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EGOS 2007 – Sub-theme 40

"Organizing to shape and create markets"

Stabilization and openness: how strategies shape the markets
The case of the US defense industry

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Stabilization and openness: how strategies shape the markets
The case of the US defense industry

To analyze what a market is and how it works as a complex social object, the question of stability and uncertainty is central. A market is both stable and "open and fluid" (Djelic, Nooteboom & Whitley, 2005: 1739). Which are the processes that lead to a stabilization of the market and the ones that lead to destabilization, to creation of uncertainty? How do these processes combine with each other? Which actors lie behind?

Economists and economic sociologists have tackled these issues. But two comments can be made. The first one is that for the last years, all the disciplines that have been interested in studying the market have focused on stabilization. In economics as well as in sociology, what has been highlighted is the stabilizing role of institutions (as noted by Aoki, 2005, most of studies start from the statement that "institutions matter"), the stabilizing role of networks of actors (Abolafia, 1998; Uzzi, 1996) or the necessary role of trust (Adler, 2001; Nooteboom, 2002). Secondly, uncertainty of markets is rather seen as coming from exogenous factors as, for example, technology. A technological breakthrough shakes up ongoing strategies and afterwards new strategies are elaborated by market participants to stabilize the market (Fligstein, 1996; 2001).

The present article aims, on the one hand, to show that the study of markets should highlight both the processes of stabilization and the processes of upholding or creation of uncertainty. On the other hand, it stresses the strategies of actors backing up both types of processes. Consequently, a market is dynamically shaped through the combined effect of strategies of stabilization and strategies of uncertainty creation developed by actors. That markets are both stable and open (even if structural conditions and exogenous factors play a role in stability and uncertainty) is explained by these strategies.

In order to understand the way processes of stabilization and of upholding/creation of uncertainty are connected on a market and the way actors create and structure these processes through their strategies, the case study methodology has been adopted. It allows to study more deeply dynamic phenomena (Yin, 2003) through sequences of events. The selected case is the one of the US defense industry.

Since at least 1945, this case is characterized by deep structural uncertainty. Actually, transactions are rare (States launch a new fighter program every 20 or 30 years). Yet when transactions on a market are neither repeated nor frequent, setting a price for the exchanged good or service becomes difficult with the absence of relevant reference. It stands as a major uncertainty, the one of valuation (Möllering, 2007). Therefore, as a counterbalance, strong

strategies take place to stabilize the market. The US defense market happened to experience a deep exogenous crisis at the end of the Cold War. The post-crisis period should therefore be characterized by extreme stabilizing strategies. The paper is focusing on this period and will strive to underline that the market shaping has been a process coming from both strategies of stabilization and strategies of upholding/creation of uncertainty.

The following part will first examine how economists and sociologists see the market dynamics, especially the importance they attach to stabilization processes, uncertainty and actors. Some propositions will be set to guide the analysis. The paper will then present the case of the US defense industry as a deviant case, well fitted to study these propositions, and give a detailed analysis of the way out of the crisis. Finally, going back to the propositions, results regarding the market dynamics and its interaction with actors will be derived from the case study.

Theoretical framework

For the last years, economists and sociologists have been interested in the functioning of markets. They tend to demonstrate that market uncertainty is exogenous, coming as a crisis or triggered by the action of peculiar players, and that incumbents develop strategies to stabilize the market by relying on institutions.

For traditional economists, the market stability is directly related to the number of competitors. When this number is reduced, when the oligopoly is a narrow one, actors can stabilize the market, even without explicit sharing of information and rules. Game theory is coherent with this approach: it actually explains that coordination is possible when the number of players is really small and much harder when the number of players rises (Philips, 1995). Under these conditions, a market‘s destabilization can only come from an exogenous shock. Nonetheless, empirical studies show that “spontaneous” stabilization does not work even with only a few players: when the number of competitors is reduced, on a commodity market, one can still observe the constitution of cartels, that is to say of rigid and elaborated mechanisms that aim to counterbalance the destabilizing forces (the case of the cement market is an example – Dumez & Jeunemaître, 2001). Therefore, indirectly, the presence of cartels in such markets tends to prove the possibility of destabilizing strategies, but this has not been studied a lot by traditional economics.

Institutional economists (North, 2005; Williamson, 1998) have added the institutional dimension to the traditional economic perspective that tended to ignore it (in the Walrassian model, the only market institution, the auctioneer, is a fictitious institution). Institutions build

the necessary trust to ensure the functioning of markets. They themselves have a stability that guarantees the one of the market.

