How do information technologies shape the rules governing stock exchanges?

Conclusion drawn from a case study on the French online brokerage industry, 1998-2002

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Comments are welcome.

Olivier Tirmarche
Center for the Sociology of Organizations
(Paris Institute of Political Science / CNRS)
email: o.tirmarche@cso.cnrs.fr
1. When technologies make economic ideals real

In the introduction to the book *The Laws of the Markets* (1998), Michel Callon lays down some stimulating arguments for bringing together economic sociology and technology studies. In one of them, he sweeps away the old critique by sociologists that neoclassical models in economics are unrealistic. Callon maintains that economics help shape actual markets, more than they account for their functioning. This is the broad idea that is suggested in the title of Callon’s introduction: “The embeddedness of economy in economics”. Furthermore, technologies play a large role in the shaping process, because they embody the principles of exchange formulated by economists, and because they channel actors to follow these principles through the rules of cognition and interaction that are compatible with such material objects\(^1\). When embodied principles refer to a “cyborg science” such as neoclassical theory (Mirowski, 2002), economic action can be said to be “mechanized”, and along with it, the ideal of perfect competition.

This line of reasoning, associated with the notion of “performativity”, is illustrated in the doctoral work of Fabian Muniesa (2003), on the computerization of securities quotation on the Paris stock market in the 1980s. Among other objectives, computerization was intended to change trading practices that were not consistent with market ideals\(^2\). And indeed, unorthodox practices had become widespread in the context of physical gathering of traders in the *Palais Brongniart*. In such circumstances, traders had to manage reciprocity constraints over time periods that far exceeded one-off transactions. These constraints were one of the many factors that pushed them to break official rules, which was all the more easy because interactions were surrounded by opacity, and because regulation authorities were weak. The use of computers seemed to allow the modification of most of the key elements of this background: interactions could take place without any physical gathering of traders, transactions were made observable by all, and detailed features of quotation devices tended to make the personalization of relationships more difficult.

While Fabian Muniesa’s work shows well how Walrasian principles of exchange were utilized in the design of computer algorithms, it is affected by shortcomings in the

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\(^1\) These arguments stem from a research program that Michel Callon has led jointly with Bruno Latour, at the *Centre de Sociologie de l’Innovation* in Paris. This program relies on the notion of “performativity”, and goes far beyond the field of economic science and economic action. For an application of this notion to sciences of nature, see Latour, 1987. For a more detailed account for the function of artifacts as materialised principles of action, see Latour, 1991.

\(^2\) For a detailed description of such practices, see: Bacot, Juvin, Dubroeucq, 1989; Hassoun, 2000.
"performativity" thesis itself: he traces the incorporation of ideas into technologies, but does not analyze very rigorously the specific consequences of this for daily interactions. He does not, therefore, tell much about either the degree to which computerization met its objectives, or the degree to which the incorporation of ideas into technology had led to the mechanization of market interactions. In the end, he assumes that it is impossible to circumvent market principles simply because they are incorporated into material artifacts.

The aforementioned shortcomings would be insignificant if we could assume that computerization acts as a substitute for human action, but this is not the case. Muniesa himself recognizes that electronic booking is only a medium for interaction, not a substitution. This point is all the more crucial because people not only work around computers, they also operate at the very core of the machines when they use computing arrays and databases, to solve problems or take into account unplanned events. This suggests that incorporated rules are attainable, that they can be changed. Therefore, in the absence of strong empirical evidence, one cannot assume that principles are impossible to circumvent simply because they are materialized. Ultimately, the question of the causal link between incorporation and mechanization has yet to be answered.

My own doctoral work helped to shed light onto this link (Tirmarche, 2004). I investigated the evolution, from 1998 to 2002, of the business model used by French online stockbrokers, providing services exclusively to individual investors. This case study is apt for answering the question above, because information technologies were a major component in brokerage firms settings, and because services could be said to be both mechanized and embedded in economics. As I argued above, services could not be said so simply because they were fully computerized, but because they were strictly conform to rules that had two main properties. First, rules were supposed to apply to all management tasks and to shape the social system so it looks like a machine. In this, they illustrated Weber’s definition of bureaucratic order (1968 [1896]). Second, rules were frequently based on ideals found in neoclassical theory, as we will see in more detail later on (Dompé, Peltier, 1996). In the following sections, I will try to answer the following questions: What role did information technologies play in the dynamic that led brokerage employees to conform to the rules? How can the role of the technical variable be formalized? Is the technical variable the only one that could

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3 Here I interviewed approximately one hundred people, who were mainly employed by seven different brokers and by their own suppliers, but also by regulation authorities. In addition, I visited three brokerage firms as a non-participating observer, for some fifteen days as a whole.
explain the mechanization process? If not, what are the other elements with which it is combined?

