The heterogeneity of firms: A challenge for theories of the diversity of capitalism.
The case study of Japan during the Lost Decade

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Summary: Most of institutional theories of the diversity of capitalism (at least implicitly) assume the existence of a representative firm in each type of capitalism. Based on the case study of Japan during the Lost Decade (1992-2005), this paper aims at showing that this assumption introduces severe drawbacks in the analysis of the Japanese capitalism in crisis. After having proposed a survey of theories of the Japanese capitalism and of its crisis, we assess the increasing heterogeneity of Japanese firms since the beginning of the 1990s, in terms of performances and in term of "models". We also propose some explanations of this increasing heterogeneity, which concerns firms of similar size and belonging to the same sectors. Then, we show how important it is to take into account this fact to understand the crisis of the Japanese capitalism during the Lost Decade. We propose an alternative interpretation of this crisis – the lack of coordination of an increasing heterogeneity – and argue that it requires a new characterization of the Japanese capitalism. In a final part, we extend our analysis beyond the Japanese case in criticizing the inability of most theories of the diversity of capitalism to take into account the heterogeneity of firms within a given form of capitalism.

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Introduction

The period 1991-2005 in Japan has deserved the title of "Lost Decade", as the astonishing performances of the Japanese economy have been in sharp contrast with the ones of the preceding period, when many analysts predicted that Japan would become the Number One economy in the world in the 1990s. At the same time, Toyota, the company which has been considered by many authors as the most representative of the specificities of the Japanese capitalism at the firm level and has been the object of innumerable studies, did not experience any major crisis. Even better, from the second half of the 1990s, every year, Toyota has dramatically increased its sales and reached a record high of profit, before becoming finally the world number one car maker, in overtaking Ford and then General Motors in 2007. Of course, this achievement has not been without any difficulty or accident (for example at the beginning of the 1990s). Yet, the contrast between the trajectories of the Japanese economy and its leading company since the beginning of the 1990s is striking.

One possible explanation of this paradox is that Toyota may have changed completely its model (for example, because of its internationalization) and is no more representative of the typical Japanese firm. This explanation is not satisfying. It is true that Toyota's organization has changed over the past decade but there is nothing new with this, as it is possible to define the Toyota model by its ability to evolve (and expectedly to improve) permanently (Fujimoto, 1999). Yet, Toyota did not change its basic principles of organization and its core social compromise during this period, contrary to other firms. It is worth considering that it is has been rather conservative from this point of view, even if it has been particularly aggressive in its internationalization and innovative in terms of process of production and of products. Moreover, we are exemplifying here the case of Toyota because of its fame, but it is far from being unique. For example, a company like Canon, which shares with Toyota many of the characteristics of the so-called J-firm model, has been particularly successful during the Lost Decade, without giving up its major principles of organization. What is paradoxical is not that during a macro structural crisis, some firms operating in specific sectors continue to be successful. This is the fact that precisely, what is presented as the limits of the model at the macro level seems to be the basis of the strength of some companies.

Another extreme explanation of the contrasted trajectories of a leading company like Toyota and the Japanese economy as a whole is that theories of the Japanese capitalism have been mistaken so far in confusing a model of capitalism and one company's organization. Again, this explanation is too much simplistic: none of the theories of the Japanese capitalism we survey in this paper have confused one particular company and the national economy. However, in a more subtle way, it is true that most of them have adopted the framework of the representative firm within a national form of capitalism while focusing on the variety of the national forms of capitalism. In this paper, we argue that this methodology introduces severe drawback in the understanding of the Japanese capitalism, of its crisis and of its current transformation.

This first paradox is directly linked to a second one, that most of the analyses of the Japanese capitalism in crisis have been unable to explain. All of them have tended to focus on the question of the institutional change. The questions addressed by various authors (among others: Yamamura & Streeck, 2003; Vogel, 2006; Witt, 2006) have not concerned the causes of the crisis by themselves but rather the change or the absence of change of the model. Basically, the investigation of the institutional change in Japan has led to a micro-macro paradox: at the macro level, the changes seem to have been very slow if not inexistent while at the micro level, drastic changes appear to have been numerous. One of the most famous (but far from being the only one) has been the alliance between Renault and Nissan, and the drastic change of management that followed. One may argue that one should not confuse the institutional change, which takes place at the aggregate level, and the organizational change, which takes place at the micro level (Witt, 2006). However, not taking into account the changes at the micro level leads to a bias of the analysis towards institutional inertia.

In this paper, we try to explain these two linked paradoxes – the micro-macro paradox and the contrasted performance of the national economy and of the firms which has been considered as the most representative of the so-called Japanese model of capitalism. First, we argue that the diverse trajectories of Toyota and Nissan are symbolic of what we label the "increasing heterogeneity of Japanese firms", a phenomenon which has been very little studied so far[2]. This increasing heterogeneity concerns both the performances and the underlying models (or strategies) of the Japanese companies. Furthermore, it concerns firms of similar size and within the same industry. Second, this trend is essential to understand the current change of the Japanese capitalism. It is also at the center of its crisis: we propose an interpretation of this crisis as a lack of coordination of the increasing heterogeneity of Japanese firms. This thesis is in sharp contrast with previous interpretations, focusing on the lack of diversity (Aoki, 2000) or the excessive coordination within the Japanese capitalism, impeding any social change (Witt, 2006).

After having briefly surveyed some theories of the Japanese capitalism and their explanation of its crisis and shown that they basically share the assumption of the representative firm within a national variety of capitalism, we assess the increasing heterogeneity of Japanese firms since the beginning of the 1990s. It means it is possible to generalize the simple example we gave in this introduction. In a third step, we show the implication of the increasing heterogeneity for the analysis of the Japanese crisis and we propose our own interpretation by introducing the concept of coordination. In the fourth and final part of this paper, we generalize our framework beyond the Japanese case and show that the theories of the variety of capitalism should better take into account the diversity of organization across firms within national models.

[2] Exceptions are Yamamura & Streeck (2003), Vogel (2005), and more recently Aoki, Jackson et Miyajima (2007).

0. Prologue: back to theories of the Japanese capitalism and of its crisis

0.1 Theories of the J model

The most influential among the institutional analyses of the Japanese model is certainly the theory developed by Aoki (1986, 1988, 1990, and 2000). It does not mention the concept of capitalism and focus on the organization of the firm as the main characteristic of the model. The starting point of this theory is the recognition that firms may be engineering entities but are also, more fundamentally, information systems. The organizational schemes differ depending on how these information processing activities are structured within the firm. In the vintage version of this theory (which can be considered as the seminal paper of 1986), Aoki distinguishes between a vertical information structure and a horizontal one[3]. The first one is characteristic of the A-firm while the second one is characteristic of the J-firm. Further versions of the theory have taken into account the historical evolution of each information structure and therefore of each organizational mode within each country: functional hierarchy and decentralized hierarchy on the one hand, and homogenous team and horizontal hierarchy in the other hand (e.g. Aoki, 2000). Each model has a comparative advantage in different industries. For example, the horizontal hierarchy fits well to the requirements of the car industry while the functional hierarchy has evolved towards decentralized hierarchy in the software industry. However, for some historical and institutional reasons, each of them is prevalent in a given country. Therefore there is a tendency towards homogenous organizations across countries, even if it would be more efficient to have diverse modes of organization in each country, depending on the concerned industries. That is why it is possible to characterize the Japanese economy as a whole by one predominant model of firm.

The Regulation theory puts also the firm at the center of the analysis of the Japanese model - successively labeled *toyotist* and *companyist* – but, as a theory of capitalisms, it embeds it in a complete set of institutional forms (wage labor nexus, monetary and financial relations, forms of the competition on the goods markets, forms of the state and international regime), whose hierarchy varied across countries and over time, from the wage labor nexus in the post war period to the financial regime since the 1980s in the case of Japan (Boyer & Yamada, 2000). According to this understanding of the nature of the Japanese capitalism after the war, the large firms are at the centre of the mode of regulation and can be characterized by a common organization. However, the coherence of the model cannot be understood without an analysis of the institutions at the macro level. A variant of the regulation analysis of the Japanese capitalism puts the accent on the inter-firms relations (characterized as "hierarchical market-firm nexus") and proposes a refined theory of the dualism of the Japanese economy, the differential between SMEs and large companies (Isogai & al., 2000). In this vision, what characterizes the Japanese capitalism is less the organization of large firms than the complex coordination mechanisms of the differentiated structure of the Japanese economy. This last variant is a major source of inspiration for the framework presented in this paper. However, it shares with the companyist hypothesis (as well

[3] These two information structures are complementary two different incentives structure, which are not taken into consideration here.

as with Aoki's theory) the idea of a strong homogeneity of firms' organization, at least within a same size category, that is, the vision of a homogenous Japanese capitalism at the level of the firm. To be fair, it is important to notice that some of the researchers who contributed to the regulation theory of the Japanese capitalism have been also involved in another type of research, the analysis of the productive models (Boyer & Freyssenet, 2000; Boyer & al., 1998; Freyssenet & al., 1998). By focusing on the car industry, they challenge the vision of a convergence of firms' organization towards the lean production (or "toyotist model") in showing the persistent differences of organization across Japanese companies like Toyota, Nissan and Honda, characterized by various profit strategies. Therefore, this perspective potentially explains the issue addressed in the introduction of this paper. Nevertheless, this research has not been connected to the analysis of the Japanese capitalism in a regulationist perspective, certainly because the regulation theory fundamentally defines itself as a macro theory.

By locating the firm at the center of the analysis, the VOC approach potentially realizes this connection and builds *de facto* bridges between business studies and comparative political economy (Hall & Soskice, 2001). As for now, this approach did not label the Japanese capitalism by itself, as Japan is considered as a variant of coordinated market economies or non-liberal capitalisms (Streeck & Yamamura's approach, 2001). In this approach, the Japanese model is defined by reference to the German model, which can be considered as the ideal-type of the CME. Both economies are characterized by the limited role plaid by markets. As a result of different histories and different traditions of political economy, the differences between these two variants of non-liberal capitalism can be summarized as follows: the G model relies more on industry-based coordination while the J model relies more on group based coordination (*keiretsu*, especially vertical *keiretsu*). For example, in Germany, companies often collaborates in the sensitive issues areas of training and technology transfer; on the contrary, the structure of the Japanese economy encourages sharp competition between companies in the same industry; cooperation is more likely to take place within the *keiretsu*, that is, among firms operating in different sectors but within one family of companies. As it can be seen from this brief summary, the VOC perspective emphasizes the relations among firms but is not concerned by any differences across the companies themselves, especially within one country.

0.2 Theories of the crisis of the Japanese capitalism

Most of the theories presented above can be considered as answers to the common belief in the 1980s and the 1990s about the convergence towards a single model of capitalism, being the Japanese model in the 1980s or the American model in the 1990s. Their contribution has been to show the fundamental diversity of capitalism, and, in particular, to prove that the Japanese capitalism is not a variant of the American capitalism. Doing so and despite their fundamental differences, they have (at least implicitly) assumed the existence of a representative firm within each national model of capitalism. We argue here that, if this working hypothesis is acceptable when the purpose is to underline the cross-section diversity of capitalism, it is misleading when the goal is to analyze

the evolution over time of one given national model. This is particularly the case when the research agenda includes an explanation of the form of the Japanese crisis and of its unusual duration. Instead of reviewing the different explanations, we organize the presentation according to three themes. The price of this thematic presentation is of course to create an artificial link between different frameworks.

0.2.1 The financial origin of the crisis

There is almost a consensus among institutional analyses of the Japanese crisis to see its origin in the financial sphere. Thus, in the understanding of Boyer & Yamada (2000), the Japanese crisis is largely endogenous and the result of a structural incompatibility between different institutional forms. To put it simply, the growth slow-down and the internationalization of the Japanese economy in the 1970s have induced pressures on the financial system to be deregulated, which has given to large firms more possibilities to be financed by the market. The inertia of behaviors inherited from the former period as well as the lack of control and supervision have led to a Bubble, whose burst has destabilized the growth regime even more.

In a different framework and in focusing on different mechanisms, Aoki (2000) gives a similar picture. According to him, this is the Main Bank (MB) system in its monitoring function, which has been affected and which led to inefficiencies in the system. In the late 1970s, two pillars of the regulatory framework that has sustained the effectiveness of the MB system – the regulation of interest rates and bond issue requirements – were gradually eliminated. Firms have come to rely increasingly on bond issues in the Eurobond market, while noncompetitive rent opportunities for banks through interest rates have decreased drastically. It made the management of firms virtually free from external discipline, except for the discipline of the product market.

