Diversity of Corporate Governance-Organizational Architecture Linkage:

Complementarities and Human Assets Essentiality

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Chicago, 7 January 2007

1. INTRODUCTION

The standard view of the corporate firm in economics is that of a hierarchical series of principal-agency relationships. The architecture of the internal organization is viewed as a nested hierarchical structure composed of the principal-cum-supervisor and the agents-cum-subordinates, within which the authority of decision-making is delegated from the former to the latter only within a contractual limit. The top management of the internal organization is considered as the agent of the investors who exercise their control through the financial market (and the board of directors) within the orbit of the legal setting. In essence, corporate governance is simply viewed as dealing with "the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment" according to an often-quoted survey of the corporate governance literature by Shleifer and Vishny (1997). However, we would argue that there are various patterns of linkage between corporate governance (CG) mechanisms (institutions) with organizational architecture (OA) as a non-market information system, the workings and implications of some of which cannot be adequately understood in terms of the standard framework. In this paper, we propose a simple framework for capturing distinct patterns of the linkage between CG and OA, clarifying basic conditions for each of them to be viable and speculating on a possible route for the emergence of a new pattern.

One possible conceptual and analytical approach to the linkage between CG and OA is to treat the corporate firm as the domain of a game between the manager, the workers and the investors (of various types) and regard a stable linkage between a particular type of CG and that of OA as an instance of equilibrium outcome of strategic interplay among those players. There can be multiple equilibria even for a simple structure of the game, out of which the selection may be conditioned by the values of institutional parameters surrounding the domain of the game (the exogenous rules of the

game). The formal rules of law, institutional organization of market processes, and prevailing social norms may be reckoned as constituting such parameters. By incorporating the workers as explicit players of the game alongside the investors and the managers (and further introducing the government and various types of market participants as possible parameters), this approach may be regarded as an attempt to operationalize the so-called "stakeholder" view of CG (see also Aguilera and Jackson 2003). However, it also anticipates the conventional market-controlled hierarchies as a possible equilibrium under certain conditions. This equilibrium solution corresponds to the standard, "corporations-as-property-of-investors" view. Thus, the game-theoretic view may be regarded as a more general approach that treats the traditional debate between the two views from a higher level and reconstructs these perspectives as special cases.

One of the present authors developed a fairly elaborated game-theoretic approach to the linkage between CG and OA in a previous writing (Aoki, 2001, particularly Part III). There he identified four modes of stable equilibrium linkage between CG and OA: owner- or market-controlled hierarchies, corporatist state-cum-codetermination, relational contingent governance, and the venture capitalist governed tournament among entrepreneurial firms. In that writing, he specified the structure of a game leading to each of those equilibrium linkages and provided a rigorous comparative equilibrium analysis. Particularly, relying on a game-theoretic analysis of strategic-complementarities, fits between institutional parameters outside the corporate domain as referred to above and a particular mode of CG-OA linkage are conceptualized as institutional complementarities and analyzed as such. Given the results of that comparative analysis, this paper tries to identify very simple conditions that sharply differentiate among the characteristics of the four equilibrium linkages. These conditions are concerned with relationships between manager's human assets, workers' human

assets, and investor-supplied physical assets. Relationships are conceptualized either as complementarity or essentiality as defined below. We will show that different modes of combinations of these relationships among those assets underlie the different modes of CG-OA linkages. This may provide a simple economic explanation for a diversity of CG-OA linkages.

One possible advantage of the suggested approach is to provide a simple way to identify and interpret the basic nature of institutional change in CG-OA linkages. As easily inferred, the four modes of CG-OA linkages referred to above may be considered as representing embryonic models of the traditional Anglo-American, German, Japanese and Silicon Valley institutions respectively. However, even though their basic nature can be captured as equilibrium phenomena, they can never be static and motionless. Institutions originate and evolve in a historical fashion, where initial conditions, power relationships, and sequences of events play an important role (Aoki 2001, Ch. 10; Thelen 1999). In fact, prompted by the global integration of markets and the development of information technology, those institutions are also being subjected to continual and gradual changes through mutual interactions and learning. Will these changes eventually lead to a convergence of CG-OA linkage mode, or alternatively to the evolution of each to a new mode? In the second part of this paper, we will present a result of cluster analysis that identifies emergent changes in the patterns of CG-OA linkage in Japan. Then using the framework developed in the first part, we discuss whether emergent patterns signal gradual convergence to the market-controlled hierarchies of the Anglo-American type or the evolution of a possibly new mode in a path-dependent manner.

