-creditors, the CAC – which promised to pay the main bankrupt's clients and helped the others – obtained a 5 millions loan from the Bank of France under a joint guarantee of all the agents⁷. This crisis proved important since this was the first case of collective guarantee (even if a short term one), and because a *Caisse d'amortissement* (sinking fund) was created in order to reimburse the amounts advanced to the colleagues in crisis; that fund was financed thanks to the payment of a *timbre* (a stamp duty) on the operations of all agents. In 1822, this fund became permanent under the name *Fonds commun*; it received the product of a *timbre* of 10% of brokerage commissions up to a total of three millions francs (above which it paid a proportional dividend to all the agents). This *Fonds* provided for the expenses of the *Chambre syndicale*, and managing the systemic risk by providing loans to *agents* suffering short term liquidity problems. If this was a change towards a more collective and hierarchical behaviour of the CAC, it still took a while before the change became substantial : during the 1823 crisis, three agents filed for bankruptcy without receiving any help, since the CAC was not in danger and it considered their behaviour had been excessively risky. The *Fonds* was used for the first time during the 1830-31 crisis, as we will discuss below.

During that first period, the *Chambre syndicale* was then not able to organize the CAC in order to take advantage of the monopoly or to increase the security of the transactions. Actually, the agents continued cooperating with the *coulissiers*, made illegal operations (either operating for themselves or on the forward market), and even contested some decisions

⁵ That police was under the control of the Interior Ministry, something that led the agents to fear interventions based on public order considerations.

⁶ A proof of that efficiency was the exclusion by the CAC of an agent (Dufresne) in december 1815, and its success at limiting the propagation of the crisis. The new powers of the *Chambre syndicale* would be exerted against agent Pillot on May 7, 1817.

⁷ It also obtained a loan from the Treasury, without giving any collective guarantee, and the promise by a group of bankers to buy *rentes* on the market, then limiting the bear pressures, on the promise that no other *agent* would go bankrupt.

of the *Chambre syndicale* in court. The *Chambre syndicale* was also unable to lobby efficiently the government in order to maximize monopoly profits: for example it could not impede the decision by the Royal Court of Paris in 1823, in a solemn audience presided by the Justice Minister, to reject the previous years' jurisprudence by the commercial courts that considered forward operations as legal and then imposed the investors to pay their debts in case of losses. The Court confirmed the "exception de jeu" which allowed a debtor not to pay if it invoked the fact he had been incited to "gamble", creating an enormous uncertainty in the forward market. Another jurisprudence disfavoured the *agents* was the rejection by commercial courts to consider the *Fonds commun* as pertaining to the CAC: when an *agent* failed, his share in the *Fonds* was considered by the courts as part of his assets, when at the same time the court refused to incorporate his debts vis-à-vis other *agents* in his liabilities (see e.g. the Cléret bankruptcy in 1824). It then suggests that no solidarity among agents was recognized.

2. 1830-1860

Major institutional changes around 1830 justify considering the markets entered a new era. They affected both the categories of negotiable securities, the validity of forward operations and the guarantees provided to investor. Thanks to these changes, the stock exchange was able to facilitate the expansion of manufacturing and especially the transport revolution, most notably by playing a major role in railroads, which alone mobilized investments of around 2% of GDP every year from the 1840s to the 1860s.

The period was first characterized by a sharp increase in the types and number of securities traded. This resulted not only from the railroad revolution, but also from the 1832 judiciary confirmation of the tradability of shares in *sociétés en commandites par actions* (the typical manufacturing firms' organization, see Lamoreaux & Rosenthal, 2004) and from the development of foreign issues on the Paris market.

This led to an increase in the heterogeneity among the securities traded (from small firms' shares to the *rente*), which made inefficient a single market organization. Although the monopoly remained in the law, in practice the *Coulisse* developed as a separate market, and the *Parquet* renounced to quote some securities, concentrating instead in reinforcing its own organization. It had actually enough with the major new issues of the period, among which railroads and new joint-stock banks were the most important, not to ask for the enforcement of its monopoly. The *Coulisse* focused instead on shares in smaller firms (which the *Parquet* abandoned after the 1837 crash on the *commandites*), in the 1840s on *promesses d'actions*

(provisory shares of not-yet-authorized corporations, mostly railroads), and in the 1850s on foreign private issues; it also competed with the Parquet on the *rentes* market, especially after the creation of bearer *rentes* certificates in 1831.

The second important change on the eve of the period was the quasi-legalization of the forward market. In 1832, civilian courts made forward contracts enforceable by recognizing their validity even without previous money deposit by forward buyers (bear speculation did not get the same approval !). The publication in 1832 of the internal rules of the CAC reinforced that decision by providing a collective guarantee of the CAC to forward operations. The fact the Finance Ministry refused to approve these rules made it compulsory for the *agents de change* but not for their clients, so that only the courts new jurisprudence protected them, sometimes imperfectly⁸. Forward operations became increasingly important, not only for the *rentes*, but mostly now for new issues of railroads shares and bonds. This justified their publication on the official listing from 1844. A last jurisprudential move in 1848 reinforced the *agents de change*' protection by distinguishing "serious" from "fictitious" forward operations (a distinction originating from the CAC own rules): serious operations were those by regular forward market operators; they could not ask for "exception de jeu". From then, the Parquet was able to develop forward markets without important restriction or loss of reputation.

The third major transformation at the beginning of the 1830s was the development of the collective guarantee of the CAC during the 1830-31 crisis. In that episode, the *Fonds commun* was used for the first time under the sole authority of the *Chambre syndicale* in order to save several *agents* from bankruptcy. From that date, the *Chambre syndicale* was allowed to use part of the *Fonds commun* (an amount equal to the quote of the agent in the Fonds – 50.000 and later 100.000 francs – the *cautionnement* plus 100.000 francs, all guaranteed by the office value) without asking the general meeting of the CAC, and the decisions of the general meeting on more substantial helps changed from almost unanimity to a 2/3d majority rule, both representing a much more structured and hierarchical organization. This position was strengthened in 1835 when the Paris court recognized to the *Fonds commun* the status of a

⁸ Actually, some courts decision still came against the agents, by recognizing the « exception de jeu » in spite of the new jurisprudence. They were increasingly rare. In 1842, an agent was penally sentenced for forward operations, provoking a strong protest from the CAC, which the Finance Minister approved ; this paved the way to the 1844 quasi officialization.

civil society, giving priority to the claims of the CAC members on those of other creditors, and then allowing the *Chambre syndicale* to use it to deal with crises.

Later on, other efforts aimed at reinforcing the security of operations for investors. They were also exclusively undertaken by the Parquet and not by the Coullisse (although it was maybe only because the official position of the *agents de change* made it important for them to appear as prudent intermediaries to the government), and focused on limiting excessive risk-taking during bull periods⁹. Above this, a regular inspection of all the *agents* accounting books was started in 1846, and the *Fonds commun* was doubled to 6 millions in 1852, also improving transaction security. These efforts didn't suppress bull or bear markets, but they reinforced the legitimacy and reputation of the Parquet. Especially important was the fact that, thanks to the *Fonds commun* and the hierarchical organization under the *Chambre syndicale*, and in spite of a number of crises, only one *agent de change* filed for bankruptcy from 1831 to 1859, and losses for the general public were very limited¹⁰.