There is an economic school that stresses uncertainty: the Austrian one. The question of uncertainty is not homogenous among the school. As regards von Mises (1998), uncertainty lies at the heart of human action and market decisions: "That man acts and that the future is uncertain are by no means two independent matters. They are only two different modes of establishing one thing (…) To acting man the future is hidden. If man knew the future, he would not have to choose and would not act. He would be like an automaton, reacting to stimuli without any will of his own". Some authors insist on the fact that the market is in itself a process based on uncertainty. A chapter from Lachmann (1986) that is called "The market is not a clockwork" uses an image borrowed from Shackle, the one of a kaleidoscope: the market is both difficult to understand and changing. It is a fundamentally dynamic and uncertain process that is made possible thanks to institutions that maintain the indispensable order: "both equilibrating and unbalancing forces are at work" (Lachmann, quoted by Chiles, Bluedorn & Gupta, 2007: 477). For Lachmann (as well as Schumpeter), the entrepreneur is the actor who, through his choices, has the role to maintain and create uncertainty.

Sociologists have also highlighted the structural conditions for the stabilization of markets. The degree of concentration and institutions stand as common points with the analysis of economists. But they add the power dimension – if it is on the suppliers' side (Baker, Faulkner & Fisher, 1998). Then sociologists analyze how stabilizing strategies take place on markets. According to Fligstein (1996; 2001), dominant players, at first, share and impose a common vision of the market, a vision that helps them to control behaviors on the market ("conception of control"). Secondly, they manage to capture the State so that it defines "property rights" in their interest, thus creating profit opportunities. They also define products and services, qualify them so that they can be exchanged, again with an opportunity of profit (Coriat & Weinstein, 2005). Thirdly, dominant players can influence formal and informal rules defining what is possible in terms of competition and cooperation (it is the "governance structure"). Lastly, "[r]ules of exchange define who can transact with whom and the conditions under which transactions are carried out. Rules must be established regarding shipping, billing, insurance, the exchange of money (i.e., banks) and the enforcement of contracts" (Fligstein, 1996: 658). Möllering (2007) takes up Fligstein's approach with another perspective. He shows that a market can work only if three types of uncertainty are lifted: uncertainty on valuation (the fact that goods or services can be associated to a value which, through the market mechanism, will turn into a price), uncertainty on competition (an excess of competition can hinder the

functioning of a market as well as an insufficient level of competition) and finally cooperation mechanisms have to take place to create trust and limit opportunism.

In a dynamic perspective, markets are seen, in normal periods, as stabilized under the effect of strategies of dominant players. They become open or uncertain only during periods of crisis triggered by exogenous shocks.

Therefore, economists and sociologists have mostly pointed out what can lift uncertainty and stabilize markets, both on the structural side (degree of concentration, institutions) and on the strategy side (the way dominant players seek to stabilize the market). They see uncertainty, market's openness, as essentially caused by exogenous phenomena and happening through crises, followed by a period of fluidity and new periods of stabilization. Only Austrians consider that uncertainty can be intentionally created through strategies of actors on the market, but they ascribe those strategies to a specific actor who is in practice difficult to identify, the entrepreneur.

With an analysis of the case of the US defense industry, this article will strive to show that the shaping of a market is in fact continuous (and not punctuated by crises followed by stabilization periods), jointly made of strategies of stabilization and strategies of upholding and creation of uncertainty that interact and are not determined by specialized actors (dominant players who only stabilize the market and "entrepreneurs" who only create uncertainty).

For this purpose, it will discuss the following propositions deriving from the theoretical framework:

<u>Proposition 1</u>: The dynamics of stabilization and market's openness is punctuated and looks like a crisis / emergence (more fluid and open period) / stabilization sequence. *Counter-proposition: Market shaping is a continuous process made of concurrent strategies of stabilization and upholding or creation of uncertainty.*

<u>Proposition 2</u>: Dominant players only develop strategies of stabilization. *Counter-proposition: Dominant players also develop strategies of upholding or creation of uncertainty.*

<u>Proposition 3</u>: Institutional actors are captured (regulatory capture) by dominant players. *Counter-proposition: Dominant players do not necessarily manage to capture institutional actors (especially antitrust authorities which maintain or create market uncertainty).*

<u>Proposition 4</u>: Market actors who are not dominant players are passive or dominated. *Counter-proposition: Other market actors also themselves develop strategies of stabilization and strategies of upholding/creation of uncertainty.*

Methodology: study of a deviant case

In order to analyze the questions previously mentioned, a longitudinal case study has been designed (Pettigrew, 1997). The above propositions serve as a "theoretical orientation guiding the case-study analysis" (Yin, 2003: 112). The analysis will pay particular attention to the study of competitive actions and reactions within their industrial environment (Smith, Ferrier & Ndofor, 2005), competitive actions being defined as "purposeful and observable moves undertaken by firms in order to improve their competitive position vis-à-vis their competitors in the industry" (Gnyawali, He & Madhavan, 2006: 511). The study of sequences of stabilizing actions and destabilizing actions (maintaining or creating uncertainty) and of turning points, epiphanies and apparent transformation associated to these trajectories (Dumez & Jeunemaître, 2006a) will help understanding how processes of stabilization and destabilization are simultaneous and complementary and what is the role of actors in those processes.