2. Elementary Linkages of Corporate Governance (CG) and Organizational Architecture (OA)

Let us simply assume that the domain of the (corporate) firm is composed of the manager, the workers and investors. To differentiate the characteristics of the four equilibrium modes of CG-OA linkage in the simplest terms, we deal with relationships among manager's human assets (MHA), workers' human assets (WHA), and investor-supplied physical or financial assets in their generic form (PA). In the literature, the firm-specificity of MHA and WHA is sometimes referred to as a key notion for specifying the nature of CG and/or OA. For example, the "board-as-the-trustee-of-stakeholders" view by Blair and Stout (1999) relies on such notion. Some others refer to complementary relationships between MHA and WHA as an important defining factor of CG-OA linkage. For example, Rajan and Zingales (2000) relies on them in refuting the relevance of property rights in PA for understanding the nature of an emergent CG mode in the so-called era of IT revolution. Although those views have substantial merits for understanding some aspects of diversity, we would argue that the firm-specificity of MHA and WHA, as well as complementarities between MHA and WHA as such, are rather ubiquitous phenomena of modern corporations and cannot constitute decisive factors for distinguishing one mode of CG-OA linkage from possible others.[1] Instead, we adopt the Edgeworth notion of complementarity between HAs (which denotes "MHA and WHA") on one hand and PA on the other, as well as the notion of "essentiality" of HA formulated by Hart (1995, p.45) where HAs are indispensable to each other and cannot be substituted by PA in the event of their cooperation. We assume that the uses of MHA, WHA, and PA are controlled strategically by the respective stakeholders (owners). A mode of strategic interactions and their stable outcome, on one hand, and a

[1] Firm-specificity of WHA, as well as complementarities between MHA and WHA, can make internal relationships between the two "relational" and their joint outcomes opened to individual or collective bargaining within the firm between the holders of these assets. But these aspects of HAs alone do not necessarily have distinct impacts on corporate governance. As we will see below, CG-OA linkages that are broadly similar to different institutional arrangements such as Anglo-American, German and Japanese models may all involve firm-specificity of HAs and complementarities between them.

mode of relationships among various assets, on the other, are codetermined and reinforce each other under possible influence of institutional complementarities.

A. Unilateral Essentiality: Market Control of Hierarchical OA

Let us start out with the classical case adapting the property rights approach formulated by Hart (1995) and his associates. Let us assume that

- MHA is *essential* in that the marginal product of WHA cannot be enhanced without the input of MHA, even if the residual rights of control (the rights to decide on the use of PA in contractually unspecified situation [Hart, 1985]) of PA is endowed to the workers.
- MHA and the ownership control over PA are *complementary* even without the cooperation of WHA in that the marginal value of MHA can be increased with the residual rights of control over PA.

Note that these two conditions do not preclude the complementarities stemming from cooperation between firm-specific MHA and WHA. The first condition of MHA's essentiality may be interpreted as capturing the essence of hierarchical ordering of organizational activities in which the manager specifies and constraints the ways in which WHA is used in operational activity. Note that this condition negates a possible complementary relationship between WHA and the workers' residual rights of control over PA in the event of non-cooperation. The second condition is prominent in the property rights approach of Hart. If these two conditions hold, they would imply that the integration

of management and ownership control of PA is the second best solution (In the worls of asymmetric information the first best solution cannot be implemented). [2]

If the manager is constrained by their own financial resources for the ownership of PA, then (s)he must rely on the supply of financial resources by investors and be subjected to market-controlled agency-contracting through which the residual rights of control over PH is delegated. Here market-financing may be said to complement the hierarchical OA in the sense that market-finance can increase the marginal contributions of MHA through the relative specialization of 'ownership', such as risk bearing functions, and 'control', which relies on specialized managerial expertise (Chandler 1977), under this setting. This is the type of CG-OA linkage most familiar to economists and remindful of the essential feature of the so-called Anglo-American model, so that much does not need to be said about this here. But a question highly relevant to us is whether this is only possible solution? If not, what situation warrants other solutions to become strategically viable?

B. Institutional Complementarities between the State and CG-OA Linkage

As in the first case, let us start with a simple situation in which the manager is not constrained by financial resources to own PA. Suppose that

- WHA and the (partial) residual rights of control over PH is complementary in workers' preferences.

That is, the workers are interested in participation in the design of work environments, the control of machinery in response to unusual events, etc., to enhance the marginal products of their own WHA and/or non-material satisfaction. On the other hand, the manager prefers not to give either wage

[2] If there were a unique and implementable first-best solution that exists, then comparative institutional analysis would lose meaningful subject of study.

premium nor to relinquish (partial) residual rights of control to the workers, but may need to grant workers one or the other to some extent in order to motivate the accumulation of WHA by the workers. Under this scenario, two (sub-game perfect) equilibria may be possible in the framework of repeated games between the manager and the worker, depending on the value of institutional parameters that define the mechanism of wage determination (Aoki 2001, pp.287-91). If the standard wage-rate is set external to the firm, such as through a sectoral agreement between an industrial association and industrial union, and the state "enables" the industrial agreement to be generally binding (as in the case of German corporatism), then cooperation between the holder of MHA and that of WHA may be sustainable on the basis of residual rights sharing (in the form of workers' participation in governance structure, the works councils, workers' stockownership plans, etc). If the state is "liberal" in that it does not intervene in private wage-contracting, the classical Hartian solution may emerge on the basis of workers' sharing in firm-specific surplus in the form of wage premium with the residual rights of control exclusively accruing to the manager. Participation is likely to be unstable in liberal states, since state intervention to establish 'non-contractual conditions of contracts', in Durkheim's sense, is necessary to complement cooperative outcomes of participation by lessening its dependence on the market power of workers and unions, and removing some contentious issues from firm-level negotiation so that local parties focus on their positive-sum gains (Streeck 1995).