Taken jointly, these three changes led the way to the development of the Parquet and its separation from the Coullisse. A last change was more progressive, less visible, but played a major role in the separation and later competition between the Parquet and the Coullisse : the more efficient organization of settlements and payments. As soon as 1836, the *Chambre syndicale* organized a centralized settlement of the spot operations, with the help of the Bank of France for the payments. This mechanism was limited because the courts required the *agents* to be always able to follow every debtor during all the transaction process, impeding multilateral compensation. It was extended to most operations and reinforced in 1843 and 1845, when a true compensation of all debts among the participants was put in place. This was allowed by the greater legitimacy of forward operations which had appeared on the *Cote officielle* in 1844. Multilateral compensation also required mutual confidence. As early as 1828, the *Chambre syndicale* had tried to limit the then limited compensations to reliable brokers, and established lists of bad payers. The increase in collective guarantee among the

⁹ In the 1830s, 42 agents asked for increased guarantees in the Caisse commune for forward operations on the Spanish rente, the main speculative security on the market. The *Chambre syndicale* asked for similar protections during the the canals and the sociétés en commandites shares' bubbles in the same years, signalling its efforts to the government. In 1844, the *Chambre syndicale* excluded promesses d'actions from the market, and switched from a monthly to a bi-monthly settlement in order to decrease the risks from forward operations at each settlement date. In 1851-52, it cooperated with the Bank of France against the bull market and imposed to the agents de change a guarantee deposit of 150 francs by share (around one third of their price) for forward operations.

¹⁰ Nevertheless, debates at the CAC general meeting on that bankruptcy show that there was still no unanimity within the CAC on collective guarantee,

agents de change in 1830 led to the restriction to that group of the mutual confidence, and then of the compensation¹¹. In the 1860s, the CAC considered its settlement mechanism as much superior both in terms of rapidity, security and cost to that existing in London, and as a direct result of the entry restriction it enforced.

The Parquet's strategy was then to provide low-cost efficient operating mechanisms and very secure operations in order to attract investors (especially risk-averse ones), and to abandon to the Coullisse the high-risk, high-return end of the market. The resulting specialization between Parquet and Coullisse was accepted by both up to the end of the 1850s, and the markets appeared mostly complementary. Nevertheless, from the very beginning, the Parquet considered the relationship as a hierarchical one, since it could choose the securities it listed, and the Coullisse mostly had to adapt. For sure, at the start of the period the *agents de change* also operated on unlisted securities in cooperation with *coullissiers*, as well as the opposite (cf PV CS 6/12/1841). Increasingly yet, they tried to enforce their monopoly on operations on listed securities, and to enlarge the list. In 1844, the Parquet created a second list (the *rez de chaussée*, or ground floor of the official list) in order to affirm its right to quote more risky shares. In 1858, they obtain the right to list foreign private securities, the last type of securities that was de facto reserved to the Coullisse up to then. All these moves were motivated by the high efficiency and the dynamic strategies of the Parquet. But they inefficiently led to an attempt at absorbing the Coullisse.

3. 1859-1882

In the 1850s, the cooperation-competition between the Parquet and the Coullisse was increasingly conflictive. The Parquet's first attempts at imposing its monopoly in courts did not succeed, though in some cases a few *coullissiers* were condemned in order to calm speculative behaviours (like in 1856). In 1859 by contrast, the Parquet obtained a very severe sentence against all the major and most reputable brokers of the Coullisse, and used it in order to absorb the Coullisse.

The Parquet modified its own organization for that purpose: new quotation groups were created, new securities were listed (especially foreign private ones), minimum commissions were decreased, new operations were introduced that existed previously only on the Coullisse (low price options in particular), the monthly settlement was reintroduced (as in the Coullisse

¹¹ The solidarity was further boosted when the Chambre syndicale obtained the right to decide at which price the charges were to be sold.

tradition). Most importantly, new jobs as “main clerks” (*commis principaux*) were created for former *coulissier*, with substantial autonomy within the *agents de change* offices.

Four main reasons explain the failure of the absorption.

First, the new *commis* did not adapt. They kept making their own operations outside the stock exchange, and took risks the **agents de change** did not want to consider as theirs. They refused the proposal of the *Chambre syndicale*, which wanted to impose to CAC members to hire them under a fixed wage in order to impede the increasing competition among *agents* that would result from having them as quasi-subsidary, negotiating commissions and taking risks and then free riding first on the charges they were supposed to pertain, second on the CAC as a whole. The conflicts that appeared within the CAC led to the re-establishment of many of these *commis* as independent brokers, without any formal organization at first, later with a very loose one allowing for operations to be done and settled (a history actually badly known up to now).

Second, the creation of a tax on foreign securities circulating in France helped to resurrect the *Coulisse*, which accepted to list and quote even securities which issuers did not pay for it. Although the State in this case probably wanted to enforce the monopoly since he was sure that the *agents de change* would not take the risk of listing securities violating the law, it was in fact unable to do it. Many securities with limited French circulation were listed on the *Coulisse* (see e.g. AG CAC, 21/12/1863; 9/5/1870).

Third reason for the *Coulisse* renaissance: the 1870s provided special opportunities to the *marché libre*. After the war with Prussia was lost, the government had to issue new *rentes* for the enormous amount of 5 billions francs within a short period. Even if they did their best, the *agents de change* and the official networks of Treasury agents in the provinces were not able to facilitate the distribution of enormous quantities of bonds towards investors. The *Crédit mobilier*, which had played a great role under the Empire, had failed in 1867 and had not yet been replaced. A speculative forward market on the *rentes* developed outside the Bourse, which “help” (since speculation remained bullish almost constantly and the price of the *rentes* increased from 1872 to 1879) the government greatly appreciated.

Last reason for the re-establishment of a *Coulisse*: the development of the newly created joint-stock banks (*Comptoir d’escompte de Paris* in 1848, *Crédit Lyonnais* in 1863, *Société générale* in 1865), which rapidly searched for diminishing their dependence towards the *Parquet* for their and their clients’ securities operations. The *Crédit Lyonnais* hosted the *Coulisse* brokers in its main building for years. These banks participated heavily in the distribution of the post-war loans. In the early 1870s, the CAC feared that some banks might

try to buy an agent de change office which would have allowed them to legalize their own operations (PV CAC 21/12/1872).

The most dynamic segment of the market then developed outside the Parquet in the late 1860s and 1870s. In particular, most of the numerous new companies in the financial sectors (insurance, banks, finance companies), were not listed on the Parquet.

Our conclusion is that the very success of the Parquet led him to adopt an erroneous monopolistic strategy: in trying to absorb the Coulisse without adapting its rules to the specificities of the Coulisse's operations, it created a hole in the provision of financial services. The Coulisse provided different services to a class of important investors and speculators which could not accept the Parquet's strict rules. When an exogenous shock increased the importance of these actors, the Parquet's attempt at controlling all the financial market was deemed to fail. This attempt's failure then confirms the importance of multi-polar organizations and the impossibility of a single market if it is centralized. It also confirms that the reason for the existence of the Coulisse was not the inefficiency of the Parquet, but the fact it imposed strict rules and regulations that did not satisfy all the actors involved.

4. 1882-1914

The 1882 "Union générale" krach was another shock that determined the long term evolution of the market. The krach mostly affected the financial industry which had been developing frenetically during the previous years, presenting all the characteristics of a financial bubble. The Union générale, the most recent of the big joint-stock banks failed in the middle of the krach, mostly because of buying back its own shares on the forward market. The krach deeply affected the Lyon stock exchange, where 14 *agents de change* filed for bankruptcy. In Paris, the crisis was also serious, since 6 *agents* had to resign and 8 others suffered enough to ask for the help of the CAC. More importantly, the Parquet had to borrow in order to face the January settlement. The Bank of France and a consortium of banks lent it 80 millions francs without which the whole market could have failed.