2. An outline of online stock-brokerage for individual traders

Before I consider those questions, I would like to give a general idea of the industrial activities to be discussed. I must specify right away that these activities do not include all the channels that converge in the electronic books managed by Euronext, nor does it include all the intermediaries that offer trading services to individuals. The firms to be studied are called “online brokers” or “discount brokers”. They are distinct from both banks and French long-established stock-brokers (the so-called “sociétés de bourse”), though they are often tied to the latter, in financial and operational terms. Comparable U.S. firms include Charles Schwab or E*Trade. In the following paragraphs, I will briefly describe the content of online services. I will then give some information about the industrial structure of the sector, since that information will be necessary for understanding the dynamic of the industry. I will conclude with a few words on how people work in this fully computerized environment.

2.1. The content of discount brokerage services

The discount brokerage model appeared in France in 1998-1999, alongside the discourse about the so-called “New Economy”. Contrary to U.S. firms such as Charles Schwab, which were well-known as soon as 1995-1996 and which provided services by phone at that time, French discount brokers immediately used the Internet. Since their business model consisted of a strategy of managing volume, some basic services were initially offered at the lowest prices, including information about quotations and electronic central booking, transmission of orders, transaction settlements, and

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4 To be more precise, I must specify that while online brokers chose the discount brokerage business model as a first step, their activity profile changed from 2000 onwards. From this time, two patterns emerged, which some cases mixed: one pattern was closed to the retail banking model, which mainly relies on the sale of products of collective asset management, while the other one was close to the profile of the old French “sociétés de bourse”, which mainly relies on personal advising and private asset management. I found such a trend surprising for two reasons. First, the changes were very quick, since they reached completion as soon as 2002. Second, in 1998-1999, discount brokers based their difference mainly on old models. These are the reasons why I chose to focus on this evolution in my PhD dissertation. I wondered whether changes were accidental consequences of the “e-crash”, or the result of more serious causes. In the end, I argued that the discount brokers’ sensitivity to those immediate circumstances was itself a structural outcome. As a matter of fact, the choice of a strategy of managing volume at the lowest cost, combined with some elements in the broad context which had made this strategy conceivable, brought firms so close to perfect competition that intermediation rents disappeared. Consequently, firms could not make profits as long as they remained discount brokers.
accounting management. Since stock-trading channels had been fully computerized between the mid-1980s and mid-1990s in France, web-sites could connect individual traders directly to central books, without any visible break in the circuit. Information produced by Euronext thus circulated in “real time”, and deals were registered in accounts as soon as the day after transaction settlements. If unable to use web-sites, clients could obtain information and give orders by phone to front offices.

2.2. The industrial structure of discount brokerage

There was a huge number of online brokers by the beginning of 2000: I could count some fifty of them at that time. Fortunately, this number had decreased to a dozen by 2002. Firms were not only numerous, they were also easily substitutable. A number of possible causes exist to explain this high number and level of substitutability.

The dramatic increase in the number of competitors resulted from a lowering of barriers to entry in the sector. This occurred because of two changes that took place in the early 1990s. The first of which involved some reforms in the regulation framework that were aimed at intensifying competition in the financial intermediation industry as a whole. The most recent of these was the 1996 Law of Financial Activities Modernization. The second change involved the emergence of a large industry of financial information, following the computerization of trading channels. This gave brokers the content they needed to implement online services and made the development of web-sites relatively quick and inexpensive.

It is important to note, in the case of France, that there was a precedent to the online brokerage, through the Minitel. However, this system was more costly to use than the Internet, less user-friendly, and less quick for stock-trading. But thanks to the Minitel, retail banks and Sociétés de Bourse already offered a brand of online services to individuals before 1998. The difference was that they did not invest much in these services, and contrary to online brokers, they kept their unitary margins relatively high. Such a conservative strategy was understandable. Before the so-called “New Economy”, French intermediaries had little reason to believe that a nation peopled with individual traders would emerge anytime soon. Given that, they could hardly be expected to bet on a dramatic increase in volumes by intentionally decreasing their unitary margins.
The high level of substitutability between services mainly resulted from the similarities between the numerous offers. Many factors were involved in generating these similarities. First, the ability to differentiate the design of web-sites and complementary products was limited by background elements, such as the detailed features of the central electronic booking system, and accounting norms. Second, the opportunity that was posed by the plethora of software and data providers was not as good as it first seemed. Ultimately, only two or three actors per type of content provided proved to be reliable. Since brokers did not want to take risks, they tended to choose the same suppliers, and this naturally led to a degree of homogeneity between the different services.