If the manager is constrained financially in the control-rights-sharing case, the outside investors are invited to provide financial resources and participate in CG structure such as in the form of codetermination a la Germany. It can be shown that outside investors prefer long-term lending to equity participation in this case, because in this way their preference in corporate control becomes congruent with those of the workers in restraining excessive risk-taking of the manager (Aoki, *ibid*.) .

In that sense, corporatism, co-determination and the *Hausbank* system in the traditional German model may be considered as constituting an institutionally complementary cluster, while the stock market control of hierarchical ordering of HA and the liberal state as another.

C. Symmetric Essentiality and Relational Contingent Governance

In the classical hierarchy, the essentiality of HA is exclusively and unilaterally attributed to the manager. Let us adopt now the following two alternative hypotheses:

- Both MHA and WHA are essential to each other in that the marginal product of each cannot be enhanced without other's cooperation.
- Their respective marginal contributions in cooperation are not individually distinguishable/observable under the impacts of uncertain external factors on their collective performance.

The second assumption is essentially equivalent to that of the "team" property of OA originally due to Alchian and Demsetz (1950). If the design of OA involves information-sharing across the management and the workers, as well as among the workers, as an indispensable feature for its efficient operation, such property may be thought to hold. For this type of OA, even if the external supply of PA is necessary for its operation, PA and individual HAs in isolation cannot be in complementary relationships. Then, it can be shown that the following type of CG is the second-best (Aoki 2001, pp.291-305).

A relational monitor-cum-investor (alternatively a delegated monitor for the investors) sustains the on-going relationships within the team composed of the holders of MHA and WHA. As far as she observes that the collective performance of the team meets a certain critical threshold point,

she delegates the residual rights of control over PA to the team and receives a constant contractual rate of returns to investment. Meanwhile, any surplus can be distributed among the holders of MHA and WHA according to organizational rules or conventions (such as seniority rules). When the collective performance falls below the critical point, she decides whether to bail out the team if preserving the continuation value of the team is judged to be worthwhile, or else withdraw the investment and punish the team members by its decomposition. Since the control rights shift between the team of HA holders and the relational monitor contingent on the value state of the firm, this model may be called the relational contingent governance model.

The effectiveness of this type of CG for inducing efficient cooperation of the HA holders is enhanced under a number of further conditions. First, HA holders may be more cooperative when the outside opportunity values for them as a threat point are worsened. This would be the case when other organizations are likewise organized as teams of long-term associations so that the reemployment of HA holders disbanded from a failed team becomes harder without the substantial loss of essentiality. Thus the convention of long-term employment in the organization domain is considered as an institutional complement to the linkage between the relational contingent governance and the team-like OA. Second, the role of relational monitor may be considered as approximated by the so-called main bank whose associations with client firms is relational.[3] Then the institutionalization of the main bank system also constitutes an element of a complementary cluster surrounding this linkage. Conversely, where the demand for external capital declines or banks become less effective in monitoring, the incentives of HA holders may be lessened due to lack of external discipline. Last, the value of team-

[3] Conversely, the organizational convention of the team-like OA enhances the incentive of the main bank to bear the role of relational monitor, because firms of that type are willing to pay insurance premium for possible bailing-out by the main bank in the event of mild financial distress. See Aoki (1984)

like OA in the context of integrated production system is enhanced where competitive advantage based on incremental forms of innovation, in contrast to situations characterized by higher technological or market uncertainty as we will discuss in the next section with regard to venture capital governance.

D. Encapsulated Symmetric Essentiality and Venture Capital Governance

Some aspects of relationships between venture capitalists (VC) and entrepreneurial start-up firms (ESFs) are known to be akin to the relational contingent governance (Kaplan and Stromberg 2003; Aoki 2001, Chapter 14). VC initially provides only a limited amount of seed money for founding ESF and afterwards it decides whether to provide further funding to the latter, restructure their management and salvage potential values of their HA, or liquidate it, depending on the progress of its development efforts. In successful cases, the relationships will be terminated by Initial Public Offering (IPO) of the ESF or its acquisition by an established firms. As it is normally the case that the VC initially provides seed money to multiple ESFs proposing similar development projects and become increasingly selective in later financing, the process may be thought of as a tournament game played among ESFs with the VC as a referee.

As in relational contingent governance, within each ESF a high degree of symmetric essentiality of HAs may be involved. However, one important characteristic of the VC-ESF relationships is that a high degree of symmetric HA-essentiality is encapsulated within respective, small-scaled ESF, but not spread within a single OA integrating a host of activities. Each ESF is specialized, and compete with others, in the development of a particular module of a potentially large innovative product system. The design of such a product system is not decomposed into modular designs by ex ante centralized planning (as in the case of the development of IBM System/360), but it evolves through ex post

combinations of successful modular designs. In order for such mechanism to be workable, it is necessary that only simplified interface rules among modular products are publicly made open ex ante or interim through communications mediated by VCs and other means. It implies that technological and attribute complementarities among modular products are to be minimized so that their design efforts can be made separable (technically this requirement can be better facilitated in the digital-based industry where design and its manufacturing implementation can be separated). Thus, if we look at VC-ESFs relationships as a system, the basic nature of its OA may be summarized by the following dual characteristics:

- A high degree of symmetric essentiality of HA is encapsulated within each ESF, on one hand, and a high degree of separability in the use of HA is realized across ESFs, on the other.