In a recent paper, E. White considers this loan as a proof of the incapacity of the Parquet to provide the security it promised. Since its superior security was a major argument in favour of the centralized organization of the Parquet, he suggests that the French financial market was globally inefficient. We disagree with that interpretation for many reasons. First, the Parquet didn't fail, so that he actually delivered the security that investors waited for. For sure, it had to ask for a loan, but the loan was reimbursed very rapidly, proving the only problem the

Parquet suffered was one of liquidity, not solvability¹². Second, the krach's effects could not be anticipated by the Parquet because they resulted mostly from the abrupt change in jurisprudence by the courts concerning forward operations: the courts allowed numerous speculators to ask for the "exception de jeu" and so increased the losses of the Parquet by 117 millions (the amounts corresponding to forward contracts annulled by the courts, including those undertaken by the Union générale itself¹³). Furthermore, speculators on the Coullisse imposed important losses to their clients (as shown by the number and results of the bankruptcies in the finance industry in the winter of 1882), and the government can be considered as responsible for not having tried to control the risks that were taken in the finance industry¹⁴.

So we can argue that the 1882 krach does not prove the inefficiency of the Parquet. The value of the *agents'* offices didn't decrease substantially after the krach, suggesting new buyers didn't think the future earnings were much affected. Nevertheless, the krach didn't either reinforce the position of the Parquet vis-à-vis the Coullisse. The confidence of contemporaries may have been damaged by the difficulties faced by the Parquet in 1882. Actually, the Coullisse was able to use the new law legalizing unions to organize more formally in 1884.

We will argue here that the main reason for the continuing decline of the Parquet in the 1880s compared to the Coullisse is neither the dynamic behaviour of the Coullisse nor the inherent deficiencies of the Parquet's organization, nor the Parquet increasing conservatism (as argued by Verley¹⁵). More important is the internal conflict that affects the CAC concerning the solidarity among agents when facing crises.

Following the 1882 crisis, the long standing (since 1861) head of the CAC (*syndic*), Moreau, was criticized for his management of the crisis, and especially for imposing the solidarity of all *agents* for the reimbursement of the 80 millions loan. Actually, he had been in that occasion perfectly consistent with the policy he had been pursuing for 20 years, which had

¹² E. White argues that the security provided by the Parquet was indeed limited because the guarantees given by the agents de change had decreased compared to the transaction volumes. Nevertheless, he neglects to include the personal wealth of the agents, which was the main guarantee of these operations, and which explains the rapidity of the loan reimbursement.

¹³ The courts argued the forward contracts of the Union générale were not "serious" (the CAC argued that all the market was lending to the Union, a bank with 150 millions of capital). The Coullisse was also affected by the krach, but maybe comparatively less, first because its forward contracts were less generally considered as secure, and also because it had claims on the Union générale (corresponding to the last share issue of the bank) the *coullissiers* unilaterally (as argued by the CAC) compensated with their losses

¹⁴ The government several times refused to legalize the forward markets before 1882, considering the risk that the courts recognized the "exception de jeu" imposed some restraint on speculative behaviours. Actually, it only created more uncertainty.

¹⁵ Verley (2007) considers that for example the increasingly long tenure of the agents in their charge, and their increasingly familial transmission are proofs of a conservative *rentier* attitude that explains a declining entrepreneurial behaviour.

permitted the CAC to protect investors for any losses in all crises except in the Leperche bankruptcy of 1868. The opposition to Moreau, which had constantly emphasized the moral hazard dimension of his policy¹⁶, convinced the CAC general meeting not to follow Moreau and the *Chambre syndicale*. Instead of the long period of reimbursement that they proposed, which imposed a long standing solidarity among the *agents*, the general meeting imposed a rapid reimbursement schedule, and made clear that the 1882 bailout was the last one. Following that decision, Moreau resigned from the *Chambre syndicale*. In the next few years, the CAC was more reluctant in paying for its members' problems, and tougher in its negotiations with banks, which had to accept their share of the losses (Vuaflart case in 1886). In the Bex case, in 1888, it refused to pay anything beyond the debts related to the spot operations, and let the *agent* go bankrupt.

Our view is that this policy change may have been rational from the point of view of some *agents* for whom the solidaristic behaviour was costly, but that overall it led to a decline of the Parquet, since the security resulting from that solidarity was one of his major competitive advantages vis-à-vis the *Coulisse*. This new policy, which led to increased competition and decreased cooperation within the CAC, was finally rejected in 1892 when Hart, the syndic who had succeeded Moreau, was removed, and the solidarity among agents was reemphasized.

During Hart's tenure, the market share of the *Coulisse* had kept increasing. The legalization in 1885 of forward operations was good news for the market as a whole since it ended a long standing uncertainty; it benefited mostly the *Coulisse* since, except for the 1882 crisis, the Parquet had obtained a favourable jurisprudence much earlier.

One question is why, in spite of much lobbying and arguing by free-markets economists, the government did not put an end to the Parquet's monopoly. To the contrary, he homologated (and then legal standing to) the Parquet's internal rules in 1890. The main reason was probably the desire to influence the market and control it; for example, in 1892, the government imposed the Parquet to develop the "second list" of medium sized firms, something he could not do with the *Coulisse*. Nevertheless, the importance of the *Coulisse* appeared with the creation of a tax on stock market operations in 1893: in spite of the absence of legal standing of *Coulisse* operations, they obtained complete fiscal status, meaning in fact the legal recognition of their validity.

¹⁶ See e.g. PV AG CAC 28/7/1882.

That orientation changed in 1896, mostly because of the “gold mines krach”. During the previous years, the Coulisse had listed a great number of new gold mines operating in the recently colonized Transvaal, which the parquet could not list. The Boers war led to a sharp drop in their prices early in 1896, and to the failure of a high number of investors and *coulissiers*. This gave the Parquet a reason to argue that the Coulisse did not provide the security required by a well-functioning market, and to ask for a re-enforcement of its privileges. This, added to nationalistic attacks against the Coulisse, which had many foreign – and, worse, mostly German – members, led to the 1898 Fleury-Ravarin law which imposed the *coulissiers* to use the intermediation of the *agents de change*, unifying the market, at least in theory, or, in practice, giving the Parquet the right to choose the securities it wanted to trade, and to impose its monopoly on these transactions. Even at that moment, the Parquet did not want to suppress the Coulisse, but only to control and dominate it, and it took care of obtaining a law reserving it the right to sue the Coulisse (and not allowing the Coulisse other clients to do it).

The Coulisse reorganized then in two organizations (*syndicats*), respectively for spot and forward operations (the second one being by far the most important). They developed organizational structures much more hierarchical than previously, inspired by the Parquet, and they kept realizing a substantial proportion of the transactions. Nevertheless, their market share was reduced from almost two-thirds of the tax on stock market operations (created in 1893) to around one third.

The Coulisse becoming more Parquet-like, a new free market appeared in the early 20th century, in order to allow for the flexibility and freedom that was disappearing from the Coulisse. Although this market remained quite limited (as far as we know, which is not much), its existence is perfectly understandable within our multi-polar framework.

Another main challenge the Parquet faced during that period was the development of the role of joint-stock banks in securities issues and trading. Earlier, the Parquet already had had to adapt to the banks competition by proposing similar services, like the payment of coupons in 1880. But it seems that then, except for major issues like those of government or railroads which required consortiums of banks, most IPOs were organized directly on the stock-exchange and via the *agents de change* (and the help of market makers). Especially after 1890, when the market developed again, the big banks started using their network to sell directly to individual investors the securities which issue they accepted to guarantee. On the secondary

market, they sometimes matched directly buy and sell orders from their clients, avoiding the Parquet intermediation.