Third, when brokers did find methods by which to differentiate their online services, innovations and specifications were easily to observe and, potentially, to copy. In compliance with one of the assumptions on which White built his W(y) model (1981), competitors made decisions by watching each other rather than by monitoring demand. According to White, the latter was supposed to consume more time and more money than the former. While that may have been the case, the results of such practices in the end contrasted with his expectations. It was found that watching competitors did not stabilize differences, but instead created a “mimetic differentiation” trend that continuously made competitive advantages disappear a few weeks after they were created.

Finally, while the development of more opaque off-line activities could potentially have facilitated differentiation, the creation of such activities was precluded by law. Unlike banks and sociétés de bourse, discount brokers were not authorized to sell personal advice. That is they were unable to advise clients on what trading strategy to follow, on what stock to buy or sell, given their wealth, their actual stock portfolio and their general life plans. Employees who answered the phones were supposed only to give public information or information related to personal accounts and portfolios.

Discount brokers were easily substitutable not just because they were numerous and similar, but also because contractual ties were weak. Such a weakness resulted first from the fact that brokers and clients were only linked by a trading account, which was neither a provision nor a destination for periodical money transfers, such as wages, such a trend had already been documented before my investigation, first in the car manufacturing industry (Pointet, 1997), and second in the food retail industry (Cochoy, 2002).
taxes and so on. Next, brokers had greatly simplified procedures for opening new accounts in order to accelerate the enrolment of new clients. However, in doing so, they also simplified the procedures for closing existing accounts, making it easier for clients to leave by reducing switching costs.

2.3. On how people work in this computerized environment

As I argued in the introduction of this paper, there are many people who work in the computerized financial industry, both around and inside machines.

In the online brokerage sector, front office employees mainly answer phone calls, either to give publicly available information and details about personal accounts, or to take orders. Clients are used to phoning when unable to get online for any reason, or when they need information that is not available on the web.

Middle and back office employees mainly manage account opening and closing procedures, money transfers to and from banks, and margin calls. When managing account opening procedures, they are supposed to collect several documents before they actually create accounts in the computer systems. When managing money transfers, employees receive and send out written orders, and they type the amounts in the systems. In addition to those tasks, they also monitor client accounts and supervise margin requirements. This last task requires some further explanation. Roughly stated, employees send out margin calls to traders who borrowed money to buy securities that have decreased in value past a certain point. When this occurs, the trader is forced either to deposit more money into his account, or to sell off some of his assets. When traders do not answer the calls, employees sell off the assets themselves. Sometimes, sales of all assets are not enough to balance a client’s debts. In those cases, firms follow legal procedures.

The brokers’ workforce also includes computer engineers and internal controllers. Their role is relatively easy to describe. The former design interfaces, computing arrays and databases. The latter monitor employees in order to ensure conformity to official rules. The controllers are employed by the firms, but they must have formal accreditation from the regulating authorities to practice (so must the firm as a whole). In addition to making sure that employees know the content of the various rules that apply to them, controllers supervise the employees by editing some lists of transactions, by
checking databases, files and so on. When a client questions a transaction that was ordered by phone, the controllers check the sound tracks that record the conversations. Finally, they send annual reports to the regulatory authorities and treat any requests made by them.

3. The actual automation of brokerage services

As I suggested above, computerization is not enough to automate stock exchanges. Automation (or mechanization) occurs when people who work with computers (which in turn work thanks to people) are forced to rigorously follow bureaucratic rules. This was the case in the discount brokerage industry, but before showing how it happened in that case, I will give a general idea of the content of rules that govern online brokerage services.

3.1. A great number of bureaucratic rules

In France, many rules apply when clients are individual traders. Most of them were clearly inspired by neoclassical ideals.

Rules for “fair prices” Economic ideals first include a definition of price fairness, according to which traders are supposed to be formally equal, among other things. The equality principle is translated into a twofold obligation: brokers must quickly transmit orders to quotation servers, and edit receipts that will register the time when they received orders from traders. Rules do not specify any legal time for orders transmission, but they do compel firms to commit themselves by contract to a maximum time.