In the context of such OA, the VC governs tournament-like competitions among ESFs through the above-mentioned stage financing. Under the condition of a high degree of uncertainty involved in the development of modular designs and their system integration, this linkage is known to have two distinct characteristics: (1) it can generate option values by running parallel development efforts (experiments) by multiple ESFs (Baldwin and Clark 2001), and (2) it can generate externalities by attributing higher expected probability of winning the tournament to higher development efforts of individual ESFs (Aoki and Takizawa 2002). In contrast to OA in the setting of relational contingent governance, this CG mode is more suitable to the high risk and high incentive structure, and greater use of external organizational flexibility with the network-based role of the venture capitalist to cope high uncertainty and brokering ongoing new combinations of HA.

3. Path-dependent Institutional Change: the Case of Japan in 2000's

In the previous section, we have identified four embryonic modes of linkage between CV and OA. One of those modes, relational contingent governance, may be thought of capturing some essential elements of the traditional Japanese system characterized by institutional complementarities among the life-time employment system, the team-like OA (the so-called J-firm), and the main bank system. However, as we documented and analyzed in detail elsewhere (Aoki et al,,2007), the Japanese system has been exhibiting substantial changes, as well as robust continuity in some respects, in the last decade or so. For example, the norm of lifetime employment has remained remarkably robust, but the number of full-time regular employees has gradually decreased and labour has become more mobile in certain industries. There are important changes in the role and scope of the main bank as an institution, new pressures from foreign institutional investors, and the efforts of firms to increase transparency and adapt the structure of their corporate boards in the context of a new legal-setting. It is interesting to examine what these changes imply: whether they indicate a gradual system convergence to another existing linkage such as the Anglo-American norm, the evolution to a new or hybrid linkage, or a superficial modification of distinctive traditional system. In this section, we first present a systemic picture of the changes based on cluster analysis and then try to interpret the nature of the changes by adapting conceptual tools as developed in the previous section.

A. Cluster Analysis of Emergent Diversity

First, let us develop an inductively based typology of the increasingly diverse CG-OA patterns among Japanese firms using survey data collected by the Policy Research Institute of the Ministry of Finance

and Nikkei in 2003.[4] The sample is limited to non-financial firms. The typology is based on a cluster analysis, which groups firms into distinct clusters that maximize the statistical differences between each group, while minimizing the variation within each group. The cluster analysis thus highlights the most common configurations of variables within the sample of Japanese firms. Fourteen data items were included in the analysis that can be interpreted broadly along three theoretical dimensions:

- Finance and ownership characteristics: market-oriented (e.g. bond finance and institutional investors) or relational (e.g. bank finance and cross-shareholding)
- Board and management characteristics: outsider-oriented (e.g. outsider boards and high disclosure) or insider-oriented (e.g. insider boards and private information).
- Employment and incentive characteristics: market-oriented (e.g. no lifetime employment, merit pay and use of stock options) or relational (e.g. lifetime employment, seniority pay, and no stock options).

If we apply the reasoning developed in the previous section, we may expect that these aspects co-vary between the financial characteristics, on one hand, and the two sets of internal characteristics related to boards and employment, on the other hand. That is, market-oriented financial characteristics will go together with more outsider-oriented boards and market-oriented employment and incentive characteristics, and vice-versa. However, the results of cluster analysis indicate that the new combinations of market finance with greater insider or relational orientation in terms of OA (Board, management, and employment characteristics) emerge as a dominant linkage.

--TABLE HERE--

[4] This data and the method of cluster analysis are described in detail in Introduction and Chapter 12 of (Aoki 2007).

Table 1 shows the average values for each group identified in the cluster analysis. The results suggest that Japanese firms fall into three broad groups: traditional Japanese (J-type) firms with strong relational elements on all dimensions, and two types of 'hybrid' firms that either combine market-oriented finance with relational OA, or relational finance or insider boards with more market-oriented employment and incentive patterns. The first and second groups can be further divided into two sub-clusters in order to highlight potential variation within each broad 'type'. Next, we describe these groups in some detail.

J-Firm Clusters. The first broad cluster composed of the columns (1a) and (1b) are traditional J-type firms with or without a slight reform in their respective internal characteristics. In terms of finance and ownership, these firms use predominately bank finance rather than bonds and have high levels of inter-firm shareholding, but low levels of ownership by foreigners or financial institutions. In terms of boards and management, firms belonging to the subgroup (1a) have not undertaken large reforms of their CG practices by 2002. These firms have low scores across all aspects of the corporate governance index (CGI), reflecting low shareholder influence, few outsiders on the board, and low levels of transparency. In terms of employment and incentives, these firms maintain lifetime employment norms and seniority-based pay systems. Only a small percentage adopted stock options as a form of managerial incentive and most of the firms have enterprise unions. As such, these characteristics are consistent with the traditional J-type firm as characterized by the linkage between relational contingent governance and the team-like OA. This group contains a large number of firms from the construction, chemicals, apparel and textiles, and small firms in machinery and automotive sectors. The external elements of firms in the subgroup (1b) are rather similar to those in the subgroup

(1a), but 'modified' the J-type pattern by scoring slightly higher in CG indices and using merit-based pay while keeping lifetime employment norms. These firms are found among retail establishments or automotive firms from the Toyota group.