How was the case selected?

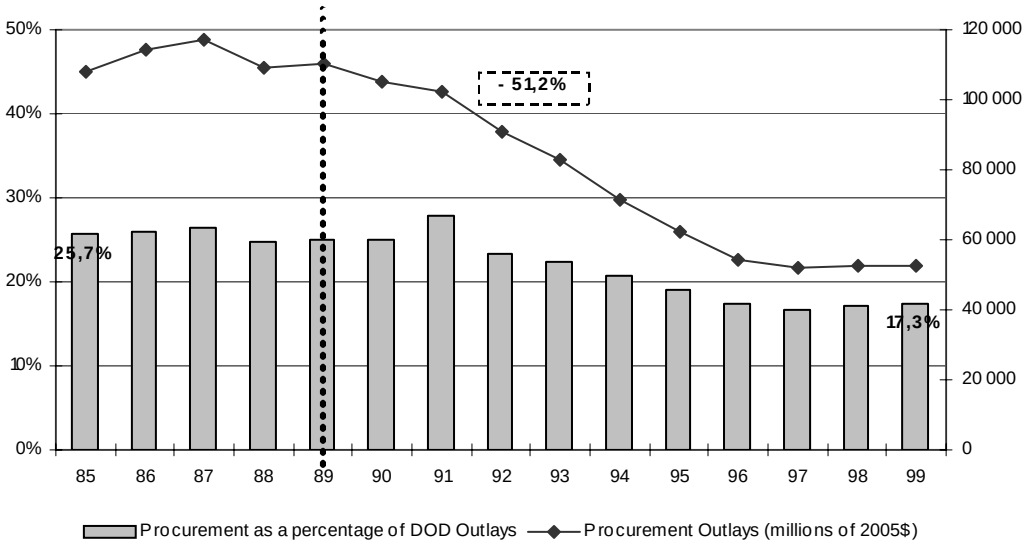
Among possible cases, the most interesting from a theoretical point of view are the "most likely cases" – those that look "over determined by existing theories" (George & Bennett, 2005: 251) – that end up as deviant cases. The US defense industry was chosen as such: it looks like a "most likely" case (this market endured a deep crisis at the end of the Cold War and the crisis was followed by strong stabilizing strategies) that ends up as a deviant case (even in this context, one can notice that actors developed both strategies of stabilization and strategies of upholding and creation of uncertainty).

Some more details can be highlighted regarding these features that make the US defense market an interesting one.

According to Fligstein (2006: 251): "Markets are usually destabilized by some form of extreme crisis. This crisis can be caused by governments (either intentionally or unintentionally), by a severe market downturn, or by the emergence of new firms that are outsiders who claim to have a new way to structure the business. It is this situation that reintroduces fluidity into market arrangements and allows for a shake-up of existing market players and the possibility for a new set of rules to emerge to structure market activity." The US defense market experienced such a crisis with the fall of the Berlin wall and the end of the Cold War (non intentional elements). This extreme destabilization was followed by two intentional changes operated by the government – a strong decrease in the defense budget and a redefinition of military missions (e.g. the ability to conduct two conflicts at the same time in two different locations in the world) – and contributed to a market slump and a reshuffle of the "conception of control" shared by dominant players (the development of new technologies emphasized the crisis). Actually, between 1989 and 1999, the US defense budget decreased from a third of its

volume. But mainly, the procurement budget (i.e. the budget for the development and production of weapon systems) is the one that most declined, loosing more than half of its value in ten years. This comes from the fact that procurement stands as more adjustable than human resources or maintenance outlays. So in ten years, the sector lost half of its volume (see Figure 1). Even if the defense market has always been cyclical and has endured some important jolts, in that case actors could have had the feeling that cutbacks would be persistent and that previous budget levels would never be reached again. This constituted an epiphany: actors both from the supply and the demand (i.e. the Department of Defense – DoD) sides changed their representations of the market and their strategies. And still, even if some firms exited the industry, the big ones (Lockheed Martin, Raytheon, General Dynamics, etc.) have been on the market for decades, giving some evidence that stabilization strategies were and are still at work.