Rules for credible commitments Other rules compel brokers to guarantee the credibility of the commitments into which individual traders enter. Two categories of procedures can be distinguished among those rules. The first is directed at securing traders’ ability to pay and includes hedging controls for spot transactions as well as margin call procedures. Since the latter can lead to legal conflicts, brokers must ensure that they have all the necessary documents to enter into such conflicts, as soon as they open accounts. These documents include signed contracts, a certificate of residence, and copies of identity papers with legible photography.
Another rule aims to avoid mistakes in order typing. This one requires that brokers systematically ask clients to confirm order instructions before sending them to central servers. Instructions include the type of order (limit order, scale order, open order…), the bid or ask price(s) when the order is not “open”, the designation of the security to be traded (code and/or name), the quantity to be bought or sold, etc. When clients use the phone to order, front office employees are supposed to repeat the detailed instructions and then to explicitly ask for a confirmation. When traders use web-sites, specific windows open after instructions are typed, requiring them to click a confirmation button.

Another rule is intended to make sure that individual traders are aware of the risks they take. When a client is about to initiate a transaction of a kind he or she is not used to making (e.g. a transaction on derivatives, or a leveraged transaction), brokers must inform the client of the potential risk. Once again, in cases when the order is sent through the web, a specific window is supposed to open.

Rules to effectively account for profits and losses_ The role of accounting rules may seem obvious in the present context. However, some economic anthropologists maintain that they nonetheless deserve attention insofar as they underlie the socio-technical construction of markets (Callon, Muniesa, 2005). Accounting rules normally include standardized techniques for bringing forward, checking and calculating exchange values, but in the present case, they also detail how and when information must be communicated to clients. This information include broker’s notes after every transaction, monthly statements of account, and annual fiscal statements.

Rules to protect incorporated rules_ Considering that many of the aforementioned procedures are implemented thanks to computing algorithms and arrays, some additional rules to prevent people, whether employee or not, from breaking into the systems and arbitrarily modifying their content. These rules involve physical and electronic barriers, such as the gathering of servers in restricted areas, and their protection by digital fire-walls. Brokers are required to maintain a list of employees who are authorized to get through the fire-walls as administrators.

Rules that allow the demonstration of the conformity to rules_ Finally, brokers are supposed to keep records of management work for certain periods of time. However, this requirement is not always explicitly stated. For example, procedures like those involved in the opening of new accounts inherently require the keeping of documents,
the absence of which shows that rules were broken. But in most cases, the obligation to keep traces does not go without saying. That is the reason why authorities require the recording of phone conversations between traders and front office employees. They also require that brokers keep digital tapes that record both transaction management operations, and the accessing by administrators of computing systems.

3.2. Conformity to rules: extremely high, but only recently so

During my empirical investigation, I noted that conformity to official rules was extremely high by the end of 2000. For a sociologist who is used to seeing people circumventing formalized procedures in all organized fields of action (Friedberg, 1997), this was astonishing. The phenomena was all the more surprising since there was a strong and large consensus in the firms on the necessity to respect the law. I expected controllers to tell me about such a necessity, because their professional accreditation can be withdrawn in the case of serious problems. I even expected that other categories of employee, such as risk managers, could behave in a similar way. But I was incredulous that all categories would do so.

I also noticed that conformity had not been immediate, but resulted from a roughly two-year process. There were two factors that allowed me to understand the gradual nature of this process. The first was the large number of inexperienced actors involved. These people had to learn the content of the rules, and how to set up the practical conditions for their implementation. This was true both at the overall firm level, because the number of discount brokers had dramatically increased during those years, and it was also true at the individual employee level, because many people came to financial intermediation at the same time, even in long-established organizations.

The second factor was more surprising: experienced employees and older organizations were in a situation that was quite similar to the new ones. They had a better knowledge of the content of rules, but still not deep knowledge of them. They often confessed that such a conformity was foreign to them since it was largely absent when they worked in traditional bank or brokerage firm settings. It is interesting to note that they were somewhat nostalgic when telling me about these past practices, almost as if it were a kind of “golden age”. In the following, I will give some details about their
stories, since they helped me to identify the key elements of the context that led to conformity in regulation procedures. Initially, I doubted the veracity of their descriptions: even though I did not think they were lying on purpose, I suspected that they at least unconsciously distorted the past to highlight present difficulties. However, those descriptions remained relatively consistent with other studies (Bacot, Juvin, Dubroeucq, 1989; Hassoun, 2000; Desbarrières, 2001), and with material evidence I observed when visiting older brokerage firms. For example, I saw that some procedures had only very recently been formalized. I saw that some old computer devices, which had remained useful in spite of the implementation of new technologies, had only just been updated or were about to be so. I also noted that some old client files did not include all of the documents that were required by authorities.