0.2.2 Duration of the crisis: institutional inertia and excess of coordination

If the origin of the crisis is easily understandable, its duration is a more challenging issue. In fact, in most of the analyses of the Japanese crisis, the assessment of the social change (or of its absence) and the explanation of the crisis are interrelated. According to the Regulation analysis of the Japanese crisis, among the various reasons of the duration of the crisis (which include the under-evaluation of the problems by the policymakers and by the private actors), the most important is the high degree of inertia exhibited by the institutional forms, especially the wage labor nexus. Thus, a specific analysis of the wage labor nexus shows a great flexibility at the macro level (noticeably for the hours and the wages); however, its overall characteristics did not experience any important change, and become structurally incompatible with the changes occurred in the financial sector (Boyer & Yamada, 2000).

This diagnosis of institutional inertia is shared by Witt (2006), who adopts a holistic perspective, like the Regulation theory and despite an inspiration mainly coming from the VOC approach. To sum-up, Witt's conclusion are the following: 1) the Japanese capitalism did not change drastically during the Lost Decade (despite favourable circumstances, basically, its dismal economic performance) because 2) of the strong societal coordination and of 3) the weak pressure from the micro level (basically autonomous and apolitical action that is

not aimed at institutional change at the system level, but at providing relief from institutional misalignment at the micro level)[4]. To understand how these results emerge, it is necessary to specify the distinction proposed by the author between two types of adjustment. One is societally coordinated in the sense that it involves the cooperation of a number of actors toward changing institution; these actors are operating at the aggregate level. The other one is autonomous: it occurs when actors introduce institutional innovations without involving active societal coordination, cooperation, or bargaining, typically through nonconformity with the informal institutional structure; these actions usually take place at the micro level; in this case, a subsequent diffusion of institutional innovation occurs through evolutionary and isomorphic processes. The latter is most popular in LMEs, while the former is the most common in CMEs, including Japan, where it has not been effective. To put it simply, according to Witt, the duration of the Japanese crisis is explained by an excess of coordination.

0.2.3 The lack of organizational diversity as the main impediment to the recovery

According to Aoki (2000), the main impediment for the Japanese economy to experience a new growth regime based on the development of the technologies of information and communication and on their use within the firm lies in the lack of organizational diversity. More precisely, Aoki refers here to what he considers as one of the major specificities of the Japanese capitalism, the so-called "bureaupluralism" which can be defined as follows: the mechanisms through which the vested interests of all parties are equally protected through the mediation of the bureaucracy. During the high-growth period, the bureaucracy has played an important and positive role as agent and arbitrator in protecting the vested interests of pluralistic groups in different fields and of redistributing the rents throughout the whole economy[5]. However, bureaupluralism is fundamentally detrimental to organizational diversity because it perturbs the Darwinian process in each industry: this is not an open pluralism as vested interests protected by bureaucratic administrative mediations merely coexist and various organizational modes cannot be freely created. That is why Aoki calls for an institutional reform that allows new organizational modes to be experimented with and implemented in industries where the conventional assimilated structure is inefficient. The only tenable choice remaining is to look for a new path to economic gains by lowering barriers in all industries and allowing the entry of diverse organizational modes both domestic and foreign sources.

To be fair, it is worth noting that in a very recent book, Aoki has revised his analysis in providing the first systematic investigation on the increasing heterogeneity of firms in the specific field of corporate governance (Aoki & al., 2007)[6]. First, Aoki recognizes that no clear single pattern has emerged and we can characterize the current situation by the coexistence of three models, the traditional J model, the hybrid model

[4] It is worth underlining that these results are in contradiction with the results obtained by Streeck & Thelen (2005), also influenced by the VOC approach, who conclude to incremental but transformational changes.
[5] This aspect will be analyzed as "coordination" in our own framework.
[6] In many ways, this revision of this analysis is present in Yamamura & Streeck (2003) who underline the following point regarding the industrial relations: "a growing diversity of employment relations whose institutional forms are driven less by the politics of class at the level of the society as a whole than by the particular pressures of product, capital and labour markets operating on individual economic organizations". In the same book, Jackson mentions the "hybridization and heterogeneity within national models" of the corporate governance.

(EMIL), characterized by market finance and greater relational orientation in term of internal characteristics, and the inverse hybrid model (relational finance with more market oriented employment and incentive pattern)[7]. Second, Aoki suggests that diversity may remain a defining feature of Japanese corporate governance. It implies that this analysis potentially overcome the limitation, which has been underlined until now, the hypothesis of a representative model in each national form of capitalism. To our opinion, this is only a potential at this stage, because the analysis need to be more theoretically founded and generalized to other dimensions of the organization of firms, beyond the case of corporate governance[8].

As it appears from this survey of the institutional literature on the Japanese crisis, despite major differences, these theories proposed somewhat similar analysis, mentioning the changes occurred in the financial sphere as a major cause of the Japanese crisis. Moreover, two basic ideas emerge from the joint analysis of the crisis and of the institutional change: the excess of coordination (Witt, 2006) and the lack of diversity (Aoki, 2000). Our own interpretation of the crisis of the Japanese capitalism shares with these analyzes the diagnosis relative to the importance of the financial mechanisms but departs from them concerning these two last results. It is especially based on the recognition of the increasing heterogeneity of Japanese firms since the beginning of the 1990s, whose assessment is the object of the next part. Then, in the following part, we argue that this increasing heterogeneity raises a specific problem of coordination, what we consider as being the essence of the crisis of the Japanese capitalism.

[7] Aoki & al. (2007) even provide an evaluation of the importance of each model in a sample of listed companies: the J model concerns 42% of the firms and 16% of total employment, while these figures are respectively 24% and 67% for the hybrid model, 34% and 18% for the inverse hybrid model.
[8] Some of the results of this book are summarized in paragraph 1.2.3.

1. Assessing the increasing heterogeneity of Japanese firms during the Lost Decade

1.1 Increasing heterogeneity of performances

1.1.1 Productivity differential

In this paragraph, we argue that theories of the diversity of capitalism would benefit very much from taking into account the developments of the econometrics of productivity at the firm level using longitudinal micro data (Baily & al., 1992; Haltiwanger & al., 1999; Bartelman & Doms, 2000; Nishimura & al., 2005a&b). However, the number of studies on the dispersion of productivity among Japanese firms is quite limited. To date, three papers, Shinoda (2003), Fukao & Kwon (2006), and Ito & Lechevalier (2007) give some evidences of an increasing heterogeneity of performances. Using a non-parametric method of estimation of TFP (the Malmquist productivity index calculated by data envelopment analysis) applied to a sample of 604 manufacturing and non-manufacturing listed companies over the period 1980-2000, Shinoda (2003) finds some evidences of increasing intra-industry productivity differences in the 1990s. More precisely, his method allows him to distinguish between technical change (technical progress of firms with the highest level of productivity within an industry) and technical efficiency (improvements in productivity of other firms). Basically, disparities in productivity emerged between firms in most manufacturing industries from the latter half of the 1990s, while the intra-industry disparities are less apparent in the case of non-manufacturing industries.

These results are confirmed by Fukao & Kwon (2006), who use another database and another methodology. Their dataset is based on a large scale administrative survey, the *kigyo katsudo kihon chosa,* (*BSBSA*) by METI, that they limited to the years 1994-2001 and to the manufacturing industries. Therefore, their results are potentially more general than the ones by Shinada (2003). They measure the gap in the TFP level between a group of high TFP firms and a group of low TFP firms and they study how it changed over time in each industry. Their main finding is that the average gap for the whole manufacturing sector widened since 1997.

Ito & Lechevalier (2007) propose further investigation of the evolution of firms' heterogeneity in using the BSBSA for the years 1994-2003 and for manufacturing and non manufacturing industries (excluding agriculture, mining, construction and finance). They find an increasing standard deviation of the labor productivity among firms for the whole economy, the manufacturing and the non manufacturing industries. This trend is common to a majority of industries, with a common turning point around 1998; which leads them to compare two sub-periods, 1994-1998 and 1999-2003.

1.1.2 Profitability gap

The studies of the dispersion of performances as measured by the profit rate are even rarer than the ones on productivity, especially concerning the recent period[9]. One exception is the study by Nakamura (2002) of 1,400

[9] For a historical perspective, the study by Maruyama & Odagiri (2002) of the long run profitability of 357 Japanese manufacturing firms over the period 1964-1997 - divided in two sub-periods, 1964-1982 (period 1) and 1983-1997 (period 2) – is particularly valuable. Although they find some forces of convergence at work (implying that inter-firm differences in the estimated long-run profit rates were

listed companied between 1980 and 1999. In a context of persistent trend of decline in the aggregated ROA Japanese companies since the 1980s, in all industries (manufacturing and non manufacturing, growth industries and not, regulated industries and not), one observes an expansion in inter-company ROA disparities throughout the 1990s, as measured by the coefficient of variation (standard deviation divided by the mean within an industry). For example, despite the stagnant 1990s, 14% of the companies surveyed by Nakamura experienced an increase in ROA. More generally, if one decomposes the inter-company disparities into disparities due to industry characteristics and disparities between companies within industrial industries, it appears that variability within the same industry explains virtually everything and expended in the 1990s. Finally, it is worth recalling that the business cycles affect the dispersion of profits: in particular, in case of downturn, one should observe an increasing heterogeneity. However, one observes a certain degree of persistence in time series transitions of the excess profit rate (defined as the difference between the ROA of individual companies and the industry average). This persistence suggests that inter-company disparities in ROA are mainly due to firm-specific factors such as capital investment strategies. This is the object of the paragraph 1.2.

1.1.3 Productivity and profitability

Even if one observes the similar trend of an increasing heterogeneity for both productivity and profitability, it is worth recalling that there is no systematic correlation between them. For example, in various analyses, Fujimoto shows that the major problem that Nissan faced at the end of the 1990s concerned the profitability, not the productivity; the revival plan that has followed the alliance with Renault has focused on the issue of profitability, not the productivity (even if some measures may have been detrimental to the productivity).

At a more general level, Fukao & Kwon (2006) and Nishimura & al. (2005a) find a negative net effect of entry and exit of firms. It means that relatively more productive firms exited the market. Even if the reason is not always a problem of profitability but of corporate finance (and especially of debt), the link with profitability issue is obvious.

One reason of this gap between productivity and profitability is given by Odagiri (1992) and by Aoki (1990): firms can pursue different strategies: profit-oriented like the neo-classical firm and most of the American companies, or growth-oriented, like most of the Japanese companies until the 1980s. In this context, the outcomes of these two strategies are expected not to be the same.

1.2 Increasing heterogeneity of "models" (1): five dimensions of firms' organization and strategy

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smaller than those in the initial profit rates and that initially profitable firms faced a higher probability of experiencing a decline in the estimated long-run profit rates from period 1 to period 2), they basically show that firms with initially higher than average profit rates were estimated to earn higher than average long run profit rate during both sub-periods and that the firms with higher than average profit rate in the period 1 are again characterized by higher than average profit rate in period 2. The consequence is a growing gap between high profit firms and low profit firms.

What has just been shown regarding the performances is also true regarding the forms of organization. We consider here successively five dimensions of the strategy of a given firm, whose coherence may define a "model". This definition, based on the existence of complementarities, is the object of the paragraph 1.3. The choice of these five dimensions is largely based here on empirical considerations and will be theoretically founded below (paragraph 3.2). These five dimensions are respectively: the diversification of products and organizational structure, the human resource management, the corporate finance and governance, the innovation, and the internationalization.

The evidence we provide in this paragraph is based on a literature review of papers, whose objectives and methodology are very diverse. Moreover, in many cases, the evidence is restricted to the assessment of heterogeneity, not of increasing heterogeneity. Nevertheless, the gathered pieces of evidence are giving a quite coherent picture of an increasing heterogeneity of models.