Figure 1. Decrease in the procurement budget after the end of the Cold War



Source: from Department of Defense – Historical Tables FY2007 & Greenbook FY2005

Then comes another interesting feature of the market. Economists and sociologists insist on firms, on the supply side. It is the latter that stabilize the market. The case of the US defense industry is appealing because the customer is a powerful one (it is a monopsonic situation) that is in fact also a regulator (through the Federal Acquisition Regulation – FAR). This situation is extreme, but other market settings happen to exhibit a similar feature, even if it is less accentuated: Airbus or Boeing, even though they do not constitute a monopsone, are in a situation to impose rules to their suppliers; strong distributors probably as well. The US defense industry case was chosen because there is, on this market, a face to face between a powerful

customer and powerful suppliers, that enhances strategic initiatives from both the supply and demand sides.

As a result, the studied case stands as a "most likely case", meaning that after the above-described crisis one should observe, after a period of relative fluidity (a shake-up of existing players), a clear stabilizing dynamics led by dominant players. Is it the case? More precisely: after the crisis, is there some fluidity and then stabilization? Was this stabilization carried out only by dominant players? To answer these questions and discuss the propositions, the paper will now analyze the dynamics of the way out of the crisis. It means understanding the processes through which actors have changed and how strategies have been renewed. This will lead to see that in reality, the way out of the crisis is made of both stabilizing and destabilizing strategies, and that these actions were carried out by diverse actors from the market.

For the purpose of this case study analysis, we made some exploratory interviews with American analysts specialized in the defense industry as well as defense firms' representatives. These interviews were completed with a systematic analysis of firms' annual reports, newspapers' articles as well as official reports and documents related to the defense sector (DoD, US General Accounting Office, now US Government Accountability Office, etc.).

Case study analysis: the post-crisis period

The case study emphasizes that the shaping of a market is made of strategic actions and reactions, which jointly create stabilization and destabilization. This is a dynamic phenomenon. Two successive phases can be contrasted.

1. The restructuring process and the first market shaping dynamics

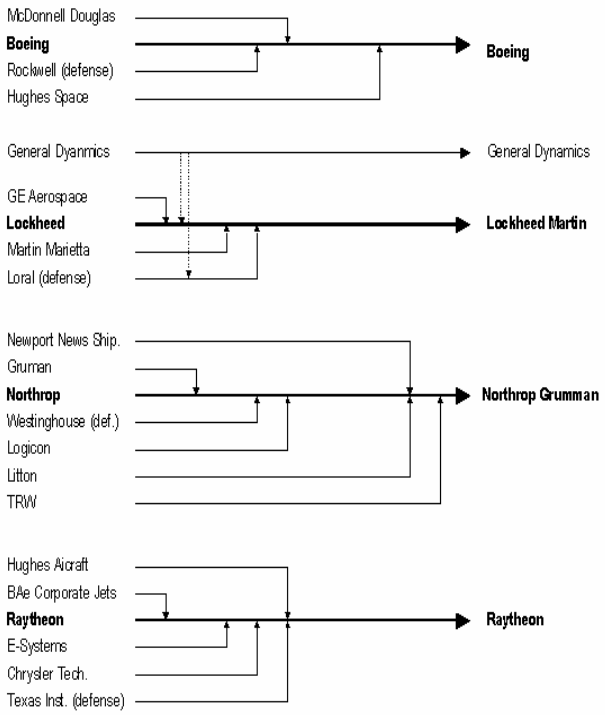
In the depths of the crisis, the first strategic move came from the customer – the Department of Defense. In July 1993 the Deputy-Secretary of Defense William Perry declared he would foster the restructuring of the industry through mergers and acquisitions that had just begun at that time. He made it clear that the government would pay for "restructuring costs on contracts transferred as part of a merger or acquisition if the business combination was expected to result in overall reduced costs for DoD or preserve a critical capability that might otherwise be lost" (GAO Report on Defense Contractor Restructuring, 1998).

This strategic action is ambiguous and difficult to interpret in terms of stabilization and uncertainty. On the one hand, the future market structure the DoD had in mind was clearly fewer and bigger prime contractors. This was supposed to improve efficiency in the development of complex programs. But this could lead to a reduced competitive intensity and market stabilization by dominant players. It was indeed likely, at the beginning of the 90s, that

the firms that would survive would be the big market actors. On the other hand, the DoD strategy introduced high uncertainty on the market: firms knew that an intense restructuring process was about to take place and that ruptures between competitors could happen, some of them creating a competitive gap between players. This first strategic move by the DoD therefore proves to be at the same time stabilizing and destabilizing.