Given the material evidence, I thought that the stories told by experienced employees relayed me a “kind of truth”, despite the fact that they certainly overemphasized the contrast between past and present. Although the conforming process occurred gradually over two years, one should admit that it was very quick on the scale of the history of the brokerage industry: during this period, they broke with a twenty-year old tradition. This raised questions like what changed at the end of the 1990s? And can technical factors explain such a turn? As I suggested above, stories about the “golden age” were very helpful in improving my understanding of what happened.

3.3. The key features of transaction management infrastructure in the “Golden Age”

In the stories told by experienced employees, computers were largely absent. This was very surprising considering that the transaction management infrastructure was already fully computerized before the implementation of new technologies in the mid-1990s. In recounting their stories, experienced employees described two different channels through which information flowed. One of these went from the retail banking branch offices towards the pit in the Palais Brongniart, and another went from the front offices of brokers to the same pit. These channels will be discussed below.

In the first step to a trade, client had to go to a bank position or at least to call his local account manager. The account manager would most often wait until there were no

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6 “Older organizations” were firms that had operated as brokers for a long time, but that changed their business
more clients in his or her office before sending the order(s) to a regional branch, via some kind of older electronic mail, or telex, or fax. When the regional branch received the order(s), an additional handwritten or typed operation was necessary in order to transmit instructions to the national branch in Paris. The national branch piled up written orders from many clients before calling a messenger to convey them to the brokers. In turn, the brokers would pile up orders from several intermediary clients before sending their own messengers to the Palais Brongniart. In the cases in which brokers provided services directly to individuals, they could also have gathered instructions received by phone through their front offices. In the pit, the brokers’ negotiators traded securities, and then laid down transaction results on notes. Finally, notes went back to brokerage firms and to bank branch offices, to be registered in customer accounts.

Many mistakes and rule violations usually occurred within these channels. Mistakes could result from the handwritten or typed operations. Regarding rule violations, experienced employees told that hedging controls were made roughly, and that regulations underpinning formal equality (maximum time to complete transaction, receipt editing, and so on) were frequently flouted. In particular, both in the pit and in actual brokerage firms, prices were often arbitrarily quoted to clients, following a “best prices to best clients” principle.

Note that the opacity that surrounded interactions was great. As a matter of fact, if a client wished to follow order channelling, he had to call his local account manager again, who in turn would to reach several intermediary actors. The client could wait for hours before receiving any information. Thus it was very difficult for clients to see mistakes and violations and it was impossible to know about detailed events in the pit. Moreover, transaction settlements could occur several days or more after tradings, so the client who did not actively try to know about the transaction’s final outcome would wait for weeks before receiving the broker’s note or his statement of account.

Despite all of the obstacles to doing so, some clients were able to detect questionable operations. When they did, both banks and brokers did not hesitate to make “fine commercial gestures” in order to be forgiven, and these gestures incidentally did not conform to regulations either, for fiscal reasons. There were two reasons why the making of such gestures was not a problem for firms. First, intermediaries made model to enter the online industry in 1998.
good profits, both because their business model contrasted with discount brokerages, and because the functioning of transaction channels allowed them to increase unitary margins (for example thanks to the pilling up of orders, which saved time and expense). Second, commercial relationships were to a certain extent personalized and based on trust.

In the end, three features of the background depicted above were significant: a great number of handwritten or typed operations, much opacity around interactions, and a personalization of relationships that resulted from the frequency of face-to-face interactions. How did the functioning of online brokerages differ from this context? To what extent could technical changes account for these differences? Are technological variables sufficient to explain the conformity to regulations?

4. From technological change to traceability

Full computerization of the French financial market infrastructure has obviously led to significant changes in the context of interactions. Those changes involved both the number of handwritten or typed operations, and the degree of opacity. As we will see, the latter has a greater relevance in explaining the conformity to regulations, although it is not sufficient.

4.1. A decrease in the number of handwritten and typed operations

The number of handwritten or typed operations sharply decreased, but did not completely disappear. It is true that when computer systems function well, and when individual traders send orders through web sites, such operations are unnecessary. However, some degree of handwritten or typed operations still occur. When clients give instructions by phone in the absence of any technical problem, front office employees take the orders themselves. And when there are technical problems, additional telephone interactions interfere in what is otherwise a seamless electronic system. Opportunities to break the rules are few and far between in such circumstances, but they do still exist. Consequently, the decrease in the number of handwritten or typed operations cannot account for the conformity to rules.
4.2. An extremely high level of traceability of management actions

Other changes concerned the opacity that surrounded interactions during the Golden Age. Computerization actually tended to make market actions more traceable, hence observable. I suggest with this argument that actions leave traces, that all actors interested in transaction management have easy access to those traces, that those traces can be interpreted and that they demonstrate the degree of conformity to rules.