1.2.1 Diversification of products and organizational structure

A first choice that any company has to make concerns the diversification of its production. In this dimension, Japanese firms are more heterogeneous than it is often believed. However, unfortunately, most of the studies in this area concern more a comparison between American and Japanese firms than among Japanese firms. For example, according to Itoh (2003), the large Japanese firm was on average less diversified than its US counterpart during the 1960s, while it may have been more diversified during the 1990s, to the point that the diversification of business has been recognized as a characteristic of the Japanese large companies, eventually organized as horizontal *keiretsu*[10]. Moreover, a recent empirical study has found some differences across firms in term of business diversification (Morikawa, 1999). This study shows that differences in terms of business diversification can be explained by the size and the R&D intensity of the companies.

The choice of the organizational structure is directly related to the form and degree of diversification of production. Here again, studies have tended to emphasize the specificity of Japanese firms by comparison to the US firms. First, the Japanese firm tended on average to diversify into more affiliated businesses than the US firm. Second, internal development was traditionally a more common method of diversification for the Japanese firm than mergers and acquisitions.

However, some changes occurred during the lost decade but they do not concern all the firms. The most remarquable change is certainly the surge of M&A, even if it is limited by comparison to some other countries. In a new macro and regulatory environment, the number of M&A in Japan started to increase in the second half of the 1990s to reach a record high in 2005 (3,734 cases). Moreover, contrary to what has been observed at the end of the 1980s, M&A targeting Japanese firms, including "out-in" deals accounts for more than 80% of the total (Iwaki, 2007). Besides, some differences across firms can be recognized: one observes a relative decline of

[10] The measure of the product diversification is itself a problem. The simplest measure is the number of segment based on standard classification codes; a more sophisticated measure is the Harfindhal index, which allows taking into account the relative importance of each product.

the cases in the manufacturing sector and an increase in the non-manufacturing industries, particularly in the entertainment, telecommunications, and financial services industries, accounting for almost 70% of the total in 2005. Although it is easier to compare the nature of the targeted companies than the targeting companies, Iwaki (2007) gives interesting insights on the differences of motives among the latter and particularly on the differences of relationship between the capital investment and the M&A, based on data taken from the *Survey on planned Capital Spending* provided by the Development Bank of Japan. First, in 2005 and 2006, the firms which had neither plans of nor interest in acquisition of assets or businesses from other firm were a clear majority (almost 2/3 of the firms of the survey), while firms which had no specific plans but were interested represented a little more than 30% and firms which had specific plans represented approximately 4%. Second, among these latter firms, the motives seem to be different and variable depending on the year: in 2005, more than half of them are planning at the same time an increase of capital investment (meaning that, from the point of view of an expansionary strategy, M&A and investment were complement), whereas the share of firms planning both M&A and increase of investment in 2006 reduced drastically. Even if it is difficult to conclude from this, it is possible to notice that the increasing practice of acquiring the assets of another company in Japan is not equally shared among all the companies and it may reveal differences of strategies.

In a more systematic way, one can distinguish between three forms of organizational structure: the unit functional form (U-form), which consists of a set of units, each of which specializes in a basic business function (such as manufacturing, marketing, finance, HRM, accounting, R&D); a multidivisional form (M-form), in which the organization is divided into a set of autonomous, self constrained divisions based on product, region or customer type; "in house" company, which means more independence of units by comparison to traditional M-form, and which is characterized by more distinction between strategy and operations, as well as performance-based control of divisions). In Japan, Matsushita was the first company to adopt the M-form; the movement towards the M-form in Japan became popular in the 1960s, when large firms were growing and diversifying rapidly, even if this divisionalized structure has been incomplete in Japan by comparison to the US and corporate groups have been prevalent (as an alternative to the M-form, when companies diversify their production). Nowadays, many multi-firm corporations have been reforming their multidivisional (M-form) organizational structures so as to transform the divisions into more independent units ("in-house companies") and their corporate headquarters into more lean and strategic offices. Sony was the first company to introduce the in-house company form in 1994. Sony has been followed by many other large companies which shifted from the M-form to the in-house companies system, but this trend is far from being as general as it was after Matsushita introduced the M-form. If Matsushita could represent a norm for Japanese companies in the 1950s-1960s, this is not the case of Sony, which keeps its image of outlier. Moreover, the revision of the Antitrust law in 1997 added a new organizational form, the pure holding company (which has been banned since the Post-War), to the available alternatives, and which has been adopted by some companies (Aoki, 2000). In this context, it is

possible to understand a trend towards increasing heterogeneity from the point of view of the organizational structure[11].

1.2.2 Human resource management

From a qualitative point of view, in their comparative study of seven countries (US, UK, Australia, Germany, Sweden, Italia and Japan) with a focus on the automobile and telecommunications industries, Katz & Darbishire (1999) find that the increasing heterogeneity of employment system within a country is a general phenomenon common to different countries, even if the degree varies from high in the US and the UK to low in Germany and Sweden. It is important to notice that their definition of employment system is broad and include not only the pay system (and the level of income inequality) but also the nature of employment security and the work organization across firms. In all these dimensions, they find wider variations. Moreover, the authors try to systematize their results in proposing a typology of four types of employment relations - low wage, HRM, Japanese oriented, joint team based – which are not specific to one type of capitalism but are rather all present in each form of capitalism. These results are confirmed by Streeck & Yamamura (2003) in their comparison of Germany and Japan.

More specifically, what can be said about Japan? First, Kiyota & Matsuura (2006) confirm this trend with a completely different methodology and perspective. Using the BSBSA database by METI for the years 1994-2002, they find different patterns of human resource management among Japanese companies. More precisely, employment volatility (as measured by the adjustment speed in a model of labor demand) is lower for MNEs than for domestic firms, and among the MNEs, it is lower for foreign-owned than for Japanese MNEs. They interpret this result in terms of difference of HRM strategy: the MNEs (especially the foreign owned ones) are focusing more on the development of firm-specific skills for their workers.

Second, in using the same type of methodology, Hurlin & Lechevalier (2003) also show an increasing heterogeneity of HRM practices (or at least one major dimension of it, employment security) between the 1970s and the 1990s, which are two periods of downsizing in this sector, across firms of similar size and within a narrowly defined sector (126 Japanese listed firms of the electrical machinery sector between 1971 and 2001). In a similar way than in Kiyota and Matsuura (2006), the speed of employment adjustment is interpreted as an indicator of the long-term employment system, which is challenged in a period of restructuring. The lower the speed is, the more long-term oriented the employment system at the firm level is expected to be. Basically, contrary to what could be expected, the authors find that, on average, the adjustment speed did not increase (0.48 in the 1970s and 0.47 in the 1990s). However, a greater dispersion is found as the standard error of the individual speeds was 0.39 in the 1970s and 0.42 in the 1990s.

[11] As a result, it clearly appears that the oppositions between non *keiretsu* and *keiretsu* corporate networks (with a multidivisional core firm surrounded by group companies) or between horizontal and vertical *keiretsu* have become too simple to describe the current diversity of organizational structure in Japan. This point, which concerns another dimension of our analysis, the coordination issue, is analyzed into more details in the paragraph 2.2.

Third, in analyzing the labor issue at the firm level, one should not consider only the management strategy but also the union strategy, as convincingly shown by Gordon (1992) or Sako (2006). The heterogeneity across unions (and *roren*, network of unions) of different sectors is not new as recalled by Sako (2006). One can emphasized two differences directly related to the differences of structure across different sectors and exemplified them through the comparison of Toyota *roren* and Matsushita *roren*: the focal union in the roren organization has a much bigger presence in the electrical machinery industry than in the automotive industry; the organizational boundary of the *roren* is more encompassing in the automotive industry than in the electrical machinery industry (in the case of Matsushita *roren*, the criterion for affiliation is shareholding linkages with Matsushita electric, while, in the case of Toyota *roren*, the criterion for affiliation includes shareholding links but also trading links). More interestingly, there are also differences between *roren* within a same sector, for example between Toyota *roren* and Nissan *roren*. For example, Nissan *roren* is more centralized regarding the levels at which union resources (money and people) are held, and concerning the bargaining and consultation. Here again, these differences are not new: they emerged as a result of a fundamental difference in organizing principles and strategy towards management. However, as the mechanisms are different from the ones underlying the differences across sectors, and as they are specifically based on an evolutionary process, they may grow in the future, maybe comparatively much more than the inter-sector differences.

1.2.3 Corporate finance and governance

A good example of heterogeneity in the corporate finance is provided by the analysis of the issue of convertible corporate bonds. Following the deregulation of the corporate bonds market in the second half of the 1980s, one observed a surge of issuing convertible corporate bonds in Japan. However, based on a panel of 345 firms listed in the Tokyo Stock Exchange, Horiuchi (1995) shows heterogeneity in the behavior of firms from this point of view: among the 345 firms, 180 have issued convertible bonds before 1990 while 165 did not. This has consequences in terms of corporate governance and performances. However, Horiuchi's study does not allow us to follow what happen during the Lost Decade from this point of view.

Aoki, Jackson & Miyajima (2007) provide a quite complete picture of the increasing heterogeneity of the corporate governance of Japanese firms, in considering different dimensions. The first dimension concerns the bank firm relationships. In spite of the deregulation of bond market in the mid-1990s, the overall dependence of firms on bank borrowing increased. Large firms lessened ties with banks and began financing through bonds, but smaller listed firms continued borrowing from banks. In sum, size matters from this point of view. But this is not the only determinant: firms with already high levels of bank debt relied on their main bank for an increasing proportion of those loans. Moreover, as shown by Ogawa (2004), even among large firms, one observed an increasing heterogeneity from this point of view. Based on a non balanced panel data set of listed Japanese manufacturing companies (chemicals, machinery, electrical machinery, transport equipment, precision instruments) for the years 1988-1991 and 1999-2001, the author shows that even if the average debt-asset ratio of these large manufacturing firms is declining over the 1990s, there still remain a number of firms that have

massive debt-asset ratio. The standard deviation of the debt-asset ratio of his panel data increased from 0.1688 at the end of the 1980s to 0.2057 at the end of the 1990s.

Second, the ratio of cross-shareholding overall declined but not uniformly. Cross-shareholding dissolved among firms where bank finance declined, but was maintained among firms that continued borrowing from their main banks. Third, institutional investors (and among them American and British mutual funds and pension funds) are becoming more important. They have concentrated on a relatively narrow segment of very large, export-oriented blue chip companies with high market capitalization, liquidity, and good performance.

These three evolutions overall lead to an increasing heterogeneity of corporate governance among Japanese firms. If size and sectors matter, they are not the only determinants of the diverging choices across firms. More empirical investigation is required on this issue (see paragraph 1.3).

1.2.4 Innovation

The level of R&D expenses is one important dimension of the innovation at the level of the firms. Differences of behavior in this field are mostly related to sectoral differences: some industries (like chemicals, pharmaceutical products, or some sub-industries of the electrical machinery sector) are R&D intensives and some not. However, as a whole, the practice of R&D in Japan concerns a minority of firms: as shown by Kiyota (2006), based on a METI database, almost 70% of manufacturing firms in Japan did not conduct R&D activities between 1995 and 2002. Of course, the level of R&D spending is just one way to capture the innovation activity of a firm; the existence of spillovers is a part of the explanation of this low percentage of R&D firms. This aspect is another key dimension of our analysis of the Japanese capitalism and of its crisis from the coordination point of view and is developed in paragraph 2.2. At this stage, it is enough to recall that spillovers are not automatic and require an active "attitude" from companies.

Furthermore, regarding innovation as a whole, firms do differentiate from each other not only in term of the level of R&D spending but also regarding the concrete form of R&D or the existence of R&D collaborations. For example, in their case study of the collaborative R&D in the robot technology between 1991 and 2004, Lechevalier, Ikeda & Nishimura (2006 & 2007) find some evidence of a significant heterogeneity regarding the degree of collaboration as well as the participation to government supported R&D consortia, which can both be considered as essential dimensions of the innovation strategy of companies[12]. Regarding the collaborative R&D, it is measured through the number of jointly applied patents by different institutions (firms, universities and public research institutes). Among the most collaborative companies, one finds Hitachi (86 collaborative patents, 24% of the total number of patents applied between 1991 and 2004), Toshiba (78, 16%), Toyota (78, 28%), Sony (75, 9.8%), and Mitsubishi Electrics (37, 11%). The less collaborative firms are respectively Mazda (0.8% of

[12] As the results of this paper could appear very specific, it is worth recalling the interest of the robot industry as a case study of the increasing heterogeneity of R&D strategies across Japanese companies. First, the robot technology is perceived as one priority of the public innovation policy, as field with high potential were Japan could increase its comparative advantage. Second, the private players in this sector include all the major companies from the electrical machinery, machinery, and automotive industries. Third, in considering this narrowly defined technology, one cannot explain the differences across firms by technological differences but rather by differences in the strategies of companies.