The CAC protested and rapidly reacted against these practices. On the secondary market, they had to accept the “par contre” in 1895, an agreement by which a bank paid commissions only on the larger of two matching orders passed in the same day; they also had to accept “remises”, that is they transferred part of their commissions to the banks that gave them orders (see AG CAC 1910 for protests for the increasing level of the *remises*). On the primary market, where no monopoly existed, the Parquet organized in the mid-1890s in order to be able to be part of the most important issues as a group. In 1894, the CAC general meeting considered this participation as an “important innovation (...) [that would help to] increase the reputation of our Company and (...) help it to rise from the negligible situation bankers want to impose it” (AG CAC 17/12/1894). After a few years, the CAC situation was well established in issue consortiums and it obtained conditions similar to those of the biggest banks (AG CAC 19/12/1904). This shows that the Parquet was not living on monopoly rents, but had to innovate in order to maintain its position. Nevertheless, its action was not sufficient. The main problem was that the banks direct selling methods in their network killed the secondary market: individual investors didn’t modify much their portfolios, and only added to it some new securities every year. This was very different from the London situation where issues were organized by brokers and were held by speculators making frequent operations for a long period before they were sold to their “definitive” holders (*Les grands marchés*, 1912). This may explain a more dynamic forward market in London and the complaints by the agents de change against the banks practice (AG CAC 21/12/1908). This may also explain the stability and more limited volatility of the Paris market during the gold standard period (*ibid*).

Many changes affect the market during that last period: after a period of development and even domination of the Coulisse allied to the big banks, the Parquet developed competitive responses and was able to regain part of its position. In any case, this does not look like a comfortable monopoly situation. Actually, in 1910, some major participants in the Parquet examine the opportunity of creating a new broad, private and less regulated market on the London model. At the same moment, London brokers discussed the creation of a new market without jobbers because they suffered the strong position of the jobbers resulting from the 1907 suppression of the dual capacity. They ended up fixing minimum commissions, which

suggests that some convergence was taking place and the Paris organization was not considered as inefficient even by the London brokers.

III. Evaluating the efficiency of the Parquet : transaction costs, risk, liquidity, volatility.

This section aims at evaluating the efficiency of the Paris stock market. Unfortunately, good data for the *Coulisse* is difficult to find, largely because of its unofficial status and limited formal organization up to the end of the 19th c. We then concentrate on the official market. Contrary to White (2007), we will argue that the organization of the Parquet actually allowed a decrease of both idiosyncratic and systemic risk. We propose to observe first transaction costs, then risk, and ultimately liquidity as the three major indicators of efficiency.

1. Transaction costs

Measuring transaction costs is complex. The most simple of these costs are brokerage commissions. Others result from the delays in payments, which involve the loss of interests. In the absence of jobbers, the Paris market provides no bid-ask spreads, the indicator of transaction costs used by Davis & Neal (2006) and Pagano & Roell (1996). Official brokerage fees were initially fixed at ¼% by a decision of the Paris Tribunal de Commerce¹⁷ from Messidor 26th, an IX (15th of July, 1801), but this level, which did not change for a long time, was widely considered as an upward limit. During most of the century, the CAC tried to define and enforce minimum commissions. The argument, still used today in economic theory, was that predatory pricing could make the intermediaries fragile and create systemic risk because of the externalities among them. Nevertheless, enforcement measures were always weak.

One must then try to deduct actual brokerage commissions from both changes in official tariffs and debates in the CAC general meetings that give insights on the distance between the rules and the practice. The main problem is that commissions varied very much not only through time, but also with the operations, the securities and the people involved.

One example is the 1836s period of speculation on (frequently unlisted) new firms' shares. In their general meetings, the official brokers defined two categories of shares supporting

¹⁷ Contrary to the “monopoly” view of the Parquet, up to 1890 commissions were not fixed by the CAC but by the Paris commercial court, which had no reason to maximize the *agents*' profits (see the conflicts on the forward market legal status, for example). These were maximum commissions. Minimum commissions could be fixed by the CAC, but they had no legal value, in particular their violation was not sufficient for the CAC to expel an *agent*.

respectively 1/8th and 1/4^{er} of a percent as commission. The category paying the lowest fee included a large majority of all shares traded, but their number varied during the following years under the influence of circumstances (and sometimes the pressure of interested bankers, heads of the listed companies¹⁸, the government, etc). It seems that the low commission became the norm at that moment, but maybe not in the bear market that followed.

For widely traded securities and good clients, the minimum fee became as soon as 1842 the standard fee, even when representing no more than 0.1%, well below the officially agreed 0.25% minimum.

Official commissions were not respected by the agents de change, at least if one considers the number of cases when the *Chambre syndicale* complained to the *agents* about the necessity of respecting their own rules. In the late 19th c., the *Chambre syndicale* tried to create rules for the retrocession of commissions to *remisiers*, bankers or even private clients. It accepted rapidly 33% rebates, and even sometimes 50% and up to 80% in some cases.

A major consideration for fixing the commissions was the volume of trade involved. After the 1866 crisis, the *Chambre syndicale* obtained a reintroduction of the bi-monthly settlement, arguing a lesser risk (see below). Since this was supposed to bring more business (those investors wanting to settle their position after one month would have to pay a reporting fee after two weeks), it accepted to reduce the commissions for the securities involved, a loss that should be compensated by the increase in business. Government securities (including foreign governments) benefited from special commissions, and even sometimes of fixed commissions (benefiting major investors) (in the 1890s). After 1871, official commissions were very detailed and changed frequently.

Commissions were negotiated by intermediaries, *coulistiers*, *remisiers* and bankers. As we mentioned above, a 1895 agreement recognized the strong position of deposit banks, creating the « par contre ».

Furthermore, the government constantly pressured the CAC for decreasing its commissions. The 1898 reorganization which reinforced the agents de change monopoly also imposed them a substantial reduction in commissions and authorized commission retrocession almost without limit.

Graph 1 proposes a summary of the main changes of commissions on the Parquet, neglecting the qualitative changes we just emphasized and which concur to significantly lower commissions, at least for the major investors. The main conclusion is that the courtages were

¹⁸ In 1838 (CS 2/5) Baron Rothschild required Mines de la Grande Combe to be included, arguing it also included a railways company and most railways were in the low-cost category.

very low: from the 1830s on, they didn't exceed 0.125% on most securities, 0.05% on the *rentes*. On the most important forward market, the maximum rate was 0.1% as early as the late 1860s, and a proportion of this was transferred to the *coulistiers*, the bankers or the *remisiers*. After 1898, even spot operations on standard securities paid no more than 0.1%, and the normal price on the forward market was 0.05%, and 0.025% for the *rentes*. Some options did not pay any commissions, the CAC considering they were necessary to the development of the market (cf. AG CAC 16/5/1902). All these prices were below those practiced in London as far as we can deduce them, something confirmed by contemporaries. Actually, after the 1898 reform, the *agents* feared that the *remisiers* left Paris for London because of the low level of commissions in Paris, which made it impossible for the *agents* to transfer them a sufficient profit (cf. AG CAC 23/6/1910). In spite of this, competition was harsh among London brokers, and was considered responsible for the 1907 crisis, at least enough for the LSE to impose minimum commissions based on that argument.

Transaction costs should also include delays in delivery and payment, which also increase the risk for both the investors and the intermediaries. Considering the rules applied at the end of the 19th century, the Parquet would compare favourably on that account with most European markets in the early 1990s (Pagano & Roell, 1992).

2. Risk

Investors in financial markets accept a number of different risks. One is the transaction risk we just mentioned, resulting from the delay in security delivery or in payment after a transaction. Another risk results from the volatility of prices. A third one is the systemic risk which would materialize if the entire stock exchange would go bankrupt. The three risks are not entirely independent but we can analyse them separately. We will argue that the Parquet organization decreased significantly all these risks.