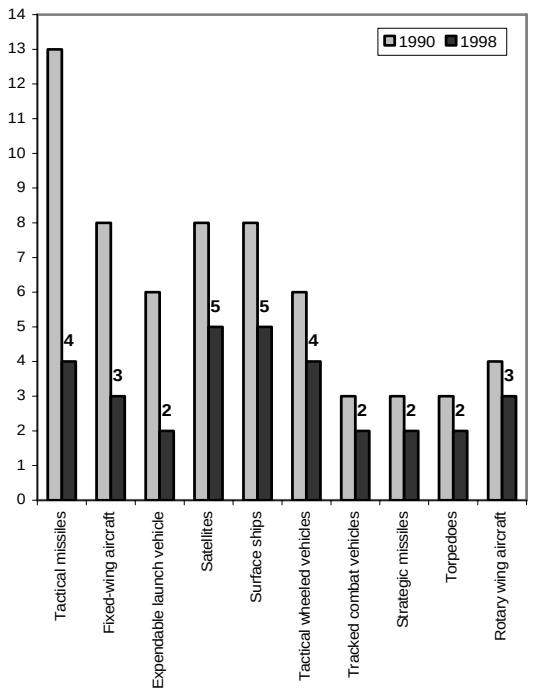
The market actually evolved as expected by the DoD: towards fewer and bigger dominant players (see Figures 2 and 3). Faced with the impulse given by the DoD, some firms exited the market, some specialized in the defense area and some chose a dual strategy – both in the civil and military activities. Those who exited and those who specialized, showing their commitment to the market, contributed to stabilize the market. The firms that engaged in the dual strategy tended to maintain the openness of the market; for, according to Chen (1996), non "market commonality" can lead to more aggressive competitive actions.

Figure 2. Consolidation during the 90s



Source: adapted from Masson (2003)

Figure 3. Decrease in the number of contractors during the 1990-98 restructuring

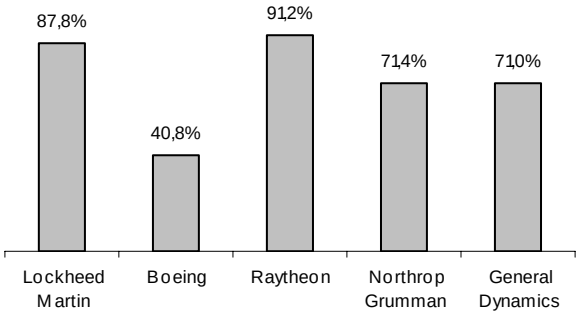


Source: GAO Report (1998)

Most of the firms were acquired or chose to specialize. It is, for example, the case for General Dynamics: "The chairman of General Dynamics, William Anders, dismisses the rewards for diversification as largely illusory. His firm is slimming. The company plans to stick to four main businesses: tactical aircraft, nuclear submarines, tanks and space equipment. It has sold others, like the light-aircraft maker Cessna, and used the cash to strengthen its core" (*The*

Economist, August 8, 1992, "The Defense Industry Jettisons Its Excess Baggage"). Only one of the main actors, Boeing, chose a dual strategy. Following the merger with McDonnell Douglas in 1997, the firm's turnover ended up being balanced between civil and military activities. With this strategy, Boeing prevented the formation of a "conception of control" (Fligstein, 1996), that is to say a vision of the market shared by actors (see Figure 4).

Figure 4. Percentage of military activity for the 5 « Top US prime contractors » (2002)



Source: from Defense News Top 100

Concurrently to these "asset orchestration" strategies (Helfat, et al., 2007: 28), actors handled some non-market strategies (Baron, 1996; Dumez & Jeunemaître, 2006b). They tried to promote the idea that the specificity of the defense industry prevented antitrust law to apply. In 1992, the Federal Trade Commission prohibited the merger between Alliant and Ordnance, a merger that would have created a monopoly for the supply of 120mm tank ammunition [FTC v. Alliant Techsystems Inc., 808 F. Supp (DDC 1992)]. The affair triggered a debate. The DoD gathered a Task Force, headed by a law professor who had already advised antitrust authorities in the past, Robert Pitofski (he will be later nominated president of the FTC by Bill Clinton). The report was delivered in April 1994 (DoD Science Defense Board, 1994). It resulted in the upholding of antitrust control on the market. Firms did not manage to manipulate the institutional framework applying to the market. On March 23rd, 1998, the Department of Justice prohibited the project for the acquisition of Northrop Grumman by Lockheed Martin (two of the top prime contractors), thereby stopping the restructuring process through mergers and acquisitions. This decision maintained a certain degree of openness of the defense market, necessary for competitive emulation.