All actions leave traces. Traces are left behind beginning with an order’s transmission operations. When instructions are digitized, they leave traces throughout the channels that go from web servers to quotation servers. These traces not only depict the content of the instructions, but they also give the time when data come in and out. Moreover, within every server, the computing processes that may restructure data are handled by arrays that function as traces themselves. Information transmitted over the phone is recorded, and any absence of recording would signal violation of rules in itself. Accounting processes that follow transaction settlements also leave traces, and once again, any holes in this data would indicate a rule violation. A clever reader might wonder whether or not it is possible to modify traces after they are left. To that reader I point out again that the accessing of systems by administrators is also recorded on digital tapes, and any attempt to corrupt those tapes would itself leave traces. Finally, note that client solvency management tasks that use neither computers nor phones, such as telegrams or registered letters also leave traces.

Easy access to traces. All actors who are interested in transaction management have easy access to those traces. Those actors not only include brokerage firms employees, but also clients and regulation authorities. Individual traders get access to most traces through web sites. Most information not displayed on web sites can be obtained quickly by phone, and is periodically sent by mail. Lastly, most of the information not sent by mail is usually transmitted directly by clients themselves, such as with the documents necessary to open an account. Access to traces is less easy for authorities, since they have to formally investigate in order to obtain information, but when they do launch an investigation, they get whatever they request.

Traces can be interpreted. Interpretation of traces requires specific skills. While the regulatory authorities are certainly skilled enough in this area, not all clients were in
1999-2000, because many of them had no idea about trading before the Internet Age\textsuperscript{7}. However, we will see in the following sections that even unskilled individuals could pose a threat to brokerage firms by questioning transaction management.

*Traces testify to rule conformity._* The financial industry is particular when compared to most other economic activities. In this industry, digital data are not representations of exchanges that take place outside computers (Bruegger, Knorr Cetina, 2002). Since the dematerialization of securities that occurred in France in 1984, stocks are nothing but virtual goods, their features are nothing but coordinates made of a couple of figures and letters. This fact is crucial for our understanding of the role played by technologies in the structuring of financial interaction.

The question now is whether or not traceability is enough or not to explain the high degree of conformity to regulations. My answer is no, mainly because the timing of the increase in traceability in the brokerage industry did not fit with the timing of the gradual conforming process. As was previously mentioned, this process was very quick and took place in 1999-2000 (that is at the same time as the discount brokerage model was implemented), while the implementation of the current traceability processes occurred in 1995-1996. Although some new technologies emerged with the new business model, these did not change anything as far as traceability is concerned (remember that there was a precedent to the Internet in France with the Minitel). Consequently, other variables have necessarily affected the context of transaction management, and I argue that the mechanization of economic actions is not a necessary result of the incorporation of ideals into artifacts. What then are the other factors we have to take into account in order to explain the switch to conformity from 1999?

5. **The significance of changes in regulation policy and industrial strategies**

There are two additional variables that led to the high level of conformity after 1999. The first of these involves changes in regulation policy that led to a sharp strengthening of the regulatory authorities at the end of the 1990s. These changes resulted from the general reform process of the French global financial regime. The second variable involves changes that were brought about by the discount brokerage model itself. These resulted more from the

\textsuperscript{7} According to a survey made by the *TLB Online* Institute, in 2000, some 50\% of discount brokers’ clients had opened their first trading account for less than one year.
brokerage’s strategy of managing the highest volume at the lowest cost than from any technical innovations they introduced.

5.1. The strengthening of regulatory oversight

The French global financial regime dramatically changed during the 1980s and 1990s (Cerny, 1989, 1993), in keeping with trends in many other advanced economies. The turn was all the more sharp in France because it was, as Germany and Japan, an “overdraft economy” as opposed to an Anglo-American style “capital economy” (Hicks, 1974). In addition to the technical improvements that led to the full computerization of transaction infrastructure, the reform process included drastic changes in the regulatory framework, which ended with the 1996 Law of Financial Activities Modernization. Regulatory changes notably intensified competition between intermediaries (see 2.2), made transactions more secure (see 3.1), and significantly strengthened regulatory oversight.