Transaction risk

If one party in a transaction goes illiquid or bankrupt before delivering a security or paying for it, the other party risks a loss. The same is true if the broker goes bankrupt. For pure spot operations, these risks can be reduced by an adequate organization of the stock exchange, matching payment and delivery. It is more delicate for transactions with payment at settlement date or for futures contracts. There are two ways to decrease that risk: a good screening of the market participants, and the provision of guarantees. The CAC always argued its organization allowed a better screening of clients, and indeed asked the agents to provide

lists of “bad clients” (sometimes in coordination with the Bank of France) (see e.g. AG CAC 13/12/1832 and 28/12/1866). Above that screening, the CAC provided better guarantees to investors.

A key question is then the type of guarantees that are provided. Parisian *agents de change* were legally responsible for the operations they executed for their clients within the framework of their monopoly. Losses incurred by an agent when executing such an operation was considered as “*faits de charge*”, and the security it had placed with the government, the value of its charge and ultimately all its assets could be seized to pay for his debts. Furthermore, the CAC considered it was morally responsible for their payment even if it always denied any legal responsibility until it was imposed to it in 1898. As we have seen in the chronological presentation, the main changes on that respect before 1898 were the creation of the *Fonds commun* in 1818 and the change in 1830 in the internal rules concerning its use in order to help *agents* in trouble. The doctrine of the *Chambre syndicale* was to first help covering the *faits de charge*, then to help those agents which were victims of a “*crise de place*” (a systemic crisis), then those victims of the bankruptcy or of the bad faith (especially those refusing to honour forward contract claiming for “*exception de jeu*”) of their debtors (but in that case the *agents* was considered having failed in his duty of vigilance), and ultimately those having violated the usual practices of the CAC. In the last two cases, the agents were required to send in their resignation before any help was given, thus limiting moral hazard issues. Loans were given under strict conditions of accounts verification, guarantees and interests payments, and only on a short term basis¹⁹. All this suggest that the conditions for an efficient collective guarantee were present. A first empirical argument, provided in graph 2, is the sharp decrease of the number of agents going bankrupt (the slopes of the lines in the graph), first after 1818, second after 1830 (much before it became impossible with the 1898 legal solidarity). The fact bankruptcies almost disappeared when forced resignations occurred at a relatively stable pace suggests the organization allowed the CAC to strengthen its reputation by assuming collectively most of the losses incurred and preventing, and, a condition for this to work, allowed the CAC to prevent even the risk-lovers among its members from taking uncontrollable risks that it would have been unable to assume. The decrease in the number of “*crises*” (here defined as crises sufficiently serious for the *Chambre syndicale* to have to ask the authorization of the general meeting) solved without

¹⁹ From 1867 on, the statutes of the CAC imposed the CS to inform the general assembly within 6 months of the loans if full reimbursement had not been made before. It likely formalized a former practice.

even having to expel the agents recurring to CAC loans also suggests that risk-taking was mostly under control.

Clearly, a precise measure of the losses finally supported by the clients of the illiquid agents would be useful. It has been impossible to gather systematic data on that account up to now²⁰. The debts for “faits de charge” were systematically paid for from 1832 on. Earlier on, definitive losses suffered by clients on that account represented a total of only 0.315 for the period from 1818 to 1831, to be compared to 0.667 million for a single bankruptcy in 1817 (Pillot)²¹.

Systemic crisis

The response of the Parquet to systemic crises is also quite efficient. The 1830 crisis, which resulted from the revolution, helped the *Chambre syndicale* obtaining from the general meeting the right to intervene more rapidly and freely, and to strengthen the CAC as an organization. The next revolution, in 1848, proves the *Chambre* was able to use efficiently these powers since not only there was no bankruptcy, but not even a single forced resignation or even a crisis mentioned to the general meeting. The same was true in 1870 in spite of the war and the *Commune*.

The 1882 krach proved that the Parquet organization didn't impede speculation in the worst sense; but is also a perfect example of the security provided by the CAC organization to individual investors. As many as 14 agents suffered some liquidity problem on the month of the krach, but six reimbursed the loans from the *Fonds commun* within the month, and among the others no one filed for bankruptcy, and only six were forced to resign by the *Chambre syndicale*. The public suffered no losses, and the solidity of the CAC was such that it was able to reimburse all the loan it had obtained from the Bank of France within a short time. This confirms that even major crises could only affect the liquidity of the CAC, but not its solvency, making operations on the Parquet very safe for any individual investor.

²⁰ It is very difficult because, as for any bankruptcy, the proceedings can take years, and the accounts and minutes at the CAC mostly measure its own losses. For example, in the 1830-31 crisis, the *Fonds commun* lent up to 3.7 millions to six agents. At the end of 1831, they still owed it 2.25 millions. In order to avoid bankruptcy, the *Chambre syndicale* decided to abandon 0.98 million of this amount to the agents other creditors. Later on, it recognized another loss of 0.45 million resulting from bad debts received from one of the *agents*.

²¹ Contrasting with that, in 1822, the Sahut case was solved without bankruptcy, the agents abandoning almost 0.3 million of their assets on him.

Settlement period

It has been argued that the interval between two settlements (*liquidations* in French) affects transaction risk, the longer the interval the larger the positions accumulated, the potential fluctuations and then the risks taken. On the other hand, more frequent settlements involved costs, and then commissions covering them; they also involved, like in New-York, the daily availability of enormous quantities of cash, when the Paris or London settlements allowed most transactions to cancel and reduced the need of cash payments. The minutes of the CAC general meetings when the choice between monthly and bi-monthly settlements was under discussion (in 1844 the bi-monthly settlement was established, a monthly one was imposed in 1859 by the government, before a partial reestablishment of the bi-monthly one in 1866) show that the agents preferred more profitable bi-monthly settlements and argued it was less risky for the market (e.g. PV AG CAC 9/7/1866). We don't consider this will make much difference with the London monthly settlement.

Volatility

Another risk is the volatility of prices, which creates an uncertainty on the price at which one will be able to buy or sale a security. It is to a large extent at the origin of transaction risk since few speculators would be unable to pay or deliver without substantial variations in prices. We have no data on volatility in the very short run, the major determinant of such risk, for the 19th c.. If medium term volatility on stock indices is a good proxy, available data suggest it was much lower in Paris than in London. The volatility of Arbulu's (1998) index of spot prices decreased significantly during the century (graph 3) suggesting the market's organization was able to limit the extent of price volatility, especially from the 1850s. Some episodes show that the CAC was able to suspend quotations when a crisis started, as in the 1904 crisis. A comparison of Arbulu's and London's "NBER-Bankers magazine" index suggest volatility was double in London compared to Paris for the period 1887-1913 (22.3 compared to 11.2%).