Besides, the DoD has been using another strategy to uphold uncertainty. In fact, it has kept on using the "winner take all" rule that allows to introduce some uncertainty to stimulate innovation, by giving an incentive prize for the firm which gets the production contract (Rogerson, 1994). The DoD acquisition process falls into different phases in the relationship with suppliers (design, development – source selection through prototypes – and production),

the number of suppliers being reduced as one goes along with the program. The division of the process into several sequential contracts introduces uncertainty on the side of firms, as they have no guarantee to get a production prize before the last phase of the program. Moreover, production contracts themselves fall into annual contracts (or multiannual, exceptionally), concurrently with the Congress annual oversight: it gives some maneuver for negotiation, being it for the DoD or for firms. As a result, despite the length of programs that tends to stabilize, the practice that consists in dealing sequentially with several contractors with a winner "taking all" in the end, allows to keep some openness. The combination of a reduced but open number of players and of the "winner take all" rule maintains these different players on a level playing field, which allows guaranteeing some openness in stability.

What is the result of the whole process as regards the shaping of the market?

During an interview, an actor expressed, through a metaphor, this market shaping resulting from combined strategies of stabilization and uncertainty creation. The market was compared with the US Major League Baseball. In such a championship, every team wins at least around one third of its games, and none wins *a priori* more than two thirds; consequently, the only uncertainty, reduced but present, concerns the remaining third part. In the same way, on the defense market, it looks like the consolidated prime contractors will now stay on the market, all of them winning a minimum of contracts and none of them being able to win all of the contracts (given the need to maintain the industrial base). They are regularly called to cooperate – prime contractors can become the subcontractor of another prime for some contracts (e.g. Boeing is a subcontractor of Lockheed Martin for the F-22, a US Air Force fighter), or two firms can be prime together (the last US Navy destroyer, the DDG-1000 Zumwalt, is for example co-produced by two prime contractors). But uncertainty remains regarding the relative position of the different primes.

Strategic interaction between the customer and suppliers thus led to a shaping made of stabilization and openness, where institutions acted to maintain this openness. However, this shaping has been questioned by firms' stabilization strategies. The latter triggered a new sequence of interactions leading to new strategic answers in terms of uncertainty creation.

2. Systems integration strategies and the second market shaping dynamics

As said before, the crisis triggered by the end of the Cold War was a budgetary one, but it was also a technological crisis in the sense of a change of paradigm, due to the expansion of new technologies linked to the notion of systems of systems (or Network Centric Warfare – NCW). New information and communication technologies lie at the core of the development of systems connecting different platforms: according to the Pentagon's Office of Force

Transformation, “NCW represents a powerful set of warfighting concepts and associated military capabilities that allow warfighters to take full advantage of all available information and bring all available assets to bear in a rapid and flexible manner”. For example, the US Army develops the Future Combat Systems program which consists in the production of a networked system of systems including a C4ISR backbone (central architecture), a ground soldier system as well as 18 systems grouped in 3 categories (manned ground vehicles, unmanned air vehicles, unmanned ground robotic vehicles).

Dominant firms have seized this opportunity by trying to stabilize the market to their advantage and by getting out of the Major League Baseball model that remained too much open.

There again, strategies of stabilization and destabilization have been combined. Actually, the DoD, which has been losing technological capabilities because of the decreasing budget (that led to more delegation), created a new type of contract: the Lead Systems Integrator (LSI) contract. According to Bergey, O’Brien & Smith (2003: 1): “An LSI is an agent with the authority to acquire and integrate assets from a variety of potential system suppliers on behalf of an organization that is acquiring a complex software-intensive system. The LSI has the authority to contract with and manage other suppliers on behalf of the acquirer.” More precisely, requirements become a variable that the contractor co-defines with the customer, thanks to its capabilities. And the LSI can be responsible for setting itself the request for proposals and choosing the contractors. In a way, this strategy is clearly stabilizing. These new systems are highly complex and ask for firms to combine diverse capabilities: it means being able to define the customer’s needs, to technically design the system and later integrate the subsystems (simulation and test capabilities) and to organize and manage the subcontracting. The few firms that get a contract are likely to benefit from a first mover advantage with a lock-in effect.