130 patents), Ricoh (1.5% of 135), Matsushita Electric Industrial (1.6% of 707), and Canon (2% of 153). Regarding the participation to 17 commissioned programs between 1991 and 2005, Hitachi and Toshiba are the most frequent participants with 7 participations, followed by Mitsubishi Heavy Industries (6 participations). On the contrary, Sony, Nissan and Toyota did not participate to any of these projects. As it can be seen from these two examples, the sector and the size do not determine the practice of R&D collaboration as well as the participation to government consortia[13].

1.2.5 Internationalization

Although the globalization of production is a characteristic of the whole Japanese economy, it is also possible to give some evidences of heterogeneous internationalization strategies among Japanese firms. For example, in using the BSBSA for the years 1994-2000, Kimura & Kiyota (2006) distinguish between four types of firms depending on their internationalization strategy: the D firms are operating only in the domestic market, the DX are producing in Japan but exporting, the DI are also producing in foreign countries but do not export, and the DXI are producing in Japan and abroad, and exporting. In 2000, the distribution of these four types of firms is the following: 76% are D type, 11% are DX type, less than 4% are DI type and more than 9% are DXI type. It means that a large majority of firms are domestic only. Moreover, even if these figures are quite stable between 1994 and 2000, the share of DXI type has increased of 1.5 points and the share of D type has decreased of 1.3 points.

1.3 Increasing heterogeneity of "models" (2): in search for coherence

1.3.1 In search of the competing models: taking into account the complementarities between the five components of firms' strategies

This growing diversity for each of the five characteristics of firms' strategy, which has been assessed, makes particularly difficult to define the competing "models". They should be characterized by some coherence, which can basically be found through the complementarities between the different elements of the strategy. These complementarities have been intensively studied. We review here some robust results. The most classical complementarity, which eventually gave birth to the theories of institutional complementarity, is the one between corporate governance and human resource management, first assessed by Aoki (1989). In the VOC framework, this complementarity is understood in term of "switchable" assets versus specific "assets". A second well-known type of complementarity is between the internationalization (of sales and production) and the nature of corporate finance and governance: the internationalization of sales and production requires the development

[13] Sakakibara (1997) provide some possible explanations for this heterogeneity of the participation of firms to government programs. According to her questionnaire sent to 398 participants to government programs, firms may have two main motives to participate to government programs, cost-sharing and skill-sharing. When members of a consortium are homogeneous from the point of view of their capability, the cost-sharing motive is dominating; when they are heterogeneous, the skill-sharing is dominating. Based on this finding, it is possible to understand why some firms find an interest in participating to government consortia and why some not, when both motives are not present.

of new financial products (for example to cover the exchange rate risk), which in turns affects the corporate finance and governance (Boyer & Yamada, 2000). A final example of complementarity is between the organization structure and human resource management. This complementarity can emerge directly: for example, the creation of subsidiaries and parent firms in Japan were clearly a component of the human resource management strategy, in allowing the development of careers and the organization of employment security at the level of the corporate group (Sako & Sato, 1997). It emerges also indirectly via the structure of unions, as shown by Sako (2006). The author proposes a framework - the SSI (strategy – structure - institutions) framework – to study jointly the formation of the boundaries of the company and of the union, by focusing on the strategy and structure of management and labour organizations. The organizational boundary of companies and unions is the result of a strategic choice from both organization and from a bargaining, if there is no initial agreement. This is why it is impossible to understand the organizational structure of Japanese firms without studying the interactions between management and unions.

However, it is important to mention that some of the most recent empirical analyses have shown that the complementarity between finance and employment is less clear than it used to be (Aoki & al., 2007). It has led these analyses to develop the concept of hybrid models. For example, one type, corresponding to the EMIL model is characterized by relational employment and market-based finance (monitoring by market rather than by the main bank); another one, labeled "inverse hybrid" is characterized by more fluid employment relations and relational finance (Aoki & al., 2007). By itself, the concept of hybrid has important implications for the theories of institutional complementarities, especially if it is found that the hybrid models will last and do not just represent a transitional stage toward more fully market oriented US style corporate governance.

We would like to argue that the emergence of hybrid models, whose characteristics are in contradiction with the postulates of the theory, shows the limits of this theory and should lead to a revision of our approach of the firm and of the institutional complementarities. To be fair, it is worth mentioning that a revision of the theory is under process. It is possible to mention two particularly important elements. One is the concept of "conversion" elaborated by Streeck and Thelen (2005) and used by Sako (2007). For example, corporate transparency may serve the interests of shareholders but also of other stakeholders, like employees. The second dimension of the revised theory is maybe even more important. Extending the analysis to additional domains may suggest wider sets of complementarities. Complementarities between finance and employment may be contingent upon the specific aspects of business strategy, organizational architecture, and related forms of human capital. To put it differently, while the theory has focused until now on the complementarity between two elements, it is time to consider the complementarities between more than two dimensions and to develop the accurate theoretical and empirical tools. From an empirical point of view, a practical and rigorous way to define the models by taking into account various complementarities is to use a cluster analysis, as done by Aoki & al.(2007) or by Ito & Lechevalier (2007). Of course, this empirical analysis should be founded on the previous theoretical analysis of the complementarities between the different dimensions of the firm's strategy. It should also be based on a precise theory of the firm (see paragraph 3.2.1).

Another way to classify the different strategies is to define a hierarchy among the five dimensions of the firms' strategy, in being inspired by the concept of institutional hierarchy developed by Amable (2003). From this point of view, it is possible to recall that the former dominant model of the J firm has been convincingly characterized as growth oriented by Odagiri (1992). Since the 1990s, Japanese corporations generally did not grow but restructured through diversification, strategic alliances, and M&A (Sako, 2006). As there are many different ways of restructuring, one can understand the observed increasing heterogeneity. Moreover, some companies like Toyota continued to grow. The stagnation, which is characteristic of the Japanese economy at the macro level, is not common to all the companies. Therefore, the opposition between growth strategies (in at least one of the five dimensions of the strategy, which have been distinguished: especially internal diversification, innovation, internationalization; the corporate finance and the HRM dimensions are more the consequences of the development) and restructuring strategies is a possible way to find coherence among the competing models[14].

A final issue at stake is to define a stable set of characteristics explaining the choice of one model rather than another one. As it seems that the growing heterogeneity goes beyond the boundaries of the sector and the size classes, it is important to assess the determinants of the divergent trajectories and the new lines of segmentation within the Japanese economy.

1.3.2 Models and performances

At this stage, it is important to recall that there is no systematic correlation between models and performances. Therefore, there is no convergence towards a specific model.

Many papers study the impact of one particular strategy, behavior or firm's characteristic on productivity. For example, in an already quoted article, Ogawa (2004) adopts a two steps procedure – study of the impact of the debt on the investment in R&D and of the impact of R&D on TFP growth - and shows that the ratio of debt to total assets has significantly negative effect on R&D investment in the late 1990s (while the effect of debt asset ratio on R&D investment is insignificant in the late 1980s on the whole) and that the TFP growth rate is positively linked to R&D investment, which implies that debt overhang in the 1990s is responsible for lowering the firm level TFP growth rate. Moreover, he shows that the larger dispersion of debt asset ratio across firms leads to more dispersed distribution of R&D investment in the 1990s, and consequently of TFP growth. A link is therefore established between a mode of financing the investment and the growth rate of TFP at the firm level. At a more general level, Aoki & al.(2007) found that the hybrid firms overall perform better than the traditional J firms. There is a potential for a dual or segmented structure to emerge, comparable to the one observed in the 1950s (Sako, in Aoki & al., 2007).

However, the positive impact on productivity of one dimension of the strategy of a company does not mean that one particular model is superior to another. What is important is the coherence of all the

[14] If the choice of a restructuring strategy is sometimes the consequence of the failure of a growth strategy, this is not always the case, as it is shown in the case of many profit-oriented American companies (by opposition to some growth-oriented Japanese companies), for which the restructuring is a first best choice, in order to improve their profitability.

characteristics of a given model. Aoki & al.(2007) show that not all combinations are viable or will achieve equal economic performance. Hybrids may be unstable. Moreover, even if, apparently hybrids perform better, as suggested by Aoki & al.(2007), this is very localized in the time and the space. Furthermore, it does not imply that, in the medium or long run, firms will converge towards one model. It can be explained by different factors. First, as recalled above, the "best" models in term of productivity do not necessarily perform the best in term of profitability. Second, the recessions have not always the expected cleaning effect. Third, vested interests or institutional impediments may be strong enough to protect the less effective models or even to make them more rational in a given environment.

1.4 How to explain the increasing heterogeneity of the Japanese firms?

Shinada (2003) and Fukao & Kwon (2006) found that increasing heterogeneity is diverse across industries. For example, the increasing disparities that Shinada found in the manufacturing sector are particularly striking in the electrical machinery sector but only modest in the case of the iron and steel industry. This stylized fact corresponds also to the case of the retail industry but less to the rest of the non manufacturing industries. In using this cross-section heterogeneity, it is possible to assess the determinants of the increase in firms' performance within a same sector, by analyzing the characteristics of these sectors.

1.4.1 The mainstream explanation: firms' heterogeneity is technology driven

A basic analysis of the complex link between technology and productivity can be found in Fung (2005): while the author recognizes that the innovation (R&D expenses) and knowledge spillovers are two ways for a firm to make technical progress, he focuses on the latter, and shows this is the basis for a process of convergence among firms in term of TFP. If we turn now to the mainstream explanation of firms' heterogeneity, it is well represented by the model of Caselli (1999), in which the increased dispersion in wages and productivity across establishments is linked to differential rates of technological adoption across establishments. The validity of this theoretical assumption is empirically assessed and confirmed by Dunne & alii (2000) in the case of the US economy.

In the case of Japan, this stylized fact is confirmed by Fukao & Kwon (2006), who analyze the inter firm differences in TFP in measuring the gap in the TFP level between a group of high TFP firms and a group of low TFP firms and in comparing the characteristics of the two groups of firms. They show that the TFP gap is widening in many industries, including drugs and medicine, electronic data processing machines and electronic equipment, and motor vehicles, where R&D intensity is high. Moreover, they find that greater R&D intensity have positive effects on firm's TFP growth. Therefore, their findings are a suggestive explanation for the increasing heterogeneity of performances. Shinada (2003) confirms these results.

1.4.2 The impact of the globalization

In an already quoted paper, Kimura & Kiyota (2006) conduct a dynamic analysis of the relationship between the internationalization strategy of Japanese firms and of their performances. Their result can be summarized as follows. First, the FDI and exportation behaviours of firms depend on their initial productivity: the most productive firms are those that engage in FDI and export; medium productive firms engage in either exports or FDI, the least productive firms neither export nor invest abroad. There is an important heterogeneity in the internationalization behaviour and the initial performances are a key factor to explain the different strategies by companies. Second, both exports and FDI do improve productivity. As a whole, these two effects – selection effect and learning effect –may explain partly the increasing heterogeneity of performances.

Fukao & Kwon (2006) confirm these results in showing that the TFP gap is widening in the industries where the internationalization – as measured by outward direct investment, the introduction of foreign capital and procurements from abroad - is more advanced. They also find that the high TFP firms tend to have a higher degree of internationalization and that internationalization has positive effects on firm's TFP growth. To sum up, they conclude that "similar to the IT divide among workers, a new divide caused by R&D and internationalization seems to be emerging and growing in Japan's manufacturing industry."

1.4.3 Introducing macro and institutional determinants of heterogeneity

Other factors are determining the level and the evolution of firms' heterogeneity in a given economy. First of all, business cycles affect the heterogeneity of firms. From a Darwinist or Schumpeterian perspective, the natural selection mechanism in a market economy leads to the survival of the best firms and the death (or exit) of the less performing ones. This is particularly the case during recessions, whose "cleaning" effect has been emphasized (Aghion & Saint-Paul, 1994). The consequences from the point of view of firms' heterogeneity are clear: it should lead to a greater homogeneity. However, does this mechanism hold in severe recessions, like the one that Japan experienced in the second half of the 1990s? This is the interest of the empirical contribution of Nishimura & alii (2005a) to show that in the case of Japan, contrary to what could be expected, TFP levels of exiting firms were lower than those of surviving firms in all periods but in the period of 1996-1997. It is interpreted as follows: relatively efficient firms in terms of TFP went out of business while relatively inefficient ones survived during the banking crisis of 1996-1997. It *de facto* produced an increasing heterogeneity of firms' performances.