3. Liquidity

The measure of transaction volumes and then liquidity on the Parquet is not straightforward, although various quantitative indicators are available in the archives. A first proxy are the volumes traded; a measure of traded volumes is provided by the *timbre*, a stamp duty levied from 1818 on the brokerage commissions of each agent in order to finance the *fonds commun*. The *timbre* is supposed to represent 10% of the commissions (after a doubling in 1822), but

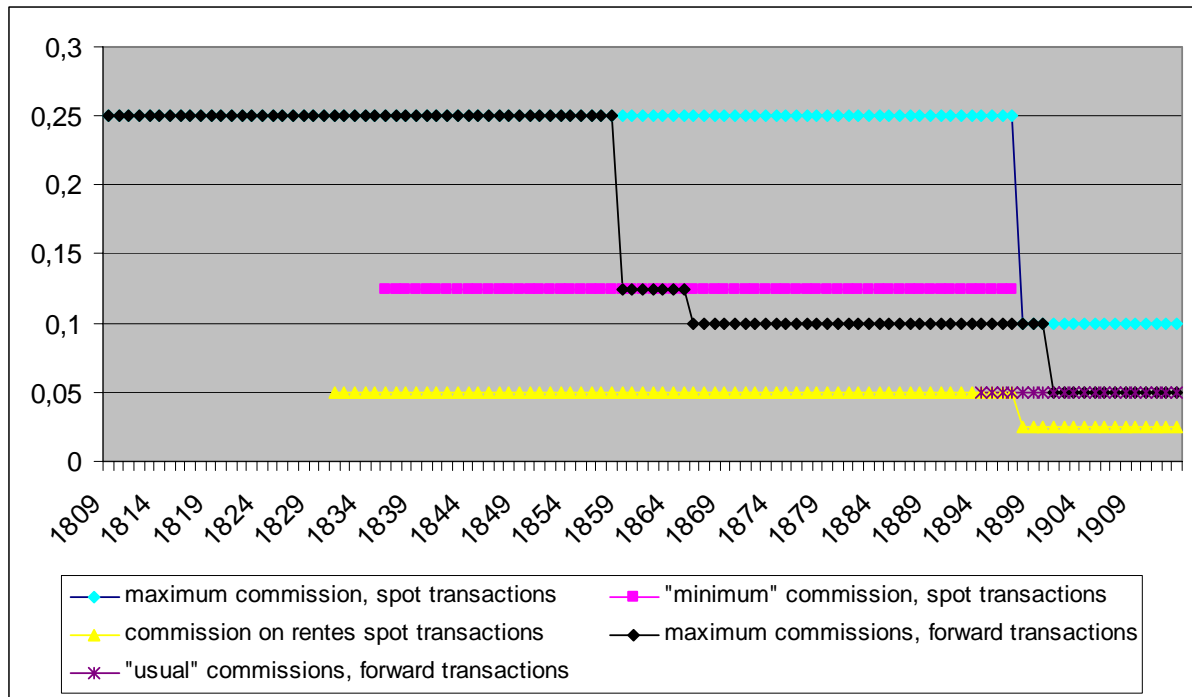
the minutes of the CAC meetings show it was not so stable: it was raised in 1882 after the crisis in order to refill the *fonds commun*, as had been previously the case in 1848. The *timbre* could also differ among securities. In 1846, a hot debate divided the agents among those wanting to suppress the reduced rate for railways shares and those considering it had to be maintained. The actual rate of the *timbre* depended on the precise way the intermediation was organized. When *remisi*ers obtained a share in the brokerage commission (to distinguish from an independent payment), the *timbre* ended up representing more than 10% (up to 25% following agent Perdrigeon, AG CAC 9/5/1870)/ More importantly, the *timbre* varied with the commissions actually cashed in by the agents, not with the volume traded, so that a decrease in commissions reflects in the *timbre* payments. Despite these limitations, the *timbre* provides interesting insights on the long term evolution of transactions on the Parquet (graph 4). It shows the vigorous surge in transactions in the middle of the century, before the competition from the *Coulisse* became so important; the following decline in the *timbre* resulted both from that competition and from the decrease in commissions.

The *timbre* was the only quantitative measure of the activity of the Parquet as a whole up to 1870. From 1871 on, the creation of a new settlement system provides a complete measure of all spot transactions. For forward operations, the same source provides only the volume of actually delivered securities, a small fraction of the total but maybe a correct proxy for its evolution since the compensation method (compensation both among clients and agents for a settlement period) does not change until World War One. Both series are provided on graph 5, although no direct comparison of the relative importance of spot and forward categories either as concerns the Parquet traded volumes or its profits can be deducted from these data. Forward market transactions measured in that way are also given disaggregated in four categories : French and foreign government debts, French and foreign other securities. Graphs 6 and 7 provide these data. A clear result is that the French *rente* was almost not traded anymore on the Parquet on the eve of World War One, the “*Coulisse des rentes*” being its almost only market in spite of the legal monopoly of the Parquet. Transactions on foreign government debts were the only one little affected by the 1882 *krach*; they grew up to the late 19th century, and then decreased under the competition of other securities, mostly shares which benefited from the long bull market of the *Belle Epoque*.

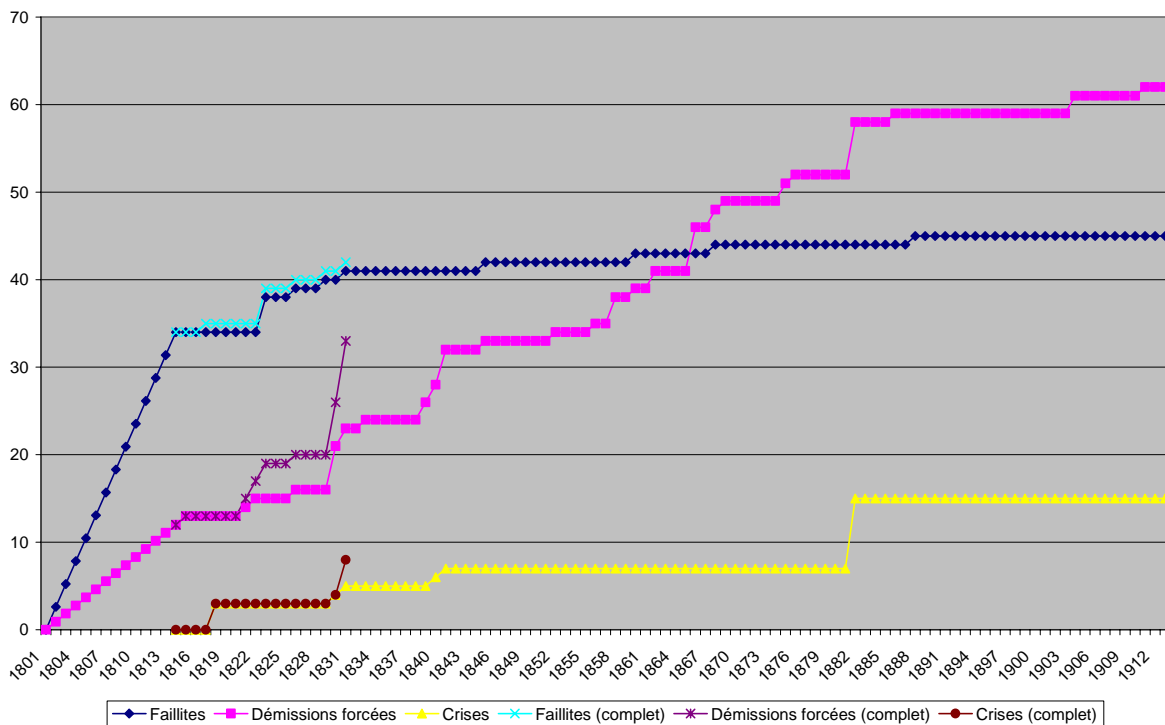
Conclusion

The Parquet, which was the centre of the Paris stock exchange in the 19th century, was not the inefficient monopoly many (sometimes interested) observers argued. It was a structured organization which minimized transactions costs thanks to very efficient settlement and compensation procedures and maximized the security of transactions thanks to collective guarantee procedures that took into consideration moral hazard and adverse selection problems. Intermediation commissions, which are supposed to be high in a monopoly, were actually low. The history of the exchange shows that these qualities resulted from a permanent interaction between the government, the *Compagnie des agents de change* and its competitors, bankers and *coulissiers*. During much of the period, the relationship between the various intermediaries was one of both cooperation and competition, involving a substantial specialization of each group. Nevertheless, some periods of conflicts had a deep impact, leading to attempts by the Parquet at absorbing the Coullisse, or by the Coullisse at suppressing all the Parquet's formal structure. In its dual form, the Paris stock exchange allowed for an enormous increase in listings, flotations and transactions that made it the second-biggest exchange in the world.