The Future Combat Systems (FCS) program embodies this change that affects both the process of definition of needs and the process of contractors’ selection. Regarding the definition of needs, it is important to understand that, with NCW technologies, the US Army literally needed to reinvent its identity and missions. In 2002, it chose the Boeing and SAIC team to propose a global solution allowing to link platforms, sensors, weapons and soldiers within a seamless and integrated network. Even if the program came from DARPA’s research (Defense Advanced Research Projects Agency), it was specified by the selected contractors, working jointly with the military customer. Boeing and SAIC had to transform the concept imagined by the US Army and DARPA into an operational solution. Regarding the contractors’ selection, the LSI has progressively built a network of 31 first-tier partners.

As for the shaping of the market, several points can be highlighted.

Systems integration goes with a risk of an excessive stabilization of the market. The restructuring process already led to the constitution of a market with a limited number of actors. Systems integration could lead to the selection of three or four durably dominant firms.

Yet the case study shows that the customer used the expansion of systems integration to develop strategies of uncertainty creation. For example, when the US Army decided to grant an LSI contract to both Boeing and SAIC for the FCS program, two new actors were thus introduced on the army market, to the detriment of the traditional first-tier contractors of the US Army, namely General Dynamics and United Defense. Whereas they previously had a direct contact with the military customer, they have become a partner-supplier of Boeing and SAIC. *De facto*, the DoD created a new type of actors, an intermediary between the customer – that is itself – and suppliers. It therefore opened the traditional playing field that was too much stabilized in a face to face between the US Army and its established suppliers.

On the suppliers' side, systems integration poses a challenge. The firms that manage to get hold of an intermediary monopolistic position between the DoD and suppliers face a problem: they have to adopt the same competitive behavior towards suppliers and their own subsidiaries (it is an independence of judgment capability – Dombrowski & Gholz, 2006). As they are vertically integrated, the customer can suspect them to favor their internal solutions. For that reason, they have to adopt some self-restraining strategies that prevent them to excessively stabilize the market at their profit. However, it is possible that the value chain is more favorable to subcontractors. So even if they manage to get hold of the highest position of the market (the new one of intermediary), it can also lead them to give up inferior positions that can be more valuable.

Moreover, the superior position is not free from reversibility. In April 2007 for example, the US Coast Guards, under the pressure of the Congress, retrieved the LSI contract of the joint venture formed by Lockheed Martin and Northrop Grumman because of their inability to properly run the Deepwater program (a massive modernization program of the Coast Guards that was set up after the 9/11 events). The costs went from the initially predicted 17 billions of dollars to 24 billions "and has included problems such as failed encryption technologies, which jeopardizes classified government information, and boats rendered unusable due to buckling and cracking hulls" (*Defense-Aerospace.com*, May 22, 2007, "Defense Contractors Running Government: A Recipe for Disaster"). The government went back on delegation: after retrieving the Deepwater LSI contract, the Coast Guards announced that from now on they would internally ensure the management of the program by reincorporating this responsibility within the Coast Guards. Even though Lockheed Martin and Northrop Grumman are not completely thrown out of the program, they are still downgraded to a "classical" prime contractor role.

Going on with strategies recreating uncertainty, the DoD recently suggested to go back to fixed-price contracts in order to favor more firms' efficiency. It looks like if there were a pendulum according to which, when there are too much costs' slippage (on average, costs are underestimated of 20% – Report from the RAND Corporation, 1993), the DoD can go back to stricter rules to balance the situation. For example, the development of information technologies is giving rise to numerous technically complex and demanding programs for which the maturation of technologies is quite slow. It creates strong uncertainty on costs and time schedules, with a DoD knowing less about the program than firms do. Using fixed-price contracts is thus a way for the DoD to transfer some risks to the contractors. It stands as an incentive for them to be more efficient. For that reason, at the beginning of 2007 the US Navy asked Lockheed Martin to build its second prototype for the Littoral Combat Ship program under a fixed-price contract, following important slippage in costs and time schedules for the first prototype. This attempt to go back to fixed-price acts as a signal that the DoD can periodically mobilize to make the market more dynamic. The decision of the Congress to set up a price-cap for the costs associated to the F-22 program stands as another example of the strengthening of contractual settings.

As for firms, they can play on their strong position to answer to these strategies of uncertainty renewal with strategies creating a new stabilization. Subsequent to the strategy of the US Navy regarding the use of a fixed-price contract, Lockheed Martin answered by refusing to take on more risks and the contract was eventually interrupted. This is related to the fact that it is very difficult to rightly anticipate the price of highly innovative programs (valuation problem), this price resulting from the power balance between supply and demand.