If one turns to more institutional explanations, one should first mention the fact that the growing heterogeneity of the corporate governance of Japanese firms is basically explained by the facts that not all firms are equally exposed to pressures for change and that existing institutions also constrain change along particular trajectories (Aoki & al., 2007). The best example is certainly relative to the growing trend of foreign ownership, which has an impact in term of corporate governance. As shown by Christine Ahmadjian in Aoki & al.(2007), the foreign investors concentrates in some firms (see paragraph 1.2.3) and this has a strong impact on the corporate governance of these firms: firms with higher levels of foreign ownership are more likely to adopt "Anglo – American" style corporate reforms, such as equity-based performance measures, changes in the

structure and function of the board, and communication with shareholders. Moreover, foreign ownership is also strongly linked to the likehood of corporate downsizing in terms of employment adjustment. On the contrary, smaller firms or large firms within more stable business groups remain less exposed to these pressures. The result is clearly a growing heterogeneity among Japanese firms.

Another reason is relative to the specific form of some reforms in Japan, resulting from a compromise between different actors (Jackson in Aoki & al., 2007). The "enabling" nature of legal reforms gives a greater choice to Japanese firms. For example, the reform of the board of directors constitutes an interesting case supporting Jackson's idea. After an opposition between the METI and the Keidanren, a compromise has been found in the 2002 amendment to the Company law, which introduced the American Style board of directors as a second option alongside the traditional Japanese style board with statutory auditors. This "reform as choice" will lead *de facto* to a diversity of choices among companies, which reflects continued functional divergence due to differences in the incentive patterns among corporate stakeholders.

Independently from the legal structure, another element may have contributed to the increasing diversity of corporate governance among Japanese firms. Changes in the role of main banks and capital markets have lessened constraints on organizations with regard to choices in other domains, such as business strategy and structure, management and employment patterns. Therefore, firms have responded to pressures in diverse ways (Aoki, 2000).

Furthermore, it is worth mentioning the importance of the decentralization as key determinant of the growing diversity of employment systems within countries (Katz & Darbishire, 1999). One dimension concern the bargaining process, much more decentralized in Japan than in other countries, which is a "facilitator" for the growing diversity. Another dimension is related to the changes in internal firms' organization: the rise in the importance of business units or profit centres within organizations contributes to the growing heterogeneity. At the same time, the change in the balance of bargaining power between employees and managers give to the latter even more scope to introduce specific reform at the micro level. This idea is found also in Sako (2006) in the case of organizational structure: the interaction between corporate strategy and labour strategy explains the contested nature of organizational boundaries (the organizational boundary is a choice variable for both union and management). The result is contestation and bargaining, when the corporate strategy and the labour strategy do not coincide. Then, power differentials are important to explain the outcome.

In an even more general and systematic way, Sako (in Aoki & al., 2007) examines how move from CME to LME is related to organizational diversity. According to her, in this case, organizational diversity will increase at the level of the national economy, sector or even corporate group. Based on a model of incremental change inspired by Streeck & Thelen (2005), Sako introduces the concepts of layering and conversion. In the financial market as well as in the labor market, the new market-oriented rules have been layered on top of older institutions in ways that facilitate new corporate strategies, while leaving old strategies intact. Likewise, institutions may undergo conversion or adaptation to new and diverse purposes as shown with the case of *shunto* (see paragraph 2.2.3). Conversion and layering lead to greater organizational diversity because the change and

adaptation of institutionalized practices involves local issues of power and contention among stakeholders at the level of individual companies. These are conflictual element of institutional change.

1.4.4 Our working hypothesis: the financial deregulation as the origin of the increasing heterogeneity

Among the institutional determinants of the evolution of firms' heterogeneity, the role of the financial system is essential. Our working hypothesis is based on the preceding analyses, which are systematized from this point of view, and on a historical comparison. According to us, what is observed in Japan in the 1980s-1990s is similar to what gave birth to the so-called dual structure of the Japanese economy in the 1950s. Whereas the origin of this last one is to be found in the differentiated introduction of foreign technology in the Japanese firms according to their size in the inter-war period (Kiyota & Okazaki, 2005), the origin of the currently observed increasing heterogeneity of Japanese firms has to be found in the financing deregulation since the 1980s, which broaden the scope of choices that firms were facing in term of financing.

If this hypothesis is true, it means that the characterization of the different "models" can be done based on the analysis of their financial structure in relation with the other dimensions of the firms' strategies (including the diversification of products and organizational structure, the human resource management, the innovation, and the internationalization). To put it simply, it is more necessary than ever to realize what Weinstein and Yafeh (1995) call for as a promising research agenda: "Further investigations of differences in behaviour between k *keiretsu* and independent firms are warranted. It would be particularly interesting to explore differences in production techniques employed by *keiretsu* and independent firms. For example, does the main bank affect the firm's choice of inputs? This is one of the questions that have yet to be answered". Weinstein and Yafeh (1995) indeed found that, under the influence of their main bank, the behaviour of *keiretsu* - affiliated firms are indeed different from independent firms, as they produce at levels beyond those warranted by pure profit maximization. However, the big difference between the period covered by Weinstein and Yafeh's analysis, which is in fact limited to the year 1988, and the period covered by our analysis is that the lines of cleavage between Japanese companies have changed and that the division into *keiretsu* - affiliated and independent firms has lost its pertinence. Therefore, to realize the research agenda proposed by Weinstein and Yafeh, it is preliminarily necessary to determine the nature of the new line of cleavage.

To summarize our findings so far and define the required research agenda, it is possible to emphasize two important points. First, beyond the national model of firm's organization (A firm, J firm), it is necessary to introduce new and diverse categories within the Japanese economy. Second, it is particularly important to define the new lines of cleavages across firms. Although the size and the sectors matter in the differentiation of firms, they are not enough to understand the "new divide" across Japanese firms. More empirical investigation is needed to identify the different groups of firms. Third, regarding the reasons of the increasing heterogeneity, to put it shortly, (product and labour) markets and technologies matter for explaining inter-sectoral differences; the

evolution of capabilities (evolutionary argument) and strategic interaction matter for explaining within industry differences (Sako, 2006).

2. Implications for the analysis of the crisis of the Japanese capitalism: introducing the concept of coordination

The simultaneity of the Japanese crisis and of the increasing heterogeneity of the Japanese firm is striking. However, this simultaneity is not enough to prove that there is a link between the two phenomena. Moreover, the question of the causality is also largely open. On the one hand, the crisis may have lead to an increasing heterogeneity: during period of expansions, the differences between firms tend to widen, as the pie to be shared is growing; this is the contrary during recessions. But in the other hand, the increasing heterogeneity may have contributed to the crisis through channels, which should be specified. This is objective of this paragraph to analyze this causality.

2.1 Why it is important to take into account the increasing heterogeneity of the Japanese firms. Some examples of issues and fallacies

2.1.1 Productivity heterogeneity and wage dispersion: explaining the increasing inequalities

The debate on the increasing inequalities in Japan has been particularly intense over the last decade. It has tended to focus on the assessment, which is by itself a matter of scientific controversy. Tachibanaki (2000) has found increasing income inequalities, while Ohtake (2000) has shown that this result is in fact due to a statistical artifact, in relation with the ageing of the population. The inequalities did not increase within a same class of age.

Surprisingly, the debate on inequalities in Japan has focused on the impact of individual characteristics (age, education, sex) but very little on the impact of firms' characteristics. However, in the case of the US, many papers have explained the increasing wage inequalities by the firms' characteristics. More specifically, Dunne & al. (2000) have shown that this trend is directly related to the increasing productivity dispersion. Therefore, analyzing more systematically the evolution of productivity dispersion and taking into account firms' heterogeneity would certainly lead to a better assessment and understanding of increasing income inequalities in Japan[15].

2.1.2 Performances: Toyota (and others) versus Japan?

Regarding the contrasted performances of the Japanese economy as a whole and of specific companies, the paradox presented in introduction cannot be understood without taking into account the evolution of firms' heterogeneity. An analysis of the causes of the very disappointed performances of the Japanese economy during the lost decade cannot be dispensed with an analysis at the micro level. As recalled in the preceding paragraph, this research has started to be done. However, the detour by a micro-analysis should not lead in a second step to a simple aggregation of micro behaviors to analyze the performance of the economy. The concept of coordination we propose thereafter aims at thinking the articulation between the micro and the macro levels.

[15] What is required to analyze even more rigorously the contribution of individual and firm effect to wage dispersion is the use of matched employers – employees data.

Moreover, these contrasted performances have also an impact from a political economy point of view. As recalled by Aoki (2000): "advanced sectors that do not need bureaucratic protection tend to drift away from the bureaupluralistic framework, while less developed sectors tend to rely on it more". Therefore, it is possible to understand why the institutional change is so complex to analyze in the context of the lost decade: it is the result of different (and often contradictory) pressures emanating from different groups. Here again, the concept of coordination we develop is a tool to understand the nature of this institutional change.

2.1.3 Models: investigating the gap between the macro and micro levels

The differences among studies in the evaluation of the changes regarding the diversification, the human resource management, the corporate finance and governance, the innovation, and the internationalization, are striking. This is not due only to the fact that the changes occurs more slowly at the macro level than at the micro level. It can be also explained by the fact that the changes occurring at the micro level can go into different directions, each type of firm reinforcing its characteristics. An example concerns the evolution of the wage labor nexus. Whereas Boyer & Julliard (1998) did not find any change between the 1970s and the 1990s regarding the speed of employment adjustment, Hurlin & Lechevalier (2003) showed in their case study of the electrical machinery sector that there is an increasing dispersion at the firm level despite the apparent stability at a more aggregate level.

Other examples can be easily found for other institutions and their counterparts at the firm level. That is why it is important to identify and to label the different firm's models within the Japanese economy.

2.1.4 Was this heterogeneity pre-existing? Has it been only revealed by the crisis?

Obviously, some heterogeneity pre-existed before the Lost Decade. To put it simply, it mainly concerned firms of different size in the 1950s-1960s (the so-called dualism of the Japanese economy) and firms belonging to different sectors in the 1970s. However, analyses focusing on these two forms of heterogeneity to explain the diversity of firms' performances in the 1990s miss the point. What has been shown in the former part is that this heterogeneity concerns firms of similar size and belonging to the same narrowly defined sectors. Therefore, it is important to define the boundaries of the new segmented structure.

Is this specific type of heterogeneity really new? Some studies showed that this specific type of heterogeneity pre-existed to the crisis in many respects. This is for example the case of the organizational structure of firms and the structure of unions (Sako, 2006). What is new is the considerable increase of this specific form of heterogeneity (that Nelson (1991) labels "discretionary"), to the point that it may be more intense than other forms of heterogeneity. Therefore, this new and increasing form of heterogeneity is not only revealed by the crisis but deeply linked to the current institutional changes.

2.2 The Japanese crisis as a lack of coordination of an increasing heterogeneity

All the fallacies described above are fundamentally due to a misleading aggregation of micro behaviours and performances. To solve this problem of aggregation, we argue it is necessary to introduce the concept of coordination, which allows a richer understanding of the interactions between the micro and the macro levels. In this section, we give only the intuition of the concept by applying it to the analysis of the Japanese crisis, before specifying it from a theoretical point of view in the paragraph 3.4.

2.2.1 Introducing the "lack of coordination" view of the Japanese crisis

To understand the nature of our interpretation of the Japanese crisis and the role that the concept of coordination plays in it, it is practical to contrast it to the interpretations proposed by Witt (2006) and Aoki (2000), which have been presented in the prologue of this paper. By opposition to these analyses, our interpretation can be summarized as follows: 1) On average, apparently, the system did not change but at the micro level, it changed drastically through an increasing heterogeneity of the firms' performances and organizations (which eventually takes the form of a polarization); 2) The Japanese crisis – its intensity and its length - is not explained by a lack of institutional change but by disruptions in the former order, and structural incompatibilities between the previous system, international pressures and its reform by inside forces, which lead to a lack of coherence and of coordination at the macro level. If we put together the two propositions above, we can summarize our interpretation of the Japanese crisis as follows: in our framework, **the Japanese crisis is explained by a lack of coordination of the increasing heterogeneity of the Japanese firms**.