Graph 1 : commissions

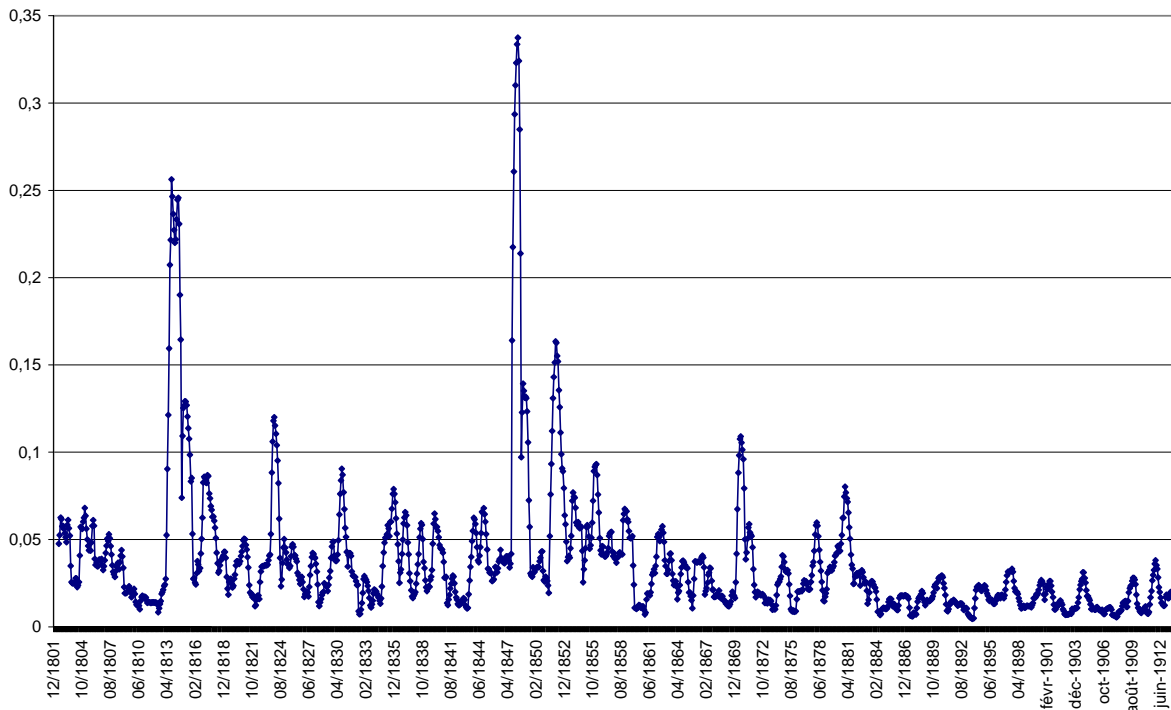


Graph 2 : agents de change faillites



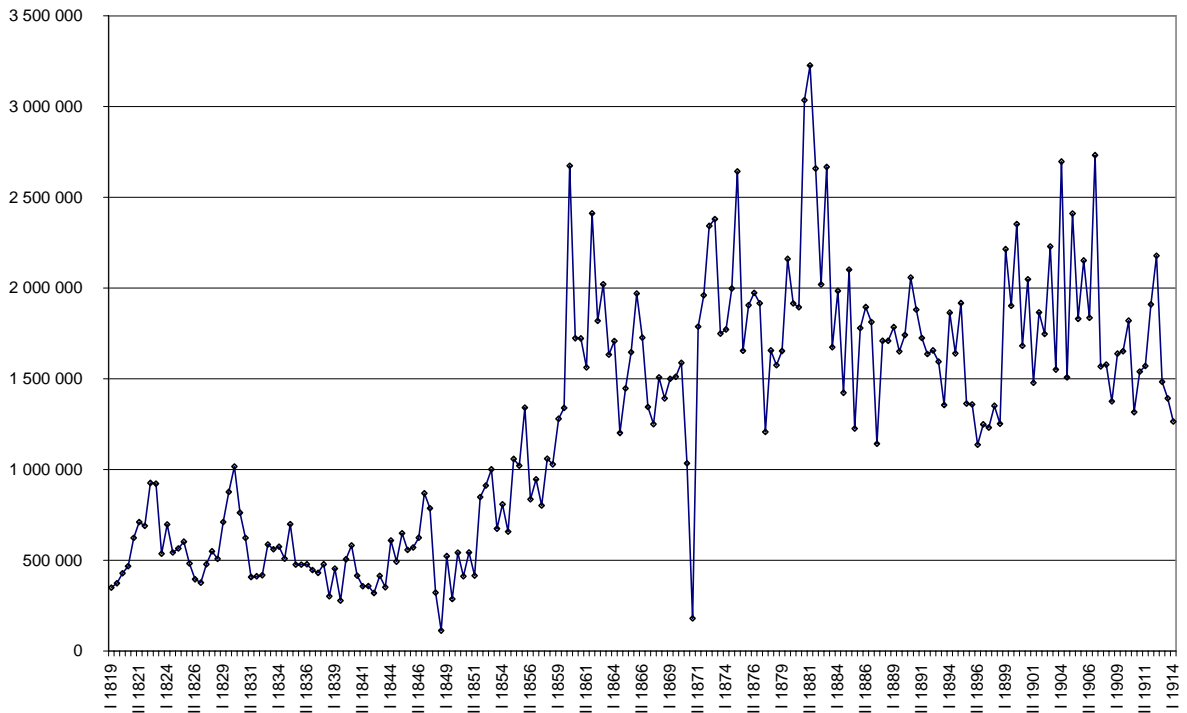
Number of *agents de change* suffering : bankruptcy (faillites), forced resignation or crises (with help from the Fonds commun). The first series take into account all cases discussed in the Chambre syndicale (up to 1830), the second ones only the cases debated in the general meeting of the CAC. From 1830 on, there was an increased number of crises for which no debate in the general meeting was necessary (because of the increased power of the Chambre syndicale, see text).