Hybrid Clusters of Type I: External Monitoring of Relational Architecture. The second broad cluster of firms in column (2) display a 'hybrid' pattern based on market-oriented finance and ownership characteristics, alongside relational employment and board structures with partially outsider-oriented elements. This group thus mixes market-oriented elements externally with non-market or relational OA characteristics. We call this group as Type-I Hybrid clusters. The firms in these clusters make strong use of corporate bonds as a source of finance, and display high levels of ownership by foreigners and financial institutions. Meanwhile, the levels of bank loans and inter-firm ownership are much lower than the J-firm clusters. Turning to internal aspects of board and management, these firms have been the more likely to adopt shareholder rights and bring in limited numbers of outsiders onto boards, but have changed most strongly with regard to greater corporate disclosure and transparency. Notably, however, these firms combine this strong capital market orientation with a relational employment patterns based on lifetime employment norms and very high levels of unionization. These firms have partially adapted relational employment patterns by modifying their predominately seniority-based wages and implementing new pay schemes based on notions of 'merit' (45% of these firms). While these firms have not abandoned seniority entirely, they have adjusted wages to reflect somewhat greater differentials within particular age cohorts based on individual performance evaluation or measures of group and firm performance (Aoki et al. 2007, especially chapters 9 and 10).

This group includes a substantial proportion of the largest internationally oriented firms. Electronics and communications are well represented, but wide ranging in terms of sectoral characteristics.

The Type-1 'hybrid' cluster is also more internally heterogeneous than the J-firm cluster and suggests distinct patterns of change. The first sub-group (2a) is distinguished by very high levels of transparency and foreign ownership, as well as the strong use of merit-based pay systems. This sub-group includes prominent Japanese blue-chips such as Toyota, Canon, or Kao. Toyota Motor Corporation is a good example, having changed its finance methods from bank borrowing to bonds, attained high levels of foreign shareholders and lower levels of inter-firm shareholding, and implementing changes toward greater transparency and stock options. Notably, Toyota has resisted placing outside members on the board and strongly upholds its lifetime employment pattern. The second sub-group (2b) have made more modest reforms to corporate governance in terms of boards and disclosure, and reflects a stronger use of corporate bonds but more modest levels of foreign ownership. This sub-group also retains some more traditional J-firm characteristics, such as modest use of bank borrowing and predominance of seniority-based pay. Well-known examples of this sub-group include Hitachi, NTT DoCoMo, and utilities firms such as Tokyo Electric Power, as well as Mitsubishi group firms. On the whole, these two hybrid groups also have stronger economic performance, in terms of return on assets, than the J-firm groups, which suggests the potential effectiveness of hybrid forms of this type.

Hybrid Cluster of Type II: Relational Monitoring of Competitive Architecture. The cluster represented in the column (3) exhibits patterns asymmetric or inverse to Type-I, which we call Type-II. It is their external elements that are similar to the J-firm clusters, such as strong bank finance and an average

level of inter-firm ownership. Turning to internal aspects of boards and management, the scores of the corporate governance index are average across the board, placing them higher than the J-firm group but lower than the Type-I hybrid group. However, firms belonging to this group are distinctly more market-oriented or 'adversarial' in terms of employment patterns with very low levels of lifetime employment and unionization, as well as frequently using stock options. This group includes IT or other high-tech service firms, retail establishments, general trading companies or family-owned companies. In these sectors, competitive advantage is either less strongly based on high employee skills or utilizes a more mobile external occupational labour market, such as in IT services.

In sum, this analysis suggests the increasing *heterogeneity of CG-OA linkage* among firms between those maintaining J-firm characteristics and those changing toward hybrid patterns over the last decade. The J-firm patterns remain the majority in terms of mere number: 55% of firms fall clearly within this cluster. The major new phenomena in Japan are Type-I hybrid forms among roughly one-fourth of Japanese listed firms. However, these hybrid groups include many of the largest Japanese firms and thus account for 67 percent of total employment. Meanwhile, only 10% of firms fall into the Type-II hybrid group with strongly market-oriented employment patterns. But as we will see, the presence of this group may not be ignored for the emergent diversity. Finally, it is quite notable that no major cluster of firms has yet emerged in Japan having highly market-oriented finance and a hierarchical OA, as outlined with regard to the Anglo-American model. While this possibility cannot necessarily be excluded in the future, the existing empirical evidence clearly does not suggest a strong pattern of convergence on this form of organization.

In terms of economic performance, Type-I hybrid group achieved significantly higher economic performance in terms of return on assets than tradition J-type firms. This poses an interesting question regarding the potential effectiveness of the hybrid linkage. Meanwhile, classic J-firms continue to struggle with stagnant or negative economic performance, suggesting that these firms may either be candidates for CG reform or at least in need of a stronger reassertion of the CG role of main banks, as they emerge from the banking crisis. The Type-II hybrid also achieved above-average performance, but also a very high standard deviation of ROA, suggesting its potential viability at least under limited sectoral or other circumstances.