There are several reasons why the online brokerage industry was significantly affected by this strengthening. First, lawmakers paid great attention to individual traders, for they were seen as weak in their ability to cope with intermediaries, at least relative to professional traders. This group was protected by more rules than any other, a fact stressed by legal courts for the last decade. In addition, the Commission des Opérations de Bourse (“COB”) created a specific department, called the “cellule de médiation”, to receive complaints from individuals. Authorities also increased their vigilance when the online industry developed, for they saw new risks in the sharp rise in the number of new firms and inexperienced traders. For instance, they edited official documents such as they specified how certain older rules should be applied to online transactions, and they managed a huge program to investigate business practices as soon as 1999. The pressure applied by the authorities was so strong in these areas that brokerage employees feared the beginning of an oppressive trend.

Investigations generated discomfort for employees, because investigators used tactics that were more or less tough depending upon type of possible infraction. The threat of public sanction that could result from severe deterioration in relations between the authorities and brokerage firms was an ominous one. It should be stressed that such a deterioration in relations could result not only from direct investigation, but also from complaints lodged by clients could. In fact, clients were generally seen as being quick to
contact the dedicated COB department (the *cellule de médiation*). More generally, they appeared as threats.

5.2. **Clients as unpredictable threats**

This perception of clients as threats made sense once put in the organizational context that emerged when brokers tried to manage the highest volume at the lowest cost. The organizational consequences of the strategy of managing volume contrasted with the aforementioned third important element of the Golden Age: the personalization of relationships between front office employees and clients. In contrast to that element, the clients of an online brokerage were anonymous, and hence unpredictable.

The decrease in the degree of personalization in relationships did not result from the physical distance that is maintained when using the Internet, for in France such distances had existed for years before the Internet, with Minitel users. Neither was it a result of the increase in the number of individual traders, because firms could have created account manager positions in front offices to help personalize relationships. A few companies tried this, but in the end gave up because such arrangements were not cost effective in the context of the discount brokerage model. Indeed, the intentional reduction in unitary margins required that brokers decrease payroll to a minimum, which ultimately meant that any employee could meet any client demand. It was mainly as a consequence of this situation that employees did not have the opportunity to strengthen ties with clients.

Anonymity had a major affect on how employees functioned with clients. Since employees were unable to rely on their knowledge of past interactions to foresee the progress of future interactions with clients, they had in mind only a rough picture of clients and of their potential needs. Furthermore, they had to make pessimistic assumptions about clients’ behavior when defining their own behavior. Those fears were based on experiences with some client strategies that had proven to be dangerous for brokers. Overall, the pessimistic hypothesis of the employees stemmed from the assumptions that any client could betray the employees’ confidence as soon as it was (literally) profitable. It is likely that, given the impersonal and easily substitutable nature

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*ADD FIGURES*
of the client-employee relationships, many clients simply felt little or no loyalty to the employee.

Some examples of the dangerous strategies that were used by clients include the following. In certain cases, clients would ask the risk managers not to sell their assets after a margin call, hoping that the securities would increase in value. When the stocks decreased again and potential losses arose, some traders would call authorities and say that the brokers had violated the rules by not selling the assets. Since the courts tended to favor individuals, many of these clients won their cases, and the brokers were forced to absorb the losses. These losses were relatively small, given the average size of transactions made by individuals (approximately 10,000 euros\(^9\)). But they were nevertheless injurious in the context of the discount brokerage business model. Because the average transaction size and the unitary margins were both small, firms had to collect many orders to balance out the losses from these client practices, and that at a time when they were struggling to attract clients and orders.

In another example, some experienced traders were able to detect defects in the brokers’ computer systems, allowing them to make transactions in conditions that did not conform to regulations. As in the previous case, when losses followed those transactions, some clients called authorities, arguing that they should not have been able to send the orders in the first place.

Note that experienced individual traders were not the only ones to pose threats to the brokerage firms. Unskilled clients often complained as well, usually because they did not understand some of the basic rules governing the stock market. Some of those complaints allowed authorities to detect intermediation practices that were not consistent with regulations, mainly because brokers were supposed to make sure that clients did not take risks they could not properly evaluate (see 3.1).

5.3. Rules as strategic resources in a three-way game

As suggested above, brokers, clients and authorities more or less explicitly negotiated with each other on rules implementation. Naturally, regulators urged brokers to conform to official procedures, while certain client strategies were trickier because they wanted to play with the rules in order to make profits. Although negotiations could

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\(^9\) My estimate.
at times involve only two out of three players, these interactions only seemed to be bilateral, because the two actors involved always took into account the third. For example, clients could complain, and regulators could brandish the threat of public sanction. The trilateral nature of the interaction structure made alliances possible. Among the three possible alliances, two were mutually exclusive: the regulator-client and the regulator-broker. It almost goes without saying that the third type of alliance, that between brokers and clients, was seldom seen (given the mistrust that resulted from anonymity).