Graph 3 : volatility on the Parquet



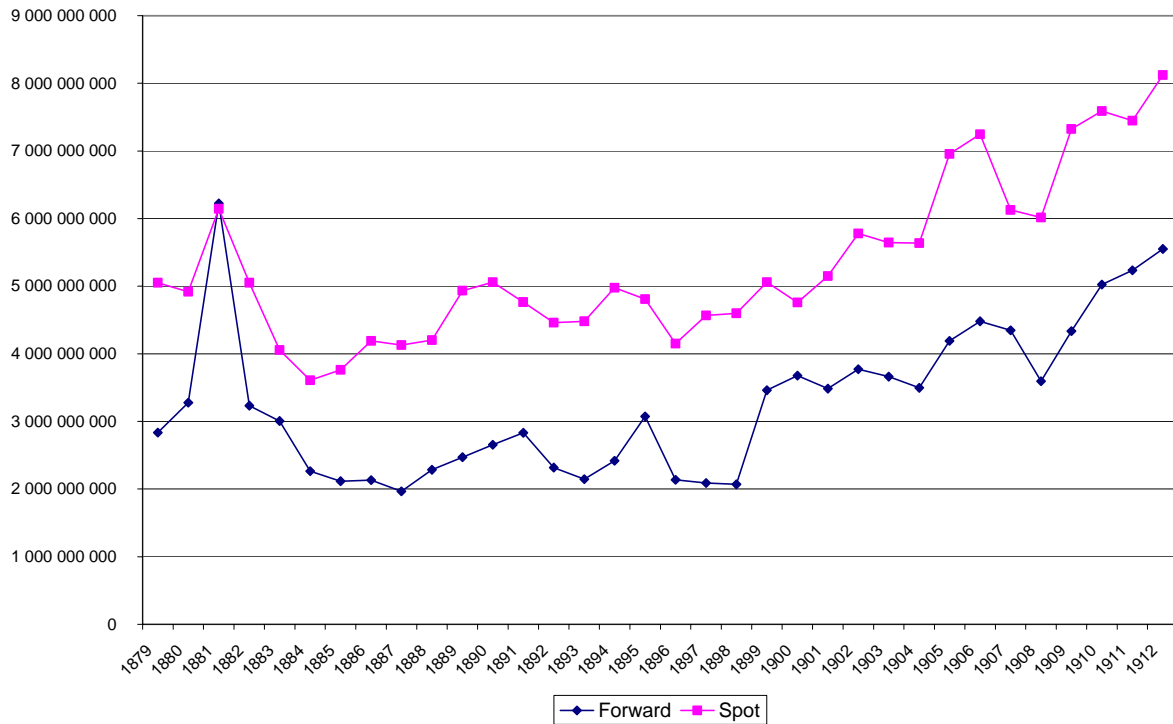
Volatility of the Parquet index reconstructed by Arbulu (1998). Volatility is measured by standard deviation / mean. All major crises appear : 1815 (restauration), 1823, 1830 (revolution), 1848 (revolution), 1853, 1870 (war), 1882.

Graph 4: Transaction volumes measured by the *timbres*.

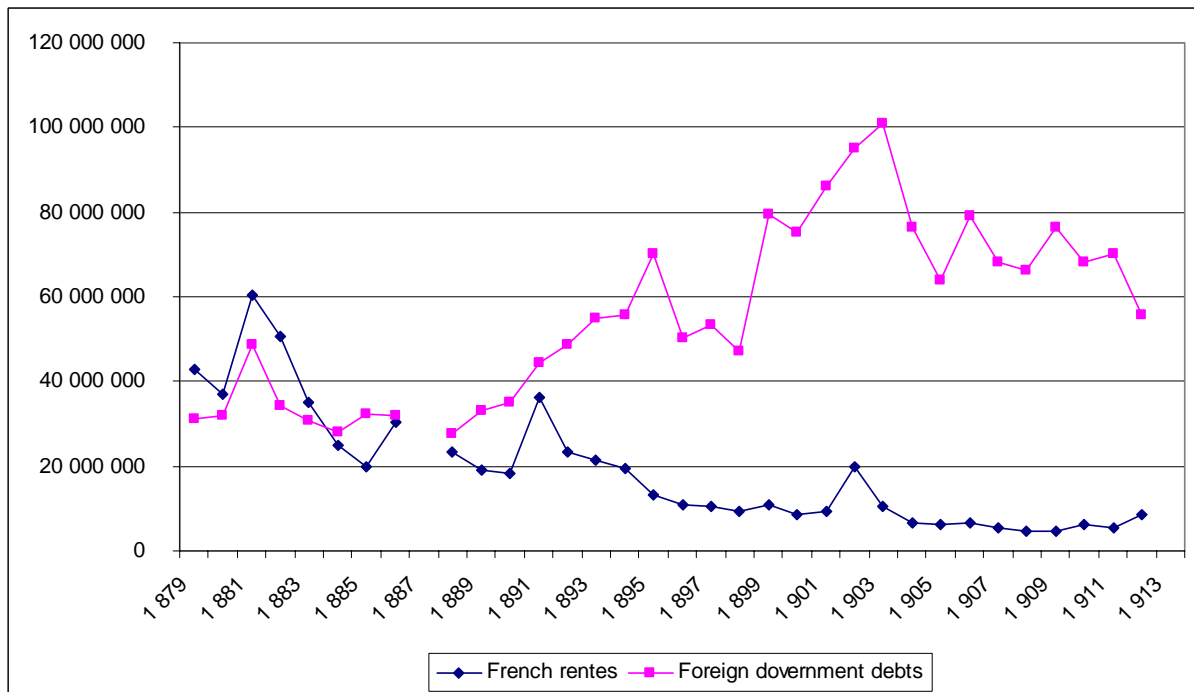


The *timbre* represented usually 10% of the commissions.

Graph 5 : Measures of spot and forward transactions

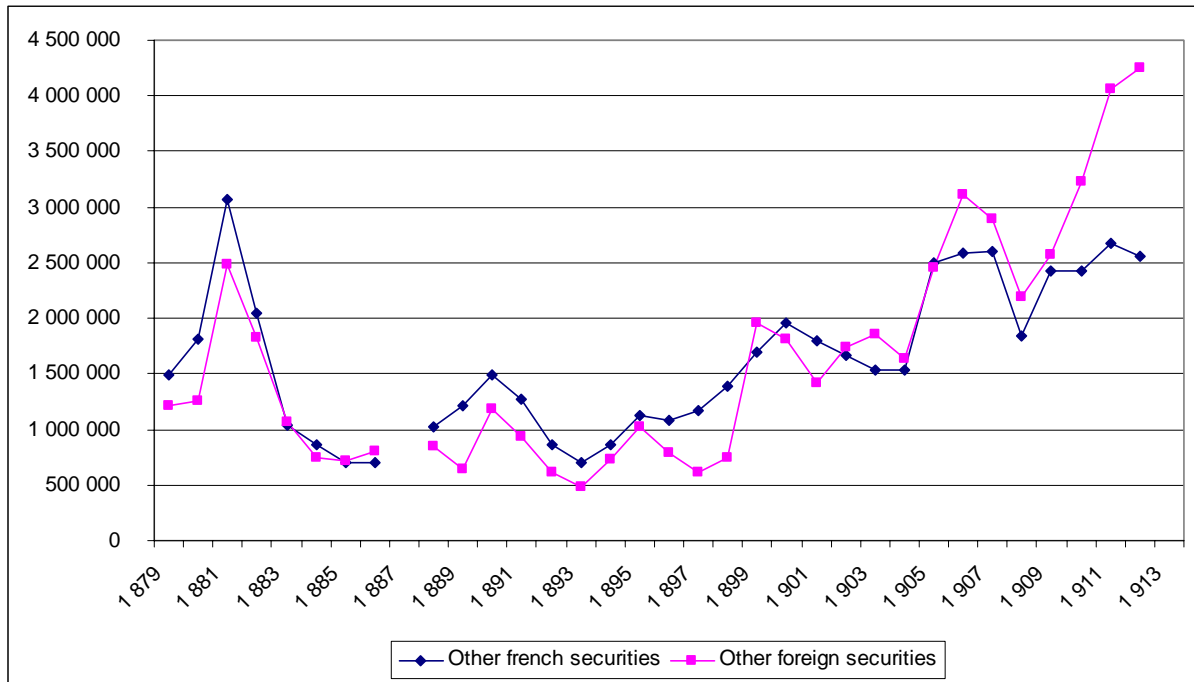


Graph 6 Government debts traded, forward market



Government debts are measured in “francs de rentes”, i.e. in francs of coupons to be paid. If the French 3% rente price was at par, 3 million of transactions corresponds to a face and market value of 100 millions. As previously, these data correspond only to forward operations actually delivered at settlement date.

Graph 7 Other securities traded, forward market



Other securities are measured in number of securities traded. Average security price was probably around 500 francs during the period, so 1 million of transactions corresponds to 500 millions francs at market value. As previously, these data correspond only to forward operations actually delivered at settlement date.