B. Is a "Hybrid" Institution Viable? External Monitoring of Essential Internal Linkage

The results of cluster analysis presented above immediately suggest a host of interesting questions: How can we interpret the emergent diversity of CG-OA linkage in the Japanese economy? Why do Type-I hybrid firms perform better? How does CG actually work in the Type-I hybrid clusters? Why do some firms opt for the Type-II hybrid forms? Are these forms viable in the long-run?

In the previous section, we suggested that market-oriented financing is complementary to the hierarchical OA, while the life-time employment system is complementary to the main bank system. But the cluster analysis in the previous section appears to challenge such a prediction. The Type-I hybrids combine market-oriented financing with the quasi-traditional employment system, while Type-II hybrids combine the traditional relational financing with more fluid relationships between MHA and WHA, suggesting a hierarchical-oriented nature of OA. Theory of complementarities suggest, however, that while complementary relationships among multiple variables make distinct combinations of their values multiple equilibria, a mixture of those equilibria is not likely to constitute

a stable equilibrium, but merely transitory.[5] [6] Thus, if an apparent hybrid form performs better and is considered to be viable, that form may involve some new element that is not a simple combination of known equilibrium values of variables.

Recall that a crucial factor distinguishing the market-controlled hierarchy from the relational contingent governance of the team-like OA was asymmetric vs. symmetric essentiality of HAs involved. One possible hypothesis that we propose is that the emergence of the seemingly new Type-II hybrid pattern may involve a new type of relationship between MHA and WHA, which may be susceptible to external market monitoring. In the traditional J-firm, the roles of the management and the workers, and thus the nature of their respective HA, are not always strictly distinct and well-articulated. It was a well-understood social norm among the Japanese firms that the top management is to be recruited from the rank of the permanent employees and considered as the pinnacle of their career advancement. This practice facilitated the sharing of information, as well as that of responsibilities for decision-making and their outcomes, and vice versa. However, in the wake of intensified global competition, the development of IT technology and more diverse social values in Japan, the managements of the Japanese firms seem to face a set of challenges to be more autonomous and innovative in the use of their own MHA, while continuing to rely on the essential contributions of associated WHA in a path dependent manner. Thus, we propose a new type of OA in which MHA and

[5] Another possibility is that such mixtures may be thought to reflect a weaker 'compatibility' among elements that survives for other non-economic reasons (Crouch et al. 2005). However, the domain of "social-exchange" may be introduced as an additional domain of the game and sociological concept such as "social embededness' may be analyzed in terms of equilibrium linkage between that domain and economic domains (Aoki 2001, ch. 8).

[6] Technically speaking, complementary (super-modular) relationship among variables implies the non-convexity of the feasible outcome set. Then the marginal incremental adjustments of the variables to increase pay-offs are likely to lead to a local optima at some end points of the outcome set (corner solutions) but any convex combination (mixture) of those points would not be equilibrium.

WHA are internally linked, and mutually indispensable in their respective roles. Suppose that MHA is mobilized for the design of a distinctive managerial business model composed of such things as: organizational architectural design, marketing strategy, organization-specific reward system, relations with the labor union, the design of work environments and corporate values to be shared with the workers, etc. We then assume that:

- MHA and WHA are *reciprocally essential* in that the workers can increase the marginal satisfaction (pecuniary and otherwise) from their WHA only through associating themselves with a matching construct by MHA (a matching business model), while the latter cannot be implemented without attracting and maintaining the workers willing to develop WHA specific to it. Namely, the residual rights of control over PA cannot be substituted for missing specific-MHA or WHA.

This condition of reciprocal essentiality is closely related to the notion of complementarities, but is stronger in that missing cooperation could not be compensated by the residual rights over PA on either side alone. Implicit in this assumption is that the nature of PA is becoming more general-purpose-oriented (as in the case of computers, robots and the like).[7]

If the management lets it to be known as a part of its business model that a proportion of the economic value created by the essential internal linkage will be accruable to the stockholders according to a certain expressed rule and if the stock market is informative, the fundamental stock value may be constructed as a summary statistic correlated to the future values of the linkage. If the board of directors is entrusted to effectively replace or appoint top management contingent on the (expected) long-term stock value, the management can be disciplined to create and sustain a valuable internal linkage. On the other hand, the stockholders themselves may be motivated to do a better job

[7] A similar condition is described in Rajan and Zingales (2000), but they do not make a clear distinction between complementarities and reciprocal essentiality.

of monitoring if they can benefit from making good evaluative judgments. Therefore, there can be complementarities between the creation and sustenance of the essential internal linkage, on one hand, and the stock market evaluation, on the other. In this model, the board of directors ought to act not as the agent of the returns-maximizing stockholders but as the "trustees" for the stakeholders including the workers (Blair and Stout 1999). It would not force the management to increase the stock value at the sacrifice of the workers, because it would be likely to destroy the valuable internal linkage. This model will work better if the government and/or privately-ordered organizations help support and enforce the infrastructure of services for stock markets to process corporate information more accurately and facilitate fair and equitable stock transactions.