At this stage, two potential objections appear. First, as it has been seen in the prologue of this article, the increasing heterogeneity within the national model is recognized in Yamamura & Streeck (2003) and is therefore not specific to our analysis. However, there is an essential difference between our framework and the one by Yamamura & Streeck. For them, the increasing heterogeneity is interpreted as a consequence of the crisis and of the reform of the model; in our framework, this increasing heterogeneity is precisely the cause of the crisis (and especially of its duration), because it is not coordinated.

Second, it is necessary to distinguish between the changes in some business units and the change of the business system as a whole: "The debate about change in Japan shows a tendency to conflate changes in parts of business systems with change in the business system itself" (Witt, 2006). A holistic view permits to take into account linkages and complementarities among component elements of the system. However, it is possible to show that the structural change fundamentally depends on the composition of the economy in terms of "models" at the firm level. Of course, this relation between the composition of the economy and the structural change is characterized by important non linearities and should not be interpreted in a mechanical manner. A possible way to go beyond the mechanical interpretation is to refer to the concept of "incremental but transformational" change by Thelen & Streeck (2005), which makes understandable these non linearities. Another way is to adopt an evolutionary framework. For example, Aoki (2000) underlines the existence of critical points: "even at an evolutionary equilibrium, the simultaneous occurrence of mass mutations by a critical mass of the population can cause an economy to shift to a different evolutionary equilibrium". Then, what has to be understood is the

interest of rational agents to choose a non-prevalent strategy. The framework by Boyer & Orlean (1994) gives a stimulating answer in considering the potential gain from the experimentation of a non-prevalent strategy at the local level.

2.2.2 The "Golden age" of coordination in the Japanese economy

The presentation of the "lack of coordination" view of the Japanese crisis preliminarily requires a explanation and a specification of the coordination in the former model of Japanese capitalism. We refer to this period – which corresponds to the high growth and to the successful adjustments of the 1970s - as the "Golden Age" of coordination in the Japanese economy. The purpose of this part is not to explain its origins, which can be found in the inter-war, the war and the immediate post-war (Okazaki & Okuno-Fujiwara, 1999).

It is possible to distinguish between three forms of coordination during this Golden Age. First, as it has been recalled in the prologue, the coordination at the group level has been the object of the focus by previous analyses of the Japanese capitalism (Streeck & Yamamura, 2001). It concerns specifically the *keiretsu* structure, whose impact in term of R&D spillovers has been particularly emphasized (Suzuki, 1993) and the sub-contracting system which has been recognized as a device to share the uncertainty and to increase the flexibility (Nishiguchi, 1994). Regarding the *keiretsu* structure, its contribution can be summarized as follows. First, as shown by Lincoln & Gerlach (2004), the *keiretsu* structure has contributed to reduce *ex post* the heterogeneity of performances of the members: their quantitative study of 259 firms belonging to *keiretsu* between the 1960s-1970s and 1997 confirm that the groups act to maintain balance in their ranks and ensure the survival of all members by supporting the weak members at the expense of the strong members. Second, these redistributive interventions have implication for the health and the characteristics of the economy as a whole. More precisely, at a macro level, the groups played key roles in the restructuring of declining industries; it is certainly one of the key explanations of the capacity of the Japanese economy until the Lost Decade for fast adaptation to macroeconomic shock and smooth transitions from stagnant or declining industries to sectors in which its competitive potential remained high. Third, the coordinating role of the *keiretsu* does not lead to collusion but rather to fiercer competition as shown by Weinstein & Yafeh (1995): non market coordination and competition are not necessarily in contradiction.

As for the subcontracting structure, a long tradition – the so-called dualist theory - has analyzed it from the point of view of exploitation. If it is true that significant differentials exist between the subcontractors and the subcontracting company (especially in term of wages and employment conditions), it should be emphasize that the subcontracting relationship in Japan developed in the post war because of its economic gains: through subcontracting, Japanese firms have developed interfirm problem-solving mechanisms to make low costs and high quality products. Moreover, this attribute of the Japanese way of subcontracting – which can be qualified of coordination oriented – is in sharp contrast with practices in UK (even in the same industries), which are more bargaining oriented and less efficient (Nishiguchi, 1994).

Second, the coordination device at the industry level has tended to be forgotten by some comparative analyses of the Japanese capitalism. However, the *shunto*, as a coordinated bargaining process, has plaid this role, especially in the 1960s-1970s. It highly contributed to the distribution of productivity gains across sectors and to the absence of inflation (Boyer & Yamada, 2000). More precisely, four characteristics of *shunto* made it an essential coordination device (Sako, 2006): 1) The initiative of Rengo and Nikkeiren as well as their bargaining process *de facto* engaged the government and the public in a debate on which pay increase Japan can afford; 2) private sector unions and leading companies in export oriented manufacturing sectors took a lead in *shunto* discussion; 3) the pay settlements were highly synchronized and this synchronization increased from the mid-1970s; 4) wage settlement norms diffused in an orderly fashion from the private sector to the public sector, from leading pattern setting sectors to followers sectors, from large to small firms, and from corporate headquarters to subsidiaries and affiliates.

Third, government played a major role of coordinator. It is here necessary to distinguish between at least two dimensions. On the one hand, as recalled in the prologue of the present paper, Aoki (2000) convincingly showed that the so-called bureaupluralism contributed to the distribution of the rents within the national economy and established a form of "solidarity" among the sectors. On the other hand, the industrial and innovation policy has plaid a more offensive role of coordination in selecting the priority sectors and technologies and in promoting the R&D collaboration among firms. The recognition of this contribution of the industrial policy does not necessarily lead to adopt a developmental-state view; an alternative is a "market-enhancing view" emphasizes the role of government action in promoting private-sector coordination, which is an indirect form of coordination by the government. (Aoki & al., 1996)

2.2.3 The decay of coordination devices in the Japanese economy

It is then possible to assess the declining coordination in the Japanese economy, which concerns the three dimensions, which have been just distinguished. First, the *keiretsu* structure has experienced drastic changes since the 1980s (Yamamura & Streeck, 2003), so that it is particularly difficult to recognize the current boundaries of the surviving *keiretsu* and maybe misleading to use them as a category of analysis. This evolution may have affected the convergence process among firms as explained very clearly by Fukao & Kwon (2006): "The slowdown of the beta-convergence mechanism seems to have contributed to the widening of the TFP dispersion among firms. Until the middle of the 1990s, large firms and many small firms were closely tied by sub-contracting and *keiretsu* relationships and it seems that though this network advanced technologies of assemblers and key-components producers were transferred to lower-tier small suppliers. But as large firms relocated their production abroad and rationalized their procurement processes, this technology-transfer mechanism probably slowed down." This is also true for the subcontracting system, which has become more fluid (Isogai & al., 2000).

Second, the *shunto* has experienced a profound decay, first in its coverage – more and more companies being not involved in the process – and second in its object – the "bargaining" concerning less and less the

increase of wage relative to the productivity gains and more and more general and somewhat vague topics (Boyer & Yamada, 2000). Moreover, the decay of the *shunto* as a coordination device may be seen through its outcomes. As shown by Sako (2006), in the 1990s, one observed an increasing variation for bonus and wage settlement within a given *roren* and between *roren*. The main reason given by unions and employers is that the settlement takes more and more into account the corporate performances. As a whole, it is possible to consider that the function of *shunto* has changed from a coordinated pay bargaining to a mechanism for legitimizing pay restraint and dispersion (Sako in Aoki & al., 2007).

Last but not least, due to policy mistakes and in a general context of deregulation, both the industrial policy and the bureaupluralism have experienced drastic changes if not decay (Aoki & al., 1996; Watanabe, 1997; Lechevalier, 2006).

These three evolutions converge towards a decay of non-market coordination devices in the Japanese economy. This is not necessarily a problem, especially if market based coordination is efficient or if, for some reasons, less coordination is needed in the economy. However, many signs converge to show that the market-based coordination mechanisms are not (yet?) functioning efficiently in the contemporary Japanese economy. Moreover, the increasing heterogeneity requires more – and not less - coordination than ever. To put it differently, we concluded the paragraph 1.3 in mentioning the potential emergence of a dual or more generally segmented structure in nowadays Japan, comparable to the one observed in the 1950s. However, the big difference between these two cases is the existence of coordination devices between the different segments in the 1950s and their absence in nowadays structure. To our opinion, this is the key for the recovery of the Japanese economy.

2.3 Towards a new understanding of what has been the Japanese capitalism and what it has become?

If this analysis of the Japanese crisis is true, it should lead to a revision of our understanding of the Japanese model. Arguably, this characterization should focus on three dimensions: the decentralization of the model, its evolving differentiated structure, and the evolving coordination.

First, the decentralized nature of the Japanese capitalism is a key to understand its current crisis and evolution. This is because he underestimated or even neglected this crucial dimension that Witt (2006) concludes – wrongly, to our opinion - that the Japanese capitalism is too much coordinated. Basically, the major origin of the departure between our approach and the one proposed by Witt is the following. Before being coordinated, the Japanese capitalism is highly decentralized by nature. The typology of Calmfors and Driffil (1988) - classifying the Japanese bargaining structure as one of the most decentralized in the world - has been justifiably criticizing as missing the key mechanisms of the *shunto* (Sako, 2006). However, it is possible to argue that the *shunto* has emerged as an essential coordination device because of the fundamental decentralized nature of the Japanese

human resource management. The decay of *shunto* coincides with the increasing diversity of employment conditions in the Japanese labor market. To put it simply, the decentralized structure of the Japanese capitalism requires a perfect market or a very good non market coordination. In Witt's analysis, the centralization - decentralization axis is missing. To our opinion, it induces a misunderstanding of the nature of the Japanese capitalism. To use Witt's concepts, *direct* micro-pressures are also important in the case of CMEs, including Japan, and should not be underestimated.

Second, the Japanese capitalism should be characterized by a differentiated structure, as argued by Isogai & al. (2000). However, the most important here is to recognize that this structure has evolved over time. Basically, it is possible to distinguish between three sub-periods after the World War II. In the 1950s-1960s, the Japanese economy has been well characterized by its dualism according to the size of the firm (Shinohara, 1970). This dual structure, which concerns the capital intensity, the productivity and the wages, has been maintained but its intensity tended to be reduced, after the turning point of the Japanese economy, at the beginning of the 1960s, when the labor surplus gradually disappeared (Minami, 1994). It leads the SMEs to increase the wages and therefore to invest more in technology to compensate the increasing labor cost by its increasing productivity. However, progressively, in the 1970s, a new form of heterogeneity, across sectors, became prevalent. This was due to the structural transformation of the Japanese economy, the decline of the sectors which had been the core of the first stages of its development (e.g. textile) and the progressive building up of new comparative advantages in the machinery sector as a whole. Finally, since beginning of the 1990s, a new differentiated structure has emerged. At this stage, it is difficult to characterize it through one single dimension. However, it is apparent as shown in the paragraph 1 of this paper that it takes place within the usual size and sector categories. While the determination of this new differentiated structure is left to further studies, it may lead to the redefinition of the industrial structure according to new criteria. As it has been already underlined, this point is critical in our analysis.

Third, the coordination itself has evolved in the Japanese economy, in its intensity and forms, as it has been shown above in the analysis of the *keiretsu* and subcontracting structures, the *shunto*, and of the government intervention in the economy.

To conclude, how to characterize the Japanese capitalism in this framework? This is a form of coordinated capitalism. As any capitalism, it is characterized by a segmented structure. Moreover, its specificity is certainly its highly decentralized nature. Finally, the most important is certainly the fact that these three dimensions – coordination, differentiated and decentralized structure – are (co)evolving overtime. The Japanese capitalism during the lost decade can be characterized as a highly decentralized, segmented and un-coordinated form of capitalism. The future of the Japanese capitalism lies in the emergence of new and efficient forms of coordination, and this future is still uncertain from this point of view.

3. Firms' heterogeneity: a new frontier for the theories of the variety of capitalisms?

Are theories of the variety of capitalism characterized by a bias towards the assumption of a representative firm within each form of national capitalism? This part tries to generalize the findings of the previous parts of this article. In doing so, we specify our theoretical framework applied to the analysis of the Japanese economy.