Alliances between clients and regulators could come about in two ways. First, it could be created on the regulators’ initiative, through public sanctions. In this case, brokers were threatened with negative reputation effects, which could lead to the defection of many clients. Second, alliances between clients and regulators could be created on traders’ initiative, through complaints to the COB and/or to the courts. These two initiatives were easily linked: by complaining, clients allowed authorities to detect infractions, which could lead to investigation, which could lead to public sanctions… Contrary to broker-client alliances, regulator-client alliances were frequent and strong, because individuals were prompt to call COB, thanks to the cellule de mediation, and because when complaints led to rule violations, brokers knew they would lose the game.

In order to protect themselves from regulator-client alliances, firms took measures to justify their actions in reference to rules. Not only did conformity to rules enable them to avoid public sanctions, it also won them support from the authorities when coping with client’ betrayals. Naturally, controllers and top executives were always concerned with the risks associated with sanctions, because they could themselves be affected by negative reputation effects, or worse, lose their accreditation. Their will to conform was therefore not surprising. In order to ensure that the firm complied with rules and regulations, they needed support from the employees who handled the tasks of daily management. Fortunately, this support was forthcoming from nearly all of these employees, because it was the operational workers who were positioned on the “front line”, and who had therefore to cope with unpredictable clients. For them, the benefits of conformity were two-fold. First, it allowed them to keep direct negotiations with clients to a minimum, saving precious time and efforts in a volume business. Second, they avoided the tough encounters with controllers and top executives, which resulted
from clients’ calls to authorities. To sum up, strong internal alliances were a precondition for profitable external alliances.

Now that we know the whole story, we should not be surprised to see that brokers conformed to regulations in a context where authorities were strong, and where the strategy of managing volume made relationships between employees and clients anonymous. In the end, the discount brokerage model led firms to set up an exchange that totally contrasted with the economic interaction structure that Granovetter depicted when he put forward the notion of “embeddedness” (1985). In such circumstances, firms probably had no choice but to conform to regulations, in order to create conditions for “impersonal trust” (Shapiro, 1987).

6. The efficiency of incorporation, between Exit and Voice

As a conclusion, I would like to try to formulate as simply as possible the conditions that allow incorporation to lead to mechanization.

In my PhD dissertation (Tirmarche, 2004), I argued that conformity to regulations was but one side of a dynamic that led firms – or “market makers”, according to Spulber’s framework (1999) – to make the ideal of perfect competition real. Actually, the discount brokerage model could not last long because paradoxically firms were condemned to be “efficient” (from a neoclassical point of view), for at least as long as they did not change their strategy.

If I correctly understood Hirschman’s line of reasoning (1970), the conformity to neoclassical norms cannot be but consequences of an economic pressurization process, resulting from a highly efficient combination of Exit and Voice. Remember that according to him, the daily economy does not encounter such strong pressure, but rather remains to a certain extent slack. The present case is thus an exception.

Technological improvements played a large role in the pressurization process. They were associated with innovating “inscription devices” (Latour, 1987), which led to an increase in the ability to visualize and mobilize traces. In the online brokerage industry, artifacts incorporated rules through the shaping and codifying of forms that traces could take. And artifacts were very powerful because finance is now about as
virtualized as it can be. In my view, attention to traces allows us to complement Hirschman’s argument in *Exit, Voice and Loyalty*. In that work, he did not treat the clients’ ability to detect industrial failures, while it is not at all empirically evident. Ultimately, if performance is not observable, then the efficient combination of Exit and Voice is not possible.

Once traces were given, Exit and Voice could play their part. Exit was easy because brokers were highly substitutable (see 2.2). Voice could be easily addressed in two ways. On one hand, brokers made themselves highly available, because call centers were seen as a means of avoiding client defections. On the other hand, regulators made themselves highly available as well, through the setting of the COB’s *cellule de médiation*.

The role played by the authorities functions as another complement to Hirschman’s argument, for he suggested that pressurization mainly resulted from a bilateral game that only involved clients and firms. In the present case, the trilateral nature of the game structure is crucial for me to account for the efficiency of the combination of Exit and Voice. On one hand, brokers were trying to shift from risks of individual defection to possibilities of individual voice taking, thanks to call centers. On the other hand, authorities had the ability to shift from individual voice taking (complaints) to collective client defection threats (negative reputation effects associated with public sanctions). Thus, due to the trilateral structure of the game, two shifting processes were implemented: from Exit to Voice, and from Voice to Exit. In the present case, firms were condemned to “efficiency” because the two processes were combined.
REFERENCES