In this regard, it must be cautioned that this model depends on a number of conjectures about how capital markets operate, whereas empirically market processes are also medium of power shaped by various diverse players (e.g. relatively patient institutional investors, private equity, hedge funds, or other firms doing M&A). For example, while institutional investors such as pension funds may take a relatively long-term view toward future values on internal linkages, other investors may not. Likewise, institutionalized rules regarding the market for corporate control may affect the conditions under which firms are sold to the highest bidder and thus whether investors may support preserving existing HA. While these issues are empirical ones and often politically controversial, the important theoretical point is that the potential for market inefficiency and misvaluation of HAs may also undermine the essential reciprocal linkage between MHA and WHA within this model.

It may be yet premature to conclude that the core part of the emergent Japanese system, Type-I hybrid cluster, tends to approximate the described model of external monitoring of essential internal linkage (EMEIL). However, this may be a worthwhile hypothesis to examine in the light of several

observations. Firstly, this cluster includes firms that are most competitive in the global market competition, while the traditional J-firm type is not adapting well to the new market environment. Thus, the change from the traditional type to the Type-I hybrid may not be casual but substantial. Secondly, the growing access to globally integrated financial markets by Japanese firms with better business models may have lessened complementary constraints on institutional change on one hand and weakened the disciplinary role of relational contingent governance on the other hand. Thirdly, the reciprocal essentiality between MHA and WHA may indicate a possibility of path-dependent evolution from the symmetric essentiality of the traditional Japanese system. The role of MHA has become more autonomous and unique, but WHA also remains to be essential in implementing the business model constructed by MHA. This observation also suggests that the emergent hybrid form may not converge to the Anglo-American model of market-controlled hierarchy in that WHA remain as essential and not substitutable by PA. Fourth, different from the relational contingent governance there is no clear commitment by a relational monitor to bail-out moderately depressed Type-II hybrid firms. Such bailing-out commitment was necessary to the preserve premature dissolution of collective HA when life-time associations of WHA are conventionalized. However, the co-emergence of Type-II hybrids facilitates labor-mobility in economy-wide albeit to a limited degree and thus eases possible burdens of the unemployed, making the bailing-out commitment less important. This situation suggests interesting complementary relationships between the co-emergence of Type-I and Type-II hybrids.

Thus there seems to be several reasons to hypothesize that the Japanese system may be evolving with the Type-I hybrid clusters as its core. However, this does not mean that the direction of CG reform in Japan is clearly set and pursued. To evaluate the value of the internal linkage between a

business model and WHA, product market evaluations (thus current profits) are fundamental. However, the product market can evaluate only the present outcome of the internal linkage, not possible outcomes in the future. Also, a valuable internal linkage takes time to build. As discussed above, the stock market may be potentially in a better position to predict future outcomes by aggregating dispersed information, expectations and values prevailing in the economy if they can filter noises to a reasonably degree.[8] Even if the stock market is hypothetically assumed to be informative for a moment, a corporate governance structure may not be complete with just that, however. One more critical question still remains to be resolved: How can a stock market evaluation of an individual firm be used effectively in the selection and replacement of management at the firm level? Who will exercise the disciplinary function in critical state of corporate-value?

No single solution seems to have been established yet. For small and medium-sized firms, as well as large firms with large bank loans in the J-firm clusters, banks may continue to perform major monitoring and disciplinary functions in some cases. But for large firms with rather limited bank loans, not to mention those with no bank loans, the ability of the banks to correct poor management before a real crisis becomes evident is definitely limited. One possible alternative to the bank's disciplinary role would be to transform the board of directors from the traditional status of a management substructure into a quasi-independent body that could discipline top executive management in a critical corporate state. As noted already, some firms may be heading somewhat in that direction by adopting a board structure with independent subcommittees or increasing the number of independent directors. How it will work has yet to be seen, but an experiment is certainly

[8] In fact, market prices cannot be completely perfect. If all information available in the economy can be immediately and completely reflected in market prices, then nobody would be motivated to collect information. (Grossman and Stiglitz, 1980).

worthwhile. Further, as WHA are essential in the implementation of business model constructed by MHA, the voice of their holders can also function as important inputs into the CG process through their own organizations (unions) and/or their implicit influence on the board.[9] For start-up firms which are not mature yet for stock market evaluation, venture capital firms that act as sort of market surrogates in a relational manner are gradually gaining visibility.

For the time being, a variety of mechanisms may be tried for using stock market signals or implicit value of the corporate firm for the governance of individual firms and subjected to evolutionary selection. The evolution of corporate governance in Japan will remain a dynamic topic over the next decades not only for its own light but also for comparative institutional analysis in general, particularly for understanding the nature of institutional change.