After having surveyed the treatment of the firms' heterogeneity by theories of the variety of capitalism and recognized that the evolutionist perspective is the more satisfying from this point of view, we underline successively two limits of this theory - the analysis of the determinants of the heterogeneity, and its normative evaluation. In a final subsection, we specify our concept of coordination by reference to these theories.

3.1 Variety of capitalism and firms' heterogeneity: the cross of institutional economics?

3.1.1 The inability of three institutional theories to think the firms' heterogeneity within a national form of capitalism

What has been found above, regarding the inability of the theories of the variety of capitalism to analyze the diversity of firms within the Japanese capitalism, holds for more general analysis. We consider here the example of three theories, the VOC, the CIA, and the SSP approaches.

Despite the influence of the new industrial economics, the VOC approach is unable to conciliate the diversity of national capitalism and the heterogeneity of firms within a given form of capitalism. The main reason of this inability is that the VOC approach assumes - for good reasons, to our opinion - that institutional structure conditions corporate strategy (Hall & Soskice, 2001). Then, even if it is recognized that structure does not fully determine firm strategy, the room for variations across firms of the same national form of capitalism is however strictly limited. In fact, the VOC approach emphasizes variations in corporate strategy evident at the national level: differences in the institutional framework of the political economy generate systematic differences in corporate strategy across LMEs and CMEs. More precisely, firms in LMEs should invest more extensively in switchable assets, while in CMEs they should be more willing to invest in specific or co-specific assets.

The CIA approach is potentially another good candidate to take into account the heterogeneity of firms within one national model. However, what has been seen in the case of the Japanese economy may be generalized as it is apparent in the following statement by Aoki (2000): "The combined effect of such factors as the bounded rationality of individuals, evolutionary pressures, and institutional complementarity is a tendency for more or less homogeneous organizational convention to be adopted throughout a particular economy. However, different organizational conventions will evolve in different nations". Among these reasons, the evolutionary pressures or the Darwinian process are certainly the most important in Aoki's framework.

This inability of thinking the firms' heterogeneity within a national form of capitalism is also characteristic of the Regulation theory and of related frameworks, as it has been shown, in the context of the analysis of the Japanese capitalism. However, the contribution of the approach in term of social system of production (Boyer & Hollingworth, 1997), which shares with the Regulation theory some elements, has to be underlined. While, the SSP approach brings the production (and the firm) to the core of the analysis, it manages to emphasize the heterogeneity of firms within countries and sectors by taking into account the characteristics of the demand. A basic distinction is between standardized and flexible systems of production. The main novelty by comparison to former approaches is to recognize that it is not uncommon for different components of varying SSP to exist simultaneously in a particular country. For example, even when standardized mass production was the dominant technological paradigm, there were always firms – or even entire industries – that were organized on opposite principles. The two organizing principles were complementary one with another: mass production tended to respond to the stable component of demand, while medium-size production systems tended to cope with the variable part of the same demand. Briefly speaking, the main channel through which the SSP approach explains the heterogeneity of firms within a same country and a same industry is the nature of the demand, which can be decomposed into a standard and stable one (for which the standardized flexible system excels) and a diverse and variable one (to which the flexible system of production is more able to answer). This effort to introduce to think the existence of various SP and firms within a national system should be highly valued. However, the argument used lacks of generality.

3.1.2 The contribution of an evolutionist approach

By comparison to these three approaches (VOC, CIA and SSP), the evolutionist theory is certainly the most successful one in combining the variety of capitalism and the diversity of firms' organization and performance (Nelson, 1981, 1991)[16]. It should be first recall that the evolutionary approach also contains a theory of the diversity of capitalism (Nelson, 1993). The prevailing institutions – private and public, rival and cooperative – are seen as having evolved through a complex set of processes that involve both individual and collective action, institutional change, like technological change. The result is that modern capitalism is a very complex system; that is why there are major differences among the major modern capitalist nations.

Regarding firms' heterogeneity, the argument starts with a stylized fact, which can be built from the industrial censuses: different vintages of firms and technologies coexist in most countries over long periods of time. As a result, one observes considerable intra-industry productivity differences among firms in the same industry and in the same country. The theoretical effort to understand this stylized fact then requires going beyond the pure perspective of an economist, to integrate the results from the management science (Nelson, 1991). The economists recognize firms' differences across sectors or countries. However, these differences only reflect differences in the contexts in which firms operate. On the contrary, the evolutionist theory is

[16] We focus here on a very specific "branch" of the evolutionist approach, the so-called "Neo-Schumpeterian" one, which has particularly emphasized firms' heterogeneity.

fundamentally interested by *discretionary* firm differences. The basic assumption is to understand this fact is a certain looseness of constraints, both in the short and in the long run, that gives room so that firms that differ in certain important aspects can be viable in the same economic environment; these differences are the result of different strategies that are used to guide decision making at various level in firms. It then affects the structure and the capability of each firm. A part of the evolutionist explanation lies in the statement of the considerable variation among firms in the technology they create and adopt and in the large gap between average practice and best practice: in a world in which innovation is permanent, innovators and imitators, leading and lagging firms will simultaneously exist. Another part of the explanation is relative to the considerable range of flexibility left by technology and managerial instructions and overview; that is why internal organization of the firm matters.

The evolutionist approach is therefore particularly attractive to conciliate firms' heterogeneity and diversity of capitalism. However, it is characterized by two severe drawbacks, which are discussed successively: first, the uni-dimensional understanding of the determinants of firms' heterogeneity, which is itself rooted in a restrictive vision of the firm, focusing almost exclusively on technology and innovation; second, its simplistic normative evaluation of firms' heterogeneity.

3.2 Generalizing our understanding of the determinants of firms' heterogeneity: beyond uni-dimensional technological determinants

This section aims at generalizing the empirical findings of the part 1.

3.2.1 Preliminary: which theory of the firm?

An evolutionary theory of the firm. What is needed in our own framework is a theory not only allowing for firms' heterogeneity to some extent but whose major aim is to explain the *discretionary* firm differences within a same country, a same sector and for firms of similar size. Given this prescription, our theory of firms has naturally an evolutionary flavor. More precisely, we retain two major ideas from various strands of the evolutionary theory of the firm. First, in an environment characterized by a fundamental uncertainty, it is inevitable that firms choose different strategies, which are always some forms of experimentation. Then, these choices will affect their structure (or organization) and their capabilities (Nelson, 1991). Second, if one views the firm as a collection of resources or competences (like in the dynamic capabilities approach or even in a resource-based perspective, which is not evolutionist), learning becomes important. This cognitive process is partly based on the past experience, which implies strong elements of continuity. Moreover, as the most important resources of the firm are the organizational capabilities themselves, which are basically non transferable, each firm's organization is characterized by important idiosyncrasies (Dosi & Malerba, 1996; Dosi & al., 2000)[17].

[17] Are reformulated here some decisive intuitions by Oï (1983).

Departures from the evolutionist perspective. These two ideas – the importance of uncertainty and of learning to explain firms' fundamental heterogeneity – are then nuanced as follows. First, the uncertainty is of course influenced by the business cycles (and the market perspectives) and by the technological changes. But these are not the only two elements of uncertainty that each firm has to face. In a changing institutional and legal environment, the domains and scope of strategic and organizational choices a firm has to make tend to widen. For example, in a context of financial deregulation and increasing openness, the range of possibilities for each firm is increasing, and the choices to be made are not without consequences. Second, the learning and the capabilities do not concern only the innovation. A fundamental departure of our perspective with the evolutionary approach is that we include the choice of technology and more generally the innovation as an essential part of the firm strategy, but not as the key of everything. To put it simply, in our view, the evolutionist approach tends to overemphasize the importance of technology and innovation. It is true that this is capital in some high-tech sectors. It is also true that each firm innovates, in a way or another, not only in spending specific resources for R&D. However, before technology and innovation, most of the firms have first to make decisions regarding other dimensions of their organization and strategy. Moreover, even if one should not restrict the innovation to the R&D, it is important to recall that, for example, the practice of R&D concerns only a minority of Japanese firms (see paragraph 1.2.4).

Five dimensions of firms' organization and strategy. As a whole, we distinguish five dimensions of firms' organization and strategy, for which choices will be the root of firms' heterogeneity. Three of them concern specifically the organization: these are the diversification of products and the organizational structure, the corporate finance and governance, and the human resource management. Two are related to what one could call the strategy level: these are the innovation and the internationalization. Strategy is distinguished here from the organization, as innovation and internationalization are in a sense "optional". In particular, contrary to what is postulated by the evolutionist approach, innovation is not the essence of firms' behavior. This essence is better defined by the production of goods and services through the mobilization of diverse resources. In this sense, the investment – and the associated capital accumulation – is the "zero degree" of firms' activity. Of course, at the same time, the resulting supply is expected to meet a demand. This is the locus of the first logical dimension of firms' organization: the degree of diversification of products and the type of organizational structure. The firm has indeed first to choose what kind of goods or services it will produce or deliver. This choice has a direct impact on its internal organizational structure. However, for a given diversification, the firm has still degree of freedom to choose its organization structure (e.g. form and number of divisions). The human resource management and of the corporate finance and governance are the two following dimensions of the firms' organization. We are here influenced by the work of Aoki (e.g. Aoki, 1989), who convincingly showed how the choices for these two dimensions are a primary source of differentiation of the firms' organization.

In our framework, innovation logically comes in the fourth position to characterize the choices that each firm has to make. At the same time, it is the first dimension of firm's strategy. As well shown by the evolutionist

literature, it is even capital for the development of dynamic capabilities of the firms. However, this is only one element among five, which characterize each firm. Finally, internationalization is the second dimension of firms' strategy (and therefore the fifth characteristic of each firm). As innovation, it concerns only a minority of firms, mainly (but not exclusively) the manufacturing firms. The choice of internationalization has become relatively recently a key dimension of firms' strategy – and not only for the large multinationals – in a context of globalization. It is basically related to the choices of export and/or FDI.

These five dimensions are integral parts of the organization and the strategy of firms. However, are they exhaustive? More specifically, we did not include another potential candidate, the relations with other institutions and organizations, namely with other firms and with the government. It is *de facto* an essential part of firms' strategy. However, we did not select it at this stage for at least three reasons. First, it is already partly included in the five dimensions distinguished above: for example, the decision to do a joint research with another company or to participate to government sponsored research consortia is a part of the innovation strategy. Second, it concerns by definition what is external to the firm, while the five other dimensions are more "internal". Last but not least, it occupies a specific place in our framework and operates at a different level, which will be defined below as the coordination level.

Looking for complementarities: defining models. In a second step, the nature of the firm's organization and strategy is defined by the complementarities between the five dimensions distinguished above. This point has been already developed in the paragraph 1.3.1 in the case of the Japanese firms and will not be repeated here. Let us just underline that it is precisely at this level, which implies coherence, that heterogeneity fundamentally takes place, even if, of course, some heterogeneity appears for each dimension of the firms' organization and strategy.

3.2.2 Heterogeneity of performances, heterogeneity of models

The various models emerging from the complementarities between the five dimensions of firms' strategy will lead to different performances. Two points should be clarified regarding this issue.

First, it is worth recalling that the size and the industry are two major determinants of the choice of organization and of the performances of one give mode of organization. However, as seen through the case study of the Japanese economy during the Lost Decade, there is room for heterogeneity within a same size class and/or a same industry. This "discretionary' heterogeneity is the main object of our analysis.

Second, there is no simplistic correlation between the firm's organization and its performances. These last ones will depend on the environment but also on the internal coherence of the organization. Consequently, there is no model superior to another one over time and across different institutional contexts, as shown by the analyses in terms of productive models (Boyer & Freyssenet, 2000; Boyer & al., 1998).

3.2.3 Converging and diverging forces

In direct relation with our departure from the evolutionist theory of the firm, because of its almost exclusive focus on technology and innovation, our analysis of the converging and diverging forces at work in the economy also diverge from a "pure" evolutionist perspective. The understanding of these forces is essential in our framework because their net effect leads to a more or less intense heterogeneity across firms. Our assumption is that these forces are not limited to the technology and they vary across countries, industries and over time.

Basically, according to the evolutionist theory, the driving force of the heterogeneity of firms is the technology. In one side, the innovation is a powerful diverging force, while, on the other side, the diffusion is an efficient converging force. Without neglecting the influence of the technology on the firms' heterogeneity, our framework aims at introducing other factors. One is related to the macroeconomic an industrial cycles. The level of activity has obviously an impact on the heterogeneity, even if the net impact is rather ambiguous, as it has been seen through the Japanese example.