The study of the development of systems integration strategies, which renewed the "conception of control" of the market, therefore clearly enhances the double dimension of the shaping. The stabilization can be seen in the formation of a new hierarchy of actors, through the monopolization by a few firms of the relationship with the customer and through the dynamic transfer of competences. Firms also develop some self-restraining strategies allowing the market to stay open. The DoD creates some uncertainty at the level of the traditional playing field where firms were too highly anchored, by creating a new position, the one of intermediary.

Discussion and results

We can now come back to the propositions and see what has been enlightened by the case study.

At first, the dynamics that follows a strong exogenous perturbation is not univocally stabilizing (even if in the short run the crisis particularly destabilizes the market and accentuates

its fluidity, the latter does not disappear after). The supposed sequence – crisis / emergence / stabilization – tends to screen the intrinsically dual nature of the market process: actions that stabilize the market and actions that uphold or create uncertainty coexist in a complementary way.

Then, who is carrying out these actions? Are some actors specialized in destabilization and institutional actors specialized in stabilization? On the contrary, the case study points out that each actor has some levers for stabilization and destabilization. For example, the DoD – both a customer and a regulator – can play with the rules of exchange by switching between fixed-price contracts (destabilizing) and cost-plus contracts (stabilizing); by selecting contractors according to the "winner take all" rule (that creates a beneficial uncertainty) and by sometimes using "compensatory" selections (stabilizing); or also by being selective early in the acquisition process (choice of a Lead System Integrator who will lead the program) or by keeping uncertainty until the choice of a producer. As for firms, they can share the same "conception of control" as well as keep some exit options; they can specialize univocally in one area or, on the contrary, surprise competitors by mobilizing their capabilities to enter new activities (cf. Boeing's interest for the FCS program for the US Army). It is important to note that there are some sequences of actions, some series of actions and reactions. For example, a firm as Lockheed Martin took up a cost-plus contract and underperformed, far away from the initial target; the customer considered that this performance was caused by bad management and decided to turn back to a fixed-price contract so as to give an incentive for a better performance; the firm refused and preferred to stop the contract rather than accept to bear the associated risks.

Therefore, one can conceive the shaping of a market as a double movement of both stabilization and upholding/creation of uncertainty, from actors who are parts of the market. The notion of stabilization is ambiguous and calls for cautious interpretation, it is more complex than Fligstein could let think. Some strategies can, at the same time, be stabilizing and destabilizing. Two types of actions are complementary: if a certain degree of stabilization is clearly necessary for actors to take part in the exchange (one only has to see the strong need for stabilization on the defense market, due to the intrinsic valuation uncertainty), a certain degree of openness of the market also needs to be maintained. The notion of openness, destabilization, upholding or creation of uncertainty, is a way to remind that stabilizing elements emanate from actors that could decide otherwise. Actors' asymmetries are of course possible, but dynamically the possibility for change and reversibility is essential. It must be possible to go back and forth, that is the only way the market can let exchanges occur.

The notion of market shaping as we tried to support it helps to identify some critical points for the evolution of a market. In the case of the defense market, it can be argued that the actual trend is probably one of an excessive stabilization. Despite some strategies to recreate some uncertainty, both on the demand side (call for fixed-price contracts, creation of new intermediary positions) and on the supply side (self-restraining strategies), a market stabilization is taking place; due to the fact that firms are progressively getting some key capabilities that the buyer has dropped (it is a path-dependency dynamics). The government has to renew its capabilities to take on a role that is no more the one of an implementer but that rather becomes a role of overseeing (Flood & Richard, 2005). What levers could allow the DoD to get back some maneuver by creating new uncertainties? Chu & Waxman (1998), for example, think that the actual game is closed because firms are too specialized. They think that the DoD should give incentives for civil firms to enter some segments of the market by working with them (the knowledge of the military customer is one of the barriers to entry, probably more than the specificity of technologies). The solution would be in a modification of the framework for exchanges, of the required capabilities to be in the market, through a decrease of firms' "defense-ness" (i.e. "the degree to which a firm has built the capability and competency to engage in business with agencies like DoD", p. 38). It comes down to play on the openness of relationships between military and civil activities, so that "specialized knowledge necessary to do business with the Department of Defense [is] either easily obtained, or no longer differentiate[s] the defense and non-defense sectors" (p. 42). As for Dombrowski & Gholz (2006), they suggest to mobilize an independent expertise with no production activity in the sector, that is to say no industrial stake, but with some capabilities that the DoD lost and cannot exclusively leave to contractors.

The notion of shaping as it was used in this article thus appears to be an interesting tool to analyze and predict in some way a market dynamics. It restores the strategic dimension of actions of market's players, without over valuating the stability of markets as process.

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