4. CONCLUSIONS AND FURTHER RESEARCH

In this paper we attempted to understand a possible variety of corporate governance (CG) mechanisms and institutions. In doing so, we departed from the standard principal-agent approach of understanding CG as the ways by which investors control (and/or ought to control) the management of corporations in order to maximize returns to their investment. Instead, we explicitly dealt with internal organizational architecture (OA) of corporations, as well as financial (and in some cases labour) control of them, and explored possible equilibrium linkages between them. Relying on the results of

[9] Existing empirical evidence in Japan suggests that firms with stronger forms worker participation may be more likely to adopt market-oriented corporate governance forms, particularly transparency (Aoki et al. 2007, chapter 12). Likewise, in countries with more formalized worker representation such as Germany, the adoption of market-oriented corporate governance mechanisms, such as stock options, has been reflected in more long-term and carefully designed incentive structures than in the UK (Buck and Sharhim 2005).

game-theoretic analysis, we posited that there can be more than one generic modes of equilibrium linkage.

To explore this venue, we explicitly dealt with two kinds of human assets: managers' (MHA) and workers' (WHA), as well as physical (financial) assets (PA), of corporations and relied on two basic concepts of internal relationships among them: complementarities and essentiality. The latter notion was initially introduced by Hart. We have elaborated on the original concept in our context so as to distinguish its four modes: unilateral, symmetric, encapsulated, and reciprocal. On this basis, we were able to subsume a celebrated property rights solution by Hart as a special case and show the possibility of multiple solutions corresponding to the diversity of these modes. We suggested that those equilibria could be understood as embryonic models of the traditional Anglo-American, German, traditional and emergent Japanese system and Silicon Valley clustering.

Although we have not fully explored comparative advantage/disadvantage of these modes in this paper, one of further avenues of exploration may be thinking how our argument relates to the business strategy literature on competitive advantage. This perspective would suggest that different linkages between CG and OA will produce different sets of competitive advantage. The US model may have advantages related to Porter's industry view of comparative advantage (essentially based on managerial expertise yielding advantages in understanding market opportunities), whereas the traditional Japanese model may be seen as relating to the resource based theory of the firm wherein competitive advantage is based on long-term organizational capacities of workers, etc. in the sense of Penrose (1959), Nelson and Winter (1982), and others. Finally, the VC model relates to an understanding of competitive advantage emerging in economic sociology, where competitive advantage is based on position within social networks that allows for access and 'brokering' of

innovative combinations of MHA and WHA (Burt 2005) and ability to overcome situations of high uncertainty (Podolny 2001).

The model based on the notion of reciprocal essentiality of HAs was proposed as a tentative hypothesis regarding the emergent diversity of the Japanese system and to explain competitiveness of its emergent core part as well as the weakness of its inertial part. In some sense, this emerging model may seek to reconcile different sets of competitive advantages. On one hand, external capital markets give greater access to external resources and more market-based flexibility for managers to shape business models based on entry and exit from businesses through M&A and the like. On the other hand, this model seeks to preserve and adapt other advantages based on WHA and the traditional organizational capabilities distinctive of the traditional Japanese model. While these approaches may seem contradictory, in fact, new combinations of advantages based on both markets and relationships are also reconciled for a particular context by the Silicon Valley model as well as emergent human asset-oriented firms (Rajan and Zingales 2000). As such, this notion of reciprocal essentiality of HAs should not be quickly dismissed. Moreover, this model may be not only interesting in its own light, but hopefully stimulate a further thinking of institutional change as a path-dependent process, and possible avenue through which 'stakeholder'-based organizations may respond to global capital markets.

Table 1: Japan's Emergent CG-OA Indices by Cluster

Cluster	J-firm			Hybrid			Total
				Type-I		Type-II	
Sub-group	1a	1b	2	*2a*	*2b*	*3*	
Bond Ratio	0.02	0.01	0.09	0.06	0.10	0.03	0.03
Bank Loan Ratio	0.18	0.21	0.11	0.06	0.14	0.17	0.16
Shares held by							
financial institutions	21.9	21.5	43.7	45.6	42.5	22.1	27.1
Other firms	32.7	34.1	17.6	16.2	18.5	28.0	28.3
Foreigners	2.6	3.1	14.5	18.3	12.2	4.6	6.0
Individuals	42.0	40.7	23.3	19.2	25.9	44.6	37.9
CGI-shareholders	3.9	5.1	7.2	7.8	6.8	5.7	5.2
CGI-board	9.5	10.5	13.7	13.9	13.6	10.6	10.9
CGI-transparency	7.9	9.3	18.2	19.7	17.1	11.0	11.2
Lifetime Employment	100%	100%	94%	84%	100%	29%	84%
Merit-based Pay	0%	100%	45%	100%	10%	100%	45%
Stock Options	19%	0%	39%	45%	35%	56%	28%
Union	70%	70%	99%	100%	99%	51%	73%
Employees (per firm)	856	1325	6293	7574	5493	1030	2065
Percentage of firms	42%	13%	24%	9.4%	14.7%	21.0%	100%
Employment Share	16%	8%	67%	31%	36%	10%	100%
ROA	0.00	-0.44	0.96	1.74	0.47	1.45	0.49

The diagram shows the results of a cluster analysis using log-likelihood method to find CG-OA linkages among 723 firms. Source: Jackson and Miyajima "Introduction" in Aoki et al (2007). Data source: Ministry of Finance Survey, 2003 and Nikkei.

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