More importantly, our perspective particularly focuses on the institutional determinants of the heterogeneity. The most obvious is the degree of internationalization of the national economy. As seen in the Japanese case, the deregulation, particularly in the financial sphere, is also an important determinant of the overall heterogeneity, as it affects the number of possible choices that the firms are facing. Last but not least, the forms and intensity of coordination in the economy affects the firms' heterogeneity. This point is developed below.

3.3 Normative evaluations of firms' heterogeneity: its impact on inequalities and on the macro-performance of countries

A second departure from the evolutionist approach concerns the normative evaluation of the heterogeneity. We discuss here this point in two steps, the first one focusing on the inequalities, the second one providing a critical view on two types of evaluation of the performances of an economy with heterogeneous agents.

3.3.1 Firms' heterogeneity and inequalities

As it can be seen through a simple model, in the presence of homogenous workers, the inequalities observed in terms of wages and employment conditions in general should come from some sort of heterogeneity on the side of the firms (Oi, 1983). This firms' heterogeneity is a sufficient condition to generate wage inequalities. To put it differently, firms' heterogeneity is always detrimental from the point of view of inequalities. Therefore, firms' heterogeneity has a social cost, whose normative evaluation is open but which should not be under-evaluated.

3.3.2 Economic gains of the diversity of organizations

Despite their diversity, the different branches of the evolutionist approach converge in their positive evaluation of the micro heterogeneity for the performances at the macro level. Without pretending to be exhaustive, we can distinguish here two arguments, respectively from static and dynamic perspectives.

The basis of the reasoning concerning the potential static gains of organizational diversity can be summarized as follows[18]. A particular organizational mode will not be the most efficient mode in all industries. The best possible option would be to have a pluralistic economy in which different organizational modes are selected in accordance with the particular market and technological environments facing each industry. That is why economies with institutional structures that tolerate the entrance of experimental organizations are likely to perform better than others.

As for the dynamic-type argument, it takes more or less the following form[19]. The diversity of technology and organization plays a positive role in providing flexibility and adaptability. Some losses in static efficiency (the average firm is far from the best practice) might be overcome by the gain in dynamic efficiency, due to the variety of alternative technologies and organizations that could be developed as firms constantly face new environments. In this framework, competition is not primarily about allocation of resources through a system of prices but more fundamentally about exploring new, potentially better, ways of doing things, about generating the variety of new routines, and the attendant shifts in resource allocation on which economic progress depends.

Both arguments are partially true but they are over-optimistic. They share what we consider as a common illusion, based on a natural science metaphor. Yet, if the concept of Darwinian selection process applies very convincingly to the diversities of natural species, it should be used very carefully in the case of organizations and especially firms. Beyond this very general critic, we would like to emphasize here a common limit shared by the two arguments: the underestimation of the problem of coordination related to firms' heterogeneity. Large heterogeneity of firms is not always the guarantee for growth. If organizational diversity is beneficial for the exploration of potential new opportunities, it raises issues regarding the selection of the various paths and the diffusion of organizational innovations. For example, in the case of technology, spillovers are not automatic, coordination is required. The final paragraph of this paper is devoted to the development of our concept of coordination.

3.4 Reconsidering the link between firms' heterogeneity and macro-performances: why coordination matters

3.4.1 The theoretical foundation of the concept of coordination

[18] This presentation is inspired by Aoki (2000).
[19] The summary of this argument is based on Nelson (1991).

In our framework, the source of the coordination problem is neither the division of labor nor the structure of the game, but rather the fundamental heterogeneity of organizations. Our concept of coordination is directly related to the existence of heterogeneity at the micro-level. In a world with only identical agents, there is no need of specific coordination beyond a pure market approach. In a world with heterogeneous agents, there is *a priori* still a place for coordination through markets. However, as it appears in the tradition of the General Equilibrium, markets loose their comparative advantage from the point of view of coordination as soon as the agents are no more identical.

The theoretical interest of this concept is to analyze the interaction between the macro and the micro level. It is not about allocation issue. It is rather about interaction between heterogeneous agents and aggregation of their behaviors and performances. Another characteristic of this concept is that it takes place in a completely decentralized environment. This is precisely because of this decentralization that coordination is required, as shown in the case of Japanese capitalism, whose coordinated nature cannot be understood without its decentralized nature.

The main source of inspiration comes from the tradition of mathematical economics, which criticizes the neo-classical hypothesis of the representative agents and propose an alternative framework to think the aggregation of heterogeneous agents (Kirman & Zimmermann, 2001; Cowan & Jonard, 2003). In fact, the inability to think the heterogeneity of firms within a given form of capitalism by theories of the diversity of capitalism (at the exception of the evolutionist approach) comes from the same drawback than the neo-classical framework, the assumed existence of a representative agent in each form of capitalism. In this context, a drastic change is required as seen through the example of the Japanese capitalism, a change of the same scale than the one proposed by Aoki and Yoshikawa (2006) in the case of a more standard approach of economics. The issue at stake is indeed to propose a new foundation of institutional economics, based on the firms' heterogeneity.

3.4.2 Specifying the concept of coordination

As it can be seen through its theoretical foundation, the coordination issue that we emphasize is located not within organizations like in the VOC approach but between them. As seen in the Japanese case, it takes basically two forms, the between firms coordination and the coordination by the government. Therefore, coordination does not mean government intervention. Moreover, the between firms coordination is a private form of coordination but is outside the scope of market coordination. This concept of coordination goes beyond the dichotomy between State and markets. Moreover, this is a macro concept. However, as shown through the example of inter-firms coordination, it can also be thought as operating at a meso level. As a whole, coordination is located at the aggregate level.

This concept of coordination is associated to a specific concept of equilibrium, very similar to the one developed by Aoki & Yoshikawa (2006): equilibrium should not be thought as a deterministic point but rather as a probability distribution over a set of points. For example, this equilibrium is characterized by a number of productivity levels rather than a unique level of productivity: productivities across firms do not equalize.

However, coordination is not only static and also allows thinking the different dimensions and levels of institutional change. As firms' heterogeneity evolves, the institutional change takes place at the micro level, through the impact of macro factors like technological change, business cycles, and changes in the institutions, whose effect is mediated through the choices of individual actors. The institutional change also takes place at the macro level, through the evolving coordination devices. To summarize, coordination has a double dimension. At a given level of heterogeneity, it defines the conditions of the micro-macro interaction. But it also influences the evolution of the heterogeneity at the firm level, as one of its determinants.

Examples of coordination devices have been given in the Japanese case: these are the *shunto*, the *keiretsu* and subcontracting structures, or the industrial policy. As it can be seen through these examples, an area where coordination is particularly important is that of the spread of technological innovation. More precisely, such forms of interaction, like externalities or spillovers are not automatic and require some coordination devices to be effective. However, diffusion of innovation is not the only field where coordination is necessary, as it is apparent with the example of *shunto*.

Finally, it is worth underlining that this concept of coordination is definitively on the "constructivist" side. Despite their critical differences regarding the homogeneity/heterogeneity of agents, the conditions of aggregation and the understanding of dynamic, the standard and the evolutionist approaches share the idea of the existence of a "spontaneous order". More precisely, in a context of micro heterogeneity and of evolutionary technical change, the evolutionist approach needs some kind of self-organization to produce an order. Therefore, it is not surprising that Dosi & al. (1988) use the metaphor of "Evolutionary Hand" to explain the production of this order in a very similar way than the famous "Invisible Hand" required in a standard approach to explain the functioning of the markets. On the contrary, our concept of coordination has nothing to do with a "natural order". This is a pure institutional and political construction, even if it is fair to recognize that the effects of the various coordination devices largely go beyond what is often expected or thought by the actors themselves.

3.4.3 The political dimension of coordination

Finally, we would like to underline the political dimension of our concept our coordination. It is first worth recalling the critics by Amable (2003) regarding the "economicist" view of institutions: according to this perspective, institutions emerge spontaneously and unintentionally out of individual interactions. On the contrary, Amable argues that institutional design reflects conflict over distributional issues; in this context, individual interactions leads to institutional equilibriums reflecting power asymmetries and conflict of interests. Institutions are not primarily designed to solve coordination problems between equal agents with similar interests, but to solve conflict among unequal actors with divergent interests. To summarize the critics by Amable, an approach in term of coordination is misleading in three respects: first, it forgets that the economic relationships take fundamentally place between unequal actors; second, the distribution issue should not be separated from the coordination issue; third, the nature of the institutions is fundamentally politic.

Let us show that our concept of coordination largely "escapes" from these critics. First, focusing on the heterogeneity of players, we allow for the introduction of unequal characteristics. Second, regarding the issue of distribution, it is possible to answer as follows. On the one hand, as it has been underlined, heterogeneity is never good for inequalities, and therefore some distribution devices are required if the level of inequalities is considered as a problem. On the other hand, and even more fundamentally, coordination by itself is often a way to redistribute across different types of organization as distinguished according to their efficiency, as it appears in our interpretation of the dualism in Japan and in the concept of "bureaupluralism" developed by Aoki.

The third dimension of Amable's critic is more difficult to answer. We refer here to the argument developed by Gourevitch (1996), which applies satisfyingly to our own approach: (1) The microstructure of industries and firms has a substantial impact on the performances of economies; thus it should be an essential object of study in comparative capitalism; (2) these microstructures are shaped by regulatory policies within countries that structure incentives of the firms to use one organizational form or another; (3) changes in structure within countries - for example in response to international competitive pressures - do not happen automatically but are mediated by policies; (4) the policies themselves arise from political processes in each country. In other words, the coordination issue is also highly political[20]. To answer, more directly to this specific objection, it is also possible to emphasize the fact that an increasing heterogeneity of firms implies divergent interests, whose coordination should be done by professional organization or the government. Therefore, the political dimension is an essential attribute of our concept of coordination.

[20] Although he convincingly developed an approach, in which coordination and power issues are jointly analyzed, we do not refer here to Bowles (2004), because his concept of coordination is based on a game theory approach and is therefore clearly distinct from ours.

Conclusion

Through the case study of the Japanese economy during the Lost Decade (1992-2005), we have argued in this paper that the implicit assumption of a representative firm in each national form of capitalism introduces severe drawbacks in the analysis of the variety of capitalism.

Taking into account the increasing heterogeneity of Japanese firms during the Lost Decade leads us to propose an alternative interpretation of the Japanese crisis as a lack of coordination of this heterogeneity: the increasing heterogeneity of Japanese firms had a negative impact in term of performances, due to the decay of (private and public) coordination devices. In turn, it should also lead us to revise our understanding of what is the Japanese model. Its coordinated nature is not enough to characterize it. Its decentralized and differentiated structures are also two key elements. Finally, not taking into account the fact that these three characteristics are evolving over time leads to a misunderstanding of the organizational and institutional changes in the Japanese economy.

In the 1980s and the early 1990s, the research agenda to analyze the specificities of the Japanese capitalism has consisted in comparisons with the American capitalism. It has led to a better understanding of both forms of capitalism … even if a more systematic comparison with Europe would have been desirable. The present paper is a call for a renewal of the studies on the Japanese capitalism. The idea is not to give up the systematic international comparisons at the aggregate level but to focus on the diversity of firms within the Japanese form of capitalism. Another object of research, which emerged from this paper, is the analysis of the new lines of segmentation within the Japanese economy. If size and industry obviously matter, they are not enough to understand the dynamic of the Japanese firms and of the Japanese capitalism. Further research should assess the new differentiated structure of the Japanese economy.

Finally, beyond the Japanese case, this paper aims at promoting a new research agenda for the institutional approach of comparison of capitalism, providing a systematic analysis of firms' heterogeneity within each form of capitalism. If the evolutionist approach is a priori better equipped than others, because of its focus on "discretionary" heterogeneity across firms, it has two important limitations: its exaggerated emphasis of technology in its theory of the firm and in its analysis of the determinants of the micro heterogeneity; its simplistic normative evaluation of firms' heterogeneity as the engine of growth. Any institutional comparative analysis of capitalism should be based on a more complete theory of the firm and on the idea that the impact of micro heterogeneity on macro performances fundamentally depends on the quality of coordination at the aggregate level.

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